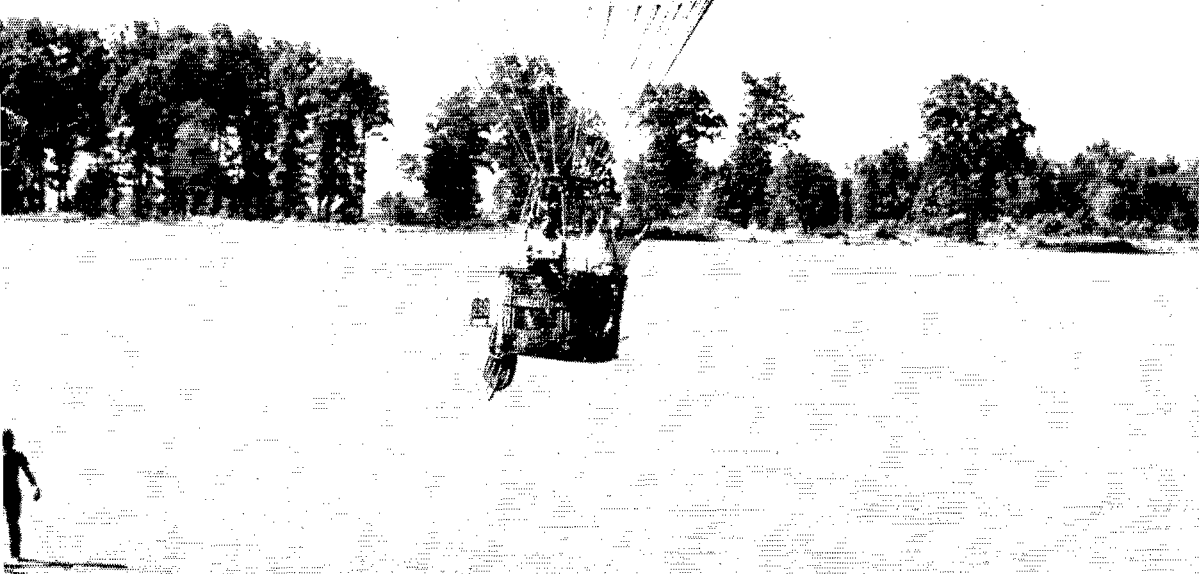


1959

QST

devoted entirely to

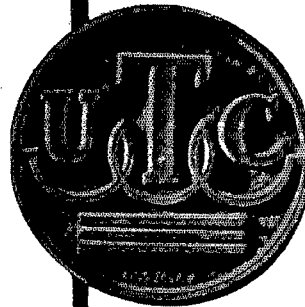
amateur radio



IN THIS ISSUE - DX CONTEST RESULTS

THE STANDARD OF COMPARISON FOR OVER 27 YEARS

HIGH FIDELITY TRANSFORMERS FROM STOCK



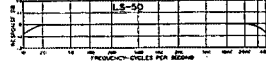
TYPICAL UNITS



LS-10X Shielded Input
Multiple line (50, 200, 250, 500/600, etc.) to 50,000 ohms ... multiple shielded.



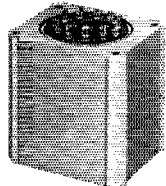
LS-19 Plate to Two Grids
Primary 15,000 ohms.
Secondary 95,000 ohms C.T.



LS-50 Plate to Line
15,000 ohms to multiple line ... +15 db. level.



LS-63 P.P. Plates to Voice Coil
Primary 10,000 C.T. and 6,000 C.T. suited to Williamson, M.F., ul-linear circuits.
Secondary 1.2, 2.5, 5, 7.5, 10, 15, 20, 30 ohms. 20 watts.



CASE LS-1 LS-2 LS-3
Length... 3 1/8" 4-7/16" 5-13/16"
Width... 2 3/8" 3 1/2" 5"
Height... 3 1/4" 4-3/16" 4-11/16"
Unit Wt. 3 lbs. 7.5 lbs. 15 lbs.



HIPERMALLOY series

This series provides virtually all the characteristics of the Linear Standard group in a more compact and lighter structure. The frequency response is within 1 db. from 30 to 20,000 cycles. Hipermalloy nickel iron cores and hum balanced core structures provide minimum distortion and low hum pickup. Input transformers, maximum level +10db. Circular terminal layout and top and bottom mounting.



HA-100X Shielded Input
Multiple line to 60,000 ohm grid ... tri-alloy shielding for low hum pickup.



HA-106 Plate to Two Grids
15,000 ohms to 135,000 ohms in two sections ... +12 db. level.



HA-113 Plate to Line
15,000 ohms to multiple line ... +12 db. level ... 0 DC in primary.

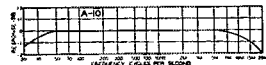


HA-133 Plate (DC) to Line
15,000 ohms to multiple line ... +15 db. level ... 8 Ma. DC in primary.



ULTRA COMPACT series

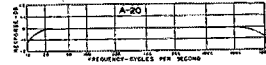
UTC Ultra Compact audio units are small and light in weight, ideally suited to remote amplifier and similar compact equipment. The frequency response is within 2 db. from 30 to 20,000 cycles. Hum balanced coil structure plus high conductivity die cast case provides good inductive shielding. Maximum operating level is +7db. Top and bottom mounting as well as circular terminal layout are used in this series as well as the ones described above.



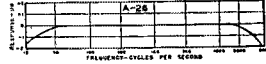
A-10 Line to Grid
Multiple line to 50,000 ohm grid.



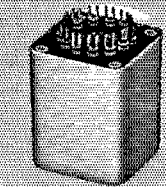
A-18 Plate to Two Grids.
15,000 ohms to 80,000 ohms, primary and secondary both split.



A-20 Mixing Transformer
Multiple line to multiple line for mixing mikes, lines, etc.



A-26 P.P. Plates to Line
30,000 ohms plate to plate, to multiple line.



A CASE
Length... 1 1/4"
Width... 1 1/4"
Height... 2 1/2"
Unit Weight... 3/4"



D-1 Line to Grid
Primary 50, 200/250, 500/600 ohms to 50,000 ohm grid.



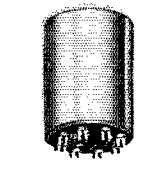
D-4 Plate to Two Grids
15,000 ohms to 95,000 ohms C.T.



D-8 Plate (DC) to Line
Primary 15,000 ohms, Secondary 50, 200/250, 500/600.



D-14 50:1 Line to Grid
Primary 200 ohms, Secondary .5 megohm for mike or line to grid.



DUNCER CASE
Diameter... 7/8"
Height... 1-3/16"
Unit Weight... 1 oz.

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that brings SSB within
reach of all...

HT-37



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You can judge — and own — the HT-37 now. Your distributor will soon have it on featured display.

Technical Details

VFO employs double reduction disc drive, fixed T.C. Sideband suppression 40 db. at 1000 CPS. Power rating: 70-100 watts P.E.P. output CW or SSB. 17-25 watts carrier on AM phone. Two 6146's in the final. 3rd and 5th order distortion prod-

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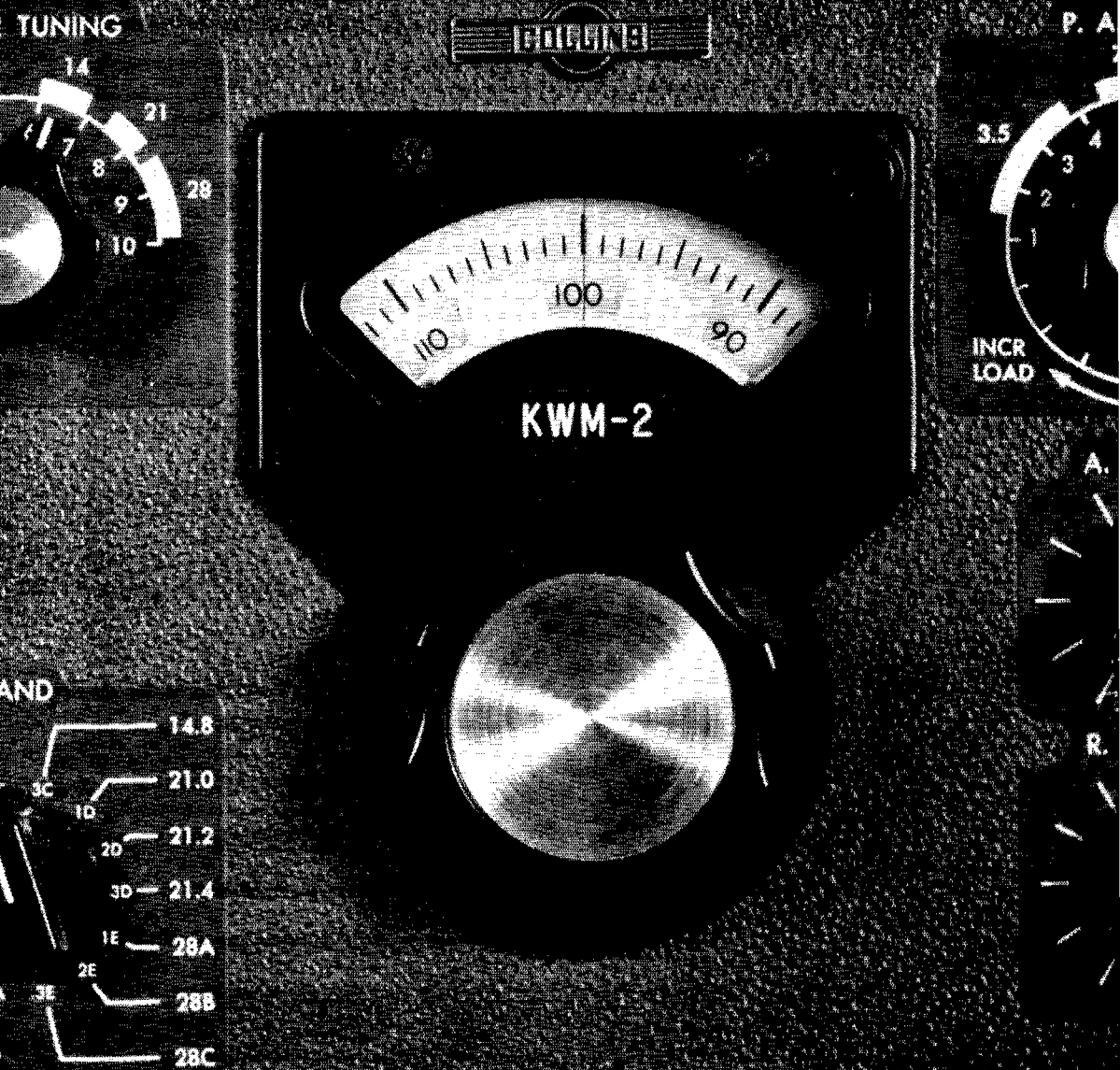
Chicago 24, Illinois

from Collins October 15

The KWM-2

mobile SSB transceiver

- covers 8-10 meters • upper or lower sideband, CW
- 175 watts PEP input • provision for external oscillator
- extended frequency coverage available



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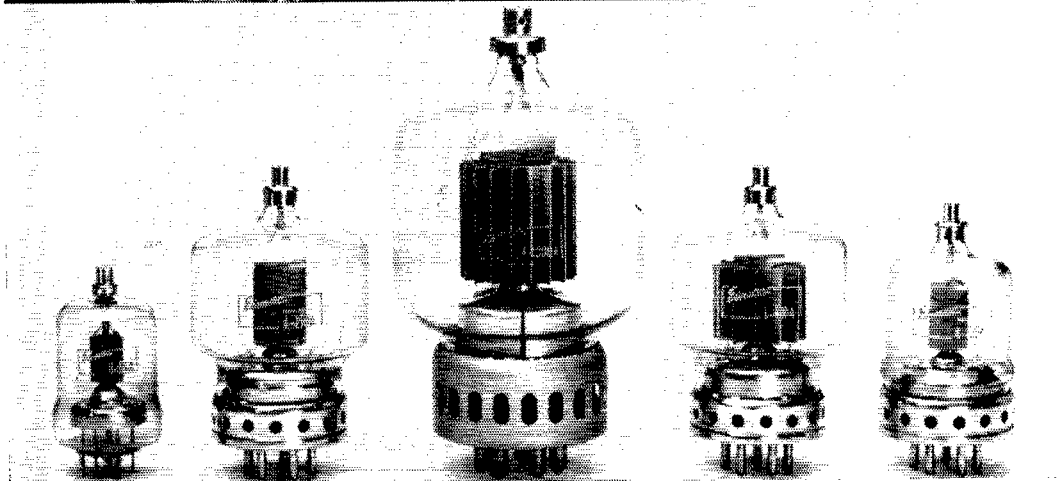
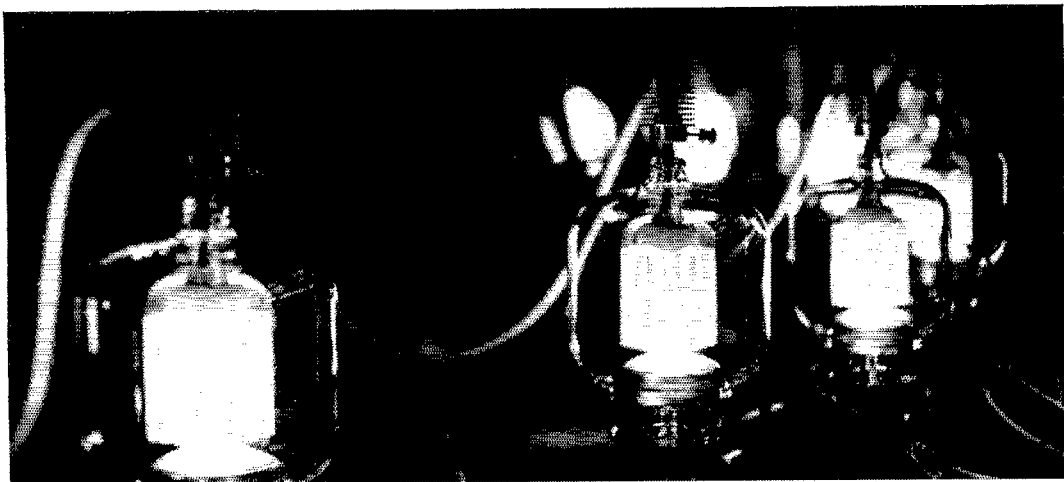
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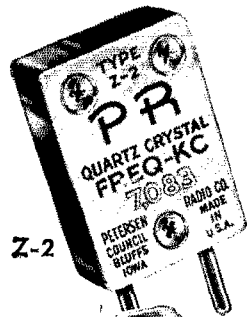
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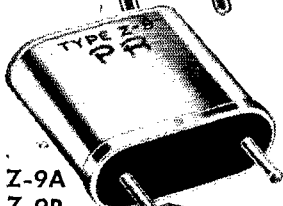
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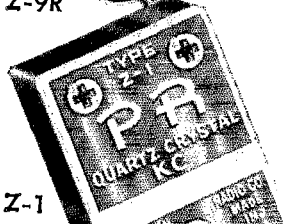
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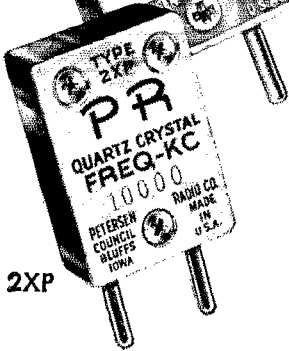
Z-2



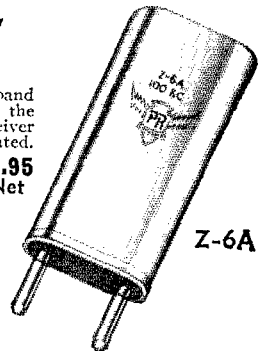
Z-9A
Z-9R



Z-1



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Z-6A

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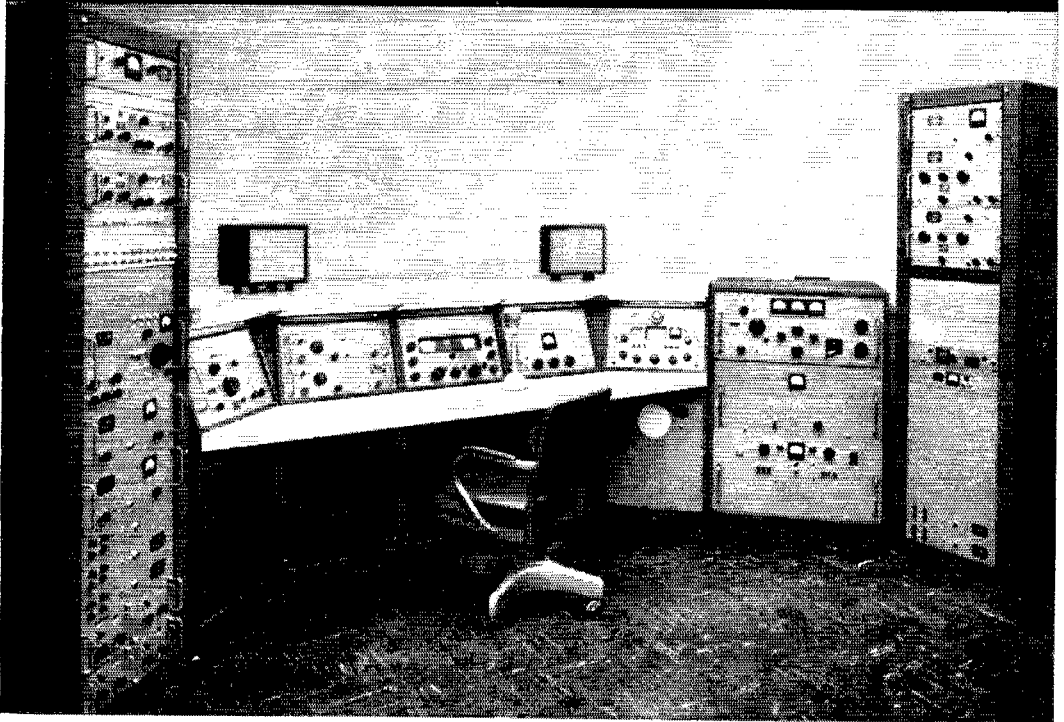
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"Of, by and for the amateur," it numbers within its ranks practically every worth-while amateur in the nation and has a history of glorious achievement as the standard-bearer in amateur affairs.

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"It Seems to Us..."

WHO DOES WHAT?

Who writes the comments of the American Radio Relay League which are filed in FCC dockets? Who decided to raise the dues recently? Who picks the material for *QST*? Who adds "countries" to the DXCC List? Who runs official League conventions? Who asks the FCC to change the rules for ham radio from time to time? Who are these people, and how did they get where they are?

Good questions, and representative of those asked or implied in letters, QSOs, club papers and personal conversations about the management of our organization. And no wonder — our ARRL has grown to be not only the largest ham group in the world, but we believe the largest hobby association of any kind. Every member naturally is concerned with how it operates and wants it to reflect his own views, interests and activities. All right, then, let us take time out from the technical articles and operating topics and explore the "Who does what" of ARRL.

First off, who's the big boss? You members! You elect from among the active amateurs in your division a member of the Board of Directors to serve you for a two-year term without pay. Before your director goes off to Hartford each May — indeed, all throughout the year — he tries to find out what you want from ham radio, and what changes in League procedure, FCC rules, the magazine, or what-have-you are necessary to keep you — collectively — happy. This opinion-seeking takes several forms: on-the-air conversations, meetings with volunteer leaders, visits to clubs, correspondence, perusal of your clubs' newspapers, and consultations with the elected Vice-Director, the assistant directors the director himself has appointed, and the elected SCMs.

At the same time, he is the League's representative in his division. The director helps to form new radio clubs and approves their applications for affiliation with the League. A club (or, often, a group of clubs) wishing to hold an official national, division or state convention first must secure the approval of the director, and then keep him informed on all convention plans. The "Directors' Letters" and auditors' statements he gets from headquarters at regular intervals all through the year help him to keep up-to-date on amateur matters.

Each May the Board of Directors meets in formal session. Every director has an opportunity to present motions or informal comments representing the views of his members on any current topic. Collectively, the directors review ARRL finances (as they did at the May meeting before deciding to raise the dues), the field of rulemaking, the operating organization, the state of the art — just anything that has any bearing on the ARRL or the hobby as a whole. Any change or new development in League policy must be decided upon by a majority of the Board, at the annual meeting if possible, or by mail vote at other times. The annual meeting, in even-numbered years, also elects the president, vice-presidents, secretary and treasurer who will serve in those offices for the following two years.

The Board also authorizes a number of committees — a housing committee, a membership and publications committee, a finance committee, the executive committee — which review current problems and formulate future plans in each of several fields. The Executive Committee especially deserves a bit of explanation. It is more-or-less a "watchdog group" which meets at least six times a year to see if there are matters the Board must rule on before they can meet again in person, and submits to the directors for mail vote resolutions dealing with any such problems. The Executive Committee also must make the final approval of applications for affiliation and applications to hold League conventions. It also must check — within the framework established by the Articles of Association and By-Laws — on the eligibility of candidates in elections for director and vice-director from half of the divisions each autumn. It also appoints the committee of tellers who must count the ballots in those divisions where there is more than one eligible candidate for either office.

Currently, there are three unpaid officers, three directors and three headquarters employees on the Executive Committee, but of the latter group only one — the General Manager — has a vote.

For matters concerned with on-the-air activities, the League is divided into 73 sections, each headed by an elected official known as the Section Communications Manager, or SCM for short. He appoints all other officials

(Please turn the page)

in his section — the Section Emergency Coordinator, the Phone Activities Managers, the Route Managers, the local or county Emergency Coordinators, the Official Observers and so forth.

Despite all this volunteer and elected personnel, there still remains much work calling for full-time specialists and clerical employees having a wide variety of skills. This is where your headquarters staff comes in, sixty-five strong, hired and headed-up by the General Manager (who in turn is appointed by the Board). Their duties include writing, editing, and the physical layout of the material which appears in *QST*, under the supervision of the staff editorial committee which includes the department heads and the assistant technical editors; the keeping of membership records; the development of new gear; contest planning and log-checking, under the staff contest committee headed by the Communications Manager; administration of the DX Century Club, also supervised by a staff committee (all members of which are DXCC members!) under the Communications Manager; operations of the Technical Information Service; public-relations work and a host of administrative and clerical functions much too numerous to recount here.

Members wanting to study the mechanisms of League organization more fully may write for a free copy of the Articles of Association and By-Laws. The Annual Report of the Officers and Directors is available at the cost price of 75 cents (while they last; because of limited demand in the past the print-order is small). The editorial in the July 1959 issue also contains important dope on ARRL, and those of you with a complete file of *QST* might want to read "The ARRL — Your Organization" by Kenneth B. Warner, *QST* for November, 1948.

But all of this work by volunteers, elected officials and employees has just one aim — to preserve and enrich amateur radio. As long as these amateurs continue to work together, and as long as the general membership keeps itself informed, and offers constructive support and constructive criticism to the leadership, the League and amateur radio will continue their traditions of public service and technical progress, with lots of personal enjoyment at the same time.

QST

COMING A.R.R.L. CONVENTIONS

October 3-4 — Roanoke Division, Richmond, Va.

October 16-17 — Ontario Province, London, Ontario.

ONTARIO PROVINCE CONVENTION London, Ontario — October 16-17

The London Amateur Radio Club will present the Ontario ARRL Convention, Friday night and Saturday, October 16-17. Convention Headquarters will be in the Hotel London.

Registration begins Friday night. A pre-convention party is also to be held the same evening. Registration continues again Saturday morning at 9:30.

Special speakers and technical talks will start at 2 P.M. and during this time, guided tours are being planned for YLs and XYLs.

The Convention Banquet is set for 7 P.M. Saturday. A Wouff Hong Initiation is to be held at midnight Saturday. Dick Roberts, VE3NG, Ontario SCM, is in charge of the ceremonies.

The Convention General Chairman, John Williams, VE3AAO, notes that it has been more than 30 years since a League convention has been held in London and the hope is to have some of the old timers at the convention to renew friendships. Hotel and convention registration forms were mailed out during August and the Convention committee asks that they be returned as soon as possible.

Registration, admission and banquet will be \$5.00. Convention registrations should be sent to the London Amateur Radio Club, Box 82, London, Ontario, Canada.



Alabama — The Auburn, Opelika, and Valley Amateur Radio Clubs will hold their annual ham picnic on Sunday, October 4, at Chewacha State Park, near Auburn. Bring your own picnic lunch. Drinks will be furnished. Tickets are \$1.00. For further information contact Ed Bailey, W4EVU, Route 2 Box 130, Auburn.

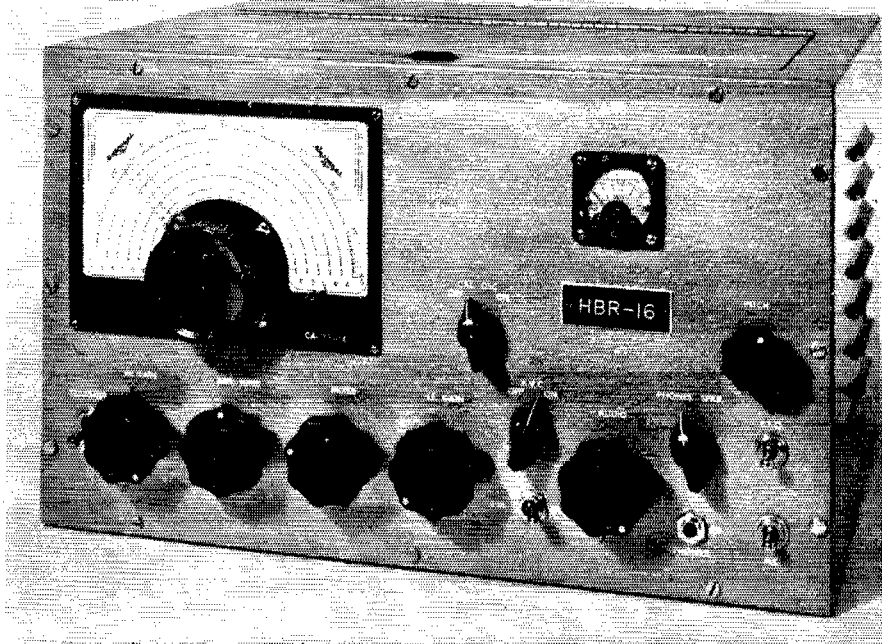
New York — The Syracuse VIII Club will sponsor the 5th annual v.h.f. roundup on Saturday, October 10, at 3 Rivers Inn, 10 miles north of Syracuse on Route 57 and Thruway exit number 38. Reservations are by pre-registration only, at \$5.50. Activities will begin at 1000. An excellent meal will be served, with professional entertainment, and a full program of events for both hams and wives.

Ohio — The Cleveland Area Council of Amateur Radio Clubs is sponsoring the second annual Cleveland Amateur-radio Convention on October 16 and 17 at the Manger Hotel, East 14th St. and Chester Ave. On the evening of the 16th there will be a number of group suppers and several hospitality shows sponsored by leading radio manufacturers and distributors. The main portion of the convention will start at 0800 on the 17th and will continue throughout the day. Technical talks, DX session, Novice meeting, and other forms of entertainment. The convention will wind up with an evening banquet in the Grand Ball Room. Registration is \$2.00 per person and banquet tickets are \$4.00. Hotel rooms may be reserved by writing the Manger Hotel. For convention registration and banquet tickets write the Cleveland Amateurradio Convention, Box 5167, Cleveland 1.

Texas — The Dallas Amateur Radio Club is holding its 8th annual hamfest on Sunday, October 11, at the State Fair of Texas. (This has been declared Eighth Annual Amateur Radio Day by the State Fair of Texas). Activities begin at 0800, while the main program will commence at 1500. Rain or shine, the hamfest will be held in the air-conditioned Margo Jones Theater at the fairgrounds. Monitoring frequencies, to zero you into this hamfest, will be 3.995 and 50.66 Mc. For pre-registration of only \$1.00, contact Bob Norris, W5KAS, 6815 Cornelia Lane, Dallas 14.

Texas — The second annual Fort Worth hamfest will be held on October 24 and 25. There will be transmitter hunts on 6, 10 and 75 meters. Big barbecue supper Saturday night, followed by informal entertainment until midnight. Registration is \$1.50, and the pre-registration date is October 1. Full info and registrations from Fort Worth Hamfest, P. O. Box 1925, Fort Worth.

The HBR-16 is smaller—9 by 15 by 11 inches—than its predecessor, but now includes a product detector and a number of circuit improvements. The compactness of the new design makes the receiver practical for a number of applications—mobile, for example—where the HBR-14 would have been unwieldy.



The HBR-16 Communications Receiver

The HBR-14 (July, 1957 QST) demonstrated beyond question that interest in the home construction of receivers was not extinct, as many had considered it to be, but simply was waiting to be stirred into action by a design that could be built by the ordinary amateur, and which promised enough in the way of superior results to make the undertaking worth while. This new version costs less and has even better performance. What further recommendation could it need?

*A Revision of the
HBR-14 — Smaller Size,
Improved Circuits*

BY TED CROSBY,* W6TC

THE JULY 1957 issue of *QST* carried an article entitled "Ham Band 14-Tube Double-Conversion Receiver", which described the homemade communications receiver I was using at that time. Seemingly, it was more or less what a sizable number of amateurs had been looking for—namely, some helpful advice as to how to go about building a high-performance receiver, one simple enough both electrically and mechanically so that the builder wouldn't have to be a genius in both fields in order to tackle it.

Over the past several months I have received numerous letters from successful builders, many of them located in the far corners of the globe. Predominately, these letters have been enthusiastic in content, it being not at all uncommon for them to contain some such statement as "My

* 10126 Colwell Drive, Sun Valley, Calif.

new HBR-14 has completely eclipsed my so-and-so, or such-and-such, commercially built receiver." In many instances the receiver referred to not only was a current production model, but a rather highly-regarded one as well. All of which is not to deny that there have also been a few failures; although every effort be made to keep such a multi-tube piece of gear as simple and straightforward as possible, there still will be some instances where the project should never have been attempted in the first place.

The New Version

In this day and age there is nothing so good that it is incapable of improvement. This most certainly was true of the HBR-14, and may also be said of the HBR-16, which I will attempt to describe in the present article. However, the

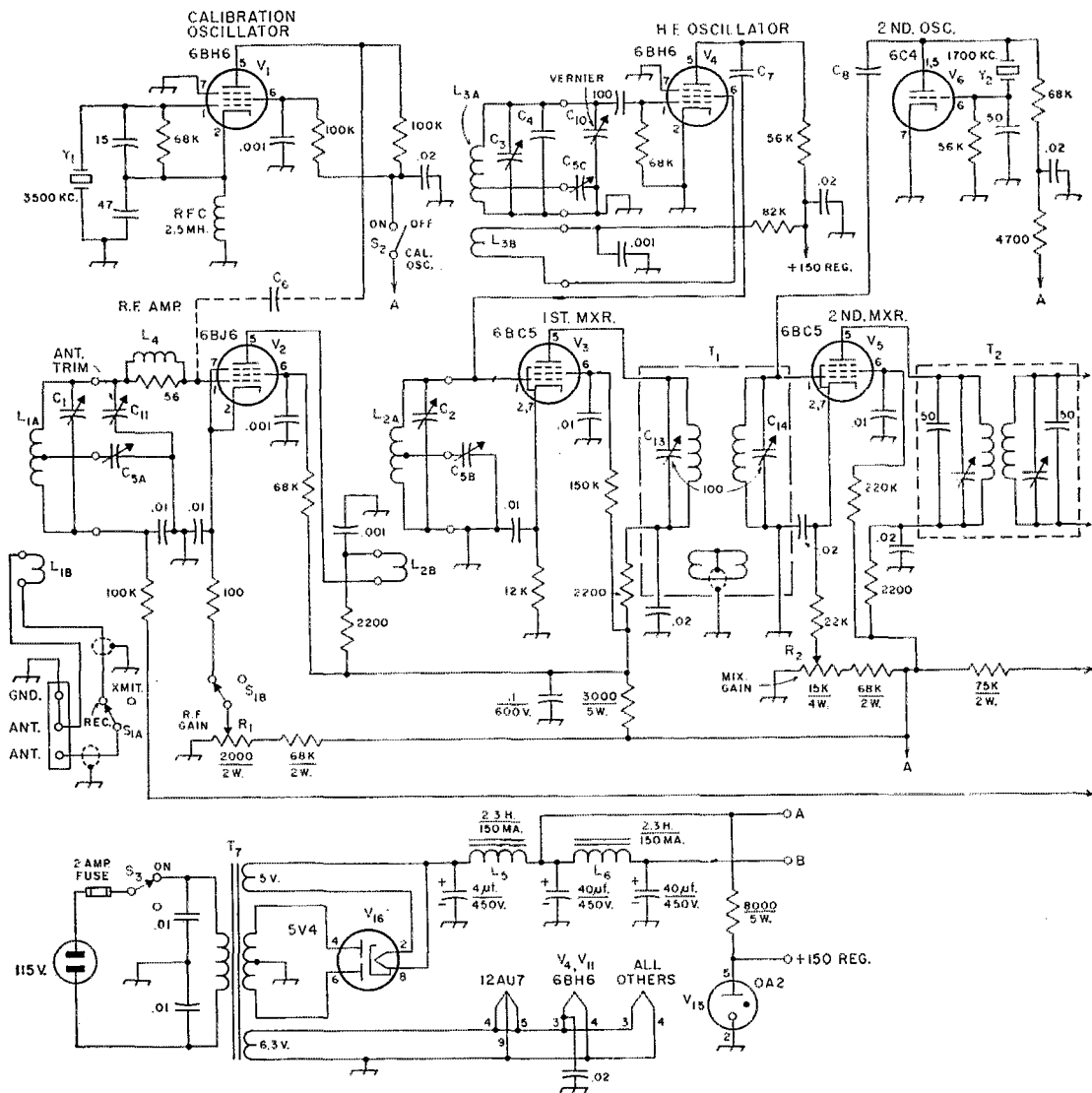


Fig. 1—Circuit diagram of the HBR-16 receiver. Unless otherwise specified, resistors are $\frac{1}{2}$ watt; 0.01- and 0.02- μ f. capacitors are disk ceramic, 600 volts; larger values are tubular paper; fixed capacitors below 0.01 are mica; capacitors with polarities marked are electrolytic. Components included in T_1 are shown inside dashed line.

C_1, C_2, C_3, C_4 —See Table I.

C_5 —3-section variable, 5-23 μ f. per section (Miller 1461).

C_6 —Short length of No. 18 in proximity to r.f. amplifier tuned circuit.

C_7 —"Gimmick" capacitor; two pieces of No. 18 plastic-covered wire twisted together for 3 to $3\frac{1}{2}$ turns.

C_8 —Same as C_7 , except 4 to $4\frac{1}{2}$ turns.

C_9 —Ceramic trimmer, 1.5-7 μ f. (Erie TS2A).

C_{10} —Variable, 1 or 2 μ f. max. capacitance (see text).

C_{11} —20- μ f. variable (Hammarlund MC-20S).

C_{12} —35- μ f. variable (Hammarlund MAPC-35B).

C_{13}, C_{14} —100 μ f. air padder (Hammarlund APC-100).

J_1, J_2 —Open-circuit jack.

J_3 —5-prong socket (Amphenol 78-PCG5).

L_1, L_2, L_3 —See Table I.

L_4 —3 turns No. 26, length $\frac{1}{4}$ inch, wound on 56-ohm

$\frac{1}{2}$ -watt composition resistor.

L_5, L_6 —2.3 henrys, 150 ma. (Stancor C-2304).

M_1 —0-1 d.c. milliammeter. (see text).

P_1 —5-prong plug (Amphenol 71-5S).

R_1 —2000-ohm 2-watt control, wire-wound.

R_2, R_3 —15,000-ohm 4-watt control, wire-wound.

R_4 —0.5-megohm control, audio taper.

R_5 —200-ohm, 2-watt control, wire-wound.

R_6 —5000-ohm, 4-watt control, wire-wound.

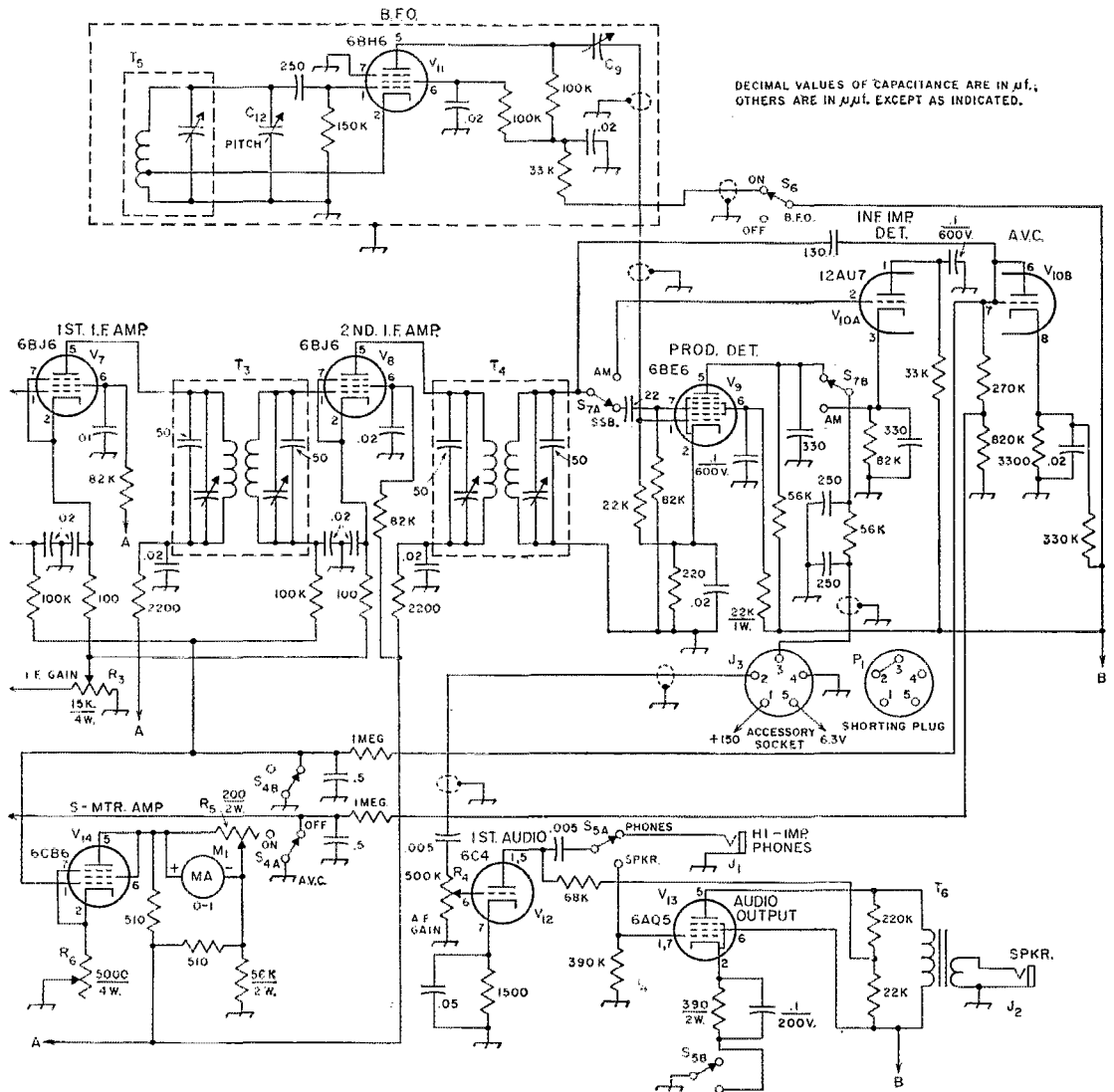
S_1 —D.p.s.t. toggle.

S_2, S_3, S_6 —S.p.s.t. toggle.

S_7, S_8 —Rotary, 2 poles, 2 positions, 1 section.

S_9 —D.p.d.t. toggle.

T_1 —Each tuned-circuit coil 90 turns No. 32 close-wound on $\frac{1}{8}$ -inch diam. polystyrene tube; link coils, 8 turns same, spaced $\frac{3}{16}$ to $\frac{3}{8}$ inch from tuned coil. Coupling between the two tuned-circuit coils is



through the links.

T₂, T₃, T₄—130-kc. iron-core i.f. transformers, input type, padded with 50- μ f. silver mica capacitors to resonate at approximately 100 kc. (Miller 612-M1).

T₅—130-kc. b.f.o. transformer (Miller 012-M5).

T₆—Output transformer, 5000—4 ohms (Stancor A-3877).

T₇—Power transformer, 540 volts c.t., 120 ma.; 5 volts, 3 amp.; 6.3 volts, 3.5 amp. (Stancor PC-8405).

latter receiver is noticeably better than its predecessor in many important respects, and again might prove to be just what the doctor ordered in many instances. It is about half the physical size of the former model, and can be built for considerably less. The cabinet, complete with panel, costs little more than the former panel alone. The Miller 612-M1 input-type i.f. transformers perform equally as well as the higher-priced transformers previously specified, for all

Y₁—3500 kc. (marker).

Y₂—1700 kc.

Major mechanical components:

Chassis, aluminum, 10 by 14 by 3 inches.

B.f.o. enclosure, 1½ by 2½ by 4 inches, channel-lock type (ICA 29400 or LMB 00).

Dial, National type SCN.

Cabinet, 15 inches wide, 9 inches high, 11 inches deep, with panel (Wyco CR-7725).

practical purposes, at only slightly more than one-third the cost — which is to be construed only as a compliment to the manufacturer's insistence on a quality product, regardless of the selling price.

As for the modified circuit, diagrammed in Fig. 1, it provides the following: 1) more effective over-all decoupling, which eliminates the instability some builders encountered, not only because of undesirable coupling within the receiver proper, but especially the coupling means pro-

vided by the impedance of the power supply; 2) b.f.o. injection of adjustable amplitude from an electron-coupled oscillator which is more stable than the original design; 3) better audio-frequency response from new detector-a.v.c.-audio circuitry which includes an infinite impedance detector for a.m. and a product-detector for s.s.b. and c.w.; and 4) last but most certainly not least, a rather unusual temperature-compensated high C -low L electron-coupled first oscillator which eliminates all signs of oscillator pulling and, in addition, makes possible an over-all receiver frequency stability which should please even the most critical s.s.b. devotee.

Obviously, any or all of these changes can be made in the original receiver. In my HBR-14, the 6BF6 product detector was mounted about one inch behind a 6SN7 infinite-impedance detector-a.v.c. diode tube which in turn replaced the 6SQ7. The 6C4 socket was mounted between the 6SN7 and 6V6 sockets. The d.p.d.t. detector change-over switch was mounted in the hole previously occupied by the calibration-oscillator off-on switch; the latter switch was remounted above the chassis in line with the a.v.c. off-on switch. The Erie ceramic variable, C_9 , was mounted inside the metal b.f.o. enclosure, directly behind C_{12} , and was suspended from the top of the chassis-box by a stand-off type of mounting consisting of two 4/40 screws running through $1/4$ inch lengths of metal tubing. A hole was drilled in the enclosure cover for subsequent screwdriver adjustment of this capacitor.

The foregoing should be all that is required to get you original HBR-14 builders "off and running". Have fun!

Newly interested readers are of necessity referred to both the original article and to some additional information which appeared in the February and April 1958 issues of *QST*.¹ The construction tips applicable to the HBR-14 apply equally well to the HBR-16.

Mechanical Features of the HBR-16

The HBR-16 chassis is mounted $1/2$ inch above the bottom edge of the front panel, to provide clearance for the $1/2$ inch flange which extends around the front of the cabinet. Two rubber feet approximately $1/2$ inch high are mounted on the rear bottom lip of the chassis, to support and stabilize the receiver assembly at that point. While the photographs do not show them, a series of $1/8$ inch holes was drilled around the upper edges of the sides and back of the chassis for ventilation, and another series of $3/8$ inch holes was drilled across the rear top edge and entire bottom of the cabinet for the same purpose. Holes in the cabinet rear wall for the antenna connections, speaker plug, accessory socket plug, and fuse holder were made with a 1-inch socket punch.

The $1/32$ -inch steel panel may seem rather too thin at first glance. However, once the receiver is completed and installed, the additional front-panel screws used, plus the cabinet's rigidity,

¹ Crosby, "Ham-Band 14-Tube Double-Conversion Receiver", *QST*, July, 1957.

Crosby, "Notes on the HBR-14 Receiver", *Technical Correspondence*, *QST*, February, 1958.

"Still More on the HBR-14", *Technical Correspondence*, *QST*, April, 1958.

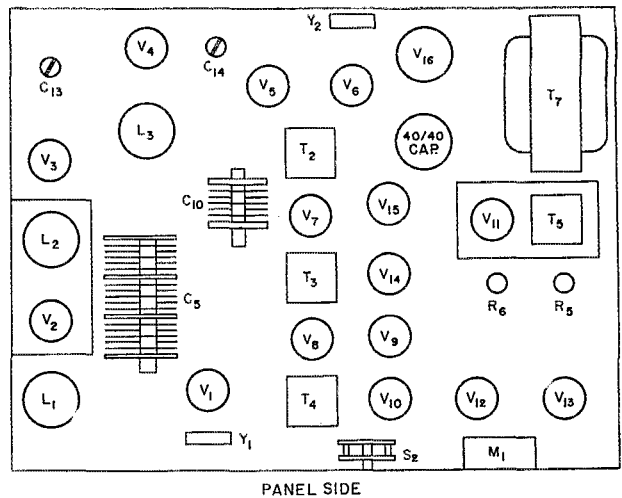
All three issues are available from the *QST* Circulation Department at 50¢ per copy. — *Editor*.

Table I
Tuned Circuit Data

All coils wound with enameled wire on $1/4$ -inch diameter polystyrene 5-pin plug-in forms (Amphenol 24-5P). Taps are counted from "cold" end of coil.
On "A" coils, turns should be evenly spaced to length specified; "B" coils are close-wound. "A" and "B" coils wound in same direction. See Fig. 3 for method of mounting capacitors.

3.5 Mc.	L_{1A} , L_{2A} : 27 turns No. 26, close-wound, then 2 turns spaced over $1/4$ inch, then $6\frac{1}{2}$ turns close-wound (total $35\frac{1}{2}$ turns); tapped at $28\frac{1}{4}$ turns.	L_{1B} : $10\frac{7}{8}$ turns No. 26 spaced $3/16$ inch from L_{1A} . L_{2B} : $11\frac{1}{8}$ turns No. 26 spaced $1/16$ inch from L_{2A} . L_{3B} : $11\frac{1}{4}$ turns No. 26 spaced $3/16$ inch from L_{3A} .	$7\frac{1}{4}$ turns. C_1 , C_2 : 50- μ mf. air padder. C_3 : 75- μ mf. air padder. C_4 : 250- μ mf. silver mica in parallel with 15- μ mf. N750 ceramic.	L_{3B} : $11\frac{7}{8}$ turns No. 26 spaced $1/4$ inch from L_{3A} .
	L_{3A} : $15\frac{1}{2}$ turns No. 22 close-wound; tapped at $15\frac{1}{4}$ turns. C_1 , C_2 : 50- μ mf. air padder. C_3 : 75- μ mf. air padder. C_4 : 5- μ mf. N750 ceramic.			
7 Mc.	L_{1A} , L_{2A} : $22\frac{1}{2}$ turns No. 22, length $1\frac{1}{16}$ inch, tapped at $9\frac{1}{4}$ turns. L_{3A} : $6\frac{1}{2}$ turns No. 22, length $3/4$ inch, tapped at $6\frac{1}{4}$ turns.	L_{1B} : $4\frac{7}{8}$ turns No. 26 spaced $1/16$ inch from L_{1A} . L_{2B} : $5\frac{7}{8}$ turns No. 26 spaced $3/8$ inch from L_{2A} . L_{3B} : $7\frac{7}{8}$ turns No. 26 spaced $1/4$ inch from L_{3A} .	C_1 , C_2 : 25- μ mf. air padder. C_3 : 75- μ mf. air padder. C_4 : 240- μ mf. silver mica in parallel with 15- μ mf. N750 ceramic.	L_{1B} : $5\frac{7}{8}$ turns No. 26 spaced $1/4$ inch from L_{1A} . L_{2B} : $4\frac{7}{8}$ turns No. 26 spaced $1/4$ inch from L_{2A} . L_{3B} : $9\frac{7}{8}$ turns No. 26 spaced $1/4$ inch from L_{3A} .
	C_1 , C_2 : 50- μ mf. air padder. C_3 : 75- μ mf. air padder. C_4 : 150 μ mf. silver mica in parallel with 10- μ mf. N750 ceramic.			
14 Mc.	L_{1A} , L_{2A} : $11\frac{1}{2}$ turns No. 22, length $1\frac{1}{16}$ inch, tapped at $3\frac{1}{4}$ turns. L_{3A} : $7\frac{1}{2}$ turns No. 22, length $5/8$ inch, tapped at	L_{1B} : $5\frac{7}{8}$ turns No. 26 spaced $1/16$ inch from L_{1A} . L_{2B} : $6\frac{7}{8}$ turns No. 26 spaced $3/8$ inch from L_{2A} .	L_{1A} , L_{2A} : $5\frac{1}{2}$ turns No. 22, length $1\frac{1}{16}$ inch, tapped at $2\frac{1}{4}$ turns. L_{3A} : $5\frac{1}{2}$ turns No. 22, length $5/8$ inch, tapped at $5\frac{1}{4}$ turns. C_1 , C_2 : 25- μ mf. air padder. C_3 : 50- μ mf. air padder. C_4 : 50- μ mf. silver mica in parallel with 5- μ mf. N750 ceramic.	L_{1B} : $4\frac{7}{8}$ turns No. 26 spaced $3/16$ inch from L_{1A} . L_{2B} : $3\frac{7}{8}$ turns No. 26 spaced $1/4$ inch from L_{2A} . L_{3B} : $8\frac{7}{8}$ turns No. 26 spaced $5/16$ inch from L_{3A} .
	C_1 , C_2 : 50- μ mf. air padder. C_3 : 75- μ mf. air padder. C_4 : 50- μ mf. silver mica in parallel with 10- μ mf. N750 ceramic.			

Fig. 2—Location of components on top of chassis.



provide an over-all mechanical stability which will stand up under the most vigorous of fist-pounding stability tests for which hams are so famous — provided, of course, that the builder hasn't come up with some rosin joints, poor-fitting tube, coil or crystal sockets, vibrating connecting wires (especially in the front end), and similar constructional faults.

Bakelite sockets were used for L_1 and L_2 because they were the only small-sized sockets on hand when I needed them. They have proved satisfactory at those points. In addition, bakelite tube sockets were used throughout the receiver, except for the first oscillator. Ceramic sockets must be used for both the first-oscillator tube and L_3 if satisfactory frequency stability is to be obtained.

In an attempt to simplify the construction even farther, if possible, the metal shield between the front end and the balance of the receiver was eliminated, as were many of the shielded-wire connections previously specified. The only shielded-wire connections now used are the three wires from the b.f.o. enclosure, the lead between the antenna input terminal and pin 1 of the L_1 socket, the line between the two 1600-ke. i.f. transformer links, and the rather long leads to and from the rear-mounted accessory socket.

The Miller 1461 tuning gang, C_5 , was secured to the chassis with three 6-32 studs approximately $\frac{3}{4}$ inch long. Threaded holes for these studs are provided by the manufacturer. A 6-32 nut tightened up against the capacitor frame locks the studs in position. Two additional 6-32 nuts on each stud — one above the chassis, the other below — not only provide for subsequent raising or lowering of the capacitor assembly, but in addition will lock it firmly in position when finally tightened.

As the Series 612 i.f. transformers are adjusted from the top of the shield can rather than from the side (as was the case with the models previously used) no valuable chassis space is

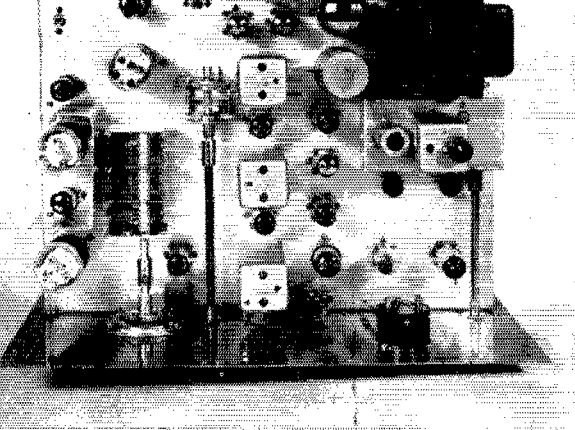
wasted on that account. This in the main explains the switch in the i.f. transformers. The 50- $\mu\mu\text{f}$. silver-mica fixed padders across the primaries and secondaries are mounted inside the transformer cans, in parallel with the variable trimmers. So modified, these transformers will be resonant at 100 ke., plus or minus a few kilocycles, as the trimmers are varied from minimum to maximum capacitance.

The all-miniature-tube line-up was necessary from an available-space standpoint, and also to keep within the $3\frac{1}{2}$ -ampere rating of the 6.3-volt filament winding on the power transformer specified. The receiver's performance is unchanged with this new tube line-up.

I suggest you proceed with caution when considering substitutions for any of the specified components, especially the power transformer and its companion filter chokes. Use something different and you may very well find that you simply do not have the room for it. The 2.3-henry 150-ma. filter chokes may seem too small for adequate filtering, but after having used this identical type choke in many receiver power supplies, I can assure you such is not the case, provided the filter capacitance values called for are used. At the approximately 100-ma. current drain of the HBR-16, these chokes are sufficiently underloaded so that the effective inductance is considerably higher than the rated value. With the 4- μf . input capacitance specified, the power supply voltage under load will be approximately 250 volts.

The 1600-ke. first-i.f. transformer, T_1 , is somewhat smaller than the one used in the HBR-14. Poly tubing (not rod) $\frac{3}{8}$ inch in diameter is used as the coil form. A suitable length of shielded wire is used as the connecting line between the two links, with the shield serving as the grounded side of the line. This transformer is resonant at 1600 ke. with the APC-100s at about three-quarters of maximum capacitance.

As you may have suspected, sticking 16 tubes



Top-of-chassis view of the receiver. Layout of components is given in Fig. 2. The calibrator on-off switch at lower center is specified as a single-pole toggle in Fig. 1 since such a switch will serve just as well as the more expensive rotary shown here.

plus the necessary accompaniment of parts into such a relatively small space does present some problems. However, if a little forethought is given to the wiring job, no particular difficulties should be encountered. Just be certain you do not get ahead of yourself to the point of leaving out a connection you will later find you cannot make because it is covered up by some other equally important connection or component. You will have room for everything provided you make good use of the available "vertical" space. Resistors and capacitors, for the most part, should be mounted in a vertical position. Obviously, a small-tipped soldering-iron is a "must". Do not use the two ends of the chassis for parts-mounting purposes. To do so would interfere with inserting and removing the chassis from the cabinet.

Tuned Circuits

The Miller people recently redesigned their No. 1461 variable capacitor, making it smaller and more rugged in the process. Unfortunately, the capacitance per section now is 2 or 3 μmf . less than in the earlier design. This necessitated a slight change in the L_1 , L_2 and L_3 coils for proper coverage of the various bands. The data in Table I are correct for the new 1461. Some slight manipulation to increase the secondary turn spacings will be required if these coils are used with the original 1461; otherwise, the band coverage will be slightly more than required.

Because of some mix-up at the factory, the printed literature enclosed with the new 1461 states that the capacitance is "3 to 16 per section". Don't you believe it. A special check by Mr. Bill Courtney, KGGEK, Miller's chief engineer, showed the actual capacitance to be 5.6 to 23 μmf . per section. Many of us, including Mr. Courtney, hope these misleading data sheets will be corrected eventually. Confusing, to say the least.

The high- C electron-coupled first oscillator and the way in which it is used are rather unconventional and probably rate some comment. On both 40 and 80 meters, the oscillator operates on its fundamental frequency, this being approximately 1600 kc. higher than the actual received signal frequency. Fundamental operation on the high side of the signal was used with all of the

original HBR-14 h.f. oscillator coils. For example, for proper mixing with an off-the-air signal of 7000 kc., a first-oscillator fundamental frequency of 8600 kc. is used. The C/L ratio of the new 40- and 80-meter L_3 coils is such that a high degree of first-oscillator stability is achieved with such an arrangement.

Unfortunately, optimum first-oscillator stability on the 10-, 15-, and 20-meter bands isn't obtained quite so simply. A satisfactory solution was finally arrived at in the following way: The new L_3 coils for the three higher-frequency bands are so designed that not only does the first oscillator operate on the low side of the actual signal frequency but, in addition, the oscillator's fundamental frequency is exactly one half of the required mixing frequency; that is, the mixing frequency is the second harmonic of the oscillator. For example, the 1600-ke. beat with an off-the-air-signal of 14,000 kc. is obtained by mixing with the 12,400-ke. second harmonic of the first oscillator, which actually is operating on a fundamental frequency of 6200 kc. This method makes it possible to use a relatively large oscillator tank capacitance on 10, 15, and 20 meters, and is of considerable help insofar as first-oscillator stability is concerned.

Some of you may raise an eyebrow at this rather unusual harmonic method of operation, but don't let it bother you too much. Months of use in my own receivers, as well as in a number of others, have proved the soundness of this arrangement from any angle you might care to mention.

The L/C ratio in the original HBR-14 oscillator was sufficiently high so that the coils could be duplicated in a more-or-less haphazard fashion, and still be tuned to the required frequency. The new L_3 coils will not stand still for such sloppy construction practices. Not only must they be tightly wound, but the over-all length (turns spacing) of the "A" windings must be very close to the specified dimensions. Otherwise, the inductance will have been altered to the point where the rather small ratio of variable to fixed capacitance provided by the APC bandset capacitor will not be sufficient to tune the coils to the desired frequency.

Some of you may wonder why I didn't relieve this situation somewhat by using a larger vari-

able capacitance, with a correspondingly smaller fixed capacitance across the coils. Such a combination was tried, with rather disappointing results. First, the larger APC condenser extends down inside the coil form to such an extent that the effective inductance and Q of the secondary are seriously affected. Second, I discovered not all APC-type variables are as good electrically as I previously may have considered them to be. Numerous L_3 experiments here have proved that, generally speaking, the smaller the variable padder the better, insofar as first-oscillator stability is concerned. I have had to replace two or three APC's because the first-oscillator frequency drift, usually in a negative direction, was so hopelessly rapid and of such magnitude that it would have been impossible to correct it by other means. Replacing the APC invariably cured this trouble. In no instance was the abnormal drift caused by a defective silver-mica/N750 ceramic fixed-padder combination. For satisfactory results the APC's must be made of brass, rather than aluminum. Hammarlund APC's are so constructed and are recommended, although surplus APC's made of silver-plated brass still are available and most certainly can be used if you have them.

Do not attempt to substitute so-called "zero-temp." ceramic fixed capacitors for the specified silver-micas in these fixed-padder combinations. Experiments here quickly showed that such capacitors actually are so "negative" in characteristics, in this application at least, they simply cannot be used. Fig. 3 shows the proper method of mounting the fixed padders in the L_3 coil forms.

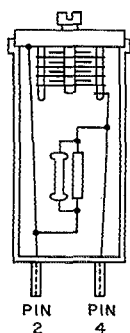


Fig. 3—Mounting arrangement for air padders (C_1 , C_2 , C_3) and fixed padder capacitors (C_4) in coil forms.

The N750 capacitances specified are those used in my own receivers, and should prove substantially correct for the average HBR as well. Larger or smaller values can be substituted should some particular receiver show a need for more close compensation. Receiver drift in the positive direction—indicated by the tuning dial's having to be moved toward a lesser-capacitance setting to maintain frequency—is rectified by increasing the amount of N750 capacitance used. Negative drift is indicated and corrected by the reverse procedure.

A crystal on exactly 1700 kc. in the second oscillator is not mandatory. Any frequency between 1600 and 1710 kc. can be substituted. But, regardless of frequency, the crystal must be a good one. A sluggish crystal at this point will seriously impair the over-all gain of the receiver.

The oscillator-injection requirements of the 6BC5 and the previously-used 6AH6 mixers are quite similar. I would suggest 4 to $4\frac{1}{2}$ turns of No. 18 plastic-covered solid wire for C_7 , and $3\frac{1}{2}$ to 4 turns for C_8 . Never forget that the heart of the HBR's performance is in the front end. A bit of experimenting not only with oscillator injection but in the L_{1A} - L_{1B} and L_{2A} - L_{2B} spacings as well, will pay handsome dividends. The results of any change can be determined by before-and-after S-meter readings. Naturally, all of the receiver gain-control settings must remain unchanged during such experimenting if the S-meter readings are to mean anything. By using the receiver's calibration oscillator as the signal generator for such tests the input to the receiver will remain constant.

In my case no additional fixed padder across the 012-M5 b.f.o. coil, T_5 , was required; the manufacturer's built-in variable capacitance plus the additional pitch-control capacitance was sufficiently large.

The parasitic suppressor, L_4 , in the 6BJ6 r.f. stage grid is there as a precautionary measure only. I have never had any parasitic problems at this point, but my correspondence seems to indicate there may have been others who were not quite so fortunate. In any case, the suppressor does not affect the normal operation of the r.f. stage, so it was installed and forgotten.

A choice of S-meter response characteristics is available in the HBR-16. The triode-connected 6CB6 specified gives S-meter readings quite in line with today's accepted standards. However, a 6AK5 can be substituted for a stingy response, while a 6BC5 can be used should your tastes run to the "40 over S9" type of report. These three tubes are interchangeable as wired; the cathode bias control (R_6) "zero" adjustment being the only thing that need be touched when the tubes are changed. The reason for the difference in response is of course the difference in amplification with the three triode-connected pentodes.

The 0-1 milliammeter in the S-meter circuit must be of the D'Arsonval type; otherwise the internal resistance will be too high for the S-meter circuit to be operative. The miniature Lafayette S meter (0-1 movement) used in the HBR-16 has an internal resistance slightly higher than that of the average D'Arsonval-type meter, which explains the 200-ohm shunting resistor now called for in the S-meter circuit.

The frequency stability of the HBR-16 is such that the 10- μ mf. variable formerly used for calibration correction is now relatively unimportant. The dial calibration remains essentially unchanged on any band, whether the receiver be

hot or cold. This being so, the capacitance has been changed to about 1 or 2 $\mu\text{f.}$ maximum, and if this control has any real use in the present scheme of things, it is as a vernier adjustment for the first oscillator, useful in s.s.b. tuning.

With the 6BE6 product detector as used in the HBR-16, the b.f.o. injection does not affect the functioning of the a.v.c. system of the receiver. Therefore, a.v.c. can be used on both s.s.b. and c.w. provided the various gain controls are sufficiently advanced to cause incoming signals to actuate the S meter.

Alignment

The alignment procedure described in the original article will apply equally well to the HBR-16. The i.f. transformer padders should be screwed down to the maximum-capacitance setting and then backed off about one third of a turn, prior to beginning. This will pre-tune all the transformers to substantially the same frequency (about 100 kc.) and allow for subsequent capacitance adjustments in either direction during the final peaking process.

The tuning gang, C_5 , should be set near maximum capacitance (about "2" on the tuning dial scale) before adjusting the APC bandset condensers, C_1 , C_2 , and C_3 , for the lower edges of the bands. Complete bandspread is more readily achieved by doing this.

The r.f. section is in the right-hand area of the chassis in this bottom view, with the r.f. amplifier at the bottom, mixer in the center, and h.f. oscillator at the top. The input coil and associated capacitor, C_{13} , of the 1600-kc. transformer, T_1 , are in the upper right corner. The output coil and capacitor are at top center in this picture, near the second-mixer socket. Filter chokes are at the upper left, and the audio output transformer is mounted at the center of the left side. Wiring associated with the various stages can be identified with the help of the top-of-chassis layout, Fig. 2.

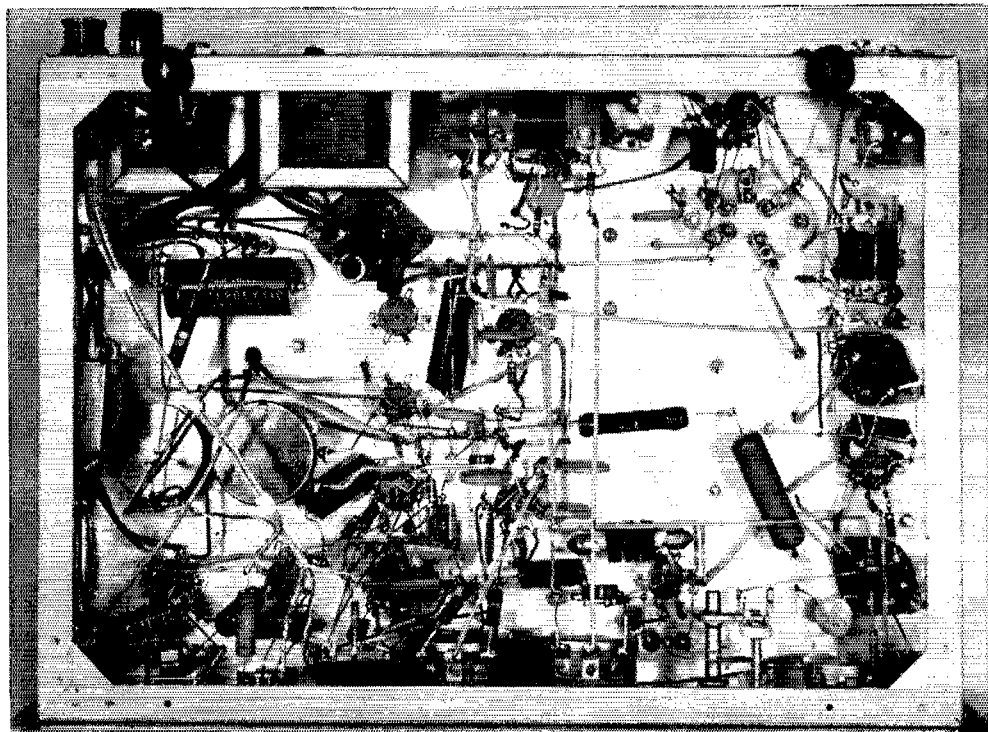
Components along the panel edge (at bottom) are, left to right, the b.f.o. and a.c. switches, phone jack and phonespeaker switch, audio gain control, a.m.-s.s.b. switch, i.f. gain control, mixer gain control, antenna-trimmer, r.f. gain control, and send-receive switch.

In Conclusion

This time, anticipating a repetition of what happened with the HBR-14, drawn-to-scale blueprints of the panel and chassis layouts will be available, also 8 by 10 glossy prints of the photographs accompanying this article, together with additional mimeographed hints and kinks for which there simply is not enough room in the pages of *QST*. A stamped envelope to me will bring further details.

In closing, may I paraphrase what I wrote in the original article: "As an all-around receiver for a.m., s.s.b. or c.w., the HBR-16 will give an excellent account of itself, in any situation, and in any company". This is even more true today than when it was originally written. My doors are always open to any of you who might want to sit in for a personal demonstration. And remember, you do not necessarily have to be a "whiz" at such things, should you decide you would like to build the HBR-16. It still is as simple and straightforward in design as a worthwhile receiver could possibly be.

I wish to thank K8EML, W1MUZ, W5DRW, VE3DOD, K6AOV, W6ERC and Mr. Bob Eckart, 6430 Lakewood Ave., Dallas, Texas for their enthusiastic co-operation and help over the past many months. If these HBR articles have accomplished something in the way of renewing interest in building your own communications receiver, these gentlemen most certainly deserve a major portion of the credit. QST



The 6DQ5 — the latest of a series of tubes of increasingly higher performance in wide-angle TV sweep circuits — takes a relatively tremendous plate current at zero grid bias, and with only 150 volts on the screen. This offers the possibility of obtaining high power output at comparatively low plate voltage, a possibility investigated by the authors and reported in this article. Conclusion: The 6DQ5 has a lot to offer as an s.s.b. linear amplifier.

Linearity and Power Output with a New TV Sweep Tube

The 6DQ5 as a Linear Amplifier

BY O. E. GARDNER,* W9RWZ AND J. D. GOOCH,* W9YRV

IN considering a tube type for use as the output linear amplifier of a mobile s.s.b. transmitter, tests were made on the 6DQ5, a new receiving type designed for horizontal amplifier service in color TV receivers.¹ Published curves show that a high peak plate current of 700 ma. flows at the time the instantaneous plate voltage swings down to 50 volts across the tube. This operation occurs without driving the grid positive and for a screen voltage of only 150 volts. Large plate voltage swings give high efficiency,² and large peak plate currents give high output power. The grid maintains good control of plate current down nearly to cutoff, which suggests that linearity can be obtained with a fairly small no-signal plate current, lowering the average d.c. power requirement. To verify these facts a graphical analysis was made to give operating values and computed linearity. These values were used for an experimental breadboard.

Linear Amplifier Requirements

Occasional speech peak powers are so much greater than average speech power that something akin to a radar pulse operation is desired. These peaks are not too important in "getting the message through" but cannot be easily clipped³ without causing splattering in sideband. For this reason a TV deflection tube designed for pulse service without the grid driven positive performs well. If properly designed Class AB₂ operation is used peaks are not clipped as the grid is driven further positive, but large drive power is required to drive the grids positive.

* c/o Control Systems Laboratory, University of Illinois, Urbana, Illinois.

¹ The manufacturer voiced no disapproval of this particular use of the tube, but the tube warranty does not include such experimental use.

² R. L. Norton, "Transmitting Tubes for Linear Amplifier Service," available from Penta Labs., Inc., Santa Barbara, California. This paper discusses tube requirements for efficient linear output. The 6DQ5 is an example of an efficient type.

³ Phil J. Ferrell, "Constant Amplitude Speech," *I.R.E. National Convention Record 1958*, Part 8, p. 190.

Puckett has described this for grounded-grid operation.⁴

In general, Class AB₁ amplifiers are limited in power output to the amplitude achieved when the grid is driven up to zero bias, while Class AB₂ amplifiers are limited in power output by heat dissipated in the plate at large inputs or simply by running out of grid power from the driver.

If flat-topping is allowed to occur only a small percentage of the time the average speech power is small compared with the peaks⁵ and, hence, on the average the tube dissipation is not too much larger than the no-signal dissipation. For this reason our amplifier is operated at rated plate dissipation under no-signal conditions, and the low average power of speech prevents exceeding the rated plate dissipation too much. If precautions during tune-up are observed and sustained whistling is avoided, good tube life can be expected, especially in mobile service.

Comparable peak power output from a tube such as a 6146 cannot be obtained by running it above its ratings on peaks unless a plate voltage several times maximum rated is used. Such mobile supplies are uncommon, and the 6146 would be continuously overloaded voltage-wise. The 6DQ5 is overloaded plate-current-wise, but during speech duty cycles only. Higher screen voltages are unsatisfactory because grid operation is then largely in the remote cutoff region, where there is diminishing control over plate current. This introduces large distortion in the cross-over region of the two-tone test, and appears as pronounced concavity in the trapezoidal linearity pattern.

Since similar considerations hold for audio-frequency amplifiers it appears that a 200-watt Class AB₁ modulator for a.m. (pardon the expression!) could be built using a pair of 6DQ5s

⁴ Puckett, "Notes on Grounded-Grid R.F. Amplifiers," *QST*, December, 1954.

⁵ H. Magnuski and W. Firestone, "Comparison of SSB and FM for VHF Mobile Service," *Proc. IRE*, December, 1956, p. 1834. This paper shows that for 2 per cent flat-topping speech, the r.m.s. power is $\frac{1}{3}$ of p.e.p.

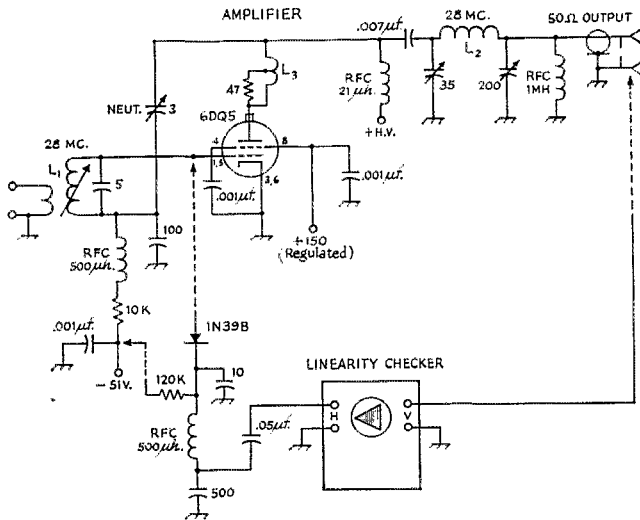


Fig. 1—Circuit diagram of the experimental linear amplifier and set-up for checking linearity. Capacitances are in μf , unless otherwise specified.
 L_1 —1 μh , with 2-turn link.
 L_2 —1 μh , (6 turns No. 16 spaced wire diam. on 1/2-inch form).
 L_3 —5 turns No. 20, tapped at center, wound on 47-ohm 1-watt resistor.

and would require only a small voltage-amplifier tube as a driver, with no driver transformer.

Linear Amplifier Construction

An amplifier was built using the circuit shown in Fig. 1 to operate at 29 Mc. Bruene capacitance-bridge neutralization and a pi-network output circuit were used. A regulated screen voltage must be furnished but since the maximum screen current required is about 8 ma, a VR tube is ideal. A variable bias supply was used, but series-connected dry batteries can be substituted since no current is drawn from them. The heater requires 6.3 volts at 2.5 amperes.

In resonating the grid and plate coils the unusually large tube input capacitance of 23 μf , and output capacitance of 11 μf , should be taken into consideration. A plate tank Q of 12 was obtained by using the plate tuning capaci-

tance per meter of wavelength shown in Table I, multiplying it by the wavelength in meters of the band on which operation is planned and subtracting 11 μf for tube capacitance. The coil that resonates with this value of capacitance gives the correct L/C ratio for a Q of 12.

The parasitic suppressor data also are given in Fig. 1. With this design the plate parasitic suppressed in our circuit was at 130 Mc., so TVI should not be much of a problem.⁶ This relatively high frequency attests to the low-inductance leads of the tube when the double pin connections to screen, cathode, and grid are used.

Since we measured 80 watts output with less than 0.4 watt driving power it is fairly obvious that good shielding between the grid and plate circuits is necessary. We did this by keeping all

⁶ Grammer, "V.H.F. Parasitics in Beam Tetrodes," *QST*, August, 1952.

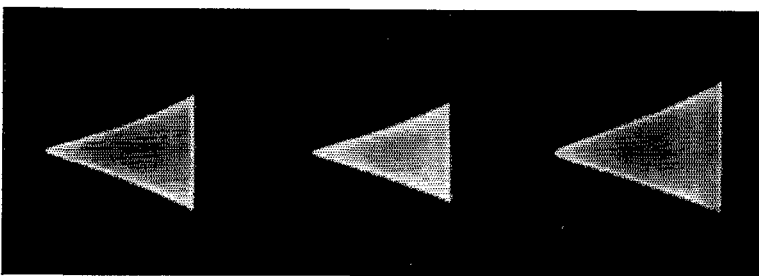


Fig. 2—Oscilloscope patterns showing linearity. Conditions for A, left, and B, center, as follows:

	A	B	Max.-signal plate current (single tone)	A	B
Plate voltage	700	500 volts		190	185 ma.
Screen voltage	150	150 volts (regulated)	Max.-signal screen current	5	8 ma.
Grid voltage	-51	-46 volts	Power output	80	53 watts p.e.p.
Zero-signal plate current	35	48 ma.	Frequency	29	29 Mc.

The pattern at C, right, taken by applying the same signal to both input terminals of the test circuit, shows the linearity of the test circuit alone, for comparison with the amplifier patterns at A and B. An ideal amplifier would give exactly the same pattern as C.

Table I

	Calculated Values ¹		Measured Values ²		
	700	500	700	500	volts
Plate Voltage	700	500	700	500	volts
Screen Voltage	150	150	150	150	volts
Plate Current (zero sig.)	35	48	35	48	ma.
Bias Voltage	-54	-49	-51	-46	volts
Plate Current (single tone) ma.	194	218	190	185	ma.
Screen Current (single tone) ma.	—	—	5	8	ma.
Input D.C. Watts (single tone)	136	109	133	93	watts
Output Power Watts (single tone)	101	71	80	53	watts
Tube Load Resistance	2080	1430	2000	1430	ohms
Plate Tuning Capacitance $\mu\mu\text{f.}/\text{Meter}$ of Wavelength ³	3.3	4.6	3.3	4.6	
Efficiency	74	65	60	57	per cent

¹ These are calculated values. The calculated outputs must be decreased by 10 per cent or so, depending on circuit losses, to get realizable output.

² These are measured experimental values at 29 Mc.

³ For a Q of 12, make plate tuning capacitance in circuit equal to this value times wavelength in meters of band operated, minus 11 $\mu\mu\text{f.}$ of tube output capacitance. For example, on 20 meters, with plate voltage of 500, plate capacitance is $20 \times 4.6 - 11 = 81 \mu\mu\text{f.}$

the plate circuit, including the neutralizing capacitor, above the chassis and the grid circuit below.

Amplifier Operation

The tube was neutralized by putting a signal into the plate output terminals and adjusting for a null at the grid input side. Then the voltages were applied and the bias was adjusted to give 35 ma. static plate current with 700 volts on the plate. The required bias varied by a volt or two on different tubes tried. At this point the bias was decreased for an instant to cause 200 ma. plate current and the circuit checked for any parasitic output. Expected troubles associated with higher-capacitance tubes were nonexistent, and the ease of obtaining stable operation was a pleasant surprise. In fact, the parasitic suppresser was removed and only a very weak parasitic oscillation was present. This, however, was a single-band amplifier and more troubles would be expected in a band-switching design.

Drive was applied and loading increased until maximum output was obtained with drive just short of grid current. If loading is not sufficiently heavy the screen current will be higher than optimum. The output was quickly measured under these single-tone conditions by an r.f. voltmeter across the 50-ohm load and an output of 80 watts was indicated. The input was 190 ma. at 700 volts or 133 watts. This is 53 watts plate dissipation in a tube rated at 24 watts, so the precautions necessary at tune-up can be appreciated. The over-all efficiency was 60 per cent. Higher efficiency is difficult to attain at 29 Mc. without more specialized components. Circuit losses generally go up with frequency, so an output closer to the calculated 101 watts should be obtained on the lower frequency bands.

In consideration of the commonly available

mobile plate supplies the circuit was then operated at a plate voltage of 500. An output of 53 watts was measured under the conditions shown in Table I. The grid drive was measured and appeared to be less than 0.4 watt.

A 6146 was placed in the circuit, and the screen voltage raised to 200 volts. The 6DQ5 produced a power output about double that of the 6146.

Linearity Measurements

A modulated drive was next substituted for the single-tone drive and the 1N39B diode envelope detector was connected to the 6DQ5 grid as shown in Fig. 1. The photograph of Fig. 2A shows the linearity with 700 volts on the plate and 80 watts p.e.p. output, while Fig. 2B shows the linearity for 500 volts on the plate and 53 watts p.e.p. output. The photo of Fig. 2C was made without the amplifier, thus giving a check on the linearity of the measuring circuit.

Calculations and Measurements Compared

Table I shows the calculated operating conditions for 700- and 500-volt plate supplies. The calculated power outputs of 101 and 71 watts do not include circuit losses. The last two columns show measured operating values and measured power outputs including circuit losses at 29 Mc. On lower frequencies, measured power outputs closer to the calculated values should be obtained since circuit losses are smaller.

Tube handbook curves for a screen voltage of 150 were replotted as constant current curves, and are shown in Fig. 3. Operating conditions and power outputs for plate voltages of 700 and 500 were computed using the Eimac Computer aid.⁷ Also, a linearity curve, shown in Fig. 4, was computed by taking various grid drive voltages

⁷ Fitel-McCullough, Inc., San Carlos, California, "Tube Performance Computer," Applications Bulletin No. 5.

Fig. 3—Constant-current curves for the 6DQ5. This set of curves was constructed from the published plate family of curves for the tube.

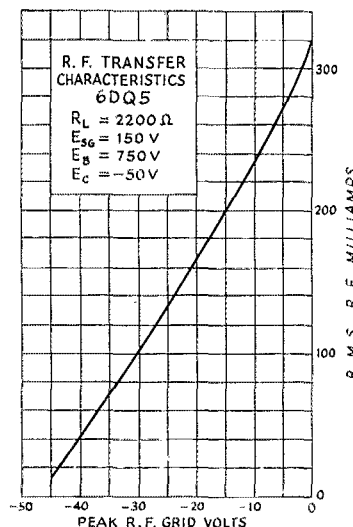
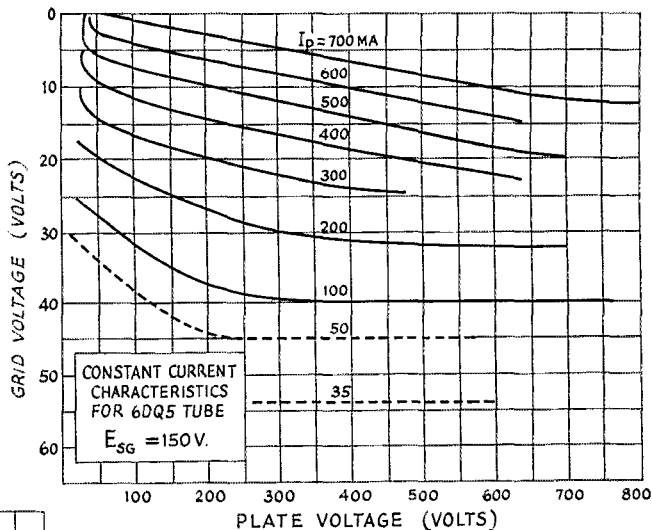


Fig. 4—Transfer characteristic of the 6DQ5 as a linear r.f. amplifier, based on data obtained from the experimental 29-Mc. set-up.

and computing r.f. output amplitudes for each drive level.

Summary

As a Class AB₁ linear amplifier, the 6DQ5 produces about twice as much power output as a 6146 at similar linearity and with similar plate voltage. Sizeable p.e.p. output of 53 to 80 watts can be obtained with one tube and a 500- to 700-volt mobile plate supply. The grid-drive requirement on 29 Mc. was less than 0.4 watt. The tube dissipation is exceeded during talk periods, but the compactness, large output, and low drive power are attractive for mobile use. Exceeding dissipation, as proposed, is not only believed justifiable because of the low duty cycle of speech but is even more tolerable in mobile use because of shorter periods of operation. Measured linearity is fairly good; rough calculations give 25 db. suppression of spurious products in the unwanted sideband, and the large peak-power capability tends to minimize flat-topping and the splatter it causes. As a final advantage, the 6DQ5 costs less than the 6146.

QST



Here is the October schedule for the Western MARS Technical Net.

AF-MARS Western

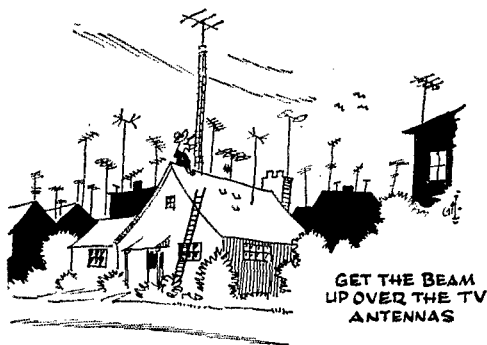
(Sundays 1400 local time, 7832.5 & 295, 143.460 kc.)

- Oct. 4 — Bowdoin Arctic Exploration.
- Oct. 11 — Net Session and Conversion Information.
- Oct. 18 — A PNP Switch.
- Oct. 25 — A Review of Parametric Amplifiers.

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Tips for Technicians and Other V.H.F. Newcomers

Firing Up on 6 and 2

BY EDWARD P. TILTON,* WHDQ

If you made your start in amateur radio in the last few years you probably came in via the Novice door. If you're primarily interested in v.h.f. work the chances are fairly good that you tarried a while in the room marked "Technicians." Quite a few of you are still there, and you're going to have company aplenty. Opening the 50-Mc. band to Technician occupancy in 1955 helped to make active hams out of thousands of holders of a ticket that up to then had been little more than a scrap of paper. Availability of 145 to 147 Mc., effective Aug. 21 gives Technicians practically unlimited operating privileges in the amateur bands from 50 Mc. up. To many newcomers, now and in years to come, there will be little incentive to go higher in the licensing structure.

That, in itself, is not necessarily bad, for it is not the class of license one holds, but what he does with it that counts. If an occupant of the v.h.f. bands conducts himself in such a way that ham radio is better for his having been a part of it, then few will care whether his ticket is marked *Technician*, *General* or *Extra Class*. What, then, is this world above 50 Mc. good for, and how do you go about setting up for business there?

Possibilities

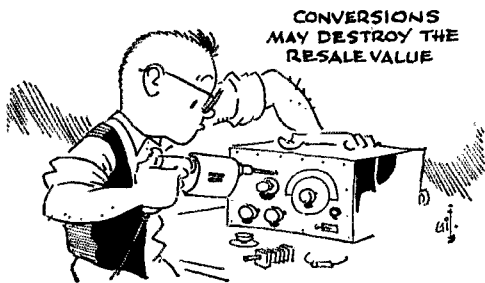
Most people are attracted to amateur radio because it offers them a means of communication independent of any commercial facility. The talking seems the thing; the means are secondary — at first. But gradually the means become more important. Often how a contact is made is far more interesting than what is said. This concern with the "how and why" looms especially large in the v.h.f. picture. The 50- and 144-Mc. bands are fine for just talking. There are few better frequencies, in fact; but the

ham who develops no interest in exploiting the various long-distance possibilities misses at least half the fun of the game.

The 50-Mc. band, for instance, is one of the most interesting slices of the radio-frequency spectrum, propagation-wise, that is open to amateur use. Everything happens there now and then. Not often enough to make any facet of 50-Mc. DX a routine matter, but still frequently enough to keep one's interest whetted the year around. We can't cover the whole story here, but the *Handbook* chapter on wave propagation tells you all you need to get started. *QST* articles listed at the end of this discussion will fill in details. When you get to the point where you can tell single-hop sporadic-E skip from double-hop, or you know whether that fluttery signal seemingly coming in off the back of your beam is back-scatter or auroral reflection, you're on the way.

On 144 Mc. you'll find some of the same thrills, plus some different ones. Here again the *Handbook* is a guide to the threshold. Practical operating experience and keen observation will take you much farther. This band will not show you all the ionospheric tricks that 50 Mc. has in its bag, but its response to weather variations is greater. You'll find a new meaning in daily weather information published in newspapers and dispensed via radio and television. You may develop into something of a weather prophet on your own, after you've watched the effects of weather changes on the strength and character of v.h.f. signals. Tropospheric propagation was the first v.h.f. DX medium to be discovered by amateurs. You'll find detailed reports on this one in *QST* as far back as 1934. Work done in this field by the late Ross Hull, and reported by him in *QST* of the middle '30s is a splendid example of the scientific potential of our hobby. His articles are "must" reading, even today.

* V.H.F. Editor, *QST*.



Transmitters

Today's v.h.f. enthusiast can set up for business on 6 and 2 without building any of his own equipment, but the fellow who has definite ideas of what he wants probably will do some building. Making your own gear is highly worthwhile experience, in any event. There are countless ways to go about setting up a v.h.f. station; only some of the more popular are discussed below.

Converting Commercial Gear. Many newcomers have commercial transmitters for the lower bands left over from their Novice days. The ARRL Technical Information Service receives hundreds of requests for information on conversion of these transmitters for 50-Mc. operation. Presumably we will now also be in for an avalanche of requests for 144-Mc. conversions. Our advice on the latter is simple: Don't try it!

Conversions of the Viking I and II, the Adventurer, the Ranger, the AT-1, the DX-35 and the DX-40 for 50 Mc. have appeared in *QST*. (Details in the bibliography.) We cannot supply conversion information on other commercial units. Conversion is cut-and-try business of a sort not normally done in the ARRL Lab. Authors of our conversion articles are hardy experimenters who worked out suitable methods and then took the trouble to write down the procedure and send it in to us for publication in *QST*. Please do not ask for conversions of units not on the above list. They are not available.

Conversion of handswitching transmitters designed for use on 80 through 10 meters so that they will work on 6 may be none too rewarding. Most such designs just about make it to 10; going another band higher in frequency takes some doing. If it were easy the manufacturer would have done it in the first place. Components that are right for 80 are almost certain to be too bulky for 6. Two tubes in parallel, for example, may be fine for a transmitter lineup intended to work on 80 through 10, but the same circuit is highly unlikely to be good for 6. It will be useless on 2. We have rejected a lot more v.h.f. conversion articles than we've accepted. Often they either are makeshifts on 6, or they represent major rebuilding operations that destroy the usefulness of the transmitter for lower bands, and thus lower the resale value.

Though someone probably will find a way to

do it, conversion of commercial multiband rigs for 2-meter operation is presently beyond the realm of practicality. Tuned circuits for the 144-Mc. band bear little resemblance to those used in handswitching transmitters of conventional design, and tubes commonly used on lower frequencies may be completely unsuited to operation above 50 Mc.

A better way to make use of commercial equipment intended for lower bands is to take the power and modulation (if any) from the existing transmitter and apply them to r.f. units designed especially for the v.h.f. bands in question. Suitable transmitter line-ups may be found in *QST* and the *Handbook*. Some commercial rigs have auxiliary power sockets that make this easy.

How Much Power?

The power level to be used is an important point for consideration. You can have fun on the v.h.f. bands with low power, and many never go above the 100-watt bracket. But if you're going into v.h.f. with both feet you will do well to bear high power in mind when you plan your station. If you do it right you can start with a few watts, expand to perhaps 100 watts in the intermediate period, and then jump to the maximum the law allows, or close to it, at a later date, without incurring needless expenditures for equipment that may become obsolete because it is not well adapted to your ultimate needs.

Building in subassemblies, with power supplies and modulation equipment on separate chassis from the r.f. units, pays off here. One-chassis stations are nice in some ways, but a complete transmitter built in one package is a lot of work and it does not readily combine with higher-powered gear later on. We lean to subassemblies in *QST* and *Handbook* v.h.f. designs on this account.

Crystal Control or VFO? Nearly all v.h.f. men have used crystal control in the past, and for good reason. It is not easy to make a good v.f.o. for v.h.f. use. A generous supply of crystals may be a much more satisfactory way of moving around the band. Don't standardize on crystals you see advertised at bargain prices, however. These are available only for certain surplus frequencies. You'll find a lot of company on these spots most of the time, and being stuck on 50.1, 50.25, 50.4, 144.13, 144.45, 145.35 or some other of those 25-cent channels may cost you plenty of dollars worth of watts wasted in calling people who will never find you at the bottom of the pile.

Order crystals slightly different from those you commonly see in the surplus advertisements, or grind or etch them yourself. It's not hard. See the bibliography.

Receivers and Converters

Today's newcomer is offered a bewildering array of equipment for v.h.f. reception. Obviously, we cannot tell you just what you should buy or build, but here are a few tips that may

help you to make an intelligent choice. You may want to do some building. The *Handbook* describes some first-class v.h.f. converters, if you decide on this course.

V.h.f. reception is commonly done with crystal-controlled converters operated in conjunction with communications receivers designed for lower frequencies. The communications receiver is important; your choice here may make or break you in your foray into the v.h.f. field. Don't overlook the used receiver market. Receivers cost a lot of money these days, but there were some mighty good ones built years ago. Quite a few of them are still adequate for use as a tunable i.f. system with v.h.f. converters. Receiver articles given in the bibliography will give you more information than we could include in a general discussion like this.

Important receiver qualities are stability, tuning rate and selectivity. With converters designed for 7-Mc. output, stability is usually not much of a problem. Most receivers are good enough in this respect, up to about 14 Mc. or so. If your i.f. is to be in the 26- to 30-Mc. range, be sure that your receiver is a double-conversion type. No single-conversion receiver with a 455-ke. i.f. has adequate image rejection for converter use above about 20 Mc. or so. Inexpensive receivers may even be poor at 14 Mc.

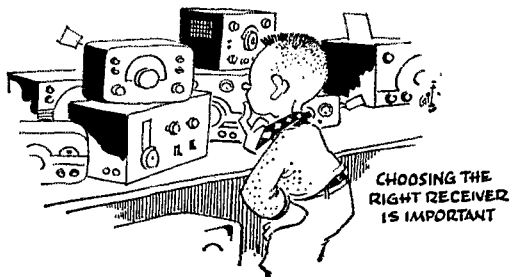
Some late-model receivers have tuning ranges designed especially for use as the i.f. range for crystal-controlled v.h.f. converters. These provide tuning-rate and dial-calibration qualities that are not readily obtainable otherwise.

A few receivers have a 50-Mc. band built in. Some of these are worth little for practical amateur purposes. Others may do a passable job, but nearly all are inferior to a converter-receiver combination. Exceptions are some new jobs designed especially for v.h.f. use. A rule of thumb to be applied to judging the usefulness of a 50-Mc. tuning range in a receiver that works on all lower amateur bands is to check to see if it is a double-conversion design. If it is, its image rejection will be good enough on 50 Mc. If its sensitivity is a bit on the low side this can be corrected by the addition of a simple 50-Mc. r.f. amplifier stage. The converter circuits for 50 Mc. in the *Handbook* show r.f. amplifier details that can be "lifted" for this purpose.

Antennas

The rule for antennas is simple: Put up the biggest thing you can get off the ground. Operation on 50 Mc. is commonly done with 4- or 5-element arrays of the Yagi type. Beware of short booms and close element spacing; the longer arrays with wide spacing between elements will almost certainly give higher gain than the close-spaced types. If you have the means to support and rotate it, go to an array of 6 or more elements. Other things being equal, the longer the boom the better. Four-element arrays should be at least 10 feet long; 5-element jobs 12 feet minimum.

Stacking of two or more Yagis one above the



other pays off handsomely. Many outstanding 50-Mc. stations employ stacked Yagi arrays of 3 or more elements each. All the information needed for building and adjusting such arrays may be found in the ARRL *Handbook* and *Antenna Book*. Stacked Yagis should never be separated by less than a half wavelength. Wider spacing is desirable.

On 144 Mc. curtain arrays are popular. These are easy to build and usually require no adjustment. Their frequency response is broad and therefore their design is usually less critical than that of arrays made up of several Yagis. High gain and sharp pattern can be achieved with stacked Yagis on 144 Mc., usually with some sacrifice in frequency response.

The long Yagi array has merit for 144-Mc. service. One widely-used design has 13 elements on a 24-foot boom. It can be made very light in construction if small-diameter elements and thin-wall tubing are used. Suitable designs are in the *Handbook*, the *Antenna Book* and *QST*.

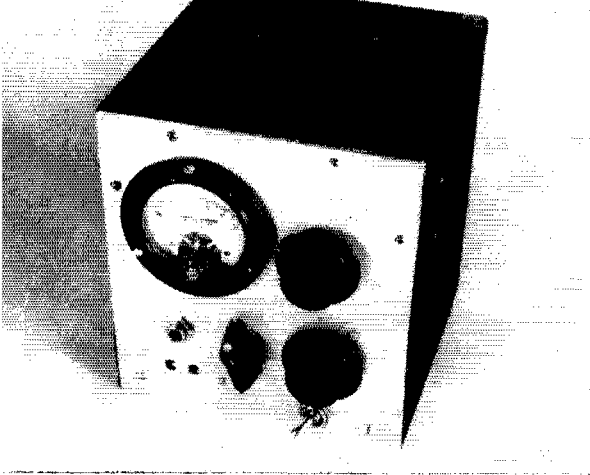
The v.h.f. array should be as high as possible. Getting the antenna up above surrounding trees, buildings and wires pays off in improved coverage, and it may be the best move you can make in the reduction of TVI. If the main lobe of the antenna is above the neighboring TV antennas and lead-ins the TVI-proofing job is likely to be much simpler than with low ham arrays.

Techniques

You can have a lot of fun on 6 and 2 meters if you never use any mode of transmission and reception except a.m. phone, by far the most-used mode. You will never know the full potential of either band in this way, however. Much of the interesting work is done when signals are at low levels, and for this purpose nothing can approach c.w. in effectiveness.

Don't let the high-speed stuff you've heard on lower bands scare you into an all-phone attitude. Many operators on the v.h.f. bands are low on code experience. They will welcome a chance to work on c.w. at low or moderate speeds. And any amateur worthy of the name is patient and cooperative with beginners. He may be able to handle 40 words per minute himself, but he'll respect you for trying when he hears you keying slowly, and will drop down to your speed, whatever it may be. Learning to use code effectively is hard for some people; easy for others. If you're

(Continued on page 180)



Below the meter are jacks for the microphone and crystal. The skirted knobs are for the input (bottom) and output (top) capacitors of the pi network. The band switch is near the center. The toggle switch is for the meter. The box is approximately a 6-inch cube.

Reliable Short-Range

Coverage with Low Power

BY D. A. KING,* K8EEY

160 for Mobile?

Many hams in the Michigan-Ohio area are avoiding the QRM of other bands in short-range mobile work by going to 160 meters. They have found that an inexpensive low-power transmitter, such as the one described here by K8EEY, will do a good job on this band.

ALTHOUGH 160-meter operation is permitted in many sections of the country, activity on this band is so low that many manufacturers have ceased to include this portion of the amateur spectrum in their receiving and transmitting equipment. This is very unfortunate as it not only handicaps the ardent 160-meter operator, but also creates apathy among the newcomers to ham radio who get the impression that the segment is useless for their needs and promptly forget its existence. The lack of manufactured gear, however, should not be allowed to obscure the many advantages that 160 offers, particularly for the mobileer who is interested in reliable short-range (under 50 miles) communication. In this respect, 160 meters is often superior to 75 since, watt for watt, at any distance, its ground-wave field strength averages 4 to 6 db. greater. Very low power can be used with outstanding results. New navigational aids operating at very low frequencies offer some hope that the existing Loran system may eventually be replaced, returning the six-position band switch to ham equipment, provided that interest is keen.

Transmitter Circuit

The photographs show a simple 10-watt mobile transmitter designed primarily for 160 meters, but also providing for 75-meter operation so that the benefits of 160-meter operation can be appreciated and advertised. The circuit is shown in

* 29418 Wand Drive, Mt. Clemens, Mich.

Fig. 1. All three tubes are type 6AQ5. A Vari-Loopstick, L_1 , is used as the inductor in the grid-plate oscillator output circuit. A d.p.d.t. rotary switch, S_1 , shunts this coil with a trimmer capacitor, C_1 , for 160-meter operation. The same switch shorts out a portion of the inductor (L_2) in the amplifier's pi network output circuit for 75-meter work.

A high-level carbon microphone drives the single-tube Class A modulator directly through a microphone transformer, T_1 . Microphone voltage is obtained from the drop across a portion of the modulator-tube cathode resistor. The center-tapped primary of a loudspeaker output transformer (T_2) is used as a 1-to-1 transformer that couples the modulator to the Class C final amplifier. A 50-ma. d.c. meter can be switched to read either final grid current or combined plate and screen current. Most of the constructional details are evident in the photographs. Arrangement of components, many of which in this instance are surplus units, is not critical.

Change-Over Switch

A three-pole double-throw rotary unit is used as the change-over switch. It switches the antenna and plate-supply voltage to either transmitter or receiver. This type of switch is quite satisfactory when shielded and mounted on the steering column or under the dash within easy reach of the driver. A discarded soup can of the 10 $\frac{1}{2}$ -oz. variety makes a suitable shield. Three coax connectors are mounted in the unopened end of the can, and the wafer switch is mounted in the center of the top cover after removing it with a can opener. The B-plus wires to the receiver and transmitter from the receiver power supply may enter the can through rubber grommets at any convenient point, or a suitable plug-and-socket arrangement can be made. When the internal connections have been made, the top cover can be replaced by soldering. A long intercom-type lever should be attached to the

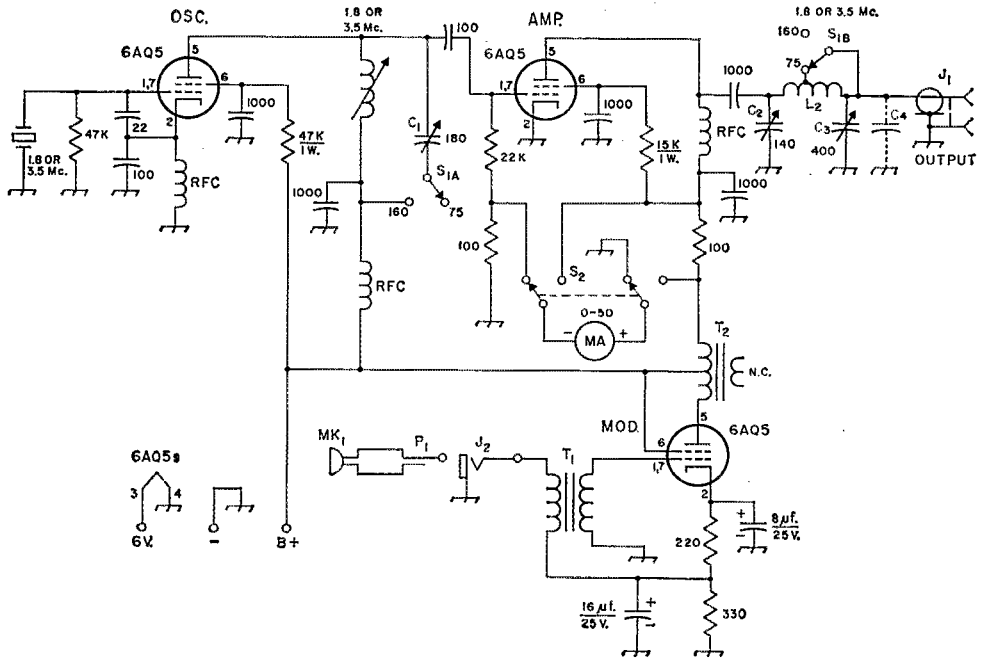


Fig. 1—Circuit of the 160/75-meter mobile transmitter. Unless otherwise indicated, capacitances are in $\mu\text{f.}$ and resistances are in ohms. All 1000- $\mu\text{f.}$ fixed capacitors are disk ceramic; those marked with polarity are electrolytic; other fixed capacitors are mica. Resistors are $\frac{1}{2}$ watt unless otherwise indicated. R.f. chokes are 2.5 mh., 50 ma.

C₁—9-180- $\mu\text{f.}$ mica trimmer (Allied Radio 60H342).

C₂—140- $\mu\text{f.}$ variable (Bud MC-1876 or equivalent).

C₃—400- $\mu\text{f.}$ variable, b.c. replacement type (Allied 61H009).

C₄—Fixed mica capacitor as required (see text).

J₁—Chassis-mounting coax receptacle (SO-239).

J₂—Open-circuit microphone jack.

L₁—Grayburne Vari-Loopstick or equivalent (approx. 50 $\mu\text{h.}$).

L₂—50 turns No. 24 $\frac{1}{4}$ -inch diam., $1\frac{1}{2}$ inches long, approx. 50 $\mu\text{h.}$ (B&W 3020).

MK₁—High-level carbon microphone (T-17).

P₁—Microphone plug.

S₁—D.p.d.t. wafer switch.

S₂—D.p.d.t. toggle switch.

T₁—High-ratio single-button microphone transformer (Triad A-5X).

T₂—14,000-ohm p.-to-p. speaker output transformer, secondary not used (Stancor A-2312).

switch shaft for easier operation. A push-to-talk relay may be substituted for this switch, of course.

Power Supply

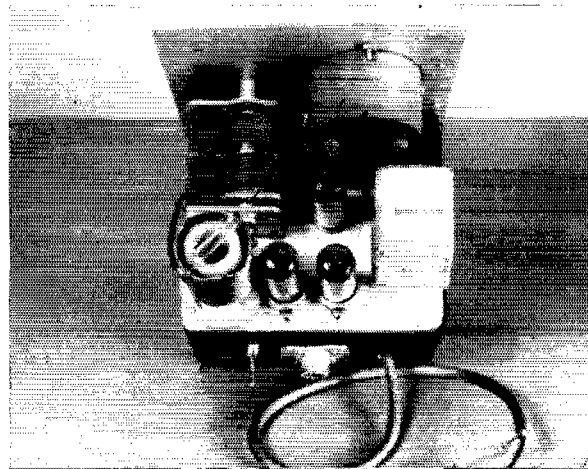
In taking power for the transmitter from the b.c. receiver supply, a length of three-conductor cable, shielded and preferably rubber-covered, is required. If necessary, such a cable can be made up of individual wires bonded together and covered with braid. The B-plus line coming from

the rectifier-filter department of the receiver should be located and disconnected at its first tie point. One of the cable wires is connected to the B-plus lead, and a second wire to the tie point. The third wire connects to the hot heater prong of the nearest tube socket (not the rectifier!).

Antenna

Good results have been obtained with an 8-foot whip and a center loading coil. The addition of

Interior view of the low-power 160-meter mobile transmitter. The modulator (right) and final-amplifier (left) tubes are at the rear of the chassis, mounted in between the microphone transformer and the output tank coil. The oscillator tube is at the center, its slug-tuned plate coil projecting from the rear. The variable capacitor (C₃) is in the output of the pi network. The input capacitor C₂ is below deck.



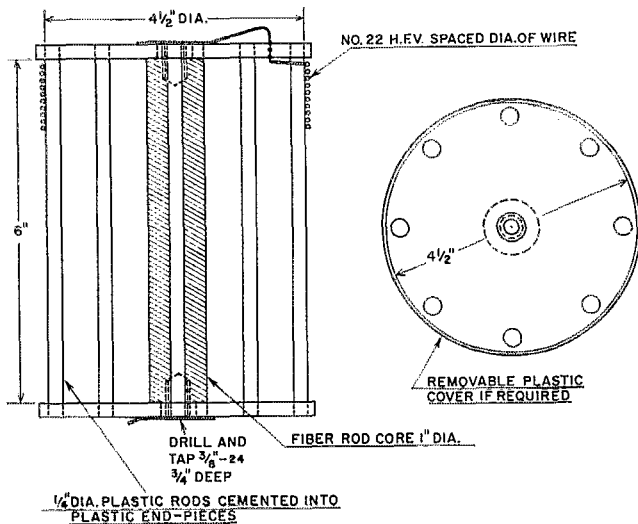


Fig. 2—Sketch showing the construction of a low-loss loading-coil form. Other details will be found in the text.

a capacitive hat or the use of a longer whip will help to extend the transmitting range.

A simple loading coil consists of a solid form of fiber, bakelite or polystyrene rod about 5 inches long and $2\frac{1}{2}$ inches in diameter, with a $4\frac{1}{2}$ -inch winding of close-wound No. 22 Formvar or enameled wire. The ends of the form can be drilled and tapped to take standard $\frac{3}{8}$ -24 whip sections. Large soldering lugs or washers can be used to make connections between the coil ends and the whip sections. A more ambitious low-loss coil form is shown in the sketch of Fig. 2.

Those who have operated 75-meter mobile antennas are familiar with the problem that the high Q of the loaded whip presents at this frequency. This difficulty is even more pronounced on 160. However, since the band segments here are narrow, they can be covered rapidly on the receiver, so there is little point in frequent changing of transmitter frequency, and most operators on this band peak the antenna tuning up for one frequency and stay there. The loading coil must be pruned accurately while resonance is checked with a g.d.o. coupled to a small coil temporarily connected at the base of the whip. If provision for 75-meter operation also is desired, a tap can be placed on the loading coil for shorting out the required number of turns. Final adjustment should be made on the air with a field-strength meter as the indicator.

In operation, the band switch is set at the 75-meter position, and the appropriate crystal inserted. The slug of L_1 is then adjusted to achieve an amplifier grid current of 2 to 4 ma. With the switch in the 160-meter position and a 160-meter crystal in the frequency range assigned to your area, adjust C_1 to again obtain correct drive. Once properly set, no further drive adjustments should be necessary. The amplifier may be loaded to the point where the combined plate and screen current is 50 ma. If it is impossible to reduce the plate current at resonance to this figure, extra fixed capacitance (C_4) should be added as required.

Receiver

For reception, a converter can be built that will work into the car's b.c. receiver operating as an i.f. and audio amplifier. However, the low-frequency (1800-ke.) segment of the band is assigned to this part of the country and many operators have had good results by simply readjusting trimmers in the b.c. receiver to shift its tuning range a little higher in frequency. To do this, a b.c. station near the high end of the band is tuned in. The oscillator padder and/or the coil slug is then adjusted slowly until the same signal appears about 250 ke. lower on the dial. A g.d.o. tuned to 1800 ke. should then be heard near the high-frequency end of the dial. The r.f. trimmers can then be adjusted for maximum gain and the dial reading noted for future reference. If the receiver has push-button tuning, one of the buttons can be set up for the ham band. Remember, however, that this process involves sacrificing some of the coverage at the low-frequency end of the b.c. band.

Hundreds of transmitters of this type are in operation in Michigan and Ohio. Distances well over 25 miles, mobile to mobile, are covered consistently with Q5 reports. For local rag chews, community activities and Civil Defense, this little rig is hard to beat at the price. Why not take a few hours, build it, interest other hams in the neighborhood and go mobile on 160? QST

Strays

Carl Dabelstein, KN0SBV, reports a hammy neighborhood around his home in Omaha, Neb. There's K0LXK across the street; K0CFQ half a block away; K4ZVX, three blocks away and Carl's dad, K0RVJ, in the same house.

Simplified Design of Inductively-Coupled Circuits

Calculations for Resonant and Nonresonant Secondaries

BY T. J. MARESCA,* W2VLA

If you are having trouble loading your final with link coupling or in driving an amplifier using inductive coupling, a few calculations using simple algebra and a check with a g.d.o. can give you the reason and tell you what can be done about it.

ONE important class of coupling networks often used by the amateur experimenter was not treated in George Grammer's excellent three-part article¹ on impedance-matching networks. This class includes the magnetic-coupled interstage or output circuit still found in many transmitters. This is especially true of the output circuit of balanced push-pull amplifiers. Too often the design of these networks proceeds in a cut-and-try fashion; the designer selects a

parallel LC resonator, while the secondary circuit is the series-tuned resonator often found in link output circuits. Both the load resistance, R_2 , and the output resistance of the tube, R_1 , are generally known. The load resistance is usually low (between 50 and 100 ohms). The output resistance of the tube is usually high (between 1000 and 10,000 ohms). The output resistance can be roughly approximated by the formula

$$R_1 = \frac{(E_B - E_{\min})^2}{2 P_o} \approx \frac{(0.7 E_B)^2}{2 P_o} \approx \frac{E_B^2}{4 P_o} \quad (1)$$

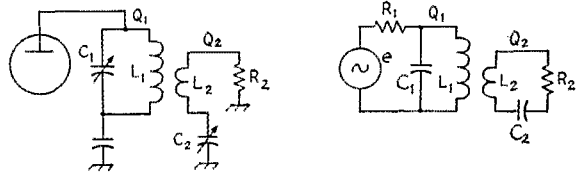
where E_B is the rated anode supply voltage

E_{\min} is the minimum anode voltage during the r.f. cycle

P_o is the rated power output of the tube.

The objective is to design a magnetic coupling network which will permit the tube to deliver maximum power to the load, R_2 , at a chosen

Fig. 1—Low-impedance (link) output circuit with resonant secondary.



suitable inductance which resonates with the output and tuning capacitance of the tube. Then he experiments with several links until he can couple rated power from the tube. The step-by-step design procedures outlined below will obviate most of the experimenting in a majority of cases.

Three types of magnetic coupling circuits will be considered: (1) the parallel-resonant primary with series-resonant secondary, (2) the parallel-resonant primary with parallel-resonant secondary, and (3) the parallel-resonant primary with untuned secondary. These three cases cover most of the amateur applications. Magnetic coupling and the measurement of coupling coefficient with instruments readily available to the average amateur will also be discussed.

Parallel-Resonant Primary and Series-Resonant Secondary

The first circuit to be considered is shown in Fig. 1. This is a typical link-coupled output stage. The primary circuit consists of the usual

frequency. At the same time, it is necessary to be certain that the circuit will discriminate against harmonic and subharmonic frequencies and not require too large a value of coupling coefficient between the primary and secondary coils, L_1 and L_2 .

The circuit will discriminate against unwanted frequencies if a large enough operating Q for the primary circuit is chosen. The operating Q is defined as the Q of the primary circuit alone. This may be as low as 5 or as high as 20, but values between 10 and 15 are usually the best. If the value chosen is too high, the tank-circuit efficiency will be reduced. However, at the higher frequencies the minimum operating Q may be limited by the irreducible output capacitance of the tube.

The maximum coupling coefficient between practical air-core solenoids is usually 0.4 or less. Measurements made by the author on the B & W JEL 40, 20, and 10 fixed-link tank coils exhibited coupling coefficients between 0.35 and 0.415. A Bud 40-meter swinging-link tank coil had a coupling coefficient of 0.3 with the link close to the primary coil. A simple method of measuring the coupling coefficient with a grid-dip meter or a Q meter is given later on.

* Defense Electronics Division, General Electric Co., Advanced Electronics Center, Cornell University, Ithaca, N. Y.

¹ Grammer, "Simplified Design of Impedance-Matching Networks," *QST*, March, April and May, 1957.

Given R_1 and R_2 , the step-by-step design procedure for the circuit in Fig. 1 is:

1) Select the primary-circuit operating Q , Q_1 . (Usually between 10 and 15.)

2) Calculate $X_{C1} = \frac{R_1}{Q_1}$ (2)

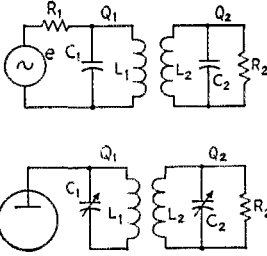


Fig. 2—Circuit for coupling inductively to a high-impedance load.

3) Calculate $X_{L1} = \frac{R_1 Q_1}{1 + Q_1^2} \cong X_{C1}$ (3)

(For Q_1 greater than 5, X_{L1} and X_{C1} differ by less than 4 per cent.)

4) Select the coupling coefficient

$$k = \frac{1}{\sqrt{Q_1 Q_2}} \quad (4)$$

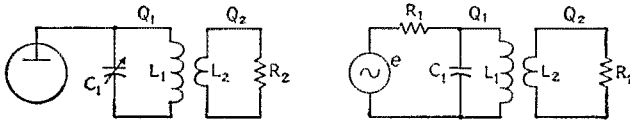


Fig. 3—Low-impedance (link) coupling with non-resonant secondary.

(This should be less than 0.4. For swinging links, choose k less than 0.3.)

5) Calculate the secondary Q ,

$$Q_2 = \frac{1}{k^2 Q_1} \quad (5)$$

6) Calculate

$$X_{L2} = X_{C2} = R_2 Q_2 \quad (6)$$

7) Calculate C_1 , L_1 , C_2 , and L_2 from the values of X_{C1} , X_{L1} , X_{C2} and X_{L2} and the chosen frequency.

The proper spacing between primary and secondary coils can be determined experimentally when making the coupling-coefficient measurement. (See latter part of article for this measurement.)

This type of coupling circuit is best suited for output coupling where the ratio R_1/R_2 is a large number. For interstage-coupling networks, where the impedance ratio is small, the circuit of the next section is often more suitable.

Parallel-Resonant Primary and Parallel-Resonant Secondary

The remarks concerning the operating Q and the largest realizable coupling coefficient made

in the preceding section also apply here. This circuit is well suited for interstage coupling because the shunt capacitance of the grid can be absorbed in C_2 . Fig. 2 shows the circuit diagram and the equivalent circuit.

Given R_1 and R_2 , the design procedure in this case is as follows

1) Select Q_1 .

2) Calculate $X_{C1} = \frac{R_1}{Q_1}$ (7)

3) Calculate $X_{L1} = \frac{R_1 Q_1}{1 + Q_1^2} \cong X_{C1}$ for $Q_1 > 5$ (8)

4) Select k (less than 0.4).

5) Calculate $Q_2 = \frac{1}{k^2 Q_1}$ (9)

6) Calculate $X_{C2} = \frac{R_2}{Q_2}$ (10)

7) Calculate $X_{L2} = \frac{R_2 Q_2}{1 + Q_2^2}$ (11)

8) Determine C_1 , L_1 , C_2 , L_2 and experimentally determine the coil spacing by making the coupling-coefficient measurement.

An alternate procedure is to select Q_1 and Q_2 and then calculate the required value of coupling coefficient. If it is not too large, proceed with the design.

Parallel-Resonant Primary and Untuned Secondary

This circuit is shown in Fig. 3 and may be used when resonating the secondary is not desired. The design steps are:

Given R_1 and R_2 ,

1) Select Q_1 and set $Q_2 = 1.2$.

2) Calculate $X_{C1} = \frac{R_1}{Q_1}$ (12)

3) Calculate $X_{L1} = \frac{R_1(Q_1 + Q_2)}{1 + Q_1^2} \cong X_{C1} \left(1 + \frac{Q_2}{Q_1}\right)$ for $Q_1 > 5$ (13)

4) Calculate $X_{L2} = R_2 Q_2$ (14)

5) Calculate $k = \sqrt{\frac{1 + Q_2^2}{Q_2(Q_1 + Q_2)}}$ (15)

If k is greater than 0.4 select higher values of Q_1 until k is less than 0.4. It can be shown that, for $5 < Q_1 < 20$, k will be minimum when Q_2 is approximately 1.2.

Experimental Determination of Coupling Coefficient

The coupling coefficient between two coils

can be determined easily using only a grid-dip oscillator or a Q meter. The chief advantage of the method to be described is that the measurement can be made at or near the actual operating frequency of the coils. The grid-dip meter and Q -meter measuring circuits are shown in Figs. 4A and 4B, respectively.

The measurement procedure using the grid-dip meter is as follows:

1) With L_2 open-circuited, resonate L_1 with C at the desired frequency, f_o . Make sure that leads are kept as short as possible.

2) Short-circuit L_2 by soldering its ends together and, with the same C , measure the new resonant frequency f_s .

$$3) \text{ Calculate } k = \sqrt{1 - (f_o/f_s)^2} \quad (16)$$

Note that f_s will always be greater than f_o because the effective inductance resonating with C when L_2 is shorted will always be less than L_1 alone.

The coupling coefficient can be adjusted to a desired value by the following procedure: After finding f_o calculate

$$f_s = \frac{f_o}{\sqrt{1 - k^2}} \quad (17)$$

and space L_1 and L_2 so that the circuit is resonant at f_s when L_2 is short-circuited. Grid-dip meter frequencies should, of course, be checked against an accurate standard.

The procedure with the Q meter is similar except that the resonant frequency is kept constant. The steps are:

1) Resonate L_1 at the desired frequency with L_2 open-circuited. The value of the resonating capacitance is C_o and is read from the Q -meter capacitance dial.

2) Short-circuit L_2 and re-resonate the circuit with the capacitance C_s , also read from the capacitance dial.

$$3) \text{ Calculate } k = \sqrt{1 - C_o/C_s} \quad (18)$$

C_s will always be greater than C_o for the same reason as given before.

If k and C_o are known, the required C_s can be found from the equation

$$C_s = \frac{C_o}{1 - k^2} \quad (19)$$

The values of L_1 and L_2 can be determined experimentally with known capacitors at or near the design frequency. Always make sure that neither coil is short-circuited when this measurement is made.

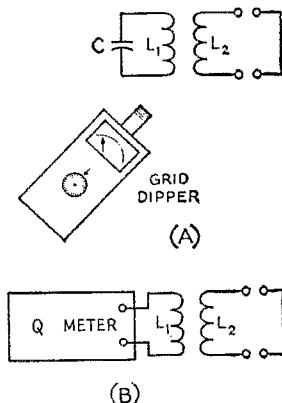


Fig. 4—Methods of determining the coefficient of coupling, using a grid-dip oscillator (A) and Q meter (B).

Conclusions

The author has used these design techniques at frequencies up to 100 Mc. with remarkable success. Once the amateur designer gets a "feel" for designing for a specified coupling coefficient and knows the upper limit of this parameter, exact design is fairly easy to accomplish. Most of the author's experience has been with the B & W Miniductors. Coils are cut from the coil stock which have the required inductance. Then the spacing between coils is experimentally determined by the grid-dip meter or Q -meter measurement. When the proper number of turns per coil and the spacing are known, a new transformer can be made by removing turns from the middle of another Miniductor without breaking the polystyrene, so as to give the required coil spacing. Then the ends of the Miniductor are cut off to give the proper number of turns for L_1 and L_2 . This results in a mechanically rigid transformer which will not get out of shape under vibration or shock.

Strays

The Totah Amateur Radio Club of Farmington, New Mexico, will make its annual 597 Totah Hallow'en Field Day expedition on October 31. The site will be Four Corners, that unique spot which is common to the states of Colorado, New Mexico, Arizona, and Utah. It is also unique because it is located on the Indian reservations of Ute and Navajo, and it is common to the call areas of 5, 9, and 7. Look for them on all bands.

WSGZ now has accumulated confirmations from 203 countries that he has worked using s.s.b.

New Jerseyite Nat Schnoll has one of those newfangled calls with the double prefix—WA2DIJ. Last time he was licensed, he didn't have *any* prefix at all. Thirty-five years ago it was, and the call then was 2AQQ! They always come back . . .

The Perseids Powerhouse

BY CLAUDE M. MAER, JR.,* W9IC

A Cool Colorado Kilowatt for 50 and 144 Mc., Without Coil Switching or Changing

FOR the uninitiated let's start out by explaining that the Perseid Meteor Shower in August provides a propagation medium for 144-Mc. signals over distances that are extremely difficult to work by any other means.¹ This opportunity is best exploited with high power, and the amplifier to be described did a fine job for the writer in the two Perseid showers. Seven new states were worked, including one over a 1240-mile path.² The transmitter has done well on 50 Mc. also. It was the means by which the sixth and final continent (Asia, JASAO) was worked for the writer's 50-Mc. WAC, in November, 1958. The amplifier features reasonably straightforward design using standard parts, and building it does not require a home machine shop or a sheet-metal factory.

Multiband transmitters have been taken for granted by amateurs for so many years that many occupants of our lower bands have hardly heard of a transmitter that will operate on only one band. The multiband rig is still rare in the v.h.f. field, however, though progress is being made in the design of setups for two or more bands through the use of coil changing or switching. Recently a commercially-available transmitter was described in which the plate circuit was designed for operation on both 50

and 144 Mc. without the requirement of coil changing of any kind.³

Building upon the two-band tank circuit idea used in the plate circuit of the Johnson 6N2, the author set out to construct a high-powered amplifier using the circuit design in both the grid and plate circuits, so that no switching or coil changing would be needed to cover both these popular v.h.f. bands. Though more than a year was spent in the design, construction and testing of the amplifier, the results have been most gratifying, and well worth the effort.

The key to the high efficiency of the amplifier lies in the transmitting tubes now available, which were designed especially for v.h.f. service. The Eimac 4X250B tubes used do a fine job at 144 Mc., as well as 50, and their cost is not out of reason in these days of liberal amateur budgets. Though it is possible that slightly higher efficiency might be obtainable in a single-band design, the results achieved with this rather unusual amplifier have shown that the difference would hardly be discernible on the receiving station's S meter.

Essentially, the Perseids Powerhouse is a push-pull amplifier, cross neutralized, with its own bias supply built in. Provisions are made for Class C c.w. or a.m., and for Class AB₁ linear amplifier service. A front-panel control switches the mode of operation, and a tune-operate switch sets up safe operating conditions for tune-up. Provision is made for external metering of the total grid current to both tubes, each tube's screen current, and the r.f. output on both 50 and 144 Mc. An external 0-1 milliammeter takes care of these functions. Another external meter should be connected in the high-voltage lead for plate-current measurement. If the input approaches the kilowatt level a voltmeter should also be provided, to determine the plate power accurately, as required by FCC regulations.

The Two-Band Tank Circuits

There is no magic or undue complication about the means by which the grid and plate

³ "The Viking 6N2 Transmitter," Recent Equipment, QST, March, 1957.

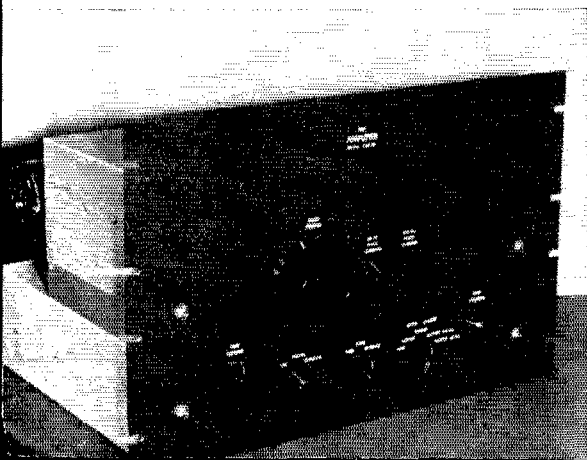
The Perseids Powerhouse, a 1-kw. amplifier for 50 and 144 Mc. Method of shielding the r.f. portion of the amplifier is visible at the left. Two chassis are used, butting together, with a "weather-stripping" of perforated aluminum covering the joint edges.

QST for

* Rocky Mountain Division Director, ARRL, 485 Race St., Denver 6, Colo.

¹ Bain, "V.H.F. Meteor Scatter Propagation," QST, April, 1957.

² "The World Above 50 Mc.," QST, October, 1958 and 1959.



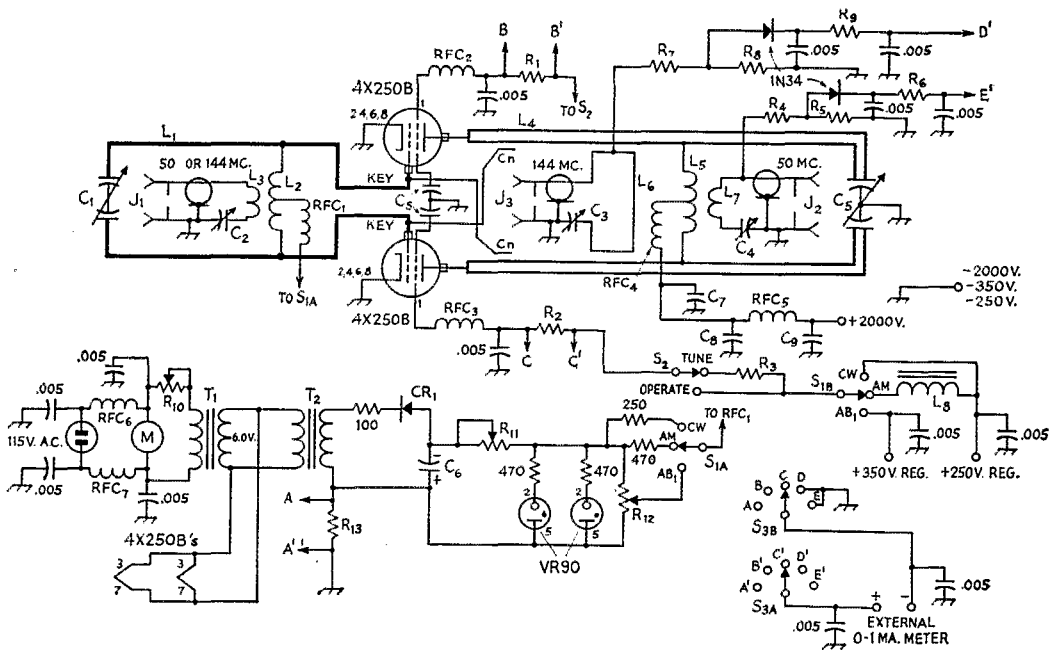


Fig. 1—Schematic diagram and parts information for the 2-band v.h.f. amplifier. Capacitors not described are .005- μ f. disk ceramic.

- C₁—50- μ f.-per-section butterfly variable (Hammarlund BFC-25). Remove two stator and two rotor plates.
- C₂—50- μ f. variable (Hammarlund MC-50-S).
- C₃—35- μ f. variable, double-spaced (Hammarlund MC-35-SX).
- C₄—50- μ f. variable, double-spaced (Hammarlund MC-50-SX).
- C₅—50- μ f.-per-section transmitting butterfly variable (B & W JCX-50-E).
- C₆—10- μ f. 150-volt electrolytic.
- C₇, C₈, C₉—0.001- μ f. disk ceramic, 3000 volts.
- C_n—Neutralizing wires; see text and photo.
- C_s—Screen bypass capacitor built into Eimac 4X150A-4010 socket. New version is SK-610.
- L₁—Half-wave grid line—No. 12 wire. Sides 1 1/4 inches apart. See Fig. 2 and photo.
- L₂—50-Mc. grid coil—6 t. No. 12 wire, 3/4-inch diam., spaced diam. of wire, except at center. See text and photo.
- L₃—Combination coupling coil and loop—No. 12 wire, 1 t. at center of L₂, with leads adjacent to L₁. See text and photo.
- L₄—144-Mc. plate line—1 \times 1/16-inch copper strap, See Fig. 2 and photo. Note slotted holes for mounting L₅.
- L₅—50-Mc. plate coil—4 t. No. 8 copper, 1 1/4-inch diam., spaced diam. of wire, except at center. See text and photo.

- L₆—144-Mc. coupling loop—No. 12 wire bent into V, 1 1/2 inches wide and 5 3/4 inches long. See text and photo.
- L₇—50-Mc. coupling loop—1 t. No. 12 wire, 1 1/2-inch diam., at center of L₅. Keep at least 1/4 inch from any part of L₅. See text and photo.
- L₈—10-hy. 110-ma. filter choke (Stancor C-1001).
- M—100 c.f.m. blower, 115v. a.c. (Burstein-Appleby 4A195).
- R₁, R₂, R₁₃—Meter shunts—adjust to read full scale at 100 ma.
- R₃—4000 ohms, 10 watts, wire-wound.
- R₄, R₇—15,000 ohms, 4 watts (two 30,000-ohm 2-watt carbon resistors in parallel). See text for location.
- R₅, R₈—300 ohms, 1 watt, carbon.
- R₆, R₉—12,000 ohms, 2 watts, carbon.
- R₁₀—100 ohms, 25 watts, adjustable.
- R₁₁—2,500 ohms, 10 watts, adjustable.
- R₁₂—50,000-ohm 4-watt wire-wound potentiometer.
- RFC₁—7- μ h. v.h.f. choke (Ohmite Z-50).
- RFC₂, RFC₃, RFC₄, RFC₅—4- μ h. v.h.f. choke (National R-60).
- RFC₆, RFC₇—20 t. No. 18 enam. 3/8-inch diam., close-wound.
- S₁—2-pole 3-position rotary switch, non-shorting.
- S₂—1-pole 3-position rotary switch, nonshorting.
- S₃—2-pole 5-position rotary switch, nonshorting.
- T₁—Filament transformer, 6.3 volts, 8 amp.
- T₂—Filament transformer, 6.3 volts, 1 amp.

circuits are made to work on both bands without switching. Both are half-wave lines at 144 Mc., with the tubes at one end and the tuning capacitance at the other. Both ends of a half-wave line used in this way exhibit high impedance, but at some point in between the impedance is very low. If the tank circuit were used for 144 Mc. only, the bias or plate-voltage connection would be made at this point of zero r.f. voltage, through r.f. chokes. Actually, anything

except a direct short can be connected there and it will have no effect on the functioning of the circuit at the resonant frequency. Thus it is possible to connect a 50-Mc. coil and, with a little care, set up the circuit so that it is capable of tuning to both 50 and 144 Mc. with practically the same efficiency as would be possible for either frequency by itself. The 50-Mc. circuit so connected works as a conventional coil-and-capacitor tank, the 144-Mc. line merely

appearing as added lead inductance at the lower frequency. Methods for locating the low-voltage point on a half-wave line have been described in the ARRL *Handbook*, and in several *QST* articles, the most recent being one by W1VLH.⁴ His method was used here, as it is most convenient for shielded lines.

Though the low-voltage point is the *electrical* midpoint of a half-wave line, if a tube is connected at one end the point will not be at the physical center of the line ordinarily. The drawings and photographs show the approximate positions for connection of the 50-Mc. coils. Precise adjustment of the connection point can be done after the amplifier is assembled.

When the plate circuit was in the design (cut and try!) stage it was obvious that a half-wave line for 144 Mc. would have to be bent in order to fit in the space available with standard relay rack mounting. The author started out bravely with two lengths of $\frac{3}{8}$ -inch copper tubing and a tubing bender, but our advice is, if you have never worked with this vicious stuff, don't! Copper tubing may well have a higher *Q* and work more efficiently than the strap used here, but if you can't bend it to fit the space available there's no point in having it. A local wholesale hardware house had 1/16-inch thick 1-inch flat copper strap, which is perfect for this work. It bends easily, yet is quite rigid when formed into the desired shape. We had no way of comparing tube and strap tank circuits, but the latter works very well in this amplifier. Dimensions of the plate and grid lines and coils are given in Fig. 2.

mounted open end up and the top one serves as a cover to complete the top of the shield. The seam between the two chassis is covered by a piece of Reynolds perforated aluminum sheet about 3 $\frac{1}{4}$ inches in width which is fastened to the sides and the back of the lower chassis with self-tapping screws. Although the perforated sheet does not cover the front of the two chassis behind the front panel, very little r.f. seems to escape. Four $\frac{5}{8}$ -inch holes are cut in the top shield chassis over each 4X250B tube for cooling air stream passage.

Throughout this discussion, the main chassis will be described from a rear view, and the location of parts to the left or to the right side of the chassis will be from a rear view. Viewed from the top, the tube sockets are mounted inside the shield enclosure and extend through the base chassis with their centers about 3 $\frac{1}{8}$ inches apart and about 2 $\frac{3}{8}$ inches from the left side of the shield enclosure. In order to have each plate line positioned the same distance from the sides of the shield cover, the centers of the sockets should be approximately 2 $\frac{3}{8}$ inches from the front and rear of the enclosure. These dimensions do not appear to be critical, but care should be used to make sure that the socket holes cut in the bottom shield chassis match accurately with the holes cut in the large base chassis. If the Finnac type 4000 socket is used, all four cathode pins should be permanently connected to the socket skirt by means of 4-40 machine screws.⁴ The type 4010 socket, which is made with the cathode pins grounded, is to be preferred.

The neutralizing leads are No. 12 wires about 1 $\frac{1}{4}$ inches long, bolted to small ceramic feed-through insulators mounted about $\frac{5}{8}$ inch apart

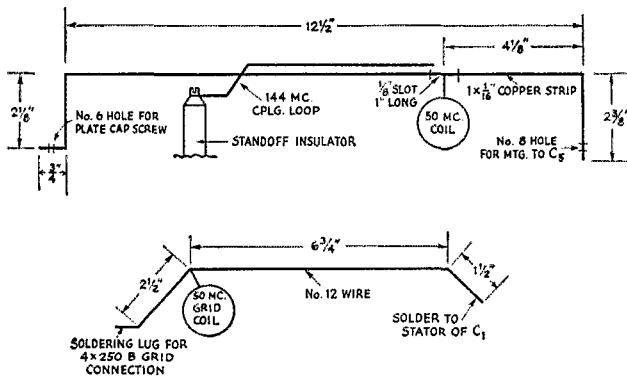


Fig. 2—Dimensions of the half-wave grid and plate lines used in the W6IC amplifier. Sides of plate line are 3/8 inches apart, center to center. Grid line wires are 1/4-inch spaced. Points for connection of 50-Mc. coils are approximate. See text for instructions for adjustment.

Construction

The amplifier is built on a 17 by 12 by 4-inch aluminum chassis, to which is attached a standard aluminum rack panel measuring 19 by 12 $\frac{3}{4}$ inches. The shielded enclosure for the plate tank circuit mounted on top of the chassis base just behind the front panel consists of two 17 by 8 by 3-inch aluminum chassis. The bottom one is

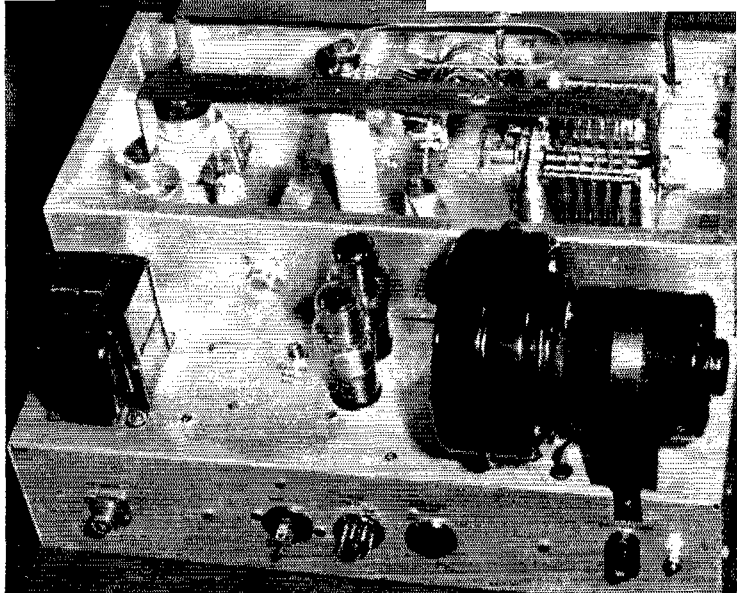
and 3 inches from the left end of the shield enclosure. This places each feed-through approximately 1 $\frac{3}{4}$ inches from the center of the associated tube socket. Adjustment of the neutralization is made by bending the wires toward or away from the anode cooler of each 4X250B.

Neutralizing is discussed in detail later in this article. A trick is borrowed from a commercial design,⁵ and a shield of copper flashing about one

⁴ Southworth, "Using the 4X250B on 144, 220, and 432 Mc.," *QST*, February, 1957.

⁵ "The Amplex KW-62 Amplifier," *Recent Equipment, QST*, July, 1955

Top view of the 2-band amplifier, with cover removed. Half-wave line at 144 Mc. made from 1-inch wide copper strap has 50-Mc. coil connected at its low-impedance point.



inch wide is mounted on soldering lugs attached to the tube socket mounting screws, as shown in the photographs. This effectively shields the neutralizing wires from the screen grid rings of the 4X250B tubes, which are exposed above the socket bases. It may be impossible to neutralize the amplifier if the neutralizing wires feed back to the screen grid rings as well as the plate terminals.

Heat radiating plate connectors are used, and the plate lines are fastened to the top of these connectors by means of the tapped hole provided.

144-Mc. Output Coupling Circuit

The principal difficulty in the adjustment of the Perseids Powerhouse occurred with the output link circuits. First attempts were made to have one output link handle both 6 and 2 meters, as is done in the grid circuit. A number of different sizes and shapes of dual links were tried, but none of them would work on both bands properly. Accordingly, the dual output coupling circuit was worked out. First, two separate output coupling links tuned by a single loading capacitor and feeding into one coax output receptacle were tried without success. Separate coax receptacles for both bands were then tried for each band, with the links tuned by a common capacitor, but still correct loading could not be accomplished on each band without the adjustment of one affecting the other. Finally, entirely separate output circuits for each band, using separate links, loading capacitors and output connectors were installed and success was achieved. However, there is still some interaction which must be watched in tuning.

The standoff insulators for holding the 144-Mc. output coupling loop are approximately $4\frac{3}{8}$ inches high, including the metal mounting hardware on top. They are mounted approximately $6\frac{3}{4}$ inches from the left side of the enclosure, about $1\frac{1}{4}$ inches apart. The open ends of the loop are bolted to the standoff insulators the tops of

which are approximately one-half inch below the plate lines. To clear the 6-meter coil, the open ends of the link are bent to leave the standoffs at an angle of 45 degrees until the main body of the loop is parallel to and slightly higher than the plate lines, as shown in the photograph. From the front standoff, a copper flashing strap $\frac{3}{4}$ inch wide and $3\frac{3}{4}$ inches long runs to the stator of the 144-Mc. antenna loading condenser. A similar strap $5\frac{1}{2}$ inches long connects the other end of the link to the 144-Mc. output coax receptacle.

50-Mc. Plate Circuit

The 50-Mc. coil is approximately $1\frac{1}{4}$ inches long, with the middle turns spread apart to leave a $\frac{3}{8}$ -inch space for insertion of the output coupling link. The ends of the coil are sweated to heavy soldering lugs. One-inch long slots about $\frac{1}{8}$ inch wide were cut in the plate tank lines to allow the 50-Mc. coil to be positioned at the exact null. The coil lugs are bolted in place by No. 6 machine screws. The approximate position of the 50-Mc. coil is indicated in Fig. 2, but the exact point of the null must be determined after the entire amplifier is completed. Plate voltage is fed through to the center of this coil for both bands.

An important point in the design of the 50-Mc. coil is to make sure that resonance occurs sufficiently far removed from the setting of C_2 that tunes the line from 150 to 160 Mc. When the amplifier is being driven at 50 Mc., considerable output can be obtained at 150 Mc. if the plate circuit tunes to both frequencies simultaneously. Proper design of the 50-Mc. coil will separate these resonance points so that there will be no danger that harmonically related frequencies will occur at the same setting of the plate tuning capacitor. Similar considerations govern the design of the grid tank circuit. Ideally, the plate circuit should just hit the highest expected operating frequency in the 2-meter band with the tuning capacitor at minimum.

The 50-Mc. output link is larger than the 50-

Mc. coil, so part of it remains outside the coil. One end of the link goes direct to the stator terminal of the output loading capacitor. The other lead runs to a 2-inch standoff insulator from which a copper strap approximately $\frac{3}{4}$ inch wide and $3\frac{1}{4}$ inches long completes the circuit to the output coaxial fitting for 50 Mc.

The tuning capacitor for the plate circuit, C_5 , is a heavy-duty butterfly type, mounted directly to the chassis, thus grounding the rotor. The rear frame of the capacitor is mounted approximately $2\frac{1}{8}$ inches from the right end of the shield enclosure, but the exact spot of mounting should await the attachment of the plate lines. The capacitor is then positioned so that no strain will be placed upon the lines and the tubes. The use of a National RAD right-angle drive permits the plate tuning capacitor to be mounted symmetrically with respect to the lines. Some backlash is introduced in tuning, but little difficulty has been experienced with this. A small hole is drilled in the top center of the front frame of the tuning capacitor for mounting a $\frac{5}{8}$ -inch ceramic standoff insulator, to carry the r.f. choke connected to the center of the 6-meter coil, and the shielded high voltage lead to the r.f. choke.

More symmetrical spacing of the two tuning capacitors and the drive shaft for the plate tuning capacitor could be devised. Their rather close spacing is the result of the 50-Mc. loading capacitor having been added after the original layout work.

The filament transformer is mounted at the lower left, on the base chassis. Above and to the right is the 144-Mc. coax output receptacle, approximately $5\frac{1}{2}$ inches from the left side of the shield enclosure and about $1\frac{1}{2}$ inches above the base chassis. The 50-Mc. output receptacle is 10 inches from the left side of the shield enclosure, and again this arrangement resulted from the subsequent need for a separate output connector for 50 Mc. The two VR tube sockets are approximately 8 inches from the left side of the base chassis, and the 50,000-ohm Class AB₁ bias potentiometer is mounted an inch or so to their left. The blower, right, posed a mounting problem be-

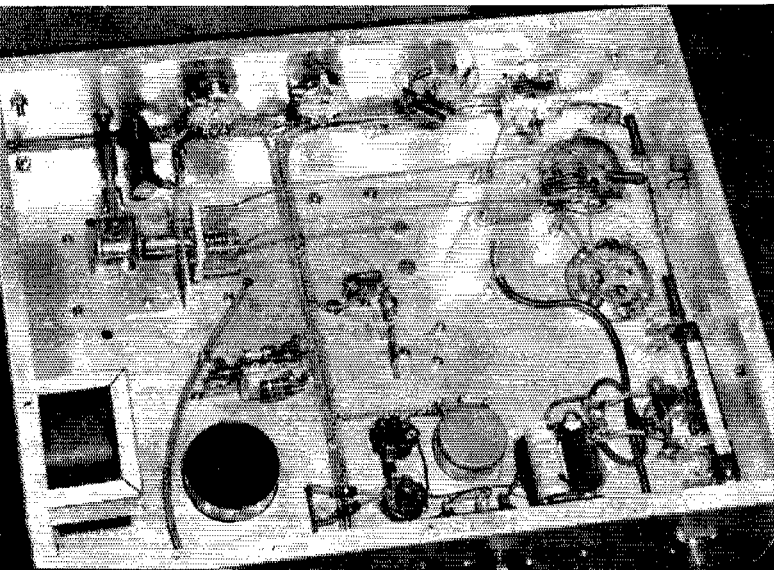
cause no mounting flanges were provided. This was solved by cutting a half circle in a small piece of 2×4 -inch pine block the diameter of the motor housing. A hole was cut in the base chassis of sufficient size to accommodate the blower output tube, and the motor housing resting on the wood base was fastened to the chassis by a light steel strap, as shown in the photograph.

On the rear lip of the base chassis there are mounted, from left to right, the r.f. input coax receptacle, the 110-volt a.c. input receptacle, the screen voltage plug, the external meter socket, the high-voltage connector and a ground connection. The spacing of these items is not critical; they should be spaced to suit the internal wiring arrangements.

Grid Tank Circuit

Now let us turn to the underside of the chassis, and the location of the components as viewed from the rear of the chassis. The grid tank circuit is similar to the plate tank circuit, but because of the lower power handling requirements, No. 12 wire is used. Fig. 2 gives the dimensions of the grid line. It will be noted that the 50-Mc. coil is connected much closer to the tube end of the line than is done on the plate line. This is because of the high grid-to-cathode capacitance of the 4X250B tubes and indicates graphically that the electrical quarter-wave point varies with the capacitance at the tube end of a half-wave line. As with the plate tank, care should be taken that fundamental and harmonic resonances do not occur at the same point of the grid tuning condenser. The tuning capacitor, C_1 , is a butterfly type, mounted on an aluminum angle with the rotor insulated from ground. Again, a right-angle drive is used, which introduces some backlash, but two rotor and two stator plates are removed, to keep the tuning rate down. Each plate is removed by grasping it with long-nosed pliers and gently bending it back and forth until it loosens from the soldered position.

The grid input-coupling link is a U-shaped affair mounted on 2-inch standoff insulators. The vertical end portions are about $\frac{5}{8}$ inch high,



Bottom view of the WØIC v.h.f. amplifier, with cover removed. On the front panel are the grid-tuning drive shaft, the mode switch, tune-operate switch, meter switch, and grid loading adjustment. The half-wave grid line occupies most of the upper portion of this view, with the tube socket at the left. In the foreground may be seen the screen modulation choke, the air intake, VR tube sockets, potentiometer and other bias-supply components.

and the horizontal sides parallel the grid lines for about 1 inch. Instead of being a closed U at the end, the link is bent into a one-turn loop about $\frac{3}{4}$ inch in diameter. This is covered with spaghetti and inserted inside the 50-Mc. coil, to provide the pickup link for that band. The parallel sides of the tank couple to the 144-Mc. line. RG-58/U coax from the r.f. input receptacle runs to one end of the link, and No. 12 wire connects the other end to the stator terminal of the grid loading capacitor. The 50-Mc. grid coil has 6 turns of No. 12 wire approximately $\frac{3}{4}$ inch in diameter and 1 inch in length. The center turns are spread about a quarter of an inch, for the 50-Mc. coupling link. Little difficulty was experienced with this coupling arrangement; the series capacitor, C_2 , may be used to vary the grid drive quite effectively on both bands.

Underchassis Wiring

At the front left will be seen the screen-dropping resistor, R_{12} , which is inserted in the screen lead when the tune-operate switch is in the tune position. For experimental purposes a third position was wired into this circuit which grounds the screens, but this was never used in actual operation. The most critical item in tuning is the screen current. Improper loading or drive can run the screen current to very high values, which if allowed to continue for any length of time will damage the tube. The 3900-ohm resistor in the screen lead effectively protects the screens against overcurrent. The screen current will not become excessive when the plate voltage is completely removed. However, it is not recommended that the tubes ever be operated with the screen voltage applied and the plate voltage removed.

From left to right at the bottom of the front panel, viewed from the rear, can be seen the mode switch, the tune-operate switch, and the meter switch, with the meter shunt resistors mounted directly on it. Shielded wire is used for all leads which leave the chassis, and in the heater circuits of the 4X250B tubes. At the lower left can be seen the screen modulation choke and to its right the air duct from the blower. It was thought for a while that perhaps a copper screen should be placed over the air duct to eliminate the escape of r.f. energy, but this has not become necessary at the author's operating location.

In front of the air duct are the parts comprising the 50-Mc. r.f. voltmeter. Above and to the right are the 144-Mc. r.f. voltmeter components. It will be noted that all the parts for the 50-Mc. r.f. voltmeter are located underneath the chassis, whereas only the diode and the output filtering circuit of the 144-Mc. r.f. voltmeter are similarly situated. It was found that when the voltage-divider (R_4 and R_5) portion of the 50-Mc. r.f. voltmeter was located in the shielded enclosure containing the plate lines maximum r.f. voltage indication did not coincide with the maximum r.f. output to the antenna transmission line. This effect was not noticed on the higher band, so the 144-Mc. voltage divider resistors (R_7 and R_8) were left in the plate circuit compartment and

the diode and filtering components placed below the chassis. The r.f. connection is made at the coaxial socket in both places.

At the lower right is a heavy duty adjustable resistor, R_{10} , which is in the primary circuit of the filament transformer. Specifications for the 4X250B tube call for 6.0 volts on the heater. This resistor is adjusted to give the proper operating voltage at the tubes, under operating conditions.

The bias circuit is quite similar to that in Southworth's single 4X250B amplifier,⁴ but because two amplifier tubes are used it was necessary to use two VR90 tubes in parallel to handle the maximum grid current. This may run as high as 64 milliamperes in a Class C operating condition. The 470-ohm resistors in the anode leads equalize the voltage drop across the VR tubes. The dropping resistor, R_{11} , ahead of the VR tubes should be adjusted to the point where the voltage applied is slightly higher than is needed for them to fire. Drive applied to the grids of the 4X250Bs will cause an increase in the voltage applied to the VR tubes, which will be effectively regulated by the VR tube action. The adjustment of the dropping resistor is just the opposite of that in a screen circuit for instance, where additional current will be drawn from the supply when drive is applied. For proper screen voltage regulation, the VR tube dropping resistor is adjusted to give maximum permissible current to the VR tube rather than minimum.

On the rear apron of the chassis (not visible in the photograph), the r.f. filtering chokes and capacitors are all mounted as closely as possible to the sockets and connectors to provide maximum r.f. filtering. Standard TVI precautions, including bypassing and shielded wire, are used on all leads leaving the chassis and no harmonic type TVI has been observed from the operation of the Perseids Powerhouse.

Setting Up the Two-Band Circuits

After both plate and grid lines have been installed with their associated tuning capacitors and the tubes placed in their sockets, a temporary hairpin-shaped link should be coupled fairly closely to the lines. A length of coax with a one-turn loop at the end should be coupled loosely to the coil of a grid-dip meter and connected to the 144-Mc. output fitting. Tune the g.d.o. to the approximate frequency of operation, in this case 144 to 145 Mc. The tuning capacitor should now be rotated until resonance is indicated by the grid-dip meter. The lead point of a wooden pencil should be touched to various places along one of the lines and the deflection on the grid-dip meter noted. It will be seen to be large when the pencil is touched to the plate terminal of the tube and it will diminish as the pencil is run down the line toward the point where the 50-Mc. coil is connected. It will rise again as the pencil point is moved toward the tuning capacitor. Somewhere along the line there will be found a point where the deflection is quite small or nonexistent. The 6-meter coil should be connected across the line

at this point.

In the case of the grid circuit, the quarter-wave point was located without placing the bottom shield cover in position, and this has proved to be satisfactory for all practical purposes. However, in the case of the plate tank it was found that placing the top shield cover in position made a substantial difference in resonant frequency of the plate tank, so it was necessary to determine the quarter-wave point with the top shield cover in place. This required the drilling of a hole at the point which had been determined to be the approximate quarter-wave point with the top shield removed. Then a pencil can be inserted through this hole and the exact quarter-wave point noted. If a standard size hole is drilled in the shield, a regular metal plug insert can be placed in the hole after the exact connection point has been determined.

Operation

If the grid and plate tank circuits have been carefully checked with the grid-dip meter prior to actual operation to see that they will tune to both 50 and 144 Mc. at different places on the dial as was previously mentioned, no trouble should be experienced in placing this amplifier in operation. Grid drive should be applied and the grid circuit tuned for the maximum grid current prior to the application of the screen and plate voltages. Detune the series capacitor, C_2 , if the current is too high. Reduced plate and screen voltages can be applied with the tune-operate switch in the tune position, and the plate tuning and loading capacitors adjusted to give maximum output, as measured on the output voltmeter circuit. Be sure that the proper coax output receptacle is used, as very little output will be obtained from the 144-Mc. output circuit when the amplifier is tuned to 50 Mc., and vice versa. At the author's station, separate antenna relays are used for 50 and 144 Mc., and coax cables are run from both output receptacles to their respective relays at all times. Both antenna relays should be activated in the transmit position when transmitting on either band. This will protect the receiver on the band not in use.

When the amplifier was originally constructed, no provision was made for neutralization, but it was soon discovered that oscillation occurred in the vicinity of 50 to 60 Mc. when plate and grid circuits were tuned to this region. Fortunately, the addition of the cross-neutralizing wires took only a short time, and the performance of the amplifier improved greatly. The best setting of the neutralizing wires can be determined by the plate-current grid-current method frequently used in commercial transmitters. Set the amplifier up on 50 Mc., working into a dummy load. Tune to the plate-current dip at resonance (not necessarily maximum output). If the grid current increases on the high-capacity side of plate-circuit resonance, the neutralizing capacitance is too high. If the opposite occurs (grid current increases on the low-capacity side of plate-circuit resonance), there is too little neutralizing capacitance.

When the amplifier is properly neutralized, grid current should not change, or should peak, as the plate circuit is tuned through resonance. Checking the neutralizing adjustment can only be done with the top shield cover in place, but it is no trick at all to neutralize the amplifier in a few minutes after you get the hang of it. A dummy load should be connected to the output 50-Mc. coax receptacle, and the exciter should be furnishing normal drive. (CAUTION — Remove all high voltages from the amplifier before removing the top shield cover and making adjustments.) Also, the amplifier should not be operated off resonance more than a few seconds. The only oscillation was in the 50-Mc. range and adjustment at that frequency sufficed for 144 Mc. When properly neutralized and with normal output loading, the amplifier is completely stable even in the Class AB_1 operating position with 350 volts on the screens and the plates drawing 200 milliamperes static current at 2000 volts.

No parasites were encountered in the development of the Powerhouse. The excellent screen bypassing characteristics of the Eimac sockets undoubtedly contribute to the stability of the amplifier. If parasites should occur, a good place to start would be to try the method used in the Johnson 6N2. A 2-watt 47-ohm resistor is tapped along each plate line for approximately one inch at the plate end of each line. In particularly difficult cases, similar treatment might be tried on the grid lines. In any event, here's hoping you have as much luck as the author in this department.

Power Supplies and Drive Requirements

The 4X250B tubes can be operated efficiently at plate voltages from 500 to 2000. However, slightly more drive and considerably more screen current is required at the lower voltages. About the best way to obtain maximum efficiency for any given plate voltages is to adjust drive, screen voltage and output loading for maximum r.f. output as measured on the output voltmeter, keeping a weather eye on the screen voltage and screen and plate currents. A very important protective device is a screen overload relay set to cut out at no more than 100 milliamperes total. Excessive plate current can be tolerated for short periods of time, but the screens can't take it and need quick protection at all times. The Powerhouse runs Class C narrow-band phase modulation with a full kilowatt input easily (2000 volts at 500 ma., 250 volts on the screens) on both 50 and 144 Mc. Considerably more than enough drive is obtained from a Johnson 6N2 operating at reduced input. If marginal drive is available, some experimenting with the grid coupling link might be desirable, to give better coupling efficiency, particularly at 144 Mc. Class AB_1 operation on 50 Mc. s.s.b. has been quite satisfactory. Operating conditions specified by Eimac are 350 volts regulated on the screen, and 200 milliamperes static plate current. The latter adjustment is made by setting R_{12} for the proper plate cur-

(Continued on page 186)

● Technical Topics

Vehicular Radio Interference Conference

RADIO interference from vehicles is a subject that needs no introduction to hams operating mobile. However, others besides hams are interested in the subject—in fact, so much so that there are organized groups, some international in scope, to combat radio noise. The parent international organization is CISPR (International Special Committee on Radio Interference). In this country, the American Standards Association has its sectional committee on Radio Electrical Coordination, in which ARRL participates.

Recently, at a CISPR meeting at The Hague, Netherlands, it was observed that many different methods of measuring radio interference from vehicles were being used in different countries. In the United States, interference is measured by placing a dipole antenna fifty feet from the side of the vehicle being checked. In Great Britain and Germany, the antenna is placed 10 meters from the engine side of the vehicle. Some countries place the antenna only a few feet from the vehicle. The actual units of measurement even differ from one country to the next. With all these and other differences, it was realized that uniform international standards should be established, but before any standards could be adopted the measuring instruments themselves had to be correlated.

Mr. Brooks Short, W9DPI, who represented the Automobile Manufacturers Association of the United States at The Hague conference, suggested that a meeting be held to study the various radio interference measuring instruments that are used in different countries. All concerned agreed that such a meeting would be helpful and it was decided to hold the conference in the United States.

The place was Anderson, Indiana, with the Delco-Remy Division of General Motors acting

as host. In attendance were representatives from the major automobile companies, ignition component manufacturers, observers from the FCC, Automobile Manufacturers Association, and the ARRL. Included were several representatives from other nations.

American, British and German instruments were all checked against each other. Test runs were made by measuring the radio interference generated by several different American and European cars. Most of the tests were made over a frequency range of 30 to 400 Mc. To eliminate variations from the vehicle source, such as engine speed changes, tests were also made using an artificial interference generator. Results showed that all the instruments gave the same reading on a given noise source. Some typical readings made on a group of 1958 and 1959 cars, using a horizontal resonant dipole 8 feet 4 inches above ground and 10 meters from the car, were:

Car (Make)	Frequency (Mc.)	Peak Value (db. above 1 μ V. per meter for 100-ke. bandwidth)
Nash.....	70	44.4
	200	49.5
Plymouth.....	70	69.4
	200	59.5
Volkswagen.....	70	52.9
	200	63.5
Renault.....	70	48.4
	200	62.0
Cadillac.....	70	38.4
	200	44.5

The conference in Anderson also generated discussion on such factors as engine speed of the vehicle under test, antenna polarization, distance of the antenna from the test vehicle and antenna height above ground. Although no agreement was reached on these subjects, the

Preparing a test vehicle for measurement at the Vehicular Radio Interference Conference. The dipole pick-up antenna is at the center of the building entrance in the background. The test site was located quite a distance from roads or other sources of electrical noise, and the building was made entirely of wood. Power is supplied through underground cables.

Equipment used for measuring vehicular radio interference. The British equipment is at the left, the American at the center background (the small instrument in front of the seated operator at the left) and the German at the right,



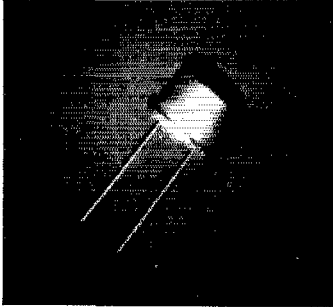
meeting did give all those in attendance a better picture of the over-all problem. At its close it was evident that the international group in attend-

ance would probably act together, insofar as possible, if any international standards are proposed in the future.
— E. L. C.

The Tunnel Diode — A New Semiconductor Device

DIODES, transistors, and spacitors are some of the semiconductor devices that have appeared on the scene over the last few years. The latest, the "tunnel" diode, seems to have just as many exciting properties as the others do.

The tunnel diode's characteristics allow it to be used in a wide variety of applications — as amplifier, oscillator or switching device. Although



The two-terminal tunnel diode looks like a conventional crystal diode but has the ability to amplify.

only a two-terminal device and still in the experimental stage, the tunnel diode is already capable of operating as an r.f. oscillator to 2000 Mc. — yet it has a minimum power requirement of only one millionth of a watt (compare this to one thousandth of a watt for transistors). One of the big advantages the tunnel diode has over the other amplifying devices is its relatively low noise when operating as an amplifier. The tunnel diode compares to the klystron and traveling-wave tube, and although it is not as "quiet" as the parametric amplifier or maser, it does not require any external r.f. power, supercooling, or magnetic bias. It is far superior to the tran-

sistor and the common vacuum tube when it comes to low-noise amplification at u.h.f.

Although similar to a transistor in some respects, the tunnel diode operates on a different principle. Conventional amplifying devices such as tubes and transistors depend on emitting electrodes, collecting electrodes, and a third signal-controlling electrode. The speed at which these three-terminal devices operate depends on how much time it takes the carriers to cross between elements. In transistors, and even in vacuum tubes, this time is relatively long as compared with the time it would take a signal to travel an equivalent distance along a metallic conductor. This is because the signal moves down the conductor by charge transfer process rather than by actual travel of a specific group of electrons.

The tunnel diode uses somewhat the same principle that the conductor does — carrying the signal by way of the fast charge transfer process. However, unlike the conductor, the tunnel diode can amplify because under certain conditions it can exhibit negative resistance; that is, an increase in voltage can result in a decrease in the current.

The name tunnel diode is derived from the "tunnel effect," discovered about a year ago by a Japanese scientist. This term is used to describe the rather complicated manner in which electrical charges move through the device under certain conditions. More information on the tunnel diode can be found in a technical information sheet on tunnel diodes published by the General Electric Research Laboratory, Schenectady, New York.

The tunnel diode is still in the experimental stage and not yet available commercially.

— E. L. C.

Automobile Temperatures — An Important Factor When Considering Equipment Placement

Most equipment ratings are based on a temperature figure that must not be exceeded for safe operation, and the maximum safe operating temperature usually is specified by the manufacturer. This is especially true of temperature-sensitive equipment such as transistor power supplies, and for long life it is extremely important that this type of equipment be placed in a favorable location in the automobile.

A leading transistor manufacturer made some temperature measurements in a car under perhaps the worst temperature conditions that

could be expected. The car was dark in color, facing south with all windows and vents closed. After being sun soaked for four hours in ambient air temperatures up to 110 degrees F., the following temperatures were measured: Under the dash, 150 degrees F.; engine side of firewall, 140 degrees F. with engine off, 180 degrees F. with engine idling; 130 degrees F. in the trunk compartment.

Although these are not ordinary conditions, the figures give an idea of the maximum temperatures one might expect. The equipment location should be selected accordingly.
— E. L. C.

• Recent Equipment —

XC-6 Crystal-Controlled Converter Kit for 6 Meters

THE Heathkit XC-6 (The Heath Co., Benton Harbor, Mich.) is a crystal-controlled converter covering the 50-54-Mc. band and designed for working into a tunable intermediate frequency of 22 to 26 megacycles. Although built primarily for use with the Heath Mohawk receiver, which has a built-in range for the purpose, the converter can be used with any general-coverage communications receiver that can tune through 22-26 Mc. It has three tubes — two 6AK5s and a 12AT7 — but no power supply; the intention is that the necessary heater and plate power will be taken from the receiver accessory socket, or from a small auxiliary supply if the receiver with which the converter is used is not capable of handling the extra drain.

The two 6AK5s are used in cascade as r.f. amplifiers, with transformer coupling between the two stages. This arrangement is used principally to eliminate feed-through at the intermediate frequency, but also contributes additional selectivity against out-of-band signals even when the tuned circuits (there are four of them altogether, including the two in the interstage transformer) are stagger tuned for broad-banding.

One triode section of the 12AT7 is used as the mixer while the other section is the crystal oscillator. An overtone-type crystal is used, working on 28 Mc. The mixer output is a resistance-loaded tuned circuit partly tuned by the receiver input circuit but using the output capacitance of the 12AT7 section as the principal tuning capacitance. The inductance of the output coil is adjustable for resonating the circuit in the i.f. band. This circuit actually will operate as an L network when the load is or simulates a 52-ohm resistance. Since it and the tuned circuit that couples the second r.f. stage to the mixer grid are a little out of the ordinary, at least in receiver applications, they are shown in Fig. 1 in simplified form.

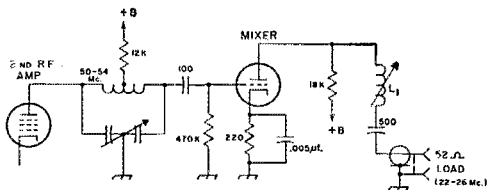
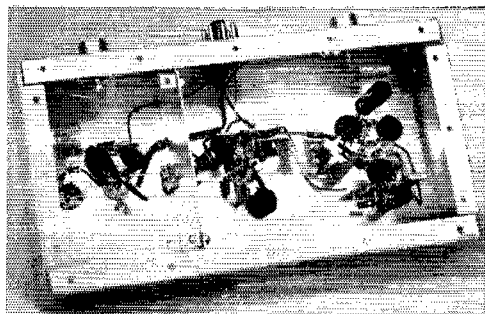


Fig. 1 — A balanced tank is used for coupling the second r.f. stage to the mixer in the XC-6. The i.f. output circuit is basically an L network when the load is an actual 52-ohm receiver input circuit.

The antenna input circuit, at the left in the bottom view of the chassis, uses an air inductor tuned by a miniature air padder. The antenna



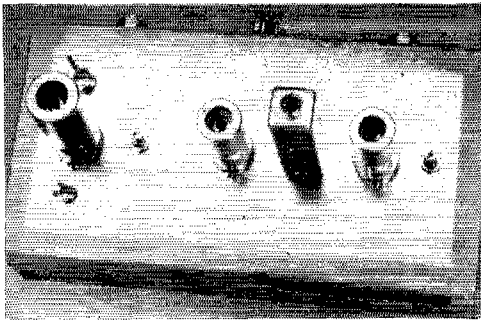
The first r.f. stage is at the left in this bottom view of the XC-6. Numerous screws for tying the bottom plate (not shown) to the chassis and interstage shield insure thorough "boxing up" of the r.f. Plated copper shields are formed across the sockets of both amplifier tubes to separate their grid and plate circuits. The oscillator section of the 12AT7 is at the lower right, with the overtone crystal mounted on a tie-point strip.

lead is tapped on this coil, well down toward the grounded end so the loading will be light and the selectivity correspondingly high. The slug-tuned interstage transformer is mounted on the chassis with the "hot" primary terminal and ground lug projecting through on one side of the interstage shield and the secondary terminals coming through on the other side. This shield fills the chassis space from wall to wall and also is fitted with small threaded brackets so it can be electrically and mechanically connected to the bottom plate in the final assembly.

The interstage coil between the second r.f. amplifier and the mixer is also air-wound, assembled with a split-stator butterfly-type tuning capacitor (Fig. 1) so that the circuit is balanced to ground. Connecting the 6AK5 plate to one side of the tank while the 12AT7 grid is connected to the other avoids placing the tube output and input capacitances in parallel across the whole circuit. It also effectively taps the mixer grid down on the circuit, thus reducing the loading and increasing the selectivity. The arrangement is a useful one where parasitic capacitances tend to result in undesirably-high C/L ratios.

The oscillator circuit is the simple triode type with the crystal between grid and cathode and with a slug-tuned coil in the plate circuit. The coil resonates with the tube capacitance. No special coupling means is provided between the oscillator and mixer; there is enough capacitive coupling to the mixer grid because of the proximity of the two triode sections of the 12AT7.

R.f. input (antenna) and i.f. output connections are made through standard coaxial fittings.



All controls—none of them intended to be adjusted during normal operation—are on top of the chassis of the Heathkit XC-6 six-meter converter. The tube at the left in this view is the 12AT7 mixer-oscillator. The tuning screw below it is for the oscillator plate coil; the one above is the mixer output coil. The screwdriver adjustment to the right of the 12AT7 is for the capacitor in the tuned circuit between the mixer and second-r.f. stages. The second r.f. tube is in the center of the chassis and the first r.f. tube is at the right; the interstage transformer is between the two. The antenna circuit is tuned by the screwdriver control at the right. R.f. input and i.f. output connectors, along with the power connector, are on the rear wall of the chassis.

The cable connectors are supplied with the kit, along with about three feet of RG-58A/U for the receiver connection. An 8-prong male chassis connector is used for the heater, ground, and plate voltages, and one prong is used for bringing out the cathode connection of the first r.f. stage. This is done so a cathode gain control can be used on this stage for handling exceptionally strong signals that might cause overloading and cross modulation. Shielded wire and 8-prong cable connectors are supplied with the kit for the external power and gain-control leads. The power requirements are 6.3 volts at 0.65 amp. for the heaters and 210 volts at 30 ma. for the plates.

The converter is built in a $9 \times 4\frac{3}{4} \times 2$ -inch chassis and has a protective cover (not shown in the photographs) that increases the total height to about $5\frac{1}{2}$ inches. The chassis, cover and bottom plate are of heavy-gauge steel, giving the unit a "solid" feel that one does not usually expect either in kits or in home-built apparatus constructed from components of the type usually available from dealers.

There are no operating controls on the unit, since tuning and regulation of gain are done at the receiver with which the converter is used.

After a small modification, the Mohawk receiver's r.f. gain control will also control the gain of the first r.f. stage in the converter; a similar change can be made in other receivers that may be used as the tunable i.f., if the builder wishes. The alignment (nonoperating) controls are all reached from the top of the chassis, including the interstage transformer tuning slugs. A special tuning tool is included in the kit for the latter adjustments. These controls are not accessible with the cover in place.

The alignment procedure as outlined in the instruction book breaks the 50-54-Mc. band into two 2-Mc. segments, inferring that a 2-Mc. band is the maximum that can be covered, with one set of adjustments, without some deterioration in performance. The tendency in homemade ham gear these days is to settle on 14-18 Mc. as the tunable i.f. because receiver stability is generally better than at higher frequencies. The oscillator and i.f. output circuits of the XC-6 can be retuned for 14-18 without modification, and with apparently as good performance as in the 22-26 range. It is of course necessary to substitute a 36-Mc. crystal for the 28-Mc. crystal supplied with the kit. We suspect that most users of the converter will sooner or later leave the cover off entirely (it has no shielding function) in order to touch up the adjustments for peak performance in various parts of the band as required.

An unhurried job of assembly and wiring consumed about six hours, split up as follows: preliminary sorting of components and checking against parts list, $\frac{1}{2}$ hour; actual assembly and wiring, $4\frac{1}{2}$ hours; making up cables, 1 hour. Contrary to previous experience with Heathkits (the writer has assembled a half dozen or so over a period of several years) the instruction book was something less than completely satisfactory—there were several errors and omissions, some obvious (like listing only one 6AK5 in the parts inventory) and some not so obvious (like the foul-up in specifying the hardware to be used on the interstage shield, which is shown as one thing in the pictorial layout and something else in the step-by-step instructions). There could also have been a few more voltages indicated on the diagram, which at the moment shows only the voltages to be expected at the tube plates. The performance of the finished unit, however, appears to be just about what one would hope for from a well-thought-out layout using low-noise pentodes as r.f. amplifiers.

— G. G.

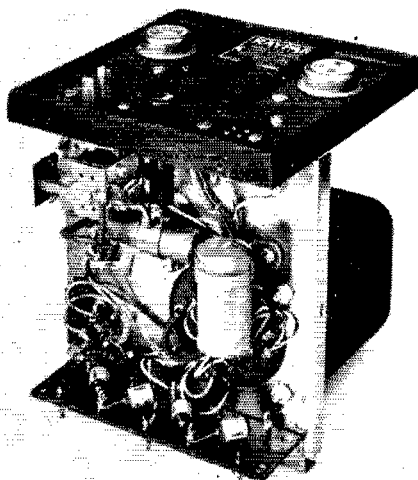
Model RP-800 Transistor Power Supply

THE Raypar transistorized power supply will deliver 450 and 225 volts d.c. at 90 watts. Input current drain is 9 amperes at 12 volts or 7.2 amperes at 14 volts. Output may be taken from either or both of the two voltage taps as long as the total load does not exceed 90 watts; for

every milliamperere of current not required from the 450-volt tap, 2 ma. may be taken from the 225-volt terminal.

The power supply contains its own built-in control circuits that switch the high-current primary circuit. When an external switch, such

View of the Raypar transistor power converter. The large cast-aluminum heat-sink panel provides ample heat dissipation so that the supply can deliver 90 watts of output power with a continuous-duty cycle (at 158 degrees F.). The control circuit relay is at the upper left of the photograph. The four tubular objects arranged along the bottom are the silicon diode rectifiers. A ventilated steel case not shown in the photograph encloses the supply.



as the push-to-talk switch on a microphone, is closed, a heavy-duty relay is activated and the supply is turned on.

A panel-mounted fuse protects the primary power circuit in case of a short circuit. If the load on the supply exceeds 120 watts the output voltage will drop to zero, but when the overload is removed, the supply will automatically go back into operation. Power input and output connections are made to Jones connectors. Mating plugs and cables are included with the unit.

The supply measures 6 inches high, 5 $\frac{3}{4}$ inches wide, 7 $\frac{3}{8}$ inches deep and weighs 8 pounds. Raypar has devised a special one-hole bulkhead mounting for the supply, and all necessary hardware for installation is included. A complete instruction leaflet covering the installation, speci-

fications, diagrams and special cautions concerning the supply is included with the unit. The RP-800 is manufactured by Raypar Inc., 7800 W. Addison St., Chicago 34, Illinois. — E. L. C.

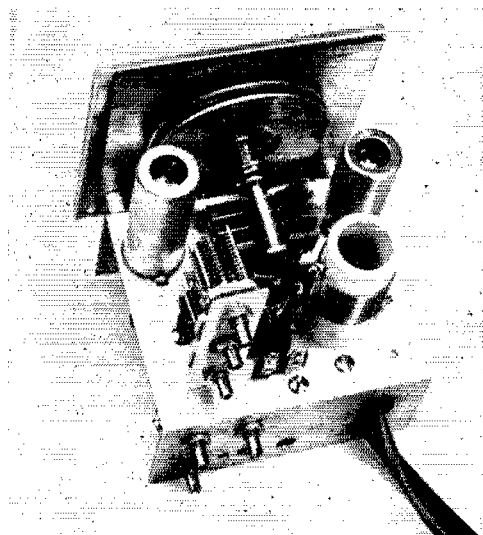
Johnson Viking 6N2 VFO

As the name signifies, the Johnson 6N2 VFO is designed to be used with the Johnson 6N2 transmitter. However, since the output is in the 8- to 9-Mc. range, the v.f.o. should also be usable with any 6- and 2-meter transmitters that use 8- to 9-Mc. crystal oscillators, either in fundamental or overtone operation.

The oscillator tube is a 6BH6 pentode in the series-tuned Colpitts circuit. Most of the components in the unit were chosen to give stability to the oscillator; for example, a front-and-rear bearing variable is used as the tuning capacitor for mechanical stability, and ceramic insulated air trimmers and a ceramic coil form minimize frequency shift from mechanical vibration. An adjustable temperature-compensating network insures minimum drift during temperature changes.

There are two controls, a band switch and a tuning control. For maximum bandspread the 6-meter band is broken up into three ranges: 50 to 51.5 Mc., 51.5 to 53 Mc., and 53 to 54 Mc. Actual oscillator output is 8.33 to 9 Mc. on 6 meters. On 2 meters, the final range is 144 to 148 Mc., the v.f.o. output for this band being 8.00 to 8.22 Mc. The tuning control covers one megacycle in one revolution on 2 meters, while on 6 meters one revolution covers about 400 kc.

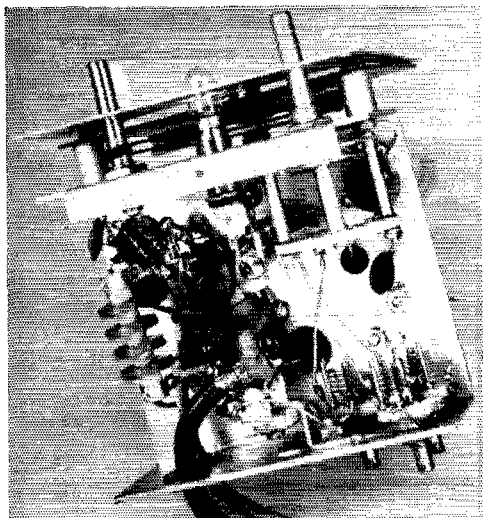
Power must be supplied from an external source. A cable with an attached octal socket comes with the unit and is wired to match the accessory socket on the 6N2 transmitter. However, any power supply that can deliver 250 to 300 volts d.c. at 10 ma. and 6.3 volts a.c. at 0.3



The Johnson 6N2 VFO uses a ceramic coil form, ceramic air trimmers and a double-bearing tuning capacitor for stability. The two tubes are the 0A2 voltage regulator (left) and 6BH6 oscillator. Output and power cables terminate at an octal socket not shown in the photograph.

amp. may be used. A built-in 0A2 voltage-regulator tube holds the voltage constant on the oscillator plate and screen.

The power leads, coaxial output cable and the oscillator cathode lead all terminate at the octal socket. When the cathode lead is grounded



Bottom view of the 6N2 VFO shows the pilot lamp projecting through a subpanel. The lamp edge-lights a Plexiglas dial. The ceramic air trimmers at the lower right are for calibrating the v.f.o. The maroon and gray v.f.o. cabinet and panel are not shown in the photographs.

the oscillator is turned on and so the lead may be keyed on and off remotely for v.f.o. spotting and for standby. There are no panel controls in the v.f.o. for the power and the cathode circuits.

Calibration instructions, wiring diagrams and operating instructions are included in the 6N2 VFO instruction manual. The unit measures 4 inches wide, 5 inches high and 4½ inches deep. The v.f.o. is available in either kit or wired form and is manufactured by the E. F. Johnson Co., Waseca, Minnesota.

— E. L. C.

Riding the Rails

A group of Ohio hams have been working from the railroad — a mobile station set up in a New York Central coach traveling between Cleveland and New York City.

“A trip through Red Tape,” reports K8GJM, Michael Treister of Shaker Heights.

The idea was born last fall when K8GJM put his head together with school pals K8IDN, Steve Bornstein and K8LBQ, Bain Cowell.

“For a long time fellows from our school had been toying with strange modes of operation,

including bicycle mobile, ice skate mobile and portable at the top of a 100-foot tree,” said K8GJM.

Dismissing these as interesting, but not really practical, the boys hit on the train.

“I checked through back issues of *QST*. There was no mention of successful railroad mobile transmissions on the lower frequency bands, although MARS had operated a station from the presidential car.

So then the fun — and frustration — began.

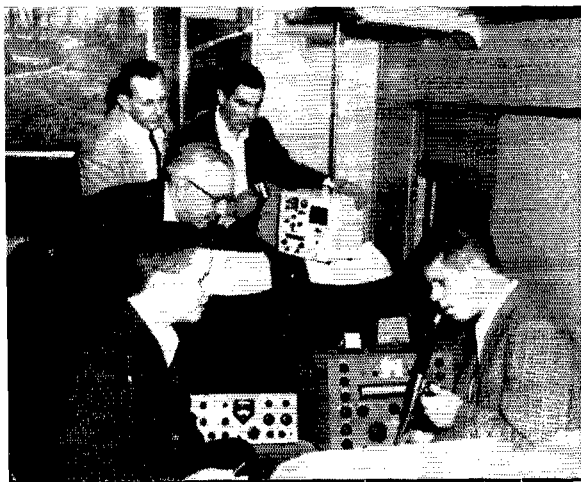
BY MICHAEL TREISTER,* K8GJM

IN OCTOBER of 1958 we started to make plans. We had to think where we could go and what equipment we could borrow. My letter to New York Central was answered in the middle of November by Mr. Warnick, public relations director for the railroad in the Cleveland area.

* 20942 S. Woodland Rd., Shaker Heights, Ohio.

The idea was tossed around by the boys at the train company until early in March, 1959, when we started to press them for a final decision on the trip. This was such an odd request that nobody really knew what to do.

After much pleading, permission was granted and we proceeded to make the final arrangements. I spoke to Don McLaren, a ham from New York



Operating the Cosmophone, at far right, is author K8GJM. At rear, are Fred Ohman, W8FAT, left, and Steve Bornstein, K8IDN, right. Seated for logging is Bain Cowell, K8LBQ, with a railroad official leaning over his shoulder

QST for

Central's new lab in Cleveland, and received some important information about the train car's length, available power, and possible antenna mountings.

About this time Mr. Warnick called me to say we would be able to ride in a coach and operate while in motion, going to New York and back, on the Empire State Express. We had hoped to get the railroad to sponsor the tickets, but after much inquiring we found that their insurance prevented this.

This fact was discovered on March 20, and we were scheduled to leave on the 30th. Equipment was still not in our hands; we had no money for the train fares; and stations around the world had been alerted to listen for us on the 30th and 31st.

We started on the telephone, explaining our problem to the newspapers, radio stations, and television stations. We then contacted local merchants, who had heard of our problem through this publicity and managed to raise several small contributions. One hundred dollars was donated and the three of us raised the other \$80.

On March 27, I called Fred Ohman, W8FAT, from the amateur radio department of Pioneer Electronic Supply, and invited him to accompany us. He was very interested in the project and managed to borrow some excellent gear for the trip.

I received a call from New York Central on March 29, telling me that the antenna was still not on the car and the power supply that we were promised by the railroad had not been installed yet. We had been advised that a 1000 watt 110 volt a.c. supply would be available, but the only thing they had lying around was a 330-watt job and we had to be happy with it. This power supply promptly fouled up our plans for a rig.

We met at the Cleveland terminal on Sunday night to see that our antenna was installed correctly and our power supply worked. At 1 o'clock, Monday morning, we left Fred on the train supervising while the three of us went home to grab some sleep.

When we returned to the yards at 8 o'clock quite refreshed, Don McClaren had managed to string up a 70' long wire, which was 14" off the steel car roof at the ends, and slightly less at the center. The power supply was finally installed and working correctly.

Fred had brought a Cosmophone 35 with him Sunday night. In the morning, just before we left Cleveland, he picked up a Gonset Communicator III and a Collins KWM-1. Tools and spare tubes were also brought. The train was scheduled to leave the Cleveland Terminal at 9:10. At 8 o'clock we were just starting to solder on the antenna connectors and plug in the gear. We got the Cosmophone on the air at 8:50 running about 10 watts input a.m. We managed to work a fellow about two miles from the Cleveland Terminal while we were still *underneath* the building. We were excited by this first contact and the hopes of the trip being a success were greatly increased.

But once we started going, contacts were few and far between. After about an hour on the air something went wrong — the antenna refused to load. We got things working temporarily, but breakdown after breakdown followed. Towards the middle of the afternoon, we put the Gooney bird on the air and began to check all of our antenna connections to the wattmeter and antenna relay on the Cosmophone.

We got things working again late in the afternoon but band conditions were very poor. We got into New York at 9 o'clock in the evening. Although we had planned to stay on the air from the car all night, we found that these plans would be impossible, so we spent the night in a YMCA. In the morning we arrived back at the train completely refreshed and ready to go.


When we left New York at 9 o'clock Tuesday morning, the KWM-1 was loading up beautifully — then the fun began. Conditions were a little better but the bands were still pretty dead. It seemed as if no one was on 10, 15, or 20. The meter showed the rig was throwing out 125 watts.

Green Light

Toward noon 20 opened up. We immediately broke into a net, and contacted about ten stations. After talking with them for about an hour, we heard a DL4 calling CQ. We gave him a shout, and then the ball started to roll. An S9 report told us that we were getting out! Labrador, Newfoundland, and Quebec soon followed suit. By six o'clock Tuesday evening we had netted about 75 contacts.

The 20-meter band started to go out and we switched over to 15. CQ's netted us several southern states. It took the conductor of the train to convince one W4 that we were actually transmitting from a train going 80 m.p.h.! When we approached the Cleveland terminal the Gooney bird was thrown on the air, and we managed to work another 15 stations on 6. Our final number of contacts was a little above a hundred.

Considering that the bands were almost completely dead, we are rather proud of the results. Most of the credit should be aimed at the equipment. The gear took a real beating. Our antenna system consisted of a 70' long wire 14" above the roof of a *solid steel* car. (In other words, 14" above ground!) Contacts were made on all bands from 40 to 6 while the train was in motion at 80 m.p.h.!

We are thankful that everything went as well as it did and that the trip was such a great success. We owe a great deal to our sponsors, and especially Fred Ohman from Pioneer Radio. His assistance on the trip contributed to our success, and without his cooperation our trip would never have been a success. 

Having battled the rails, the boys are looking for new mobiles to conquer.

"Has anyone ever operated submarine mobile?" inquires K8GJM. — Ed.

The experienced amateur knows that there is a wide tolerance in the values of many of the components that go into radio circuits, and very often a particular value is specified in a published description simply because it happened to be on hand at the time the circuit was tried out. The beginner, lacking this experience, sometimes misses opportunities to use what he already has, and thus is out of pocket for new parts he didn't really need to buy. This article should help answer the question "Can I substitute a such-and-such for a so-and-so?"

Knowing How To Substitute Can Save You Money

BY LEWIS G. McCOY,* W1ICP

What Value Component?

NO DOUBT you have wondered at times how the designer of a piece of radio gear arrives at the values of the different components used in it. Also, you've probably been mystified by the fact that different component values have been used for what seem to be identical purposes in similar pieces of equipment. And — probably more important to you as a prospective builder — you've debated what values can be substituted while still having the unit work as the designer intended.

Actually, there are very few critical values in a piece of radio gear. For example, it is relatively simple to design two transmitters having the same output power and covering the same frequency ranges but with quite different component values in each one. In this article the functions of some of the more commonly used components will be discussed, and the question of what values can be substituted will be considered.

Capacitors

Let's take capacitors first and see what they are used for and what values will be suitable in each application. One of the things a capacitor will do is pass r.f. and audio currents but stop d.c. In radio circuitry it is sometimes necessary to shunt such currents across certain parts of the circuit, and a "bypass" capacitor is used for this purpose. For example, a bypass is usually connected across points in the circuit where the power supply voltages are introduced. The bypass capacitor prevents r.f. from flowing back into the supply. Another case is where a resistor used for d.c. voltage dropping may offer an undesirably high impedance path to r.f. currents; a capacitor is used to bypass the r.f. around the resistance. An example of the uses of bypass capacitors is given in Fig. 1.

Capacitors carry a "working voltage" rating that indicates the maximum d.c. voltage that

should be allowed to appear across the capacitor. Always use capacitors that have at least as high a rating as that specified by the designer. (It is of course permissible to use units that have a *greater* voltage rating than specified.) If ratings are not given in the design (and this happens quite frequently) you needn't be at a loss to choose the proper rating; simply determine what the supply voltage is and then use capacitors with ratings equal to or greater than that voltage.

Capacitance values of bypass capacitors are not critical in the 80- through 10-meter range. Values from 0.01 $\mu\text{f.}$ to 0.001 $\mu\text{f.}$ are commonly used. If you use values much greater than 0.01 $\mu\text{f.}$ you run into two problems. First, the capacitor is likely to have significant inductance and the unit will not be an effective bypass at the frequency for which it was intended. Second, the physical size of the capacitor will be much larger.

In v.h.f. construction, capacitors designed for this type operation should be used. The older style mica and paper capacitors, while they may have the correct capacitance value, are not suited for v.h.f. work. The smallest (physically small) disk capacitors should be used. The biggest value of bypass capacitance is rarely more than 0.005 $\mu\text{f.}$, and even this value is used only for 6 and 2 meters. U.h.f. work requires special bypasses. The reason for limiting values to 0.005 $\mu\text{f.}$ for v.h.f. work is that greater values will be inductive and physically large. It is important to keep lead lengths as short as possible in v.h.f. work, and this would be impossible if large capacitors were used.

Whenever TVI suppression is a factor special bypassing techniques must be observed. This is a whole story in itself and cannot be covered in this article. However, the BCI-TV1 chapter of the *Handbook* treats the subject in considerable detail.

There is one other factor to consider when deciding on the value of a bypass capacitor. If

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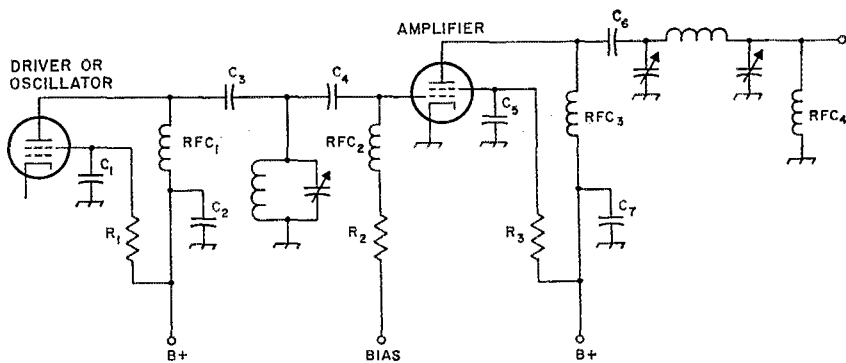


Fig. 1—This typical circuit shows the uses of some of the components in a simple transmitter.

C_1, C_2, C_3, C_7 —Bypass capacitors.
 C_3, C_4, C_6 —Blocking or coupling capacitors.
 R_1, R_3 —Voltage-dropping resistors.
 R_2 —Bias resistor.
 RFC_1, RFC_3 —Plate r.f. chokes.
 RFC_2 —Grid r.f. choke.

RFC_4 —R.f. choke used as safety precaution in the event that C_6 breaks down. In such case a dangerous d.c. voltage could appear on the feed line and antenna. With RFC_4 in the circuit this voltage is short-circuited if C_6 is shorted.

the r.f. circuit being bypassed carries audio too, as in a modulated amplifier, the capacitance should be limited to a value that will not affect the higher audio frequencies—no more than 0.002 $\mu\text{f.}$ in the ordinary case.

Coupling and Blocking Capacitors

A "blocking" capacitor is used to couple r.f. (or audio) currents from one circuit to another and to isolate one of the circuits from a d.c. voltage present on the other. An example of the use of blocking capacitors is shown in Fig. 1 at C_3, C_4 and C_6 .

"Coupling" and "blocking" capacitors actually perform similar functions, and the two terms are usually interchangeable. The distinction is that the blocking capacitor is a special case of coupling capacitor, in that it has to "block off" d.c. that might be harmful if present on one of the circuits. The blocking function is not always needed, since in some circuit arrangements a coupling capacitor is called for even though no d.c. voltages are involved. However, in most transmitting applications the coupling capacitor is used because d.c. blocking is essential, and it is therefore proper to call it a blocking capacitor.

Capacitance values and voltage ratings are similar to those used for bypasses. In r.f. circuits a minimum value of about 100 $\mu\text{f.}$ is customarily used in the 80- through 10-meter range. Any value from 100 $\mu\text{f.}$ to 0.01 $\mu\text{f.}$ is permissible in this type of circuit. Occasionally you may encounter circuits where critical values are specified, and in such cases the designer's specifications should be followed.

Power-Supply Filter Capacitors

One of the purposes of a power-supply filter is to smooth out the rectified a.c. voltage and keep the ripple percentage below certain limits. The power-supply ripple should not exceed 5 per cent for c.w. transmitters and should be no more than one per cent for phone rigs. Modulator

supplies and those for high-gain speech-amplifiers should be held to considerably lower ripple figures.

The capacitance required in a filter capacitor, for a given ripple percentage, depends on the inductance of the associated filter choke. Let's consider the single section filter shown in Fig. 2A. The percentage of ripple obtained with this type

filter is determined by the formula $\frac{100}{LC}$, where L

is in henrys and C is in microfarads. It is obvious from the formula that in order to obtain 5 per cent ripple the product of L and C must be at least 20. There is, of course, considerably more to the subject of power-supply filters than can be given here. The *Handbook* should be consulted for information on other types of circuits.

The point to keep in mind is that there are certain minimum requirements for component values, and as long as the minimum requirements are satisfied a wide range of values can be used. For example, suppose the designer shows an 8- $\mu\text{f.}$ capacitor but you happen to have a 16- $\mu\text{f.}$ or 20- $\mu\text{f.}$ unit in your junk box. Since your capacitor more than meets the designer's requirements, it can be substituted.

When substituting a different capacitor in a power supply never use one that has a lower voltage rating than specified. You will be safe in assuming that the designer's rating is the minimum.

The use of electrolytic capacitors has until recently been largely confined to low-voltage supplies (up to 600 volts), but there has been a trend in the last few years toward the use of electrolytics in high-voltage supplies as well. By connecting two or more capacitors in series, as in Fig. 2B, the total voltage rating can be increased. For example, two 500-volt, 16- $\mu\text{f.}$ electrolytics can be connected in series to obtain a 1000-volt rating, at the expense of halving the capacitance so that the total becomes 8 $\mu\text{f.}$

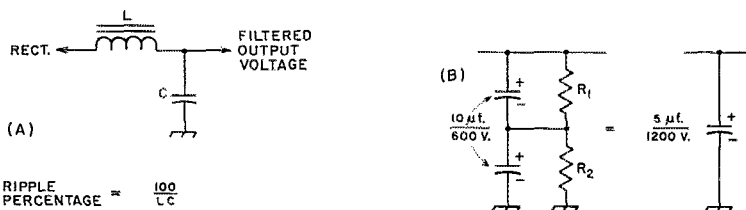


Fig. 2—A typical choke-input power-supply filter is shown at A. The method of connecting capacitors in series to obtain a higher voltage rating is shown at B. When capacitors are connected in series each capacitor should be shunted with a resistor (R_1 , R_2) with a resistance of about 100 ohms per volt of supply voltage. The resistors can serve as part or all of the bleeder resistor.

Nevertheless, this is often economical; for example, using the two electrolytics to obtain 8 $\mu\text{f.}$ at 1000 volts costs approximately \$1.75 while a similar capacitance in an oil-filled unit would be about \$9. It is permissible to substitute electrolytic capacitors for oil-filled or paper capacitors called for in a design, or in existing equipment. If, for example, a 10- $\mu\text{f.}$ 1000-volt unit blows out in a power supply, it could be replaced by two 20- $\mu\text{f.}$ 500-volt electrolytics connected in series.

Variable Capacitors

A common question asked by beginners is whether they can substitute variable capacitors having different values than those specified in a particular piece of equipment. The answer is yes in many cases. Suppose the circuit calls for a variable that has a minimum capacitance of 15 $\mu\text{f.}$ and a maximum of 100 $\mu\text{f.}$ and you have a unit that has a range of 10 $\mu\text{f.}$ to 150 $\mu\text{f.}$ The range required in the circuit would fall within the limits of your unit so it would be OK to use it. The only time you couldn't substitute would be when your unit doesn't have a low enough minimum capacitance or a large enough maximum. However, designers usually allow a certain amount of "extra" capacitance as a safety factor, and if you know the inductance of the circuit being tuned by the capacitor, you can find out how much range is actually required. One method is to use the *ARRL Lightning Calculator*. The calculator will show you what capacitance is needed to tune a given range and will also show you how to find the inductance of r.f. coils.

In substituting for a variable capacitor in a transmitter it is just as necessary to keep voltage ratings in mind as in the case of fixed capacitors. Use a variable with at least as much air gap between plates as was used in the original equipment.

Resistors

Resistors are used to provide bias voltages, to reduce or "drop" voltages, as bleeders in power supplies, and in many other applications. Most circuit designs are based on a plus-or-minus 10-per-cent resistance tolerance because resistors having this value of tolerance are generally available. However, in some cases tolerances are actually specified on a diagram, and in such event substitutions should be within the tolerance of the specified item. (This is, of course, true with

any component.) If no tolerance is specified you can substitute any resistor value that falls within the 10-per-cent region.

Resistors can be connected in series or parallel to provide a desired resistance. For example, suppose the circuit calls for a 5000-ohm, 2-watt resistor and you have two 10,000-ohm, 1-watt units on hand. The two resistors can be connected in parallel to provide the 5000 ohms at 2 watts. If you have a well-stocked junk box you'll probably find many combinations that will work in any particular circuit.

Circuit diagrams customarily specify the power ratings of the resistors required in a unit. It is, of course, OK to use resistors with a larger power rating than specified. Watch out for one thing, though: never substitute a resistor that has a power rating less than that called for.

Fixed resistors are supplied in two general types, wire-wound and composition. Never use the ordinary wire-wound type where it would have to carry r.f. Wire-wound resistors have an appreciable amount of inductance, which will upset the operation of an r.f. circuit.

If too much heat is used in soldering or unsoldering composition resistors, particularly the $\frac{1}{2}$ -watt size, the resistance value can change. It is a good idea to check previously-used resistors with an ohmmeter before installing them in a piece of gear.

R.F. Chokes

Another component that has wide use in radio equipment is the radio-frequency choke. The inductance of an r.f. choke is intentionally made large, with respect to the inductance of a coil used in a tuned circuit, so that it offers a very high impedance at radio frequencies.

Examples of the use of r.f. chokes are shown in Fig. 1. RFC_1 and RFC_2 are connected in the d.c. leads to the plates of the tubes. These chokes prevent r.f. current from flowing back into the power supply. If a bypass capacitor alone were used for this purpose, the plate tank circuit would be bypassed and the amplifier wouldn't work. By installing the r.f. choke the r.f. currents are prevented from flowing back into the supply but are not prevented from flowing to the tank circuit.

In transmitters in the 80- to 10-meter region choke values from 750 microhenrys to 2.5 milli-

henrys are commonly used. Tolerances are not "tight" and it is possible to substitute values and have the equipment perform as it is intended to do. In v.h.f. construction, on the other hand, it is a good idea to follow the designer's specifications as closely as possible.

In some cases an r.f. choke will work well on most bands but may have a self-resonance in one particular band. When this happens the choke acts as a power-absorbing tuned circuit and will develop "hot spots." If the power level is high enough the choke may actually burn out. A grid-dip meter can be used to check a choke for such resonances. Connect the two ends of choke together with a short length of wire and couple the grid-dip meter to the choke. Tune the grid-dip meter through the bands you plan to use, and if there are any hot spots they'll show up as a dip in the meter reading.

Power Transformers

Two factors must be considered when deciding on a transformer substitution — the voltage and current ratings. Let's take current first. You can always substitute a transformer that has a current rating equal to or greater than that called for in the equipment. Transformer manufacturers usually design their transformers for continuous duty, not for amateur service, which can be considered to be intermittent. This means that in many cases transformers used in amateur equipment are underloaded rather than overloaded. Many designers of amateur equipment know this and will take more power from a transformer than its ratings ostensibly would allow.

If you plan to substitute a transformer that has different ratings and are in doubt, there are a couple of ways of working out the problem. If the design tells you the total current requirements you can get a pretty good idea whether your substitution will work. However, this information isn't always furnished, and in such cases you'll have to estimate the total current by adding up the amounts taken by all the tubes.

While it is possible to take more than the rated current, intermittently, from the plate winding of a transformer without seriously overloading it, this is not generally true of the filament or heater windings because the tube filaments usually run continuously. As long as the filament winding rating in your substitute is equal to or greater than the actual heater current demanded by the tubes it is all right to use it. Incidentally, beginners frequently ask if it is OK to use a filament winding that has a greater current rating than is required for the tube or tubes they plan to use. For example, a tube may be rated at 6.3 volts, 1 amp., and the transformer can deliver 5 amperes

at 6.3 volts. This doesn't mean that 5 amperes *have* to flow through the tube heater; the current will be only 1 ampere because that's all the tube will take when the proper voltage — 6.3 volts — is applied to the heater. All that happens is that the transformer winding runs a lot cooler than it would if it were loaded to full capacity.

Where voltage ratings are concerned it is generally possible to substitute transformers that are not exactly the same as originally specified. For example, a transmitter circuit may call for a 400-0-400-volt transformer and you have one giving 350-0-350 on hand. The 350-volt transformer can be used, but the power input will be lower than it would have been with the higher-voltage job. In most cases the difference will not be serious. It may be necessary to increase screen voltages to bring them back up to rating; this is usually a simple matter of reducing the screen-dropping resistance appropriately.

If the output voltage of the substitute transformer is too high, you can use voltage-dropping resistors or a voltage divider to bring the voltage down to what is required. But watch out for the possibility of exceeding filter-capacitor voltage ratings when you do this. The power supply section of the *Handbook* should be consulted for information of voltage dividers.

Power-Supply Chokes

As shown earlier, the inductance required in a power-supply choke depends on the amount of capacitance used in the filter circuit. Here again, as with other components, there is plenty of flexibility. You are usually safe in substituting chokes that have a larger inductance than the one specified, without making any other changes in the filter circuit, as long as the choke has a similar current rating. As with transformers, the manufacturer's ratings on chokes are for continuous duty, so there is considerable tolerance available for amateur service.

If you have any doubts about substituting certain components in particular applications it is a good idea to use manufacturers' and distributors' catalogs as a reference guide. For example, you may have a wafer switch on hand and aren't sure that it will be suitable for use in an r.f. circuit. The manufacturer's catalog will usually provide this information. The same holds true for voltage and current ratings of components. Additional information on the subject is contained in an excellent article by Geiser¹ on capacitors. Also, the *Handbook* section on components and color codes is a good reference.

QST

¹ Geiser, "Choosing Capacitors," *QST*, July, 1958.

Strays

The Connecticut Jaycees have whipped the problem of the hectic milling around that precedes big parades. Jaycee president Edward Volle, W1STM, reports that the 100-unit parade at the state convention at Willimantic

was a model of order. "The parade committee was in constant communication by means of amateur mobile equipment. All parade units were assigned quickly and efficiently to their proper places."



Breaking through the one-million barrier was VP7BT. Running only a couple of DX100s, long wires, and a dipole didn't make it any easier. John was on the lookout for six-meter contacts, but the band just didn't pan out.

Official Results – 25th ARRL International DX Competition

UAOS were easier to work on 20 than G's!" This comment by W9QYW typified one of the highlights or central themes of the 1959 ARRL DX Contest. Every contest is a unique personality in and of itself and this was especially evident this year. Said W9GIL: "USSR activity really kept the boys going." W3WPG added: "Lots of Russian stations on, to add a little spice." "Hundreds of Russians active," exaggerated W2SZ. "I think the boys from the USSR deserve a tip of the hat for their fine operating," said K9ELT. W9RKP observed: "Heard many USSR stations call me after contacts with others." Meanwhile W3SOH chirped: "Think the USSR boys should be congratulated on their big turn out in the contest this year." A quick check of the tabulation shows these observations are true. This writer was most

certainly aware of the influx of Russian log entries . . . and as most logs were written in Russian, this writer was forced to become a linguist overnight!

But a contest personality has many traits. Conditions are always included in the makeup of any contest. W3LEZ spoke for the majority with the comment: "Conditions were super both week ends. Worked six new countries to add to the fun." Said W9MUR: "Band conditions were very good; never heard so many DX stations coming in S9 in all my life." Many many comments brought out the fact that new countries and states had been worked, as well as DXCC made in the contest. Also many commented that they had nearly doubled their scores of the previous year. Conditions for '59 were definitely ripe!

Last year's results carried a special plea for more Canadian activity. This was another most striking feature of this year's DX Test. As EI9J so aptly said: "There seemed to be a very welcome increase in VE activity." This was putting it mildly! A check of the tabulation results show *better than a 100% increase in VE log entries*. As the W/VE contingent salutes the increased USSR activity, so the DX conglomerate salutes the VE activity. Straight from the horse's mouth, VE2WW said: "To answer the query 'Where are the Canadians,' just say: 'Underneath the W's!'"

To further shed light on the countenance of the Test, the 11 meter band was a source of comment and observation. As the United States and Possessions for the first time did not have 11 meter privileges most did not miss it. W1BOD sighed: "It was really nice not to have to worry about 27 Mc." Million-plus scorer of last year, KH6LJ, was handicapped in this respect and had to increase his QSO total to overcome it. With 27 Mc. privileges, VP7BT made clever use of the band luring VEs to the megacycle below after establishing contact on 10; an important multi-





Making it all the way this year was W3DHM's 261,660-pointer. Bud has been in the running since '46 but really scored big this year, leading all U. S. phone scorers. Bud also took bows for the Frankford Radio Club.



You bet that W3ECR rig got a good workout in this DX Contest. At left is W3MFW who did the singleop keying for U. S. high score of 977,385, and right W3ECR who joined with two other operators on phone.

plier of five was thus earned.

A contest is good only as it can lure new customers into the fold. This writer read comments as to this being first Test try until blue in the face. "I have never been so excited since ham radio found me than I was when I knocked off my first UAØ, and then things started happening which were big game for a novice," enthused KN6TUN. Said K9JWP: "First ARRL DX Contest: what a mess!" K9IYW stated: "My first DX Test. I thought Sweepstakes was a rat-race, but these are the real big rats." (hmmmm, what does that imply? — *Ed.*) Added WA2CCC: "This was my first ARRL DX Contest, and boy did I get my feet wet in this one. In all I had fine experiences and now that I've been exposed, look out next year!" Oh, yes, 13-year-old W1NJL asked: "Was I the youngest op?" "No!", K8JXX, age 11.

The makeup of any personage is not always peaches and cream. Our Test was no exception. All does not always go well as the following indicate. "Frustrating! Antenna trouble, power supply trouble, very little rare DX," de VE2BP. GM3MCH asked: "Where were those Wyoming and Nevada operators — digging for uranium?" BV1USB was plagued with "a great deal of difficulty in convincing a considerable number of the U. S. gang that my call had a B on the end of it." W3GYP had trouble as follows: "Measles laid me low the second c.w. week end, so I

couldn't operate at W3BES as usual. The difference between a kw./beam layout and my 50 watt/dipole rig was more than slight!" W3CPB sleepily stated: "This is the best ARRL contest of them all — except it is *too long.*" Speaking of lack of hibernation, W5NOP commented: "This year I had a bit of bad luck. After a sleepless night in the contest, I decided to cut the lawn but ended up cutting off part of my toe in the lawn mower — too sleepy I guess, hi." W2BUI, having more than his share, added: "First week end practically operated from hospital bed, as I had come home the day before; second week end I had to work overtime; Sunday my DX100 blew up; what a scramble for parts. There's always next year, as the saying goes." W8OOR has "concluded that only four changes are needed to get into the running on the ARRL DX Test: (1) new transmitter (2) new receiver (3) new antenna and (4) new operator."

Of course, the contest was not void of poor operating techniques, but on the whole almost everyone was up to snuff. W4BYU observed: "Splendid cooperation by DX stations." ZE8JJ said: "Not once did a W/VE call out of turn." While VS6DS stated: "Standard of operating of W/VE stations very high." OD6CI said: "No interference until sign off, then — oh my!"

A contest is not void of comment of its participants. Some of the comments made of other stations were as W3ECR said: "I was sure

Not only a fine DXer, but a "snake charmer" as well. XZ2TH keyed his way to 46,284 points and found himself exceedingly popular to the W/VE gang. Brass snakes, of course!

October 1959





Tuning up is PAØLZ who doubled his last year's score to top other high scoring PAØs. The rig and operator just can't wait for next year's go sign.

thrilled with the Asians who showed up on 10 — UAØKIA, VS6DS etc. and XZ2TH, VS9MB etc. on 15. On the second c.w. weekend VU2RM was booming through all day on 10 meters." Said W2SDB: "Thinking XZ2TH to be another NE (he was S3 when first picked up), I didn't pay too much attention, but was I surprised when I was able to get his call straightened out, hi." Said W3MWC: "Got a big kick out of working VK9XK on 40. When I changed to 20, VK9XK was the next contact." DL9IB moaned: "Somebody said all the hams in W/K land are from Pennsylvania and the Canadians must be on strike."

The DX Contest is a most interesting character to analyze, as it has so many interesting quirks to investigate. However, in the last analysis, CN8JE put it so apropos: "What a contest!"



C.W. Call-Area Leaders			
Single-Operator			
W1BIH.....	709,758	VE1EK.....	116,028
W2WZ.....	774,324	VE2YU.....	285,735
W3ECR ¹	977,385	WØAIIH/VE3.....	284,418
W4RQR.....	615,228	VE4RO.....	311,502
W5CKY.....	356,364	VE5VL.....	98,125
W6YMD ²	865,389	VE6BY.....	79,134
W7QGF ³	263,961	VE7ZM.....	282,186
W8FGX.....	874,515	VE8TO.....	82,422
W9LNM.....	685,362	VO2NA.....	41,184
W9GDH.....	464,142		

¹ W3MFW, opr. ² K6EWL, opr. ³ W7DL, opr.

C.W. Highlights

Leading the W/VE parade was Eastern Pennsylvania's W3ECR ably operated by W3MFW with an all time high U. S. score of 977,385 points, accomplishing same with 945 contacts and a multiplier of 345. Close behind was W3BVN with 919,989 points with 859 QSOs and a contest high multiplier of 357. In show position was W8FGX with a 337 multiplier and 865 contacts amounting to a score of 874,515.

A quick check shows that last year 11 W stations topped the half million mark, while this year 21 single-op stations surmounted the half-million mark. Following the top three were the following: W6YMD 865,389, W3GRF 829,260, W2WZ 774,324, W1BIH 709,758, W3ALB 706,680, W9LNM 685,362, K2DCA 657,090, W9YSX 640,845, W4RQR 615,228, W9HUZ 611,544, W1JYH 595,608, W3DBX 552,240, W2JVU 538,269, W4FVR 536,256, W2BYP 523,905, W1LOP 521,118, W9ERU 511,875, W6WWD 509,736.

In the multiple-operator W/VE class, W6RW capably manned by five operators bested the 1956 multiple-operator record of W3C.T.J. W6RW surged forward with 850 contacts, a multiplier of 343, for a total of 874,650 points. Twelve other groups topped the 500-K level: W3AOH 865,305, WØNTA 848,736, W4KFC 836,097, W3GHM 832,371, W3MSK 812,175, K6EVR 812,160, W3BES 751,200, W3WV 688,080, W3MFJ 671,892, W3FYS 589,680, W1ICP 571,671, VE2WW 524,124. Special section awards in this category went to W3GHM, W3WV, and W6RCC.

Stations with tremendous one-band multipliers

If that Viking II looks a little warm, it has cause to be. Taking honors for British Columbia on both c.w. and phone for a real rugged workout was VE7ZM.

included W2HMJ with 119 countries on 14 Mc. His total multiplier of 134 was obtained via 134 contacts! W3GAU had 115 countries, W2PCJ 113, and K4PDV 112, all on 14 Mc. W2CYS broke the century mark on 21 Mc. with 103 countries.

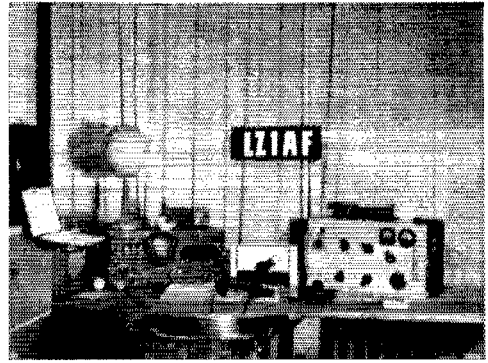
The strong Canadian contingent was led by VE4RO's 311,502-pointer followed by other strong finishers: VE2YU 285,735, W0AIH/VE3 284,418, VE7ZM 282,186. Bringing up the rear of the parade with 88 points was Prescott, VE9NG, whose v.f.o. knob jammed on 11 meters. A hearty salute to the VE's for their fine showing!

To get a clear view of the contest on a world wide scale, let us take a world cruise continent by continent. Our regal schooner first takes us to Africa, where Morocco again led. But this year it was CN8JE pacing the field with a score of 326,244. Other leading scorers were EA8BF 200,655, ET2KY 134,640, 5A3TQ 130,778, VQ2AB 108,636.

The long journey to exotic Asia finds JA1VX leading that continent for the third straight year, with 2527 contacts and 477,540 points. The place and show positions both went to Ryukyus with KR6AK scoring 159,432 and KR6BF totaling 118,776 points. Other top scorers were as follows: OD5CI, 101,116, UA0OM 92,655, HSIC 76,260, JA7AD 73,800, UA0GF 64,578. Multiple-operator scores of 100-K plus were received from UA0KIA and UA0KSA.

The plains of Marathon were the scene of a record shattering performance by SV0WP, who broke all previous European high totals with 2800 contacts to score 621,600 great big points. Last year only ten European stations crashed through the 200-K mark, but this year 27 performed the feat! PA0IZ doubled his last year's score to come up with 505,020 points. Competition was keen indeed from Netherlands, as no less than three others scored over 200-K. G4CP set a new mark for England with a score of 357,939. Meanwhile in Germany DJ2HC beat out strong competition, to post a Germany high score of 310,992 points. OZ7BG came through in fine style from Denmark racking up a big 413,220 points. Multiple-operator station UR2KAA posted 384,714 points with 2220 QSOs. One can easily see, records were broken, competition keen, and scores all around on the upgrade, as Europe led the DX contingent in this ARRL DX Competition. It will take a tremendous effort next year to maintain the high scores posted this year.

In North America, our next stop, VP7BT



Shown in the picture is the rig of LZ1AF, who was in rather great demand, enough so to lead Bulgaria with 45,744 points.

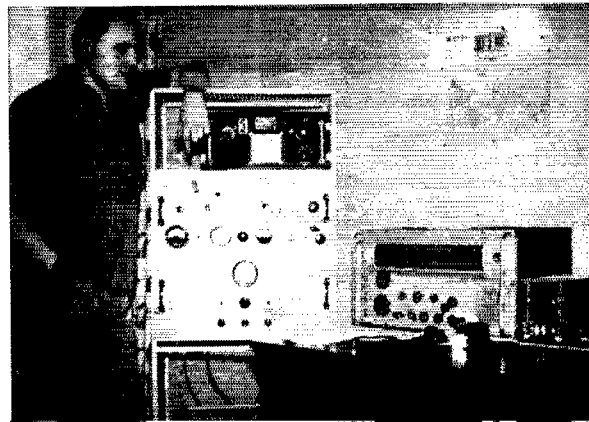
joined the select group now consisting of three who have broken the one million barrier. John, running only 100 watts with a pair of DX100s to long wires and a doublet, scrounged up 3344 contacts, a tremendous multiplier of 105, and a point total of 1,053,360! A multiplier of 12 on 160 meters was no small help in attaining the above score. Scores of 300-K plus were also reached by W9KLD/KL7, KP4CC, XE2OK, VP5FP.

Our windjammer then takes us across the majestic Pacific to the islands, known as Oceania, where (yep, you guessed it) KH6IJ came battering through with 987,102 points via 3538 QSOs. Hampered by the loss of 11 meters, Katashi couldn't quite make the one million mark; a superb performance none the less. KH6IJ serves notice that he does not expect to be in the contest in 1960; we'll certainly miss you, Katashi. Two other strong showings from Hawaii came from KH6AYG and KH6MG. Australia was the scene of VK5NO with 439,064 points emerging the victor over perennial winner VK2GW, 334,230. Fourteen other contestants scored over 100-K, for an outstanding performance from the islands.

Our last stop is South America where activity was again in demand. Many stations bemoaned the fact that South America just did not have the activity. *The plea is for more activity from Latin America next year.* Nevertheless, CE3AG led the gang with 1759 contacts and 364,113 points to set the mark for that continent. ZP9AY also posted a fine score of 140,619. Come to think of it, this is not our last stop. Our cruise now takes us to the phone highlights.

Competition was really keen in Germany, with DJ2HC coming out on top. Photo shows the transmitter and antenna tuner and to the right the receiver and electronic keyer. DX work on 80 meters is Wolfgang's speciality.

October 1959





Petite OH5SL added charm and beauty to the contest in leading Finland on phone with 52,767 points.

Phone Highlights

The microphone parade was led by W3DHH who talked his way to 261,660 points via 445 contacts and 196 multiplier during a 75 hour talkathon — a real nifty score. Others busting through 200-K were W9EWC 222,950, W1PDF 214,020, W1ONK 213,300, W3ALB 202,608, W8NWO 200,718.

The rig of W3ECR was given another workout during the phone portion with three operators racking up 499 QSOs, 209 multiplier, and 312,873 points, to lead the multioperator teams. Other teams topping the 200-K level were W3GRF 280,368, W3KFQ 249,244, W8NGO 241,224. Without a doubt these totals helped bring up the scores of the club totals.

Libya's 5A5TO led Africa's phone contingent with 170,748 points, with ZS5JY posting 104,340. Multi-op CN8JE came through with 296,784 points.

The scores from Asia were not very high but the rare ones like XZ2SY, VS6AE, XW8AL, HS1E, HS1C, and VU2RM kept the boys hopping. Top scorer was KA2UJ with 32,364. KA9MF, multiple-operator, also posted 41,400.

Europe turned up some real fine scores with DJ1BZ the top continental scorer with a round 182,000 points from a big 941 contacts and 65 multiplier. Others with heads above the 100-K indicator were EA3JE 167,022, ON4OC 149,267, and UR2BU 107,696.

Old reliable VP9L again led the North Americans with his 228,270-pointer via 1087 QSOs and a multiplier of 70. Others doing a bang up job were XE1AE 213,888, TI20E 206,640, YN4CB 128,592, VP2DX 125,850.



Phone Call-Area Leaders			
Single-Operator			
W1PDF.....	214,020	KØRNZ.....	40,488
W2PUN.....	159,390	VE1IM.....	26,080
W3DHH.....	261,660	VE2JR.....	73,337
W4LNE.....	133,736	VE3EHR.....	75,240
K5MDX.....	146,080	VE4RO.....	180,504
W6AED.....	146,016	VE5VL.....	152,912
W7WDM.....	95,121	VE6TP.....	10,218
W8NWO.....	200,718	VE7ZM.....	185,058
W9EWC.....	222,950	VO1CZ.....	2232

KH6IJ again told the story in Oceania with his 421,245-pointer; his 2035 QSOs and 69 multiplier produced the top score of the microphone contest. New Zealand had a close one with ZL1NT's 81,312 nosing out ZL1MQ's 81,180.

VP3HAG upped his score from last year to 197,860 to again lead the South Americans. Following were CE2CC 57,150, OA4V 26,078, OA4DE 20,434. As on c.w., however, the cry went up for more activity from South America.

The Clubs

Man, the clubs had a swinging time this year. No doubt many of the larger clubs had an all out drive for members to turn in their scores for the winner this year doubled the score of last year's club winner. Emerging from the abyss of third place last year, the club scores box clearly shows the Frankford Radio Club reigning supreme. The Potomac Valley Radio Club did not, however, roll over and play dead. Even after doubling their last year's effort, which was tops then, they still succumbed to the Frankford assault. The west coast also saw a reversal of last year's scores. The Southern California DX Club regained its supremacy over the Northern California DX Club, with a third place finish. It was a close decision though with the latter club finishing a strong fourth. Thirty-seven clubs engaged in the frolic with 27 c.w. and 15 phone people gaining club honors. If this is any indication of what is in store for '60, wow, watch out!

Disqualifications

The following are deemed ineligible for score listings or awards. In each case disqualification under contest rule 14 was in view of non-observance of FCC rules as reported by at least two accredited Official Observers, or by a single FCC citation. Such violations as out-of-band operation, A2 emission, power in excess of 1 kw. etc. were the criteria for these disqualifications:

One who really raved about the fine conditions was 5A5TO. He had real reason to rave as the bands treated him to 170,748 points to lead the phone men for Africa.

CLUB SCORES

	Score	C. W. Winner	Phone Winner
Frankford Radio Club	11,143,573	W3ECR ¹	W3DHM
Potomac Valley Radio Club	10,047,331	W3GRF	W3AYD
Southern California DX Club	4,419,612	W6YMD ²	W6N3U
Northern California DX Club (Hawaii)	4,298,974	W6KQ	W6AED
Kauii High School Radio Club (Hawaii)	2,045,187	K6HJL	
Rochester DX Assn.	1,951,098	W2FBA	W2PUN
The DX Club of Greater St. Louis	1,947,774	W9WUZ	W0GUV
Order of Boiled Owls (N. Y.)	1,889,839	W2AYJ	
Ohio Valley Amateur Radio Assn.	1,861,447	W8FGX	
The DX Club (Pa.)	1,250,404	W3GHS	W31MY
San Diego DX Club	1,203,432	W6ZVQ	W6RCJ
Milwaukee Radio Amateurs' Club	1,111,554	W9GIL	W9GIL
Connecticut Wireless Assn.	1,052,427		
El-Ray Amateur Radio Club (Mass.)	991,847	W1BOD	
Four Lakes Amateur Radio Club (Wis.)	836,232	W9LNM	W9LNM
Westpark Radtops (Ohio)	706,553	W8YPT	W8AJW
South Florida DX Assn.	691,730		
Southeastern DX Club (Ga.)	612,152	W4RYU	
Garden State Amateur Radio Assn. (N. J.)	515,296	W2BOK	
South Jersey Radio Assn.	510,008	W2ZX	W2ZX
Lake Success Radio Club (N. Y.)	276,927	K2YOR	K2DZU
Hamleters Radio Club (Ill.)	248,016	W9IRH ³	
Willamette Valley DX Club (Ore.)	212,013		
Chicago Suburban Radio Assn.	182,043	W9WFS	
Merrimac Valley Amateur Radio Assn. (Mass.)	152,130	W1UW	W8VOW
Columbus Amateur Radio Assn.	148,621		K4KAC
Amateur Radio Club of Selma (Ala.)	131,177	W8OKB	
Springfield Amateur Radio Club (Ohio)	90,024		
Oxford Circle Radio Club (Pa.)	66,249	W8KMF	
Canton Amateur Radio Club (Ohio)	63,672	W0CXN	
Sioux City Amateur Radio Assn. (Iowa)	63,549		
Broward Amateur Radio Club (Fla.)	46,646		
Goose Bay Amateur Radio Club	46,359		
Bronx High School of Science Radio Club	37,359		
Ramona Radio Club (Cal.)	18,495		
Oakland Radio Club	12,279	K6AUD	
Radio Amateur Megacycle Society (Ill.)	8,673	W9FCQ	

¹ W3MFW, opr. ² K6EWL, opr. ³ W9FVT, opr.

Cal. — W1QV, K3ALD, W3EQA, K4MOF, W8KX, W8SZS, W8VOW, K8HFJ, W7TML;
Phone — W1GET, K2CMF, K2KHR, W3EAN, W4DS, W4ZGE, W5INL, W6USV, W6VSS, W7VCB, K8HJS, K8HVT, K9HMY, W9UEM, W9PKE, W0VFE.

Twenty-Fifth ARRL International DX Competition

Operator of the station first-listed in each section and country is winner for that area. . . . The multiplier used by each station in determining score is given with the score — in the case of U. S.-Canada this is the total of the countries worked on each frequency-band used; in the case of non-W/K/VE/VO entries it is the total of the U. S.-Canada districts worked on each band. . . . The total number of contacts is listed next. . . . The letters A, B, and C approximate the input to the final stage at each station; A indicates power up to and including 150 watts; B indicates over 150 watts, up to and including 500 watts; C indicates over 500 watts. . . . The total operating time to the nearest hour is given for each station and is the last figure following the score. . . . Example of listings: W3ECR 977-385-345-C-81, or final score 977,385; multiplier 345; 945 contacts; power over 500 watts; total operating time 81 hours. . . . Stations manned by more than one operator are grouped in order of score following single-operator listings in each section or country tabulation; calls of participants at multi-operator stations are listed in parentheses. . . . In sections or countries where three or more multiple-operator entries appear, the top-scoring station is being awarded a certificate.

C. W. SCORES

ATLANTIC DIVISION

Eastern Pennsylvania			
W3ECR ¹	977,385-345-945-	C-81	W3ANZ. . . 10,125-45-75- B-20
W3AIB	706,680-312-755-	C-80	W3MDO. . . 4902-38-43-AB-
W3DBX	552,240-260-728-	B-80	W3TJW. . . 4851-33-40- B-10
W3FCB	499,611-259-643-	R-	W3HHK. . . 4428-36-41- R-10
W3CJT	392,238-231-566-AB-65		W3NHX. . . 3705-23-55- B-10
W3GHS	390,900-240-543-	B-53	K3BPL. . . 1104-16-23- A-5
W3KTI	339,240-220-514-	C-	W3DQG. . . 768-13-16- A-4
W3CGR	338,031-213-529-	C-65	K3ANU. . . 12- 2- 2- A-1
W3OU	333,288-216-515-	C-64	W3GHM (W3s G1HM KDF NOH) 832-371-323-859-BC-70
W3BIP	278,100-206-450-	B-55	W3BES (K2CPR, W3s BES GYP) 751,200-313-800- C-90
W3LSG	275,094-189-493-	B-72	W3KTFQ (W3s KFQ QKV) 457,812-243-628- C-86
W3ARK	273,195-195-467-	B-	W3WJD (W3s DQG WJD WCK) 341,532-212-537-ABC-65
W3BB	250,414-188-444-	C-35	W3MWC (W3s HHK MWC) 296,244-211-168- B-86
W3LEZ	235,188-188-417-	C-35	W3DHM (W3s JNQ QKV) 262,200-200-437- C-35
W3MLV	220,050-163-450-	B-50	W3DAO (W3s BYX DAO) 219,420-159-460- B-88
W3MLW	171,630-148-338-	B-66	W3HHA (W3s HHA VTT) 139,302-142-327- B-75
W3WPG	135,018-136-331-	C-67	<i>Mid.-Del.-D. C.</i>
W3GRS	119,658-154-250-	A-28	W3BVN. . . 919,989-357-859- C-83
W3ADZ	119,475-135-205-	C-36	W3GRF. . . 829,280-340-813-AC-85
W3QNZ	97,104-119-272-	C-54	W3MSR. . . 494,949-259-637- C-88
W3GHD	94,605-119-265-BC-		W3IYE. . . 446,581-273-599- C-85
W3EAN	90,972-114-266-	C-22	W3EIS. . . 406,500-250-505- C-66
W3EYW	86,346-117-246-	C-33	K3CBQ. . . 392,616-228-574- C-68
W3MDE	73,260-111-220-	A-	W3A7S. . . 378,504-246-513- C-61
K3ALU	60,606-111-182-	A-	W3VAN. . . 363,652-229-530- C-50
W3SOH	52,128-96-181-	A-	K3CIO. . . 340,875-225-505- C-63
W3QLW	29,547-67-147-	A-38	
W3DYU	27,264-71-128-	C-27	
W3GYP	25,227-67-127-	A-25	
W3HUS	13,608-58-81-	C-20	
W3KVO	12,150-50-81-	B-7	
W3ISE	11,310-45-84-	A-	
W3AEM	11,178-46-81-	B-11	

The impressive rig shown is that of W6YMD, which K6EWL keyed to the top W6 score of 865,389 points.



UA1KSA (3 oprs.) 1581-12-44-A-17	HA5DH... 31,024-28-370-A--	SP4JF... 55,890-45-416-A-41	White Russian S. S. R. UC2AA... 47,854-42-383-A-18
UA6KAB (multiopr.) 1260-10-42-A-8	HA0HN... 8840-13-230-A--	SP6WM... 40,800-84-800-A-47	UC2KAC (3 oprs.) 22,338-17-438-B-15
UA1KWB (3 oprs.) 1230-10-41-B-9	HA5BW... 6237-21-99-A--	SP6LB... 39,732-44-301-A-47	Yugoslavia YU2QZ... 20,616-24-289-A-26
<i>Faroes</i> OY8RJ... 624-8-26-A--	HA5BL... 4147-13-107-A--	SP8HR... 38,028-36-329-A-40	YU18F... 17,864-22-284-A-38
OY7ML... 51-3-6-A--	HA6NJ... 576-9-22-A--	SP8DT... 20,124-42-268-A-29	YU1YE... 13,134-22-201-A-38
<i>Finland</i> OH2LA... 208,650-50-1398-A--	HA5AM... 3960-6-20-A--	SP2CO... 11,988-27-148-A-24	NORTH AMERICA
OH60A... 113,666-46-831-A-80	HA5KAG (3 oprs.) 174,816-46-1267-A--	SP6ZA... 11,802-21-190-A-40	<i>Alaska</i>
OH3NY... 108,943-45-807-A--	HA1KSA (4 oprs.) 73,626-42-590-A--	SP6XA... 10,759-29-124-A-38	W9KLD/CL7 481,824-72-2231-C-56
OH8PX... 71,148-44-539-B--	HA8KCU (2 oprs.) 9087-13-236-A--	SP2EQ... 10,710-14-260-A--	KL7BTF... 10,143-23-147-A-10
OH5RZ... 64,722-42-517-A--	<i>Iceland</i> TF3KG... 127,959-51-842-A-47	SP5AAU... 10,388-28-124-A--	<i>Bahamas</i>
OH1SN... 44,730-30-504-A-8	TF3PI... 86,544-48-601-A--	SP6PRG... 9,450-18-176-B-30	VP7BT, 1,053,360-105-3344-A-06
OH7NW... 39,171-33-396-A-16	TF3AB... 51,480-31-520-A--	SP6MJJ... 1836-18-34-A--	<i>Bermuda</i>
OH2FT... 21,812-28-260-A-14	TF3MB... 4992-16-104-A--	SP6DB... 720-10-7-A-18	VP9CR... 116,802-84-721-A-36
OH2XK... 20,503-29-238-A--	<i>Ireland</i> EI9J... 217,320-72-1145-A-31	SP6HS... 666-11-20-A-4	<i>Canal Zone</i>
OH3RS... 15,312-24-213-A--	EI6D... 130,364-52-841-A--	SP8AG... 426-6-24-A-1	KZ5LC... 201,240-65-1032-A-15
OH6RC... 14,938-14-357-A-22	EI9G... 50,766-27-628-A-22	SP8FV... 210-5-16-A-8	KZ5WZ... 92,080-40-768-ABC-A-15
OH2HW... 7050-15-158-A-18	E15G... 3705-19-70-A-5	SP6KBE (2 oprs.) 63,180-36-586-B-75	<i>Costa Rica</i>
OH2ZL... 4736-16-99-A--	I1NT... 221,247-61-1209-B--	SPIKBT (SP1s JV 2BT) 20,800-16-438-B--	T12WD... 83,334-38-734-A-25
OH5RO... 3952-19-70-A--	I1BLF... 29,988-34-204-A-14	<i>Portugal</i> CT1TT... 88,125-47-632-A-33	T12RO... 1800-8-75-A-3
OH2CF... 2988-12-85-A-6	I1ER... 25,710-36-242-A--	<i>Scotland</i>	<i>Greenland</i>
OH9QL... 2160-16-45-A--	I1TCI... 22,110-22-335-A-26	GM3EOJ... 161,406-63-854-A--	KG1AQ... 179,883-69-869-B-32
OH3RQ... 1510-10-51-A-6	I1TGA... 21,120-36-238-A-32	GM8FM... 66,270-47-470-A-25	OX3UD... 3924-12-109-A--
OH2GJ... 975-13-25-A-8	I1ZCN... 3024-17-158-A--	GM8SQ... 37,695-35-359-A--	<i>Mexico</i>
OH5AA... 520-8-23-A-5	<i>Latvia</i> UQ2AS... 143,136-56-866-A-58	GM3MCH... 17,784-19-312-A-17	XF2OK... 366,240-60-1522-A-40
OH2YV... 288-6-16-A--	<i>Moldavia</i> UO5AA... 62,912-32-657-A-25	GM5CL... 3318-14-80-A-10	<i>Puerto Rico</i>
OH7PR... 204-6-31-A--	<i>Netherlands</i> PA0LZ... 505,020-76-2215-A-78	<i>Spain</i>	KP4CC... 363,168-78-1552-B-52
OH5QV... 105-5-7-A--	PA8LOU... 403,670-74-1838-A-68	EALAB... 150,984-54-932-A-38	KP4KD... 165,900-46-1200-A-48
OH5RU... 27-3-5-A-2	PA0VB... 296,100-70-1410-A-60	EALC... 49,860-10-408-B-35	KP4AKI... 91,538-37-832-A-73
OH2AA (OH2s KH LP) 24,835-35-237-A--	PA0VW... 271,048-68-1336-A-68	EALCP... 48,065-37-415-A-46	<i>St. Lucia</i>
<i>France</i>	PA0LV... 76,479-53-381-A-32	EALCR... 43,092-42-342-A-41	VP2LO... 28,027-33-273-A-21
F8VJ... 289,008-72-1343-A-51	PA0TAU... 42,810-42-340-A--	EALCE... 8220-20-137-A--	<i>Turks & Caicos</i>
F8ZF... 209,734-71-1008-A--	PA0WAC... 34,425-25-459-A-8	EA5FU... 2340-12-65-A--	VP5FP... 322,650-75-1434-A-15
F8TQ... 76,340-55-466-A--	PA0SNG... 33,988-29-393-A--	<i>Sweden</i>	OCEANIA
F7FD... 75,650-50-511-A--	PA0KZ... 31,730-38-282-A-24	SM5CCE... 187,108-58-1066-B-50	<i>Australia</i>
F9BB... 37,408-28-447-A-25	PA0YN... 26,994-38-236-A--	SM5BCE... 183,680-64-957-A--	VK50N... 439,604-72-2010-A-72
F8TM... 26,055-45-193-A--	PA0CF... 20,720-37-188-A-31	SM5BU... 99,450-50-663-B-49	VK2GW... 334,230-65-1714-A-59
F3II... 14,472-24-201-A--	PA0WTJ... 15,810-34-155-A-20	SM7FH... 60,720-10-508-A-35	VK7JB... 82,350-50-549-A-36
F8KA... 8519-17-169-A--	PA0RU... 7140-28-85-A--	SM3BNL... 55,852-46-404-B-46	VK3AQF... 55,751-49-101-A-32
F2SQ... 3705-13-95-A--	PA0TA... 798-14-19-A--	SM4AEQ... 51,385-43-390-B-47	VK2PV... 27,900-31-300-A--
F0CE... 3486-14-83-A--	PI1NTB (3 oprs.) 22,624-32-236-A-67	SM1BVQ... 25,384-33-259-B-14	VK5JT... 25,575-31-275-A--
F8VO... 3480-20-58-A--	<i>Northern Ireland</i> GI5UR... 83,520-48-580-A-15	SM7MS... 16,632-24-231-B-16	VK3CX... 17,856-16-372-A-19
F8EP... 2830-19-50-A--	<i>Norway</i> LA1OA... 117,501-53-739-A-49	SM5CKG... 13,050-25-174-A-17	VK4W... 5213-13-135-A-21
F2NZ... 1836-12-51-A--	LA7AE... 91,608-41-694-A--	SM5AJR... 10,608-34-105-A--	VK3XB... 1089-11-33-A-3
F3MD... 621-9-23-A--	LA2HC... 78,312-52-502-A--	SM4AWW... 10,125-25-137-A-19	<i>Cook Islands</i>
<i>Georgia</i>	LA4SE... 72,078-41-583-A-56	SM5AHJ... 8670-17-470-A--	ZK1BS... 140,430-62-755-A-29
UF6FB... 2889-13-74-B-6	LA3SC... 68,040-42-540-A-45	SM5XX... 6996-22-108-B-24	ZK1AK... 10,990-14-262-A--
UF6KAF (3 oprs.) 19,040-17-374-B-49	LA6U... 52,608-48-377-A--	SM5ATK... 6128-16-128-A--	<i>Eastern Carolinas</i>
UF6KPA (3 oprs.) 3081-12-86-A-13	LA4LE... 43,848-36-106-A--	SM5AQV... 3510-18-65-A--	KC6JC... 10,260-15-228-A-20
UF6KAE (2 oprs.) 2160-12-62-A-10	LA4K... 1092-14-26-A--	SM5BBC... 3237-13-84-A-10	<i>Fiji Islands</i>
<i>Germany</i>	LA2Q... 135-5-9-A--	SM6AMN... 2755-19-49-B-35	VR2DA... 186,355-61-1023-A-48
DJ2HC... 310,992-76-1364-B-45	LA1K (4 oprs.) 121,660-55-742-A-60	SM7BVO... 2299-11-70-A-3	<i>Hawaii</i>
DJ1BZ... 280,768-64-1467-B-65	<i>Poland</i>	SM5RC... 2256-16-47-A-7	KH6JJ... 987,102-93-3538-C-76
DJ2KR... 276,570-63-1475-B-63	SP5AR... 171,304-56-1026-B-68	SM6JY... 672-12-19-A-4	KH6AYC... 858,486-50-2327-C-70
DL7CW... 263,142-66-1320-B-56	SP8CK... 85,550-50-571-B-69	SM5AVV... 504-8-21-A-9	KH6AM... 450,300-79-1000-C-45
DL9DIB... 28,842-38-254-AB-38	SP8HU... 60,114-43-466-B--	SM3VE... 147-7-7-A-4	KH6BBV... 100,020-62-1033-A-35
DL8CM... 14,927-31-140-A--	<i>Switzerland</i>	SM5BUR... 3-1-1-A--	KH6BB... 188,460-60-1039-A-36
DL7BO... 14,448-24-204-A--	HB90Q... 212,550-65-1091-A-70	SM6NN (4 oprs.) 215,946-54-1333-B-54	KH6CQ... 170,793-62-905-A-22
DL7EN... 3198-13-82-B-7	HB9KC... 13,608-28-162-A-18	<i>Ukraine</i>	KH6CQF... 57,684-44-497-A-38
DL4MG... 1296-12-36-A--	HB9QA... 1935-15-43-A-4	UB5WF... 210,689-59-1192-B-38	KH6RR... 42,501-31-611-C-13
<i>Greece</i>	<i>Ukraine</i>	UB5TV... 124,814-59-716-A-40	KH6CJG... 28,923-31-316-A-30
SV0WP... 621,600-74-2800-B-85	UB5CL... 44,100-42-350-B-32	UB5FTV... 124,814-59-716-A-40	KH6BXE... 13,209-37-119-A-7
<i>Hungary</i>	UB5EF... 41,778-33-422-A--	UB5CL... 44,100-42-350-B-32	KH6CS... 12,474-27-154-A-10
HA8WS... 66,650-50-447-A--	UB5CV... 6649-15-149-A-18	UB5EF... 41,778-33-422-A--	KH6CS... 11,951-17-235-A-31



Shown here is VE8TO, whose 82,422-pointer was tops from Yukon-N. W. T. Running 500 watts with a Collins 431B transmitter to a "Vee", with 375-foot legs, did the trick.

QST for

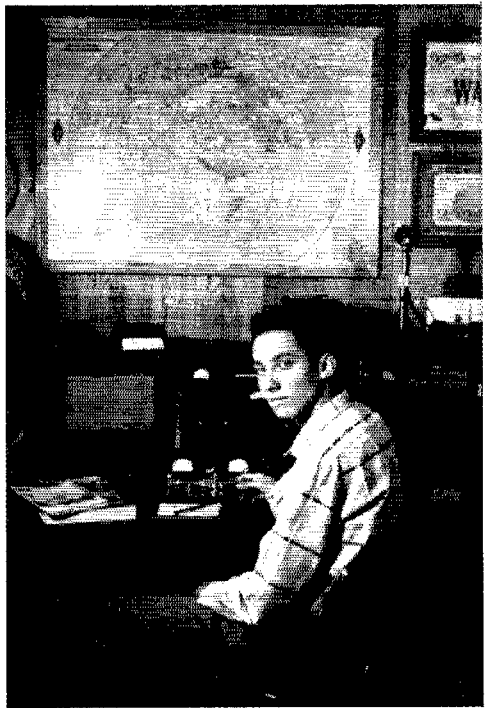
Marianas		SOUTH AMERICA	
K6TSQ/KG6	105,365- 51-690- A-44	Argentina	
Marshall		LU9DL... 45,990 35-438- A-27	
KX6CW... 221,131- 49-1507- B-51		LU3UP... 17,472- 28-208- A-39	
KX6AF (4 oprs.)		LU1AAH... 92641- 35-193- A-16	
212,520- 47-1720- B-94		Bolivia	
Midway		CP3CD... 2343- 11- 71- A- -	
KM6BL... 218,484- 68-1071- B-68		Brazil	
Netherlands New Guinea		PY5TH... 8343- 27-103- B- 9	
JZ0HA... 38,626- 14-923- A-16		PY4AXN... 5707- 13-147- B-21	
JZ0DA... 4212- 12-117- A- -		Chile	
New Hebrides		CE3AG... 364,113- 69-1759- C-46	
VJ1DL... 36,531- 27-451- B-20		CE1AD... 30,368- 37-355- B-23	
New Zealand		Colombia	
ZL1NG... 242,136- 57-1416- A-57		HK5SG... 10,731- 21-511- A-21	
ZL1MQ... 135,408- 62-728- A- -		HK3TH... 1431- 9- 53- B- -	
ZL2AXU... 55,722- 37-502- A-15		Paraguay	
ZL1APL... 48,960- 32-510- A-16		ZP9AY... 140,619- 57-826- A-75	
ZLACK... 7560- 14-180- A- -		ZP5JP... 3090- 15- 69- B- -	
Papua		Peru	
VK9XK... 173,337- 57-1014- A-52		OA4FA... 77,154- 42-620- B- -	
Philippines		OA5AGL... 21,840- 35-208- C- 6	
DU7SV... 124,128- 48-862- B- -		Uruguay	
Wake Island		CX2AZ (CX2AZ 7CO 9AJ)	
K6PQG/KW6		46,035- 33-465- A-25	
13,728- 22-208- A-12		Venezuela	
		YV5GO... 4488- 11-136- A- -	

¹ W3MFW, opr. ² W9FVT, opr. ³ W7YAQ, opr. ⁴ W2MYK, opr. ⁵ Hq. staff — not eligible for award. ⁶ W1WPR, opr. ⁷ W7DL, opr. ⁸ W3-BOA, opr. ⁹ K4MXF, opr. ¹⁰ K6EWL, opr. ¹¹ UG6AV, opr. ¹² OK3WX, opr. ¹³ DL4FN, opr.

PHONE SCORES

ATLANTIC DIVISION

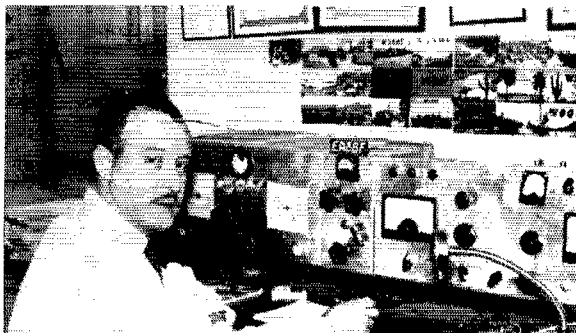
Eastern Pennsylvania		W3KLA... 468- 12- 13- A- 3	
W3DHM... 261,660-196-145- C-75		W0BPO/3... 18- 4- 4- A- -	
W3ALB... 202,608-168-102- C-70		K3BQB... 48- 4- 4- C- 1	
W3FVB... 184,977-153-403- B- -		W3GRF (4 oprs.)	
W3EQA... 104,281-124-282- C-48		280,368-198-172- C-96	
W3KTT... 86,352-112-257- C- -		W3GQF (10 oprs.)	
W3IMV... 71,904-107-224- B-50		12,768- 56- 76-BC-40	
W3BB... 61,275- 95-215- C-62		Southern New Jersey	
W3ZSS... 59,691-101-197- C-20		W2ZX... 97,630-130-251- C-34	
W3ORU... 51,528- 76-226- C-37		W2DMR... 44,616- 88-169- C-53	
W3OHM... 26,312- 71-124- B-30		K2MPB... 34,410- 74-155-AB-10	
W3HHA... 17,751- 61- 97- B-40		W2SZP... 5814- 38- 51- A-28	
W3GRS... 10,944- 48- 76- A- 9		W2ATE... 4872- 29- 56- C- 5	
W3TJW... 7068- 38- 62- B-30		W2QKJ... 1410- 30- 49- B-18	
W3FDY... 6324- 34- 62- C- 8		K2OEK... 3534- 31- 38- A-15	
W3QJW... 5643- 33- 57- A-10		W2FXN... 1298- 18- 24- C- 5	
K3ALU... 5616- 39- 48- A-21		K2UTR... 1248- 16- 26- A-13	
W3PHL... 4785- 29- 55-BC-28		K2ZOM... 798- 14- 19- B- -	
W3LEZ... 3936- 32- 41- B-10		K2CPR... 168- 7- 8- A- 4	
W3GHS... 3813- 31- 41- B- 5		W2MEO... 3- 1- 1- A-10	
W3GHD... 3483- 27- 43- B- -		Western New York	
W3ARK... 1104- 16- 23- B- 6		W2PUN... 159,390-165-322- C-59	
W3ADZ... 1035- 15- 23- C- 6		K2GXI... 110,121-141-261- B-58	
W3EUV... 918- 17- 18- C- 4		K2OMY... 56,232- 99-100- C-48	
W3MWC... 897- 13- 23- -		W2ROM... 45,198- 93-162- B-54	
K3ALD... 27- 3- 3- A- 2		K2PMZ... 34,425- 85-154- A-50	
K3BPL... 27- 3- 3- A- 1		W2RWN... 21,318- 51-144- B-30	
W3ECR (W3s APO ECR, K3ADV)		W2WSZ... 11,421- 47- 81- A-19	
312,873-209-499- C-80		K2ITM... 6840- 38- 60- B-18	
W3KQF (W3s KQF MQC QKV)		W2QJM... 3588- 26- 46- A- 6	
249,444-164-507- C-86		K2LAV... 1026- 18- 19- A- 9	
W3CGS (W3s CGS DQG)		W2QCI... 756- 14- 18- A- 5	
127,896-146-292- B-70		W2RUJ... 624- 13- 16- A- 6	
Md.-Del.-D. C.		Western Pennsylvania	
W3DRD... 75,144-124-202- B-38		W3TUD... 28,956- 76-127- A-70	
W3AYD... 18,216- 69- 88- B-26		W3ZBF... 5120- 40- 44- B-25	
W3NNX... 16,500- 55-100- A-34		W3MBN... 2496- 24- 36- A- 7	
W3HZG... 2400- 25- 32- A-17		W3ZAO... 147- 7- 7- B- 1	
W3HSL... 1800- 20- 30- A-17		W3AOH (7 oprs.)	
W3CAU... 972- 18- 18- C- 9		417,312-224-621- C-90	
W3KDP... 594- 11- 18- -			



A rapid rise to fame describes W9YSX. Only 17 years old, Skip has 260 countries worked and confirmed, and scored 640,845 points to lead the Indiana section on c.w.— nothing to sneeze at.

CENTRAL DIVISION

Illinois		K9CUI... 3828- 29- 45- A-23	
W9NZM... 145,390-155-313- C-66		W9AVO... 3672- 21- 51- A-24	
K9HGL... 37,422- 81- 54- A-68		K9CLO... 3108- 28- 37- B- 6	
W9SD... 30,996- 84-123- C-39		W9UAM... 960- 16- 20- C- 9	
W9WKU... 24,272- 74-110- C-24		K9DWK... 168- 7- 8- A- 4	
W9PVA... 20,280- 65-104- B-27		K9PDH... 147- 7- 7- - 6	
W9MWO... 11,484- 44- 87- B-23		W9UTQ... 126- 6- 7- B- 6	
W9IVG... 8316- 44- 63- C-23		Wisconsin	
W9IGK... 3948- 28- 47- A-16		W9EWC... 222,950-182-409- C-75	
W9PNY... 3255- 31- 35- A-25		W9GIL... 135,888-149-304- C- -	
W9RYU... 3174- 23- 46- A-10		W9LNM... 53,790-110-163- C-40	
W9YYG... 1794- 23- 26- A- 6		W9MBF... 25,272- 78-108- B-21	
W9WIO... 1656- 23- 24- BC- 8		W9QYW... 8319- 47- 59- B-16	
K9GTK... 1273- 19- 23- B- -		W9NJJ... 6042- 38- 53- A- -	
W9KHG... 660- 11- 20- B- 5		K9CJL... 2883- 31- 31- B-10	
W9VTV... 120- 12- 13- AC-24		W9RKP... 2250- 25- 30- B-12	
W9PNE... 330- 10- 11- A- 5		W9ORH... 2208- 23- 32- A- 7	
W9DRN... 75- 5- 5- B- 6		K9ALP... 1932- 23- 28- A- 6	
K9HAI... 48- 4- 4- -		W9SFK... 1738- 22- 27- C-18	
K9DCE... 27- 3- 3- A- 1		K9GSC... 672- 14- 16- AB-21	
K9OCU... 24- 2- 4- A- 1		W9ELT... 270- 9- 10- A- 3	
K9BLY... 18- 2- 3- A- 1		W9MJE... 234- 9- 9- A-11	
K9HAJ... 12- 2- 2- -		W9YT (W9s LPL SZR)	
		15,675- 55- 95- AC-35	
Indiana		DAKOTA DIVISION	
W9WHM... 164,160-152-360- B-64		North Dakota	
W9LRH... 26,544- 79-112- C-70		W0SRH... 2520- 28- 30- A-25	
W9RKE... 7839- 39- 67- A-35		(Continued on page 192)	
W9JHB... 5967- 39- 51- B-24			



An 807 for 20 watts scored EA8BF 200,655 points from the Canaries for one of the top c.w. scores from Africa.

W3RQZ BALLOONATICAL MOBILE

CONFIRMING QSO OF 4 JULY 1959
FROM W3RQZ, BALLOONATICAL
MOBILE AT HRS.
UR 29.493 SIGS.
FROM EASTERN PENNSYLVANIA

Balloon Mobile

BY ROBERT G. THOMAS,* W3QZO

IN recent years the Balloon Club of America has revived the almost-forgotten sport of free-flight balloon ascension, whereby several venturesome souls ride aloft beneath a large gas-filled balloon, drifting wherever they are taken by the wind. Because of the uncertain nature of the flight path, the balloonists have enlisted the assistance of the Phil-Mont Mobile Radio Club, whose members follow the balloon overland in their mobile units, and report its position for relay to the Federal Aeronautics Administration and to other members of the balloon club, who follow with a trailer to gather up the gas bag paraphernalia when it comes down. This activity has been coordinated between the two clubs by W3UMK, and in appreciation for his efforts, and the cooperation of Phil-Mont, the balloonists offered to let Dick bring along a rig and make an ascension with them. Well, Dick doesn't mind flying as long as he can keep one foot on the ground so he deferred, but another Phil-Mont member, W3JIL, does a lot of private flying and gladly accepted when the offer was made to him.

* 1712 Ballemead Ave., Havertown, Pa.

The date was set for July Fourth at the Valley Forge Airport. W3QZH offered the use of his ten-meter walkie-talkie for the rig to be taken on the flight.

Since a balloon can hardly be classed as a common conveyance for the average ham, it might be well to take time here for a short description of the contraption. The main body of the balloon used locally is a rubberized fabric sphere about fifty-four feet in diameter. As can be seen in the photographs, it is surrounded by a rope net, from which is suspended a wicker basket large enough to hold four or five people. The balloon is filled with ordinary cooking gas — the kind that explodes, that is — so needless to say, extreme precautions were taken to eliminate sparks from the walkie-talkie! Sand ballast is thrown over when it is desired to go up, and gas is released for coming down. As a safety measure, transmissions were not made during ascents, since stray gas envelops the passenger area during this maneuver.

W3JIL wrapped some wire around the outside of the basket for a half-wave dipole in case the whip mounted on the walkie-talkie was inadequate. It turned out during the flight that this was the case, and Al extended his range tremendously by using the horizontal dipole, even though the ground stations were vertically polarized.

Dawn on the Fourth broke calm and clear, and found W3JIL already at work installing the rig while his fellow "Balloonatics," as they are known locally, busied themselves untangling ropes, inflating the balloon, filling bags with ballast and checking weather reports for some hint of the direction the wind would carry them. Preparations were completed at 0900. At 0930 Al and his three companions clambered into the

This is W3JIL in the gondola basket beneath the balloon, checking out the 10-meter portable prior to the ascension. During flight, the handset was wrapped in a handkerchief to minimize the danger of sparks setting off an explosion of the cooking gas which was used to inflate the balloon. The large rope at the right is a drag line used for stopping movement of the balloon as it nears the ground on descent.

Ballast bags are at the left.



The "welcoming party" scurries out to meet the descending balloon. The rig could not be operated at this time because so much gas was being released. However, previous contact between the balloon and the ground party had provided the necessary liaison for having the ground crew be at the proper site for the landing activities.

basket, and the ground crew guided the balloon out to the center of the field for the ascension. At 0945 the balloon was released and Al, operating under the club call, W3RQZ, was on his way.

The silvery balloon was an inspiring sight as it silently rose from the earth, drifting slowly toward the west. The balloon club chase car and trailer got underway immediately, followed by W3QZO and YL in one radio-equipped car, and W3UMK/m in another. It has been found extremely helpful to have a "navigator" in the mobile units to keep an eye on the balloon and plot a corresponding course using available roads, while the driver operates the rig and watches where he is going. Contact was first established with W3RQZ/balloon by W3QZO/m at 1005 when the balloon had leveled off at an altitude of 2000 feet. This was followed by contacts with W3UMK/m, W3WUN, W3ZPP, K3DJE/m, K3GNM and W3DSG. The signal from the balloon was not very strong, however, and stations more than twenty degrees from directly beneath it had difficulty reading Al. Later during the flight he changed over from the whip to the horizontal dipole and worked W3QV, about twenty miles distant, with good reports both ways.

By this time the wind had shifted somewhat, changing the flight path to a northeasterly direction. We decided to head due north on one main road, then turn to the west on another main road to avoid the necessity of going through the city of Phoenixville, where traffic and tall buildings might have caused us to lose sight of the balloon. It soon became apparent, however, that this route was not close enough to the flight path, so we back-tracked and took a chance on passing through the city. Once on the other side of the city it was an easy matter to track the balloon overland by following whatever country road seemed to go in the most desirable direction. We would occasionally get ahead of the balloon and wait for it to drift overhead. At one time when they were directly above us, Al mentioned via the ten-meter link that since they were drifting with the wind, it was perfectly quiet, and they could hear children playing and dogs barking. I asked Al to stand by, then sent "hi" on the car horn. He read it perfectly from a 2300-foot altitude! As we passed through small towns we could see the excitement of the residents as they stopped their work to watch the balloon pass over-



head. Later we learned that two motorists became so engrossed watching the unusual spectacle that they didn't see each other and had a collision; as previously mentioned, it pays to have a navigator in the mobile so the driver can drive.

About forty-five minutes after they had taken off, Al reported that they were looking for a suitable field in which to land. We located the balloon chase crew on a nearby road and signalled them to pull over so they could talk directly to the occupants of the balloon to discuss flight and landing details.

Safety considerations made it necessary for Al to sign off from W3RQZ/balloon before descent was made. The balloon, looming larger and larger as it raced toward its shadow back on earth, finally settled down in a field about twelve miles "as the balloon flies" from the starting point. Thus ended one of our most unusual and exciting activities in the mobile phase of amateur radio. An activity combining all the best features of a pleasant ride in the country, a sports car rallye, and a "hidden" transmitter hunt in which you never lost sight of the transmitter! QST

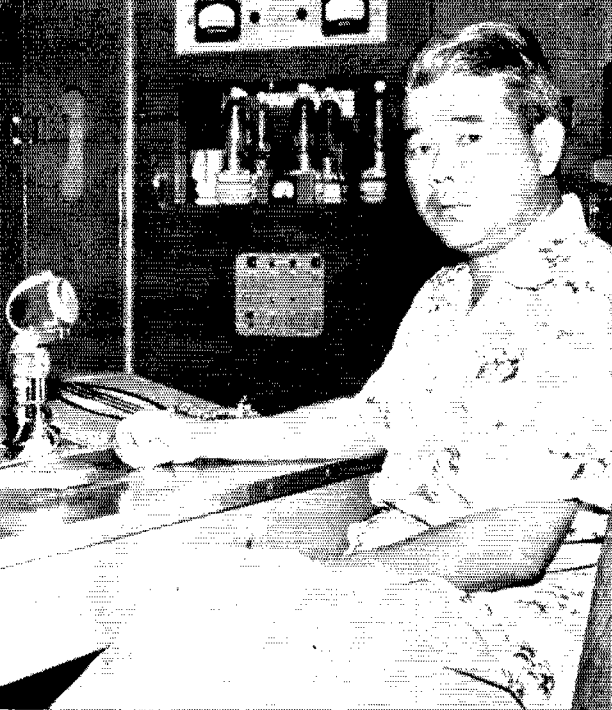
Strays

One hundred and fifty hams, each with the handle "Doc," crowded into the top floor suite of K2SVD at one time or another during the six-day American Medical Association convention in June. Hooky-playing physician hams were lined up twenty deep at times for cracks at the rig K2SVD brought to Atlantic City, N. J. The set-up resulted in an excellent public relations piece in the medical news magazine *Scope Weekly* and, we bet, a resolve by approximately 149 M.D.s to bring their own rigs next year.

The author, KH6IJ, in his Hawaiian shack ready for some DXing. Nose (pronounced No-see) is a high school teacher, and has a special grant to study at Harvard University for a year, starting this fall. So don't look for KH6IJ in the 1960 contest. Here he tells about contests . . .

Operating in the ARRL DX Test

From the DX Viewpoint



A STATISTICAL study of results of the past nine years of contesting at KH6IJ shows one trend: scores have been getting bigger and bigger. But with frequency limitations in effect¹ a plateau has been reached. It is the hope of this article to raise—or at least maintain—this plateau.

Two excellent articles² written by prominent contestants have gone a long way toward publicizing what makes a contest man tick. Now let me show you what is on the other end of the rope—the DX man's problem.

Validity

It is unfair and pointless to compare scores, there being no common yardstick, but there is justification in a comparison involving 25 years of contesting with the same operator from the same location with comparable equipment.

The nearest U. S. station is 2300 miles away, separated by detrimental time zone differentials. My equipment uses the maximum allowable by law on all bands, single-band beams and rhombic antennas, adjusted for maximum signal into the United States. Also used are electronic bugs, VOX, mechanical filters, s.s.b., and other techniques as they develop.

Variables

The variables responsible for the scores as I see it are as follows:

(a) Ability to get into high density areas—Unless one can put a good signal into the high ham population areas, namely the Eastern United

States, one gets "fished out" in short order.

(b) Band conditions—There isn't much that can be done about this but reference to Figs. 1 and 2 point out that the high frequency bands hold the key to success. The lean years on 28 Mc. were 1953, 1954, 1955, lagging slightly behind the sunspot cycle. Extrapolation of this curve should bring a downward trend in the usefulness of the higher-frequency bands (and thus of scores) in a number of years.

Phone contacts, not shown on any figure, numbered four in 1955 and leaped to a spectacular 726 the very next year.

Fifteen meters, non-existent prior to 1953, shows a healthy upward trend and may well hold the key to future high scores.

The low frequency bands, 40, 80, and 160, remain remarkably consistent, well within the limits of predictability. There was a time when the bulk of contesting was done on 14 Mc. It is still unsurpassed in reliability but the gap is being closed by 21 Mc. The 14 Mc. band, however, still holds the fastest operators and the best time can be made on this band.

(c) Operating technique—The key to large scores lies with the U. S. operator. A good DX operator gears his speed to what comes back, and any DXer worth his salt is good for at least 60 words per minute. Let me give you a few hints:

- (1) Repeats—A DX operator asks for a repeat not because of your weak signal but because of QRM. There is no percentage in chasing a weak signal. In baseball, a "floater" catches the batter offguard—by slowing down, you are catching the DXer off guard. It takes only one break to get the information wanted. There is no

* RR 1, Lihue, Kauai, Hawaii.

¹ No 27 Mc. after 1958, restricted 160-meter operation.

² Bill Leonard—*Sports Illustrated* June 30, 1958. Lawrence Le Kashman, *QST*, Sept., 1958.

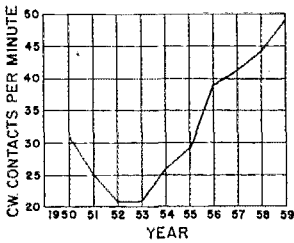


Fig. 1—Who needs to plot the sunspots? Just follow KH6IJ's "contacts-per-minute" curve.

point in repeating anything, or in slowing down. Gear your speed and procedure to that of the DXer. If he insists on sending everything once, he expects that of you too.

- (2) Speedy exchange — Top speed ranges up to 120 contacts per hour. That's two a minute. This speed is maintained only when starting out on a new band, fresh and "un-fished," usually during the first week end of the contest.

One call may result in at least ten stations calling on your frequency. A good operator calls once, gets his response, exchanges serial numbers and is through just about the time the slower ones are signing off to listen for you. So you must then quickly exchange serials with the slower one who thinks he has gotten you on first call. In extreme cases this may be carried on "three deep" with none of them the wiser. Thus a number of three-contact-a-minute exchanges may take place within the hour.

Fig. 2 shows the steady improvement in contacts per hour. The upper limit is not in sight but will be determined by you — the U. S. operator.

The drop-off in 1952 and 1953 is explained by the almost total lack of high-

frequency signals for long periods during the day, coupled with the non-existence of the 15-meter band. The result was many hours of non-profitable operation.

The second week end of these contests usually nets only 60 to 70 percent of the volume made during the first week end. Toward the end, contacts drop off to a point where it is more profitable to catch up on one's sleep.

Operating Aids

With contacts numbering over 5500 for the entire run, one must of necessity develop a system. As W7KVU says, "Imagine picking up a pencil 5000 times" or saying "Thanks for the contact, 73" 5000 times.

Needless to say, one must use carbon paper sheets for logging. During the thick of things, especially when starting out a new sheet, one must keep at least two contacts behind, remembering calls, times, serials and states, and then catching up while the third contact is being made.

"Baiting" the East Coast

On the low-frequency bands, attracting the attention of the high density East Coast is a problem. One way of solving this is to let the strong W6s call you in vain and when enough of them pile up, "to peel them off in layers" gradually working East.

This serves a twofold purpose: the strong W6s serve notice for you that there is something interesting underneath, and you get rid of the strong signals which knock your ears off, enabling you to dig for the weak East Coast.

S.S.B.

The advent of s.s.b. was thought to be the answer to the phone contact problem. But we found most s.s.b men are not contest minded and much time was spent explaining what the contest was

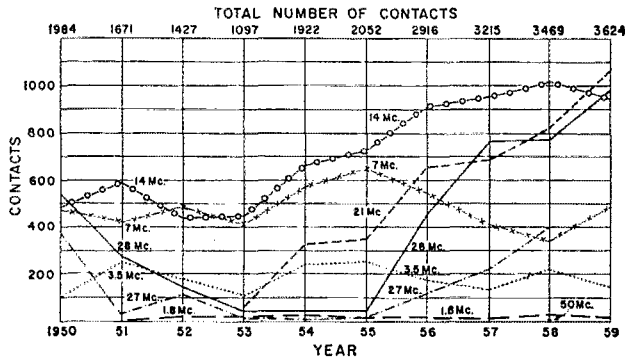


Fig. 2—Here again we see the influence of the sunspot cycle, particularly vivid in the case of 28 Mc. Note that there was no 21 Mc. used prior to 1953, no 27 Mc. after 1958, restricted use of 1.8 Mc. in 1959, and 50-Mc. contacts were made only in 1958.

STATISTICAL STUDY
ARRL DX Contest — KH6J

C.w. Entry: Bands vs. Districts Worked

	1.8	3.5	7	14	21	27	28	50	Final Score
1950		17	18	18		16	18		517,824
1951	1	12	16	16		14	15		349,428
1952	4	15	16	18		12	13		331,918
1953	2	14	15	18	12	3	4		223,788
1954	10	16	16	17	16	3	6		484,344
1955	2	15	17	16	16	3	5		461,700
1956	6	16	17	19	19	12	16		909,792
1957	2	12	18	18	16	15	18	1	964,400
1958	8	15	16	19	17	17	17	3	1,165,360
1959	6	15	18	18	18	*	18		1,011,096

Phone Entry: Bands vs. Districts Worked

		6	*	14	*	13	14		Final Score
1950		6	*	14	*	13	14		105,409
1951	1	12	*	15	*	8	10		95,634
1952	2	11	*	14	*	12	13		159,432
1953	2	7	10	14	*	0	0		25,077
1954	0	13	13	14	14	1	3		175,044
1955	1	13	11	13	14	2	5		162,486
1956	1	11	11	14	12	11	15		274,200
1957	2	11	10	15	13	15	15		466,074
1958	1	11	12	15	15	15	16	2	545,751
1959	2	10	11	15	14	*	17		427,455

about in the same manner necessary in the high end of ten meters after the contest-happy low end was "fished out."

S.s.b. with VOX has tremendous possibilities and in a few more years it ought to rival a.m. in

number of contacts.

The QSL Problem

With 5000 contacts, even if one-fifth of those worked sent QSLs, one contest is good for 1000 cards. If one enters three or four contests yearly as I do, you can imagine the QSL problem. A DXer appreciates a self addressed stamped envelope and times in GMT with his date, as one hates to wade through thousands of entries to find the right one.

The Equipment and Operator

A contest is the place to test out a piece of equipment. One doesn't revel in a S9 plus report from Podunk. You either get out well, all the time, on all bands, or else you don't win.

Unfortunately 1957 and 1958 were the only years when six-meter openings coincided with the dates of the ARRL DX contest, and then they were poor openings.

An Apology

In conclusion, may I apologize for my rudeness, for the hurt feelings that may have resulted in the wake of this quest for speed. I shall be glad to ragchew after the contest. Meanwhile, polish up your bug speed and oil your push-to-talk switches for faster contacts next season. **QST**

Balanced?

OR

Unbalanced?

ANONYMOUS

THE Amateur is Balanced — Radio is his hobby. He never allows it to interfere with any of the duties he owes to his home, his job, his school or his community." That's what Point Five of the Amateur Code says. And every time I open the *Handbook* and read that paragraph, I just shake my head. Not in remorse, you understand. I treat amateur radio strictly as a hobby. It is never allowed to interfere with my job, except of course, when a fellow ham stops by the lab for an eyeball QSO, but that hardly counts. (They won't let me bring my rig into the plant, anyway.) As for the duties around home, well, radio never interferes with them. The animals make so much fuss I couldn't hear the receiver even with carphones on if I didn't feed them at the appointed time. We live way off in the woods so I have no walks to shovel in winter and I'm allergic to spring grass and ragweed so that eliminates lawn mowing in the summer which

does reduce my home duties considerably. As for duties to the community, ham radio got me into a lot more civic activities than I ever thought existed: Civil Defense, Civic Association, even politics!



ED. NOTE: The author would actually *love* to have his name in *QST*; he just doesn't dare!

No, I'm not the one who is unbalanced. It is, believe it or not, my XYL! Now I must admit she doesn't complain about the money I spend on equipment nor even about the amount of time I spend on ham radio. So what am I griping about? I'll tell you. She is a ham, too. And she is the most unbalanced ham you ever saw! Of course, you probably think I'm prejudiced. I hear a lot of you fellows mumbling "What the heck's eating him? He doesn't know how lucky he is, having a wife with a ticket!" That's what you think, boys. Read on.

You notice this Point Five says he (and I assume that also means she) never allows amateur radio to interfere with any of the duties he owes to his home or job. I realize it's a little difficult to clearly outline the duties involved in the job of housewife. But there are certain basic things that I feel are absolutely essential and should be carried out with efficiency and dispatch, namely the feeding, clothing and general care of the man of the house. Let's take up the feeding first.

Any of you who might meet me in person would recognize that I have just about the physique of a certain popular crooner. (I'm not blaming that on the XYL, though. It seems to be an inherited characteristic.) But even though it may not look that way, I like to eat — regularly, well, and plenty often. Therefore, I take a rather dim view of what happens around this QTH on week ends, particularly. During the week, the XYL works in the afternoon, and I get home from work first so I sit down at the rig immediately upon getting into the house and she has no choice except to get supper. Week ends are a different story. Friday and Saturday nights the XYL stays up until the very wee hours hamming away, so naturally she doesn't get up very early the following mornings. In fact, often it's nearly lunch time before she gets squared away and into the kitchen. So I lose out on one of my three squares right then and there. On week ends we eat brunch! That wouldn't be so bad if dinner were forthcoming at the usual hour. But all too often she gets busy doing the housework she should have done that morning or during the past week and dinner hour comes and goes with no tantalizing aromas from the kitchen. Only when everyone else on the air gets the chow call and signs with me, does she realize that maybe I am hungry too. I must mention though that when she does get out to the kitchen and gets going, you can't find a better dinner anywhere. You will notice I haven't even mentioned hand openings or contest week ends. I'm just resigned to eating my own cooking at those times.

Now for the clothing bit. I have done everything I can think of to make the laundry problem simple. I took the hard earned money I was saving for a super signal shifter and bought a brand new electric dryer. However the old washer we had was not automatic and after the XYL unexpectedly washed the floor a couple of times because she was busy talking or listening while filling the washer, she found the easiest way around that problem was not to wash. So I gave

up the idea of getting a higher power transmitter and bought a new automatic washer. Then it seems that when the dryer is running it causes noise in the receiver and makes weak signals hard to copy. Well, at least the clothes get washed promptly even if they don't get dry too promptly. Next I mounted the microphone on a boom and put the station control switches into a weighted minibox on a long cord so that they will reach out over to the ironing board. That, I thought, would take care of the clothes when they did get dry. Well, they get ironed all right. But occasionally little accidents occur. Like the time she was down on 15 calling CQ and her first DX station came back to her. It wasn't until she smelled smoke that she realized she had left the iron face down on the board. It was my favorite shirt too. So much for that.

General care is a broad term and I'm not one to fuss about details. I don't mind little things like the cobwebs on the ceiling that some visiting ham pointed out the other day; or the fact that the car hasn't been washed in some weeks; or even the fact that the new front door still hasn't gotten its final coat of paint. You don't hear me screaming about the knee high grass in our yard or the overflowing trash cans that need to go to the dump. I might even do the latter myself occasionally. After all, she worked a ZE3 on 6-meter phone the other day and that deserves some recognition! But when she talks half the night and then doesn't hear the alarm in the morning so that I have to take off for work without my usual bacon, eggs, toast, tomato juice and coffee, I call that gross mishandling of a husband. And when she gets on the air, looking for extended ground wave before I even get out of the door in the morning and so forgets to hand me my briefcase — I ask you, isn't that letting radio interfere with one's job? Then too, there's the little matter of bolstering the male ego. At least I understand that is a matter of prime importance stressed in all articles on "How to Hold Your Husband" in the women's magazines. But she doesn't read women's magazines — just QST. So I have to put up with things like the fact that the only reason most hams around here know *my* call is because we use my call for the 6-meter rig and she mostly works 6. Not to mention the time when the new transmitter wouldn't load right. I checked the voltages, I checked resistances, I checked the schematic, I checked everything. The XYL came into the shack, twiddled a few knobs, looked at the instructions, and said calmly, "You wired that switch in backwards." Sure enough I had, but after all, how high do you think that made me feel? You'd never believe it, but she looks doggone feminine, too.

All in all I lead the proverbial dog's life. But before any of you OWs (Old Wolves, that is) start heading this way to crowd me out of my doghouse, let me tell you this. I'm not about to trade this XYL in on a new model. Balanced or unbalanced, crazy or not — as long as she continues to be as crazy about me as she is about ham radio, I'm satisfied. QST

ANNOUNCING 1959 SIMULATED EMERGENCY TEST

October 10-11, 1959

Each year we "pry off the lid" of the active operating season by conducting a nationwide activity involving the organized emergency and traffic nets and systems. Opportunities for participation exist at section, state, regional and national levels in cooperation with both the Red Cross and civil defense. The purpose of this announcement is to give some information on how the activity is conducted, what it involves, and how *you* may take part.

The annual SET is at once both a demonstration of our Amateur Radio Emergency Corps facilities and versatility to the public and a look-see at our own emergency capability as it exists today. It resembles both the annual ARRL Field Day and the annual civil defense Operation Alert but is identical to neither. The SET is not a contest, as is the Field Day, and not an activity devoted to one aspect of emergency communication, such as Operation Alert, but it is, like both of them, a test of emergency communications facilities under conditions of stress. Your "score" competes with no one and is strictly a group, not an individual, proposition; its only purpose is to add to the national performance index in numerical terms. That is, we try each year to attain a national total score higher than that of the previous year, and each group tries to better its last year's score. As in the case of most ARRL operating activities, there is nothing quite like it.

In the SET, the basis of all activity is generated at the local AREC group level. Without participation at this level, there can be no national aspect. Therefore, it is imperative that as many of our local AREC units as possible implement plans for a simulated emergency test.

No doubt many of you reading this have the feeling that participation in AREC activities is something that falls under the classification of a duty or obligation, and that it's "no fun." This is so only if you make it so. It's serious business, all right, but the demonstration of skill, versatility and usefulness is as much "fun" as anything in amateur radio.

Here's how you can participate in SET:

(1) Get signed up in the AREC, if you aren't already. Your local Emergency Coordinator is the man to get in touch with. Even if you are signed up, this is a good time to get your card endorsed and check on plans and status. If you have no EC, get together with other interested local amateurs and recommend one to your SEC (see page 111) or SCM (see page 6).

(2) Find out the date of your local SET. It may be that for local reasons your EC is planning to have the SET at some time other than the recommended Oct. 10-11 week end, so it is important that you contact him if he doesn't contact you. Even if the EC is inactive or nonexistent, this doesn't mean that the SET is out of

the question. Agree on a local leader (who may later become EC) and get something planned. In that case, the chosen guy will want to ask us for a copy of the SET Bulletin, which gives full details.

(3) During the test, originate a message to ARRL headquarters indicating your participation. Make it a *short* message (ten words should be plenty). Plans should exist for funneling such traffic into the National Traffic System, or it can be cleared on one of the National Calling and Emergency frequencies (3550, 3875, 7100 or 7250 are usually the best, but for long hauls 14,050, 14,225, 21,050 or 21,400 may be better). Regular traffic men will be monitoring these frequencies and will be on the lookout for such traffic. *Your message should identify the group with whom you are participating.*

(4) After the test, your EC will summarize the results on a regular report form. *Urge your EC to report, so your work will receive credit.*

We'd like very much, this year, to get some of the big cities into the SET. Last year we had no reports of activity from some of the most crucial cities where an emergency can be really serious. The demand for activity should be spontaneous, arising from the grass roots. If you live in or near a large city, how about talking it up this year? Conspicuous by their absence in last year's SET: Boston, New York, Washington, Philadelphia, Detroit, St. Louis, Kansas City, Milwaukee, Minneapolis, Dallas, Denver, Seattle, San Francisco, Los Angeles. QST

Strays

The RTTY Society of Southern California announces another RTTY Sweepstakes from 1500 EST Friday October 30 to 2400 EST Saturday October 31, thus giving thirty-three hours of operating time. Stations will exchange messages consisting of message number, origination station's call, check or RST report of two or three numbers, ARRL section of originator, local time (0000-2400 preferred), date, and band used. Score one point for a message received and acknowledged by RTTY. For score, multiply total message points by the number of different ARRL sections (see p. 6) worked. Two stations may exchange messages again on a different band for added points, but the section multiplier does not increase when the same section is worked on another band. Each foreign country counted by ARRL for DXCC credit is treated as a new section for RTTY multiplier credit. Suggested congregating frequencies include 3620, 7140, 14,090, 21,090 kc. Logs should be mailed to Merrill L. Swan, W6AEF, 372 West Warren Way, Arcadia.

Bamboozlement

BY SYLVIA L. DECKER*

IT ISN'T that I'm complaining, really. Let's say that this is merely a running commentary on what it's like to be married to a "ham." Why I didn't knot my few possessions into a kerchief and run away when first I discovered that I will never be as beautiful in his eyes as an oscilloscope or even an egg insulator, I'll never know.

It began in 1941, two months after we married. W3HPK, my erstwhile bridegroom, returned from a trip to New York and a short safari down radio row. He woke me out of a dream wherein I was floating about in a hostess gown from Nan Duskin's, lighting tapers on an exquisitely set table for two, with roses curving gracefully over the pristine silver and goblets.

"Honey," he said, ardent in his voice, "Wake up and look at what I found in New York today." A cardboard carton was dumped on my midriff, the bedlamp was clicked on, and he unceremoniously dragged me to a sitting position. Two finger-

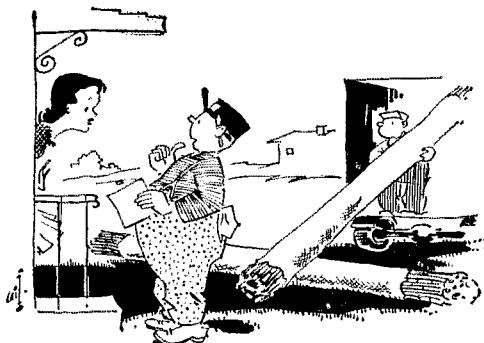


nails went the way of all pampered fingernails as they struggled with a tightly sealed carton, corrugated buffers, and tough paper tape. What came to light was a series of aluminum fins, and I wondered whether the gadget was for whipping potatoes or rindng an orange, or what.

"It's a capacitor, dear," he enthused. "Surplus. Normally costs upwards of \$50, and I got it for \$2. Isn't that the prettiest thing you ever saw?" Some little instinct in me gave me the grace to say, "I just can't imagine getting all this for \$2," and he went happily to bed while I stared at the ceiling and wondered what the ding-dong ham radio was all about.

In the ensuing years, I have been indoctrinated. Little and big cardboard cartons are "part and parcel" of it. So are telescoping towers, vanned in by uninitiated drivers who want to know whether we are affiliated with one of the big networks. I smile and say, "Oh, no, this is just a Junior Erector set for our small son." They go away, bewildered, and really, how *would* you explain it to someone so thoroughly outside the pale?

*4229 Mariposa Drive, Santa Barbara, California



It took rather a while to adjust to all of it. Dinner, shrinking like a headhunter's skull in the oven, while a roundtable discussion took place, and finally a tray of food delivered to the ham shack and the kiss behind the ear that said, "I don't mind, really, dear." The contest stints, where you ran with sharpened pencils, coffee, and you bribed the kids into silence and obscurity with cokes, Eskimo pies, and fabulous promises of living with them in your very laps once the contest was over.

But am I *really* indoctrinated? It so happens that W3HPK, now K6BPY, is experimenting with a cubicle quad for 40 meters, and 30-foot bamboo poles are of the essence. For weeks, he has tracked down every importer in the country, and it became such a "thing" with him that I would have settled for hiring a coolie to lash the poles together and hand-paddle them from Japan to the States.

What prompted all this was the arrival of a truck, with what appeared to be two huge rugs, wrapped in burlap. The driver came to me with the invoice and a pencil pointed at me like a gun and said, "Where do we dump the bamboo?" The shipment proved to be two bundles of 15-foot bamboo poles, 25 to a bundle, out of which K6BPY hopes to find 8 perfect poles which can be spliced for the desired 30-foot length. When I gingerly inquired of K6BPY what he had in mind for the 42 bamboo poles that would be "rejects", it became clear that my stint is to convert them into bamboo café curtains, rugs, hot pads, toothpicks for canapes, and garden stakes. And the burlap can be put to some constructive use in the future . . . you never can tell when we might want to ball and move one of these 60-foot Monterey pines that so beautifully screen (to some degree) both towers!

At this point, I would settle for hiring a someone to lash the 42 residual poles into a raft and hand-paddle them *back* to Japan.

Meanwhile, failing this . . . bamboo broth, anybody?

QST-



Hints and Kinks

For the Experimenter



A FLEXIBLE COAX ANTENNA

A NOVEL but effective flexible coaxial antenna and feed line can be made from a length of coax cable and an insulator. It can be rolled up in a small space for use as an emergency-portable antenna or it can be hung permanently from a fixed support. Feed-line and radiating portions are all one piece so that there are no joints or soldered connections except at the transmitter end of the line where the plug of your choice is installed. Although a compromise antenna, it is simple to construct and is an easy solution to the portable antenna problem.

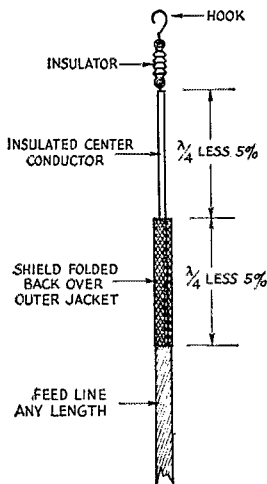


Fig. 1—Portable Coax Antenna made from common coax cable.

Select your coax cable and cut a length equal to about one-quarter wavelength at the desired frequency plus the length required for the feed-line. Any of the popular coax cables such as RG-58/U, RG59/U or RG-8/U may be used. At one end of the cable, slice down and pull off the outer insulated cover (being careful not to damage the shield underneath) for a distance of one-quarter wavelength plus about 10 inches. Push back the exposed shielding to loosen it up, then fold it back over and down the feed-line portion of the cable. The shield will form the bottom section of the coaxial antenna. The shield will not reach down the cable for the entire length it was cut—thus the reason for cutting it 10 inches longer than necessary. Pull the shield down as tight as possible, measure a quarter wavelength at the desired frequency less 5 per

cent, and trim off the excess shield. A few extra turns of tape should be applied to keep the shield from creeping up the cable. Now measure out on the insulated unshielded center conductor one-quarter wavelength less 5 per cent. Remove all of the insulation beyond this point. Attach a supporting insulator to the top of the antenna using the length of stripped wire. Now wrap the entire length of exposed shield with plastic tape, making it firm at both ends to prevent slippage.

The coaxial antenna can be rolled up and tucked away in the car. Merely connect it to the transmitter and attach the insulator end to a tree when using the mobile rig at a fixed location. A metal hook formed at the insulator will facilitate "hanging" the antenna.

—Melvin H. Dunbrack, W1BHD

HEADPHONE BALANCER

WHEN the sensitivity of one phone in a headset is a little higher than the other, place a piece of tissue paper between the diaphragm and the coils of the sensitive phone. This dampens the vibrations but doesn't introduce any noticeable distortion.

—William Lise, WV2AUC

PARALLEL-FED PLATE MODULATOR

THE CIRCUIT shown in Fig. 2 makes use of a modulation principle that is more or less standard in commercial broadcast transmitters but is seldom used in ham equipment. It consists of two capacitors and one filter choke in addition to the usual plate modulation components. Capacitors C_1 and C_2 isolate the r.f. amplifier plate voltage from the modulation transformer and if, for some reason, the r.f. amplifier is turned

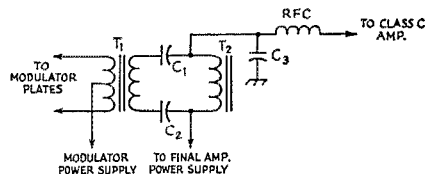


Fig. 2—Parallel-fed plate modulator. Capacitors C_1 and C_2 should have a voltage at least twice the modulated-amplifier plate voltage.

C_1, C_2 —4 μ f.

C_3 —.005 μ f. bypass.

T_1 —Modulation transformer

T_2 —Filter choke, 20 or 30 henrys (capable of carrying amplifier plate current).

off before the modulator, the choke will act as a load and protect the modulation transformer.

—Michael Novick, K2EKC

SOCKET PUNCH DRIVER

DRIVING the smaller Greenlee and Pioneer socket punches, which are equipped with a hex-head drive screw, is most difficult with the customary Crescent wrench, and becomes nearly impossible with that tool when the new socket hole has to be punched in a crowded chassis.

These and similar socket hole punches can be driven rapidly and conveniently with a tool consisting of an Exelite series 99 No. 14 ($7/16$ " nut driver clamped in a carpenter's bit brace. Punching a $5/8$ -inch socket hole with this tool combination takes only a few seconds as contrasted to about five minutes with a Crescent wrench.

— Ronald L. Ives

MODULATION-PERCENTAGE INDICATORS

THE CIRCUIT of a modulation indicator that I use with my 813 rig is shown in Fig. 3. It indicates by the use of neon lamps when the modulation exceeds 89 and 100 per cent and is superior to a meter indicator since the flashing lamps can be seen at a glance without looking directly at the indicator. The audio gain controls on the speech amplifier-modulator are set so that the 89 per cent indicator flashes only occasionally. The indicators are NE51 neon lamps.

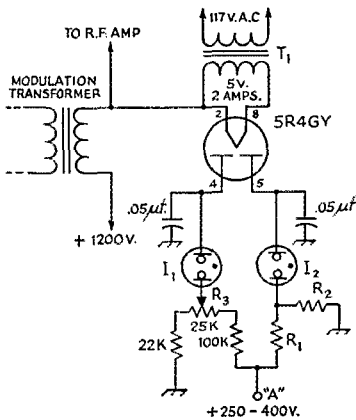


Fig. 3—Diagram of W1IOW's modulation indicator. Transformer T_1 should have high-voltage insulation.

Variable resistor R_3 is adjusted, with the r.f. amplifier plate voltage turned off, until indicator I_1 ignites from the voltage source at "A". In actual on-the-air use, the r.f. amplifier plate voltage will swing to zero on negative peaks during 100 per cent modulation and the lamp will ignite. Indicator I_2 is biased to about 200 volts by choice of the proper values for the voltage divider $R_1 R_2$. I used two 47,000-ohm, 2-watt resistors with 400 volts at point "A". The ignition voltage for the NE51 is around 65 volts. When the r.f. amplifier voltage is less than 135 volts ($200 - 65$) the indicator will ignite. The formula for

calculating per cent modulation is

$$\% \text{ modulation} = \frac{E_s - (E_B - E_I)}{E_s} \times 100$$

Where E_s is the r.f. amplifier d.c. plate voltage, E_B is the neon lamp bias voltage and E_I is the neon lamp ignition voltage. Substitution in the formula for indicator I_2 in Fig. 3:

$$\frac{1200 - (200 - 65)}{1200} \times 100 = 89\%$$

The 5R4GY rectifier can be used in circuits where the plate voltage does not exceed about 1400 volts d.c. For higher voltages a 2X2A can be substituted (along with a suitable filament transformer).

— Charles R. Greene, W1IOW

The modulation-monitor circuit shown in Fig. 4 does away with the necessity for using a sepa-

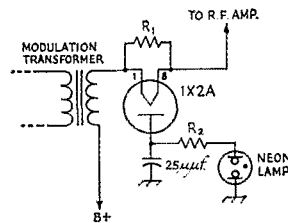


Fig. 4—Diagram of W2GOO's modulation indicator which obtains filament power from the r.f. amplifier plate supply.

rate filament transformer or a filament winding with high-voltage insulation, and can be used at Class C plate voltage levels as high as 10,000 volts d.c.

The monitor uses a diode designed for television receiver power supplies, and will work with any a.m. transmitter in which the Class-C plate current is 125 ma. or more. The diode direct-emitting filament nominally requires 200 ma. at 1.25 volts, but the tube will operate as a monitor with as little as 125 ma. through the filament. When the tube is connected as shown, the power dissipated is only about $1/4$ watt. Therefore, heat generation is not a problem and the tube may be mounted in any convenient spot.

Resistor R_1 should be included in the circuit if the d.c. plate current of the r.f. amplifier exceeds 250 ma. The resistor's value may be calculated by using Ohm's law. Substitute 1.25 volts for E , and the excess current over 200 ma. for I in the formula.

Resistor R_2 is a current limiting resistor which protects the rectifier. Its value depends on the type of rectifier and neon bulb used, but something around 100,000 ohms should be about right.

More than one rectifier may be used by connecting the filaments in series. Again, if the Class C plate current exceeds 200 ma. connect resistors in parallel with each filament.

— Eugene A. Anthony, W2GOO

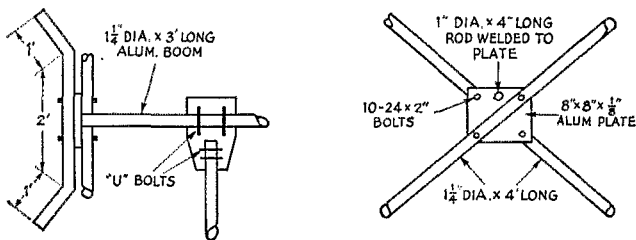


Fig. 5—Mechanical details of the spider are shown in the side view (left) and front view (right) of the Quadruple Quad antenna.

THE QUADRUPLE QUAD

OPERATING experience with cubical quads on 10, 15, and 20 meters resulted in my becoming an enthusiastic booster for this antenna. A desire to operate on 40 meters and dissatisfaction with results obtained from a 40-meter vertical antenna prompted me to consider a 40-meter quad. Since loaded verticals and beams seem to perform well, why not a loaded quad? A rough sketch was made to determine support length versus element size and director spacing. From this it was reasoned that use of a loaded quad could be made feasible by a 17-foot spreader which would give a side dimension of 21 feet and a reflector spacing of 0.1 wavelength on 40 meters.

The mechanical arrangement of my original quad had proved satisfactory and so it was duplicated in the four-band version. Overall dimensions were governed by the length of available bamboo poles which were about 17 feet long. Some of the mechanical details of the quad are shown in Fig. 5. The spider is constructed with 1 1/4 inch aluminum tubing which is bent as shown in the side view. Spider arms are secured to the square 1/8 inch aluminum plate with 10-24 bolts. The 1 1/4-inch diameter boom is welded to the spider flat plates and held to the supporting mast with "U" bolts.

Fig. 6 gives dimensions of the four quads along with details showing the placement of the 40-meter loading coils. To visualize the construction and placement of the stubs and feedline, see the sketch in *QST*, April 1957, page 19 (Fig. 3).

The loading coils are wound on ribbed coil forms 1 1/2 inches in diameter. Resonance at 7250 kc. was obtained by using eight coils, one in each corner, with 24 turns of No. 21 enameled wire spaced the diameter of the wire.

The quad antenna is fed with 50-ohm RG58/U coax. Quarter-wave transformers made of RG59-U coax are used to match the feed lines to the antennas. To calculate the length of the quarter-wave sections use the following formula:

$$\text{Length (ft.)} = \frac{246 \times .66}{\text{Freq. in Mc.}}$$

Stubs for each band are made from open-wire line. Bandwidth of the 40-meter quad is adequate to cover the entire 40-meter phone band. Directivity does not seem especially critical for domestic contacts on 40 meters. However, DX stations have reported a definite drop in signal strength as the antenna is turned away from the station heading, and S-meter readings do show some directivity.

— R. E. Friebertshanser, K4LWI

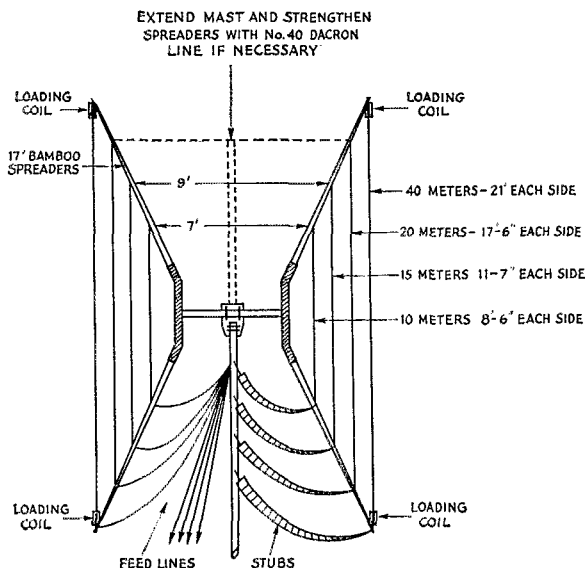


Fig. 6—Sketch giving dimensions of the antenna.

GRID-DIP METER CALIBRATION

THE grid-dip meter isn't intended for extremely accurate measurements, but it is frustrating to find that the oscillator frequency does not always conform to what the calibration scale indicates. There is a simple solution which is not usually mentioned in the g.d.o. instruction books.

The outside rotor plates of the oscillator tuning capacitor are slotted, and by bending these leaves in certain combinations it is possible to add or subtract capacitance anywhere along the tuning curve. If the capacitance is increased in the area that engages at the high-frequency end, then the entire scale will be moved to a lower value unless there is a corresponding reduction of capacitance (outward bending of the plate) in the area that comes into action as the low-frequency end is approached. The g.d.o. coils are wound and checked to a standard so if one coil is made to track properly the others will fall into line also.

Some g.d.o.'s use the Colpitts oscillator circuit so only one section of the split-stator capacitor needs to be worked on since the capacitors are in series across the coil. The calibration problem isn't serious at low frequencies where the station receiver can be used to check the g.d.o. frequency. But on the higher frequencies for which there are usually no frequency monitoring devices, it is nice to know that you can depend on the g.d.o. dial.

— *Edson B. Snow, W2BZN*

CHANGING RESISTOR VALUES

IT is possible to change the value of fixed composition resistors for experimental purposes and low power applications. All that's necessary is to notch the resistor with a file or grinding wheel. Connect an ohmmeter to the resistor during the grinding and stop the operation when the resistance reaches the desired value. Of course, the original resistor must always be lower in value since this method increases the resistance. It also decreases the power rating to some extent. The only limitation to this process is the physical size of the resistor.

— *R. C. Benson, W1HAC*

REDUCING CHARGING CIRCUIT INTERFERENCE

IF you are beset by regulator hash in your mobile station, the following method will in many instances remove most, if not all, of the offending interference. I incorporated the method in my automobile which uses a Leece-Neville alternator but it should also be equally effective in a conventional charging system.

Construct two filters by connecting a 10-ohm resistor and a 0.5- μf . capacitor as shown in Fig. 7. The capacitor can be the type normally sold by automobile parts suppliers as a generator bypass capacitor. The resistors should be connected as close as possible to the capacitor, taped at the junction and secured to the capacitor with plastic tape. Anchor the filters to any metallic portion of the car body, preferably as close to the regulator

as possible. The two filter leads are fed into the regulator box where one is connected to the upper section of the voltage regulator bracket and the other is connected to the upper portion of the current regulator bracket. These filters will not affect the functioning of the regulator.

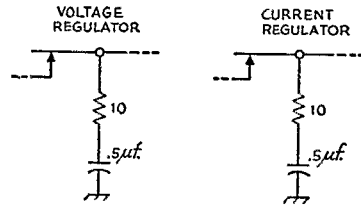


Fig. 7—Filters on the voltage and current regulators to reduce radio interference.

In addition to the regulator filters, a tuned filter in the field lead will aid in the reduction of interference. It is constructed by winding a self-supporting coil, L_1 , of 8 turns of No. 10 enameled wire about 1 inch in diameter. Connect a 100- μf . variable capacitor across the coil and bypass the filter with a 0.005- μf . capacitor and a 10-ohm resistor. Insert the filter in series with the generator field lead and tune the capacitor for minimum interference.

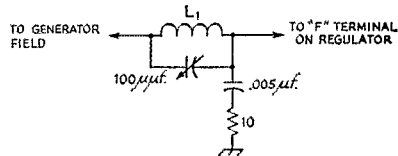


Fig. 8—Tuned filter placed in the generator field lead. See text for information on L_1 .

Other schemes can be used to reduce any remaining residual ignition of regulator hash, such as inserting 0.1- μf . disc ceramic capacitors from the tail lights, from the license plate lights and from the dome lights to ground. Also, grounding the muffler and tail pipes in several spots will sometimes help. If the receiver's antenna or power leads pass in close proximity to the regulator, generator or high-voltage ignition components, try moving them away or encasing them in a grounded shielded jacket.

— *Maurice I. Sasson, M.D., W2JAJ*

NOTE TO MOBILE OPERATORS

HERE'S a suggestion that mobile hams get in touch with local automotive shops that service and install the electrical systems of local police cars. The mechanics can probably give tips on extra-heavy batteries, special generators, and general information on the do's and don'ts of mobile systems. Also, they can probably recommend sources of such items as wheel static rings, special spark plugs, suppressor capacitors and other equipment of interest to the mobile ham.

— *Lanny Marcus, K6PQL*



The author at the phone station. Swimming trunks hanging on the line were used many times each day. It was the finest swimming any of us has ever enjoyed.

The Story of KS4BB

BY MAC REYNOLDS,* W9EVI

SOMEHOW, everything seemed to go wrong—right from the start. Perhaps it was a bad case of Murphy's Law, or just Ol' Lady Luck . . . but then I'm getting ahead of myself. Let's go to the beginning.

Serrana Bank is a group of five small islands lying about 208 miles east of Puerto Cabezas, Nicaragua. Both the U. S. and Colombia claim the islands. There is a treaty between the two countries whereby the U. S. has the right to erect navigational aids, while Colombia has the fishing rights in the surrounding waters.

Roncador Cay is a single island—very small—surrounded by a huge submerged reef, and lying about 50 miles south of Serrana Bank.

The License

The job was to get a license. Just apply to the FCC and wait, but the FCC was obliged to turn us down because of the unsettled claim between the two countries. Then the Colombian Consulate in Chicago advised that a letter to Colombia might do the trick, provided I would warrant that the proposed amateur activity would not prejudice either country's claim, and would be temporary in nature. The Colombian government advised that all was fine provided I would advise the Colombian League of Radio Amateurs of the DXpedition. A re-application to the FCC brought KS4BA for Roncador Cay, and KS4BB for Serrana Bank.

The Early Plans

At first a Bonanza aircraft was lined up as were several crackerjack operators. Then the plane fell through, as did most of the operators. We hoped to fly from the U. S. to Grand Cayman, to Puerto Cabezas, to Bluefields (Nicaragua) to San Andres (HK0) and take some boat to Serrana Bank. One by one the lads fell off the bandwagon for business and health reasons. This left Dick Young, W3PZW of recent KB6 activity, Don Chesser, W4KVX of KC4AF, and Joe Schroeder, W9JUV. No plane, no plans, just a red-hot license. This was the beginning of the random luck that was to plague us for some time. Then Lee McMillan of St. Louis offered a twin-engine Apache for the flight. It seemed as though we

* 3120 Deerfield Rd., Deerfield, Ill.

were all set. This was the last week in February, 1959.

Then Joe couldn't make it because of business. We groaned under the increasing financial load, but figured we could make a saving by stuffing the extra seat full of extra gear. This later proved a dandy mistake.

Through the marvelous help of YN4HC and YN4CB, the *Rosemar*, a 69-foot diesel ship, was arranged for from Bluefields. All we had to do was meet it in San Andres and sail merrily for KS4. Simple? Indeed. Except that we were to meet it on Friday the 13th. We should have seen the handwriting on the wall.

Getting Started

Two sets of 600Ls, 20As and companion 458 v.f.o.'s were supplied from Central Electronics and airfreighted to San Andres. We carried our own receivers, antennas, spare parts etc.

Lee's plane was in Pittsburgh on a charter flight, I was in Deerfield, Dick had joined Don in Burlington, Kentucky. Lee was to pick me up, then to Cincinnati, then to San Andres. The plane was iced-in badly in Pittsburgh. Three days later we met Don and Dick at the Cincinnati airport, loaded up a vast collection of miscellany, and took off—so heavily tail-loaded that the plane wanted to fly straight up if the pilot let go of the controls. In Fort Lauderdale, we threw out everything labeled "unnecessary." This meant that Don and Dick sat on the runway with a bathroom scales carefully eliminating 160 lbs. As a result, nothing was in a box or any other sort of a container, and it was not unusual to fly along at 10,000 feet and spot a tooth brush, a film case and a rectifier sliding along the plane floor. That was Friday. By Saturday the plane had developed a cracked manifold and ignition trouble. The radio direction finder was on the fritz too.

On The Way

We took off, overflying Cuba to Grand Cayman, worrying about customs. (Don's passport was missing and it was after business hours.) (It was always after business hours or a holiday.) Luckily, we followed an airliner in at dusk and whizzed through customs to a hotel to stay over night. An "Old Sport" in a local bar spent an

hour telling us about a boat that just recently plowed into a submerged reef off Serrana Bank. The next morning (Sunday) we discovered there was no 80-91 octane aviation gas anywhere. After much fuss we found some 100 octane mixed it thoroughly in our tanks, requested expensive special Sunday customs in Puerto Cabezas, and took off — half expecting to burn out the engine valves and drop noisily into the sea.

Suddenly, we realized we were two days late meeting the boat in San Andres. We made the quick mid-air decision to waive Puerto Cabezas, and try non-stop for San Andres. Dick was sure we'd be thrown in jail somewhere along the line. We agreed glumly.

The island of San Andres appeared on the horizon shortly after lunch. Lee called the tower and no answer. Again and no answer. Finally a voice came on in Spanish with 300% modulation, and then in English. Lee circled the island just above the tree tops. We gayly snapped pictures while Lee was obliged to read off every single document in the plane. We landed and were met by a crowd of persons wondering why we circled for 30 minutes. Their wonder turned to pop-eyed stares as we unloaded mounds of gear onto the taxi-way. None of it was in boxes, you will remember. Herbie, HK0AL, and Vic, YN4DLS, met us and hurried us through customs. When we told the customs official we were going to Serrana Bank, he just laughed.

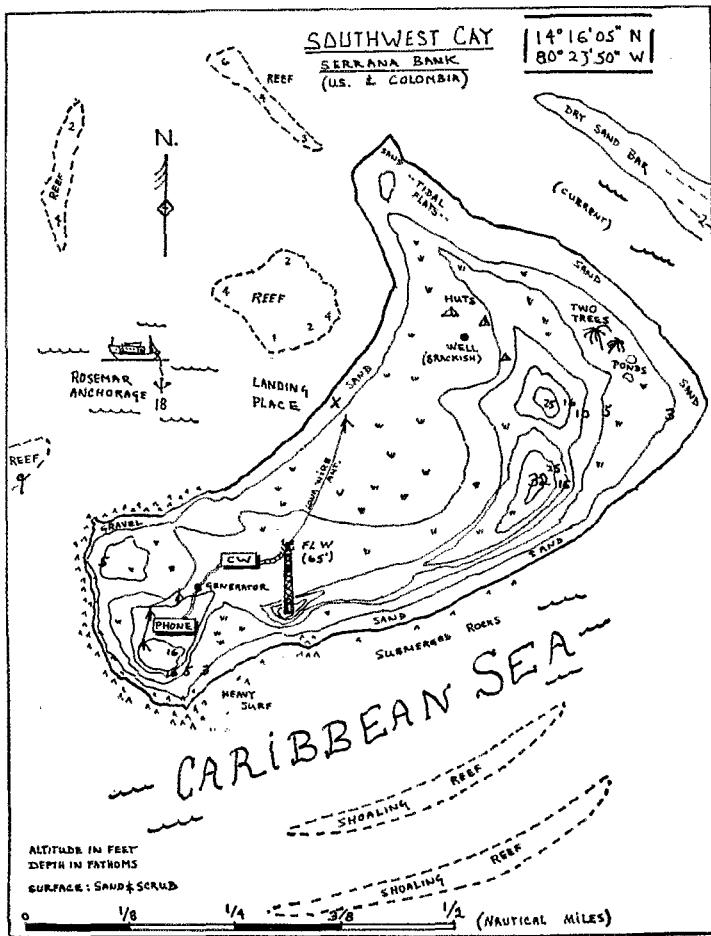
Dick fired up HK0AL. Lee went after gas, while the rest of us met Capt. Ormsby Downs on the *Rosemar* and sewed up the deal. Herby found a man named Mouchet who said he was a navigator, and we were set.

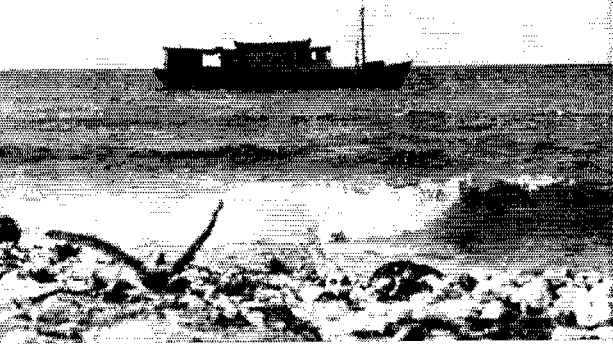
It was Sunday night, very late and we had no food or supplies. Don and Lee thumped on the door of a general store with great vigor, ordering a dozen of this and a case of that. Vic and Herbie hurtled off into the night looking for gas for the generators. We forgot potatoes and Vic reawakened the store proprietor. The transmitters were loaded on board, and it was just after midnight on Monday morning. The navigator came on board. We set up a rig and left the harbor.

Sailing, Sailing Over the . . .

Dick struggled with a 20-meter dipole as soon as we hit open sea. (Whoever heard of doing it at anchor?) By dawn we were somewhat seasick. By dark and with heavier seas and wind we were utterly green. Dick fired up on 20 e.w. and advised the gang we would be on as KS4BB late that night. The diesel exhaust blew out of both sides of the *Rosemar* and always made its way back into the cabins. As a result, we all were coated with an oily soot and were very sick.

Serrana Bank should have appeared at dusk dead ahead. It didn't. The wind out of the east picked up a heavy sea and the *Rosemar* pitched and rolled in the darkness. The generator ran out of gas and no one dared go out on deck and refuel it. We had sailed for 26 hours by now, four hours beyond Serrana Bank, and apparently had passed through the channel separating Serrana Bank and Quita Suena Bank to the west. It was at this point in the game of "island, island, who's got the island" that Capt. Downs must have turned to the navigator, Mouchet, and said: "Well, how is our course? Are we there yet?" The navigator must have said something like this in reply: "I don't know. I was hired to get you





The *Rosemar* laid anchor on the west side of the island in about 50 feet of water. Food was brought ashore daily in the canoe shown perched atop the cabin.

through the reef, not to get you there!" About 15 persons all chattering at once mounted the wheel house, charts came out, and everything but the wind and heavy seas stopped. In the argument that followed (lasting two hours), it was discovered that the ship's compass was probably inaccurate because of the steel diesel barrels lashed to the mast some six feet away. Capt. Downs told us that in 38 years of sailing, this was the first time he had ever been lost, but lost he was.

What then happened I cannot explain. We somehow compromised the arguments and turned east into the wind for about 1½ hours, then due south. This probably saved our lives for had we turned 180° to the south 1½ hours earlier we undoubtedly would have plowed into that huge and barely submerged coral reef Quita Suena Bank, inasmuch as we had not compensated for wind and current. It is about four feet below the water in spots and is dotted with the wrecks of several ships. We were told we were lost and went to bed too seasick to care much.

The Big Caribbean

The following morning, with the generator gassed up, Dick asked for a radio fix through a W3 and KV4AA. The FCC and the U.S. Navy gave us all the help a fellow could ever ask. Our 20-meter fix had QSB and spotted us within a 40-mile circle, but it told us we had travelled south and west down near Providencia Island. This was the 17th of March. The boys in the States kept our families informed and we ran for several known islands, but no landfall. KV4AA met us every hour on the hour for three days, a kindness never to be forgotten. The sea settled down, the flying fish and porpoises were everywhere and a curious fluorescent plankton glowed in the water at night where the bow cut through.

During this period an amazing food was introduced as our basic meal; morning, noon, and night — fried green bananas. I remember one instance where someone yelled "Look at the big fish out there!" While crew and cook turned to look, five plates of fried green bananas slid silently into the sea. We lost 15–20 lb. on the trip.

Finally the decision was made to try for the Nicaraguan coast because we were down to our last barrel of diesel, and out of cigarettes and food. Just as darkness closed in on the 19th, we spotted the Pearl Cays a few miles off Nicaragua,

first land in four days. We shoved off then to Corn Islands, arriving at 2 A.M., "liberated" the only barrel of diesel on the islands and sailed back to San Andres. Vic fired off a cable to Herbie in San Andres saying we were O.K. Later we learned that this simple act saved us from horrid embarrassment and financial ruin.

San Andres Again

The *Rosemar* entered the harbor in the early afternoon. It was a religious holiday and everything was closed down (naturally). Herbie met us with the news that Nicaragua, Costa Rica, and the U.S. in Balboa had been having quite a discussion as to who was going to fish us out of the sea. The U.S. finally sent a rescue plane taxiing down on the runway at Balboa; and had it taken off, we would have been liable for a pretty tidy sum. It had been stopped by Vic's cable.

The harbor master met us and we went ashore. Don disappeared in a taxi. Dick fired up HK0AI, and the rest of us went off, looking for a navigator, diesel oil, and ice cream. Three navigators were located, but were at a wow of a party and were not interested. Finally, at Colombian Naval Officer, Captain Suarez, of the converted minesweeper *Providencia* agreed to go.

Back in the village the only diesel available, was at the very bottom of the hold of the *Providencia*. Back to the Governor's house. We interrupted his supper and were given permission to "borrow" the diesel. It was about 8 P.M. and a holiday to boot. We proceeded to load for the *Rosemar*.

The generator gas was missing. Dick stood on the deck of the *Rosemar*, while Don flashed c.w. on a flashlight from the dock. The gas drum was finally located, and we boarded the boat.

Serrana Bank at Last

By 6 P.M. the following day Southwest Cay, Serrana Bank, was sighted, smack dead ahead. The *Rosemar* laid anchor about 700 feet off shore. Don and I jumped in a dugout and were paddled ashore. As we hit the beach, three men appeared over the hill of a supposedly uninhabited island. They were there for a week or so collecting bird eggs to sell elsewhere — some 20,000 eggs. Don reconnoitered a station location at the base of the 65-foot lighthouse. Lee, Vic, and Dick came ashore with the equipment and spent 10 minutes

Dick operating c.w. in early morning. Left to right: Don, Mac, Vic. During the previous night the soaring generator voltage had raised havoc with equipment.



chasing more birds than I had ever before seen.

In the darkness we set up the 20A-600L c.w. station on a table fashioned from the *Rosemar*'s wheelhouse floor, and called out first CQ using a 500-foot long wire strung from the top of the lighthouse. No answer. Again CQ. Finally, at 0417 GMT, W3MSR became the first amateur to contact Serrana Bank. W1VG, W2WZ, K4TML, W5BRR, W6WWQ, W7FB, W8HRV, W9INN, W0NTA became the first in their call areas. VE1EK was the first non-W. An unbelievable pileup was under way and Don and Dick logged up to five per minute during this period of the ARRL DX contest.

The phone station was set up some three hours later about 500 feet to the south, with the 2.5 kw. generator in between. The whole operating table fell over onto the ground in the process. Lee and Vic picked it up, shook out the sand, and plugged everything back in, and the 20A-600L combination worked without a hitch. A 20-meter dipole was strung about 20 feet above ground, and a CQ called on 20 s.s.b. No answer. Then W0HBG/3 became the first phone contact at 0759 on the 20th. W1LIF, K2ODE, W4UKS, W5SVP, K6TXR, W7GXA, W8VLK, W9MAR, W0UTF became the first in their call areas. ZL3PJ, the first non-W, was phone QSO #7. Business picked up and several hundred contacts were digested by dawn.

The Days

Roland, the cook, appeared at sunrise with fried eggs, spam, and cocoa. The tropical sun was unbearable because the forest of palm trees we expected had turned out to be only two trees at the other end of the island. The bamboo Vic and gang had brought along with which to make parasitic beams was used to fashion crude supports for dipoles and for tarpaulins as sunshades. It helped some. The wind never ceased and constantly tripped the VOX circuits by blowing so hard on the microphones. On about the third day Lee ventured to the top of the lighthouse, announced that there was a terrific beach on the east coast of the island, and we went swimming. The clearest water I have ever seen churned over a reef and rolled up onto the very white sandy beach. It was a paradise. That night the generator suddenly took off, raising the line voltage to such a value that almost all the selenium rectifiers

and some of the tubes burnt out. Don did a miraculous job and shortly the rigs worked again. Then the generator coughed to a standstill. We were short of oil to mix with the gas. One gallon left and still tremendous pileups.

Dick came running over to say that Bob Denniston of FO8AJ fame in 1954 had called in and was laughing so hard at our plight that he had had to sign off. If anybody in this world knows what bad luck is, Bob knows.

On teamwork Dick and Don manned the c.w. station; Vic, Lee, and I operated the phone. Both stations ran 24 hours per day which meant that some pretty good cooperation was necessary for sleep and logging. During the rush hours — around breakfast time and after four p.m. local time — one operated and another logged, and it was hard to log the right one with all the thousands calling. Twenty meters proved far and above the best band. 10 c.w. and 15 a.m. phone were excellent, but 40- and 75-meter phone were hopeless because of QRM.

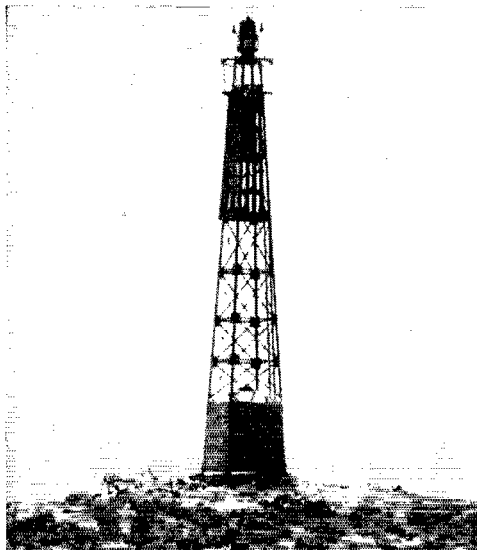
On about March 23, the cigarette supply ran out. Don and I tried rolling our own from a collection of butts, but the filter jobs don't leave much tobacco for such purposes. By the 24th we were on a steady diet of eggs, fried bananas, snails, and water. The water came from a well near the huts. Lee had saddened us by emptying our last bottle of Scotch on the sand to provide a water bottle. The water was brackish and tasted like birds, but no one died, although Vic got a dandy bellyache.

No one slept in the boat while KS4BB was in operation. Each would curl up on the sand and snooze. The temperature at night was 45-50° F . . . about 100° or so during the day, and there was scarcely a cloud in sight throughout the whole trip.

The Return to San Andres

By late evening on the 24th, the generator oil was gone. The phone station was taken off the air, and the auxiliary 700-watt 4-cycle, generator brought into service. At 1202 GMT on the 25th Dick signed off with JA9AA on c.w. and KS4BB was closed down for good. We loaded up for the canoe trip to the *Rosemar*.

By 1030 a.m. we were loaded, except for the antennas which were politely left in place for the next expedition, and the *Rosemar* sailed



The light burns acetylene gas and is serviced by the U. S. Government. Painted lettering on base was done by men of the Colombian navy on an earlier visit. Wreckage of a ship is visible just to the left of the lighthouse base.

south. Late that night we stopped in beautiful Providencia Island while Capt. Suarez attended to some business. At dawn we held a shaving ceremony to remove a week's stubble, consumed the last of the Scotch, and landed in San Andres on Thursday, a holiday.

The trip back to Fort Lauderdale was uneventful; we arrived some fifteen days after leaving.

Some Operating Notes

DXpeditions are made for the sole purpose of providing as many contacts as possible during the period on the air. One thing that strikes the DX operator is the humor. Hams say the darnedest things. One lad wanted to know if we were given the KS4 call because the FCC had run out of K4 calls to issue. Another laced our operator up and down for some time because he knew darned well our operator had heard him an hour earlier and didn't come back. Still another lad on the East coast told us we were bootleggers because we weren't in his Call Book! On the serious side, top group honors for operating excellence should go to the VK's on c.w. and the VP9's on phone. This is not to say that there aren't good operators everywhere, but these lads as a group were excellent. Short and sweet. It was a pleasure to work them.

Some stations probably missed out all together because of their long tedious calls. The DX operator wants to hear your call letters. He knows

this by heart. On phonetics, an operator in a hurry has no idea what "Washboard, Caramel, Railroadtrack" stands for. I suggest using the same as the DX operator. The "Alpha, Brave" series is not recommended because only those recently in military service are familiar with them. The infamous good ol' Charlie Browns of SV0WP must be passed up in the interest of courtesy to the rest of the boys. On c.w., when the DX operator is using the BK system or the DE system, use it. Above all, spend a little time studying the DX operator's tuning and answering procedure. Listen for the calling procedure that is bringing results. Even when the bands sound loaded to you and most signals are getting over S9, an S4 can be heard if he finds a hole. There are always holes and it pays to find them. Tune your own frequency often.

Many precious minutes were lost because lads insisted on knowing our names, our QSL managers, our equipment, temperature, and other such items. These minutes lost added up to hours, and hundreds of QSOs never made. The DX operator will never belong to RCC, although, by refusing exchange of comments, he will have been courteous to thousands.

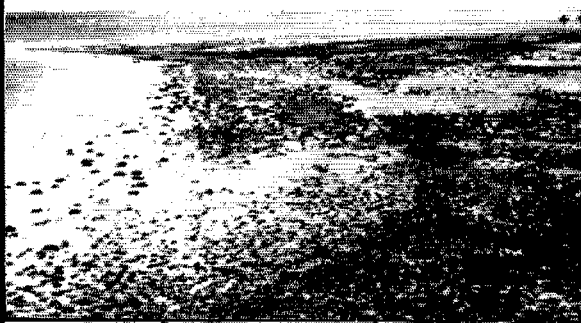
On both phone and c.w., when you are given a break for a report transmission, there is no sense in signing out and in on each transmission. A simple "589 BK" or, "you are 5 and 8, go ahead," will do and will save time for others to get a contact while the band is open. Savvy operators dispense with the sending of RST before the report numbers. In the interest of time the DX operator must answer the first station he hears that breaks to him.

On Serrana Bank we all listened to signals calling that were head and shoulders above the pack but who called us so long that it was expedient to pass them by. A big signal is both a blessing and a responsibility to its owner.

We hope these observations will assist you in working 300 countries. This is the way it seemed to us from the DX end of the stick.

Those of us at KS4BB wish to thank the Colombian, Nicaraguan, Costan Rican, and U.S. Governments for their help and comfort. To Victor Abrahams, HK0AI, we are especially grateful for his herculean assistance, without which KS4BB would never have come to pass.

To the hams who handled our traffic and arranged our radio fixes, and to the 6000 amateurs contacted in 80 countries, we say thanks. **QST**



View looking north from the top of the lighthouse. Our landing was made on the beach at left. Note the three huts where 20,000 bird eggs were stored. The only two trees on the island are visible at far right. The mottled effect is the result of contrasting white sand and scrub grass.

Happenings of the Month

Report from Geneva

Mexican Third-Party Traffic

GENEVA CONFERENCE OPENS

The Ordinary Administrative Radio Conference got underway on schedule, with the first plenary session being held on Monday, August 17. Conference organization, formation of committees, selection of committee chairmen and discussion of the specific terms of reference for each committee occupied the first week.

The conference unanimously elected as its chairman Charles Acton, VE3AC, and as its vice chairmen Juan Autelli, LU9DL, and Dr. Sarwate of India. Gerald Gross, HB9IA (ex-W3GG) as acting Secretary General of the International Telecommunications Union, was named secretary of the conference. Committees were formed as follows:

- | | |
|-----------------|----------------------------|
| 1 — Steering | 5 — Frequency Registration |
| 2 — Credentials | Procedure and Lists |
| 3 — Finance | 6 — Technical |
| 4 — Frequency | 7 — Operations |
| Allocations | 8 — Drafting |

Our main interest is of course in Committee 4. At the time of writing, only two brief meetings had been held, but it was expected that the committee would get down to serious business before long.

There are some 80 people, plus an office staff, named in the official list of the U. S. delegation, although only 50 or so were present at the opening. The delegation has organized itself into working teams comparable to the conference committees. The League's representatives, General Manager Budlong, and Assistant General Manager Huntoon, are working full-time with the group on allocations, and, of course, will have occasional contact with the other teams dealing with definitions and Article 42 (general rules for the amateur service) should such matters need our assistance. The allocations team meets daily for reports of progress the previous 24 hours, and to coordinate, and occasionally to make specific assignments for, activities in connection with the coming day's agenda. The full delegation meets weekly, each Monday, for similar objectives.

At the second plenary meeting, August 18, the

International Amateur Radio Union was one of 16 international groups admitted to the conference. For the first few weeks the representatives of IARU were John Clarricoats, G6CL, general secretary of the *Radio Society of Great Britain*, and Per-Anders Kinnman, SM5ZD, a director of the *Sveriges Sandare Amatorer* (Sweden). It is expected that other amateurs representing the Region I Division of IARU will participate as observers in rotation.

Alex Reid, VE2BE, ARRL's Canadian Division Director, is also in Geneva, participating in the work of the Canadian delegation. There are a good many amateurs present with other delegations as well, but no list was available by our normal copy deadline for this issue.

The early work of the conference, then, was mainly concerned with the task of shaking down 600 participants into committee and subcommittee organizations, and such matters as the now-familiar attempts of the USSR and satellite countries to obtain the admission of Communist China, East Germany, etc. But the conference was expected to start quickly on the business of examining the world's radio regulations.

FORT BRAGG MANEUVERS

The Army has notified the FCC that large-scale maneuvers will take place in the vicinity of Fort Bragg, N. C. from October 17 through November 10, 1959. The Army has requested the use of two frequencies in the 2-meter band during "Operation Dragon Head," subject to the condition that interference will not be caused to amateurs. The FCC has offered no objections, feeling that the proposed temporary operations will cause no hardship to amateurs, and requests the voluntary cooperation of radio amateurs within interference range of the maneuver area.

THIRD-PARTY AGREEMENT WITH MEXICO

As was reported briefly in September *QST*, the United States and Mexico have agreed to permit

(Continued on page 180)

Three of the principal officials elected by the first plenary session of the Geneva telecommunications conference were distinguished amateurs: Chairman (president) is Charles J. Acton of Canada (VE3AC). On his left is vice-chairman Juan A. Autelli of Argentina (LU9DL). On his right is Gerald C. Gross (HB9IA, ex-W3GG), acting Secretary General of the International Telecommunications Union, named conference secretary.





CONDUCTED BY EDWARD P. TILTON,* WHDQ

WE may as well warn you — there is going to be a lot about meteors in this department this month. Just as we were sorting out results of the August Perseids Shower, to be summarized later, we received some fine information on meteor-shower prospects for October, from Jack Berry, W4PME, of Georgia Tech. This concerns the Draconid Shower of Oct. 9-10, an event that keen v.h.f. enthusiasts have looked forward to for years. 1959 should be the peak of the 13-year period of this shower, associated with the comet, Giacobini-Zinner.

The last close brush between this comet and the earth in October, 1946, was probably the first time that meteor trails were used for actual communication purposes by anyone, though the basic idea of meteor-trail reflection of radio waves had been known for some time. Results are summarized in *QST* for December, 1946, page 43. If you don't have a copy, beg, borrow or steal one and read up on what the night of Oct. 9 was like on 50 Mc. 13 years ago. That date is an important landmark in the history of amateur v.h.f. communication.

Briefly, 50-Mc. contacts were made over distances of 200 to 1200 miles, with a continuous but fluttery quality never observed before or since. Checks with voice and c.w. showed either to be usable, though the flutter tended to break up c.w. keying. There was no real DX activity on 144 Mc. in those days, but October 9-10, 1959, should be a far different story. Nobody knows for sure just when the shower will peak, or how high the burst count will go, but one thing is sure: once again amateur radio has an opportunity to do an important job. We pass up some of our editorial comment to present the following timely information.

Draconids Meteor Shower, 1959

By J. W. Berry, jr., W4PME*

V.h.f. enthusiasts can help astronomers look for the return of the Draconid meteor shower on October 9-10. If the shower returns with 1946 proportions, many should be able to communicate via meteoric ionization, because of the high burst rate. In order to aid amateurs interested in this shower I have prepared a set of charts and graphs which show the shower activity over 6 maximum-length paths. Using these as a guide,

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it should be possible for amateurs located almost anywhere in the United States or Canada to find the best and antenna heading for their paths.

A few facts about meteor-burst communications and this shower in particular are in order before proceeding with an explanation of the charts. For general information on meteor-burst propagation see W4LTU's article in the April, 1957, issue of *QST*.

Range — About 1200 miles maximum.

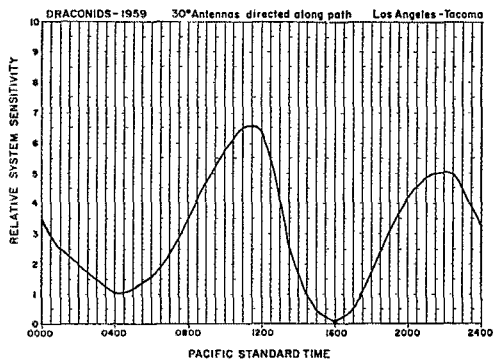
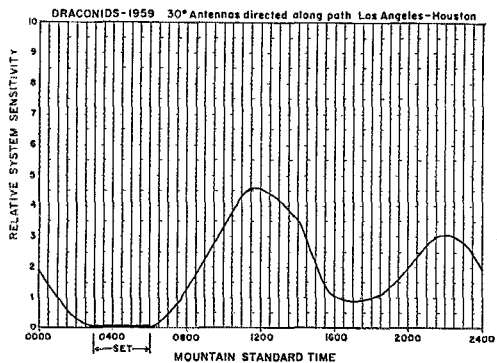
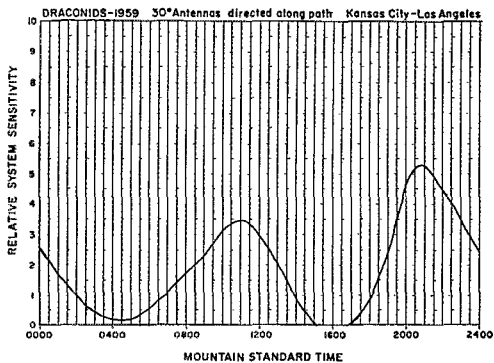
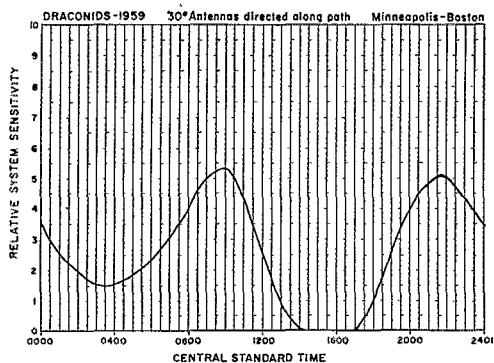
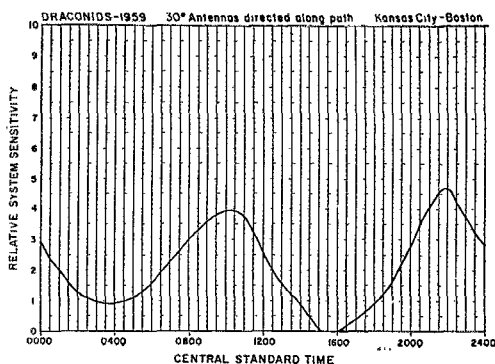
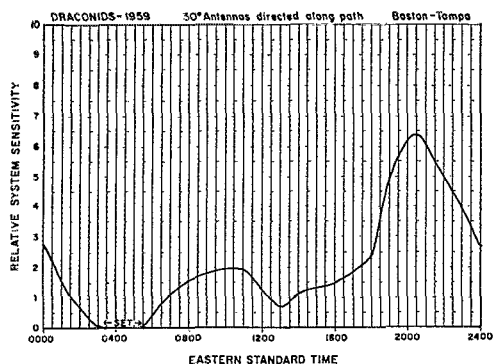
Equipment — Stability is more important than power. If W4XXX is looking for you on 145.000 Mc. with a 2-ke. filter he won't hear you if you are on 145.006. Since speech is somewhat redundant it may be more effective than code with fluctuating signals. Because of the wider bandwidth required, however, more power may be needed to get through on voice. Single sideband looks like best bet for burst-type voice communication.

Antennas — For shower work, narrow-beam antennas are best. However, for the long enduring meteor trails, a broad-beam antenna is best. Since most contacts will be made on the long enduring signals the possibilities of a moderate beamwidth antenna should not be overlooked.

Radio telescopes — If you have a v.h.f. rig and a recorder (an s.s.b. type S meter and a pencil will do) you have a radio telescope. A distant transmitter will serve as a source for a simple c.w. radar system. Slow response recorders such as the Easterline-Angus recording milliammeters or ordinary S meters are too slow to count meteor bursts. To count them, tune in a distant identifiable station and point your antennas to a point of predicted activity. Count the number of bursts of certain fixed amplitude, or greater, per unit time. For example, count all *fast rise* bursts of stronger than S3 over a 20-minute interval. The number of these bursts divided by the time interval is the meteor radio *rate*. This rate as a function of time of day and antenna orientation is of interest to the radio astronomers. I suggest that the result of any such tests be forwarded to Ed Tilton, WHDQ, V.H.F. Editor, *QST*.

Bursts — A typical meteor burst from a 1-kw. 6-meter rig will last about 0.3 seconds. At 2 meters it would last about 0.03 seconds. Fortunately, the longer the path, the longer the burst will last. A simple calculation would lead us to conclude that if the rate were 200 per minute, *continuous* communication should be possible on 6 meters. This reasoning, though not quite statistically correct, gives an idea of the possibilities of a 400-per-minute Draconid shower!

This is the most intense of the regularly recur-



ring showers. It is associated with the comet Giacobini-Zinner. Although the earth crosses this comet's orbit each year, the swarm of meteoric dust is close to the comet itself, and meteor showers occur only when the earth and comet come close at the common intersection. This occurs about every 13 years on the average. At the intersection in 1946 the earth was 15 days behind the comet and an intense shower was recorded. At the 1959 crossing the earth will be about 45 days ahead of the comet. A moderately intense shower is expected.

A comet's "tail" does *not* stream out behind it but is an optical effect caused by solar light pressure. The visible tail always points away from the sun. The meteoric dust rides approximately the same orbit as the comet, some in front and some behind. It is not visible. The com-

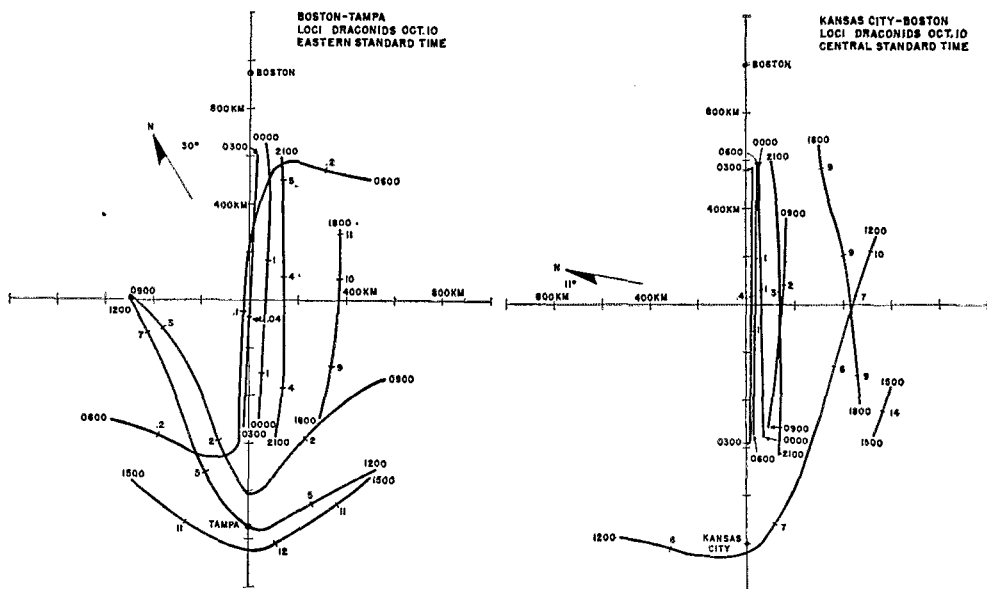
et's orbit is always shifting and the close approach in 1946 may have deflected it enough to prevent future showers. However, the comet could conceivably collide with the earth, and what fireworks that would cause! If the more probable occurs and the comet is in its same orbit here are the details of the 1959 shower:

Time of maximum — 0600 EST, 10 October 1959.

Hours of maximum — 0300 EST — 0900 EST.

Radiant at maximum — Elev.: $1\frac{1}{2}$ degrees, Azimuth: N14 degrees E from East Coast.

The charts presented here were prepared with the aid of the UNIVAC computer at Georgia Tech. It took UNIVAC about 30 minutes per path to digest and compute the location of the loci and the system sensitivity. The loci plots shown are very helpful in orienting antennas and



scheduling tests. Each heavy line (locus) identified by an hour is the locus of shower activity for that hour. The little numbers along the line are related to the activity and geometry of the path. Amateurs with sharp beam antennas should illuminate as much of the locus as possible for best results. The locus position is changing with time. Its position is shown at approximately 3-hour intervals. If the shower is on schedule the position of the locus at 0600 EST is of primary interest. For example, at 0500 CST the Minneapolis-Boston amateurs should point their antennas 4 degrees south of the great circle path.

The system sensitivity graphs were computed for 30-degree beamwidth antennas directed along the path. Since this shower does not last for 24 hours, the shape of each curve should be modified by the shape of the shower activity graph. Again, if the shower is on schedule, this would mean raising the shape around time of predicted maximum. These curves will be most useful in planning maximum path schedules where off-path loci are out of range, and also for the many amateurs with moderate beam antennas. Note that local time at path midpoint is used.

For paths between cities other than the six shown select a set of data with about the same path midpoint latitude and bearing and use local time at the path midpoint. If the midpoint falls near a time-zone boundary, add or subtract a half hour.

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 Rich Electronic Computer Center, Georgia Institute of Technology.

Perseids Summary

The S2s were flying thick and fast around the low end of the 2-meter band during the period between Aug. 8 and 14,

the annual visit of the Perseid meteor shower. As usual, opinions vary as to the shower activity, but contacts were made in all sections of the country. Included in these were some "firsts." W7CJM, Boise, Idaho, worked W6WSQ, West Covina, Cal., for the first known out-of-state 2-meter DX from Idaho. W1REZ, Fairfield, Conn., worked W0QDH, Salina, Kan., 1300 miles, and W0EMS, Omaha, Neb., for first 2-meter contacts between Connecticut and these two states, and in the case of W0QDH, the best DX of the shower.

To observe the build-up of the shower, W4RMU and your conductor kept skeds from Aug. 8 on. Signals were identified and good bursts recorded each way daily, and we were close to a QSO by the break method the first morning. On the morning of the 11th signals were in very frequently, and an easy exchange was completed after only 10 minutes of trying, on a long burst that began at 0709 EST. W4RMU worked W2TTM at 0620 on the 9th. Allen and W2CXY made contact on the first try, after a bit of sked-making on 7095 kc. W2CXY had been hearing W4RMU well, and they completed contact in 8 minutes, beginning at 0020 Aug. 13.

A summary of contacts thus far reported is given below:
 W1REZ, Fairfield, Conn. — W0QDH, Salina, Kan., 0147 8/13. W0EMS, Omaha, Neb., 0115 8/14.

W4RMU, Jacksonville, Fla. — W2TTM, South Amboy, N. J., 0620 8/9. W1HDQ, Canton, Conn., 0709 8/11. W2CXY, Chatham, N. J., 0020 8/13, and W0JJI, Wheaton, Ill., time and date unknown.

W4LTU, Springfield, Va. — W0QDH, 0400 8/12, and W5AJG, Dallas, 0500 8/13.

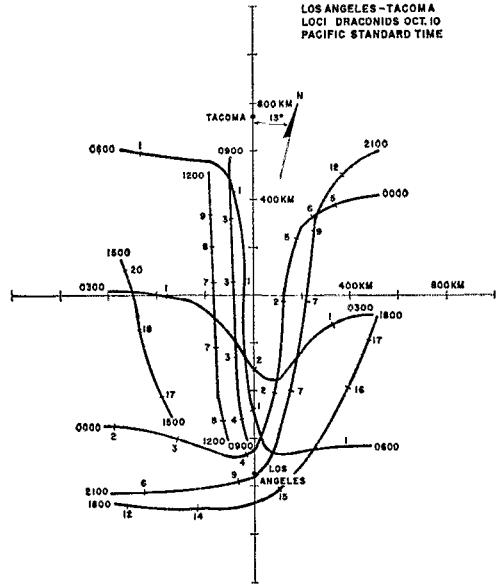
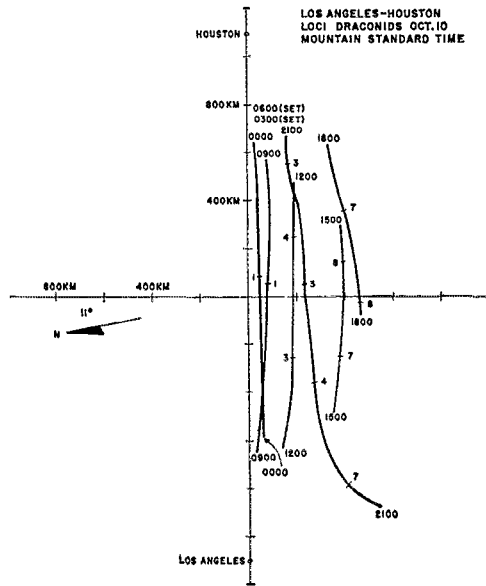
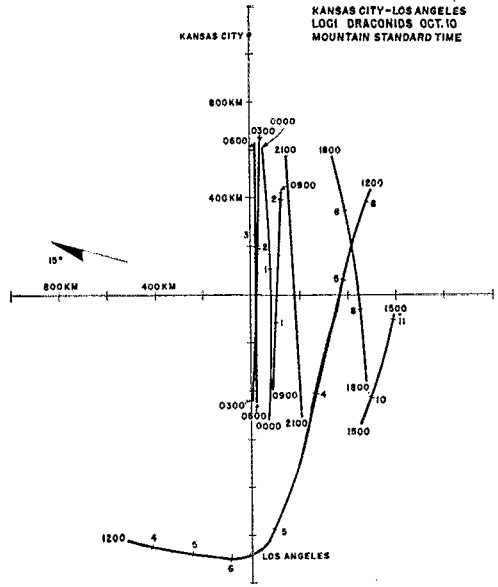
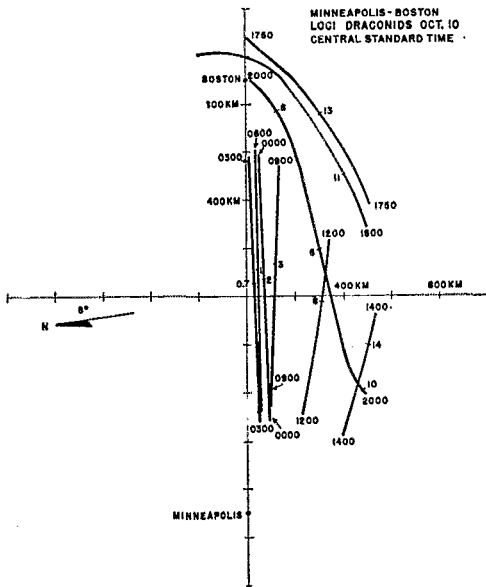
W5AJG, Dallas, Texas — W4LTU, W0IC, Denver, Colo., 0442 CST 8/13.

W6WSQ, West Covina, Cal. — W0IC, 0730 PST 8/12. W7CJM, Boise, Idaho, 2330 8/12.

W0IC, Denver, Colo. — W5AJG, 1142 MST 8/13. W9GAB, Beloit, Wis., 0454 8/13. W6WSQ, 0829 8/12. W9QXP, Glen Ellyn, Ill., 0921 8/13. W7FGG, Tucson, Ariz., 0703 8/12.

W3TDF, Langhorne, Pa. — W5JWL, Gurdon, Ark., time and date unknown.

W0IC's work was done with beam headings 20 degrees off true; south in case of the east-west paths and east on the Tucson skeds. Other Perseids oddities include the use of cross-polarization for the W6WSQ-W7CJM contact, with the latter being vertical. W0IC reported results much better than last year, yet he was using a smaller and lower antenna than before. Last year he had a 32-element job high above the housetops; this year the beam was a 10-element cut-down Channel 6 TV array, using a 12-foot boom. This was the second alteration of the antenna, it having served W0IC for satellite monitoring on 108 Mc.



It was only 35 feet above ground, or about half the height of the 32-element array used in his former location. Claude's transmitter is the 4X250B amplifier, described beginning on page 32 of this issue, driven by a 6N2.

Results at W0IC indicate some of the schedules may have been set up too early. His burst counts and duration were better with W6WSQ at 0800 than 0600, and the signals from W9OJI and W9QXP at 0920 to 0930 were exceptional.

Many schedules were set up for distances of 1400 miles and greater, but nothing positive was obtained on any of these. WIREZ recorded two pings on the right frequency for AJ2GA in Spain, and AJ2GA heard one right-time right-frequency ping for WIREZ. There were many full or partial identifications, and parts of exchanges on quite a few circuits, but all the ones beyond the 1400-mile limit produced nothing positive. There were several inside the assumed short limit, however. W4LTU positively identified W2ORI on what must be assumed to be back-scatter.

W5AJG says that most of the stuff he heard was weaker and the bursts farther apart than in his past experience. With W4LTU, for example, nothing was heard for 40 minutes. Had this been one of the usual 30-minute skeds, Leroy would have thought it completely unproductive. Extension of the normal sked time was also required with W0IC.

VE3DIR didn't do so well in the Perseids. His one sked, with W0IFS, netted some good bursts, but no QSO. Then, on the night of Aug. 17, Tony and Russ worked via aurora.

Meteor-scatter QSOs can be made on 144 Mc. merely by keeping schedules religiously during the optimum hours. (See W4LTU's article in Apr. 1957, QST, for details.) W1JDF, Methuen, Mass., and W4RMU, Jacksonville, Fla., kept 0600 skeds for several weeks. Your conductor monitored these (with both stations on 144.097 it was easy) and heard something from W4RMU on every try. On the morning of July 27 we heard a complete 30-second transmission from W4RMU at 0619. As expected, W1JDF was

50 Mc. WAS

1 W0ZJB	32 W6TMI*	38 W7ILL	56 W6ANN
2 W0BJV	21 K6EDX	39 W0DDX	57 W1SUZ
3 W0CJS	22 W5SFW*	40 W0DO	58 W1AEP*
4 W5AJG	23 W0ORE	41 K9DXT	59 W5LFH
5 W9ZHL	24 W9ALU	42 W6ABN	60 W6NLZ
6 W9OCA	25 W8CMS*	43 W6BAZ	61 W7MAH
7 W6OB	26 W0MVG	44 VE3AET	62 W8ESZ
8 W0INI	27 W0CNM	45 W9JFP	63 W2BYM
9 W1HDQ	28 W1VNH	46 W0QIN	64 W7ACD
10 W5MDJ	29 W0OLY	47 W0WWN	65 K6PYH*
11 W12DZ	30 W7HEA	48 K9ETD	66 W4HOB
12 W1LLL	31 K0GQG	49 W0FKY	67 K0JJA
13 W0DZM	32 W7FFE	50 W8LPD	68 K6RNO*
14 W0HWV	33 W0PFP	51 W0ZTW	69 W9QWT*
15 W0WKB	34 W6BJJ*	52 W6GCC	70 W6EDC*
16 W0SMJ	35 W2MEU	53 W2RJV	71 K6VLM*
17 W0GWW	36 W1CLS	54 W1DEI	72 K6GOX*
18 W7ERA	37 W6PUZ	55 W1HOY	73 W0EDM
19 W3OJU			*49

VE7CN	45	VE4HS	41	LU9MA	26	LA7Y	20
KL7AU	44	SM6ANR	30	ZS3G	26	VQ2PL	18
VE1EF	42	SM7ZN	29	T1CO	24	J8AAO	18
VE2AOM	38	PZ1AE	28	C06WW	21	J8ABU	17
XR1GE	37	SM6BTT	28	LA9T	21	J1AAT	17
KH6UK	37	CO2ZX	27	LU3DCA	20	J1AUH	16
EL2W	37	ZE2JV	26	SM5CHH	20		

right in there at the end, and for the first time we had an opportunity to hear a complete meteor-burst QSO, with both ends at the same signal level. The tape recorder was not running, of course, so we missed a chance of a life time.

W4LTU adds some information on the Oct. 9 shower. Walt has it that prospects are poor, generally, but we should hear down, even so. The 1952 shower (not a peak year) gave burst counts of 200/hour, when the earth was 195 days before the comet. Walt suggests around midnight EST Oct. 9 as the most likely time, with east-west paths favored.

One way to be sure that you catch the shower, if any, is to monitor the several high-powered scatter circuits near the 50-Mc. band. Here are some frequencies and approximate locations: Florida — 46.62 Mc., Upstate New York — 49.9 Mc., Central Illinois — 49.72 Mc. When you hear meteor activity build up on any of these, get cracking!

Here and There

A couple of months back we listed a record of 5½ hours for 50-Mc. WACA, set by K8ACC. In his location, with most of the country within single-hop range, he might find it easier than a fellow on either coast, but K6BQ is not too far behind. On July 12 Frank worked W1LGE W2RLV K3DXV K4UKQ K6SWL W6KD K7HKD K8EKQ W9RBX and W9WYX in 8 hours.

Japan has an award for working all JA call areas on 50 Mc. Several Ws have qualified for it, but the first award was

issued to VK4NG. It's none too easy for Japanese operators to turn this trick. The first 50-Mc. WAJJD certificate to be issued to a JA went to JA1AAT. His contacts were spread over nearly a year of operating.

JA1AAT and JA1AN both sent us some sad news this month: JA6FR, co-holder of the world 50-Mc. DX record, died recently after a short illness. We usually leave mention of the passing of v.h.f. men to the "Silent Keys" column, but we call attention to the loss of JA6FR because of his special niche in our hall of fame.

A frequency to watch this fall when you suspect a possible Asian opening is 50.5 Mc. There will be found JA1IGY, running 50 watts continuously, with a 3-element beam aimed at this country. Modulation is A2.

When you're struggling in the QRM at the low end of the 50-Mc. band, remember this bit from W5LFM: Cal reports that K5PIB moved up above 53 Mc. during a recent

(Continued on page 186)

2-METER STANDINGS

Figures are states, U. S. call areas, and mileage to most distant station worked.

W1REZ	32	8	1300	W5VY	10	3	1200
W1AZK	26	7	1205	W5SWY	10	3	900
W1KCS	24	7	1150	W5YYO	5	3	1330
W1RFU	23	7	1120				
W1ARL	21	6	1130	W6W5Q	14	5	1390
W1HDD	21	6	1020	W6NLZ	12	5	2540
W1MMN	20	6	900	W6DNG	9	5	1040
W1LZY	19	6	875	W6AJF	6	3	800
K1CRQ	19	6	800	W6ZL	5	3	1400
W1AFO	17	6	920	W6MMU	3	2	950
W1CLH	17	5	450				
				W7VMP	15	6	1280
W2NLY	37	8	1390	W7JRG	10	4	1040
W2CXY	37	8	1360	W7LHL	4	2	1050
W2ORI	37	8	1330	W7JIP	4	2	900
K2CQI	30	8	1200	W7JU	4	2	353
W2AZL	29	8	1050				
W2BLV	29	8	1020	W8KAY	38	8	1020
K21EJ	25	7	1060	W8SDJ	35	8	990
W2AMJ	25	6	960	W8PT	34	8	985
W2DWJ	23	6	860	W8FX	34	8	980
K2HOD	23	7	950	W8LOP	33	8	1060
W2PAU	23	6	753	W8AHL	22	9	810
W28MX	22	6	940	W8SVL	30	8	1080
K2CEH	22	8	910	W8SFG	30	8	1000
W2LWL	21	6	700	W8PHW	29	8	860
W2RXG	20	6	700	W8LPD	29	8	850
W2UTE	19	7	800	W8WRN	28	8	680
W2RLV	19	6	720	W8LW	27	8	720
W2WZR	18	7	1040	W8DX	26	8	720
W2ESK	18	5	850	W8ILC	25	8	800
K2RLG	17	6	980	W8JVV	25	8	940
				W8GPN	23	8	540
W3RUE	30	8	975	W8NOE	21	8	975
W3TDP	29	8	1050	K8AXU	21	8	750
W3GPK	29	8	1020	W8LCY	21	7	610
W3KCA	28	8	1110	W8BLN	21	7	610
W38GA	26	7	700	W8GTK	17	7	550
W3EPH	22	8	1000	W8NRM	17	7	550
W38YF	22	6	660				
W3LXJ	21	7	730	W9KLR	41	9	1160
W3NKM	20	7	730	W9WOK	40	9	1150
W3LZD	20	7	650	W9GAR	33	9	1075
				W9AAG	32	8	1050
W4HJQ	38	8	1150	W9REM	31	8	850
W4HHK	35	9	1280	W9ZTH	30	8	830
W4ZSL	34	8	850	W9LVC	27	8	850
W4AO	30	8	1120	W9EQC	27	8	820
W4LTU	29	8	1160	W9ZHL	25	8	700
W4MKJ	28	8	850	W9BPV	25	7	1030
W4UMF	28	8	1110	K9LOP	24	7	900
W4VLA	26	8	1000	W9PLP	24	8	820
W4EQM	25	8	1040	W9OJL	23	8	850
W4WNH	24	8	850	W9LFL	22	7	825
K4EUB	24	6	765	W9KPS	22	7	690
W4VCJ	23	6	725	W9PMN	19	6	800
W4VVE	21	6	720	W9ALU	18	7	800
W4TLN	20	7	1000	W9CUC	18	7	800
W4IKZ	20	6	720				
W4OLK	20	6	720	W98MJ	29	9	1075
W4AIB	19	7	840	W0IHD	27	7	890
W4CPZ	18	6	650	W0BFB	27	8	1060
W4RFE	18	7	820	W0QDE	24	9	1300
W4MDA	17	6	750	W0HLF	23	7	900
K4YUX	16	8	830	W0NLI	21	6	830
W4RUM	15	7	1080	W0UOP	21	7	900
W4LNG	15	6	1080	W0TGC	21	7	875
				W0RYG	20	8	925
W5RCI	34	9	1215	W0IC	16	7	1240
W5DFU	25	9	1300	W0IFS	16	6	1100
W5AJG	25	8	1360				
W5LPG	25	7	1000	VE3DIR	30	8	1350
W5KTD	23	8	1200	VE3AIB	27	8	1340
W5JVL	21	7	1150	VE3BQN	19	7	790
W5EPZ	16	1300	VE3BER	17	8	1340	
W5VGH	15	5	720	VE3AQ	17	7	800
W5ML	12	5	700	VE3HW	15	7	1350
W58FC	12	5	1390	VE2AOK	13	5	550
W5HEZ	12	5	1255	VE3BPP	14	6	715
W5FYZ	12	3	735	VE7FJ	2	1	365
W5CWW	11	5	1180				
W5NDE	11	5	625	KH6UK	1	2	2540

220- and 420-Mc. STANDINGS

220 Mc.

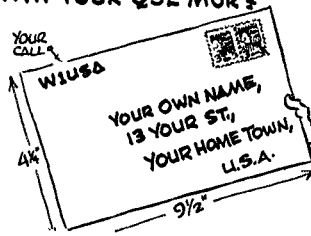
W1AZK	9	3	412	W6RCI	7	4	700
W1HDD	11	5	450	W6NLZ	3	2	2540
W1OOP	12	4	400	K6GTTG	2	2	240
W1RFU	11	5	480	W6MMU	2	2	225
W1THE	11	4	385	K8AXU	5	5	680
W2AOC	13	5	450	W8JG	9	5	475
K2AXQ	8	3	230	W8LPD	6	4	480
K2CBA	8	5	315	W8NRM	8	4	390
K2DIG	4	3	140	W8PT	7	3	550
W2DWJ	13	6	740	W8SVL	6	4	520
W2DZA	12	5	410	W9EQC	8	4	740
W3AHQ	4	2	180	W9JCS	5	2	340
W3LCC	8	5	360	W9JFP	9	4	540
W3LZD	14	5	425	W9OVL	5	2	290
W3RUE	5	4	225	W9UFD	4	4	605
W3DJG	11	5	400	W9ZIH	5	2	270
W3ZRF	5	3	112	K9GUK	1	1	2540
W4UBY	7	5	320	VE3AIB	5	3	350
W4UMF	11	5	420				

420 Mc.

W1HDD	8	3	210	W4HHK	3	3	520
W1RFU	8	4	410	W4VVE	6	4	410
W1OOP	9	3	390	W5RCI	4	3	340
W1THE	3	2	430	W7LHL	2	1	180
W2AOD	6	4	290	W8HCC	3	2	355
W2BLV	11	5	360	W9NKM	3	2	390
W2DZA	5	3	150	W9GAB	6	3	520

The function of the ARRL QSL Bureau system is to facilitate delivery to amateurs in the United States, its possessions, and Canada of those QSL cards which arrive from amateur stations in other parts of the world. All *you* have to do is send your QSL manager (see list below) a stamped self-addressed envelope about 4¼ by 9½ inches in size, with your name and address in the usual place on the front of the envelope and your call printed in capital letters in the upper left-hand corner.

IS YOURS ON FILE WITH YOUR QSL MGR?



- W1, K1 — G. L. DeGrenier, W1GKK, 109 Gallup St., North Adams, Mass.
- W2, K2 — North Jersey DX Ass'n, Box 55, Arlington, N. J.
- W3, K3 — Jesse Bieberman, W3KT, P.O. Box 400, Bala-Cynwyd, Pa.
- W4, K4 — Thomas M. Mcss, W4HYW, Box 644, Municipal Airport Branch, Atlanta, Ga.
- W5, K5 — Brad A. Beard, W5ADZ, P.O. Box 25172, Houston 5, Texas.
- W6/K6 — San Diego DX Club, Box 16006, San Diego 16, Calif.
- W7, K7 — Salem Amateur Radio Club, P.O. Box 61, Salem, Oregon.
- W8, K8 — Walter E. Musgrave, W8NGW, 1245 E. 187th St., Cleveland 10, Ohio.
- W9, K9 — J. F. Oberg, W9DSO, 2601 Gordon Drive, Flossmoor, Ill.
- W0, K0 — Alva A. Smith, W0DMA, 238 East Main St., Caledonia, Minn.
- VE1 — L. J. Fader, VE1FQ, P.O. Box 663, Halifax, N. S.
- VE2 — George C. Goode, VE2YA, 188 Lakeview Ave., Pointe Claire, Montreal 33, Que.

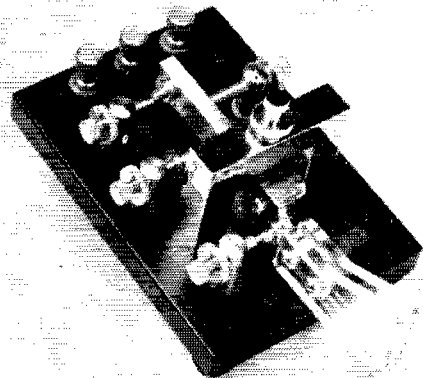
- VE3 — Leslie A. Whetham, VE3QE, 32 Sylvia Crescent, Hamilton, Ont.
- VE4 — Len Cuff, VE4LC, 236 Rutland St., St. James, Man.
- VE5 — Fred Ward, VE5OP, 399 Connaught Ave., Moose Jaw, Sask.
- VE6 — W. R. Savage, VE6EO, 833 10th St., North Lethbridge, Alta.
- VE7 — H. R. Hough, VE7HR, 1684 Freeman Rd., Victoria, B. C.
- VE8 — J. A. E. Williat, VE8JW, P.O. Box 534, Whitehorse, Y. T.
- VO1 — Ernest Ash, VO1AA, P.O. Box 8, St. John's, Newf.
- VO2 — Douglas B. Ritecy, Dept. of Transport, Goose Bay, Labrador.
- KP4 — E. W. Mayer, KP4KD, Box 1031, San Juan, P. R.
- KH6 — Andy H. Fuchikami, KH6BA, 2543 Namanu Dr., Honolulu, T. H.
- KL7 — KL7CP, 310-10th Ave., Anchorage, Alaska
- KZ5 — Catherine Howe, KZ5KA, Box 407, Balboa, C. Z.

• *New Apparatus*

New "Sideswiper"

DESIGNED specifically for use with electronic keyers, the Elkey (Poucel Electronics, P. O. Box 181, Babylon, L. I., New York) is a mechanical switching mechanism that will close one of two electrical circuits when the Lucite paddle arm is moved either side of its normally centered position. Unlike the semiautomatic keys that automatically generate dots when the paddle is pushed to one side, the Elkey makes continuous contact on both sides. However, when used in conjunction with an electronic keyer the Elkey becomes a truly automatic key, making automatic dots and dashes. The key is not restricted to use with an electronic keyer, but can also be used as a sideswiper.

The solid one-piece base weighs 3¼ pounds and is fitted with rubber feet to prevent skidding. The paddle and armature are supported by a massive chrome-plated solid brass yoke. All major controls are adjustable, including the spring tensions and contact gap spacing. The contact points are made of silver while all posts, arms and



hardware are chrome-plated machined brass.

Since the keyer "feels" and performs the same when pushed either side of center, the Elkey may be used by a southpaw, too!

— E. L. C.

It Isn't Easy

"A Study in Togetherness"

BY CHARLES L. HANSEN,* WØASO

IT ISN'T easy to be an "OM" these days — I really mean an OM with prospective amateur material growing up. I had tried my best to persuade the young lad that electronics and especially amateur radio would be good for him. For several years, when he was between the ages of nine to twelve, we worked on father-son projects mostly centered around crystal sets and simple two-tube receivers. He went along with me all the way through the various projects and thought it was real fun to build "radio stuff." For several days I would observe his interest in working with the project that had just been completed. After that the project would gather dust and other things such as yo-yo's became more important. I had failed to create in him the desire to become interested in electronics. It happened numerous times. I think every ham father secretly wants his son to be just like he was. Fond memories of your starting days are recalled when you think of the many thrills that amateur radio offered. Building the first receiver and transmitter from old junk parts, saving school lunch money to buy a Y-cut crystal, scrounging enough copper wire to erect an antenna, and finally after a lot of planning and sweat and shear guts — a contact. The kid didn't know what he was missing. His OM had been through the mill building receivers, transmitters, antennas, etc. — he should be real grateful to have such expert guidance. Why couldn't he see it.

We were still pals — fishing, a little hunting — but no electronics. Three years passed. I had been inactive for about five years now. Anything that resembled a transmitter consisted of parts stored in the attic and basement. He was now fifteen, and the picture began to change. Questions such as "Could I have enough money for a CK-722 transistor" or "Why won't this transistor circuit work with that old crystal I found in the basement junk box," were coming with great frequency. What happened? He's interested! I began getting out out of more good TV programs — offering moral support. I ask myself, how did this all come about. Maybe talk around the school with other boys, a magazine article, or was it that the seed planted three years ago was starting to grow? I find myself sending code to him. This kid won't let me rest. I even missed ten minutes of Gunsmoke. He gets novice ticket, KNØBF. We build a transmitter. 6L6 tritet, to parallel 24G's for 40 and 15 meters. During construction

*3552 Pacific St., Omaha, Nebraska.

he is convinced that it won't work because I didn't use a diagram out of the *Handbook* or *QST*. Those old parts and tubes could not possibly be any good. Lots of static in this direction. "Why not buy a Super Master Transmitter, etc." Climb roof January 1958, skin knees, risk life — how did I ever get into this? I'm too old for this stuff. He makes contacts. Man, it seems good to hear c.w. echoing around the home again. I am proud of the lad, so proud that I am bragging about him. He is the topic of conversation with my electronic friends around the coffee break table. "Yes, sir. The kid is slapping a bug around now. Working lots of DX on 15, got 43 states." Little did I realize how involved this would get when I made the statement "When you get your general license we will put a kw. on all bands." Six months pass. I'm back watching TV again. The kid is still pounding brass. August 1958 — General license KØBF. Question — "Well, dad, should we get started on the kw.?" What kw., I said. "You know you said we would have a kw. on when I got my General?" — Ye Gods, I did say that. didn't I. September — "How about the kw. dad?" Why, son, you don't need all that power on 15 meters, look at all the DX your working. You see, it has to do with the Heavyside layer. You really don't need that much power to . . . "But you said —" OK. I could see then that anything I said wouldn't go. I grumbled and repeated several sayings to myself "Face the problem, don't fight it." "Damn the torpedos, full steam ahead" "Figure out how to get the job done and not why it can't be done." The project begins. The goal in mind — get transmitter on the air for sweepstakes contest.

October 13. I arrange with my boss to take a week of vacation October 18 through October 25 to build transmitter. October 13 thru October 17 I look over junk in attic and basement. I thumb through *Handbook* and *QST*'s for ideas. What are these pi-tanks, timed-sequence keying, 1958 design? The last time I built a transmitter of any size I used triodes-100TH's. I guess I'd better go out and buy a transmitter, but I can't do that. Oh, why did I ever say "kw. when you get your General." Then I remember my slogans and draw design for transmitter.

October 18, Saturday. I go to the radio store and buy fifty dollars worth of parts. Saturday afternoon I start work on the exciter. 5763 v.f.o., 6C4, 5763, 5763, 6146 pre-tuned on all bands, band switched, low impedance output.

October 21, Tuesday. I finish construction on exciter.

October 23, Thursday. All bugs are out of exciter and final modifications completed.

October 24, Friday. I go to radio store for forty dollars more parts for final and power supply.

October 25, Saturday. I build kw. pi tank and connect switch. I start building final.

October 27, Monday. I arrange with boss for another week off November 2 thru the 8.

November 1. I finish final wiring.

November 2. I build power supply for final.

November 3. I hear by the weather report that bad weather coming. I purchase a 4-band trap vertical, assemble and mount on roof.

November 4. I finish installing antenna.

November 5. Scout around town for Reynolds aluminum perforated sheets for transmitter shielding. I install shielding.

November 6. Get a meter panel drilled. Build a three by eight foot desk. I try transmitter.

November 7. I test transmitter into dummy

load. I remove bugs from final.

November 8. I change taps on final pi tank. I add neutralizing capacitor to final.

At 12 noon I see smoke coming from exciter.

There is no output. The 5763 blew out and radio stores close in one hour. I get 5763 and borrow a v.t.v.m.

By 3:00 P.M. I replace 5763 and dropping resistor.

I set voltage on 5763, and reduce voltage further by adding cathode dropping resistor.

At 5:00 P.M. I am tuning the transmitter. I remove a parasitic.

By 5:30 P.M. I think the transmitter is ready to go. The receivers are in a room up stairs. I bring down to basement.

6:00 P.M. I string up antenna for receiver.

At 6:26 P.M. We get first SS contact with W4LVV.

From 6:26 to 8:15 P.M. we test out transmitter on 40, 20, and 15 meters.

At 8:17 P.M. we start having SS contacts! **QST**

• New Apparatus —

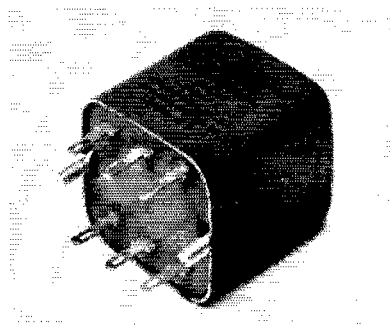
Wide-Band Transformers

THE new wide-band transformer shown in the accompanying photograph is designed for matching a 75-ohm unbalanced source to a 600-ohm balanced load over a wide frequency range. Available in two models, the transformers cover the frequency ranges 0.2 to 40 Mc. or 3.0 to 100 Mc. Amateur applications include antenna matching, receiver and low-power transmitter coupling, or use in any circuit where isolation, impedance-matching or voltage step-up is required over the available frequency range.

The Model 1210 shown in the photograph measures $1\frac{1}{2}$ inches long, $1\frac{1}{16}$ inches wide and $1\frac{3}{16}$ inches high with mounting centers $1\frac{3}{8}$ inches. This series is potted in open metal cases with a terminal board on the bottom, and has 6-32 spade mounting bolts. The 1211 series (not shown) is hermetically sealed with glass-seal terminals and is mounted with 4-40 studs on the bottom.

In a test in the ARRL laboratory, the impedance measured at the 75-ohm side, with a 600-ohm resistive load connected to the output terminals of a Model 1210, was as follows:

Frequency (Mc.)	Input Resistance (Ohms)	Equivalent Shunt Capacitance ($\mu\text{mf.}$)
3.5	72	- 47
5.0	72	- 31
10.0	72	- 20
20.0	73	- 28
40.0	90	- 18



The figures in the equivalent shunt capacitance column are the shunt capacitance values required for resonating the circuit at the given frequency.

The transformers are manufactured by North Hills Electric Co., Inc., 402 Sagamore Ave., Mineola, Long Island, N. Y.

— E. L. C.

Strays

W1JNV, driving home from work, halted in traffic behind a shiny station wagon with the letters K9CAB in gold on the back and sides. He rapped out a HI on the horn and received a nasty look. Curious, he pulled alongside and inquired if that were a ham's car. "Heck, no," came the reply. "I'm the dog catcher."

26th ARRL Sweepstakes — Nov. 7-8 and 14-15

Are you game for the endurance test of the year? If you are located anywhere in the League's field-organization territory (see page 6), you are cordially invited to take part in this popular annual operating activity. Any amateur bands, phone or c.w., may be used. The total operating time allowed each contestant is 40 hours. Phone entries are compared only with other phone entries — c.w. scores only with other c.w. scores — in your particular section, in the competition for awards. Special Novice certificates are also issued. The week-end periods starting Saturday afternoon (1500 PST or 1800 EST) on the 7th and 14th of November mark the open season for SS contacts.

A complete announcement of the contest, including the rules governing participation, will appear in November *QST*. The rules will be the same as those of the 1958 SS. Amateurs in remote ARRL Sections who do not receive the next issue before the Sweepstakes may refer to November, 1958, *QST* for contest details.

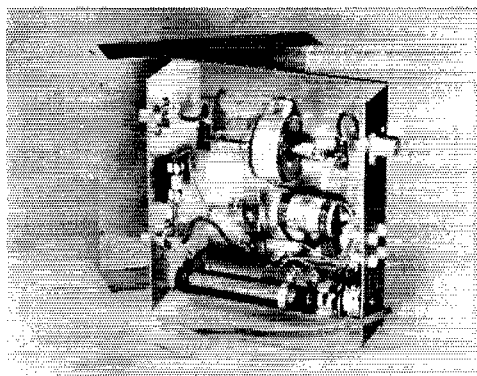
Contest reporting forms will be sent to all amateurs who request them by mail or radiogram. It is not necessary to use these forms if the report form prescribed in November 1958 or in the next issue of *QST* is followed.

• *New Apparatus*

New Vacuum Coaxial Antenna Relay

POSITIVE, fast-acting antenna switching is the job the South Bay Vacuum Coaxial Antenna Relay is designed to do. The heart of the unit is an evacuated contact system, operated by an external magnet. By eliminating arcing, the vacuum reduces contact wear and pitting to practically nothing. Designed to handle the maximum amateur power limit the relay has, for all practical purposes, no insertion loss when used in 50- or 75-ohm lines at frequencies up to 30 Mc. The switch is fast enough for use in the sideband station where voice-controlled operation requires rapid switching.

Power for the relay magnet is d.c., supplied by a built-in rectifier-filter system operated from 117 volts a.c. The unit also contains a conventional d.p.d.t. relay that can be used to control other equipment. Connections to the antenna, transmitter, and receiver lines are made through coax connectors. Pin jacks connect to the auxiliary relay contacts and power for the unit is



obtained through a 117-volt receptacle attached to a short line cord. The relay is available from the South Bay Electronics Co., 3125 Barney Ave., Menlo Park, California. — E. L. C.

Strays

Bob Gunderson, W2JIO, received a complaint from the priest of a church near the New York Institute for Education of the Blind, where Bob teaches. As the priest told it, just as he came to the part of the sermon where it was written, "And the Lord spoke," Gunderson came crashing through the church's new public address system, calling, "CQ 75."

In case you were wondering about headphone reception with the 453 tunable-i.f. receiver described in September *QST* (page 30), W2PPL writes that he inadvertently omitted the headphone jack in his circuit diagram. It is in the plate circuit of the 6SQ7 first-audio tube, with the jack frame grounded and the hot side connected to the plate through a 0.05- μ f. capacitor.

Strays

The El Paso ARC will sponsor a Worked All El Paso contest on the week ends of October 17-18 and 24-25, running from 1600 MST on Saturday to 1600 MST on Sunday, each week end. A WAE certificate will be awarded to each person who works 15 El Paso hams. This certificate can be earned anytime during the year but, of course, there will be a special burst of El Paso activity during the contest. To apply for the certificate, send a list of the El Paso QSOs (with date and time) to Milly Aldrich, W5OVH, El Paso Amateur Radio Club, 1501 Golden Hill Terrace, El Paso, Texas.

The last few weeks we have received what almost amounts to a deluge of claimants for the "longest QSO" record. Rather than mention all the also-rans, we will simply record that as of this writing (September first) WV2EAF and K2DGU hold the record with a QSO that lasted for 60 hours, 21½ minutes.

The late K2AE, who at his death at the age of 93 was the oldest active radio amateur, is being honored by a memorial administered by the Schenectady Amateur Radio Association. The memorial will be in the form of a trophy or plaque which is to be awarded annually to that local amateur who makes the greatest contribution during a time of disaster or civilian emergency.

Over the sea and on TV—all at the same time. That's the story of a little chat between W3BIW, Mrs. Eleanor Hammons of Bryn Mawr, Pa., and GM3MBC, John Churchill of Glasgow, Scotland. It was the first simultaneous trans-Atlantic filming of a conversation between British and American amateurs. The film was made by Scottish TV for an educational feature, "Long View—Short Wave." Philadelphia TV station WFIL cooperated. The contact lasted four hours, but only 20 minutes was used on TV.

"We took a big risk in scheduling this contact at this time of year, but we were dead lucky," said Churchill. "But the day before and the following day the band was completely out." W3BIW was up at 3 a.m. to hit GM3MBC just after his breakfast time. Immediately after contact was over, GM3MBC was called by W1HZG/MM who had listened to the whole thing on board the USS American Packer 600 miles out in the Atlantic.

There's nothing earth-shaking about a QSO between Atlanta, Ga. and New Zealand—but W4EJN *was* shaken when he discovered ZL1AAX was transmitting on an 11-transistor phasing-type s.s.b. rig, powered by a 12-volt flashlight battery.

"It was the most exciting moment in my nearly 25 years of hamming. Indeed, I feel that this is the forerunner of the 'wrist-watch radio' that will be heard 'round the world," said W4EJN.

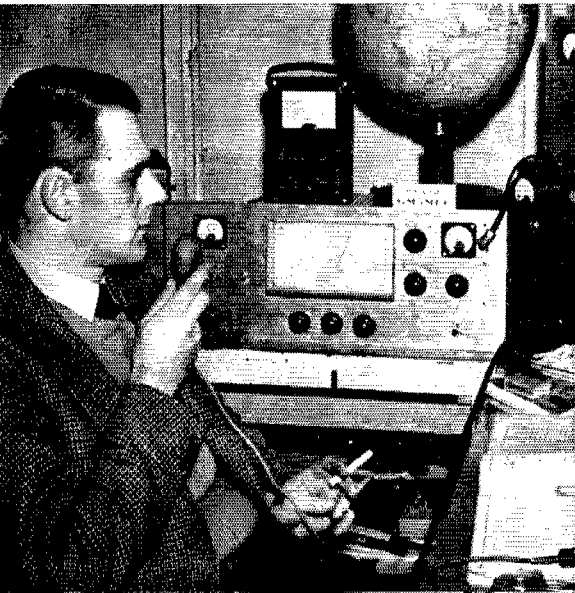
ZL1AAX had a power input to the final p.a. which is a 2N247 transistor of 20 milliwatts power. He was using a cubical quad antenna.

W4EJN, wandering through the bands on May 1, heard ZL1AAX rag-chewing with ZL3AB. W4EJN, Jim Fields of Atlanta, broke in to tell ZL3AB, an old friend, that Jim was reading ZL1AAX Q5 86-7 although ZL1AAX appeared to be having some difficulties with his rig.

Jim arranged to have the New Zealander listen for W4EJN on s.s.b. inside the American phone band (the two ZL's were on 14315 kc.) They had a one-hour QSO, ending at 2350 EST.

W4EJN tape recorded the conversation and sent the tape to ZL1AAX to take with his rig to the N.Z.A.R.T. annual convention. W4EJN received on a SX-100 with a tri-bander beam.

KNØRTI has a suggestion to save Novices money. Why not order General QSL cards, ink in an N while they are Novices and be ready to go ahead as is when that General arrives?



Variable SWR†

BY HERBERT HARTMAN,* K2HY

I REALIZE that this should be a documentary or a technical article, but my psychiatrist has cautioned against any serious work during the present stage of my recovery. Accordingly, I will set forth the facts only, and if any further research is indicated, it will have to be done by those hams who are still in complete command of their mental faculties.

It all started a few months ago when I decided to install a rig at my summer home on Barnegat Bay. I had toyed with the idea for quite some time because the QTH seemed so ideal, and after a lucky day at the race track, I broke down and bought a Collins 32S-1 and a trapped vertical for 10-15-20-40.

The house fronts on the bay, in a little cove, and commands a very nice maritime view. The only thing wrong was that several years back I had planted a pine tree in line with our picture window and the bulkhead. It was only six inches tall at the time, but, as trees will, it had grown and was beginning to block the XYL's view.

Being alone one week end I decided that I could kill two birds with one stone, so I chopped down the tree, dug up the roots, and put the antenna up in its place.



One of the most appealing features of the QTH is the fact that it is quite low, our bulkhead being only about four feet above salt water. The entire area is sandy, and what little top soil there is has been imported from the mainland, seven miles away.

Well, first I bought a ten-foot stainless steel pipe, 1 1/2" diameter. The job was going to be done right, with nothing but the best, so I bought the pipe before I priced it. (Anybody ever buy a piece of stainless? Price it first, brother — I almost died!)

Well, I drove this gold-plated piece of plumbing down until only two feet remained above ground, and I erected the vertical as a ground-plane antenna, omitting the radials.

I thought it was a nice substitution for the tree, but apparently the XYL didn't share my opinion, because things were very quiet around the house the following week end. Eventually she did comment (she is quite artistic) that it didn't add much to the appearance of the place.

After a bad wind storm I decided that the vertical needed a couple of guys, and after dismounting the antenna for fastenings, I decided to give the aluminum a coat of metallic paint for protection. My only can of aluminum spray paint was empty, but I did see some cans in the garage that my wife had bought. One can was chrome yellow, one was cherry red, and one was white. She wanted things artistic, eh?

Well, the U.S. Coast and Geodetic had, for a while at least, a beautiful triangulation monument on Barnegat Bay, for free. Unfortunately, the XYL's reaction was a little *too* reactionary, to put it mildly. I won't repeat the conversation, but I distinctly remember hearing the word "senility" somewhere along the line.

The redeeming thing, however, was the way the rig worked. My first QSO was with KH6CRL who gave me a 5-8-9, and from there I really went wild. The set-up worked like a house on fire, and I was really in a DX paradise. If I'd had any sense, I would have left well enough alone, but a ham is a ham.

† Salt Water Resonance.

* Harvey Cedars, N. J.

The author — before he encountered SWR.

The author's QTH

on Barnegat Bay



Somewhat the 32S-1 didn't load up the way the instructions said it should. The antenna people claimed a $1\frac{1}{2}:1$ s.w.r. on all bands, and these odd loadings began to bother me.

So I bought an s.w.r. bridge.

Now I have made some mistakes in my life, but believe me, the purchase of that bridge was a real lulu.

I remember I was on 15 when I hooked it into the coax. Beautiful! $1\frac{1}{2}:1$. It wasn't until the next morning that I checked the 20-meter band. I could be wrong, but I'll swear that I had more r.f. coming back at me than was going out! So I checked back on 15. Funny thing, now 3:1!

In complete consternation, I checked all bands, and the ratios varied all the way from 3:1 to the dilly on 20.

So I got a ladder and a ruler and checked the dimensions of the vertical. I had put it up correctly, but the instructions gave two sets of dimensions, one for ground mounting and one for roof mounting. I had used the ground mounting set, so I now loosened up the guys and changed all lengths to the other set.

Well, the s.w.r. changed all right. 15 was now 5:1 and the rest were nicely assorted.

The trouble *had* to be with the bridge. I opened it up and checked it against the circuit, but everything seemed to be in order.

The following week I had to go up to the city, but I kept thinking about my troubles. I became convinced that I needed radials, so I bought some wire and insulators.

Well, the antenna is right in the middle of a planting area, to which the XYL has given loving care over the years. Need I say more? I got the radials up, but at what a price! We're just getting back on speaking terms now.

Once again a goofy set of s.w.r.'s.

I knew! It had to be a trap! I dismantled the whole works and checked each trap with a grid-dip meter. Has anyone ever checked those commercial traps? Before you try it, brother, you had better get the specs. 15, for example, peaks somewhere around 19,015.

I didn't get the null on the 10 that I felt I should have, so I decided to eliminate that trap as the possible source of trouble.

That really did it. It seems that every time you change the length of one section of a trapped vertical, the others are affected. I must have made two dozen trips from the rig to the ant, moving the aluminum step ladder back and forth, before I found *that* out. To make matters worse, I had to sand off my beautiful paint job, a little part for each change.

I've come to the conclusion that the antenna manufacturers must use an electric computer to figure the dimensional combinations. Finally, in desperation, I decided to eliminate all but the 15-meter trap, which would give me 15 and 20. (Who wants to work 10 and 40 anyway?)

Now I had only two combinations to work out.

The following Saturday it rained, and back and forth I trudged, with a ruler and a wrench, carrying the stepladder each time. The house was wetter inside than out, and the XYL was getting a scared look on her face.

Finally, after a hundred trips or so, I got the s.w.r. somewhere near $2\frac{1}{2}:1$ on both bands, but I was so near the point of ulcerated frustration that I was too exhausted to try a QSO.

That night it blew hard out of the northeast, and the surf was high and heavy along the ocean front. The next morning, still bleary-eyed, I sat down to breakfast, and over black coffee I gazed morosely out upon a shorter and sadder-looking antenna and a storm-swept bay. The tide was exceptionally high.

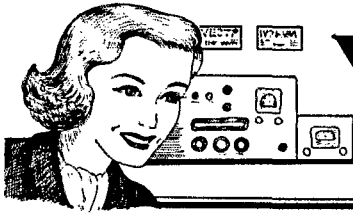
The tide???

I rushed into the shack, and with trembling hands, turned on the rig — 1:1 on both bands.

The doctor says that I'll be all right in a few months, but under no circumstances am I to work on the combination s.w.r. bridge and tide-gauge that I now have in mind.

In the meantime, if anyone wants a sked on 15 or 20 only, I'll be glad to oblige as soon as I get the latest tide almanac from Washington. **QST**

The latest word from K2HY relates that a friend of his wife's came to visit the other night and, in the dark, took a short cut through the yard. It wasn't enough that she tripped and fell over one of the radials — she fell over three of them in rapid succession! She hasn't been back since, and K2HY says he is still in the doghouse. — *Ed.*



YL NEWS AND VIEWS

CONDUCTED BY ELEANOR WILSON,* W1QON

THE STORY

1959 marks the twentieth anniversary of the Young Ladies Radio League, the first and largest of the YL clubs of the world. During the past twenty years the YLRL has steadily pushed forward in prominence. It has a history of which it can be proud. Its members have been unified by an esprit de corps which seems continuously recharged with enthusiasm. Its officers seem ever receptive to new ideas to better the organization, and, beyond the aims of the club alone, to further the interests of licensed women radio operators in general.

A. David Middleton, W5CA, said in the Preface to *CQ YL* by Louisa Sando, W5RZJ, the first non-fiction book about women radio operators: "From the moment the first two-way amateur radio communications began it was inevitable that there would be women radio amateurs as well as men. And, it was therefore inevitable that some day there would be a sizeable number of YLs; that the ladies would band together to form their own organization, the YLRL."

Thus, the inevitable happened, and we hope the ham world is the better for it.

(To clear a point, it has oft been reiterated that this column, the *QST* YL column, is not,

*YL Editor, *QST*: Please send all news notes to W1QON's home address: 318 Fisher St., Walpole, Mass.

and never has been, a column or a project of the YLRL. While much material for publication is supplied by the YLRL, this column is in no way affiliated with the YLRL. It exists in the interests of *all* licensed amateur women radio operators the world over.)

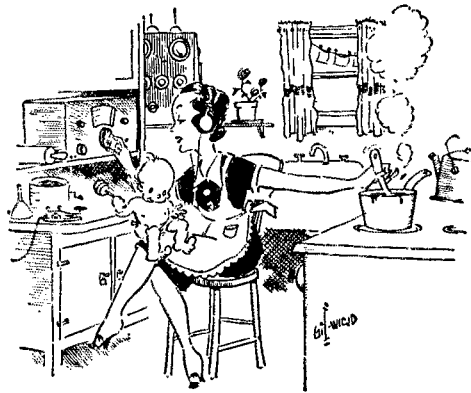
It was the now famous lace-bordered ad signed with "88" by the ARRL which appeared in the May 1939 issue of *QST* which innocently begat the creation of the YLRL. In an ad for the book *Two Hundred Meters and Down* by De Soto an observation was teasingly offered for what it was worth: "Goodness knows — and you won't tell how many of you YL key-twitchers there are." The question proved worth a lot to Ethel Smith, W7FWB, who retorted with a query which appeared in *QST* a couple of months later. She beseeched YLs to make themselves known, whether they be key-twitchers or tonsil-busters. And she even dared advance the idea that they might band together in a "YLRL or something."

Ten YLs answered Ethel. Enid Carter, W9NBX (now Enid Aldwell, W6UXF), drew up a constitution. In October 1939 the constitution was adopted and officers selected. W7FWB became the first president, Carol Keating, W9WWP (now Carol Witte, W6WSV), Vice President; W9NBX became Secretary, and Anita Bien, W8TAY (now W4JCR), was appointed Publicity Chairman. Chairmen for each call area were also appointed.

In November 1939 W9NBX began publication of a monthly bulletin which was christened *YL HARMONICS*. In spite of periodic changes of editorship, *HARMONICS* has successfully continued to this day to be the most unifying factor in an organization which now comprises more than 900 members who live in some 30 countries.

A year later, in the *QST* of May, 1940, the article "The YLs Unite!" recounted some of the activities of the new YLRL. The cartoons — produced by an OM — are reproduced here . . . still valid after 19 years.

Activities of the YLRL are well-known not only to YLs but also to countless OMs who participate in YLRL sponsored contests and who ardently seek the various certificates and awards the club offers. Each year the number of par-



—GOOD STUDENTS, HOMEMAKERS AND MOTHERS—AS WELL AS GOOD OPERATORS—

ticipants in the popular YL-OM contest has exceeded the record set for the previous year. OM interest in the YL Century Certificate, the DX-YL Award, and the WAS and WAC YL Awards seems as keen as YL interest. And the pride of OMs whose wives are YLRLers is obvious. At the national convention in Galveston recently, for one instance, it was flattering to realize how solidly the OMs stood behind their YLRL wives engaged in their own special YL activities. Then too, more than one OM has prevailed upon the YLRL for help in getting a ham ticket for his XYL, with happy-ending results.



For YLs only, the club sponsors the Anniversary Party each Fall and a variety of nets during the year (see schedule published last month). YL get-togethers and conventions are encouraged, and YLRL affiliated clubs are urged to promote local activity.

The club's third international convention is scheduled for Boston, Massachusetts in June, 1960. Interest is already high in the affair, which is expected to surpass in size the first two international conventions held in 1955 and 1957 in Santa Monica, California, and Chicago respectively.

Present officers of the organization are Pres. Kay Anderson, W4BLR; Vice President Gladys Eastman, W6DXI; Secretary Connie Hauck, K6EXQ; Treasurer Evelyn Tibbits, W9YWH; Publicity Chairman Mary Meyer, W9RUJ; and Editor of *HARMONICS* Wanda Gluck, K6ENK. Any licensed woman amateur radio operator is eligible for membership, including novice licensees. Dues are \$2 annually, and entitle a member to receive *YL HARMONICS*. An application for membership may be obtained from Secretary Connie Hauck, K6EXQ, 794 Glen Eagles Ave., Pomona, California. Complete details of YLRL are contained in the Constitution and By-Laws, a copy of which is available to each member.

In her book *CQ-YL*, the first history of YLs in amateur radio, author Louisa Sando, W5RZJ, devotes five chapters to the YLRL, tracing in detail its beginnings and growth to the present day. For the complete YLRL story, *CQ-YL* is

recommended reading.

During the past twenty years YLRL has been recognized by the government and military as well as by officials within amateur radio for contributing to the advancement of radio and the maintenance of "peace through preparedness." Individual members have been cited for outstanding work in World War II, in emergencies and disasters, in teaching, in traffic-handling.

YLRL has grown to be an integral part of ham radio. All signs within the organization point to an even more successful and productive next twenty years. Happy Birthday and Congratulations, YLRL, with 33*.

YLRL Awards

YL Century Certificate — The most popular of the YLRL awards is available to all amateurs upon proof of contact with 100 different licensed YL operators anywhere in the world. All contacts must be made from the same QTH or within a 25 mile radius. One hundred QSL cards, or other written communications from the stations worked confirming the necessary two-way contacts, accompanied by a list of claimed contacts, including the full name of the operator, alphabetically arranged, and the date and time of contact, must be submitted by the applicant directly to the YLCC custodian. Sufficient postage must be sent with the confirmations to finance their return by first class mail. Endorsements are issued for confirmed contacts with each additional 50 different YLs. Award custodian is Katherine Johnson, W4SGD, Box 666, Fuquay Springs, North Carolina.

Worked All States/YL — Proof of contact with a licensed YL operator in each of the 49 states is required. This award parallels the ARRL's WAS. QSLs should be sent to Custodian Grace Ryden, W9GME, 2054 N. Lincoln Ave., Chicago, Illinois. A list of the contacts must accompany the cards and sufficient postage must be sent to finance their return.

Worked All Continents/YL — Proof of contact with a licensed YL in each of the six continents should be sent to Barbara Houston, K8LYV, General Delivery, Richardson, Texas (temporary address for K8LYV). IRCs, or equivalent, must be sent with the confirmations to finance their return, by first-class mail.

* Join the YLRL and learn the meaning of 33.





One of the ten YLs who answered W7FWB's famous query, Enid Carter, W9NBX, drew up the YLRL constitution in Oct. 1939, and served as the club's first secretary. Now the XYL of W6ZD, William Aldwell, Enid operates as W6UXF in Los Angeles. Thirty years after graduating from high school, Enid returned to college to graduate with honors last June from UCLA.

DX-YL — The newest YLRL certificate will be issued to any YL who works 25 other licensed women operators outside her own country on or after April 1, 1958. A copy of the log of the 25 contacts should be mailed to Custodian Maxine Willis, W6UHA, 6502 Wynkoop St., Los Angeles 45, California.

YLRL Affiliated Club Certificate — In accordance with the new YLRL constitution, effective Jan. 1, 1959, those YL clubs with fifty per cent of their members belonging to YLRL are eligible for national YLRL club affiliation. Interested clubs should apply for an affiliation certificate to Secretary Connie Hauck, 794 Glencagles Ave., Pomona, California.

Ethel Smith, K4LMB, (ex W7FWB and W3MSU) founded the YLRL in 1939 and served as first president. Licensed in 1936, Ethel was the first YL ham active in the Naval Reserve Electronics Program and the first WAVE to participate in the Military Amateur Radio System. Ethel is an electronics engineering aide at the Naval Research Laboratories in Washington, D. C. She continues to be an active ham, operating both fixed and mobile.



TWENTIETH YLRL ANNIVERSARY PARTY

CONTEST PERIOD

PHONE —

Starts: Wednesday, Nov. 11, 1959, 12 noon EST
Ends: Thursday, Nov. 12, 1959, 12 midnight EST

C.W. —

Starts: Wednesday, Nov. 18, 1959, 12 noon EST
Ends: Thursday, Nov. 19, 1959, 12 midnight EST

ELIGIBILITY: All licensed YL and XYL operators throughout the world are invited to participate. YLRL members only are eligible for the cup awards; non-members will receive certificates. Only YLRL members are eligible for the Corcoran Award (an award donated by Marie, W8TPZ, and Corky Corcoran reinstated for this contest). Contacts with OMs will not count — the YL/OM contest will be held early in 1960.

OPERATION: All bands may be used. Cross-band operation is not permitted. Only one contact with each station will be counted in each contest, phone and c.w. All contacts must be made during the contest times indicated above. Any 30 consecutive hours may be worked in each of the two sections.

PROCEDURE: Call "CQ YL."

EXCHANGE: Station worked, QSO number, RS or RST report, ARRL section, U. S. possession, VE district, or country.

SCORING: (a) Phone and c.w. sections will be scored as separate contests. (b) Multiply number of contacts by the total number of ARRL sections, U. S. possessions, VE districts, and countries worked. (c) Contestants running 150 watts input or less at all times may multiply results of (b) by 1.25 (low power multiplier).

AWARDS: Highest phone score — gold cup. Highest c.w. score — gold cup. Highest phone and c.w. score in each district, U. S. possession, VE district, and country will receive a certificate. The Corcoran Award will be given to the YLRL member with the highest combined phone and c.w. score.

LOGS: Copies of all logs must show claimed score and be postmarked not later than Nov. 30, 1959, and received by the Vice President not later than Dec. 15, 1959. Send logs directly to Gladys Eastman, W6DXI, 735 Glen Avenue, Glendale 6, California.

KEEPING UP WITH THE GIRLS

A correction for the YLRL net schedule published in the September column. W7HHH's Monday YL Net meets Monday at 1500 PST on 3890 kc., not 3980. . . . K4RNS, Marge, and her OM K4RNR received the *Florida Skip* award for public service for their radio efforts in behalf of a nursing boy. . . . W4VCB, Evelyn, is the first stateside YL to receive the "20-K" award sponsored by OM K2QXG. . . . Forty-six YLs enjoyed the ARRL Southwestern Division Convention at Pasadena in July. W6JZA, Elsa, was in charge of YL doings. . . . Thousands of non-ham New Yorkers undoubtedly read an interesting two-page write-up in the *N. Y. Mirror* on the radio career of well-known traffic handler Georgianna Mezey, W2KEB, of Malverne, Long Island. . . . *The Monitor*, Texas monthly ham publication, boasts four YLs on the staff. W5JCY, Bertha, is YL editor, K5BNQ, Doris, is Oklahoma editor, K5BDL, Rosemarie, writes the VHF column, and W5SYL, Iva, is a contributing editor. . . . New officers of the LARK of Chicago are Pres. K9IVG; V.P. W9UON; Secy. W9IWP; Treas. K9BWJ; Nov. Rep. K9HGY; Pub. K9IWR; Editor W9MYC. . . . Iris, ZS2AA, and her OM entertained Peter Townsend at their home during an African visit of the gentleman of Princess Margaret fame (item via W4VCB). . . . Maxine, ex-W5YRT, relates three "news" for her — new call, WA6BQU, new son, no. 4, new member of BAYLARCs of San Francisco. . . . Officers for the coming season of the San Diego YLRC are Pres. K6UTO; V.P. K6VRH; Secy. K6YGJ; Treas. W6BNS. . . . K9DCC reports she had the pleasure of playing Dan Cupid via radio. Following a QSO with W7RNL, Edith suggested to a friend the idea of correspondence with the lonesome chap in Spokane. The wedding takes place in September and the bride-to-be plans,

One of the youngest YLs around is nine-year-old Diana Hunter, KN9SMK, of Indianapolis, Indiana. She is a member of Brownie Troop 555. Diana comes by her hamming honestly. Her dad is KN9LVS and her brother is K9DWT.



to show her gratitude to ham radio by getting a license too. . . . Congratulations to YLRL President Kay Anderson, W4BLR, and her OMI W4BVB, Harmonic #5, and first girl arrived June 7th.

Seventy new SWOOPs were initiated at the San Jose Pacific area convention in July. Ceremonies were conducted by W6BDE, Esther, and K6HIW, Kay. W6BDE relates that at the SWOOP breakfast W5DEW, Mary, the bride-to-be of ARRL President Dosland, was made a member of SWOOP by proxy, to become effective the date of the wedding July 31st. Her proxy stand-in, by special dispensation, was the groom-to-be, who recited the oath and sang the SWOOP song with all the fervor of a new SWOOP. At the YL Forum conducted by W6BDE, President Dosland spoke followed by Directors W6HC of the Pacific division and W6MLZ of the Southwestern division. The forum was moderated by W6DXI, Gladys, YLRL V.P., who reported that

of 3600 licensed YLs in the U. S., 875 are in California.

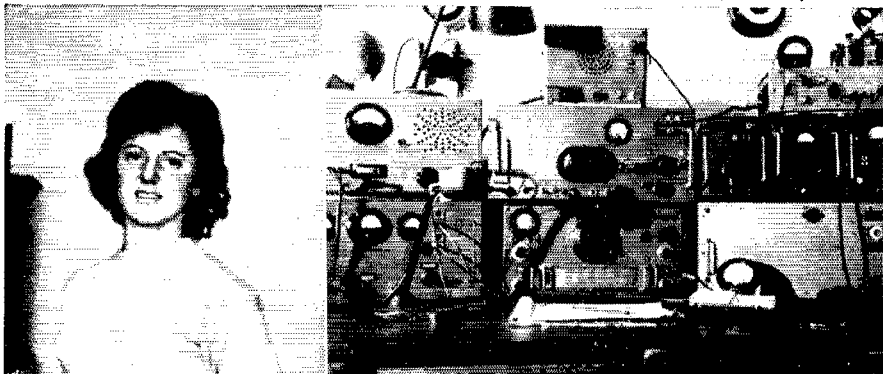
COMING YL GET-TOGETHERS

Women Radio Operators of New England — Annual Fall luncheon-meeting Nov. 7th at Towne Lync House, Route 1, Lynnfield, Mass. Contact K1IZT, W1TUD, or W1HOY. Plans for 1960 YLRL convention will be discussed.

Young Ladies Radio League — The Hotel Commander in historical Harvard Square, Cambridge, Mass. has been chosen as the site for the third international convention of the YLRL, June 17th-19th, 1960. Registration will be \$10.00 for YLs, \$5.00 for OMs. Reservations for hotel rooms must be made before May 1, 1960. WRONE is hostess club. Co-chairmen are W1ZEN and W1SVN.

BAYLARC of San Francisco area — Family Get-together at Sigmund Stern Grove on Oct. 31st. Halloween fun for the whole family.

We are sorry to have inadvertently omitted OE2YL from the YL DXCC list in the May column, but perhaps Inge Ehrmann wouldn't have sent her picture if we hadn't. Inge has DXCC #282 (phone) dated Aug. 8, 1950 and issued when she was OE5YL. Since 1954 Inge has operated as OE2YL from Salzburg, Austria, on 10, 15, and 20 phone.



Please Write Your Postal Zone Number

• By including your correct zone number each time you write your address you can speed delivery of your own mail and help cut Post Office costs. The Post Office must do extra work to deliver each letter, parcel and magazine that does not show the correct postal zone number in the address. It will help you — it will help the Post Office — and it will help us. Thanks.

Silent Keys

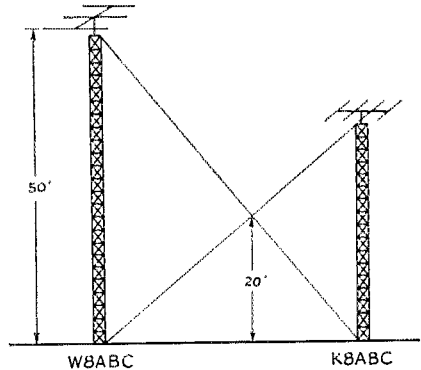
It is with deep regret that we record the passing of these amateurs:

W1GND, Wilbur H. Tracy, Brockton, Mass.
 W2BLN, George C. Rightmyer, Richmondville, N. Y.
 W2CYI, George S. Giles, Ventnor, N. J.
 W2DWL, Seymour R. M. Woolsey, Troy, N. Y.
 W2LL, Fred J. Gutberlet, Elizaville, N. Y.
 W3KFE, John J. Korzdorfer, Montrose, Pa.
 W4DND, Elder T. Holbrook, Warner Robins, Ga.
 W4ICC, Robert H. Dellar, Springfield, Va.
 W5FJF, Charles Fermaglich, Houston, Texas
 W6EL, Frank Wilburn, Sunland, Calif.
 K6OWV, Norman A. Haas, Imperial Beach, Calif.
 W6QBO, Harold E. Leigh sr., San Jose, Calif.
 W6TJ, Harry H. Crawford, Riverside, Calif.
 W6WYS, Richard C. Hamilton, San Diego, Calif.
 W7OAP, Kenneth F. Kemp, Portland, Ore.
 W7TSG, John Warwick, Great Falls, Mont.
 K8FTI, Robert B. Bickel, Kansas City, Kan.
 F8PQ, Roger Pieton-Fresson, Dordogne, France
 JA6FR, Yasuo Oshima, Takagi, Takagise, Saga, Japan

Quiz

Dale Griffith, W8RRV of Parkersburg, W. Va., has this teaser for you:

W8ABC and K8ABC are neighbors, and their antenna towers are close enough so that the base of one tower can serve as the anchor for a top guy wire on the other tower. The tower at W8ABC is 50 feet tall, and the guy wires cross 20 feet above the ground, as shown in the sketch. How tall is the tower at K8ABC?



October, 1934

... The big news twenty-five years ago was the beyond-the-horizon pioneering of Ross Hull on five meters. He had commenced to put a solid signal into Boston from West Hartford, a distance of better than a hundred miles, and had local five-meter circles all agog. The lead article described the directive antennas that he used to turn the trick. . . . Then along came L. W. Hatry with info on r.f. transformers for shortwave receivers, and Jim Millen with a six-hand exciter using a pentode in the output. Frank Davis discussed using the tri-tet principle in frequency multipliers, and then there were a few pages of hints and kinks.

... By golly, it was just twenty-five years ago this month that W2BSR proposed the use of the RST signal-reporting system, to replace the old QSA, R, T system. As you old-timers know, it caught hold quite quickly.

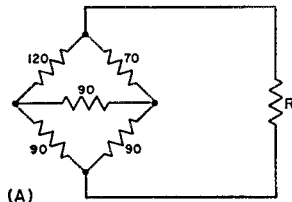
... Another feature of this issue was the complete 10-page National Company catalog of amateur equipment, bound in as an integral part of the issue.

... And in Ham-Ads twenty-five years ago you could buy an SW-3 receiver for \$12.50, a 3000-volt kw. plate transformer for \$11.00, or QSL cards in two colors for 75¢ a hundred.

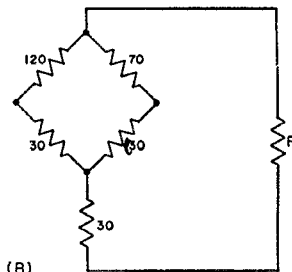
Strays

Claude Hasslocher, PY3AWO, figures there's nothing like your own voice to interest you. He sends QSL cards with a plastic recording of the QSO attached.

"I always record the signals of the station I work, so that its owner may place the recording on his own record player and hear how well (or how badly) he was heard in Brazil. This gives a more accurate report than could be done with a set of numerals." PY3AWO was PY1ALZ and still uses that call when he works from the state of Rio de Janeiro.



(A)



(B)

The key to last month's problem is that R will receive maximum power when its value is equal to the resistance looking back from R . Redrawing the circuit as at A is the first step. The delta (π) of three 90-ohm resistors is then replaced by the wye (T) of three 30-ohm resistors, as at B. (This step, the interchangeability of π and T structures, is a fundamental network theorem.) From there on it is a cinch to find the resistance — try it for practice.

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

How ???

The WIBIH "echoes" yarn in our March column provoked a flurry of commentary on allied phenomena. We particularly liked W2DFZ's note on Texas TV signals that came back to annoy British TVLs three years after the station closed down. (They really get out in Texas.) But the sheer simplicity of the following tale from Down Under seems to sharpen its bizarre flavor. You might title it "The Weird Windom." At any rate, as NZART's *Break-In* reveals, it surely is

A Red Hot Mystery

Here is one for the back-room boys. Perhaps someone can work it out for me. . . . I was working a ZL1 one evening before the war. My rig at that time had a pair of 210s in the final running about 80 watts, with a single-wire matched-impedance antenna. Ground was made to a 2½-inch brass pipe as used by fire brigades for hydrants. This pipe was buried three feet in the ground with about one foot sticking out above ground. On the night in question my XYL, as was her usual custom, brought out a cup of coffee for me about 10 P.M. She asked why the earth pipe outside was red hot. I told her, in the superior manner of the male, not to be so silly. But I requested the ZL1 to stand by; sure enough, the piece of pipe sticking out of the ground was glowing red! It was no optical illusion, either, as I proved to myself by placing my hand near it. The ground wire connected to the pipe, the usual tinned copper strand, showed no sign of heat whatsoever, from the transmitter right down to the object of mystery. I concluded the QSO and closed down. The glow subsided, but for a considerable period of time afterward the pipe was quite hot. (If only I could have put that power up into the skywire. Anybody got a theory?)

— Mark Pettifer, ZL2KJ

Well, Jeeves has a theory that the coffee might have been a chaser. As little Oswald helped to demonstrate in our February '57 overture, however, all of radio is quite absurd. Sizzling earth-worms?

The subject of time is an interesting one, especially when tangled with long-distance radio work. Imagine attempting to correlate a flock of world-wide DX QSOs and QSLs without that handy normalizer, Greenwich Mean Time!

Nevertheless, reader E. M. Boedner of 1938 W. Morse Ave., Chicago, who was intrigued by our September 1958 dissertation on the matter, points out that it is possible to relate remote local time quickly, conveniently and accurately. Based on U. S. Navy Hydrographic Office, British Admiralty and other material, he has developed an ingenious dial calculator and reference chart that performs this trick as well as other geochronometric functions. It's no mere toy — he welcomes inquiries.

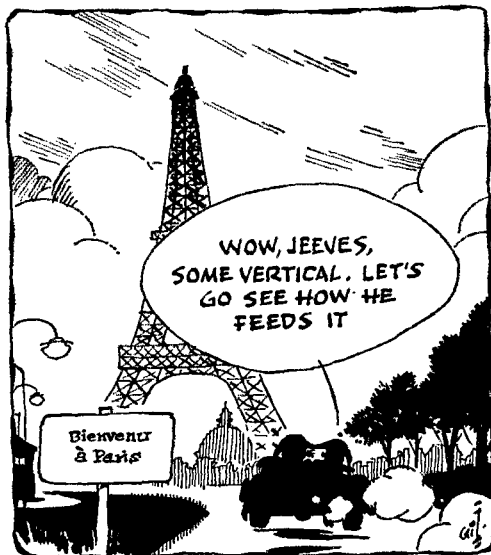
* 4822 West Berneau Ave., Chicago 41, Ill.

We vote emphatically for adherence to GMT in routine DX work but we'll grant that there are instances where local times can become important. For what hour should you set your alarm clock after overhearing 9N1AC tell VQ8APB, "See you on schedule at six-thirty your time tomorrow morning, old man"? And many a suspected phony rare one could enhance or impugn his own authenticity in response to the question, "What is your local time?"

What:

DXers of the 160- through 10-meter stripe are rarely sorry to see summer behind them and autumn at hand. This year is no exception, what with DXaspirating fade-outs, high noise levels and absorptions riddling the spectrum with increasing magnitude throughout the W/K/VE hot months. Let's spin those beams while the spinning's good! . . .

10 phone followers traditionally anticipate October and the m.u.f.'s annual rise. East-west paths began to solidify in mid-August for W/K/VEs and the 1959-'60 28-Mc. season now is well under way for better or for worse. K2UYG, K4RJN, W81BX, K0LEQ, IRLI, ISWL, JDXRQ and LU4FJ (88 worked on phone) worked, heard worked, called or heard called such 10-meter specimens as CE1ACI, CN8s FJ HQ, CRs 6BX 6CA 6CS 7DN, CT3AN, E43CM, ELs 1G 1H 2F 4A 4J, FB8s of the Comoros, FF8s AP CK, FM7WQ, FO8AX, FO8s AD AE AF 18-19 hours GMT, HGs 1FG 4IE, HHs 11B 2AD 2AE 2W 2Z 5LA, HISGA, HP-ON, HZ1AB*, IT8MO, JA2AQ, K9MIF, KR6s CGA HIRB, KX6s BQ* BT, LX1s DG JW, MP4BCI, OAs 2A 4JH, OEs 5HE 7SU, OD5s CI CL, OOs 5HV 5HZ 5IG 5JW 5PU 5RS 9DM, OR4RW of the br-tr south, P2UCE, PX1YI, PZ1s AC AS, SP5GX, SVs 1AB 1AH 8WB, TGs 9CD 8AA, TF3KA, THs 2IT 2OE 2WD, UB5FG, UR2s AB BU, VEGOG/BU, VKs 7MF of King Isle, 9AD of Norfolk, VPs 2LS 3AIC 4LD (28,540 kc.) 23 GAIT, 4TS 5AR 5EM 6SS 8DS 9F, VOs 2NS 2RB 2RD 2SB 3CF 3CG 4EY 4RF 5FS 5GF 8AV, VSs 1GC 1GZ 1GZ 1GZ 6AE 9AR, VU2s CQ* PS, XW8AL, YNs 1AA 1CJ 4CB, ZBIUSA, ZCs CH JC VI, ZDs 1FG 6DT, ZEs 2JA 6JU 7JR, ZP5s JP MQ, ZSs 3T 9G, 4S7FJ, 4X4s FK FU, 5A5TO, 9G1s BV CP, 9K2s AP AZ and 9M2GA, the asterisks representing single-sideband signals. . . . Ten



c.w.? There's plenty of room, for Ks 2UYG and 4TKM have only CX2BT, YV5ADP (250) 19 and the garden variety in their early returns.

20 phone also swarms to life at this time of year. No place for transistor DX, but if your signal has muscles you might collect colorful QSLs from AP2CR*, BV1s US (14-183 kc.) 14, GMIT, USC* (302) 12, USR* (307) 13, CES 2CO 7AY* (310) 1, 9AAL, CNgS 2BK 8IX (150) 1, SLE, CR9AH* (302) 14, CF3AN (165) 0, CX2CO* (304) 1, DUs IAP (196) 14, 1CV 7SV* (311) 0, EA6 6AR (370) 5, 8CG 8CR (155) 19-20, 9EA (174) 4, EL8 1C* (312) 23, 21A* (305) 23-0, 2Q (210) 7-8, 4J, ETs 2US* (328) 0, 3MA (125) 13, FB8s BC (30) 4, ZZ (185) 14, F8AK (163) 5, FGXE (173) 12, FK8AU (172) 7, FM7WN, FO8s AC (140) 7, AX (165) 15, F8PAP, FR7ZD (180) 14, FU8AC (160) 7, FY7YT*, GC5ZC* (323) 21, HClS FG FO, HH2s DL LD Z, H18s CM TC*, HKs 4AQ* (317) 4, 8AI of San Andrea, HL9KT (21), HRs 1MM (100) 7, 2MT 3HH (325) 6, HSIE (170) 4, HZ1s AB* (282) 3, AK, ITI2HA (111) 16, 15s FLGN* (306) 14, STP* (306) 4-5, JZ6HA (212) 17, KAs 2YA* (309) 14, 0CG 0IJ* (318) 15, 0IN* (317) 14, 0IW* (315) 15, KCs 4USN (295) 4, 4USV* 6SP (248) 12, KGs 1AA* (285) 2, 4AA (221) 2, 4AI 6AHA (208) 14, KM6BI* (209), KR6s DT* IT JR* LL* LP* (171) 13, RA* KV4AA* KGW6L* (287) 12, KX6s AF (222) 13-14, BP (283) 13, CA, LX1RK* LZs 1UR (130) 4, 2KSP, MP4s BCC BBW* (306) 2, OAs 2P 5H*, OD5s BN LX, OH6NC, OQ5s (4U* IE*, OY3PF, PJ2s AV* (310) 3-4, CE, PZ1s AB AM (190) 22, SL5AX just Sweden, SPs 5GN 6QH 8CK, SUIs AS KH MS (185) 5, SVs 1AB* (320) 6, 1BA* (311) 6, 0WAC (189) 3-4, 0WB* 0WH* (310) 4, 0WJ*, TGs 7TD 9AL 9MB 9PS, TF2WDX* (310) 21, UAs 1DZ* (310) 12, 3C 3KAB, UF6s AS FB, UL7GL, UP2s KCB KCW, UQ3s AN (170) 5, DC (240) 14, UR2KA, VE6QG/SU* (323) 15, VKs 2PFR* (312) 6 of Lord Howe Island, 9AD* (310) 6 of Norfolk, 9CC* (346) 6 on Macquarie, VPs 2AR 2DA 2GS 3RO 4TT (160) 3, 5AB 5FI 5FR 6AA 6FO 7CA* (308) 1, 7NS 9EC* (310) 13, VOs 2RB (129) 5, 3GX* 4AC 4CW 4ERR* (305) 15, 5KRL 5FS* (306) 15, 5GJ 8AL (162) 4, 8APB (100) 12 on St. Brandon, 8BA (134) 4, 12, VR2s AC (179) 6-7, DP (100) 11, VSs 1GL* (275) 16, 4JT* (301) 8, 5BY* (307) 16, 6AZ* (304) 16, 9AC 9AH (120) 3, 9OM, XW8AL (167) 16, XZ2s AD (267) 15, TH, YA1PB* (309) 11, YN1s AA BS, YSs 1IM* 1LA 1MS* (305) 15, 2MG, YVs 1CM (207) 7, 3CN 5AHM, ZC4s BE* (308) 3, CS GP, ZDs 2CKH (150) 6, 6DT, ZEs 1JU 5JJ (307) 14, 5JU (185) 13, 6JA (141) 13, 7JR* (317) 15, 7JZ (155) 14-15, ZKs 1BG (130) 5, 2AB (160) 8, ZSs 2MI (240-180) 14 of Marion Is, 3B* 3DP 5RD/7 (180) 16, 9G 9H 13-14, 4X4s AS (159) 0-1, CX* (315) 21, DK* (331) 5, IM (116) 23, 5As 2TZ* (309) 3, 4TI (133) 5, 9G1s BF BQ* (320) 7, 9K2s AM* AY, 9M2s DA (147) 15, DQ (180) 14, FR (112) 14, GA (183) 15 and 9NIC* (307) 3, the specks (*) for sidebanders. This 1-4-Mc. A3 glossary is the work of W2HMJ*, W4UO, K4TEA, K6LAE, W8IBX, CO2US, EL4A, HK5SG, VE1PQ (117 s.s.b., 140 including a.m.), C. Claunch, IRLL, ISWL, NNRC, SCDXC, VERON, WGDXC and WVDXC.

20 c.w. with its inexhaustible variety of prefixes and propagation is the vehicle for WIDGT, W2s GVZ (253/250), H1MJ (283/281), JBI, K2s QBJ/2 UYG (110/85), VNO, W3CMN (67/58), K4s IEX RJM TEA TKM YCW (106/52), K5TER (105), W6PHF, K6s BHM (121/101), CUF LAE (167/144), STZ SWH (118/95), THZ, W7s DJU LZF YAQ, K7AWH (100/76), W8s AYS IBX KOS KX (161/155), YGR, K8s BPX IKM, K9s GTK (139/100), LIO, W6BTD, EL4A, FO8AW, HK5SG, KP1AOO (118/94), VE1PQ (245/236) and VE8OM in pursuit of BV1s USB (14,000 kc.) 12 GMIT, USC 7-8, CE8AC (78) 3-5, CNgS 8BK (50) 5, 8LG (40), 9CK (20) 0, CP3s CD (10) 1, CN 3, CRs 4AH 5AR (75) 1, 6AI (10) 15, 7CH 7CS 7, 9AH (40) 11-14, 10AA, CT2s AI BO, CX1RY 1, DM2ADN, DUs IAP 1DR (85) 14, IOR 9, 6IV (65) 13, 6TY, 7SV (28) 7-13, 9JO, EA8s 8BF 8CG (60) 8 and 23, 6AF, EL4A 6, ET2US, curious FA1HMS (20) 22-23, FA8RJ 6, FB8ZZ (40) 10, FG7ZE (84) 13, FK8AW (65) 9-13, F08HK (61) 22-23, FR7ZD (84) 13, FY7s YF YG (115) 2, GC2FMV (73) 19, GD3s FXN UB, HA8s 1KSA 5FO 8CG, HC2s 2AF 2BA 2GM 2IU 4IE, HH2JV (40), HKs 1HI 3KG 3TH (5), 4IC (28) 0, 5SG, HL9KT 9, HR1MM (40) 0, HSII, ISIs 3MM ZEO (50) 2, ITIAGA (8), JAs in every call area, JZ6DA (40) 10-12, K6QPG/KW6, KAs 2KH (60), 2KS,

8KW (30) 2, SRH, KC4s USB USK (83) 12, USV, KC6AT of the E.C.I., KGs 1AQ (25), IEG (103) 16, 4AK 6AAY 11, 6AIF (65) 11, 6AIG 11, 6CY 6, 6NA, KH6CV/KG6, KM6s BK 8, BR 10, KR6s GY HV MG RP (65), SW, KV4AA (80) 22-1, KW6CU (40) 12, KX6BT (40) 10-11, LA3SG/p (67) of Jan Mayen, LZs 1AF 1KBL 2KBA (25), MP4s BCU (25) 0-1, OAO (35) 22, OAs 3D, 1, 4FT 4KF, OD5LX (16) 3-5, OQ5EH (32) 14, OX3s DL RH 6, OY8RJ (79) 4, PA1BRD, P1MID (50) 22, PJs 2CP (70) 1, 2ME of Sint Maarten, 3AB, RAEM of Moskva, SM1BVQ (50) 1, SUIAs (8) 4, SV6WP (75), TG9LAU TT2s CMF DN WR (1), UA1KA6/6 of the polar south, UA9s KCC KDN, UA0s CD CF 10, CN (65), IK IM JK KCK KCO KDA KQB LA LC, UB5s KBU KCD (1), NB, UC2s AD AR AX, UH8KAA (62) 13, UMRKAB 0, UO2s AE/mm (75), AN CA CC (75), VEs 3EGD/SU 6GQ/SU (323) 3, 8AY 8AT (10), VKs 9AD (65) 11-12, 9GK (55) 11, 9RO (80) 11, 0CC (80) 13, 0RII, VPs 1AR 2AR (91) 5, 2GF (20) 3, 2GAK (30), 5FP 5ME (10) 9, 6PJ 6PV (10), 7BT (10), 9B0, VOs 2CZ 2EW (30) 13, 2JM 3CF (46) 18, 3CG 12, 4HT (14) 13-14, 6LQ (25) 4-5, VR2DK, VSs 11EA 1FZ 1GZ (25) 16, 1JU (30), 5GS (22) 14, 6AZ (25) 13, 9ANS (58) 14, VU2s BK NR (55) 11, RA (9) 2, RM (38) 12, XE3W, XZ2s BB (65) 11, TH (35), YO3RI (2) 22, YJ1AA, YVs 5AHs 6BI (49) 0, ZCs 4CS (75) 14, 5AF (60) 14, 5VS (80) 15-17, ZDs 1FG 7-8, 2DCP 7, 2GUP 7, 2VPF (68) 1, 6DT, ZEs 5JU 14, 8JL (14) 19, 8JN, ZKs 1AK (5) 5-7, 1AU (40) 7, 2AK, ZL3BV of the Chatham, ZP5s AY CF, ZS3T (40) 23 of Walvis Bay, 4S7s FJ (10) 12, FMI (42) 13, 4X4s GD 8, JN (10), JR (20) 2, 7GIA (55) 19, 8J1AA (80) 11 of Japan's Antarctic effort, 9M2s FK 13, FR (78) 11, GE (20,55) 14 and 9N1AB.

15 c.w. intends to stick around a while, delighting W3HMJ, W3s CAZ CMN, K4s IEX IGD (99), TEA (105/70), TKM YCW, K5TER, K6s BHM CJF, W6AUA, W7YAO, W8s AYS IBX (188/169), KX YGR, K8s BPX JZZ, K9s GDF (39/23), GTK JWH (63/40), LIO, EL4A and KP4AOO with the likes of CE1s AD 1IN 3NE, CN8LG, CRs 4AH 5AR (32), 7JP, CTs INT IQN 2A 3AF, CX6AB, DM2ABL, DUIFMI (67) 17, EA6AA, ELs 1H 4A, FASUO, FK8AL, FO8s AG HD HE, FY7YF, GC3HFE, GD3FXN, HA1KSA (70) 14, HC2s 1ET ILE 2BA 2IU, IT1s AGA ZND (55), JA8FO, KG4AL, OAs 3D 4BP 4KF, OQ5IG, PJ2CP, ST2AR, SUIAs, TI2s CMF W.D., UA1KEP, UB5s AQ FG NG, UO5AA, VE1LV of P.E.I., VP9CR VOs 2AN (40), 2CZ 3CF 3HD, VR2DK, VS5GS, XE1s PJ UJ (20) 20, YVs 5HL 6BS (60) 19, ZB2A, ZC4s BC CH, ZEsJG, ZPs 6AV 9AY, ZL/VKs in number, 4X4FU, 5A5TO (75) 18-22, 7GIA (50) 15-16 of the Republic of Guinea, and 9K2AD. . . . W6AUA gets good results after dark with 15 supposedly "dead." True, indeed - transequatorial propagation persists on higher-frequency ranges long after other paths close.

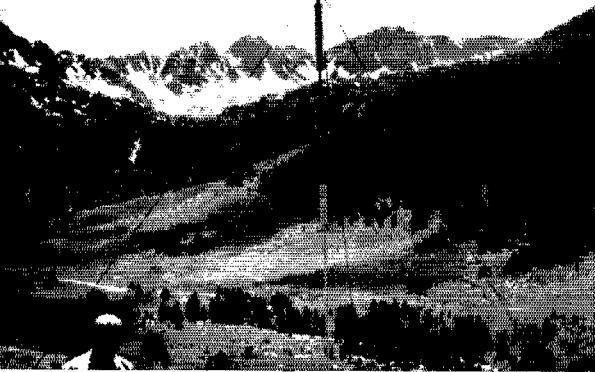
15 Novice news reflects the summer lull this month. KN8NHC (22 countries) and WP4ARR did well with CNgS 2BK 8IT 8MS, CR5AR, CX2BT, FO8AJ, HR1EP/mm, HZ1AB, KG1FZ, KN4IDP/mm, KVs APB KD, KZ5SW, OAs 3D 4KF, ON4LD, OQ5s CX VP, TI2CAF, VE8SA, VP9MN, VO4DW, WH6DBF, WP4AQK, XE1PJ and 5A5TO. School and fine fall conditions collide now for the younger set!

15 phone will boom along with ten meters. Early dispatches find W2HMJ, W3CMN, K4s IEX TEA YCW, K5TER, K6LAE, W8MLX, EL4A, KP4AOO and YAI1W taking the measure of CR6Bs, EL2Z, FE8AH, HH2s AE NV Z, HR2DK (301) 20, OA4HK, PZ1AA, TF2WDX, TG9RY, TF2WD, VPs 2DJ 2SL 5AK 6ZX, VOs 2DS 2SB 4FB, XE1s AAH CW, YN1s CJ LR LW, ZB2A, ZC4s CH (360) 23, CS, ZDZCKH, ZK2s AB (198) 5, AD, 5A2CS, 9G1CT and 9M2DQ.

40 c.w. may get the vote for rookie of the year if preliminary returns are borne out. K3BVV, K4IEX, K5JVF, K6DV, W7s DJU YAQ, W8s GKB IBX YGR, KN8NHC, K9ICG, ISWL and VERON front-line correspondents on the 7-Mc. front describe the barrage of GMs 5RV 6PL, CO2s BG QR, CR7s AX BS CH, CT2s AI (1) 2, BO, DU7SV, ET2US, HA2MA, HG1HC, IS1HOI (30) 23, JA8 IAO IANP 1BNK 1CID 1CJF 1LR 1PS 1YV 2AAQ 2AIX 2AQ 2BP 3ACT* 3AM 3AB 3AS 3AT 3F 3FV 3QY 4LL 4VQ 6AGJ (21) 19, 6AIJ 7CL 7HK 7IL 7JQ, 8AE 8DS 8HO (5) 9, 8LA 8LN (10) 13, 8AIs 9IV 9JC,

HL9TA's enthusiastic operator staff attends a lively antenna-raising party at the billet of HL9KJ (W8NYG) in Seoul. Left to right: Cho Dong In, Miss Im Jung Hyuk, HL9KJ, Cho Yo Youn, and a helpful s.w.l. Miss Im is Korea's No. 1 YL licensee.





PX1DE, with the sweeping Andorra back yard at left, and EA9DE, the cozy shack at right, were summer DXpeditionary ventures by EA2CA. W2KUW, whose KWM-1 and QSL assistance helped Juan pull off this DX doubleheader, relayed these photos for your pleasure.

KH6BDV/KJ6, KR6MD, LZ2KSL, OA3D, OR4RW, OX3s DL RH (8) 0, OZ4LP/p in the Caribbean, PJ2MF, PYs in profusion, TF3KA, UA9s AA CB, UC2WP, UF6CC, UO5KRU (15) 22, UP2s KAA (37) 3, NAI, UQ2AB, UR2KAE, VKs galore, VP8 2GAK (8) 2, 4LR (15) 3, 7BT (1), 9AK 9BO (5) 3, VO2s AW IE PAI, VR2DK, XEs 1B (8) 16, 2NL (20) 11-12, 0WWS, YO6 6XI 7BL, YV5HL, YUs by the fistful, ZLs likewise, ZB2A (10) 22, ZE8JJ, ZSs 8I 9G and 5A5TO (5) 22. Old forty's coming along fine! Even the 7-Mc. voice range, particularly at the high and low extremities, permitted KH6EX and W8GKB* to capture KG1FR*, KH6s BGS* CMJ* CSE* DGL* PD*, KL7AIZ*, WA6FRV/KL7*, XE1IG* and ZL31D (130,208) 10, stars denoting s.s.b. users.

80 c.w. is a slot to keep under close surveillance. W4VNE, W8IBX, ISWL and MARTS informers already are logging such items as SM5WI, VKs 3AKN 4YP 9XK, VO2SB, VS1s EB GZ JU, ZLs 1AH 1AWX 1CI 3JT 4AD 4KH, ZSs 4LA 4PW 5AY 5KR 5MS 5PG 60F 9G, ZP9AY (2) 23, 5A5TO and 9M2DQ. LX1RK's s.s.b. has been dazzling the East Coast gang from time to time. No documentary evidence on 160 so far this season but we hear that UA3BS (1819) 23-0 and VS1EB are ready to roll on top band.

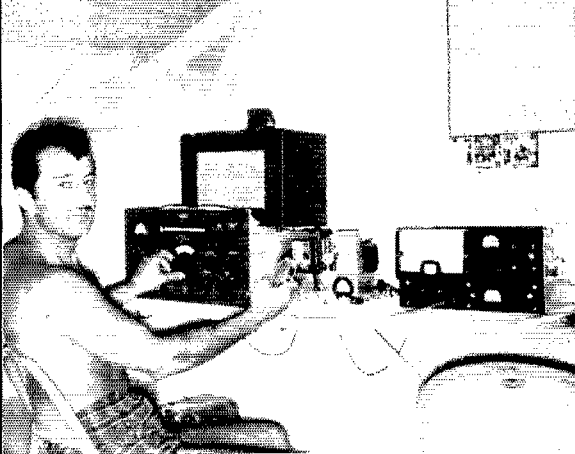
Where:

Asia — Have you checked your IRC hoard lately? KH6OR, way up to here in YA1PB QSL chores, is uncomfortably face to face with one of those curses of DX bigness. "In the past, International Reply Coupons received at KH6OR were passed along to others and never cashed. Then along came YA1PB duties and my troubles started. About half the cards received for Paul arrived with IRCs enclosed. This looked fine to me and a great batch accumulated; in the meantime I had run up quite a postage bill on the assumption that it would all cancel out when the coupons were redeemed. Then came the revelations that (1) there is a Government regulation that prohibits a postal clerk from taking more than ten IRCs at one time, and (2) U. S.-issued IRCs cannot be exchanged here for U. S. stamps. Now, by golly, about ninety per cent of my incoming IRCs were originally purchased in the States despite the fact that a great many of them were received from foreign points. Those lads did exactly what I did in the past, merely passed them along. The P.O. informed me that the office where each IRC was issued would redeem them at face value — less one cent each. So I took a look at that possibility and this is what I found: The things represented a pretty good cross-section of the entire country and no more than two were issued by the same local post office. Many had the names of the towns of issue badly smeared. It would be a monumental task to return them to points of issue, even discounting postage and time lost in shipment." Other Stateside QSL managers for rare foreign stations take note! More about those catchy coupons follows. KH6BPF, attempting to assist 4S7YL in QSL matters, requires self-addressed stamped envelopes from U. S. applicants, s.a.e. plus IRCs from foreign points, in addition to full QSO data. (Perhaps we should specify non-U. S.-issued IRCs to keep Richard solvent.) In this arrangement much depends upon how well Soma keeps KH6BPF supplied with log transcripts. From OK1JX via W1WPO: "JT1AB tried to handle his own QSLs directly from Mongolia but discovered that many incoming and outgoing cards were being lost. So a new arrangement was made and his QSLs will be managed by ex-JT1YL, now OK1KX, through the Czechoslovakia bureau." Jan adds, "All cards for JT1s AA and YL are out now. But it appears

that many went astray in mailing, so duplicates are being issued when necessary." "I've had 500 VS9MB cards printed and they're ready to go," writes K2QXG. W9WIO observes that Mac receives VS9MB logs twice monthly. K2QXG also assists JA5AI and VK9VM in QSL matters. YA1IW (K61WG) finds it necessary to by-pass Afghanistan's unpredictable mail routes by transmitting log excerpts to OQ5FH for mailing to W6DXI. W6BRF writes from amateurless Turkey concerning recent TA QTH listings: "I immediately checked with Turkish authorities as to whether licensing had been done and they again confirmed that no amateur operation, national or otherwise, is permitted. No amateur, MARS or AFRS systems or stations are allowed here except closed-circuit setups for bases." MARTS QSL bureau duties now are performed by 9M2CL. VERON has it that s.a.e. and four IRCs will net direct MP4QAO QSL replies for W/Ks from the QTH specified last month. KR6JR (W5DKK) does honors at the Okinawa Amateur Radio Club bureau and seeks the present whereabouts of KR6s AA AU AY BB BQ and CH to clear his files. "If they'll send me s.a.s.e.s I'll be most happy to forward their QSLs." KA2RJ (W9VCH) vows to enter all contests and QSL 100 per cent. *That's the spirit!* "While I was operating, VS1HS in Singapore I sometimes accepted QSLs for VS1BB DXpeditions," pens G3CCN. "But now I am in England and have no knowledge of VS1BB's whereabouts. Regarding my own hamming in VS1, I eventually worked 83 countries two-way s.s.b. and a QSL was sent to each sidebander worked. Anyone who still requires my card should drop me a line."

Africa — W9YNB volunteers more IRCs comment, this from 5A5TO: "Hams in the U. S. who send out Coupons (which I for one certainly appreciate) should carefully supervise the P.O. employees who stamp them. We get many duds; if they're stamped on the right side instead of the left, most post offices will not accept them. We receive many with no stamping at all, duds again. Use only GMT on QSLs, too, for I would just as soon look over the band for a possible new country as to convert 'EDST' to my log time for inconsiderate characters." "Be advised that I am handling all Stateside QSLs for ELs 2AB 2AD and 8C. W/Ks should send me the usual s.a.s.e.s." This from W6ZRK whose new address is included in the roster to follow. WGDXC's *DX Bulletin* notes that ZEs 3JJ 3JO and 8JJ intended to do their own QSLing 100 per cent upon conclusion of their Nyasaland maneuvers. Also that CN8MAM's 23,000-QSO confirmation backlog will be attacked at the new Brazil diggings of Eva and Alex. K6KII's VQ6LQ loggery dates from July 20th, according to WGDXC. Regarding their Seychelles effort, VQ9s AIW and ERR commendably decline "contributions." Self-addressed stamped envelopes will suffice for direct replies to W/Ks; otherwise the bureaus route will serve.

Oceania — KC6s AT and ZZ, operated by W3AFM on Ponape, scored some 1200 QSOs in a summer flurry. Paul expects to have answered all QSLs received for this activity via bureaus by this time. Straightforward words from W5JPC: "The FO8 referred to in your July column must be good old FO8 —. Well, 'tardy' would hardly be the word so far as I and a scad of others are concerned. I've worked that gentleman three times since 1955 and each time the old boy is emphatic that he *will* QSL sure, sure, sure. If he doesn't intend to QSL he should say so and be done with it." No argument with Norm there; four years is a long time for "QSL sure." WGDXC notes that ZK1BS commenced a summer Stateside visit in July with hopes of establishing a foolproof QSL-manager arrangement



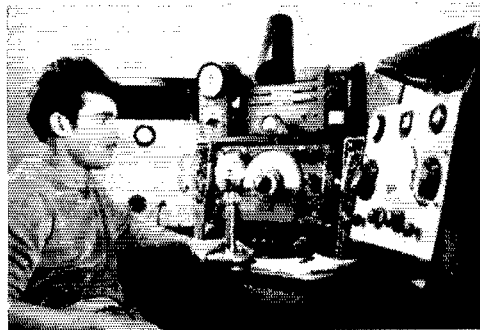
VP5GM puts Grand Turk on 10, 15 and 20 meters with an 813 150-watt modulated by 811s. Back home in Massachusetts George is quite well known as W1GAC. (Photo via W4IYT and Florida Skip)

for the dissemination of his Rarotonga QSLs. Bill expects to resume ZK1BS operations early next year.

Europe — "Have just returned, Stateside after two years of wonderful DXing as SV0WY," writes K4LFU/1. "The big switch was pulled with much regret on the 1st of July. Anyone who has not received my deserved QSL is requested to be patient. I'm way behind, and it will be six or eight months before I'm in the clear." John's new New Hampshire address follows: K1DSA, formerly F7EH, communicates: "Any of the boys still due QSLs from F7EH will receive them upon request." ON4GM eagerly collects W/K pasteboards and informs, "For every first contact I QSL 100 per cent. Please use only GMT in making out your cards." Gunter prefers his QSLs direct, and his new QTH follows: Through WGDXC and VERON, W1YQ reports incomplete receipts of HVICN-bound QSLs for his September 12-16, 1958, Vatican stint. Vic offers to clear up the matter upon receipt of full QSO data and, from W/Ks, self-addressed stamped envelopes. Regarding their September Alands sortie, OH2s XK and YV assure 100-per-cent QSL via bureaus, direct by air for three IRCs, surface mail for two.

South America — LU2JV escaped an April flood with his family but lost most of his gear, QSLs and records. Some outbound cards may have gone astray at the same time, so Jose stands ready to make good on replacements. LU2JV did manage to rescue the QSLs he hopes to include in a future WAS application, however! F7YGR offered direct QSL reply to W8YGR upon receipt of three IRCs. Concerning VPNC's recent hurried departure from Grahamland, G8KS illumines: "Owing to an extremely cold winter which prevented the sea ice from melting and which did not allow the relief ship a berth near the base, they had to abandon the station taking with them as little as possible in the way of personal belongings on dog-pulled sledges. They walked over the frozen sea for thirty miles to the U. S. Navy icebreaker *Northwind* which marked its position by firing rockets at regular intervals. Though Colin left personal articles behind him, this did not prevent him from saving 1400 QSLs he had made out in a 100-per-cent QSL effort for QSOs over the previous two years. When he finally arrived at the Falklands he posted the batch to G2MI who cleared them through bureaus in early July. This was a magnificent effort on VPNC's part, carried out in the true spirit of amateur radio."

CR6CN specializes in 15-meter phone DX work in New Lisbon. Carlos is regularly found around 21,160 or 21,240 kc. between 1830 and 2300 GMT. (Photo via W3ICQ)



Hereabouts — K4IIN assures that he does not act as QSL-handler for any KC4. VE8OM is looking for the lad who now signs VE8MT. Bill Calder, Hudson's Bay Co., Igloolik, Fox, via Frobisher Bay, N.W.T., who used the tag VE8MT five years ago, now is receiving misdirected cards for the new holder of the call and will gladly forward them. W2JBI reports that VP6PV finally received his cards from the printer and is shipping them out direct to IRC donors. Don Edman, Elect. Eng., USAFF (EPC), APO 633, New York, N. Y., will gladly take care of his share of KC4USK QSL matters upon valid petition.

Second-hand IRCs are troublesome enough, but W1MGP has as much grief with International Reply-Paid Postcards. "The trouble with IRPs is not all at the DX end. I have fought a losing battle ever since their availability was announced. A year or so has passed and still many large U. S. post offices do not stock them, often don't know what they are. I also note that the return rates from certain countries differ from U.S.P.O. information." Gee, the concept of IRPs certainly seemed to be a natural for DXers but so far we've heard little to recommend them. Anybody getting decent results from rarish countries with the things? XE1CV, on behalf of the XE4B Socorro gang, advises: "The only authorized QTH for XE4B QSL handling is LAIRE, P. O. Box 907, Mexico City. However, all QSLs sent to XE1XX and myself will be answered in due course. Pierre Wolf, our QSL manager, had already received some 700 cards by mid-July and we expected to have completed answering them by the middle of August."

Since May of last year I have been handling all incoming QSLs for K8s at the W8NGW ARLR bureau. I notice that new DXers want their cards much faster than they come in. But, when they finally make DXCC, they neglect to send envelopes to the bureau. Let's all help out our bureaus by keeping them fully supplied with s.a.s.e.s. W5HNS, finding DX time on his hands thanks to marginal conditions, offers to help a deserving rare one with QSL chores. W6FSJ suggests that somebody issue a "WACTN" award to those who work all overseas QSL clients of W2CTN. Jack already has four QSLs toward such a certification. VE8OM attempts to QSL 100 per cent but fears that some outgoing shipments may have strayed. If still shy, reapply. WGDXC hears that VP1s EE EK GLG HA and OLY are swift QSLers down British Honduras way. Now some individual quotations:

- BV1US, USTDC, MAAG, APO 63, San Francisco, Calif.
- CN8HO (to W4FEE)
- CN9CK, F. T. Burgueno, Box 124, Tetuan, Spanish Morocco
- GM2ON, Ayesteran 4300, Ap. 22, Cerro, Havana, Cuba
- CO8LV, Renaldo Valdos, RCA Radio, Antilla, Cuba
- CR6CP, J. A. Dias Mendez, Box 305, Lobito, Angola
- DU1RTM, R. Mitchell, APO 929, c/o USVA, San Francisco, Calif.
- ELs 2AB 2AD 8C (W/Ks via R. E. Moncrieff, W6ZRK, Box 29, Mojave, Calif.)
- ET3MA (via ET3RC)
- ET3XY, P. O. Box 714, Addis Ababa, Ethiopia
- ex-F7EH-W1SWX (to K1DSA)
- ex-F7EM (to W4ERZ)
- F8EX/FC (to F8EX)
- FG7XC, Pierre A. Habazac, Raizet Airport, Guadeloupe F.W.I.
- FK8AU, Box 63, Noumea, New Caledonia
- FP8BD (via G3LMD)
- FP8BE (to K4BFA)
- FP8BF (to W4PAA or K4RSD)
- FR7ZD (via ZE7JZ)
- HA5KAG, Radio Club of Orion, P. O. Box 84, Budapest 10, Hungary
- HA5KFR, P. O. Box 185, Budapest 4, Hungary
- HG1ET, c/o F. Myer, U. S. Embassy, Quito, Ecuador
- HH2JF, P. O. Box 671, Port-au-Prince, Haiti
- HH6DH, P. O. Box 71, Cayes, Haiti
- HK1IH, C. A. Herrera, Soledad Airport, Baranquilla, Colombia
- HK2LO, P. O. Box 522, Santa Marta, Colombia
- HK6IC (via LCRA)
- JA8GS, T. Sakai, 62 Wangetsuch Akkeshi, Hokkaido, Japan
- JA8OF/mm, Y. Hirose, Senyo-Maru Isumikisen Ltd., 4-1 Minamihama, Otaru, Japan
- JT1AB (via CAV, attn. OK1KX)
- KA2RJ, R. J. Finger, Hq. NSPAC, APO 343, San Francisco, Calif.

ex-KA0CY (to W3MDD)
 KC4USK (see preceding text)
 KC6s AT ZZ (to W3AFM)
 KC6AU (via W4PYZ)
 KG6CY, H. Fowler, Navy 926, Box 149, FPO, San Francisco, Calif.
 ex-KH6AJK (to K6YKI)
 KH6CV/KG6, A. K. Leong, Box 67, Agana, Guam
 KH6IJ/1, K. Nose, 9 Concord Ave., Belmont, Mass.
 KM6BR (via KM6BI)
 KP4ARL, MCB No. 4, FPO, New York, N. Y.
 KP4UH, USNRS, Sabana Seca, P. R.
 KR6GY (via OARC)
 KZ5RF, P. O. Box 371, Howard AFB, C. Z.
 KZ5TD, P. O. Box 1111, Balboa, C. Z.
 LU2JV, J. C. Romero, Estafeta No. 3, Concordia, E. R., Argentina
 LZ1BW, Mitko Hadjiljisky, Trapezica St., Pazardjik 2, Bulgaria
 MP4BCU (via ISWL, 86 Barringer Rd., London N. 10, England)
 MP4s MAA TAD (to MP4DAA)
 MP4s MAB TAE (to MP4QAO)
 OA3D, Box 168, Chimbote, Ancash, Peru
 OA8K (via W8HWN)
 OK1IZ, Jiri Bilek, Post Box 286, Plzen 1, Czechoslovakia
 ON4GM, G. Meyerheim, P. O. Box 634, Brussels 1, Belgium
 OQ5AO, G. Patigny, Box 3748, Elisabethville, Belgian Congo
 OQ5RL (to ON4UN)
 OQ8PA, Khtenga, Kuanda-Urundi, Belgian Congo
 PY3KA (via PY3AA)
 PY7CP (via PY7AA)
 PY7SC (via PY4TK)
 ex-ST2KO, M. Dransfield, G3JKO, "The Spinney," King's Ln., Southwater, Horsham, Sussex, England
 ex-SV0WY, John F. Corey, K4LFU/1, 182 Maurice St., Manchester, N. H.
 TG9TS, P. T. Sulsona, c/o U. S. Embassy, Guatemala City, Guatemala
 VE8DC, Frank Hughes, Box 160, Edmonton, Alta., Canada
 ex-VK1RG (to VK9RO)
 VK9CP, Rev. C. J. Patrick, Catholic Mission, Kavieng, T.N.G.
 VK9MV (new call of ZC3AC; via MARTS)
 VK0RH (via VK2EG)
 VP1AR (via VP1HA)
 VP2GAF (via VP2GW)
 VP5FP (via WITBS)
 VP5GM (to W1GAC)
 VP7CA, Det. 3-1, MCB No. 7, FPO, New York, N. Y.
 VP9EN, T. B. Lynch, Sans Pareil, Southampton, Bermuda
 VP9WB (via VP9BDA)
 VQ2CZ, Box 332, Kitwe, No. Rhodesia
 VQ2WR, Box 1006, Kitwe, No. Rhodesia
 VQ4HT, P. O. Box 4452, Nairobi, Kenya
 VQ5GK (via ARSU)
 VQ6AB (via RSGB)
 VQ8APB (to VQ8AP)
 VQ9AIW (via W1DVN)
 VQ9ERR (via W4IYC)
 ex-VS1GY (to ZL1A0V)
 ex-VS1HC, D. Parr, G3MIR, Exeleigh Lodge, Exeleigh, Star Cross, Devon, England
 ex-VS1HY, B. C. Barker, 10 Fairhill Close, Fairways Estate, Newcastle-on-Tyne, England
 VS9AAH, A. N. Healey, RAF Saltjans, BFPO 69, Aden
 ex-VS9MA-4S7DT (to G3NJT)
 W4GDR/VO1, Patrol Sqdn. 16, FPO, New York, N. Y.
 WP4ARR, L. Frick, Box H-3, USN CommSta, San Juan, P. R.
 XE2LR, Box 474, Monterrey, Mexico
 XE2NL, A. Castillo, Campo Militar No. 2, Monterrey, Mexico
 XZ2BB, Box 449, Rangoon, Burma (or via XZ2TH)
 YA1TD, 1937 Lucas St., San Fernando, Calif.
 YN1LR (via YN1LB)
 YV3CD, Box 199, Barquisimeto, Lara, Venezuela
 YV3CE, Carora, Lara, Venezuela
 YV5ABF (via RCV)
 YV5AES, Box 2034, Caracas, Venezuela
 YV5AIS, Box 2064, Caracas, Venezuela
 ZC4BE (via C. H. Watters, WSDPF/4, P.O. Box 13154, Tampa, Fla.)
 ZC5AF, N. Fender, RAF Labuan, British No. Borneo
 ZD2VPE, E. V. Forbes, c/o WAAC Opns., Ikeja, Lagos, Nigeria
 ZD6FC, W. Clark, P.O. Box 434, Limbe, Nyasaland
 ZP6AY (via RCP)
 ZS3T, P.O. Box 267, Walvis Bay, Southwest Africa
 ZS5RD/7, Box 1058, Durban, Natal, So. Afr.
 487YL (see preceding text)
 5A2TI (to WA2BKK)
 9G1CW, Hans Sues, P.O. Box 1945, Kumasi, Ghana
 9M2GI, R. C. Walker, Sabraon Camp, Taiping, Malaya

For the foregoing directory you're indebted to W1s DGT WPO, W2s IIMJ TBL, K2s QXG UYG, K3BVV, K4s IEX IGD RJAI TEA TJKL, W5KNE/5, K5s JVF TER, W6ISQ, K6s BHM CJF LAE, W7s DJU LZP, K7s AWH

DFW, W8s AYS IBX KX MLX YGR, K8BPX, W9WIO, K9s ICG JWH, W0BTD, KP4A00, LU4EJ, OK1JX, YA1IW, C. Claunch, A. Rugg, I. Waite, DX Club of St. Louis, International Radio Listeners League, International Short Wave League, Japan DX Radio Club, Newark News Radio Club, Northern California DX Club, Ohio Valley Amateur Radio Association, Southern California DX Club, VERON of Holland, West Gull DX Club and Willamette Valley DX Club. Recruits for this dragnet are always welcome.

Whence:

Asia — YA1IW, formerly W7ORZ, HC2s 2IW 6IW and K61WG/HC, describes the DX situation in rugged Afghanistan. Niles and co-op Cal have another month or two in which to work 10, 15 and 20 meters with their G-66 and G-77 combo, usually on 21 Mc, between 0100-0300 and 1400-2300 GMT, from a 10,000-ft. high tent a few miles south of Russia. "Weather here usually is quite bad — winds from 60 to 100 m.p.h. for days on end with freezing temperatures at night. Others operating hereabouts are YA1PB (usually on 20 phone around 1200-1400 GMT) and YA1TD (K6UGH) who uses his ART-13 and BC-348 on 20, plus a 3-watt Collins MBF on 10. At present YA1IW has had about 700 QSOs with 106 countries, mostly phone." Niles, YA1PB, KN6UBB and VU2NR are considering possible DXursions to AC3 AC5 VU4 and VU5 territory. Problems of authorization, gear and transportation are under attack, and W2KUW has offered his KWM-1 Maldives misses from K2QXG and W9WIO disclose that Bob and Jerry remain to man VS9MB after operator Bryan's departure U.K.-ward. But the club's DX-35 flipped



VS4JT has collected over 100 two-way-sideband countries in Miri, Sarawak, doing more than his share to popularize the mode. Jim also is tempted to try occasional s.s.b. luck in rare local areas. (Photo via MARTS Malayan Radio Amateur)

its power pack, so K2QXG has forwarded replacement components to get Gan back on the air. . . . K2QXG hears that 4X4DK narrowly beat out MP4BBW in a race to accumulate two-way sideband QSLs from 100 countries. Ian's neighbors, MP4s DAA and QAO, now are licensed respectively as MP4s MAA and MAB for Masqat rambles, MP4s TAD and TAE for Trucial Oman travels. And MP4QAO writes W1WPO: "I do try to QSO and QSL as many stations as possible and I attempt to stay up all night once each week to give the boys in the States a chance to work Qatar. Fighting through the pile-ups is very hard work, believe me, especially when the temperature is about 120° F, and the rig-top would fry an egg." K2QXG finds Brian raisable around 14,300 kc, from 2200 to 2300 GMT. . . . W2HMJ reports DL7AH still seeking ham authorization down EP-EQ way. VS5JA-ZL1JA also is on the scene. LA4FA left Iran after a four-year hitch and will probably activate soon as an FT3. . . . Ceylon's status via W2HMLJ; 487FJ continues super-active on 15 and 20 c.w., 487FM has two crystal frequencies on 20 c.w. and phone, 487PM tries sporadic c.w. and phone sessions, and 487YL keeps her modulator quite warm on 15 and 20. . . . HS1C tells W6PHF he's heading Statesward this month, leaving his potent beam in the hands of newly licensed HS11. . . . W9VCH now is active as KA2RJ on sideband and c.w., 14, 21 and 28 Mc. You may have worked Ron previously as KA4AS. . . . K6DV notes that ex-J3DX has applied for U.S. citizenship in L. A. where he and his daughter are stationed with Conset. . . . New Singapore brethren: VS1s FO and JX, Freshly ticketed in Malaya are 9M2s GF GG GH and GI, MARTS Malayan Radio Amateur re-



CT2AH ably represents the Azores with a modest yet effective phone layout in sunny Gamboa. Fernando's favorite frequencies are 28,300, 14,150 and 3600 kc. (Photo via EL4A)

ports VS1s F WGM HY JH KH and JL recently departed for England, 9M2FD likewise. By the way, QSLs from ten VS1s, ten VS2/9M2s, two VS4/V8Ss and a ZC5 — 23 cards in all — will qualify you for the new WAAMA certification (Worked All Malayan Areas) issued by MARTS. Check with the society at P.O. Box 777, Kuala Lumpur, Malaya, for full details. . . . VU2RG (ex-AP2N) tells K6QPG/KW6 he's just about set to fill a triband beam with 150 brand new watts. . . . XW8AI advised W2CTN and K6QPG/KW6 that he closes down this month in favor of an F.W.I. locale.

"Today just one Laos station is active, XW8AL." . . . Asian miscellany courtesy DXCSL, WGDXC and WVDXC: Need Nepal, pal? The 800-watt and 3-el. spinner of 8000-ft.-high 9N1AC creates quite a phone stir near 14,305 kc. around 0200 and 1400-1500 GMT. ZP5B also is over there awaiting his authorization. . . . VS1BB, bound for U. K. leave, anticipated an enjoyable tour Stateside en route. . . . A few W/K/VEs recently checked their 4X4 files to discover they had Palestine confirmed without realizing it. Gravy! Among several such Jerusalem entries active are 4X4s KP (14,060 kc. around midnight GMT), DK and IE, ZC6s UJ and UNJ also are said to be imminently workable on 14-Mc. a.m. sideband and c.w.

Africa — W/K/VE certificate-hunters, another target for your DX arrows: DC'BRU — *Diplome du Congo Belge & du Ruanda-Urundi* — a trophy issued by UCAR. Twenty OQ-type QSLs are necessary: five from stations in the province of Leopoldville, five from Katanga, three from Orientale, two from Kasai, two from Kivu-Maniema, two from Ruanda-Urundi, and one from Equateur. QSOs must date after January 1, 1958, and further data may be obtained from OQ5AO (new QTH in "Where?"). . . . LARA (Angola) promises a fancy QSL from CR6LA if you nail the



Ham radio recently came to the attention of prominent circles across the sea. At left we see the U. S. ambassador to Israel accepting from 4X4BX, on behalf of W3IMV, the North America continental trophy for high score in last year's IARC 10th Anniversary DX Test. At right G3IUL, well known to W/K/VE 10- and 40-meter DXers, describes the function of exhibition v.h.f. gear to the Duke of Edinburgh while an official looks on

station before Luanda's fair closes on the 15th of this month. . . . ON4UN-W8FTD expects to commence his 10-watt 20-meter OQ5RL c.w. operations this month from various spots around the Congo. . . . EA2CA intends further Canary sideband sessions, according to W2KUV. . . . Switzerlander 9G1CW resumed ham action in Ghana last month after a short Alpine holiday. . . . Ex-KG1DE, now K4RFP, anticipates early assignment in Libya with DX-100B, 85-10 adapter and TA-33 DX weapons. . . . S.w.I. A. Rugg of Quebec understands that ex-ZD1SW is heading for Switzerland and a possible Liechtenstein affair. ZD1FG also leaves Sierra Leone. . . . EL4A reports neighbor EL4J now pushing twenty ambitious phone watts on 14,150, 21,225 and 28,300 kc. EL4A rolled up some 720 DX contacts in July. Near-by EL2Z tells W8MLX he would like liaison with Charleston, S. C., on 15 phone. . . . K2UYG finds CR5AD's Portuguese Guinea phone workable around 14,160 kc., and observes FR7ZD brushing up on his c.w. in the 14,060-ke. region, 1200 GMT. . . . OK1JX assures W1WPO that 7G1A will remain active on 14 and 21 Mc., c.w. and sideband, in the Republic of Guinea for several more months. . . . DXCSL, ISWL, NNRC, SCDXC and WGDXC volunteer additional Africa data: VQ8APB of St. Brandon isle startled 20-meter c.w. scanners near 14,100 kc. at 1200 GMT beginning in August. . . . FB8CD puts the Comoros on 15 c.w. more frequently of late. . . . Marion Island ZS2MI displays a sideband signal near 21,400 kc., a.m., on 14,180 around 1230 GMT. . . . WA2BKK is about to terminate his 5A2TI layover. . . . VQ6LQ still keeps in practice at 1300-1400 GMT, 14,030-ke. c.w. . . . VQ8BA, 14,155 kc. at noon GMT, is a fresh candidate for your YL-type DXCC.

Oceania — FK8AW, formerly F8AN and F8AE, returned to the air this summer and is moved to these words: "W/Ks are a bunch of enthusiastic kids, but aren't we all? I am afraid I am going to permit myself a complaint; not a nasty one, but a necessary one. When you hear unusual DX or a country that is not on your list, especially when it is in QSO, please do not just dive at your keys and mikes and call unceasingly. Apart from the fact that this helps no one, you can't imagine how pleasant it is to have a nice quiet QSO instead of playing hide and seek. As you know, most unusual DX asks nothing more than plenty of QSOs. They want to please everyone. But, alas, like everybody else, each has only two ears and one hand to operate with — the other being occupied with the knobs, blending cigarettes, or cuffing the ears of local QRM. But never mind, if it's any consolation to you, your kilowatts and 3-element beams come through perfectly in almost every corner of the world; except, of course, in extremely bad conditions which have been very rare indeed. In conclusion, *have patience*. I know it's sometimes difficult, but the reward is all the more appreciated. In anticipation of fair play in the proper ham spirit, I hope to CU and CUAGN: 73!" . . . W1DGL reports VK5NO giving G3JUU a workout while spending six months in the United Kingdom. . . . K5JVT, sweltering in 40 in Oklahoma's August, was moved by VK3MH's complaints about near-zero weather. . . . W1IA writes W1BDI of his visit to DU1PAR, the Pan-Pacific Boy Scout Jamboree exhibit station, and meetings with DU1s GF RC and RTI. . . . K6QPG/KW6, still recuperating from summer's woeful DX conditions, reports five KW6s currently active, mostly a.s.b. KW6CGA is QRL with traffic for the most part. Ex-KW6CY now signs K6CGJ on Ponape. Herself, K6QPG/KW6 has been hitting 10, 15 and 20. c.w. and phone, with a will. Mary got quite a kick on 21-Mc. A3 recently in giving YL OAHK (ex-W5JJK) Oceania toward YL-WAC. . . . DXCSL, VERON and WGDXC Pacific patter: VK9MV, who for-

(Continued on page 176)





Correspondence From Members-

The publishers of *QST* assume no responsibility for statements made herein by correspondents.

SUPERPOWER

18229 Leswie
Detroit 35, Michigan

Editor, *QST*:

W3SUR's suggestion in the August *QST* to raise the legal power limit from one to ten kilowatts to get rid of QRM is attacking the problem from the wrong end. One kw. is enough to work anywhere in the world, so what more does he want? With ten times the power we will have ten times the QRM. Then what happens to the poor fellow running one or two hundred watts? He'll be so far down in the QRM that nobody will ever hear him.

Our rich friend also mentions that we should have the best bands so that we can use more inexpensive equipment. With this I agree. Let's use the inexpensive rigs and keep the 10 kw. boys from clobbering them.

Let's keep ham radio everyone's hobby and not give it to the millionaires.

— Phil Kaufman, K8HK5

Munn Lane E.
Haddonfield, N. J.

Editor, *QST*:

W3SUR's proposal that we be given 10 kw. on 40 and 80 is certainly ridiculous. The accomplishments of other countries on these bands with one-half the power now in use by most American amateurs testifies to the truth of this statement . . .

Only a person with a poor fist or had technique needs more than a kw. for DX from 10-40; as for 80 meters, that is used now as a ragechewing band for "local" work, and a kw. is more than enough to accomplish this type of work.

— John Lewis, K2RUE

175 St. George Ave
Norfolk 3, Virginia

Editor, *QST*:

Mr. Hammerstand, W3SUR, (Correspondence From the Members August, 1959) hit upon my pet peeve.

The proposal for an increase in maximum legal power to 10 kw. is certainly absurd and *definitely not* an answer to the growing QRM on the amateur bands today. If anything it is "adding oil to the fire."

Actually working DX with low power is half the fun of ham radio. Where is your sportsmanship? Would you go hunting with a cannon?

Anyone who cannot operate efficiently with 1 kw., I feel reasonably certain, couldn't work out any better with 10 or even 20 kw.

Indeed, the present conditions would be improved tenfold if the maximum power were limited to 200 or 300 watts. I for one would give three cheers for the FCC if such a limitation were enforced.

Of course, this is strictly *obiter dictum*.

— Walter Nagel, W4EUX

P. O. Box 883
Port St. Joe, Florida

Editor, *QST*:

. . . All I have to say now is QRN filled QSOs to you and your 10 kw. rigs, W3SUR! . . .

— E. A. Zeuk, Jr., K4UPI

521 W. 11th Street
Port Angeles, Washington

Editor, *QST*:

. . . I believe a little more attention to the transmitting antenna, and a little less attention to the power angle would not only serve the best answer, but would be more in the range of what most hams can and do afford in the way of transmitting equipment.

Wonder what kind of a pattern 10 kw. would make on the neighbors' TV set if it were on the high end of 6? . . .

— Bob Burke, W7FEL

8 Pleasant Gardens Road
Canton, Massachusetts

Editor, *QST*:

. . . If interference is now evident on our present bands along with the probability of losing, and not gaining, spectrum space what will happen if the full potential mentioned (170 million) all got to 10 kw.? Being realistic this undoubtedly would never occur, so the power companies can throw the aspirin bottles away, but it is food for serious thought.

Interference is a positive, downright, and absolute fact now and very evident to all that operate the h.f. bands. Should we add to our QRM woes by increasing the electromagnetic energy that is now saturating our radio spectrum? My vote is no! What is yours?

— Paul I. Cleveland, W10HA

1630 — 17th Street
Hayleyville, Alabama

Editor, *QST*:

I agree with K3SUR (August *QST*) on choice ham bands and ten k.w. or more for power.

I also think that the Novice bands should be larger (although I am grateful for what bands I have).

Ever try to work stations 500 miles or more away on 40 meters at night?

— Mack Williams, KN4FTC

526 N. Sheridan Road
Waukegan, Illinois

Editor, *QST*:

. . . In keeping with Mr. Hammersand's reasoning, perhaps I should begin collecting parts for my 750-watt Novice rig . . .

— Brian Sherer, KN9PID

Box 516
Greene, New York

Editor, *QST*:

. . . After two years on 75 phone running 25 watts, I know what low power can do, as long as a kw. doesn't set on your frequency, and it is my suggestion that the maximum legal input power be *decreased* to, perhaps, 200 watts!

The bands will become useless to the average ham who is in this hobby to have fun, if 10 kw. stations are permitted, for they could easily dominate the amateur bands, making it impossible for low-powered communications. By the same token, if power input was limited to 200 watts for everyone, many more Q-5 QSOs could be carried on in a given band than is now possible with kw. stations scattered around the band.

Personally, I say if Mr. Hammersand wants to run 10,000 watts, let him do it on 10,000 megacycles.

— Wayne G. Brown, W2TPV

1381 High Street
Westwood, Mass.

Editor, *QST*:

. . . I agree with W3SUR on the fact that the ham bands should be widened. With more and more hams being licensed every day, there just isn't going to be enough room before long, unless we want to QSY above 30000 Mc. From what I hear, there was a time when we had everything from 200 meters on down.¹ That's an awful lot compared to what we now have.

The part of his letter I disagree with is the 10 kw. bit. I think what he means is for half a dozen of his friends

(Continued on page 172)

¹ Editor's Note: Tain't necessarily so. See page 54 of the August issue.



Operating News



F. E. HANDY, WIBDI, Communications Mgr.
GEORGE HART, WINJM, Natl. Emerg. Coordinator
JOHN F. LINDHOLM, WIDGL, Communications Ass't.

ROBERT L. WHITE, WIWPO, DXCC Awards
LILLIAN M. SALTER, WIZJE, Administrative Aide
ELLEN WHITE, WIYYM, Asst. Comm. Mgr., Phone

Hawaii Statehood Date August 21, 1959. The League's WORKED ALL STATES Award, starting from this date takes on 50-state significance. We anticipated this by comment in May *QST* (page 96) but can only now give you the date. Submissions for Worked-All-States now require inclusion of a Hawaiian confirmation, this representing a QSO accomplished *on or after* the above date, that of the Presidential proclamation making the statehood officially recognized.

If you made a 49-state WAS before August 21, 1959 you have until March 15, 1960, a grace period, to permit getting in those 49 QSLs for a WAS issued "as of Aug. 21, 1959." The policy is exactly parallel to that taken following Alaskan statehood (See page 78, Sept. '58 *QST*.) Starting next March 15th, only applications supported by proof of contact with all 50 states including both Hawaii and Alaska will be acceptable for WAS. ARRL members now working for WAS may request the gratis Operating Aid No. 8 and our WAS Map; this Operating Aid constitutes a convenient alphabetical list to fill in as you work states and has provisions to show both Alaska and Hawaii, also assisting you to put the cards all in the proper alphabetical order by states.

Use Best 2-Meter Frequencies for Locals and DX. A concentration of activity at the low frequency end of "two" often has been pointed to as disadvantageous. Do we pick a QRM segment from choice or habit? Why not move higher? Netters and stations working other bands most often choose the *least* congested parts of bands for their work. Let's extend this principle to v.h.f. W2CPE (Basking Ridge, N. J.) recently made an interesting survey, sampling this band 25 evenings in May and June '59, recording the frequency of stations heard. 23.4% of the stations logged were using spots between 144-144.2 Mc. or the lowest 5% of the band. Thirty seven point eight per cent of the stations were in the ten per cent of the band at this end. Of the Novice stations sampled 68.6% were in the lower one-third of their 145-147 Mc. portion. Our new Technician occupancy, unless by better individual choices made at the 147 Mc. end, is likely to add 145-145.5 Mc. congestion.

W2CPE points out that when band openings do occur DX at times cannot be worked at all because of local interference at the low end of the two meter band. Without getting into technicalities, one can concur in W2CPE's thought that a good deal more local work could go on with minimum interference from amateur choice

of the 144.3-145 and 145.3-148 Mc. frequencies, avoiding most work where activity now peaks.

This would have two very good purposes: *Local work* would proceed in volume with greater pleasure and success, subject to less interference. *When DX occurs* due to band openings, the chances for operators, especially those using A-1 emission on the low end, would be tremendously greater. Both routine two meter contacting and the chances of finding the elusive DX by using selective tuning and other measures for the hunt would be improved. Spreading out in frequency, avoiding the hot spots for daily v.h.f. QSOs, should help all users of this 144-148 Mc. band. Let's make use of it *all*.

Novice Licenses Suspended. In addition to "not being cricket" in the eyes of most amateurs, to purloin or appropriate the answers of others in an examination is by all standards fraudulent and dishonorable. FCC quite properly provides appropriate penalties to enforce its examination structure, and two recent operator license suspensions are announced by FCC as necessary under its provisions.

FCC ordered (Mar. 31, 1959), that the Novice Class amateur radio operator license (KN1HRV) of David G. Doe, Norwood, Mass. scheduled to expire June 16, '59 BE SUSPENDED for the remainder of the license term, *it appearing that the licensee*, Feb. 27, while taking the General Class amateur operator examination, copied answers to certain examination questions from the paper of another person in violation of Sec. 12.162 of FCC's Rules.

FCC ordered (Mar. 31, 1959) that the Novice Class amateur radio operator license (KN11MH) of Edward V. Lajoie, Norwood, Mass. scheduled to expire Aug. 20, '59 BE SUSPENDED for the remainder of the license term, *it appearing that the licensee* on Feb. 27, while taking the examination for General Class amateur operator license, copied answers to certain examination questions from the paper of another person, in violation of Sec. 12.162 of FCC's Rules. These orders are under authority contained in Sec. 303 (m) (1) (F) of the Communications Act of 1934, as amended, and Sec. 0.292(f). The two suspensions became effective from mid-April.

On Holding ARRL Station and Leadership Appointments. The fall is a favorite season for SCMs to clear out deadwood in the SCM appointment categories. Inactives and non-reporters must be dropped by SCMs not only to keep down overhead in mailings but to make each post and each group a live wire one, contributing to the radio success of the individual and the communications capabilities of our whole ARRL organization. This fall situation creates vacancies to be filled. SCMs are alert constantly to give full Appointment Recognition to actives in every category, where vacancies permit or quotas for certain section radio operations are

not already filled. An SCM requires *only so many* OBS to cover each different frequency band and mode and give radio coverage of his section. But both RM and PAM leaders have to be found to manage and promote each special net group that can meet for sectionwide relaying of traffic. The SCM needs active ECs in *each* community or county, depending on the organizational patterns for emergency. On the three basic station appointments of our following list there are no quotas. Posts are always open to those whose reports of activity show demonstrated operator capability along stated lines of interest!

Detailed appointment requirements are set out in the booklet, *Operating an Amateur Radio Station*. This booklet, free to members, is sent on radiogram request. Types of operational service represented in available SCM-posts are:

- ORS — Official Relay Station. Reliable traffic service, high procedure standards, 15 w.p.m. c.w. requirement.
 - OPS — Official Phone Station. Voice operating, exemplary operating procedures, dependable traffic activity on voice.
 - OES — Official Experimental Station. Experimental operating on v.h.f., u.h.f. or s.h.f. bands, OES report propagation data, support v.h.f. nets.
 - EC* — Emergency Coordinator. Recruits and organizes amateurs of a community or other area for emergency radio service; sponsors tests, arranges liaison with officials and agencies served, also with local communication facilities. Assists in RACES implementation.
 - OBS* — Official Bulletin Station. At least three times a week transmits ARRL and FCC information in radio bulletins to amateurs.
 - OO — Official Observer. Sends cooperative notices to amateurs to help them catch and correct signal difficulties, assist in frequency observance, insure high quality signals, and prevent FCC trouble.
- * Available where SCM determines vacancies exist or quota of qualified workers is not full. Ask your SCM.

Operational activity, whether by phone, c.w., RTTY etc. reported to your SCM, plus frequent participation in your own section net, makes a good start toward *station appointment*. Unless you already hold some station post, your SCM, if you are active and will report, invites your application for an official-station ARRL post. You will find his address on page 6 of this *QST*.

Tip Off on Good Sending. How is Your Spacing? *Naval Communications Bulletin* (No. 55) gives some excellent and basic dope on **SOLID SENDERS** . . . affirmation that the skills in manual transmission and reception are of high importance. Let us quote some ideas that every person learning and using code might well take to heart.

"It is not necessarily true that a fast operator is a good operator. An operator who can send good code without errors at a moderate speed can accomplish much more than the 'speed-demon' who garbles and repeats his way through a message. Speed is only relative. There is no point to sending faster than the operator on the other end of the circuit can receive. To send good code, operators must know how good code sounds. The perfect character formation and spacing of automatic transmissions are an excellent pattern to follow. . . .

Contrary to popular belief, it is *not* easier to send than to receive. It may seem easier to pound a key, at first thought, but the test is whether what comes out is readable code. Once we know how good code sounds, there is only one way to make our sending match it — practice. All operators do not have the same sending difficulties; therefore, practice should not be haphazard but should be designed to fit the operator's individual needs. Determine

your own troublesome characters. With incorrect formation of even one character, your sending will lack the quality which distinguishes between the perfect sender and the average. When character formation has been mastered, concentration should be given to correct spacing. This is no great problem when the rhythm of good code is known. The principal consideration is to keep equal spacing between all letters of any word, and equal spaces between words. It is always better to err on the side of too much spacing rather than too little. Common examples of poor spacing are sending 'PD' for 'AND,' '6E' for 'THE,' and 'NST' for 'TEST.'"

S.s.b. Operating on Increase. For seven consecutive years our annual Affiliated Club survey has included a question concerning the s.s.b. operation of club members. Clubs representing 3053 amateurs reported 194 members working s.s.b., with 105 others expecting to start. 64% of our clubs showed some s.s.b. users. The number of sideband stations per 100 amateurs has climbed steadily, the last year-end index being presently at 6.36. Comparable figures for the two years immediately preceding were 5.0 and 5.9. Speaking of s.s.b. DX, W2KPKQ editor of *The Sidebander* quotes an AM operator in Qatar, MP4QAO, as stating that he hadn't heard an AM signal from the USA in six months of listening, but there were, he said, plenty of such s.s.b. stations heard on 14 and 21 Mc.



Typical of the Field Day installations is the Calhoun (Mich.) Area Radio Club, W8YN/8. Good ham radio publicity was created with the release of pictures like this to local newspapers.

The Simulated Emergency Test. For all Amateur Radio Emergency Corps members, also the ARRL Emergency Coordinators and Radio Officers in leadership capacities, the SET should be a starting point or first one of the new season's emergency tests. The SET also marks our Annual Roll Call time. All licensed amateurs should be registered in the AREC; all those who have been in it should have their registrations receive annual EC endorsement. Please consult WINJM's full announcement of the SET, elsewhere in this issue. This radio exercise can be a challenge, a working out of a first class demonstration, also a lot of fun! Remember that your EC is the key man. Each test is *locally sponsored* in every case; the test involving a *simulated emergency condition* is what your EC, with your help and that of other local amateurs can make it. Check with your EC to see if the date of the local test will actually be October 10-11, as has been suggested or if it will be a few days earlier or later as a matter of local option. We hope all ECs will get some statements or messages from city or state officials, CD directors and other agencies, as part of their exercise. *This SET can and should improve on*

past deployments of mobiles and amateur facilities. We'll be looking for that message to ARRL as the radio clincher reporting the test.

May we encourage ECs to sign up Novice operators in AREC, likewise newly licensed General Class personnel, and all available amateurs, regardless of which band they specialize in. *All are needed.* Those AREC members having operative mobiles should ask ECs for the *Official Mobile Unit* pocket cards. Also, we recommend to all and sundry the use of ARRL's *Emergency Radio Unit* placards during this test as well as all other workouts, so needed and desirable during the year. Placarding will help better public understanding of these amateur radio service functions. The SET besides an essential workout for equipment is emergency-type training in setting up and its efficient operation, so we can better provide a practical radio communication when needed. The ERU card on one's car or emergency equipment advertises the public service aspects; a critique after each test should be used to discuss and analyze results, and work out plans for *best performance*.

— F. E. H.

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We have just done an editorial checking job on a new printing of the Emergency Communications Manual. This was strictly a routine job to bring the manual up to date for a reprinting to replenish diminishing supplies; but in reading over it, we find much in it, along with its companion publication, "Operating an Amateur Radio Station," that answers questions we receive almost daily in the mail.

We wonder how many AREC members, not to mention ECs and SECs, have read this booklet carefully. Because it is a standard "hand-out," we suspect that most amateurs cast it lightly aside when they get it, perhaps with intentions to look it over some time. Yet, it contains basic principles that are elementary in an emergency communications organization of *any* kind; principles which, once absorbed, will

inevitably form the basis for all the details of your operation; principles whose application, we suspect, is all too frequently lost sight of in the flood of details besieging emergency leaders. Fellows, we didn't write that booklet for our own amusement, and we don't go to the expense of printing and distributing it to use up some excess funds. It was written, printed, and is being distributed for *you*. If you don't read and apply it, you're not getting your money's worth if you are a League member, and passing up something for free if you aren't.

True, the emergency manual is not entertaining reading, unless you're one of these rare birds who find absorption of knowledge a form of entertainment. It has no pictures, no cartoons, no jokes. It's strictly utilitarian, mostly plain common sense evolved through more than a quarter-century of combined amateur experience in emergency communications matters. If you're looking for entertainment, go back to your TV set; but if you want to understand the principles of emergency communication, *read the emergency manual*.

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On June 2, workmen installing a water service in a nearby house accidentally severed telephone lines to the Alaska Native Hospital in Anchorage. KL7AHH immediately stationed his mobile unit outside the hospital and established communication with his home station to handle both in-



Here are a couple of Western New York ECs. On the left is the new EC for Tioga County, N. Y., W2VDX. Shown with him in the picture is his XYL, W2EWO, who is an OO. On the right is W2YLM, EC for Broome County, whose efforts in developing the AREC in his county has made it one of the most outstanding in the section. Thanks to SEC W2GBX for these photos.

coming and outgoing hospital emergency calls until the break had been repaired. Telephone operators were instructed to transfer calls to the hospital to KL7AHH's home, where an operator relayed them to KL7AHH/mobile at the hospital. Later, KL7AHH installed a speaker inside the hospital, and still later put in a portable rig to avoid the inconvenience of running in and out to the mobile rig. This went on for ten hours before the break was repaired.

On two occasions during June, amateurs assisted the Mountain Rescue and Safety Council of Oregon by providing communications in connection with climbing accidents in Washington and Oregon. On June 7, when three climbers roped together slipped and tumbled on an ice-encrusted slope, seven mobiles and fifteen fixed stations were involved. The mobiles, working from dangerous mountain roads on Mt. St. Helens, Wash., were W7s H10 RCL AOB UTE DAE SAO and AXH. Fixed stations serving as relays were W7s RVN BLN DPW YKY DZT THX PFA FSU NCW JVO CJY SAP, K7s AMF BKS.

On June 20, on the south slope of Mt. Hood in Oregon, a small avalanche swept five climbers into a crevasse, resulting in injuries and one death. Amateur emergency communication in connection with the rescue was furnished by three mobiles: W7s DGE CHN and H10; and by seven fixed stations: W7s RVN WFP HDN NGW YKY UWD and MBX. — W7JDX, *SCM Oregon*.

Setting up for Field Day on a small island near New York City, members of the Fordham Radio Club noted a small cabin cruiser dangerously close to the rocks and seemingly being driven ashore by the strong wind. One of the members was sent along the beach with a walkie-talkie to get a closer look and radio back a report. In a few minutes the group was informed that the boat had lost its power and was being driven into the rocks. There were four people on board. Using coax cable in lieu of rope, the boat occupants were rescued after considerable difficulty and one ducking. Fifteen minutes later the mainland was contacted and the Coast Guard notified. A good piece of work by the Fordham RC gang, K2SOQ/2.

Another emergency that occurred during the FD period was the explosion of railway cars filled with butane gas at Meldrim, Ga., in which fifty people were killed. This occurred at 1435 on June 29. W4KGP, EC for an area including Savannah, was alerted by his c.d. director upon his return from FD at 1720. Within ten minutes he had lined up two mobiles and three fixed stations and the mobiles were on their way west. Civil defense identification got them through the road blocks and communication en route was established with W4LXK in Macon and W4TJS in Atlanta. The latter is state radio officer. Mobiles were W4GMA and K4YSA. It was necessary to communicate with Atlanta to get information back to Savannah. A full report on the emergency had been completed by 2130. Respect for the emergency frequency was closely observed by Georgia amateurs. Other fixed stations participating included K4s MIC OSL TZN ZHU GNO GOE, and W4YEK.

When seven mental patients at the state hospital in Wooster, Ohio, escaped on July 6, W8JHS was notified and immediately alerted six other mobiles and took charge of amateur operations. The seven mobiles joined forces with ten police cars to throw a cordon around the wooded area in which the escapees were known to be hiding. The operation started at 2130 and ended at 0200, by which time six of the seven had been captured. The availability of intercommunication between the cars greatly facilitated the operation. Besides W8JHS, the following mobiles took part: W8s GFT IMJ, K8s BDK GVA EIO DGV. — W8AEU, *EC Cuyahoga County, Ohio*.

Hurricane Cindy caused a little excitement as she approached the South Carolina coast on July 8. At 1800 the South Carolina Net was called into session and remained in session until 2340. A total of 21 stations reported in and 22 messages were handled. W4DAW at Charleston operated throughout the alert on emergency power and gave first hand reports of the storm's progress. W4SOY/4, also on emergency power, supplied further info from Murrell's Inlet, very near the beach. W3ECP was the contact with the American National Red Cross in Washington. SCN services were offered to the state c.d. director but were not needed as

the hurricane "fizzled." — K4GAT, *Mgr. SCN*.

On June 18 a freak tornado hit Dade County, Fla., injuring over 100 persons. SEC W4IYT immediately alerted the 2, 6 and 10 meter sections of the Dade Emergency Net. W4IYT then went into the disaster area, opened up the Red Cross building, started the emergency generator and within minutes people were streaming in the front door. K4PAE alerted K4IWT on 2, 6 and 10 meters. As it turned out, amateur communications were not needed, but 23 amateurs were on hand, ready, trained and eager to do their stuff. — W4IYT, *SEC Eastern Fla.*

Twenty-three SEC reports were received for June activities, representing 9602 AREC members. This is the same number of reports as last June but a considerable step-up (over 300) in AREC members. One new section, Utah, makes its first 1959 report. Other sections reporting: Ont., Colo., Ind., S. Texas, Wis., NYC-LI, W. N. Y., Mich., Minn., E. Fla., San Joaquin Valley, Santa Clara Valley, Ore., Wyo., Nevada, E. Pa., N. Mex., Ga., Tenn., Kans., Ala., Maritime.

RACES News

On June 7, Brevard County (Fla.) RACES had its first tactical drill exercise. At 0930 the deputy director relayed a message to K4SZC at central control that a commercial plane with 73 persons aboard had gone down somewhere in the area. K4SZC activated the two-meter net and relayed orders from the director. K4RAZ went aeronautical mobile to help search for the simulated missing plane, with two other amateurs assisting as operators. Seven mobiles were also in the field and seven fixed and portable stations took part. The mobile units were dispatched to areas where reports had been received of a possible plane crash. The aeronautical mobile located the wreckage and central control immediately dispatched all participating mobile units to the scene, one of them labeled PLANE so that it could be seen from the air. Boy scouts acted as injured and dead and were immediately taken to hospitals, concluding a very successful drill.

The training exercise of the Los Angeles County RACES designated "Operation Roadblock South" was carried out on July 12. Starting at 1330 a routine activation of mobile units was effected in 14 of the county RACES districts. In response to requests for mobile units from three "target areas," these mobiles were formed into convoys and directed to such areas. Operation was on RACES segments in the 160, 75, 10, 6, 2 and 1½ meter bands. The ROs of the target areas were ordered to provide radio communication at selected points around the perimeter of their jurisdictions and deputy sheriffs were dispatched to meet the RACES vehicles at the designated points. The district ROs then assigned and dispatched mobiles, both from their own members and from the incoming convoys. The mobiles met the deputies and each deputy reported to his station commander via amateur radio. This accomplished, the deputy was dispatched to a new location and the process repeated with another RACES mobile unit. In all some 89 mobiles were so dispatched with 100% mission completions.

This may sound a bit complicated, or at least comprehensive, but when you have a RACES organization as big as that of Los Angeles County, complications are what you run into, and it takes dedicated amateurs such as W6QJW to tackle them.

TRAFFIC TOPICS

The subject this month is the service message. When for one reason or another you are unable to deliver a message, it is proper to originate a "service" message to the originating station. The good traffic man does not peremptorily cancel a message he cannot deliver. He informs the originating station of the circumstances and awaits a reply. Only if no reply is forthcoming within a reasonable time (say ten days) should the message be canceled, and at this time another service message should be originated informing the originating station of this fact.

A service message is *not* an answer to a message received by or delivered to you, unless you are replying to a service message. Some traffic men appear to think that any message

between two amateurs is a service message. This isn't so. It must refer to the delivery status of another message before it can be so classified.

The form of the service message is little different from that of any other message. Actually, there are only two differences: first, in sending the message, you *indicate* its status (c.w.: HR SVC NR . . . ; phone: "Service message number . . ."); second, the service message may contain common amateur abbreviations when transmitted by c.w. Note that the indication of a service message comes *before the number*, not in place of the check. The message should contain a check, same as any other message. If it does not when you receive it, it should have one when you relay it. Its function is the same and just as important (sometimes more) as in any other message.

Give service messages the fastest possible handling. Remember, the delivery of another message is awaiting the completion of service info.

In originating a service message, several things must be kept in mind. First of all, make sure the addressed station knows which message you are talking about. The number and the date are usually enough reference for this, but the reason for non-delivery may also have a bearing. For example, if the addressee moved but left no forwarding address, your service origination need not contain the complete address of the message. But if non-delivery was caused by being unable to find the addressee because of wrong address, no such town, no such person at the address given, or some other reason having to do with the address part of the message as received, then repeat the apparent faulty part of the address in your service message so the originating station may correct it if garbled.

In other words, use your noodle. A service message that says "your number 1, Aug. 10, undelivered, please give better address" (equivalent abbreviations on c.w.) tells the originating station nothing, especially if the address seemed perfectly all right when he sent it. You should give the address *as you received it*. On the other hand, if the address was not at fault it is useless to repeat it in the service message. In that case, you would simply refer to the message by number and date and simply ask what you should do with it (i.e., "advise disposition").

A lot of useless details and explanation in a service message are wasteful of a net's time in relaying it. Keep them as short as possible while still giving the originating station all *essential* information. Don't cancel the message unless you don't receive a reply to your service, and then so inform the originating station. The only possible exception to this rule that we can think of is if the addressee is known to be deceased. In any event, always inform the originating station of whatever action was taken.

Some service messages are addressed only to the call letters of the originating station. This is decidedly improper. The preamble of the message in question should contain the location of the originating station. If it does not (as in an improperly-refiled MARS message), get it from the call book. Above all, don't originate a service message with an improper or incomplete address asking the addressee to correct or supply a proper address to another message!

No doubt you will have a lot of "what ifs" to all the above. We'll be glad to wrestle with them for you, but most of them can be resolved by resort to a little logical reasoning. Before you ask us, think about it yourself. You're just as rational and logical as we are.

Net Reports. Hudson Traffic Net reports 30 sessions, 254 check-ins, 221 messages. Early Bird Tranceon Net reports 33 sessions and 760 message handlings. Transcontinental Phone Net reports July traffic of 563. The 7290 Traffic Net had 46 sessions with 1173 check-ins and handled 506 messages. Mike Farad Net reports 13 sessions, 44 messages.

National Traffic System. An important milestone has almost passed without being noticed. As you well know, NTS doesn't go in much for holidays — that is, the system functions pretty much as usual on all national holidays as well as week ends and summer vacations. And so it will, no doubt, on October 1, 1959, which happens to be the *NTS's tenth anniversary!*

While we don't expect to make a big thing of this (but just wait till the 25th!), we think it would be very nice if the entire system put on an exemplary performance on that date. No late QNTs, no absent NCSs, all liaisons on deck, everybody in his best bib and tucker performance-wise to do

honor to the nationwide traffic-handling system we have all worked so hard to perfect. And while we are doing it, let's make some tape recordings of the nets and send them in for posterity. We'll re-record those that seem outstanding and use them as examples of good net procedure to ship around to interested parties. Thus, we'll commemorate a milestone at the same time we make some training material available.

For an organization that has existed for a comparatively short time, NTS has gotten up quite a head of steam and even created some traditions and customs of its own. Its early history, however, was full of controversies, doubts, anxieties and irregularities, not to mention a few naivetes. All in all, the original plans have been pretty thoroughly vindicated. Anyway, most of them are still in effect and are working. Many suggestions (and some demands) for change have been made, and a few have been adopted after serious consideration.

As an example, we originally had no Transcontinental Corps. Liaisons between area nets were conducted in much

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for July traffic:

Call	Orig.	Recd.	Rel.	Del.	Total
W3CUL	297	2741	2402	472	5902
K2UTV	628	1745	1634	111	4118
W2KBB	337	1734	1365	454	3890
W3ATL	399	1066	17	10	1992
W0LGG	34	620	1161	35	1850
W0ZJB	111	906	775	13	1805
W9DO	20	754	668	106	1548
W7BA	21	651	619	36	1327
W0BDR	5	691	599	17	1312
W8TPE	15	620	569	55	1249
W9YQ	27	610	533	50	1220
W9NZZ	380	385	3	380	1148
W6RSY	37	551	436	110	1134
W9SCA	16	530	536	7	1109
W4PL	18	603	411	15	1047
W6CYH	167	355	349	4	875
W0LCC	20	414	409	5	848
W5RCF	26	413	371	32	842
K6BPL	12	410	359	51	832
K9GYQ	17	402	339	42	800
K0ONK	120	340	324	12	796
K6HLR	17	376	313	14	720
K1CTE	330	174	102	51	657
W8DAE	56	308	180	113	657
W7ZB	8	318	304	12	642
K1GRP	14	310	296	14	634
W7BDU	1	318	305	9	633
K6PTW	56	256	211	97	620
W7DPW	30	285	276	12	603
W3AHQ	14	298	277	5	594
W6BOT	12	296	248	29	585
K4QES	20	285	273	3	581
W5DWB	7	299	237	38	581
K6GZ	370	100	8	32	570
W8LLE	18	273	256	13	560
K1BCS	57	254	192	55	558
K2QBW/2	25	273	132	121	551
W9ZYK	13	268	224	31	536
K4AHA	54	240	192	48	534
W9MMU	33	230	201	6	530
W3VR	26	236	194	41	517
K7BYC	75	228	122	87	512
K0KBD	24	242	235	7	508
Late Reports:					
K5USA (June)	.98	220	218	1	537
K5MBK (June)	.4	264	250	13	531

More-Than-One-Operator Stations

Call	Orig.	Recd.	Rel.	Del.	Total
W6IAB	75	981	953	28	2037
KG1DT	193	212	14	168	617
K5WSP (June)	101	992	985	7	2085

BPL for 100 or more originations-plus-deliveries:

K2YTD/1	186	W0VPQ	121	K8GTB	102
K2IDEM/1	181	K9KHW	118	W9GSR	101
K7AWD	173	VE2WT	117	W2TJF	100
K2ZHK	170	K2NVL	114	Late Reports:	
K5LGH	162	K7BKH	114	W5QBG/5 (June)	149
W5SMK	150	W3TN	111	K2QBW (June)	114
K4CNY	136	W4CGE	105		
K3ANA	135	K6GCC	105		
K2PHF	125	W2OPB	103		

More-Than-One-Operator Stations

W0TUS 101

BPL medallions (see Aug. 1945 QST, p. 64) have been awarded to the following amateurs since last month's listing: KLADH K1GRP K4CNY K4ZMT K7LZK K9DAC.

The BPL is open to all amateurs in the United States, Canada, Cuba and U. S. possessions who report to their SCIM a message total of 500 or more or 100 or more originations plus deliveries for any calendar month. All messages must be handled on amateur frequencies within 48 hours of receipt, in standard A.R.R.L. form.

the same fashion as those from section to region and region to area — that is, one area station was designated to report into the area net of destination. Perhaps naively, we assumed that we could find stations in the Eastern Area (for example) with enough power combined with the necessary operating ability and time availability to report directly into PAN — and this on 80 meters! Perhaps such stations do exist, but we couldn't find them, so we organized the TCC which is much more practical.

Originally, the area net lasted only until 2115, but this had to be extended to allow more traffic clearance at that level. The originally-projected section traffic net at 2200 was not generally adopted; apparently not many traffic-inclined amateurs operated that late, so some alternative provisions had to be made. The Mountain Area Net and region nets in that area had to be abandoned because of lack of participation.

There was no great hullabaloo accompanying the first initiation of the NTS. It was a cautious experiment. Operation started with four area nets and nine region nets, in addition, of course, to the many section nets which had been operating right along. The Third and Ninth Region Nets were slow in getting started, the twelfth finally got under way in 1959, and the Eleventh (in the Mountain Area) never did get started. Others were having their difficulties. You might be interested in knowing who managed these pioneer NTS nets and note that some of them are still active in NTS today. On Oct. 1, 1949, the EAN manager was W2BYF (now K6EWY). For CAN we had W0HMM, for MAN W0IC and for PAN W7PIX. Region net managers were: 1RN-W1BVR (and he's still manager); 2RN-W2LRW; 3RN-None; 4RN-W4ANK; RN5-W4NNJ; RN6-W6CE; RN7-W7CZY; 8RN-W8NOH; 9RN-None; TEN-W0AUL; TRN (now ECN)-VE2GM. Yes, we still have all the old files of correspondence and reports. What a job! We wouldn't want to go through that period again, but it was certainly worth it. NTS is now pretty well accepted, but in those days it was often bitterly reviled, sometimes by traffic men whom we loved and respected, some of whom still think that NTS won't (or doesn't) work and that it isn't here to stay.

July reports:

Net	Ses- sions	Traffic	Rate	Aver- age	Repre- sentation (%)
EAN.....	30	1208	.777	40.2	93.3
1RN.....	29	533	.448	18.4	78.4 ¹
2RN.....	48	357	.354	—	96.4
3RN.....	62	484	.360	7.8	92.5
4RN.....	62	502	.235	8.1	74.4
RN5.....	62	831	.335	13.4	96.1
RN6.....	61	1287	.376	21.2	91.3
RN7.....	62	634	.258	10.2	37.1
8RN.....	56	347	.202	6.2	83.9
9RN.....	51	1915	.787	37.5	82.8
TEN.....	62	932	.505	15.0	66.4
ECN.....	19	48	.131	2.5	57.1 ¹
TWN.....	31	480	.392	15.5	57.4 ¹
Sections ²	611	4709	—	7.9	—
TCC Eastern... 47 ³	138	—	—	—	—
TCC Central... 72 ³	1073	—	—	—	—
Summary.....	1244	15,478	9RN	11.5	2RN
Record.....	1551	21,316	.928	12.3	100.0

¹ Regional representation based on one session per day. Others are based on two or more sessions.

² Section nets reporting: S. Dak. 40 Phone, S. Dak. 75 Phone & S. Dak. CW; MLD (Md.-Del.-D. C.); QMN (Mich.); ILN (Ill.); SCN (Calif.); NJN (N. J.); MSN, MSPN & MSPN Noon (Minn.); Iowa 75; GSN (Ga.); VN (Va.); WSN (Wash.); AENO, AENP, AENP Morning, AENB (Ala.); TPTN, FPTN, FMTN, Gator (Fla.).

³ TCC functions performed, not counted as net sessions.

Late report:

RN6.....	58	1394	.426	24.1	97.8
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If the above summary seems a bit sketchy, please bear with us. Many of the above data were filled in after this was written, so as of this writing we don't know how many NTS nets are going to make the Aug. 10 deadline we mentioned last month. Those which come in before the 15th will be listed under "late reports" in November *QST*, with no stigma attached for being late.

All this because we don't trust anybody to present these statistics in our absence afield — not that anybody would try anyway.

The old spectrum is starting to show signs of nervousness again as we start dipping into the low part of the cycle. WIBVR reports one 1RN session was washed out during July. W3UE reports that 3RN continues to improve during the worst part of the year, which makes things look rosy for the fall season. K6HLR says we're a bunch of slave drivers, but got his report in. RN7 certificates have been awarded to H7s AIB OEB ZIZ and K7CLL. W6TOL is stepping out as TEN manager in December. VE3AUU says traffic is quite brisk on ECN despite summer slump (*what slump?*).

Trans-continental Corps. No reports received at time of writing, except TCC-Eastern's "recap" message. We'll hold the summary box open anyway.

Maybe we've said this before, but doing a job on TCC during the summer is a pretty rough job — just a bit rougher than most other NTS jobs. That's why these fellows get gold-embossed certificates. They *work* for them.

July reports:

Area	Functions	% Suc- cessful	Traffic	Out-of-Net Traffic
Eastern.....	47	76.6	596	138
Central.....	72	97.2	1588	1073
Summary....	119	89.1	2184	1211

W1AW OPERATING NOTE

The W1AW summer schedule which appeared on page 97 of September *QST* will be maintained through October 25. The W1AW fall schedule, effective October 26 with the return to standard time, will be carried in next month's issue.

NATIONAL RTTY CALLING AND WORKING FREQUENCIES

3620 kc. 7140 kc.

These frequencies are employed throughout the United States by amateurs using radioteletype.

A.R.R.L. ACTIVITIES CALENDAR

- Oct. 7: CP Qualifying Run — W6OWP
- Oct. 10-11: Simulated Emergency Test
- Oct. 17-18: CD Party (c.w.)
- Oct. 20: CP Qualifying Run — W1AW
- Oct. 24-25: CD Party (phone)
- Nov. 5: CP Qualifying Run — W6OWP
- Nov. 7-8, 14-15: Sweepstakes Contest
- Nov. 17: Frequency Measuring Test
- Nov. 18: CP Qualifying Run — W1AW
- Dec. 2: CP Qualifying Run — W6OWP
- Dec. 17: CP Qualifying Run — W1AW

OTHER ACTIVITIES

The following lists date, name, sponsor, and page of this *QST* in which more details appear.

Sept. 26-27: VE/W Contest, Montreal Amateur Radio Club (p. 49, last month).

Sept. 26-27: Scandinavian Phone Activity Contest, SRAL (p. 75, last month).

Oct. 3-4: Connecticut QSO Party, Connecticut Wireless Assn. (p. 150, this issue).

Oct. 3-4: VK/ZL DX Contest (phone), WIA (p. 75, last month).

Oct. 10-11: VK/ZL DX Contest (c.w.), WIA (p. 75, last month).

Oct. 30-31: RTTY Sweepstakes, RTTY Society of Southern California (p. 68, this issue).

Nov. 21-22: 21/28 Mc. Telephony Contest, RSCB.

RESULTS, JULY CD PARTIES

The hot summer months found the leading bug swatter in the July CD Party from the southwest, namely, K5DGI with the top QSO figure of 536 and section total of 65, yielding a final score of 175,825. W3MSR placed while K4SXO showed. The microphone maniacs were led again by K2PHF who came up with 25,575 points via 148 contacts in 33 sections. Fellow NYC-LI K2QZS was second with 19,360. The



Contest and CD Party enthusiast K9ELT came up with 111,560 points in the July c.w. Party. Phil has really been keying his way along, hitting the high claimed scores consistently for several parties.

following are the high claimed scores. Figures show score claimed, number of QSOs, and number of different sections worked. Final and complete standings will appear in the October *CD Bulletin*.

C.W.	Score	QSOs	Sections
K5DGI	175,825-536-65	536	65
W3MSR	167,090-528-62	528	62
K4SXO	157,235-526-59	526	59
W1RAN	142,740-462-61	462	61
K4CAX	136,710-434-62	434	62
K2PHF	135,115-436-61	436	61
W8IBX	132,455-444-59	444	59
K2QBW/2	130,095-406-63	406	63
W3DQC	126,575-411-61	411	61
W8GKB	126,000-357-70	357	70
W9YF*	124,110-388-63	388	63
W1WAJ*	123,000-409-60	409	60
W8NYU	112,200-367-60	367	60
K9ELT	111,560-380-58	380	58
K5BSZ	107,010-364-58	364	58
W3GYP	106,500-350-60	350	60
W1AW*	104,160-365-56	365	56
W3NF	106,200-353-59	353	59
K8IEB	100,595-337-59	337	59
K8KPK	94,400-315-59	315	59
K9DWK	93,195-323-57	323	57
W8FNI	93,090-316-58	316	58
K4RJM	92,125-331-55	331	55

*K4DRD, opr.; †W9SZR, opr.; ‡K2KIR, opr.; § Multiple-operator Station; ¶W1FYF, opr.

PREVIEW, 1959 FIELD DAY

Here are some high claimed scores reported for the 23rd ARRL Field Day. These are subject to checking and grouping according to the number of simultaneously-operated transmitters at each station. Final and complete FD results will appear in *QST* as soon as the checking can be completed.

CLASS A — Portable Clubs and Groups

(Listings show call, club name, claimed score, and number of simultaneously-operated transmitters.)

W2LI/2	Tri-County R Assn.	22,851-12
W5SC/5	San Antonio RC	19,841-11
W7HZ/7	Valley ARC	18,027-7
W7DK/7	Radio Club of Tacoma	17,577-10
K2AA/2	South Jersey R Assn.	16,423-6
W2GSA/2	Garden State AR Assn.	15,594-10
W3RCN/3	Rock Creek AR Assn.	15,495-11
W2SOQ/2	Fordham RC	13,500-8

W10C/1	Concord Brasspounders	13,087-10
W20YH/2	Morris RC	12,843-5
W6FNE/6	(nonclub group)	12,735-5
W9RK/9	Northwest ARC	12,609-10
K6DTA/6	West Valley RC	12,407-11
K2USA/2	Ft. Monmouth RC	12,360-10
W4FU/8	Ohio Valley AR Assn.	12,096-3
W2VDJ/2	Lakeland AR Assn.	11,736-7
K8AIR/8	A Mars Communicators C.	11,595-5
K2DN/2	Watchung Valley RC	11,502-7
W3TYU/3	William Penn RC	11,457-3
K6BAG/6	Pacifico RC	11,454-5
W9SW/9	Chicago Suburban R Assn.	10,978-7
K6EA/6	Assoc. RA of Long Beach	10,926-12
K6QEH/6	Hughes ARC	10,863-2
W6HS/6	Crescenta Valley RC	10,305-4
W2YKQ/2	Lake Success RC	10,275-5
W3JNQ/3	Frankford RC	10,188-2
W2OR/2	Pompton Valley RC	9,837-4
W2GTD/2	Ridgewood ARC	9,504-5
K6GLC/6	San Bernardino Valley Contest Assn.	9,009-2
W3ISE/3	Society for the Preservation of Key Clicks, Splatter and TVI	9,324-4

VE3NAR/3	Novtown ARC	8,851-10
W5KHB/5	Old Natchez ARC	8,652-3
W3EIS/3	Potomac Valley RC	8,586-2
W3MFW/3	Elizabethtown Area R Society	8,460-2
W1ECO/1	Sub Sig ARC	8,118-7
K2BC/2	Wind Blowers VHF Society	8,100-3
W9AA/9	Hamfesters RC Eleven	8,097-3
W2SSC/2	Niagara Frontier DX Assn.	7,938-2
K6DI/6	Santa Barbara ARC	7,873-5
K4CYP/4	Wayne County AR Assn.	7,848-6
W4PLB/4	Orlando ARC	7,731-3
W5MPZ/5	Sandia Base RC	7,485-3
W2RK/2	Larkfield RC	7,416-6
W6PMI/6	United RAC	7,413-6
W7AW/7	West Seattle ARC	7,380-5
W4MI/4	Jefferson County AREC	7,363-6
W9AB/9	Michiana ARC	7,304-3
W4SKH/4	Oak Ridge R Operators C.	7,290-4
W3BTN/3	North Penn ARC	7,203-5
W8HLD/8	Catalpa AR Society	7,189-10
W6PD/6	Foothill Mobile Net.	7,117-3
W4GNF/4	Greensboro RC	7,116-3
W9SWQ/9	Four Lakes ARC	7,074-7

CLASS B — Unit and Individual Portables

(Listings show call and score.)

K5DGI/5 (2 xmtrs)	11,191	KP4AJN/4	2574
W2FBA/2	6359	K6UNT/6	2360
K6SXA/6	5256	W6ANB/6	2250
K6QIK/6	3645	K4LDR/4	2232
K6GOI/6	3577	W4JZC/4	2052
W9DO/9	3492	W9ZHD/9	2040
W9UA/9	3213	K2SYS/2	2034
K5DRC/5	2826	K4BOM/4	2034
W6UF/6 (2 xmtrs)	2640	K8GJM/8	2007

CLASS C — Mobiles

W8PVC/8	7987	W8GCMK/8	2389
K6EPC/6	3442	W6RRD/6	2322
W8GHO/8	2929	W8QAV/8	2282
W2MIU/2	2524	W8AEU/8	2268
W3VXN/3	2484	W8QXG/8	2268
K8IZM/8	2417		

CLASS D — Emergency-Powered

Home Stations

W4NPT (5 xmtrs)	546	W1GFH	244
W5FC (3 xmtrs)	420	K6VTT	241
K4JLA (2 xmtrs)	308	W5HTK (2 xmtrs)	203

CLASS E — Commercial-Powered

Home Stations

K0LIR (4 xmtrs)	535	K6UKX	271
W5VVF	492	K0SLD	250
W4LYV	424	W6GEB (2 xmtrs)	246
W4BTO	407	K4MYR	230
K6QHC	382	K6VLG	219
K4HAV	358	K2TCD	215
K2EZG	340	W2GRD/2 (2 xmtrs)	210
K4ISM	338	K4RBH	209
W4WKQ	330		

Section Emergency Coordinators of the Amateur Radio Emergency Corps

The Section Emergency Coordinator is appointed by the SCM to take charge of the promotion of the Amateur Radio Emergency Corps organization throughout the Section. He acts as the SCM's executive in the furthering of provisions for emergency amateur radio communications in every community likely to suffer in case of a communications emergency. One of the duties of the SEC is to recommend the appointment of Emergency Coordinators for the various communities in his Section. Does your town have an EC? If not, recommend the name of a likely prospect to the SEC. The SEC invites your questions concerning the status of the AREC in your Section.

ATLANTIC DIVISION			
Eastern Pennsylvania Maryland-Delaware-D. C. Southern New Jersey Western New York	W3DUI W3PKC W2YRW W2GBX	Emmet W. Kuehner John J. Campodonico John Wesley Sammis J. Bruce Sift	242 E. Broad St. 629 McCabe Ave. 300 S. Woodstock Dr. Communications Office, Con- solidated Erie Office, Office of Civil Defense, 218 City Hall
Western Pennsylvania	W3OMA	Walter P. Remele	20 N. Howard Ave.
CENTRAL DIVISION			
Illinois Indiana Wisconsin	W9HOA W98NQ W9YQH	A. B. Brand Leonard M. Chalk Chet T. Horton	1211 Harlem Blvd. 815 West Arch St. 930 Oregon St., Box 179
DAKOTA DIVISION			
North Dakota South Dakota Minnesota	K0JLW W08CT W0TUS	Vernon C. Evenson Lester R. Lauritzen Robert H. Power	916—16th St. Rt. 3, Box 32 Bob's Radio TV, Box 2
DELTA DIVISION			
Arkansas Louisiana Mississippi Tennessee	K5CIR K5HYO W4RRV	Odia L. Musgrove Thomas C. Pate S. B. DeHart	1321 W. Baraque Ave. N-Bayou Rd. 227 S. Purdue
GREAT LAKES DIVISION			
Kentucky Michigan Ohio	W4BAZ W8YAN W8UPB	J. B. Wathen, III Donald E. Blashfield Dana E. Cartwright, sr.	391 Mockingbird Valley Rd. RFD 3, Box 561-A 2979 Observatory Rd.
HUDSON DIVISION			
Eastern New York N. Y. C. & Long Island Northern New Jersey	W2KGC W2ADO W2CWW	William L. Stahl Maurice Mulligan Edward Erickson	Box 543 Box 134 148 Miller Ave.
MIDWEST DIVISION			
Iowa Kansas Missouri Nebraska	W0MG W0IFR K0LTP W0JDJ	Russell R. Rosenkrans E. L. Duffield Henry Miller Francis B. Johnson	2121 Byron Ave. 902 N. Chestnut 2033 Eureka 820 S. 44th St.
NEW ENGLAND DIVISION			
Connecticut Maine Eastern Massachusetts Western Massachusetts New Hampshire Rhode Island Vermont	W1EOR W1AOG W1BYH W1BXU W1PAZ W1EIB	John L. Henley Donald F. Guntill Norman Rivers William E. Goldthwaite Thomas C. McCormick Harriet Proctor	RFD 1 17 Park St. Court 18 Squi Pkwy. 24 Franklin St. 1934 Smith St.
NORTHWESTERN DIVISION			
Alaska Idaho Montana Oregon Washington	K17BBS W71WU W7UQI W7QYS W7PQT	Herbert R. Tresidder Alan K. Ross Emmett F. Roberts Jim A. McCurdy Vern C. Shafer	1719 Snowcap Drive 2105 Irene St. Box 771 Fairview Rt. 319 Talcott
PACIFIC DIVISION			
Hawaii Nevada Santa Clara Valley East Bay San Francisco Sacramento Valley San Joaquin Valley	W7JU W6NVO K6DQM K6IKV W6EBL	Ray T. Warner Edward T. Turner Alex Eastman Antone F. Buzdas F. E. Robinson	539 Birch St. 3847 Fernwood 210 Castle Hill Ranch Road 4308 — 38th Ave. Sonora Motor Hotel
ROANOKE DIVISION			
North Carolina South Carolina Virginia West Virginia	W4HUL K4PJE K4MJZ W8HLA	Elbert H. Petree, Jr. Woody Brooks William B. Zammit John A. Davies	328 Gloria Ave. Box 455 1323 Kaiser Place 659 Forest Circle
ROCKY MOUNTAIN DIVISION			
Colorado Utah New Mexico Wyoming	W0NIT W7FSC W5CIN W7CQL	Donald Middleton Douglas E. Butler Leonard M. Norman Wayne M. Moore	920 West Adams 4851 West 4805 So. 903 North Butler Ave. 2000 E. 1st
SOUTHEASTERN DIVISION			
Alabama Eastern Florida Western Florida Georgia West Indies (Cuba-P.R.-V.I.) Canal Zone	W4WJX W4YPT W4PQV W4PMJ K4P4AAA KZ5RM	Adrene D. Christian Andrew C. Clark Harold S. Smith Harold M. Rosser Ernesto Viera Roger M. Howe	8436-7th Ave., No. 41 Lenape Drive 306 Henry St. P.O. Box 14 170 Artzamendi St. Box 462
SOUTHWESTERN DIVISION			
Los Angeles Arizona San Diego Santa Barbara	W6LIP W7YWF W6LYF K6EAF	Bruce T. Huntley Howard Hampton Harold Lindsay Edward J. Shedd	4570 San Blas 2812 W. Campbell Ave. 4126 Falcon St. 3018 Lomita Rd.
WEST GULF DIVISION			
Northern Texas Oklahoma Southern Texas	W5QKF	Dr. R. O. Best	P.O. Box 1656
CANADIAN DIVISION			
Maritime Ontario Quebec Alberta British Columbia Yukon Manitoba Saskatchewan	VE1BL VE3KM VE2QN VE8MJ VE7KX VE5IG	C. A. Smith T. W. Clemence Felix Edge Sydney T. Jones J. T. Hepburn Harold Gronsdahl	Transmitter Bldg., R.R. 1 2278 King St., East 2604 de la Falaise Ave. 19706-57th Ave. 864 General Currie Rd
			Hazelton Baltimore 12, Md. Haddonfield Buffalo 2 Bellevue 2 Rockford Portland Oshkosh Bismarck Centerville Backus Pine Bluff Cleveland Oak Ridge Louisville 7 Battie Creek Cincinnati 5 Fishkill Westbury Sayreville Waterloo Iola Springfield Lincoln 10 Andover Medford 55 Pitcburg Concord Centredale 11 East Middlebury Anchorage Boise Canby Coquille Sedro Woolley Boulder City Salt Lake City Walnut Creek Sacramento Sonora Winston-Salem Andrews Falls Church So. Charleston 3 Pueblo Kearns Farmington Casper Birmingham Miami Springs Warrington Hephzibah Rio Piedras, P. R. Balboa Heights Woodland Hills Phoenix San Diego 3 Santa Barbara Corpus Christi Lakeburn, N. B. Hamilton St. Foy Edmonton Vancouver 14 Congress

MEET THE SCM's

Ralph P. Thetreau, W8FX, Michigan's new SCM, received his first license in 1921 but has held an interest in amateur radio since 1912.

An ORS appointee, SCM Thetreau also is a member and former officer of the Detroit Amateur Radio Association. He holds membership in the ROWH, A-1 Operator Club and Old Timers Club. From 1921 to 1927 he belonged to the City Straits Radio Club, in which organization he held various offices. Among the contests in which he participates



are the ARRL CD Parties, Field Days and Sweepstakes. He has worked on a number of DARA Ypsilanti Hamfests and has been secretary of the Michigan (QMN) traffic nets since 1941.

W8FX's transmitting tube line-up is as follows: V.f.o. 6AU6, 6AU6, 6AQ5, 2E26, p.p. 24Gs, 250 watts, in a 6-ft. rack; also V.f.o. 9002, 6AG5, 6AU6, parallel 807s, 80 watts, in a 3-ft. rack. In addition a 274N mobile transmitter for 80, 40, 20 and 10 meters is available. Receivers are an NC-240D and a BC-348 and the antenna is a 137-ft. dipole.

Tate's other hobbies include the collection and placement of ancient wireless gear in the Ford Museum and/or the Michigan State Historical Museum. He enjoys gardening and fishing. Before his retirement he was employed by the U. S. Post Office as a mail carrier.

ELECTION RESULTS

Valid petitions nominating a single candidate as Section Manager were filed by members in the following Sections, completing their election in accordance with regular League policy, each term of office starting on the date given.

Oregon	Hubert R. McNally, W7JDX	June 10, 1959
Nebraska	Charles E. McNeel, W0EXP	June 10, 1959
Maine	Jeffrey I. Weinstein, W1JMN	Aug. 9, 1959
Western Massachusetts	Percy C. Noble, W1BVR	Aug. 11, 1959
West Virginia	Donald B. Morris, W8JM	Sept. 18, 1959
San Joaquin Valley	Ralph Saroyan, W6JPU	Oct. 10, 1959
East Bay	B. W. Southwell, W6QJW	Oct. 14, 1959
San Diego	Don Stansifer, W6LRU	Oct. 15, 1959

In the Hawaii Section of the Pacific Division, Mr. Samuel H. Lewbel, KH6AED, and Capt. George R. Crisp, KG6AHY, were nominated. Mr. Lewbel received 126 votes and Capt. Crisp received 37 votes. Mr. Lewbel's term of office began July 14, 1959.

ELECTION NOTICE

(To all ARRL members residing in the Section listed below.)

You are hereby notified that an election for Section Communications Manager is about to be held in your respective Section. The notice supersedes previous notices.

Nominating petitions are solicited. The signatures of five or more ARRL full members of the Section concerned, in good standing, are required on each petition. No member shall sign more than one petition.

Each candidate for Section Communications Manager must have been a licensed amateur for at least two years

and similarly a full member of the League for at least one continuous year immediately prior to his nomination.

Petitions must be in West Hartford, Conn., on or before noon on the closing dates specified. In cases where no valid nominating petitions were received in response to previous notices, the closing dates are set ahead to the dates given herewith. The complete name, address, and station call of the candidate should be included with the petition. It is advisable that eight or ten full-member signatures be obtained, since on checking names against Headquarters files, with no time to return invalid petitions for additions, a petition may be found invalid by reason of expiring membership, individual signers uncertain or ignorant of their membership status, etc.

The following nomination form is suggested. (Signers will please add city and street addresses to facilitate checking membership.)

Communications Manager, ARRL. [place and date]
38 La Salle Road, West Hartford, Conn.

We, the undersigned full members of the.....
.....ARRL Section of the.....
Division, hereby nominate.....
as candidate for Section Communications Manager for this
Section for the next two-year term of office.

Elections will take place immediately after the closing dates specified for receipt of nominating petitions. The ballots mailed from Headquarters to full members will list in alphabetical sequence the names of all eligible candidates.

You are urged to take the initiative and file nominating petitions immediately. This is your opportunity to put the man of your choice in office.

— F. E. Handy, Communications Manager

Section	Closing Date	SCM	Present Term Ends
Yukon*	Oct. 12, 1959	W. R. Williamson	Mar. 17, 1949
West Indies	Oct. 12, 1959	William Werner	Aug. 10, 1958
Mississippi	Oct. 12, 1959	John Adrian Houston, sr.	May 29, 1959
Saskatchewan*	Oct. 12, 1959	Lionel O'Byrne	June 10, 1959
Manitoba*	Oct. 12, 1959	James A. Elliott	Aug. 9, 1959
Utah	Oct. 12, 1959	Thomas H. Miller	Oct. 28, 1959
Alabama	Oct. 12, 1959	Clark A. Simms, jr.	Dec. 14, 1959
Quebec*	Oct. 12, 1959	C. W. Skarstedt	Dec. 15, 1959
Western			
Florida	Oct. 12, 1959	Frank M. Butler, jr.	Dec. 15, 1959
Illinois	Oct. 12, 1959	Edmond A. Metzger	Dec. 15, 1959
Rhode Island	Oct. 12, 1959	Mrs. June R. Burkett	Resigned
Eastern			
New York	Dec. 10, 1959	George W. Tracy	Feb. 10, 1960
New Mexico	Dec. 10, 1959	Allan S. Hargett	Feb. 10, 1960
Virginia	Dec. 10, 1959	John Carl Morgan	Feb. 11, 1960
Maritime*	Dec. 10, 1959	D. E. Weeks	Feb. 15, 1960
South			
Carolina	Jan. 11, 1960	Dr. J. O. Dunlap	Mar. 4, 1960
Ohio	Jan. 11, 1960	Wilson E. Weekel	Mar. 5, 1960
North			
Carolina	Jan. 11, 1960	B. Riley Fowler	Mar. 6, 1960
Georgia	Jan. 11, 1960	William F. Kennedy	Mar. 18, 1960

*In Canadian Sections nominating petitions for Section Managers must be addressed to Canadian Director Alex Reid, 169 Logan Ave., St. Lambert, Quebec. To be valid, petitions must be filed with him on or before closing dates named.

NATIONAL CALLING AND EMERGENCY FREQUENCIES (Kc.)

3550	3875	7100	7250
14,050	14,225	21,050	21,400
28,100	29,640	50,550	145,350

During periods of communications emergency these channels will be monitored for emergency traffic. At other times, these frequencies can be used as general calling frequencies to expedite general traffic movement between amateur stations. Emergency traffic has precedence. After contact has been made the frequency should be vacated immediately to accommodate other callers.

The following are the National Calling and Emergency Frequencies for Canada: c.e. — 3535, 7050, 14,060; phone — 3765, 14,160, 28,250 kc.

CODE PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW will be made Oct. 20 at 2130 Eastern Daylight Time. Identical texts will be sent simultaneously by automatic transmitters on 3555, 7080, 14,100, 21,075, 28,080, 50,900 and 145,600 kc. The next qualifying run from W6OWP only will be transmitted Oct. 7 at 2100 PDST on 3500 and 7129 kc.

Any person can apply. Neither ARRL membership nor an amateur license is required. Send copies of all qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m. you may try later for endorsement stickers.

Code-practice transmissions are made from W1AW each evening at 2130 EDST. Approximately 10 minutes' practice is given at each speed. Reference to texts used on several of the transmissions are given below. These make it possible to check your copy. For practice purposes, the order of words in each line of QST text sometimes is reversed. To improve

your fist, hook up your own key and audio oscillator and attempt to send in step with W1AW.

Date Subject of Practice Text from August QST

- Oct. 5: *Radio Detection of Silent Satellites*, p. 34
- Oct. 8: *Amateur Communication at 36,600 Mc.*, p. 28
- Oct. 13: *A 75-Watt V.F.O. for 20-40 C.W.*, p. 38
- Oct. 16: *Geneva - 1959*, p. 54
- Oct. 22: *Down the Hatch*, p. 50
- Oct. 27: *Adding a Reflector to the One-Element Rotary*, p. 36
- Oct. 30: *HPE CUAGN ON C.W.*, OBI, p. 60

BRIEF

Word from the MARC notes the following corrections in the 1958 VE/W Contest results: W2PRE is the Northern New Jersey section winner with 23,790 rather than W2BWW with 2,816. Switch K0ITF from the Missouri section to the Kansas section, thereby making him the section winner there with 37,363 and making K0JPL the Missouri winner with 33,140. Oregon winner K7AAW was incorrectly listed as K7AWW.

DX CENTURY CLUB AWARDS

HONOR ROLL

W6AM.....295	W6ENV.....290	W9YFV.....287
W1FH.....294	W8BRA.....289	W9RBL.....287
ZL2GX.....293	W3JNN.....289	W3KCT.....287
W8HWG.....293	W5ASG.....289	W8BKP.....287
PY2CK.....292	G3LAM.....289	W6MX.....286
W3GHD.....292	G2PL.....289	W3BES.....286
KVAAA.....291	W2HUQ.....289	W8DMD.....286
W9NDA.....291	ZLHY.....289	W6ADP.....286
W8JLN.....290	W1ME.....289	W6EBG.....286
W6SYG.....290	W6CJQ.....289	W7AMX.....286
W2AGW.....290	W6DZZ.....288	W7GUV.....286
	W6GFE.....288	

Radiotelephone

PY2CK.....292	W8FH.....280	W6AM.....276
W8GZ.....284	W3JNN.....280	W6YU.....276
Z86BW.....283	W9RBL.....279	W9NDA.....272
W8HWG.....283	ZLHY.....278	CX2CO.....272
VQ4ERR.....283	W8KML.....276	4X4DK.....268
W1FH.....282		ZL2GX.....268

From July 1 to August 1, 1959 DXCC certificates and endorsements based on postwar contacts with 100-or-more countries have been issued by the ARRL Communications Department to the amateurs listed below.

NEW MEMBERS

K6CQM.....223	W1ONP.....106	W4PM.....101
K2FC.....207	W1KT.....105	K4ZCP.....101
ZK1BS.....180	W5KOD.....105	W5KFT.....101
5A5TE.....134	W5LKK.....105	K6EJL.....101
W9DO.....133	HP1LB.....103	K6YFP.....101
UC2CB.....130	H4ZKAW.....105	W6WQT.....101
JALGC.....122	K4MOF.....104	DL6YQ.....101
Z97JY.....116	G3CGD.....104	G3LYC.....101
VU2AJ.....113	K4OYE.....103	ZLLAPM.....101
G3KBB.....112	K4MQG.....103	K2AZL.....100
W2KOY.....111	W5YJB.....103	W2BLP.....100
W7WJF.....111	K0BIB.....103	K3AXH.....100
J43AA.....111	DL1MS.....103	W60JW.....100
K2ZKU.....110	HR9EQ.....103	W6PHF.....100
K5KES.....110	W2V8S.....102	W6UNP.....100
K42BB.....109	K8HX.....102	DJ2WA.....100
VQ2VZ.....109	VE1QN.....102	DM2AHM.....100
PA0DN.....108	K1AQ.....101	F88HD.....100
W3ISD.....107	W1CPV.....101	UB5ND.....100
	K4GLA.....101	

Radiotelephone

ZK1BS.....160	E43LL.....106	W6WNE.....102
W3DJZ.....135	F9AOW.....105	T12PI.....102
W8BIM.....128	W5CP.....103	W9ZVM.....101
5A5TE.....119	HP1LB.....103	W1LSS.....100
G3JQ.....114	HR2MT.....103	K8AEK.....100
LU1DJU.....112	W2QJO.....102	W9ZTD.....100
DJ3QX.....106	W4UK.....102	G3BDS.....100

Endorsements

W1BH.....280	W1BLO.....230	W6MEL.....217
W68N.....273	W6VQ.....230	W1EOB.....216
SM5LL.....270	W2ZX.....229	CB3HL.....216
W6KZL.....251	W7BCJH.....224	W2GFV.....212
H4OF.....248	W8WFB.....223	W9FVU.....212
W6NJU.....241	W9DYG.....222	OK1CX.....212
KP4KD.....240	W3HLX.....221	WIWY.....210
W3RUT.....236	W6GMC.....221	K2CP.....210
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• All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

ATLANTIC DIVISION

EASTERN PENNSYLVANIA—SCM, Allen R. Breiner, W3ZRQ—SEC: DUL PAM: TEJ, RM: AXA. The Phone PFN Net meets Mon through Fri. at 1800 EDST on 3850 kc. The EPA C.W. Nets meets nightly at 1930 EDST on 3610 kc. MFW received WAA and WAZ awards after waiting a year and a half for a QSL from JTIAA. The license and measles arrived the same week for KN3GZS. The new long-wire antenna is working fine for K3ALD. K3ATX is on 6 and 2 meters with a Globe Scout and an SCR-522. CMN snagged VS9AS for WAC with his new Valiant. HUS is QRT because the dual quad came down. K3CVF, IPM, CNN and ATX are new OEES. A new ORS is NNL and the new EC for Lancaster County is K3BLC. Population increases were recorded for NWP, HNK and CUK. CUL is adding RTTY to the shack. A number of clubs have joined forces and formed the Delaware Valley Council of ARC. New club calls issued are CCX, Mount Airy V.H.F. Society; and K3IZU, Bucks County ARC. K3AWC is now General Class. VSU has received DXCC, WAS and WAC certificates, all for 20-meter phone. The West Philadelphia Radio Assn. is issuing the WAWPRAM certificate. For details, write LOZ. The new officers of the Short Skip ARC are 2ILN, pres.; AAU, vice-pres.; ZPX, treas.; K3AUW, secy. The North Penn ARC supplied communications for the 6th Annual Port Indian Regatta. Twenty-one members of the Chester County Emergency Net collaborated in its 3rd anniversary by assisting with the Miss Pennsylvania Parade in Chester. AD was a visitor to the Windham ARC in Vermont. GYP reports rough going during the CD Party and FBY reports very good conditions on 6 meters. Those QRL painting, making hay, harvesting and putting the shack in condition for the winter are ALB, OY, NNL, EU and ZRQ. TEJ visited BZR while on vacation in Western Pennsylvania. Presentation of Section Net certificates at the Hershey Picnic were made to the following: W3E, ACH, AMC, BNR, GIU, HNK, HOF, IYS, NQB, TIV, TEJ, VKE, ZRQ, OVU, GKQ, JSX, AXA, BFF, BUR, CDT, FKB, HBA, KMD, QKW, ZLP and K3S AHT, ANU, DZE, ANS, BHY, DFS, DCB and AUS. Traffic: W3CUL 5902, VR 517, WHK 305, IVS 256, K3DZB 202, W3AXA 141, ZRQ 95, K3ALD 93, W3FKE 78, BFF 65, W1NJM/3 46, K3AET 42, W3NNL 32, ZLP 28, K3ANS 24, W3TEJ 22, HNK 16, VKQ 13, AMC 12, NQB 8, ELI 7, DUI 4, EU 4, CMN 3, BNR 2, JSZ 1.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA—SCM, Arthur W. Plummer, W3EQK, Asst. SCM Delaware: P. R. Decourcelle, 3DQZ. *Delaware report:* IYE represents Delaware in traffic. SEC PKC invites applications for ECs from Kent and Sussex Counties in Delaware. How about it, ARRL members? KHU, EC for New Castle County, Del., reports there are 10 members in the AREC and he hopes to increase this considerably in the near future. IHBO/3 and K3BYJ are handling Delaware traffic on MDD. GPK is supplying Delaware QSOs on 7030-7050 kc. at 1930. Here's your chance for Delaware. *Md. and D.C. report:* Official Observers AHQ, MSR and ZAQ report very many harmonics and bad c.w. notes. The old-timers should help the newcomers to eliminate this condition as fast as possible. New-comers: Ask your club or your neighboring ham for help and you will get it. ANA and TN made BPL on organizations plus deliveries. BKE is back on MDD and 3RN. AKB and BWT are working on a new v.f.o. BOM has been appointed OO and reports two grandchildren. ZAR was married in Weisbaden to an Oklahoma YL on May 23. His DL4ACN is active on 10 meters. Look for him. KN3BKE was transferred from Ft. Howard to the Memphis VA Hospital and will be on 40 meters soon. CNY has a new crank-up tower and a rhombic antenna. LMC has a 32S1 S.S.B. IFW built a transistor power supply for

the Volkswagen. YPW has a new Elmac mobile. KN3HLC is working for a General Class license and says that social life interferences with code practice. KN3EZI has a home-brew rig and an HRO and will be on 40 meters. BUD sold his other gear and is building a Knight receiver to go with a Globe Chief modulator. CBQ has an 813 driver and a 6-meter converter. CDQ was in XF-Land for 2 weeks. K3CIO blew up his transmitter going after EA9LA but got him next day. CN says it is too hot to move. CQX is trying to get information on t.r. switches and if he gets in touch with OYX in his home town he will get all the dope. DCP is chairman of programs for BARC and is busier than a hound dog with fleas and two bad feet. ECP took a trip North but could raise no one in D.C. on 10- or 75-meter mobile. EOY vacationed through the Middle West and is mobile on 10 and 20 meters. FRM's new harmonic is keeping him inactive. GEK received a plate transformer from 2PZP to help him get about 100 watts on the air, and is trying to work all Pennsylvania counties. GJD is active in MDD and 3RN. GVD operated portable 8 and had canary trouble with the rig—chirps. JME, EC for Baltimore County, is going great with his group but needs more stations in other parts of the county. JZY, the old man of the mountain, still is in business. OYX says Hagerstown is too darn hot, too. PQ, PZW, TN and UE are very active on MDD and 3RN. MDD needs outlets in Western and Northern Maryland. QBJ still is doing business at Walter Reed Hospital. WSE complains about heavy (11) traffic. The B&ORRARC reports that certificate No. 12 went to K3EVR. K3CZA recently was married to Florence Finklestein. K3DIW and K3EFU have a new harmonic. EFU was the first XYL to have a transmitter in Johns Hopkins Maternity Ward. PKC, SEC for the Md.-Del. D.C. section, needs ECs for Allegheny, Caroline, Charles, Frederick, Garrett, Howard, Kent, Montgomery, Queen Anne, Somerset and Worcester Counties in Maryland. KLA reports the new officers of the AERO ARC are K3GDB, pres.; JDF, vice-pres.; ZAQ, treas.; Joe Bosak, secy. Traffic: (July) W3AHQ 594, K3ANA 352, W3PZW 336, UE 192, TN 127, PQ 125, K3GJD 121, WBJ 94, W3ECP 38, BKE 31, KHA 25, ZNW 23, EOY 19, WSE 11, JZY 10, CN 6, WV 6, BUD 4, JME 3, BWT 1. (June) W3UE 328, NNM 40, ZNW 18, WV 6, IYE 2.

SOUTHERN NEW JERSEY—SCM, Herbert G. Brooks, K2BG1—SEC: W2YRW, RMs: W2BZJ, W2HDX and W2ZJ, W2RG, Merchantville, continues to be top traffic handler in the section. Ed is Radio Officer of Camden County. The DYRA, via its club station W2ZQ, conducted an "on the air" forum on Licensee Plate Bill No. 213. K2AAR acted as moderator. W2BEI, Audubon, has a new transmitter, receiver and a three-band trap antenna. W2BZJ has completed his antenna rebuilding, but summer activities have curtailed his activities. The DYRA's secretary reports a very successful trip to High Point, N. J. with about 40 participating. W3GHD, outstanding DXer, was the SJRA's July speaker. W2OSD, the SJRA's Field Day Chairman, reported 1804 contacts made by the club's stations. W2YRW has been elected president of the Philadelphia Electric Radio Club. W2BLV now edits the SJRA's News and Libel column. Ex-K2CIQ, now K5UNK, QTH New Mexico, visited S.N.J. with his XYL. What has happened to K2HOD and K2JVX on 2 meters? The Burlington County Radio Club meets the 1st Fri. of each month in Moorestown. K2GX is the club's president. W2PZX and W2PEN are back on 2 meters. W2ZJ, N. J. Phone Net Mgr. reports 31 sessions in July and a traffic total of 94. The DYRA's Field Day score was 992 contacts, 5 transmitters and a total of 6192 points. No reports were received from Atlantic, Gloucester, Cumberland or Salem Counties. Traffic: W2RG 110, W2ZI 40, W2BEI 12, K2CPR 11, W2BZJ 7.

WESTERN NEW YORK—SCM, Charles T. Hansen, K2HUK—SEC: W2GBX, RMs: W2RUF and W2ZRC, PAMS: W2PVI and W2LXE (v.h.f.). NYS C.W. meets on 3615 kc. at 1900; ESS on 3590 kc. at 1800; NYSPTEN on 3925 kc. at 1800; NYS C.D. on 3509.5 and 3993 kc. at 0900 Sun.; TCPN 2nd call area on 3970 kc. at 1900; IPN on 3980 kc. at 1600. K2DNN has been appointed EC for Chemung Co. W2EZB has been appointed ORS. Endorsements: W2PVI as PAM and OPS; W2EMW as ORS. K2SSX received 25-w.p.m. CP. K2RYT is going to SV-Land (Crete). K2SYN is going to VP9. K2MEF, at 311 Main St., Owego, wants to start a club in that area. The *CV. ARC Radio Bulletin* has been received. W2GHC reports that he, W2UXC and K2-

(Continued on page 134)

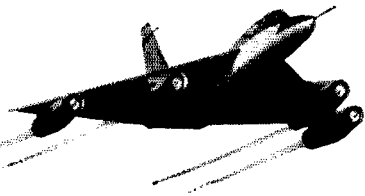
HELPFUL FACTS ABOUT TRANSMISSION LINES

WHILE the following statements are elementary to many old-time amateurs, it is hoped that these condensed and simplified points will be of some help to the newcomer in obtaining better performance from his station.

1. To deliver maximum power with lowest losses, a transmission line must be terminated in a resistance equal to the characteristic impedance of the line.
2. A correctly terminated transmission line of any length will, from the sending end (transmitter), appear as an impedance equal to the characteristic impedance of the line.
3. A correctly terminated and balanced line has essentially no radiation from the line.
4. A correctly terminated line has the most power absorbed by its termination (load); hence, none is reflected and its V.S.W.R. is unity.
5. If a line must be pruned or adjusted to a critical length, it is not terminated correctly.
6. No matching device at the sending end (transmitter) can reduce the V.S.W.R. on a line which is improperly terminated.
7. An improperly terminated or unbalanced transmission line will:
 - A) Reduce power capacity of T.V.I. filters.
 - B) Distort radiation and polarization patterns of the antenna.
 - C) Induce power losses in nearby objects or buildings.
 - D) Increase B.C.I. and T.V.I. problems.
 - E) Not absorb or transfer maximum power from many types of transmitters.
8. Improperly terminated transmitter lines, when used for receiving, may cause reduction in apparent receiver sensitivity due to losses because of mismatch between antenna and line.
9. To obtain maximum transfer of power between any two networks, the impedances must be equal, or must be equalized by a matching network or transformer.

— FRITZ FRANKE

Buel Kelley Jr. W. J. Halley for **hallicrafters**



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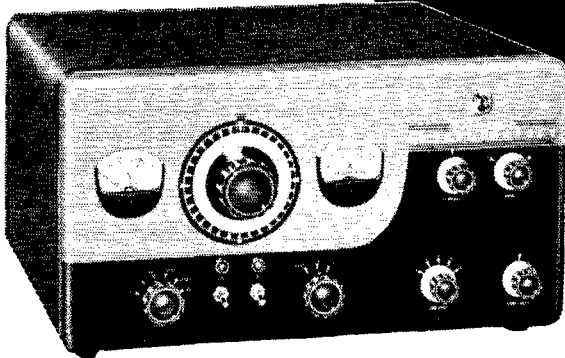
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Thunderbolt Power Amplifier



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 Bandswitching 6 and 2 meters!

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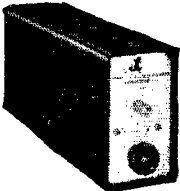
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For detailed specifications on the new 6N2 Thunderbolt, write for Data Sheet 714



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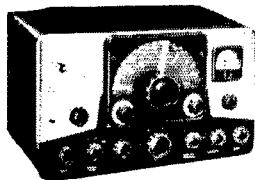
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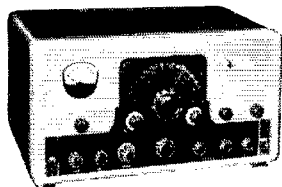
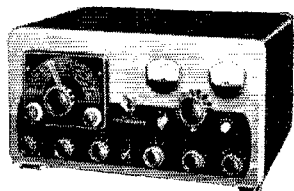


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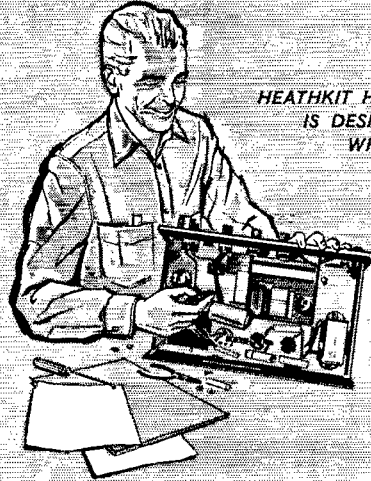
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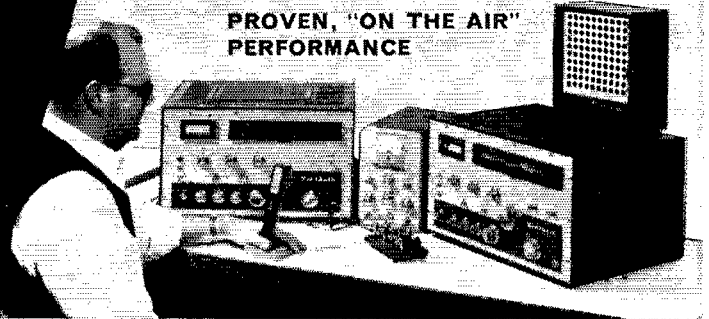


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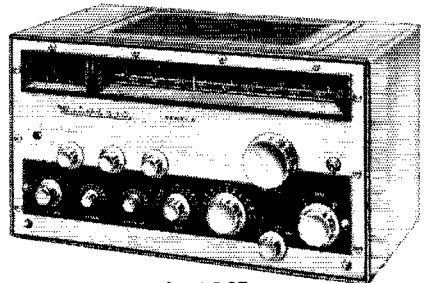
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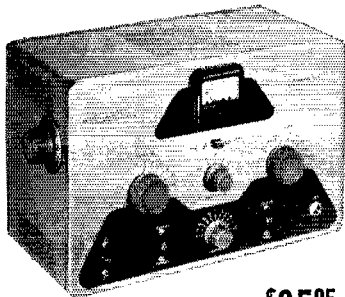


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Mobile Gear...for the Ham on the Go!

"CHEYENNE" MOBILE HAM TRANSMITTER KIT

All the fun and excitement . . . plus the convenience of mobile operation are yours in the all-new Heathkit "Cheyenne" transmitter. The neat, compact, and efficient circuitry provides you with high power capability in mobile operation, with low battery drain using carrier controlled modulation. All necessary power is supplied by the model MP-1 described below. Covers 80, 40, 20, 15 and 10 meters with up to 90 watts input on phone. Features built-in VFO, modulator, 4 RF stages, with a 6146 final amplifier and pi network (coaxial) output coupling. High quality components are used for long service life and reliable operation, along with rugged chassis construction to withstand mobile vibrations and shock. Thoughtful circuit layout provides for ease of assembly with complete instructions and detailed pictorial diagrams to insure success. A spotting switch is also provided. A specially designed ceramic microphone is included to insure effective modulation with plenty of "punch". Plan now to enjoy the fun of mobile operation by building this superb transmitter. Shpg. Wt. 19 lbs.



HEATHKIT MT-1
\$99⁹⁵



"COMANCHE" MOBILE HAM RECEIVER KIT

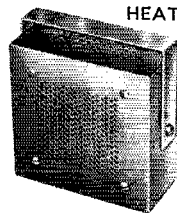
Everything you could ask for in modern design mobile gear is provided in the "Comanche" . . . handsome styling, rugged construction, top quality components . . . and, best of all, a price you can afford. The "Comanche" is an 8-tube superheterodyne ham band receiver operating AM, CW and SSB on the 80, 40, 20, 15 and 10 meter amateur bands. A 3 mc crystal lattice-type IF filter permits the receiver to use single conversion without image interference, and at the same time creates a steep sided 3 kc flat top IF bandpass characteristic comparable to mechanical type filters. The neat, compact and easy-to-assemble circuitry features outstanding sensitivity, stability and selectivity on all bands. Circuit includes an RF stage, converter, 2 IF stages, 2 detectors, noise limiter, 2 audio stages and a voltage regulator. Sensitivity is better than 1 microvolt on all bands and signal-to-noise ratio is better than 10 db down at 1 microvolt input. One of the finest investments you can make in mobile gear. Shpg. Wt. 19 lbs.



HEATHKIT MR-1
\$119⁹⁵

MOBILE SPEAKER KIT

A matching companion speaker for the "Comanche" mobile receiver. Housed in a rugged steel case with brackets provided for easy installation on fire wall or under dashboard, etc. Uses 5 PM speaker with 8 ohm voice coil. Measures 5" H. x 5" W. x 2 1/2" D. Shpg. Wt. 4 lbs.

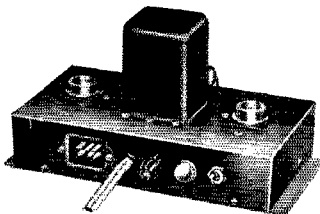


HEATHKIT AK-6
\$5⁹⁵



HEATHKIT AK-6
\$4⁹⁵

HEATHKIT MP-1
\$44⁹⁵



MOBILE POWER SUPPLY KIT

This heavy duty transistor power supply furnishes all the power required to operate both the MT-1 Transmitter and MR-1 Receiver. It features two 2N442 transistors in a 400 cycle switching circuit, supplying a full 120 watts of DC power. Under intermittent operation it will deliver up to 150 watts. Kit contains everything required for complete installation, including 12' of heavy battery cable, tap-in studs for battery posts, power plug and 15' of connecting cable. Chassis size is 9 1/16" L. x 4 3/4" W. x 2" H. Operates from 12-14 volt battery source. Circuit convenience provided by self-contained relay which allows push-to-talk mobile operation. Shpg. Wt. 8 lbs.

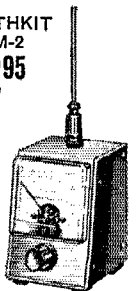
MOBILE BASE MOUNT KIT

The AK-6 Base Mount is designed to hold both transmitter and receiver conveniently at driver's side. Universal mounting bracket has adjustable legs to fit most automobiles. Shpg. Wt. 5 lbs.

POWER METER KIT

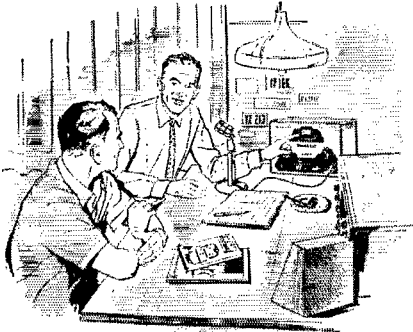
This handy unit picks up energy from your mobile antenna and indicates when your transmitter is tuned for maximum output. A variable sensitivity control is provided. Features a strong magnet on a swivel-mount for holding it on a car dashboard or other suitable spot. Has its own antenna or may be connected to existing antenna. Sensitive 200 ua meter. Shpg. Wt. 2 lbs.

HEATHKIT
PM-2
\$12⁹⁵





COMPANION UNITS



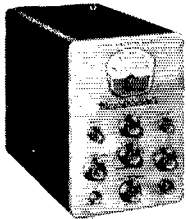
HEATHKIT TX-1 \$234⁹⁵

"APACHE" HAM TRANSMITTER KIT

The many features and modern styling of the "Apache" will provide you with just about everything you could ask for in transmitting facilities. Emphasizing high quality the "Apache" operates with a 150 watt phone input and 180 watt CW input. In addition to CW and phone operation, built-in switch selected circuitry provides for single-sideband transmission using the SB-10 External adapter. The newly designed, compact and stable VFO provides low drift frequency control necessary for SSB transmission. A slide rule type illuminated rotating VFO dial with full gear drive vernier tuning provides ample bandspread and precise frequency settings. The bandswitch allows quick selection of the amateur bands on 80, 40, 20, 15 and 10 meters. This unit also has adjustable low-level speech clipping and a low distortion modulator stage employing two of the new 6CA7/EL34 tubes in push-pull class AB operation. Time sequence keying is provided for "chirpless" break-in CW operation. The final amplifier is completely shielded for TVI protection and neutralized for greater stability. A cooling fan is also provided. The formed one-piece cabinet with convenient access hatch provides accessibility to tubes and crystal sockets. Die-cast aluminum knobs and control panel escutcheons add to the attractive styling of the transmitter. Pi network output coupling matches antenna impedances between 50 and 72 ohms. A "spotting" push button enables the operator to "zero beat" an incoming frequency without putting the transmitter on the air. Equip your ham shack now for top transmitting enjoyment with this outstanding unit. Shpg. Wt. 110 lbs. Shipped motor freight unless otherwise specified.

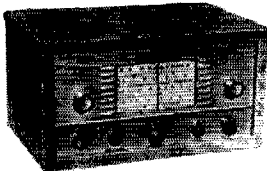
HEATHKIT SB-10 SINGLE SIDEBAND ADAPTER KIT

\$89⁹⁵



Designed as a compatible plug-in adapter unit for the TX-1 "Apache" transmitter, this unit lets you operate on SSB at a minimum of cost, yet does not affect the normal AM and CW functions of the transmitter. By making a few simple circuit modifications, the DX-100 and DX-100-B transmitters can be used, utilizing all existing RF circuitry. Extremely easy to operate and tune, the adapter employs the phasing method for generating a single-sideband signal, thus allowing operation entirely on fundamental frequencies. The critical audio phase shift network is supplied completely preassembled and wired in a sealed plug-in unit. Produces either a USB, LSB or DSB signal, with or without carrier insertion. Covers 80, 40, 20, 15 and 10 meter bands. An easy-to-read panel meter indicates power output to aid in tuning. A built-in electronic voice control with anti-trip circuit is also provided. 10 watts PEP output. Unwanted sideband suppression is in excess of 30 db and carrier suppression is in excess of 40 db. An EL84/6BQ5 tube is used for linear RF output. Shpg. Wt. 12 lbs.

MODIFICATION KIT: Modifies DX-100 and DX-100-B for use with the SB-10 Adapter. Model MK-1. Shpg. Wt. 1 lb. \$8.95.



HEATHKIT AR-3

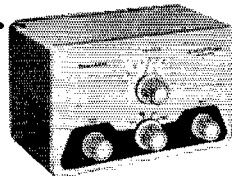
\$299⁵

(less cabinet)

ALL-BAND RECEIVER KIT

A fine receiver for the beginning ham or short wave listener, designed for high circuit efficiency and easy construction. Covers 550 kc to 30 mc in four bands clearly marked on a slide-rule dial. Transformer operated power supply. Features include: bandswitch, bandspread tuning, phone-standby-CW switch, phone jack, antenna trimmer, noise eliminator, RF gain control and AF control. Shpg. Wt. 12 lbs.

CABINET: Opt. extra. No. 91-15A. Shpg. Wt. 5 lbs. \$4.95.



HEATHKIT QF-1

\$99⁵

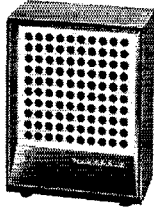
"Q" MULTIPLIER KIT

Useful on crowded phone and CW bands, this kit adds selectivity and signal rejection to your receiver. Use it with any AM receiver having an IF frequency between 450 and 460 kc that is not AC-DC type. Provides an effective "Q" of approximately 4,000 for extremely sharp "peak" or "null". The QF-1 is powered from the receiver with which it is used. Shpg. Wt. 3 lbs.

OF DISTINCTIVE QUALITY

ACCESSORY SPEAKER KIT

Handsomely designed and color styled to match the "Mohawk" receiver this heavy duty 8" speaker with 4.7 ounce magnet provides excellent tone quality. Housed in attractive $\frac{3}{8}$ " plywood cabinet with perforated metal grille. Speaker impedance is 8 ohms. Shpg. Wt. 7 lbs.



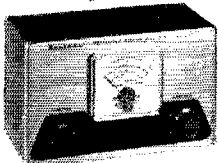
HEATHKIT AK-5
\$995



HEATHKIT RX-1 \$27495

"MOHAWK" HAM RECEIVER KIT

Styled to match the "Apache" transmitter the "Mohawk" ham band receiver provides all the functions required for clear, rock-steady reception. Designed especially for ham band operation this 15-tube receiver features double conversion with IF's at 1682 kc and 50 kc and covers all the amateur frequencies from 160 through 10 meters on 7 bands with an extra band calibrated to cover 6 and 2 meters using a converter. Specially designed for single sideband reception with crystal controlled oscillators for upper and lower sideband selection. A completely preassembled wired and aligned front end coil bandswitch assembly assures ease of construction and top performance of the finished unit. Other features include 5 selectivity positions from 5 kc to 500 CPS, bridge T-notch filter for excellent heterodyne rejection, and a built-in 100 kc crystal calibrator. The set provides a 10 db signal-to-noise ratio at less than 1 microvolt input. Each ham band is separately calibrated on a rotating slide rule dial to provide clear frequency settings with more than ample bandwidth. Front panel features S-meter, separate RF, IF and AF gain controls, T-notch tuning, T-notch depth, ANL, AVC, BFO, Bandswitch tuning, antenna trimmer, calibrate set, calibrate on, CW-SSB-AM, receive-standby, upper-lower sideband, selectivity, phone jack and illuminated gear driven vernier slide rule tuning dial. Attractively styled with die-cast aluminum control knobs and escutcheons. No external alignment equipment is required for precise calibration of the "Mohawk". All adjustments are easily accomplished using the unique method described in the manual. An outstanding buy in a communications receiver. Shpg. Wt. 66 lbs. Shipped motor freight unless otherwise specified.



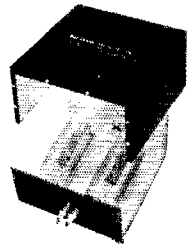
HEATHKIT AM-2
\$1595

REFLECTED POWER METER KIT

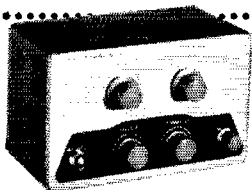
The AM-2 measures forward and reflected power or standing wave ratio. Handles a peak power of well over 1 kilowatt of energy and covers 160 through 6 meters. Input and output impedance provided for 50 or 75 ohm lines. No external power required for operation. Use it also to match impedances between exciters or RF sources and grounded grid amplifiers. Shpg. Wt. 3 lbs.

BALUN COIL KIT

Match unbalanced coaxial lines, found on most modern transmitters, to balanced lines of either 75 or 300 ohms impedance with this handy transmitter accessory. Capable of handling power input up to 200 watts, the B-1 may be used with transmitters and receivers covering 80 through 10 meters. No adjustment required. Shpg. Wt. 4 lbs.



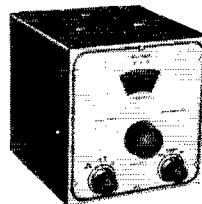
HEATHKIT B-1
\$895



HEATHKIT VX-1
\$2395

ELECTRONIC VOICE CONTROL KIT

Eliminate hand switching with this convenient kit. Switch from receiver to transmitter by merely talking into your microphone. Sensitivity controls allow adjustment to all conditions. Power supply is built in and terminal strip on the rear of the chassis accommodates receiver and speaker connections and also a 117 volt antenna relay. Shpg. Wt. 5 lbs.

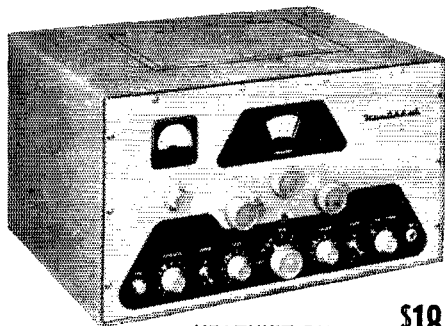


HEATHKIT VF-1
\$1950

VFO KIT

Far below the cost of crystals to obtain the same frequency coverage this variable frequency oscillator covers 160, 80, 40, 20, 15 and 10 meters with three basic oscillator frequencies. Providing better than 10 volt average RF output on fundamentals, the VF-1 is capable of driving the most modern transmitters. Requires only 250 volts DC at 15 to 20 ma, and 6.3 VAC at 0.45 a. Illuminated dial reads direct. Shpg. Wt. 7 lbs.

Save 1/2 or more...with Heathkits



HEATHKIT DX-100-B \$189⁵⁰

DX-100-B PHONE AND CW TRANSMITTER KIT

A long standing favorite in the Heathkit line, the DX-100-B combines modern styling and circuit ingenuity to bring you an exceptionally fine transmitter at an economical price. Panel controls allow VFO or crystal control, phone or CW operation on all amateur bands up to 30 mc. The rugged one-piece formed cabinet features a convenient top-access hatch for changing crystals and making other adjustments. The chassis is punched to accept sideband adapter modifications. Featured are a built-in VFO, modulator, and power supply, complete shielding to minimize TVI, and a pi network output coupling to match impedances from 50 to 72 ohms. RF output is in excess of 100 watts on phone and 120 watts on CW. Band coverage is from 160 through 10 meters. For operating convenience single-knob bandswitching and illuminated VFO dial on meter face are provided. A pair of 6146 tubes in parallel are employed in the output stage modulated by a pair of 1625's. Shpg. Wt. 107 lbs. Shipped motor freight unless otherwise specified.

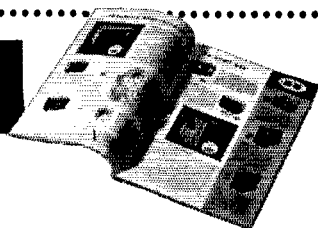


HEATHKIT DX-40 \$64⁹⁵

DX-40 PHONE AND CW TRANSMITTER KIT

An outstanding buy in its power class the DX-40 provides both phone and CW operation on 80, 40, 20, 15 and 10 meters. A single 6146 tube is used in the final amplifier stage to provide full 75 watt plate power input on CW or controlled carrier modulation peaks up to 60 watts for phone operation. Modulator and power supplies are built in and single-knob bandswitching is combined with the pi network output circuit for complete operating convenience. Features a D'Arsonval movement panel meter. A line filter and liberal shielding provides for high stability and minimum TVI. Provision is made for three crystals easily accessible through a "trap door" in the back of the cabinet. A 4-position switch selects any of the three crystals or jack for external VFO. Power for the VFO is available on the rear apron of the chassis. Easy-to-follow step-by-step instructions let assembly proceed smoothly from start to finish even for an individual who has never built electronic equipment before. Shpg. Wt. 25 lbs.

Free Send now for latest Heathkit Catalog describing in detail over 100 easy-to-assemble kits for the Hi-Fi fan, radio ham, boat owner and technician.



HEATH

*pioneer in
do-it-yourself
electronics*

COMPANY BENTON HARBOR 9, MICH.

D a subsidiary of Daystrom, Inc.

Send latest Free Heathkit Catalog.

NAME _____

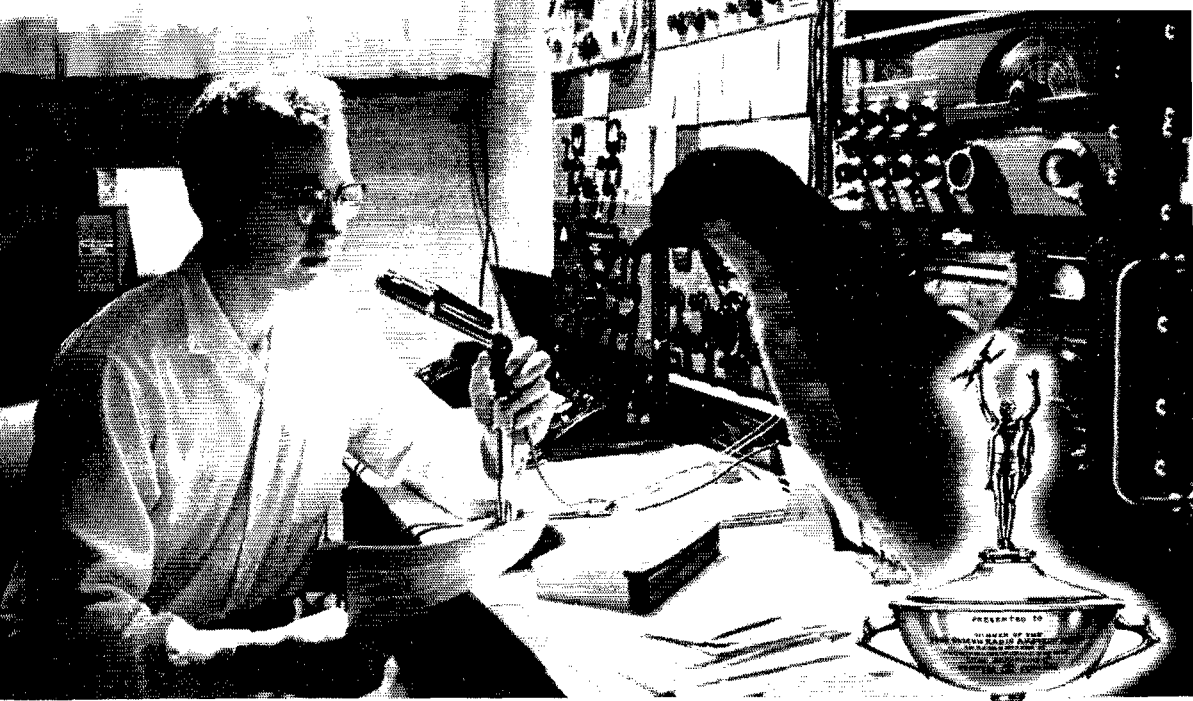
ADDRESS _____

CITY _____

ZONE _____

STATE _____

QUANTITY	KIT NAME	MODEL NO.	PRICE



1958 AWARD WINNER Julius M. J. Madey, K2KGJ, has handled more than 12,000 messages to and from persons at isolated U.S. Arctic, Antarctic, and South Pacific bases. The 18-year-old New Jersey amateur devotes an average of 90 hours weekly to this service. Several times he has sent or received official Navy and Coast Guard messages, and the Navy has publicly commended Madey for his work. Nominated by Mayor Jay A. Stemmer of Clark Township, New Jersey.



1959 Edison Award Nominations Now Open

The Edison Radio Amateur Award for 1959 will be your eighth opportunity to share in honoring an amateur who—like K2KGJ above—has rendered public service that reflects credit both on himself and his fellow hams.

The Award winner, as before, will be chosen by a committee of distinguished, impartial judges. They will make their selection only from names you and others have submitted by letter.

Your part, therefore, is vital. By nominating a suitable amateur, you will help make sure that the judges overlook no worthy candidate. See rules at right for help with your nominating letter! Mail it to *Edison Award Committee, General Electric Company, Electronic Components Div., Owensboro, Ky.*

RULES OF THE AWARD

WHO IS ELIGIBLE. Any man or woman holding a radio amateur's license issued by the F.C.C., Washington, D.C., who in 1959 performed a meritorious public service in behalf of an individual or group. The service must have been performed while the candidate was pursuing his hobby as an amateur within the limits of the United States.

WINNER OF THE AWARD will receive the Edison trophy in a public ceremony in Washington, D.C. Expenses of his trip to that city will be paid.

\$500 GIFT. Winner will be presented with a check for this amount in recognition of the public service he has rendered as a radio amateur.

WHO CAN NOMINATE. Any individual, club, or association familiar with the public service performed.

HOW TO NOMINATE. Include in a letter a full description of the service performed, as well as the candidate's name, address, and call letters. Your letter of

nomination must be postmarked not later than January 4, 1960.

BASIS FOR JUDGING. All entries will be reviewed by a group of distinguished and impartial judges. Their decisions will be based on (1) the greatest benefit to an individual or group, (2) the amount of ingenuity and sacrifice displayed in performing the service. The judges will be:

E. ROLAND HARRIMAN, Chairman, The American National Red Cross.

ROSEL H. HYDE, Commissioner, Federal Communications Commission.

GOODWIN L. DOSLAND, President, American Radio Relay League.

Winner of the Award will be announced on or before Thomas A. Edison's birthday, February 11, 1960.

Employees of the General Electric Company may nominate candidates for the Edison Radio Amateur Award, but are not permitted to receive the Award.

GENERAL  **ELECTRIC**

R-524-401

IS K6INI THE WORLD'S CHAMPION DX OPERATOR?

Judge for yourself! Read his letter and count the DX he has worked—with only 65 watts and a \$16.95 Gotham V-80 Vertical Antenna.

2405 Bowditch, Berkeley 4, California
January 31, 1959

GOTHAM
1805 Purdy Avenue
Miami Beach 39, Florida

Gentlemen:

I just thought I would drop you a line and let you know how pleased I am with your V-80 vertical antenna. I have been using it for almost two years now, and am positively amazed at its performance with my QRP 65 watts input! Let me show you what I mean:

I have worked over 100 countries and have received very fine reports from many DX stations, including 599 reports from every continent except Europe (589)! I have also worked enough stations for my WAC, WAS, WAJAD and ADXC awards, and I am in the process of working for several other awards. And all this with your GOTHAM V-80 vertical antenna!

Frankly, I fail to see how anyone could ask for better performance with such low power, limited space and a limited budget. In my opinion, the V-80 beats them all in its class.

I am enclosing a list of DX countries I have worked to give you an idea of what I have been talking about.

Wishing you the best for 1959, I am

Sincerely yours,
Thomas G. Gabbert, K6INI (Ex-TI2TG)

List of 105 countries/stations worked with 65 watts and a V-80 vertical

BV1US	KG4AI	VK3YL
CE3DZ	KG6FAE	VK9XK
ZL5AA	KH6IJ	VK9AT
CO2WD	KL7BUZ	VK8CJ
CN2BK	KM6AX	VP2KFA
CN8FB	KP4ACF	VP2AY
CR9AH	KP6AL	VP2DW
CT1CB	KR6BF	VP2MX
CX2FD	KS4AZ	VP2LU
DL1FF	KV4AA	VP2SW
DU7SV	KW6CA	VP5CP
EA1FD	KX6AF	VP5BH
EL4N	KZ3CS	VP6TR
F8VQ	LA3SG	VP7NM
FB8ZZ	LU2DFC	LU1ZS
FG7XE	LZ1KSP	VP9BK
FK8AL	OA4AU	VR2DA
FM7WT	OE9EJ	VR3B
FO8AD	OH2TM	V51HC
G3DOG	OK1FF	V52DW
GC8DO	ON4AY	V56LN
GI3WUI	KG1AX	XE1PJ
GM3GJB	OZ2KK	XW8AI
GW3LJN	PA8FAB	YN1JW
HA5KBP	PJ5AA	YU3FS
HC4IM	PJ2ME	YV5HL
HC8LUX	PY2EW	ZC5AL
HE9LAC	PY8NE	ZE1JV
HP1LO	SM5AQB	ZK1BS
II1MV	SP6BY	KH6MG/ZK1
JATANG	TI2LA	ZK2AD
JZ8HA	UA1AU	ZL1ABZ
W1AW	UA8KKB	ZL3JA
KB6BJ	UQ2AB	ZM6AS
KC4AF	VE8OJ	ZS1OU



FACTS ON THE GOTHAM V-80 VERTICAL

- If K6INI can do it, so can you.
- Absolutely no guying needed.
- Radials not required.
- Only a few square inches of space needed.
- Four metal mounting straps furnished.
- Special B & W loading coil furnished.
- Every vertical is complete, ready for use.
- Mount it at any convenient height.
- No relays, traps, or gadgets used.
- Accepted design—in use for many years.
- Many thousands in use the world over.
- Simple assembly, quick installation.
- Withstands 75 mph wind-storms.
- Non-corrosive aluminum used exclusively.
- Omnidirectional radiation.
- Multi-band, V80 works 80, 40, 20, 15, 10, 6.
- Ideal for novices, but will handle a Kw.
- Will work with any receiver and xmitter.
- Overall height 23 feet.
- An effective modern antenna, with amazing performance. Your best bet for a lifetime antenna at an economical price.

73,
GOTHAM

AN APPEAL TO INTELLIGENCE

A product that is consistently advertised in *QST* month after month, year after year, has to be good. Over 10,000 GOTHAM antennas have been purchased by *QST* readers. Even the "price-is-no-object" customers choose GOTHAM antennas on the basis of performance and value. Select your needs from this list of 50 antennas:

Airmail Order Today — We Ship Tomorrow

GOTHAM Dept. QST
1805 PURDY AVE., MIAMI BEACH, FLA.

Enclosed find check or money-order for:

TWO BANDER BEAMS

A full half-wave element is used on each band. No coils, traps, baluns, or stubs are used. No calculations or machining required. Everything comes ready for easy assembly and use. *Proven Gotham Value!*

6-10 TWO BANDER.....	<input type="checkbox"/>	\$29.95
10-15 TWO BANDER.....	<input type="checkbox"/>	34.95
10-20 TWO BANDER.....	<input type="checkbox"/>	36.95
15-20 TWO BANDER.....	<input type="checkbox"/>	38.95

TRIBANDER

Do not confuse these full-size Tribander beams with so-called midgets. The Tribander has individually fed (52 or 72 ohm coax) elements and is not frequency sensitive, nor does it have baluns, coils, traps, or other devices intended to take the place of aluminum tubing. The way to work multi-band and get gain is to use a Gotham Tribander Beam.

<input type="checkbox"/> 6-10-15	\$39.95	<input type="checkbox"/> 10-15-20	\$49.95
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2 METER BEAMS

Gotham makes only two different two meter beams, a six-element job and a twelve-element job. They are both Yagi beams, with all the elements in line on a twelve foot boom.

<input type="checkbox"/> Deluxe 6-Element	9.95	<input type="checkbox"/> 12-El	16.95
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6 METER BEAMS

New records are being made every day with Gotham six-meter beams. Give your rig a chance to show what it can do, with a Gotham six-meter beam.

<input type="checkbox"/> Std. 3-El Gamma match	12.95	<input type="checkbox"/> T match	14.95
<input type="checkbox"/> Deluxe 3-El Gamma match	21.95	<input type="checkbox"/> T match	24.95
<input type="checkbox"/> Std. 4-El Gamma match	16.95	<input type="checkbox"/> T match	19.95
<input type="checkbox"/> Deluxe 4-El Gamma match	25.95	<input type="checkbox"/> T match	28.95

10 METER BEAMS

Ten meter addicts claim that ten meters can't be beaten for all-around performance. Plenty of DX and skip contacts when the band is open, and 30-50 miles consistent ground wave when the band is shut down. Thousands of Gotham ten meter beams have been perking for years, working wonders for their owners, and attesting to the superior design and value of a Gotham beam.

<input type="checkbox"/> Std. 2-El Gamma match	11.95	<input type="checkbox"/> T match	14.95
<input type="checkbox"/> Deluxe 2-El Gamma match	18.95	<input type="checkbox"/> T match	21.95
<input type="checkbox"/> Std. 3-El Gamma match	16.95	<input type="checkbox"/> T match	18.95
<input type="checkbox"/> Deluxe 3-El Gamma match	22.95	<input type="checkbox"/> T match	25.95
<input type="checkbox"/> Std. 4-El Gamma match	21.95	<input type="checkbox"/> T match	24.95
<input type="checkbox"/> Deluxe 4-El Gamma match	27.95	<input type="checkbox"/> T match	30.95

New! Ruggedized Hi-Gain 6, 10, 15 METER BEAMS

Each has a TWIN boom, extra heavy beam mount castings, extra hardware and everything needed. Guaranteed high gain, simple installation and all-weather resistant. For 52, 72 or 300 ohm transmission line. Specify which transmission line you will use.

<input type="checkbox"/> Beam #R6 (6 Meters, 4-El)...	\$38.95
<input type="checkbox"/> Beam #R10 (10 Meters, 4-El)...	40.95
<input type="checkbox"/> Beam #R15 (15 Meters, 3-El)...	49.95



15 METER BEAMS

Fifteen meters is the "sleeper" band. Don't be surprised if you put out a quick, quiet CQ and get a contact half-way around the world. Working the world with low power is a common occurrence on fifteen meters when you have a Gotham beam.

15 METER BEAMS

<input type="checkbox"/> Std. 2-El Gamma match	19.95	<input type="checkbox"/> T match	22.95
<input type="checkbox"/> Deluxe 2-El Gamma match	29.95	<input type="checkbox"/> T match	32.95
<input type="checkbox"/> Std. 3-El Gamma match	26.95	<input type="checkbox"/> T match	29.95
<input type="checkbox"/> Deluxe 3-El Gamma match	36.95	<input type="checkbox"/> T match	39.95

20 METER BEAMS

A beam is a necessity on twenty meters, to battle the QRM and to give your signal the added punch it needs to over-ride the high power boys. Hundreds and hundreds of twenty meter beams, working year after year, prove that there is no better value than a Gotham twenty meter beam.

<input type="checkbox"/> Std. 2-El Gamma match	21.95	<input type="checkbox"/> T match	24.95
<input type="checkbox"/> Deluxe 2-El Gamma match	31.95	<input type="checkbox"/> T match	34.95
<input type="checkbox"/> Std. 3-El Gamma match	34.95	<input type="checkbox"/> T match	37.95
<input type="checkbox"/> Deluxe 3-El Gamma match	46.95	<input type="checkbox"/> T match	49.95

(Note: Gamma-match beams use 52 or 72 ohm coax. T-match beams use 300 ohm line.)

ALL-BAND VERTICAL ANTENNAS

<input type="checkbox"/> V40 vertical for 40, 20, 15, 10, 6 meters	\$14.95
<input type="checkbox"/> V80 vertical for 80, 75, 40, 20, 15, 10, 6 meters.	\$16.95
<input type="checkbox"/> V160 vertical for 160, 80, 75, 40, 20, 15, 10, 6 meters.....	\$18.95

Gotham Antenna Company
 1805 Purdy Ave.
 Miami Beach 39
 Fla.

J. E. Bloomus
 209 N. 83rd Ave. NW
 Enumclaw, Wash.

Dear Sir:

While I was in Enumclaw I purchased a Gotham V-80 antenna and took it back to Tibet with me. On my way back I stopped off at Tokolau (ZM7) and was on the air for two days and worked many other stations all over the world with 25 watts. I was very surprised at the strength of one station whom I worked. This was W7PHO, who I later found out was using a Gotham vertical. I received very loud reports from all over the world from here.

I went to Tibet and used the V-80 on all bands and got excellent reports from W stations. I have never called a CQ yet and not had quite a large number of stations calling me. This was true at ZM7C as well as AC4AZ. Here in Tibet I heard W7PHO again on 20 meters using his V-80. He is running 100 watts and was the loudest signal on the band.

I am very pleased with all of my results and certainly hope that you can encourage your patrons to use it even more by reproducing this letter as an excellent recommendation.

Sincerely,

J. E. Bloomus
 EK ZM7C - AC4AZ

HOW TO ORDER. Send check or money order directly to Gotham. Immediate shipment by Railway Express, charges collect. Foreign orders accepted.

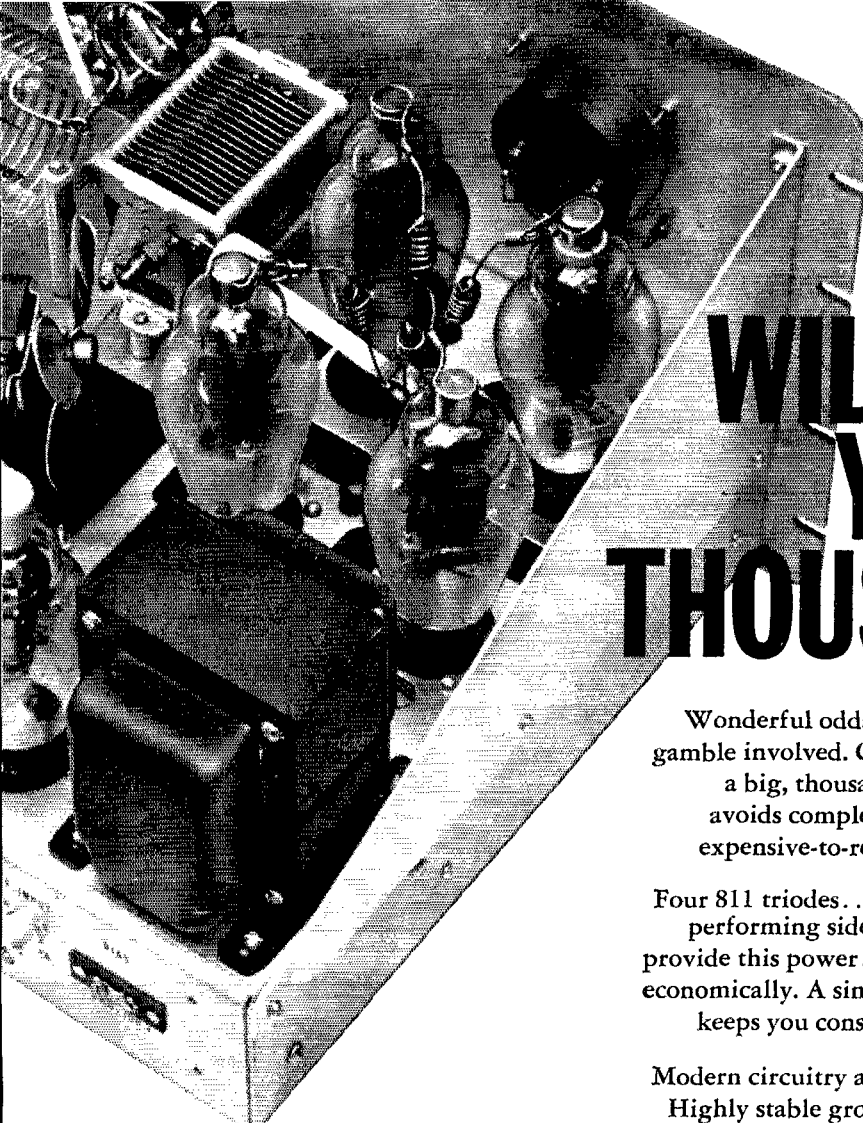
FREE! FREE! FREE!

Valuable catalog of 50 different antennas, with specifications and characteristics. Gives bands and frequencies covered, element information, size of elements, boom lengths, power and decibel gain figures, weight, feed line used, polarization, and other valuable information. Send card today!

Name.....

Address.....

City.....Zone.....State.....



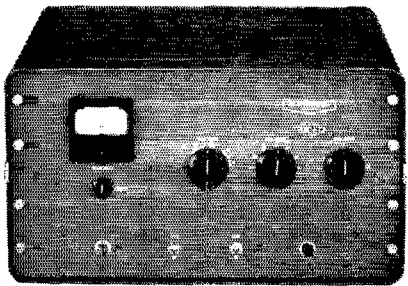
FOUR WILL GET YOU A THOUSAND!

Wonderful odds certainly. But no gamble involved. GSB-101 gives you a big, thousand watts P.E.P.—avoids completely, any need for expensive-to-replace large tubes.

Four 811 triodes . . . well-proved, top performing sideband veterans . . . provide this power . . . conservatively, economically. A single low-cost spare keeps you constantly in business.

Modern circuitry adds further value. Highly stable grounded-grid linear amplifier doesn't waste drive power in swamping, lets it appear as useful talk power in amplifier output circuit. (Drive requirement, 60-70 watts, ideally supplied by Gonset GSB-100.)

Operation on 80-40-20-15-10 meters . . . full bandswitching of course. Heavy-duty power supply with 2-866A's and bias supply built-in. Operating conveniences include, quiet, DC-operated antenna relay, indicator for constant check on output.



GSB-101 LINEAR AMPLIFIER.

Unquestionably, your biggest power-for-dollar value!

439.50

*Watch for the new
Gonset Mobile SSB!*



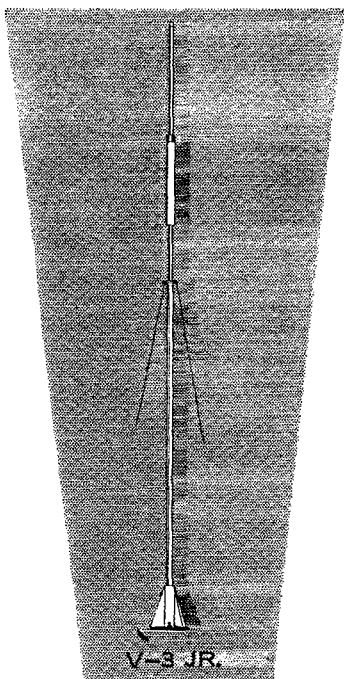
GONSET

Division of Young Spring & Wire Corporation
801 SOUTH MAIN ST., BURBANK, CALIFORNIA

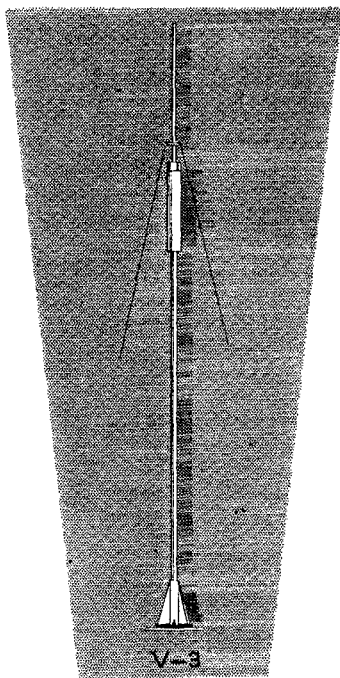
EXPORT SALES: WESTREX CORP., 111 EIGHTH AVE., NEW YORK 11, N.Y.

on this page you will find . . .

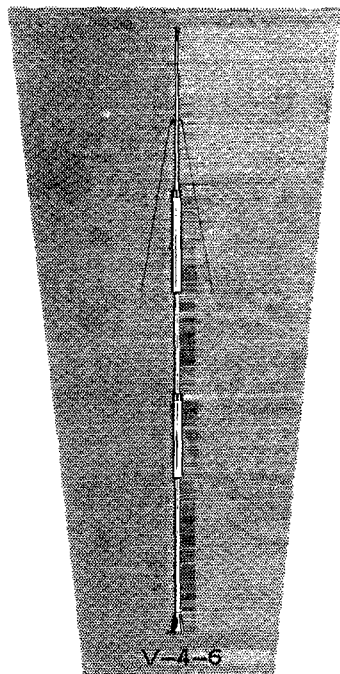
Your Antenna



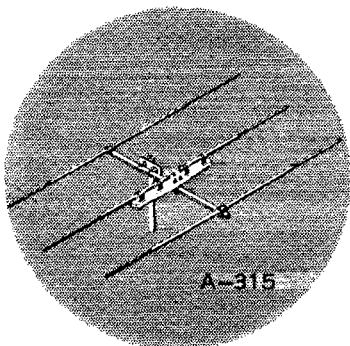
V-3 JR.



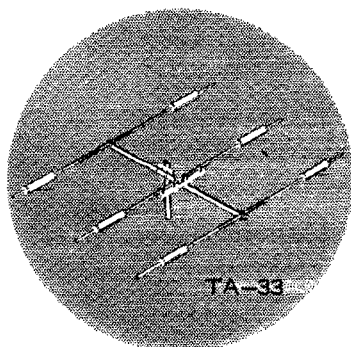
V-3



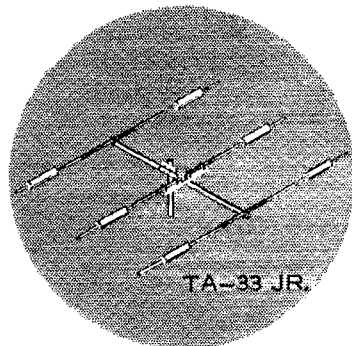
V-4-6



A-315



TA-33



TA-33 JR.

There is a MOSLEY Antenna to suit every Amateur's need! Whether you choose a beam or a vertical; whether you're a DX'er, a Net Operator, a "rag-chewer" or a VHF fan - join the thousands of Hams all over the world who are *glad* they chose MOSLEY!

You hear it on the bands . . . "A MOSLEY Antenna can't be beat!"

Turn the page to find listed a Distributor within driving distance who can supply *from stock* the MOSLEY Antenna of your choice.

Mosley Electronics, Inc.

St. Louis 14, Missouri

129

WHERE TO BUY YOUR MOSLEY ANTENNA

The Distributors shown here are STOCKING Mosley Antennas and will give you prompt, courteous service. Drive in today—drive home with your MOSLEY Antenna!

To qualify for this listing, each Distributor must carry in stock a variety of MOSLEY Antenna models. Every effort has been made to compile a complete and accurate list. We offer our sincere apology to any qualified Distributor inadvertently omitted.

ALABAMA

Birmingham—Ack Radio Supply Co.
Huntsville—Curle Radio Supply Co.

ALASKA

Anchorage—Alaskan Electronics Supply, Inc.
Yukon Radio Supply, Inc.

ARIZONA

Phoenix—Acme Electronics
Radio Parts of Arizona
Tucson—Elliot Electronics

ARKANSAS

Texarkana—Lavender Radio and TV Supply, Inc.

CALIFORNIA

Berkeley—Electronics Suppliers
Burbank—Valley Electronics Supply Co.
Long Beach—Larry Lynde
Scott Radio Co.
Los Angeles—Henry Radio, Inc.
Radio Product Sales, Inc.
North Hollywood—Woody's
Palo Alto—Zack Radio Supply
Pasadena—Dow Radio, Inc.
Riverside—Mission Ham Supplies
San Diego—Western Radio & TV Supply Co.
San Francisco—Fortune Electronics, Inc.
Northern Calif. Amateur Supply
San Francisco Radio Supply

San Jose—Quement Inc.
Vallejo—Electronics Wholesale Co.
Van Nuys—Valley Electronic Supply Co.

COLORADO

Denver—Radio Products Sales Co.
Rogers Radio Company

CONNECTICUT

Hartford—Harty of Hartford, Inc.
New Haven—Radio Shack of Connecticut

DISTRICT OF COLUMBIA

Washington—Electronic Wholesalers, Inc.

FLORIDA

Cocoa—Thurow Distributors
Daytona Beach—Thurow Distributors
Ft. Lauderdale—Vance Baldwin, Inc.
Jacksonville—Peard Electronic Supply
Miami—Walder Radio & Appliance Co.
Pensacola—Grice Radio Electronics, Inc.
Tampa—Kinkade Radio Supply, Inc.

GEORGIA

Albany—Specialty Distributing Co.
Atlanta—Ack Radio Supply Co.
Specialty Distributing Co.
Augusta—Specialty Distributing Co.
Columbus—Specialty Distributing Co.
Macon—Specialty Distributing Co.
Savannah—Specialty Distributing Co.
Valdosta—Specialty Distributing Co.

HAWAII

Honolulu—Kaimuki Radio Co.
Precision Radio, Ltd.
Radio Wholesale & Supply Co.

IDAHO

Idaho Falls—Moore Radio Supply, Inc.
Schwendiman Distributing Co.

ILLINOIS

Alton—Ebinger Radio, Inc.
Chicago—Allied Radio Corp.
Green Mill Radio Supply
Newark Electric Co.
Moline—Lofgren Distributing Co.

Peoria—Klaus Radio and Electric Co.
Selectronic Supplies, Inc.
Rockford—H & H Electronic Supply, Inc.

INDIANA

Angola—Lakeland Radio Supply
Evansville—Castrup's Radio Supplies
Fort Wayne—Brown Electronics, Inc.
Gary—Walker-Jimieson, Inc.
Indianapolis—Graham Electronics Supply, Inc.
Van Sickle Radio Supply Co.
Kokomo—George's Electronic Supplies
Portland—Bucks Radio and TV Supplies
South Bend—Radio Distributing Co., Inc.

IOWA

Cedar Rapids—Ken-Els Radio Supply
Council Bluffs—World Radio Laboratories, Inc.
Davenport—TCR Distributors
Des Moines—Bob & Jack's Store for Hams
Fort Dodge—Ken-Els Radio Supply Co.
Sioux City—Molstad Distributing Company, Inc.

KANSAS

Wichita—Amateur Radio Equipment Co., Inc.

KENTUCKY

Louisville—Universal Radio Supply Co.

LOUISIANA

Baton Rouge—Davis Electronic Supply Co., Inc.
Lafayette—Butcher Dist. Corp.
Lake Charles—Wholesale Radio Equipment
New Orleans—Radio Parts, Inc.

MARYLAND

Baltimore—Amateur Radio Center
Silver Spring—Uncle George's Radio Ham Shack

MASSACHUSETTS

Boston—Cramer Electronics, Inc.
DeMambro Radio Supply
Radio Shack Corporation
Lawrence—Alco Electronics

MICHIGAN

Ann Arbor—Purchase Radio Supply
Detroit—M. N. Duffy & Co., Inc.
Ferndale—Erickson's Electronic Wholesale, Inc.
Flint—Radio Tube Merchandising Co.
Grand Rapids—Radio Parts, Inc.
Jackson—Matteson Electronics, Inc.
Kalamazoo—Warren Radio Company
Laurim—Northwest Radio of Michigan
Marquette—Northwest Radio of Michigan

MINNESOTA

Duluth—Northwest Radio
Minneapolis—Electronic Center, Inc.
Lew Bonn Company
Rochester—Elliot and Hanson Co.
St. Paul—Gopher Electronics Co.
Hall Electric Company

MISSISSIPPI

Jackson—Swan Distributing Co., Inc.

MISSOURI

Butler—Henry Radio Company
Kansas City—Associated Electronics Supply Co.
St. Louis—Walter Ashe Radio Co.
Springfield—X-Ray Electronic Supply, Inc.

MONTANA

Billings—Electronic Supply Company
Great Falls—Modern Equipment Company

NEBRASKA

Omaha—Ladd Electronics Company

NEW HAMPSHIRE

Concord—Evans Radio, Inc.

WHERE TO BUY YOUR MOSLEY ANTENNA (continued)

NEW JERSEY

Bloomfield—Variety Electronics Corp.
Mountainside—Federated Purchaser, Inc.
Newark—Hudson Radio & TV Corp.
Passaic—Nidisco-Passaic
Ridgefield Park—N. R. M. Wholesale Radio, Inc.

NEW MEXICO

Albuquerque—Electronic Parts Co., Inc.
Santa Fe—A-1 Communications Supply Co.

NEW YORK

Albany—Fort Orange Radio Dist. Co., Inc.
Brooklyn—National Radio Parts Distg. Co.
Buffalo—Genesee Radio & Parts Co., Inc.
Radio Equipment Corp.
Elmira—Chemung Electronics
Hempstead—Standard Parts Corp.
Jamaica—Harrison Radio Corp.
Lafayette Radio
Long Island City—Spera Electronic Supply
Mineola—Arrow Electronics, Inc.
New York City—Arrow Electronics, Inc.
Harrison Radio Corp.
Harvey Radio Company, Inc.
Hudson Radio & TV Corp.
Midway Radio & TV Corp.
Milo Electronics Corp.
Terminal Radio Corp.

Rochester—Rochester Radio Supply Co., Inc.
Syracuse—Morris Distributing Co., Inc.
Utica—Associated Electronics Supply
Grapac Electronics Co.
White Plains—Melville Radio Corp.

NORTH CAROLINA

Asheville—Freck Radio Supply Co.
Charlotte—Dixie Radio Supply Co., Inc.

NORTH DAKOTA

Fargo—Fargo Radio Service Co.

OHIO

Akron—Warren Radio Company
Canton—Burrughs Radio Co., Inc.
Cincinnati—Steinberg's, Inc.
Cleveland—Pioneer Electronics Supply Corp.
Radio and Electronic Parts Corp.
Columbus—Universal Service
Dayton—Custom Electronics, Inc.
Toledo—H & W Auto Accessories
Selectronics Supplies, Inc.
Warren—D and J Electronic Supply Co., Inc.
Youngstown—Armies Electronics

OREGON

Albany—Oregon Ham Sales
Portland—Portland Radio Supply
United Radio Supply

PENNSYLVANIA

Allentown—A. A. Peters, Inc.
Bristol—Powell Electronic Sales Co.
Elkins Park—A G Radio Parts Co.
Erie—Erie Electronic Supply Co.
Harrisburg—Radio Distributing Company
Philadelphia—Almo Radio Company
Consolidated Radio Co.
Radio Electric Service Co.
Pittsburgh—Cameradio Company
Reading—George D. Barbey Co., Inc.
Wilkes-Barre—Shelborne Electronics, Inc.

RHODE ISLAND

Newport—N. F. Andrews Elect. Supply Corp.
Providence—DeMambro Radio Supply

SOUTH DAKOTA

Rapid City—Burghardt Radio Supply, Inc.
Watertown—Burghardt Radio Supply, Inc.

TENNESSEE

Chattanooga—Curle Radio Supply Co.
Specialty Distributing Co.
Memphis—Bluff City Distributing Co.
W & W Distributing Co.
Nashville—Electra Distributing Co.

TEXAS

Dallas—Central Electronics
Crabtree's Whsle Radio & TV
Fort Worth—Bill Sutton's Whsle Electronics
Houston—Busacker Electronics Equipmt Co., Inc.

UTAH

Salt Lake City—Manwill Supply Company
Standard Supply Company

VIRGINIA

Arlington—Key Electronics
Norfolk—Priest Electronics, Inc.

WASHINGTON

Everett—Pringle Radio Whsle Co.
Seattle—Amateur Radio Supply, Inc.
Pacific Electronic Sales
Seattle Radio Supply
Spokane—Northwest Electronics, Inc.
Tel-Electric Distributing, Inc.
Tacoma—C & G Radio Supply

WEST VIRGINIA

Bluefield—Meyers Electronics, Inc.
Charleston—Hicks Radio Supply

WISCONSIN

Appleton—Valley Radio Distributors
Fond Du Lac—Harris Radio Corp.
Kenasha—Chester Electronic Supply Co.
Madison—Satterfield Electronics, Inc.
Milwaukee—Amateur Electronic Supply

CANADA

ALBERTA

Calgary—Sacker Electronics Co., Ltd.
Smalley's Radio, Ltd.
Edmonton—Canadian Electronics, Ltd.
Taylor, Pearson & Carson, Ltd.

BRITISH COLUMBIA

Vancouver—Taylor, Pearson and Carson, Ltd.
The Ham Shack
Hygrade Radio, Ltd.
Western Agencies, Ltd.
Victoria—Ellison Queale Radio Supply, Ltd.
Western Agencies, Ltd.

MANITOBA

Winnipeg—Cam Gard Supply, Ltd.
Sparling Sales, Ltd.
Western Sound Services, Ltd.

NEW BRUNSWICK

St. John—Eastern Distributors, Ltd.

NEWFOUNDLAND

St. John's—Electronic Centre, Ltd.

ONTARIO

Brantford—Brant Electronics, Ltd.
Downsview—Alpha-Aracon
Fort William—Inter-Com Supply
Hamilton—Crawford Radio
London—C. M. Peterson Co., Ltd.
Ottawa—George A. Lafleur Radio Co.
Toronto—Electro-Sonic Supply Co., Ltd.
Windsor—Adams Electronics-Windsor, Ltd.

QUEBEC

Montreal—Payette Radio, Ltd.

SASKATCHEWAN

Regina—Radio Supply and Service, Ltd.
Saskatoon—A. A. Murphy and Sons, Ltd.
Radio Supply Co., Ltd.

OVERSEAS AMATEURS—MOSLEY Antennas are stocked by many Distributors throughout the world. For name of nearest supplier, write: MOSLEY ELECTRONICS, Inc., International Division, 15 Moore St., New York 4, N. Y. or: MOSLEY Electronics, Ltd., 15 Reepham Rd., Norwich, Norfolk, England.

Mosley Electronics, Inc.

SAINT LOUIS 14, MISSOURI

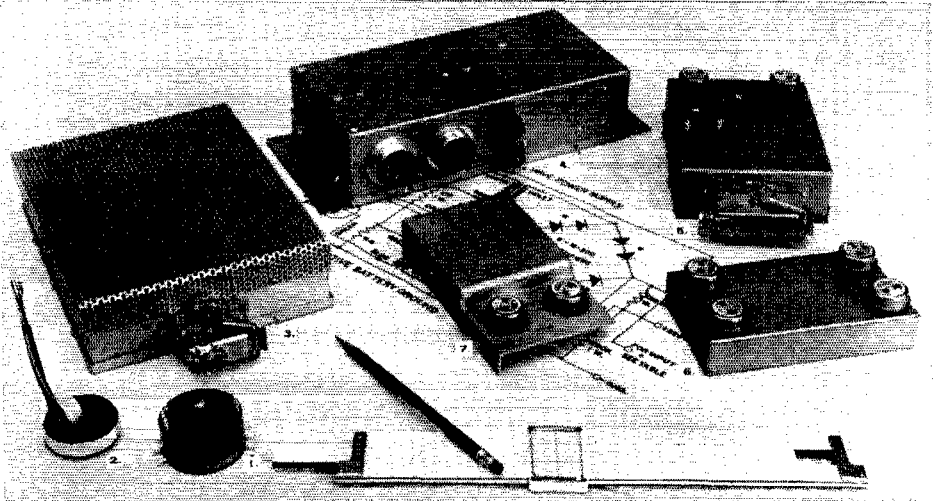
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Custom Power Supplies and Transformers

SUNAIR has expanded its staff and plant facilities to give you the advantages of special power supplies and transformers. SUNAIR will design to your requirements, manufacture to your specifications, and conform with Military specifications. Pictured below are a few of the many special items SUNAIR has designed and manufactured.



KEY:

1. Encapsulated toroid supplied manufacturer of FM Mobile Units.
2. Unencapsulated toroid used for missile telemetering device.
3. Multiple voltage transistor power supply unit designed and manufactured for Military Agency. 12 VDC input, 400 VDC @ 200 ma, 250 VDC @ 200 ma, 200 VDC @ 200 ma, 150 VDC @ 200 ma, -60 VDC @ 100 ma, 5 VDC @ 6 amps, 3 VDC @ 3 amps, all simultaneous.
4. Dynamotor replacement used on famous SUNAIR HF transceiver, 500 VDC @ 250 ma, 250 VDC @ 100 ma simultaneous outputs.
5. Power Supply. Power unit used on microwave surveying device. 260 VDC @ 60 ma, -235 VDC @ 15 ma, 6.1 VDC @ 3 amps, 6.3 VAC @ 1 amp.
6. DC-DC Converter. 100 watt. Output voltage to 500 v. maximum. Available in 6 v., 12 v. or 24 v. input.
7. DC-AC Converter. 400 cps, 115 v., 1.5 amp AC output. Available in 12 v. or 24 v. input.

Choose SunAir To Meet Your Requirements . . .

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SUNAIR ELECTRONICS, INC.
BROWARD COUNTY INTERNATIONAL AIRPORT
FORT LAUDERDALE, FLORIDA, U.S.A.

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SUNAIR

for QUALITY!

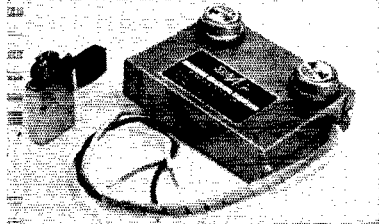
Utility Transistor Power Supplies*

NOTE: ALL ITEMS ON THIS PAGE ARE NORMALLY AVAILABLE FROM STOCK

D SERIES (Standard)

*Complete Units

Continuous operation at 30 watts. Selective taps at 200, 250 and 300 volts; intermediate voltage at 1/2 selective taps. Both voltages can be drawn simultaneously if total power does not exceed continuous ratings. Positive or negative ground operation. Input and output filtering included except for intermediate tap. Size: 4 3/8" x 3 1/4" x 1 1/8". Wt.: 10 oz. 6- or 12-V Input: **\$39.95** 24-V Input: **\$61.95**



DA SERIES

Continuous operation at 45 watts. 450 volts and 225 volts simultaneous if total power does not exceed continuous ratings. Intermittent duty to 90 watts, 450 volts at 150 MA, 225 volts at 100 MA (5 min. on, 20 min. off). Positive or negative ground operation. Input (primary voltage) filtering; partial high voltage filtering provided. Size: 4 3/8" x 3 1/4" x 1 1/8". Wt.: 14 oz. 6- or 12-V Input: **\$57.50** 24-V Input: **\$79.50**

Toroid Transformers for Transistor Power Supply Application

H SERIES

H-6-450-1 Input: 6-VDC. Output: 450-VAC center tapped... 450 and 225 VDC from bridge rectifier ... 45 watts.

H-14-450-12 Input: 12/14-VDC. Output: 450-VAC center tapped... 450 and 225-VDC from bridge rectifier... 55 watts.

H-28-450-15 Input: 24/28-VDC. Output: 450-VAC center tapped... 450 and 225-VDC from bridge rectifier... 65 watts.

H-6-100-125-150-D Input: 6-VDC. Output: Voltage doubler configuration. Secondary tapped for either 100, 125 or 150-VAC. DC Output: 200, 250 or 300-V at 100 MA.

H-12-100-125-150-D Input: 12/14-VDC. Output: Voltage doubler configuration. Secondary tapped for either 100, 125 or 150-VAC. DC Output: 200, 250 or 300-V at 125 MA.

H-24-100-125-150-D Input: 24/28-VDC. Output: Voltage doubler configuration. Secondary tapped for either 100, 125 or 150-VAC. DC Output: 200, 250 or 300-V at 150 MA. Without Encapsulation (2 ozs.) 1 - 10 units: **\$12.00** ea. With Encapsulation (3 ozs.) 1 - 10 units: **\$14.50** ea.



Secondary tapped 300-V at 150 MA. Without Encapsulation (2 ozs.) 1 - 10 units: **\$12.00** ea. With Encapsulation (3 ozs.) 1 - 10 units: **\$14.50** ea.

HD SERIES - 2000 CPS

HD-14-225-300-2-D Input: 12/14-VDC. Output: Voltage doubler configuration. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 200 MA.

HD-28-225-300-2-D Input: 24/28-VDC. Output: Voltage doubler configuration. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 200 MA.

Without Encapsulation (3 1/2 ozs.). 1 - 10 units: **\$14.50** ea.

With Encapsulation (4 1/2 ozs.). 1 - 10 units: **\$17.00** ea.

HDS SERIES - 2000 CPS

HDS-14-225-300-3-D Input: 12/14-VDC. Output: Voltage doubler configuration. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 300 MA.

HDS-28-225-300-3-D Input: 24/28-VDC. Output: Voltage doubler configuration. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 300 MA.

Without Encapsulation (3 1/2 ozs.). 1 - 10 units: **\$17.00** ea.

With Encapsulation (4 1/2 ozs.). 1 - 10 units: **\$19.50** ea.

400 CYCLE SERIES

14-115-1.5-400 Input: 12/14-VDC. Output: 115-V at 1.5 amp.

Dim: 3" dia. x 1" thick. Without Encapsulation (12 ozs.).

24-115-1.5-400 Input: 24/28-VDC. Output: 115-V at 1.5 amp.

With Encapsulation (16 ozs.). Per Unit: **\$57.00.**

SUNAIR

OEM Prices on Request

All fully performance tested, 100% guaranteed. Manufactured by makers of world-famous SUNAIR H.F. Aviation Transceivers.

SUNAIR ELECTRONICS, INC.

BROWARD COUNTY INTERNATIONAL AIRPORT
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**"CALL ME
for
Personal Service"**

ON

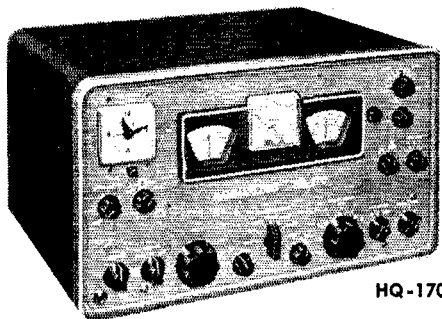


Bob Henry
W0ARA
Butler, Mo.



Ted Henry
W6UOU
Los Angeles

HAMMARLUND



HQ-170

Single Sideband at Its Very Best!

Triple conversion HQ-170 • 20 monthly payment \$17.77. \$35.90 down. CASH PRICE \$359.00. Radio amateur's ideal for modern SSB reception in performance, tuning techniques, dependability. Clock timer \$10 extra.

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HQ-145 RECEIVER	\$269.00
HQ-110 RECEIVER	249.00
HQ-160 RECEIVER	379.00
HQ-100 RECEIVER	189.00
MATCHING SPEAKER	14.95
CLOCK TIMER	10.00

Complete stock of all transmitters, receivers, antennas, rotators, towers, parts, accessories, equipment. Henry has ALL the new equipment first.

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Station Activities

(Continued from page 114)

OPH operated Field Day from the top of Whiteface on 2 meters. K2TLJ is pres.; K2DJA, treas.; K2UYM, secy. K2QPC reports much DX activity on 6 meters with ten new states worked. W2MTA reports that the AWTAR Powder Puff Derby received the assistance of Broome County AREC, including W2NEF, W2OW, W2YLM, K2-CWD, K2OYX, K2QJZ, K28VU, K2YYF, K2UNY, W2MTA, W2EOW and W2VDX. K2UJZ has a new Apache. Plan to attend the Fifth Annual V.H.F. Roundup to be held by the Syracuse V.H.F. Club at Three Rivers Inn on Oct. 10. Contact W2OQY for details. This is a must for v.h.f.ers. I never miss this one. WA2BEU is running a DX-20 with UM-1 and VF-1 on all bands. Congratulations to the Corning ARA on its ARRL affiliation. W2EAW reports 227 confirmed. He has never used a beam! W2SB reports that the clubrooms are coming along fine at the N. Chantauqua RC. WA2DNK now is on RTTY. That husky 150 watts is getting k2QFZ around. K2KTK reports that the new DX-100 and DX-99 perform beautifully. WA2AEA, K2UOQ, K2PGL, WA2ADZ and K2UOP all passed the General Class exam. K2AGC is organizing RACES on 50.7 Mc. in Schuyler Co. They are home-brewing transceivers. K2UOP has a new Challenger. Erie County CD has two KWM-1s to go with the KWS-1 and 75A-4. Your SCM would like to hear from all who are interested in Radio Control, especially at 220 Mc. W2ICZ has a six-element Telrex beam (full size) on 15 meters. K2LGJ has a Pacemaker on s.s.b. Traffic: (July) K2SSX 263, W2EZB 262, W2RUF 101, K2UJZ 94, W2TPD 93, K2IYP 58, W2DSS 43, K2JBX 40, W2ZRC 34, K2RYT 26, W2BKC 22, K2OPU 21, WA2BEU 13, W2PVI 12, K2RWV 10, W2MTA 8, W2EMW 1, K2KTK 1, (June) W2EZB 166, K2UJZ 89, W2MTA 24, K2MEF 22, K2BCL 10.

WESTERN PENNSYLVANIA—SCM, Anthony J. Mroczka, W3UHN—SEC: OMA, RMs: GEG, NUG and LXU, PAM: AER. The WPA Traffic Net meets Mon. through Fri. at 1900 EST on 3585 kc. The Penna. Fone Net meets Mon. through Fri. at 1800 EST on 3850 kc. GEG has taken a job in Ohio and shortly will be moving into 8-Land. Success at your new QTH. Clyde, NUG and UL, with the XYLs, motored to Texas for the National Convention. WRE gave an interesting talk on amateur radio to the Johnstown Lion's Club. A new licensee in New Castle is K3IZP. CA got DXCC 200 and WAZ. AJN is in the Veterans Hospital. KN3GHH received his 20-w.p.m. CP. OEZ is in the hospital. The Radio Assn. of Erie's Hamfest held on the Peninsula was a success. The Etna RC reports via *Oscillator* that the club participated in Field Day at North Park. New officers of the Breeze Shooters' Net are: TVW, pres.; GEN, secy.-treas.; BEX, checker; SIR, ZWI and NKM wind gaggers. K3GVW just recently installed a 70-ft. tower. The Washington County ARC still is very active holding meetings regularly with food as a side dish. K3AFZ is the new sector Radio Officer in Westmoreland County. K3ABN is moving to Virginia. GJY again will present a trophy to the highest scoring station (phone or c.w.) during the forthcoming ARRL Sweepstakes. The trophy, designated as the "Francis B. Burke, W3AAX Memorial Award," is being presented to honor the memory of one of Western Pennsylvania's outstanding amateurs who passed away suddenly during 1959. The award will be presented to the highest scoring "single operator" station who qualifies under the operating standards as defined by the League and scores as listed in final tabulations in QST will decide the ultimate winner. Traffic: K3CLX 238, ICN 51, W3KUN 43, KN3ESO 9, W3WRE 8, K3COT 5.

CENTRAL DIVISION

ILLINOIS—SCM, Edmond A. Metzger, W9PRN—Asst. SCM: Grace V. Ryden, 9GME, SEC: HOA, RM: PCQ, PAM: RYU. EC Cook County: HPG. Section net: ILN, 3515 kc. Mon. through Sat. on 1900 CST. PCQ reports that the ILN cleared 119 messages in 17 sessions during the month and the North Central Phone Net traffic count was 237. UJ has returned from the South Pacific Islands and has been showing the gang colored slides of his trip. The v.h.f. gang reports that the 6-meter opening in July resulted in some FB DX on this band. K9KEJ has a new Mosley on top of a 35-ft. tower and is waiting for the tough DX. MAK is back from his vacation and is getting his gear ready for the fall operating. SKR is working on his new final amplifier and should be on the air by the time this column is in print. DGW and K9IDN are new converts to 2 meters and have been chalking up fine scores, while K9JXO is raising his 2-meter beam higher to compete with them. K9LTN is now mobile on 6 meters. Belvidere has five new hams: KN9REV, KN9SSY, K9QFS, K9-

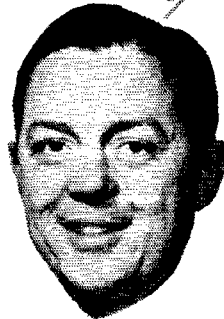
(Continued on page 136)

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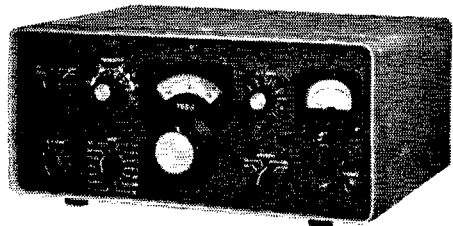
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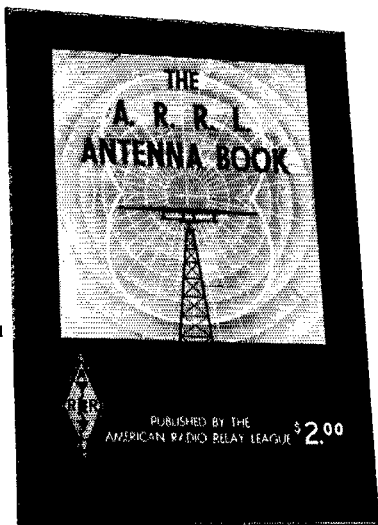


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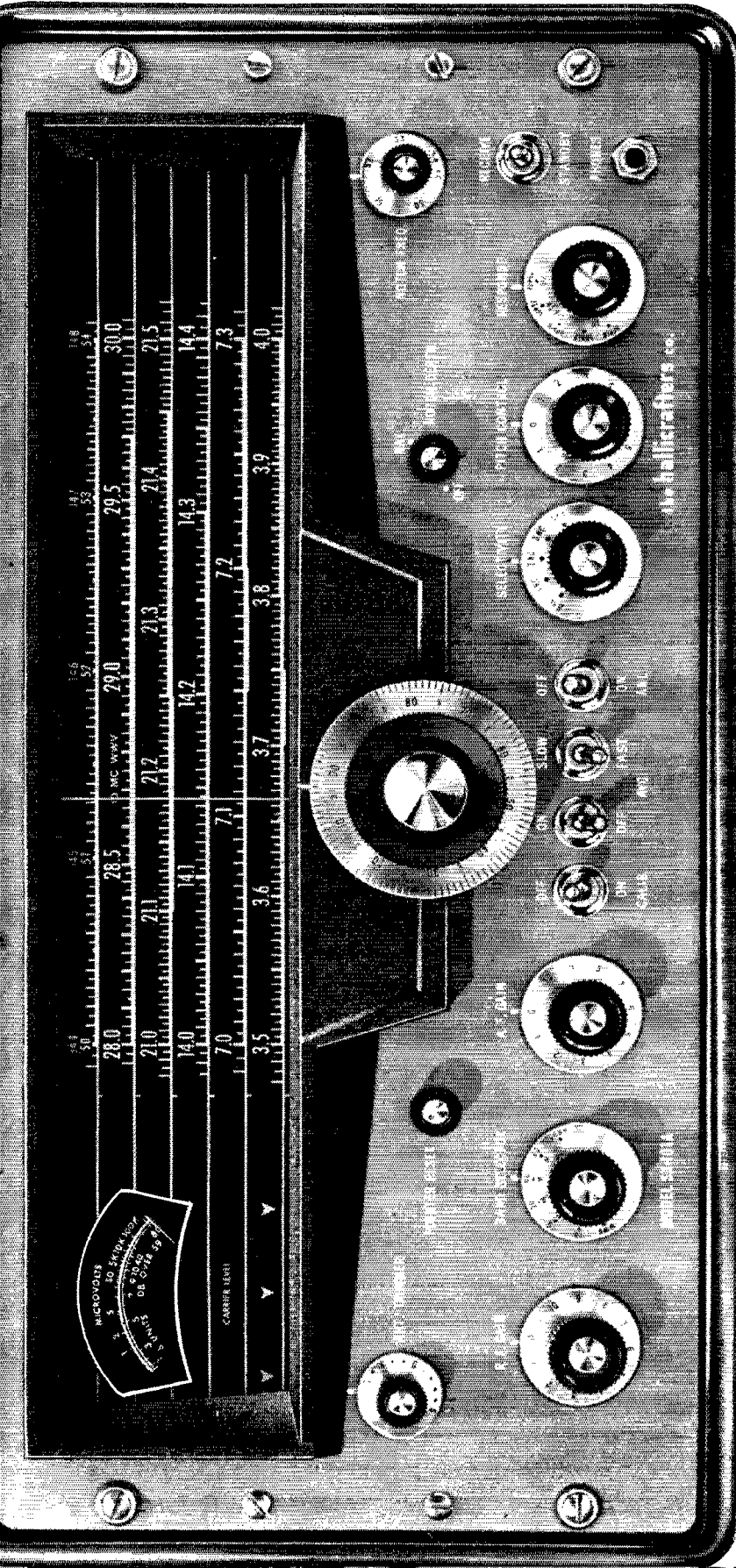
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QOT and K9QPG, HOA is purchasing new equipment for the Rockford Red Cross station, RGU. New Novice calls heard were KN9SBD, KN9SJS, KN9SPW, and KN9SZX. K9JUA wants working schedules on 2-meter c.w. in Nebraska and New York. The Hamfesters' (Chicago) recent hamfest was one of its largest and Director Doyle, GPI, was among those present as well as your SCM. The *Ham Club* had an FB article praising LNQ in its latest issue. LNQ was the originator of this fine club bulletin. K9KPM is now on the air with 420-Mc. TV transmitter equipment. K9EID has received his WAS on 6 meters. PCQ and TZN were high scorers on the last Frequency Measuring Tests. PBV, YOK, K9-JAW, TLC and EU are all on teletype. VOK also has been appointed Civil Defense Director for Ottawa. K9MWA has completed his new Apacite and is working the hard skeds. Reports are still coming in to this writer commenting on the fine time had by all at the combined Central-Midwest Convention held in St. Louis. It was a pleasure meeting with the gang and all the League Officials and appointees present. KN9PXW underwent surgery and is on the road to recovery. VZP has completed his 40-zone contact by working FB8XX, ZFN and REY are renovating the Starved Radio Club ham shack. Traffic: (July) K9AIR 1992, W9DO 1548, USR 347, MAK 198, FAY 112, K9CWT 62, PLE 58, W9PCQ 53, SXL 48, BLTU 43, W9LGH 23, K9CIL 20, W9BU 14, YBV 13, PRN 11, TZN 9, SKR 4, NN 2, K9MDK 1, (June) K9LTU 32, MDK 10, (May) W9SXL 42, K9MWA 3.

INDIANA—SCM, Arthur G. Evans, W9TQC—Asst. SCM; 9NTA, Seth Lew Baker. SEC: SNQ. PAMs: BDG, BKJ, MEK and UXX. RMs: DGA, TT and VAY. Net skeds: 1FN (a.m.) 0800 daily and 1800 M-F on 3910 kc.; 1SN (e.s.b.) 1900 daily on 3920 kc.; QIN 2000 daily and RFN 0800 Sun. on 3656 kc. QIN (Novice) 1800 M-W-F on 3745 kc. There were a number of new station appointments this month: W9QFQ, as ORS; K9LZJ and W9ZPP, as OPSS; K9TJ and K9JKS, as OOs; K9PGK, as OES. If you are interested in an appointment send me a card or message. The annual IRCC Hamfest was held at Crown Point Aug. 19. Indiana's Outstanding Amateur Award was presented to K9LXD for her fine work in editing the *Bison* and other ham papers. The Club Field Day award was won by the Michiana ARC with a one-transmitter score of 4230. The 6-meter award went to the Indianapolis RC and the 2-meter award to the Michiana Club. New officers of the Hancock ARC are ATG, pres.; DZC, vice-pres.; #AJQ, secy.; YWE, treas.; HKZ, act. mgr. FJR earned his 9RN certificate. This represents a lot of activity in traffic on 9RN. The first three certificates given out for participation in the slow-speed QIN Net went to KN9s PDE, RMQ and SKR. K9JWJ is on 20 meters and looking for DX. RTH is on with a new Valiant. The Michiana ARC is sporting a new 2.5 kva, gasoline-powered generator. The fall meeting of the IRCC will be held at South Bend Sun., Oct. 18. Be sure your club has a representative there. DKR put up a 45-ft. tower complete with 20-meter beam. K9PGK has a new SR-34 and is getting ready to go on 2 meters. K9CFG is operating DS8 on 6 meters. K9MWU is a new General Class licensee and is active on 1FN using a DX-40. Traffic is holding up well with net reports as follows: 1FN, reported by BDG, traffic 470; QIN, reported by VAY, traffic 406; 1SN, reported by MEK, traffic 65; RFN, reported by TT, traffic 58; 1MO 6-Meter Net, reported by K9GLL, traffic 49, K9KBW, NZZ and ZYK made BPL. Traffic: (July) W9NZZ 1148, ZYK 536, VAY 317, BDG 312, K9AYI 257, W9JOZ 188, TT 170, K9KBW 153, W9ETM 137, EJV 80, DKR 67, K9MAE/3 66, W9TQC 60, FJR 57, QFQ 53, K9LBD 52, W9WLY 48, K9JKK 46, W9MEK 43, DOK 37, K9LZJ 35, IHG 32, PHP 32, KN9RMQ 27, PDE 26, W9CLF 25, YXX 25, SNQ 24, K9IND 23, W9NMY 23, DZC 22, RTH 22, SWD 19, RVM 18, GJS 17, K9GBB 16, W9ZPP 15, DGA 14, FWH 13, BDP 3, CC 3, JZU 3, K9MWU 2, W9BUQ 5, WTY 5, NTA 4, WAU 4, K9LZN 3, BSU 2, KN9TCG 2. (June) W9GJS 34, JZU 11, K9LZN 2.

WISCONSIN—SCM, George Woida, W9KQB—SEC; YQH, PAMs: NRP, GFL and K9IQO. RAIs: SAA and K9ELT. Ex-RM LFK renewed his ORS appointment, issued as No. 1 in 1946. K9s ENB and EZG are new Class IV OOs. K9PDJ is a new OBS on 75 and 80 meters. K9RRS received an OES appointment. K9ERN received a WSSN certificate. The amateur radio booth set up at the Boy Scouts show in Madison was viewed by 10,000 people. Three stations were operated by UTV, ZZW, UGT, RUB, PYE and K9KRE. The MRAC held its annual picnic with a ball game between the married and single men highlighting the event. NLJ has formed a DX club in Sheboygan. CCO has black balloons after a lightning strike. K9GDF had an average of 40.7 error in parts per million in the May F.A.I.T. RKP's average error was 10.4 in parts per million with six measurements made. CXY now is back on the traffic nets after a long lay off. HDZ has a three element 6-meter beam on his
(Continued on page 138)

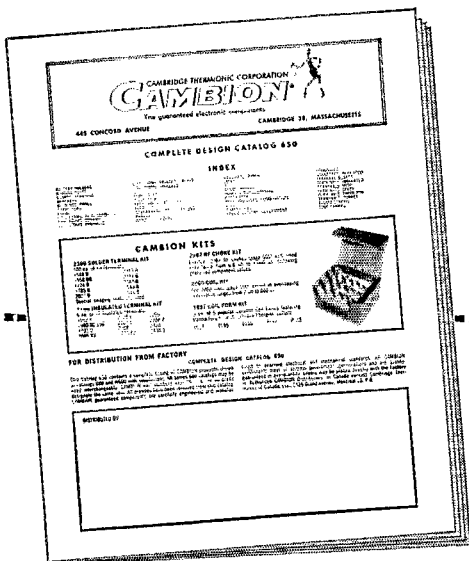


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120-ft. tower. K9JIG has a new Viking II and v.f.o. for operating while attending college at Eau Claire. K9ELT has taken over as manager of WIN, replacing K9AEQ, who is leaving for college in Florida. The Milwaukee e.d. station received LIT as its call, as reported by Radio Officer RUF. The Manacorad Club issues call-letter pins to its 5-year-continuous members. New stations in Two Rivers include KN9TBY and KN9TIO. The MIRAC's new meeting place is at 1113 W. State St., Milwaukee. Meetings are held the first three Thurs. of each month. YT received its WAC and W-Del certificates. K9IQO reports high activity by the new Badger V.H.F. Club of Milwaukee. See you at Watertown Oct. 11. Traffic: W9DYG 1220, K9GYQ 800, DTK 195, W9KQB 90, CXY 84, K9ELT 42, W9NRJ 27, VHP 27, OTL 26, LFK 25, K9PDJ 22, ESN 20, W9SAA 20, VIK 20, YT 20, K9CJL 18, DOL 17, W9XLJ 13, SIZ 11, CCA 10, K9IQO 7, W9FZC 6, K9GSC 5, JIG 5, JQA 5, LCA 3, GDF 1.

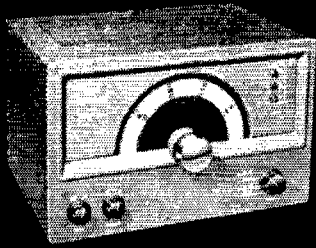
DAKOTA DIVISION

NORTH DAKOTA—SCM, Harold Wengel, W8HVA —SEC: K8JLW. The North Dakota Hamfest and Convention at Dickinson was attended by about 85 hams and their families from North Dakota, South Dakota, Montana and Canada. QYH won the NC-300, K8AZX the DSB-100 and K8ITQ the Mosley Tri-band beam. K8GRM has a brand-new HQ-160. K8IQJ has left Bismarck and will reside in Billings, Mont. K8TTY will leave Bismarck. QYH was in the hospital at the time of the hamfest. HVA has a new GSB-100 transmitter. K8MHD has a new GSB-100 and a GSB-101. Traffic: W8CAQ 41, K8MHC 35, TKK 14, AZX 11, MPH 8, KJR 7, PVH 5, LTP 4, RMS 3, W8BHF 2, K8GGI 1.

SOUTH DAKOTA—SCM, J. W. Sikorski, W8RRN —SEC: SCT. In an attempt to bring the CD appointment list up to date, I'd appreciate receiving your certificates for endorsement and inquiries for new appointments as soon as possible. New calls (all KNs): VLL, Marilyn Gruneich, Wolsey; UXC, Delmar Markus, Corsica, and SEJ, Norman Jordan, Corsica. Since dropping the "N" PAW has installed a G66 and a G77 in a new Lincoln. SDE has accepted a Civil Service job in Alaska. W8IKE (formerly 8MPQ) and KH6ABQ visited the SFARC during July. IKE is now located in Youngstown. ABQ is with FAA in Honolulu. ZWL has a newly-acquired 32V-2 and a 75A-1 set up in her kitchen. K8ACJ, formerly of Lead and Canon City, Colo., has settled in Piedmont. Traffic: W8SCT 224, BMQ 42, YQR 36, DVB 24, ZWL 17, DUR 9, FJZ 5, RWM 5, LKH 3, LXH 3, INZ 2, KLR 2, OPF 2, TQF 2, CWJ 1, PMA 1.

MINNESOTA—SCM, Mrs. Lydia Johnson, W8KJZ—Asst. SCM; R. O. Hall, 8LST, SEC: TUS, RMS: RIQ and K8IZD. PAMs: TUS, TCK and QVR. K8DID resigned as EC of Cook County. K8KKQ had his EC appointment endorsed. An EC for Hennepin County is needed. While K8IZD was in the hospital the Worthington Radio Club assisted him and W8MZR replaced him as EC. The AREC welcomes back AA, a real old-timer. KN8THM, W8FYT, RQJ and K8ICG also registered for the AREC. TUS, the SEC, made RPL again. Picnics were held at K8HKK's, Mankato, St. Cloud and Minneapolis. All net operators read QST, Sept. '54 page 68, Jan. '56 page 69 and Jan. '59 page 87. "Wallpaper" collectors, yes there is a "Worked all Minnesota" certificate issued by the SPRC. The latest to qualify are OJK, OPX and K8BDD. Congratulations to K8IDV, Dakota Division top scorer in both phone and c.w. in the April CD Parties. The QVQ-QVR combination moved to a new farm home near Hugo and had the antenna up before the kitchen sink. IKJ was the St. Cloud Queen at the Duluth Seaway Celebration. QXA and QXF roughed it on a canoe trip through the North Bay country. In three years the s.s.b. group on the phone nets have grown from none to 12 or more. We will have to learn to tune s.s.b. as the following are now heard regularly. K8AEE has a new Drake receiver; EOW and IDV new Gonsets; IKU, JYJ, MEQ, QEK, DZZ, MBD and PET new HT32s; TCK a new 20A and slicer; WMA a new Collins noise blander. IRD and TUS both had short hospital trips. TWG is under coronary care at Bemidji. K8EWC is back on the air after much surgery. KDR was sent to St. John's hospital with a heart attack. K8RCF visited the SCM. KJZ and her OM URQ vacationed in the Black Hills. The former SCM, KLG, had a vacation trip through Yellowstone, Big Horn Mountains and the Black Hills. He will be on 8 meters with a Seneca v.f.o. rig, a beam and converter. Traffic: W8TUS 208, RIQ 174, KJZ 120, OPX 120, K8IDV 116, W8LST 101, HEN 93, K8ORK 87, W8KLG 55, K8GIV 50, W8UNX 47, KYG 42, K8MGT 40, W8FGP 39, K8KYK 32, W8SFO 28, OJK 25, K8IKU 24, W8OJG 23, QVR 23, KFN 21, K8MAH 18, MFG 16, PML 16, IZD 15, W8OET 15, PET 13, QVQ 9, WMA 5, MXC 4, RA 2, YAC 2.

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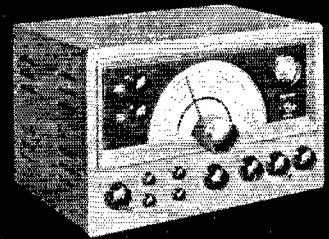
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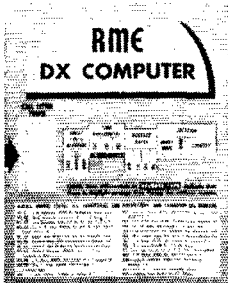


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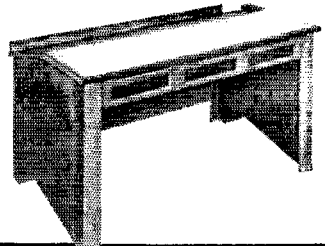
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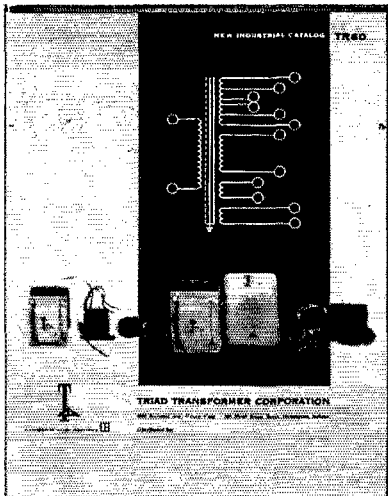
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DELTA DIVISION

ARKANSAS—SCM, Ulmon M. Goings, W5ZZY SEC: K5CIR, PAM: DYL, RM: K5TYW, ZZY and family have returned from Kansas City after visiting K0LXC and hams in that city. K5PYL is a new ham at Hazen. K5HYB has a new s.s.b. rig on the air. Wink is very proud of his dad, whose new call is K5WKL. Both are in Texarkana. Three new hams in Alpine are in one family—David, K5QCH; Rod, KN5UPG and John (the Dad) KN5UEX. Other new hams are K5-QHY, Alpine; K5UUJ, Harrison; KN5UEI, Conner. The newly-organized Boone Co. RACES Net meets Mon., Wed. and Fri. at 0700 on 3993 kc. 60WD is visiting in Hot Springs. K5JEO has a new Apache with an SB-10. K5BPI has a Heath SB-10, VAM has an HT-32. CAC and NKH have been appointed OO. INC recently purchased a 51J-3 Collins receiver and is busy assembling emergency gear. WUU, at Bald Knob, is back on the air after a three-year absence. He has a new Globe King 500-C and an HRO-60 receiver. The Miss. County RACES plan has been approved by FCC. DUW is Radio Officer for the County. The Arkansas Emergency Phone Net meets daily at 0600 on 3885 kc. The OZK C.W. Net meets Mon. through Fri. at 1900 on 3790 kc. Please support your National Traffic System in these nets. Traffic: K5HSJ 159, TYW 84, 1PS 20, HYB 15.

LOUISIANA—SCM, Thomas J. Morgavi, W5FMO—PAM: CEW, RM: EA. At present we have no Section Emergency Coordinator. Applications are solicited. Because of his fine showing in the last two Frequency Measuring Tests K5ESW is now Official Observer Class 1. Monthly reports to the SEC were received from SKW and K5OPH. K5EFS has been transferred from Alexandria to the Cor Jesu School in New Orleans. The Baton Rouge Club held a hamfest Sept. 20 at UCT Park. The Jefferson ARC has planned a repetition of last year's steak luncheon at a Metairie playground for Sept. 27. CEW blames missing the BPL on too much QRN and 6 meters. There is a 6-meter MARS Net operating on 49.94 Mc. with K5CZ and DAV as NCSs. EC activities around Shreveport are at a summer standstill but the Caravan Club Net has been meeting regularly at 1400 Sun. on 3860 kc. MXQ drops a hint that they are getting ready for a hamfest in New Orleans sometime in October. Incidentally, MXQ is taking up water-skiing. QEG/5, the station of the Amateur Radio Club of Southwest La., originated 105 messages during the month of June from its location at Camp Edgewood, La. Messages were originated by the Boy Scouts camped there to their homes. K5DGI is running 300 watts and has a DXCC total of 151 worked and 142 confirmed. EA is busy with a new home going up and splitting time between TV and BC stations and operating a ham station. K5OKR is active at Jackson, La. With the help of SPZ and MXQ, FMO has finished putting up a 60-ft. triangular-guyed tower with plans for 6- or 2-meter antennas for the top. Traffic: (July) W5CEZ 462, MXQ 126. (June) W5QEG/5 193.

TENNESSEE—SCM, R. W. Ingraham, W4UIO—Welcome to the following new net members: K4AAM to the C.W. Net and K4STR and K4TYZ to the ET Net. JVM won a Chattanooga certificate with fifty 6-meter contacts. OGG visited ICW, HHU, PL, GXR and K4PUR on a trip to the Smokies. 5RCF is looking for RTTY skeds on 80 meters in Tennessee. K4LLB is rebuilding a BC-610. UVP reports that ANN sends regards from Florida, and that ABX has a BC-610 operating in the club trailer in Johnson City. K4ILU is putting an A54H in the car. Congratulations to BPL winners PL, W5RCF and K4CNY. New appointments: JVM and TDZ as OPSs, UVP as OES, K4AAM and K4RSU as OOs. Thanks to FX and PAI for net reports. Traffic: (July) W4PL 1047, W5RCF 842, K4CNY 184, W4CXY 76, VJ 61, EIN 56, K4LLB 59, W4TZG 38, FX 35, PQP 28, UO 24, PAH 20, UVP 17, K4OUK 16, W4OGG 13, NHT 7, RRV 7, K4LPW 6, TYZ 5, W4YRM 5, K4KYL 4, W4UVL 3, VTS 3, JVM 2. (June) K4AUF 34, TYZ 13, KYL 6.

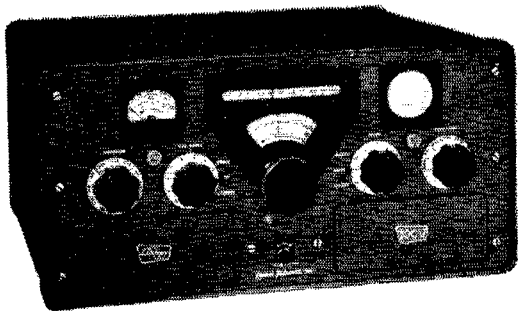
GREAT LAKES DIVISION

KENTUCKY—SCM, Robert A. Thomas, W4SUD—Asst. SCM: W. C. Alcock, 4CDA. SEC: BAZ, RM: K4-CSH, PAMs: GTC and K4MMW, S.S.B. PAM: MMY. VHF PAM: K4LOA. Congratulations to the Louisville fellows for a most successful hamfest. Let's hope there will be many more to follow. We are all grateful to K4AIS for his efforts as RM for the past two years. Thanks for a job well done, Ted. K4CSH the new RM, has everyone's support. SEC BAZ is diligently improving the State's emergency preparedness. JB hopes to improve AREC and State e.d. mutual support. Keep your AREC application up to date by contacting your local EC now. All Kentucky traffic nets will feel the loss of K2UTI/M and chief

(Continued on page 142)

THE REVOLUTIONARY NEW CENTRAL ELECTRONICS 100V EXCITER-TRANSMITTER

BROADBAND! ONLY ONE TUNING CONTROL, THE VFO ITSELF.



CENTRAL ELECTRONICS, THE PIONEER OF AMATEUR SSB IS PROUD TO BRING YOU THE FINAL RESULT OF THREE YEARS OF THE KIND OF PATIENT ENGINEERING, TESTING AND IMPROVING THAT MAKES FOR A SUPERIOR PIECE OF ELECTRONIC GEAR.

MANY OF THE TRIED AND TRUE PRINCIPLES AND FEATURES OF THE ORIGINAL MULTIPHASE EXCITERS HAVE BEEN RETAINED IN THE NEW 100V, ALTHOUGH IN VASTLY IMPROVED FORM. THE USE OF PATENTED BROADBAND CIRCUITRY THROUGHOUT PRACTICALLY ELIMINATES "COCK-PIIT" TROUBLE.

REGARDLESS OF YOUR PREFERRED MODE OF OPERATION, IT'S ALL IN THE 100V. SSB, DSB, AM, PM, CW and FSK . . . AND ALL AT THE FLIP OF ONE SWITCH. ALTHOUGH THE 100V WILL PROBABLY FIND ITS GREATEST USE AS A SINGLE SIDEBAND SUPPRESSED CARRIER EXCITER-TRANSMITTER . . . NO ONE HAS BEEN "LEFT OUT IN THE COLD" IN ITS DESIGN. THIS IS THE KIND OF A RIG THAT HAMS DREAM ABOUT!

CHECK AND COMPARE THESE FEATURES

STABILITY: The new patented two tube permeability tuned VFO circuit is exceedingly stable and is immune to the effects of line voltage fluctuations and tube ageing. Built like a battle ship, it is tuned by a husky precision lead screw assembly running in ball bearings. This is a VFO to end all VFO's.

FREQUENCY COVERAGE: 80 METERS — 3.5 to 4.5 Mc. 40 METERS — 6.5 to 7.5 Mc. 20 METERS — 13.5 to 14.5 Mc. 15 METERS — 20.5 to 21.5 Mc. 10 METERS — 27 to 29.7 Mc. A spare X position provides for the installation of broad-band coils for 160 meters, MARS, etc. OR any 1 Mc. portion of the spectrum between 1.5 Mc. and 25.5 Mc. OR any 2 Mc. portion of the spectrum between 25.5 Mc. and 29.7 Mc. YOU DON'T SETTLE FOR HALF A LOAF OF FREQUENCY COVERAGE WHEN YOU HAVE A 100V!

THE TUNING DIAL: Band scales in the large slide rule window change with the band switch and are calibrated at each 100 KC point. Frequency is read directly in 1 KC increments by the circular KC dial without any computation whatever. Approx. 12 feet of bandspread on each band. A smooth running two-speed tuning knob allows fast tuning at 100 KC per turn and slow tuning at 750 CYCLES per turn. Calibration accuracy is 250 cycles between any two 50 KC points.

METERING: Reads POWER INPUT (0-200 watts) RF AMPS OUTPUT, AC LINE VOLTAGE and CARRIER SUPPRESSION IN DB DOWN TO 70 DB.

MONITORING: A 2" scope provides an instantaneous visual check on non-linearity resulting from improper loading. Also indicates proper setting of carrier injection for 100% AM modulation. Scope presents trapezoid pattern.

OTHER INDICATORS: Below the meter a neon indicator provides a check on the operation of the NEW AUDIO LIMITER CIRCUIT. Below the scope a second neon indicator starts operating if you have the antenna or load mis-matched.

NEW AUDIO FILTER-LIMITER: The new filter is composed entirely of R-C components, yet has the steep side response and rejection characteristics of a four toroid tuned filter but without the usual harsh, ringing effects. Bandpass is 200 to 3700 cycles. This filter precedes the phase shift system and will maintain 50 DB SUPPRESSION OF THE UNWANTED SIDEBAND. The new audio limiter maintains audio drive to the balanced modulator WITHIN 1 DB, REGARDLESS OF HOW HARD THE MIKE IS HIT. IT'S IMPOSSIBLE TO OVERDRIVE THE 100V BALANCED MODULATOR! Inverse feedback circuits allow 10 DB OF CLIPPING with negligible distortion.

NEW PS-2 AUDIO PHASE SHIFT NETWORK: A twelve cross-over point network is composed of heat-cycled components having .1% accuracy. Even changing the balanced modulator tubes has no effect on its maintaining 50 DB OR BETTER suppression!

POWER OUTPUT: The husky, ultra-linear type 6550 tubes in the final of the 100V will deliver 100 WATTS OF SINGLE TONE POWER, EVEN ON TEN METERS! AND WITHOUT GRID CURRENT FLOW. Two tone third order distortion products are down in excess of 40 DB. A new POWER OUTPUT CONTROL eliminates the need for power dividers when driving AB1 or AB2 linears, since power output is continuously variable from 10 watts to full output.

SET AND FORGET CONTROLS: These seldom used controls are all located behind the flip down magnetic doors on the front.

GENERAL CIRCUITRY: Crystal controlled master SSB generation is at 8 MC. VFO injection is 5 to 6 MC. Crystal controlled heterodyne oscillators operate into mixer stages for various bands. This system, originally developed by C. E. is today the standard of the industry. Blocked grid keying of mixers and final amplifier provides perfect CW and PHONE BREAK-IN.

PHYSICAL DATA: Panel is standard 19" width by 8 $\frac{3}{4}$ " high. Finish is smooth grey. Attractive heavy duty rounded corner cabinet is 15" deep, is finished in grey wrinkle and has a latch type access lid. Shipping weight approx. 90 lbs.

MULTIPHASE 100V complete Amateur net \$695.00

Orders entered prior to June 1, 1959 will be shipped at the original price of \$595.00

COMING UP! MORE SUPERIOR GEAR FROM C. E. THE SSB PIONEER

A NEW COMPANION RECEIVER: Which will TRANSCIVE THE 100V or separate the two VFO's at the flip of a switch. The 100V has the interlock control sockets built in.

A NEW 2500L BROADBAND LINEAR AMPLIFIER. Big brother to the famous 600L.

A NEW HETERODYNE CONVERTER: To cover all of the 2 and 6 meter bands with the 100V. Interlock control sockets are in the 100V.

SORRY, INFORMATION AND DELIVERY DATES ON THESE NEW ITEMS NOT YET AVAILABLE.

MULTIPHASE

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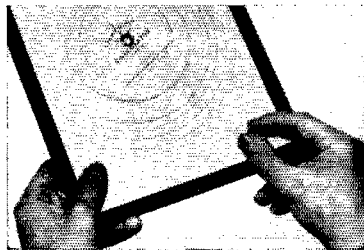
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How Many Turns?



BESET with a knotty technical problem? Why not let an ARRL Lightning Calculator provide the solution and save hours of operating time, or time you might better spend in constructing that new rig.

IF YOU'RE trying to figure out how many turns to wind on a coil for a particular band, you'll find the answer more quickly by using the Type A Calculator, designed especially for problems involving frequency, inductance and capacity. Direct-reading answers to Ohm's Law problems involving resistance, voltage, current and power may be obtained rapidly on the Type B Calculator. Be sure — and be accurate — with one of these dandy time savers.

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Type A or Type B

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THE AMERICAN RADIO RELAY LEAGUE

West Hartford 7, Conn.

operator of K4WBG. Dick says thanks for your kindness and support. Hope you return to Kentucky soon. Dick. An OO report was received from K4BUB, KNN manager K4DFZ and K4ZIQ received their General Class tickets. GTC has a new vertical antenna. K4SPJ was active portable in Dayton during vacation. K4IFB will be back soon. New on KYN are K4DFO and AVX. Traffic: W4ZDB 181, K4CSH 95, W4GTC 89, K4QCO 57, M4MW 47, W4CDA 42, K4JOP 28, DFZ 25, CC 22, VTY 22, W4SUD 20, SZB 20, K4QCN 16, W4VJV 16, K4QHZ 15, HCK 13, ZIQ 13, W4MMY 12, K4PNA 9, SPJ 9, SBZ 5, IFB 4, W4SZL 4, K4KIS 2.

MICHIGAN—SCM, Ralph P. Thetreat, W8FX—SEC: YAN, RMs: SCW, OCC, QOO and FWQ. PAMs: AQA, NOH (v.h.f.), ECs to: K8CIS, JYJ, DXH, PQO, GJB, FQO, QGO, K8IWF, ORS to: ILP, K8BQD, MGQ, WXO, WVL, NUL, KOX, IBB, DSE, SWG, OPS to: SWN, JYJ, OO to: MGQ, KOX, K8MIC, QWB, CXP, K8HFO. ORS/OES: PT. The Grand Rapids ARA and the U. S. Coast Guard furnished radio communications for the 100-mile boat race at Grand Haven. The hams who took part were FOL, IIE, OMB, ONH, PCY, QBD, SPX, K8 BCN, IDP, IFR and KBN. They used 50,550 Mc. NOH worked FM on 6 meters using fast c.w.! NOH also is running 400 watts on 144 Mc. K8ODZ is a new "General." Both the BR/MIEN Net and the West, Mich. v.h.f. gang, had well-attended picnics. K8HJI has a new left-handed bug. PT worked VE3AIB July 26, on 220.162 Mc. RHD reports the Straits Area RC handled radio communications at the Top O'Mich outboard marathon using 3.8 Mc. V.h.f. in Jackson is going strong on 50 Mc. and a new v.h.f. club has been formed there. MTI is all set for RTTY. K8BND, K8HRK, K8LOS and others have started an informal net on 21 Mc. after the hand goes dead. No activity reports have been received from the U. P. yet except the M&M RC Field Day report. TIN reports new 6- and 2-meter nets are being formed in the Flint Area by AF/MARS. Traffic: (July) K8BQD 236, W8OCC 232, FWQ 134, K8GTB 103, W8YAN 75, FX 64, JKK 54, NOH 53, K8GJD 50, AEM 30, W8DSE 30, ILP 29, SWG 27, TBP 23, K8EXE 20, W8EU 15, K8KMQ 14, NAW 12, W8AHV 11, AUD 8, QIX 8, EGI 5, K8CKD 4, W8IZS 4, K8HJI 3, W8TIN 3, K8HFO 1, W8HKT 1. (June) W8QOO 99, JKN 95, ILP 38, AHV 13, K8HJI 9, EXE 6, W8VYG 6, K3CIS 5, W8IBB 5.

OHIO—SCM, Wilson E. Weckel, W8AL—Asst. SCM: J C. Erickson, 8DAE, SEC: UPB, RMs: DAE and VTP. PAMs: HZJ and WYS. The Gum Bumpers Net meets Tue. at 2100 on 28 Mc. with QMH as secretary. The Chix on Six Net meets Wed. on 51.3 Mc. at 2100 and officers are OIS, pres.; VLS, vice-pres.; K8MZT, secy.; and WRH, treas. Its aim is to aid all VLS and XYLs in North-eastern Ohio to get their licenses. The welcome mat is out to all licensed YL amateurs who do not as yet belong to this net. A certificate will be issued to any station who has worked eight of the Chix on Six members. If eligible, advise K8MZT, SSF, K8s DRAI, LEV, LEW and MTK received their General Class tickets. K8s LEV and LEW are a man-and-wife team. K8SPOI is a new ham in Massillon. K8EKG received a W-FRC certificate. FFK vacationed in Michigan. K8QGE is a new ham in Hamilton. MAN is in the hospital. The Greater Cincinnati ARA's *The Key and Mike* informs us that TIM spoke on s.s.b. transmitters. The Cuyahoga County AREC took part in a search for escaped mental hospital patients, with GFT, IMJ, JHS, K8s BDK, DGV, EIO and GVA participating, and also supplied communication in two parades, the Patriot Parade with AEU, BAH, LHX, OHA, ZEP, K8s ABA and JIC helping and the Flag Day Parade with AEU, BAH, QXG, K8s ABA, BWH, JHZ and MBW taking part. Columbus ARA's *Carascope* tells us the v.h.f. section held its annual picnic. DMV is on 6 meters. K8OVA is a new ham in Columbus. Your SCM wants to thank the club for sending the bulletin in a first-day-cover envelope of the Seaway Commemorative. How did you know I collected U. S. stamps? Toledo's *Ham Shack Gossip* named WIT as its Ham of the Month and states that HIF was assigned as the station call of the Toledo RC. MNR and KN8NQi have a new harmonic. K8LBU and KN8PMI are new hams in Toledo. BBO and HUX vacationed in Florida. K8HUI is on 75 meters. MWL has moved to Florida. The Seneca RC held a 2-meter transmitter hunt and the Seneca County RACES named K8AEC as Comm. Officer. WAB as RO and IJL and K8BCX as Alternate ROs. The Piqua RC has a new roof. New appointments are K8s: AJF and IKS as OES and K8ITH as OO. Those who made BPL in July were DAE and UPH. KN8SPUT has a new SX-99. Your SCM attended the Hocking Valley RC Hamfest in Glouster with about 200 attending and 55 amateurs registering. K8ITH has a new Mosley Tribander beam, K8s LEV and LEW have a new Mosley Tribander beam and a Valiant. WKY has a new HRO receiver. BML has a new Challenger.

(Continued on page 144)

Last Month - the Exciting New **Globe Chief Deluxe**

NOW the NEW **Globe Scout Deluxe**

FINAL AMPLIFIER WORKS STRAIGHT THROUGH ON ALL BANDS • HIGH LEVEL PLATE MODULATION • PI-NET OUTPUT ON 10-80 METERS; HIGHLY EFFICIENT TUNED LINK COUPLED OUTPUT ON 6 METERS, MATCHING INTO LOW IMPEDANCE BEAMS • THREE-GANG (1300 MMFD) LOADING CAPACITOR FOR CONTINUOUS ADJUSTMENT 10-80 METERS PLUS HARMONIC AND TVI-SUPPRESSION • SEPARATE CAPACITOR GANGED TO LOADING CAPACITOR TUNES OUTPUT LINK FOR 6 METERS • LINK TUNED FROM FRONT PANEL • BUILT-IN POWER SUPPLY • HIGH QUALITY CHOKE INPUT FOR BEST REGULATION • NOVEL 3-COLOR DIAGRAMS SIMPLIFY KIT CONSTRUCTION

Styling

MODERN NEW "LOW LOOK" CABINETY
ROLLED EDGES • ROTARY SWITCHING



90 WATTS CW; 75 WATTS PHONE
BANDSWITCHING 6-80 METERS

Operation



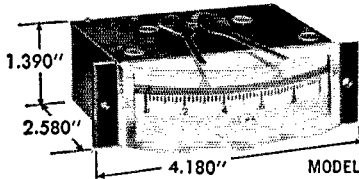
A new concept in transmitter design, the Globe Scout Deluxe incorporates a host of features to make it the most outstanding and exciting low cost AM transmitter available. The newly designed cabinet features the modern "low look" which is so popular today. The attractive panel is etched aluminum, trimmed with black. Styling and appearance blend with any surroundings, making the unit at home in livingroom, den or office. New RF circuitry provides greater output and efficiency. Six meter output as great as that of any comparable transmitter on the market today. Extensive TVI precautions have been taken, including separate shielding of final amplifier and meter. Convenient rotary switches used throughout; no unsightly toggle or slide switches to mar appearance. Functional design of the meter face extends the length of scale for easier reading. Kit contains all parts, tubes, pre-punched chassis and detailed construction manual with three-color diagrams. Compact cabinet; 15 1/4 x 6 1/4 x 11 1/4". Shipping weight: 35 lbs.

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NEW ELECTRONIC Control Meter



MODEL 2545

OPERATES WITHOUT CONTACTS AT THE CONTROL POINTS • Transistorized Circuit
Operation without contacts at switch points makes full scale indication always available. Insures more reliable switching by eliminating contact resistance, arcing, corrosion and flutter. Same scale length as conventional 4 1/2" meters. Accurate readings because the indicating circuit is completely isolated from the switching circuit. External zero adjuster and external arms for setting 2 control points. No reset necessary.

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P.O. BOX 2954, NEW HAVEN 15, CONN.

SIDE INDICATOR PANEL METERS



MODEL 1145

- MAXIMUM ACCURACY AND READABILITY with MINIMUM PANEL SPACE
- FOR HORIZONTAL or VERTICAL MOUNTING
- 3 SIZES . . . Model 1145, 2.7" scale length; Model 1135, 2.1" scale length; Model 1120, 1.2" scale length.

Accuracy held to $\pm 2\%$ of full-scale deflection for dc ($\pm 3\%$ for Model 1120) and $\pm 5\%$ for ac. Dustproof cases. Clear plastic front covers permit maximum light on scale and readability. Wide variety of standard and special ranges, and as Expanded Scale Voltmeters, VU and DB Meters.

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P.O. BOX 2954, NEW HAVEN 15, CONN.

DXC has a new 833-A. WJB has a 20-A. K8HED has a 10-B. MWL has a new Mosley Tribander and an HT-33A. K8IPD has a new Ranger. From the grapevine we learn that Cleveland is going to hold an amateur convention at the Manger Hotel Oct. 17. ZWE is in the hospital. *Notice to all who hold an appointment:* Check your certificate and if it is over a year since it has been endorsed, send it to me for my endorsement. I have started to clean out the deadwood, canceling those who haven't sent reports for some time. Remember the Ohio Phone Net and the Buckeye Net are looking for more outlets. Traffic: (July) W8UPH 1249, DAE 657, K8DHLJ 124. HGT 117, CTQ 95, W8ZYU 87, QJLJ 80, IBX 59, K8GVV 43, W8YGR 41, AL 21, K8GWK 19, W8BZX 18, GQD 18, K8HDO 18, IQJ 17, BPX 16, EUL 13, EGX 12, W8WVY 10, K8EKG 8, W8HYJ 8, ZAU 7, GKB 5, LGR 2, DG 1, FFK 1, K8GPI 1, HVT 1, MSJ 1. (June) W8ZYU 326, SYD 40, K8CTQ 24, EKG 7, GWK 6, HVT 5, W8WE 3.

HUDSON DIVISION

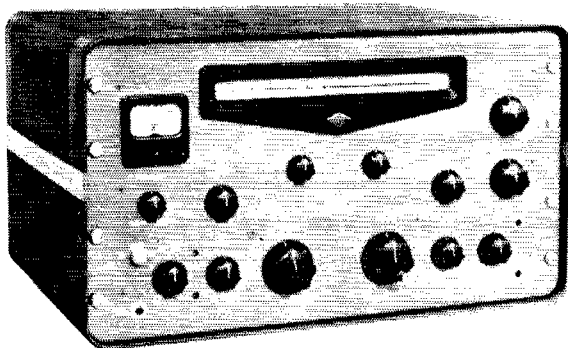
EASTERN NEW YORK—SCML, George W. Tracy, W2EFU—SEC; W2KGC, RAM; W2PHX, PAMS; W2JIG and W2NOC. Section nets: NYS on 3615 kc. at 1900; NYSPTEN on 3925 kc. at 1800; IPN on 3980 kc. at 1530; ESS on 3590 kc. at 1800; ENY (emerg.) on 29,490 (Thurs.) and 145.35 Mc. (Fri.) at 2100; MHT (Novice) on 3716 kc. Sat. at 1300. Appointments: K2BGU as OES, WA2ALO as ORS and K2BIG as OO. Endorsement: W2HZZ as EC. Congrats to K2UTV on his large BPL total. He really worked for it. K2YTD spent the summer as counselor teaching radio in camp at Lenox, Mass. WAC on 15 meters is reported by WA2AKK. Was K2MBU/2 the only E.N.Y. station in the July (C.W.) 'CD Party? He seems to think so. K2ZLX and others are planning to break the DX record on 21,000 Mc. this fall. They also hope to do the same thing on 5700 Mc. Good luck. A DXCC award for being first in the U. S. on 21 Mc. was received by K2TCD during the 8th LABRE Contest. W2LQO/2 is attending M.I.T. and runs a Viking II and an SX-71 with a four-element beam on 10 meters. K2UTV is now asst. mgr. of NYS. K2CVG reports 36 states on 6 meters but wonders where the 220-Mc. boys are these days. He also reports arrival of a new harmonic which makes four jr. operators. Among the newcomers to traffic handling are WV2DRP, WV2FII and WV2BWE on the Novice nets. W2AWF ran the battery rig at camp during July with nice signals on 3.5 Mc. WA2ALO invites teen-agers to QNI the Teen Age Slow Speed (TSS) Net weekdays on 3720 kc. at 1600. Traffic: (July) K2UTA 418, K2YZI 233, W2EFU 163, K2MBU 152, W2ATA 83, K2OZT 75, WA2ALO 73, K2YTD 18, W2PKY 16, K2VCZ 11, K2CVG 3. (June) K2RKY 64, K2BIG 51, W2PHX 50, K2MTS 10, K2AYB 10, WA2ALO 4.

NEW YORK CITY AND LONG ISLAND—SCM, Harry J. Dannals, W2TUK—SEC; W2ADO, RAM; W2VDT, PAM; W2UGF, V.H.F., PAM; K2EQH. Section nets: NLI 3630 kc. nightly at 1930 EDT and Sat. and Sun. at 1915 EDT; NYC-LPN, 3908 kc. Mon. through Sat. from 1730 to 1830 EDT; NYC-LI AREC, 3908 kc. Sun. at 1730 EDT; V.H.F. Traffic Net, 145.8 Mc. Tue. through Sun. at 2000 EDT. Congratulations to our five BPL stations, W2KEB, K2QBW/2, K2PHF, K2DEM/1 and W2TJF, the latter three on originations plus deliveries, who earned them during hot July. The section will lose K2QBW during the school months. Ray will be signing in from WIMX as a Freshman at M.I.T. K2DEM's mother, K2UTP, obtained her Technician Class ticket. A new ten-element 2-meter beam is in use at K2IRS. After 23 years of hamming, K2KYS reports he made DXCC. Contrast this with the accomplishment of K2DGT, who worked 101 countries in four days without benefit of any DX contest! Bob's performance was aided by a three-element 40-meter rotary beam at a height of 100 feet! K2SJE sends in a fine traffic report for his first month on NLI. K2DVT returned to NLI with 10 watts. W2IVS replaced the vibrator/dynamotor in the mobile with a transistor supply. K2TPU and his sister, WA2BEA, passed their General Class exams. W2SEU/5 reports that he soon will be leaving Texas for an Air Force assignment in Illinois. K2DQD vacationed in South and Central America visiting quite a few DX prefixes. K2EEK joined the s.s.b. ranks on 50 Mc. with a P&H heterodyne unit and a 20A. K2IBJ is converting a TBY for 6 meters and would like to know if anyone else has done the same job. In anticipation of the opening of 2 meters for Technicians, K2SVY added four-element beam and a 6146 rig for that band. K2TBU returned to W3AEQ for school. K2UVV added a new TA-33 Jr. beam and made WAC. A Viking Valiant is now in use at K2JWD, who also snagged WAC. WA2EGK is using a DX-40 and a VF-1. K2JLC, K2JLD's father, passed the General Class exam. K2VDR now has 40 states contacted on 6 meters and

(Continued on page 148)

Choice of the careful buyer

GSB-100, SINGLE-SIDEBAND, AM, PM, CW
TRANSMITTER, EXCITER



GSB-100 is a welcome exception in today's market... returns full value for each of your hard-earned equipment dollars. It is truly the choice of the careful buyer—and there are many—as the number of GSB-100's on any band will clearly show.

GSB-100 performs... does what it is designed to do... with ease. Non-marginal, non-critical, stable. You set up on any band... 80-40-20-15 or 10 meters... on any mode, SSB with selectable sidebands, AM, PM, CW... in seconds. Exciter circuits are ganged for single control. Pi network output setup is simplified by output indicating instrument. You change sidebands at the flip of a switch... a quartz crystal "notcher" keeps carrier nulled perfectly without adjustment. The voice-operated-relay (VOX) adjusts precisely to your own voice characteristics... gives you "at ease" operating enjoyment. "Peek" control allows you to zero-in without turning on amplifier. CW men all agree that keying of this unit when on CW is exceptionally good.

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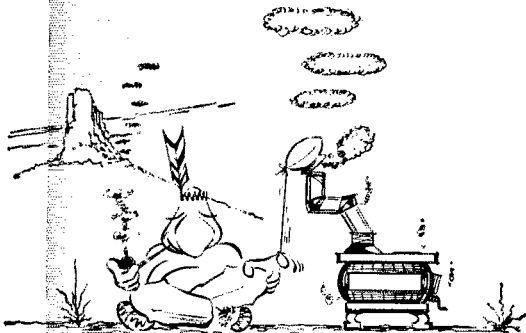


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Cabinet 5" wide 6" high 9" long

Meter switch wiring and Chassis soldering completed and over 100 parts mounted.
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completed WANJ-50 Mc. W2IVA, W2PF's son, graduated from M.I.T. and received his commission as 2nd Lt. in the Army Signal Corps. WA2BWT passed the General Class exam. K2YOY is interested in starting a radio club in Elmort and would appreciate hearing from interested hams in the nearby areas. W2DUS moved to Dix Hills. W2VDT put up a new skyhook for 80 meters and finds all reports better. Your SCM visited Maine on two-weeks' active duty with the U. S. Navy at K1NAN. Regular skeds were kept with OM K4GG via 20-meter mobile and the s.s.b. gear at K1NAN. K2AZT reports 220-Mc. activity increasing. K2KSP is looking for more 2-meter mobiles for the 145.68-Mc. AREC Mobile Net in Nassau County. W8ZRA/2, your SCM's brother, is now mobiling with a KWM-1. Traffic: (July) W2KEB 3890. K2QBW/2 551. W2JGV 475. W2VDT 387. K2PHF 378. K2DENL 1 230. W2TJF 100. K2MIG 99. K2IRS 79. W2EWF 62. K2KYS 58. K2SJE 53. K2DVT 48. WA2BVH 48. K2YQK 46. W2UAL 16. WA2CSE 12. K2QZS 11. K2MEM 9. W2PF 3. K2AAW 2. W2DUS 2. W2IVS 2. K2TPU 1. (June) K2QBW 432. WA2ABC 159. W2CQF 51. W2LGG 28. W2HST 23. W2EC 14. W2GP 14. K2MYS 9. K2TSE 8. W2PF 6. W2DGT/2 4. K2GB 2. W2JGY 1. W2EGC 1. K2QQH 1. K2RUP 1.

NORTHERN NEW JERSEY—SCM, Edward Hart, jr., W2ZVW/W3NF—SEC: W2IN. RMs: W2RXL and W2ADE. PAMs: K2KVR and W2REH. K2VAC, former PAM, was forced to quit, as he is going to school in the fall. The NJN meets on 3695 kc. at 1900 daily and during July held 28 reported sessions with attendance of 433 and 296 messages handled. The New Jersey Phone Net meets daily except Sun, on 3900 kc. at 1800 and Sun. at 0900. July totals in 31 sessions show an attendance of 478 with a traffic total of 94. W2RXL thinks results are not too bad considering the conditions. W2CFB is working on a kw. linear final. K2AGJ still has trouble getting on 80 meters. K2VAB lost his 80-meter antenna at Budd Lake, and is now on v.h.f. K2EGP worked KP and CO on 50 Mc. W2COT is working portable from Cape Cod, and K2TWZ is in Vermont. K2PVH is a new OPS, as is K2CBG. K2VVL is in the Adirondacks, but made HPL for July. W2ADE took off to drive to Alaska. W2EWZ skeds K2VVL. K2ZHK, operating from Camp Winnebago, made BPL for the third time. W2TSQ is working on a 6-meter kw. W2NIY was first in N. J. in the Vt. QSO Party. K2YBC is now using a Viking Courier but still has trouble getting out on 80 meters. W2OPB apologizes to any in the CD Party he may have swished over. His v.f.o. zero switch broke. W2BVE finally got a QST out of a UR2. K2PTI, using 25 watts, has worked 34 states. K2GIF had a break-down in the large rig and is using a BC-669 temporarily. K2UKQ needs Cape May, Warren and Hunterdon for WANJ. W2ZVW is in Warren. W2CVW will have been on the air ten years in November. K2MFF is trying to put a mobile rig on a Vespa scooter. K2ZMO has been giving 20 meters a whirl. W2REH has 80 worked and 54 confirmed for DXCC. W2MRV won an S-85 in the *Boys' Life* Radio Contest. K2SRD is screen-modulating his OX-20. Sussex county had another lost child and the following hams assisted in finding him: K2YNO/m, K2BXW/m, W2NSG/m, W8SZY/m, K2AQV, W2DMJ, W2POB and K2CBK. Traffic: W2OPB 254. W2RXL 217. K2ZHK/2 208. K2GIF 207. K2VVL 159. K2MFF 115. K2UCY 112. W2CQB 64. K2YBC 64. W2ADE 56. W2REH 35. W2ZVW 32. K2EQP 27. W2DRV 26. K2LWQ 24. W2CVW 22. WA2APY 21. W2RZO 21. K2AGJ 20. K2SLG 20. W2BVE 19. K2PVH 17. K2TPU 16. K2ZMO 15. W2ONL 8. W2CFB 6. K2EGP 4. K2UKQ 4. K2CBG 3. W2TSQ 3. W2CJX 2. W2EWZ 1.

MIDWEST DIVISION

IOWA—SCM, Russell B. Marquis, W8BDR—SCA made BPL No. 100 in July. He is the first Iowa station to make this record. K8LKE moved to Florida. IGX and IGX moved to California. LWJ is vacationing in California. K8KAQ, KCK and GBB vacationed in Colorado. SEW received an EC appointment. Renewals: UTD and LCX as ORSS and VQX as EC. K8APL was host to PTL, FMX and BDR. UNJ, KYQ and ESS have been transmitting and receiving amateur TV on 430 Mc. in Sioux City. K8AGJ is sending code practice with a keyer and 1AW tapes on 3700 kc. immediately following the bulletins from 1AW at 1800 CST. LCX is now on s.s.b. K8GXP has a new 75-meter doublet. QVA reports 14 new Novices in Burlington as a result of his code lessons. NWX showed pictures of his Clipperton Island DXpedition at the Central Iowa Club meeting. The Fort Dodge Club is arranging a TVI series with the FCC Field Office. K51PK visited several Iowa amateurs while on vacation. PTL vacationed in Montana. K8BLJ reports that TLON will go on a fall and winter schedule Oct. 5. WVF operated his other

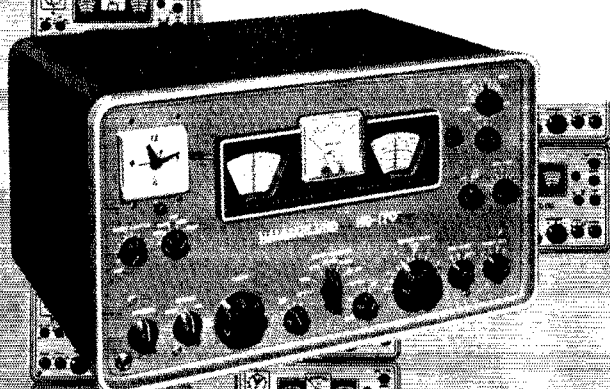
(Continued on page 148)

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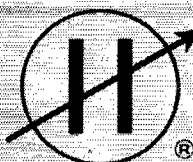
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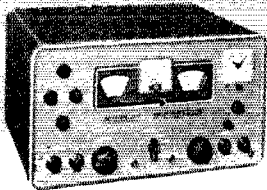
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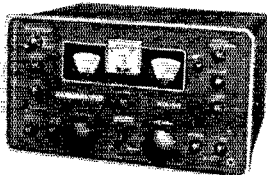


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station, K0CFB, at Clear Lake. Traffic: (July) W0LGG 1850, BDR 1312, SCA 1109, LCX 848, K0CLS 275, W0GXQ 149, K0BLJ 56, W0LJW 48, SLC 38, K0AGJ 27, W0NGS 26, NTB 21, QVA 21, VVF 18, NYX 12, K0GXP 11, APL 9, W0UTD 9, K0JGM 8, KZC 8, POB 8, W0IHC 7, JPJ 7, UTX 7, YDV 7, K0BRE 6, W0GQ 6, FDM 5, K0GHH 4, W0QVZ 4, W0VQX 3, K0KAQ 2, W0PTI 2. (June) W0MEL 13, FDM 3.

KANSAS—SCM, R. E. Baker, W0FNS—SEC: IFR, Asst. SEC: LOW, RM: QGG, PAM: VZM, V.H.F. PAM: HAJ. On July 19 your SCM and SEC had a very fine coffee meeting with the following Topeka amateurs: MXG, WIZ, JMF, ICV, BJF, KXB, UPU, KOL, TTG, KKF, ECF and BAU. Now we know why these Sunday meetings are so enjoyable at the Squat and Gobble: all subjects are handled. The Concordia Club held its usual swell hamfest with 152 registered, 225 present, 44 mobile units. Our SEC was kept busy signing up new AREC members. He states there were more XYLS there with licenses than any place he has attended. K0IZM and 25 members of the Flint Hills Amateur Club made a field trip to the Wichita Weather Bureau. LOW, Asst. SEC, has the following Colby boys with General Class tickets: K0R XR, R XS and R XT, R XV soon will be General Class. ICV is on his Canadian trip and possibly will work 20-meter s.s.b. R JF is headed for Minnesota for a vacation. K0BLX and his XYL K0L JH went to Colorado for their vacation. RM QGG is back from his vacation with his big signal and swell fist. K0BLX did a wonderful job in relieving him while he was gone. Our nets continue to do a good job in really bad band conditions. Let's not forget to help our NCSs—VUI, FHT, EFL, UTO, LZM on KPN, 3920 kc. Mon., Wed., Fri. 0645 and 0800 Sun: QGG, TOL, BIX, KMZ, R JF, QKS 3610 kc. 1830 daily: Traffic: W0FNS 222, TOL 219, K0JYX 217, BIX 145, KMZ 100, W0SYZ 79, IFR 58, VZM 51, QGG 49, K0IZM 35, W0ABJ 30, R JF 28, G JG 17, QOB 14, UTO 12, BBO 11, VUI 11, TTG 10, FHT 7, WFD 7, K0QWN 3, EFL 2, GEL 2, W0LOW 2, KN0TCT 2.

MISSOURI—SCM, C. O. Goseh, W0BUL—SEC: K0LTP, RMs: OUD and QXO. PAMs: BVL, OMM and K0K LQ. Net reports: (June) MON (0700, 3580 kc. M-S) 25 sessions, QNI 42, QTC 6. NCS OUD: (June) MON (1900, 3580 kc. M-S) 26 sessions, QNI 151, QTC 186, NCSs OUL 6, RTW 6, K0ONK 5, KBD 6, OJC 5, ARO 1; (June) SMN (1800, 3580 kc. Sun.) 4 sessions, QNI 7, QTC 3; MEN (1800, 3885 MWF) 13 sessions, QNI 445, QTC 101, NCSs OVV 1, VPQ 4, OHC 5, OMM 4. The SCM enjoyed meeting lots of new friends at the Annual V.H.F. Picnic July 12 at Bowling Green, hosted very ably by LFE and gang. There were approximately 200 in attendance with 20 v.h.f. mobiles. Officers of the Three Rivers Radio Club (Bates, St. Clair and Cedar Co.) are K0IHK, pres.; K0IHPX, vice-pres.; K0BNL, secy.; RPW, treas.; EIQ, act mgr. The reorganized group of RACES in the St. Louis Area has chosen the following officers: EST, op.; ODI, tlc.; K0JED, pep.; MUX, sup.; PML, maint.; UJE, ch. insp.; K0COD, pub.; WPS, ch.; IGU, health dir. The group plans an extensive training and preparation school in the immediate future. CPI/5 is copper-screening in the radio room at his new QTH, which will be air conditioned. There was a considerable amount of activity in the section on Field Day. Among those participating was EBE/0, Springfield, who received a nice write-up in the local press (picture and everything). K0SGJ reports that 50 Mc is open to almost all call areas, including XE and CO, using a 10-wavelength long wire. It is with sincere regret that we must report the passing of IVL. Traffic: (July) K0ONK 796, KBD 508, OJC 199, W0VPQ 191, KIK 143, OMM 81, OUD 72, K0LZG 48, W0OVY 48, MKJ 44, K0SGJ 25, W0BUL 24, LWX 24, K0RIN 6, W0VFP 6, BVL 4, GEP 4, GMK 2. (June) K0KIK 119, QQC 91. (May) K0KIK 78.

NEBRASKA—SCM, Charles E. McNeel, W0EXP—ZWG reports that the Nebraska 75-Meter Phone Net, which meets at 1230 CST daily on 3983 kc., had QNI 296, QTC 21. The Western Nebraska Phone Net, on 3850 kc. daily at 0700 MST, NIK as NC, reports QNI 548, QTC 38. ZOU has been operating mobile from Niobrara. K0OBF is doing a fine job as an OBS on 14,090 and 7,045 MC. The North Platte Picnic was held Aug. 2 with about 75 in attendance and all reported a fine time. There is not very much news this month. It could be the hot weather and vacation time. Traffic: (July) W0NYU 186, K0BDF 122, HKI 36, W0EGQ 35, HOQ 25, K0JW 22, W0VEA 22, AFG 13, ZPJ 13, NIK 8, VZJ 8, ZOU 8, K0DFO 7, KJP 7, BRQ 5, MISS 4, PNB 4, W0QKR 4, RJA 4, HTA 3, KDW 3, K0SLB 3, W0SPK 3, HOP 2, K0QFK 2. (June) W0EGQ.

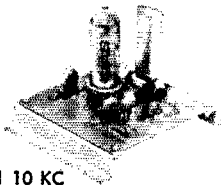
**NEW ENGLAND DIVISION
CONNECTICUT**—SCM, Victor L. Crawford, WITYQ
(Continued on page 150)



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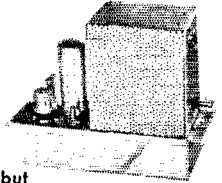
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Wired and tested \$15.95
100 KC crystal only \$8.50
for use with FMV-1 10 KC multivibrator
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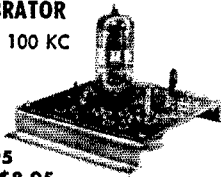
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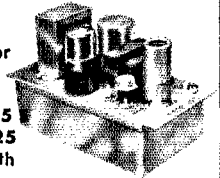
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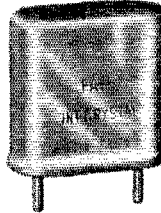
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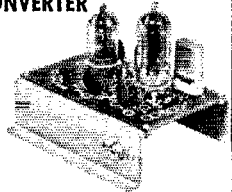
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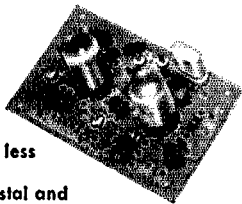
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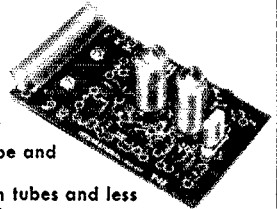
FCV-2 CONVERTER

Model 50, 6 Meters
Model 144, 2 Meters
Kit with crystal less tubes \$12.95
Wired with crystal and tubes \$17.95
Shipping Weight 2 lbs.

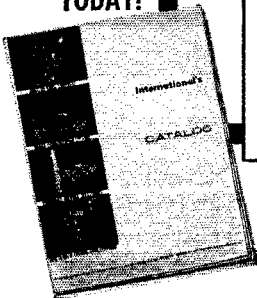


MODEL T-12 12-WATT CRYSTAL CONTROLLED TRANSMITTER

T-12 kit less tube and crystal \$8.95
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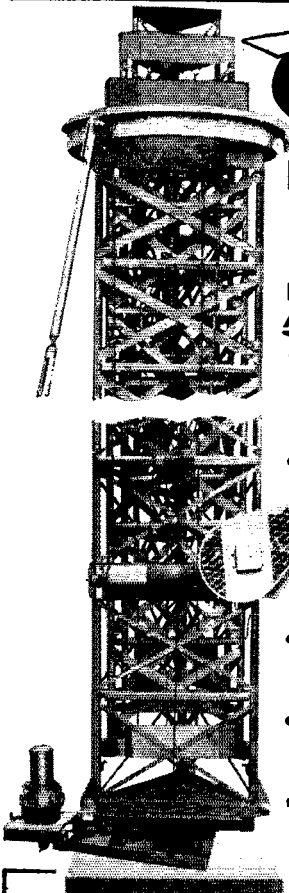


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--K2DEM/1, working from New Milford, made BPL, GVJ, science teacher at New London High School, attended Yale University for summer studies after receiving a scholarship from the National Science Foundation. LGE worked a KPI and a CO on 6 meters. KNIHKZ has dropped the "N." KIDPL operated portable on 2 meters from Windsor. KIGHL has moved to Windsor Locks and is active on 6 meters. KYQ reports that CN handled 321 messages, including 61 on the second session, during 31 sessions. Average attendance was 10 stations. High QNI goes to KIHWF, OBR and RFJ. HYF is home traveling 13,300 miles in 35 states and attending four hamfests. LHR has been appointed EC for Columbia. OBR and his XYL toured Canada and the Midwest on their vacation. YNP is with the Navy in Key West, Fla. YBH advises that CPN met 30 times, handled 267 messages and had an average daily attendance of 27 stations. High QNI were FHP, 30; MDB, TVU, 28; KIBEN, KICRQ, OQC, 27; KICBV, 25. KIBFJ vacationed in Europe. KLK is with the Air Force in San Antonio. KIBEB has increased his country total to 123/85 since putting up a Hy-Gain beam. WPR spent his vacation in Pennsylvania. GUV and KHYQ vacationed on Long Island Sound in a cruiser. DDE's XYL is now KILBQ. FHP advises CVN handled 20 messages during 14 sessions and had a total of 117 stations check in. QNI honors go to FHP, 14; KNIKEA, KNIKGI, 12; WIHJG, II. New stations on CVN are KNILDJ, KNIML, KNIKSZ and EQV. KIPW vacationed in Kansas. KICFW is the new chief operator for the CQRC Tue. night net on 2 meters. Sailing has cut down the humming activities of CHR. QVF worked FOR (Southington from Canton Center) on 50 Mc, using a transistor rig. BDI has been assisting NJM with the Sunday night high-speed code practice. BFS has a new Hornet tri-hand beam. Business and transmitter trouble have kept ROX off the air. KIAAE is working on a new 400-watt rig. Appointments renewed: MBX as OO; YNP as OBS; KIBEB, KIBFJ, KIDLAM, ECH, FHP, GVJ, LIG, NEK as OPSs; BIH, ECH, GVK, HUM, JTD, NJAI, QJM as ORSs. DDE, FDJ, HDQ, NJM, NQO, RAIT, TVU, ZPD as ECs; GTG, HDQ, ZTT as OESs. Reports received: OES from KIDPL, FVV and LGE; OO from LCG and MBX. Traffic: WIOQC 461, AW 295, K2DEM/1 230, KIHWF 198, WIOBR 134, KYQ 127, YBH 83, FHP 51, RFJ 40, KICBV 31, WIEFW 31, TYQ 28, VVY 27, CHR 23, BDI 18, KIAOE 10, WIFBS 10, CUI 8, KICAK 4, WIJZA 4, KIDPL 1, WIFPF 1.

C.W.A. TWELFTH ANNUAL CONNECTICUT QSO PARTY OCTOBER 3-4, 1959

All Connecticut amateurs are cordially invited to take part in the 12th Annual Connecticut QSO Party sponsored by the Connecticut Wireless Assn., Inc.

Rules (1) The party will begin at 5:00 P.M. EDST October 3 and end at 11:00 P.M. EDST October 4. (2) Any and all amateur bands may be used, and either phone, c.w., or both. C.w.-to-phone and cross-hand contacts are permitted, but not extra credit is allowed for such QSOs. (3) The general call will be "CQ CN" on c.w. and "CQ Connecticut" on phone. (4) The same station may be counted but once regardless of band. Mobile, portable and home stations covered by the same station license all constitute the same station. (5) Exchange names of town areas. (6) Score one point per contact; multiply contact points by number of town areas worked for final score. (7) Reports must show band, times of QSO, call of stations worked, town area of station worked. All reports must be postmarked no later than November 15 and should be sent to George Hart, WINJM, 66 Highland St., Newington II, Conn. (8) Special recognition to the high scorers, the v.h.f. leader, and the top-scoring Novice. All decisions of the C.W.A. Contest Committee will be final.

Here is an opportunity to see how many Connecticut stations you can work in a 30-hour period. Get on the air this October week end and meet the gang in your section-

EASTERN MASSACHUSETTS—Frank L. Baker, jr., W1ALP—New appointments: LMZ as OES, K4HOU/1 as ORS. Appointments endorsed: MD Hingham, TZ Alt. R.O. for Sector 2D, DOF Revere, KEK Lynnfield, CWR Newburyport, AWA North Reading as ECs; UKO and DOF as OPSs; DFS as PAM for 75-meter phone; AWA as OBS. We are all very sorry to hear of the death of
(Continued on page 152)

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A Word From Ward . . .



"THE MIGHTY GOONYBOX"

A number of years ago when a traveling circus came to town, I once got into a conversation with a midget who wasn't much taller than a yardstick. During that chat he made a remark I never forgot.

"We midgets," said the midget, "have a very important mission in life. If we do nothing else, we at least show normal-sized people how much of them is absolutely superfluous!"

My pint-sized philosopher was right. A thing doesn't have to be big to be good. And in many things—especially in electronics—the smaller they are, the better!

If you have a gold medal around you'd like to hand out to someone who has achieved the ultimate in the fine art of miniaturization, I suggest you give it to the Gonset people for their latest 2 and 6 meters Communicators.

What a pint-sized package of power! Each of these units isn't much larger than a couple of cigar boxes. Yet they're more versatile than an acrobat with four arms. Your power is 6 VDC, 12 VDC, 115 VAC? The Communicator uses them all. Plant it in your car, take it to camp, tote it to a friend's house, rig it up at home, in hotels, motels, convention quarters, the Gonset Communicator—affectionately known as "The Goonybox"—will often out-DX transceivers many times its size and price!

Come in at your leisure or drop us a line. See the Goonybox for yourself or you'll never believe how Gonset crammed so much performance into so small a package. Even our midget would beam with admiration!

Ward J. Hinkle W2JBU

Before you buy or trade, wire, write, call or drop in to see WARD, W2FEU

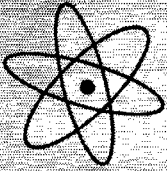
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W6ZZ, ex-W1WV. GOU has 200 confirmed, all on 10 meters, for DXCC. Heard on 75 meters: IYL and XZO mobile, KIBUR, CJM and YIB. Heard on 2 meters: KIKZG, JTF, KNIS KHT, KUY and WIUXZ. 3VQP visited OFK. KIIMD has a Valiant DX-40 RME 4350 AR3 on all bands. KIQP has an Adventurer. KYC is going to New Mexico for a trip. Who is KNILBA? IHC has joined FCD Hq. at Natick as a c.d. operator. HIL has a new big antenna for DX. K4HOU/1 has a DX-100 and an HQ-129. KIQPH expects to transmit "TV" on 436 Mc. with 40 watts and a high-gain Yagi antenna. MID went to Europe for a month and came home broke. The new c.d. set-up in Norwood is as follows: GNK, Comm. Officer; LUG, Radio Officer, TBX and NBS Alt. R.O.s; KIGUN, EC, K1JMR is the call and NBS the trustee. PEX is very active in many nets handling traffic. EAE was on the Cape for a vacation. KIBVY is on several nets. HIC was in New London, N. H., for the summer. KICMS and ILA took a trip to VE-Land. NJL went to Miami. K1GYM is on 20-meter s.s.b. LGO vacationed in New Hampshire. K1JME is active on 6 meters. KICOV has a Globe Scout and an NC-183. NF still is working DX. CWR has been ill but is feeling better. The Braintree Club held a family picnic. GDJ and BGW took part in the May F.M.T. Our Mass. Phone Net is now a part of the National Traffic System. KNILKI is in Brockton. LMZ reports lots of activity on 2 and 6 meters for DX. He has a new eight-element beam for 2 meters. K1JSE, on Texas Tower No. 3, is on 145.03 Mc. each night. IEF operated at Bass River but is now at 28Z. KIBZL has a new home-brew mobile on 10 meters. KIBOF/1, from West Island, and area hams met at his QTH for an annual picnic. KIDPI has a new 75A-2. K1DWD is new in the area. KIBVD has a new Apache. AGG is mobile on 10 meters. KIDPI needs Delaware for WAS on 10 meters. UQH is raising the antenna at his new Mattapoisett QTH. The Motley Crew meets each night on 29.064 kc. with KIBZL as NC and K1s DPI, BYD, EEQ, EBJ, Wis, UQH, HXA, ME, ONK, DIY, VDF, ZHC, AZY, AQS, APN, CDO, AGG, CNT, WA and 2CFR/1, reports K1AWX. K1KCG is new in Marlboro. K1HHL is new in Rehoboth. BQP has a Ranger and a Gonset on 2 and 6 meters with beams. K1JUP has a DX-20 and a home-built receiver. PEX is official representative for the Eastern Mass. 2-Meter Net to the Mass. Phone and TCPN. EAE is official representative for the above to the Eastern Mass. C.W. Net and 1st Regional Net. OFK worked LRE on 2 meters and has the beam up at the new QTH. PEX and K1GRP are new OPSS. 51OU/1 has a mobile rig for all bands. AWA is overhauling the rig. Traffic: (July) K1GRP 634 W1PEX 343, AWA 217, UIR 149, EMG 120, NJL 107, KIDIO 72, K8MMZ/1 68, K1GYM 66, BUF 64, BYL 57, W1OFK 53, EAE 51, LMZ 44, SIV 36, AKN 34, KIDGI 25, BYV 19, CMS 15, W1CZW 12, ATX/1 12, ZSS 12, AOG 11, GEK 10, IEF/1 10, TY 10, DTH 6, WU 5, K1IKX 4, WHIC 3, AUQ 2. (June) W1UR 195, EAE 100, K1BYL 41, GYN 17, WILGO 7, K1AQI 2, JME 2, WINJL 2. (May) K1BYL 149, W1AOG 20.

WESTERN MASSACHUSETTS—SCM, John F. Lindholm, W1DGL—Asst. SCM: Richard J. Kalagher, 1K6J. SEC: BYH, RM: BVR, PAM: ANG. The West Mass. C.W. Net meets on 3560 ks. at 1900 Mon. through Sat. The Mass. Phone Net meets daily at 1800 on 3870 kc. The Worcester County V.H.F. Net meets at 1900 on 51 Mc. Our section had the pleasure of having K2YTD and WY2CCE operate /1 from a camp near Lenox this summer. K1GCV and W1MUN took part in the latest Frequency Measuring Test, with W1MUN, our section hot shot, right up there again nationally. The Asst. SCM, KGJ, with whom your SCM has had a great deal of pleasure working, will leave that post to enter Tufts University in the fall. As mentioned last month the Novice Net is QRT for the summer. BYH is now running 150 watts with a Meissner transmitter and v.f.o. DGL is operating portable from Connecticut. The Worcester County V.H.F. Net has made a good start toward providing section net coverage on v.h.f. Thanks to HGN for being the mainstay of NCS and to GLD, of Worcester, for helping to promote the venture. Next stop Springfield? As reported before, your SCM has resigned the post in favor of duties at A.R.R.L. Hq. as Communications Assistant. I hope most have been satisfied with my output. My sincere thanks to all for making my term in office a pleasant one. Special thanks to BVR, MNG, BYH and KGJ for their support and confidence. Our section is really fortunate that BVR will return to the post of SCM, held by him in the past. Let's all get behind Percé and pull together for some real activity this fall. Traffic: K2YTD/1 205, W1BVR 113, DNS 63, AGM 35, K1LIV 31, WY2CCE/1 8, W1DGL 3.

NEW HAMPSHIRE—SCM, Robert H. Wright, W1RMH—SEC: BXU, RMs: K1BCS and K1CTF, PAM: HQ. V.H.F. PAM: TA. The following are the active New
(Continued on page 154)



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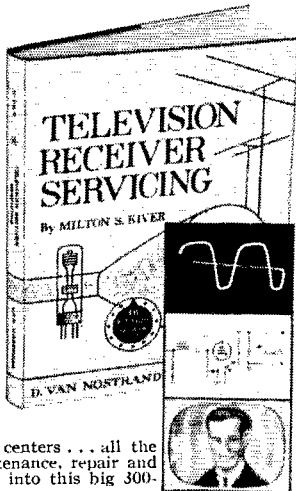
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Hampshire nets: Granite State Phone Net meets on 3842 kc. Mon.-Sat. at 1900 and Sun. at 0900; the NFN (e.w.) on 3685 kc. daily at 1830; the Northeast V.I.F. Net on 145.8 Mc. daily at 1930. QGU has been endorsed as ORS for another year. The Cootocook Valley Radio Club has been successful in obtaining the call K1BKE as a memorial to Robert Willard. ARR/6 has graduated from Army Language School. Bob reports carrying on a QSO with GABKDA—in Russian. K1C1F is the proud possessor of a new HQ-170 receiver and reports fine results. The following New Hampshire stations are all active on RTTY: FTZ, MDP, RMH, and YHF. There is not too much to report this month. Remember that what appears in this column depends on who reports so if you have something of interest to hams how about passing it along. Traffic: (July) K1C1F 657, BCS 558, W1QGU 83, TA 68, DYE 53, K1IJK 26, W1EVN 18, YHF 14, ALJ 10, K1DKD 10, W1BYS 2, (June) W1AJ 18, KYC/1 8, BYS 2.

RHODE ISLAND—SCM, Mrs. June R. Burkett, W1VXC—SEC: PAZ, PAMs: KCS and YRC. RM: BBN. Endorsements this month: TGD as EC of Burlington and GR as Class 1 OO. A section Net certificate has been awarded to KILSM, K1IAP, K1DPR and K1JPK, all members of the Lincoln Amateur Radio Association, have their General Class licenses. On Aug. 2, LQJ entertained members of the RIN and R1SPN at his home in Westerly. Traffic: W1SMU 530, KILSM 189, W1TXL 98, VBR 18, CMH 13, WED 12, YRC 11.

VERMONT—SCM, Harry A. Preston, jr. W1VSA—SEC: EIB, RM: K1BGC, PAM: K1GLO. Vermont frequencies: e.w. 3520, phone 3855, RTTY 3620 kc. Nets: C.W., M-W-F 1830; VTPN, Sun. 0900; GMIN, Mon.-Sat. 1700; VEPN, Sun. 1700. The International Field Day and Vermont Hamfest held at the Lake Champlain Club at Burlington was a great success. The ARRL meeting was attended by about sixty persons. NLO has a new HQ-160, KN1RH has a new 2-meter Communicator III and a new HQ-170. TLI received a new HQ-170 for his birthday. KN1LLK also purchased a new HQ-170. QQN has a new Gonsel GSB-100 and a Hallicraeters SX-101C. KJG has been cruising the Lake with his 33-foot yacht. SEL is operating a new SX-101C and an HT-32. OJU has a new Valiant on the air. K1AUE has gone sideband. ZYZ has a new HQ-145. Civil defense had its new 2- and 6-meter Gonsels in operation during its picnic and also its new net control rig of a Thunderbolt and Pacemaker. We need news from other points of Vermont and also station activity reports. Hope to see you at the different club meetings this winter. Traffic: W1VSA 251, V1EAZI 172, W1HRG 60, K1GBF 55, HKL 1 48, BQB 37, W1ELJ 19, ZJL 3.

NORTHWESTERN DIVISION

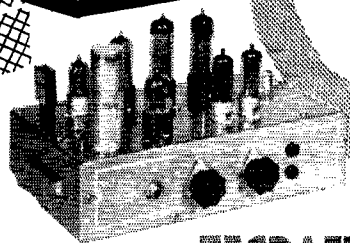
ALASKA—Acting SCM, Kenneth E. Koestler, K17BZO—The Anchorage Amateur Radio Club held its Annual Hamfest and presented AYZ with the Ham of the Year Award for his outstanding performance as an amateur. APV won the mobile hunt. A good time was had by all who attended. The Spenard Lions Club raised money for people in need of eye glasses and hearing aids by delivering chicken dinners to homes. They asked the Anchorage hams for help and MF, AMS and CEJ gladly donated their time and helped by calling in orders on the 2-meter band. BZO and his XYL W17CZU took the advice of W1EN and made the same cabinet for their rig. AUV worked KG1FR, Ice Island, on 6 meters three times in July. Traffic: (July) KG1DT 617, (June) KG1DT 592, (May) KG1DT 437.

IDAHO—SCM, Mrs. Helen M. Maillet, W7GGV—The Big Springs W1MU Hamfest was a big success with 205 registered. New officers are DWE, pres.; JFA, vice-pres.; GGV, sec.; all from Idaho. DWE is the new EC for Madison County. GIL and EMT were active in the CD Party. DHL and VQC are setting up county stations for c.d. headquarters. K7BWV won the VE/W and Phone SS Contests for the State. Congrats! K7ATO, Wendell is the new Faro Net Control. EPD was elected president of the Area Chamber of Commerce. YUX's and CRE's new son slowed publication of the *Idaho Call Book*. GR's spent time in the hospital for surgery. JFA's son is now K7JES. New hams in Pocatello are K7JK and JIL. OL got a prize at the hamfest for being a ham since 1912. The Twin Falls ARC, SWS, needs a final tube for the Viking I. GMC is building a Comanche for mobile. NSN needs a Boise or vicinity check-in and the Regional 7 Net needs Idaho check-ins. Traffic: W7GMC 92, K7BWV 22, W7VQC 14, GGV 9, SWS 2, DHL 1.

MONTANA—SCM, Vernon L. Phillips, W7NPV/WX1—TSG joined Silent Keys. The Glacier Hamfest was a huge success. NCS was elected president for next year (Continued on page 156)

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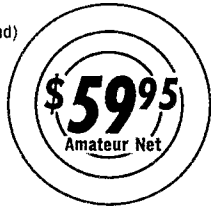
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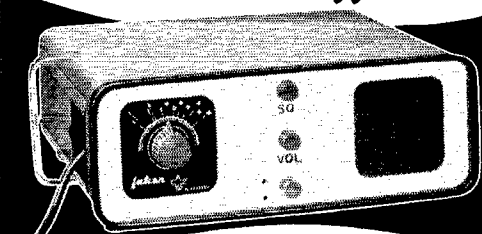


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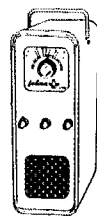
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and UPR won the HT-32. The YRC held a picnic at Fishtail. HVS got married. Vacations: K7ABV and K7BFH in Nebraska, K7CZV in Kansas City, K7BFJ in Hawaii and W7TQC in California. New calls: K7ISE, KN7s IYW, IYX, IYY, IYZ, IZB, IZC and IZD in Billings; K7DNY in Miles City; KN7JAP in Bozeman; K7CLW, KN7s ISX, IZA, JAT and JBH in Laurel; KN7s GYE, IEU and ISW in Forsyth; KN7s HOS, HOT and IUI in Belt; KN7JAZ in Lewistown; KN7IQA in Cut Bank. Moves: AQM and CUN from Butte to Salt Lake City, NWC from Butte to Great Falls, DXK from Cut Bank to Opheim and INV from Missoula to Bellflower, Calif. 6AAX, ex-7FTX, vacationed at Hamilton. K7AWD, K7BKH and K7BYC made BPL. JFR has a new Apache. A new radio club is the Big Stack Radio Club at Great Falls. K7GPR is president. Traffic: (July) K7BYC 512, AWD 241, BKH 179, EWZ 45, W7IDK 42, YUP 26, CQC 14, K7GHC 6, DVZ 5, W7LBK 3, K7DC2 2. (June) W7MIQ 21.

OREGON—SCM, Hubert R. McNally, W7JDX—SNA is moving from The Dalles so BZC has been appointed as SEC for Wasco County. K7EPO appears to be an expert at typewriting? RXJ is getting parts together for an all-band rig. DIC has had visiting relatives but promises more activity soon. LT is trying out a new Triband beam. K7ETL and K7GSR are new OES appointees. DEM is painting and loafing. HI, FY still has no traffic but he is always around. We regret to announce the passing of OAP. A swell OEN picnic was held at Canby on July 19. Also the Affiliated Council of Portland Radio Clubs had a picnic at Lewisville Park, Wash. A nice letter was received from K7AUV, who is in the Air Force at Lackland AFB, Tex. A swell report for July came from UQI, our SEC. The new AREC Net on 3875 kc. is coming along fine. ZB and BDU both made BPL again in July! Mobiles attached to the Mountain Rescue and Safety Council (MORESCO) are still at it. During June, on Mt. St. Helens, HIO, RCL, AOB, UTE, DAE, SAO and AXH aided a rescue party with communications. Also, in June, on Mt. Hood, DGE CHN and HIO aided another rescue party. All of these boys were mobile and spent a long time on the job. Many thanks, fellows! Traffic: W7ZB 642, BDU 633, AJN 47, LPH 34, LT 29, K7EPO 27, W7DIC 18, OMO 18, UQI 15, MW 11, RXJ 4.

WASHINGTON—SCM, Robert B. Thurston, W7PGY —The Tacoma and Pierce County ECs are making plans for fall and winter drills. The Spokane Radio Club had 33 operators participating in the Powder Puff Derby July 4 to 8. OBH was chairman. New officers of the Washington Amateur Radio Traffic System (WARTS) are K7AJT, mgr.; LFA, asst. mgr.; REC, secy.; K7AJT, W7EHH, DZX, UWT and YFO, directors. QLH reports a slow-down in traffic on RN7. DPW made BPL for the third time and has a new rig running 600 watts. AIB has been horse-trading and came up with a new Navigator for spare rig and portable use. CWN returned from a four-month trip to Mexico and W6-Land. AMC attended the hamfest at Glacier Park. FIX is thinking of RTTY and looking for gear. K7APJ made WAS. JPH has a 75A-4. WAH is chasing a parasitic in the final amplifier. GAT is back on WSN again. EKE is NCS of the Columbia Basin Net on The OIV. PUA and KL7CTH made a trip by car from Anchorage to Eatonville, Wash. DNU is erecting a new three-element Trihandler. MPH is raising new antennas at the new QTH. KN7IYR is a new Novice in Richland. WXW is going mobile on 75 meters. HUT vacationed in W6-Land. CZY is working on RTTY gear. The North Seattle Amateur Radio Club held a picnic at Lake Goodwin July 26. CAM is installing a new Tribander. FZL worked in Seattle during the school vacation. K7AJT has a new mobile rig. PAE moved to Ephrata. BA took a business and vacation trip to Victoria, B. C. The Washington State Net (WSN) had 22 sessions with 236 QNIs and 207 QTCs for the month of June and for July had 22 sessions with 234 QNIs and 176 QTCs. RGL assisted with communications for the onboard races at the Bremerton Seafair on July 25. Appointees again are reminded to check the expiration dates on their certificates. Traffic: W7BA 1327, DPW 603, HUT 340, DZX 303, QLH 286, APS 170, KZ 118, AMC 88, AIB 49, EKE 48, IEU 40, WAH 30, K7DDQ 28, W7OIV 26, PRU 18, EKT 11, CZY 8, IGF 5, K7GNA 1.

PACIFIC DIVISION

NEVADA—SCM, Charles A. Rhines, W7VIU—Our section rated 3rd nationally during 1959 for reports from our ECs. Let's keep up the good work. KN7HWR, Navy radioman, recently kept several skeds with YRY, his father, from Australia. K6PBW7 is now K7ICW. AZF is QRL working for the State Forestry Dept. Seen at the San Jose Convention: VIIU, PC, VJR and his XYL, MAH and XYL, MAH's XYL won a prize.

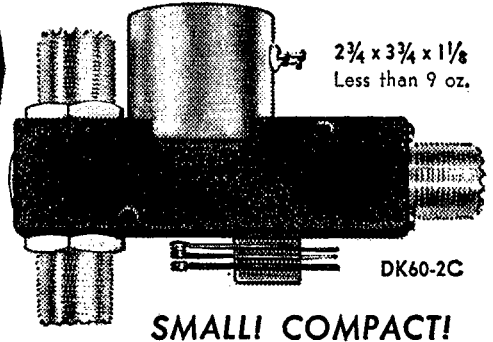
(Continued on page 158)

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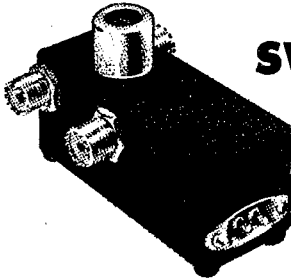
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with
**BUILT-IN
POWER
SUPPLY!**

Designed to operate in the 1.8 to 30 mc range requiring NO EXTERNAL D.C. POWER SUPPLY! Has a BUILT-IN POWER SUPPLY which may be operated from a regular 120 volt A.C. circuit. About 15 watts of power is required.

DKC-TRP features include: Rated maximum legal amateur power. Low VSWR. Aluminum casting construction makes DKC-TRP TVI proof. Switch allows break-in operation with a single antenna system. Type N connectors available at slight additional cost.

DKC-TRP, each. **\$27.75**

DOW-KEY GUARANTEE:

All Dow products fully backed by traditional factory warranty for unit replacements.

r.f. SPECIFICATIONS

- Low VSWR, less than 1.10:0 from 0 to 400 mc.
- Low Losses. Fine silver plated parts used in crucial positions, contacts pure silver.
- Low Cross-Talk in DK60-G and DK60-G2C through use of patented receiver protection connector which provides shield between receiver and transmitter line greater than 100 db. isolation, 0 to 500 mc.
- High Power Rating - to one kilowatt in transmit position when connected to matched line.
- Single Pole Double Throw r.f. contacts.

MECHANICAL SPECIFICATIONS

- High Contact Pressures.
- Long Life Expectancy - greater than one million operations.
- Continuous Duty.
- New Coil Terminal Design - Teflon feed-throughs used to provide connection ease.
- Small Size - new compact design, only 2 3/4" x 3 3/4" x 1 1/8".
- Light Weight - less than nine ounces.
- Newly designed Dow UHF (standard) or type N (at slight additional cost) r.f. connectors available. Specify if type N connector required.

ELECTRICAL SPECIFICATIONS

- Wide variety of coil voltages - D.C. volts at 6, 12, 24, 32, 48, 110 (5,000 ohm), 220 (10,000 ohm) at 3 watts or 6, 12, 24, 110, 220 A.C. at 6 volt-amps, 50-60 cps. (Special voltages available on request.)
- Auxiliary contacts available for power control - DPDT @ 5a, 110 vac. on DK60-2C and DK60-G2C.

Guaranteed free from Hum or Chatter.

DK60 - DK60-G - DK60-2C - **10⁹⁰ to 1420**
DK60-G2C, A.C. or D.C.

SEE YOUR ELECTRONIC DEALER for these and other Dow-Key Quality Products!

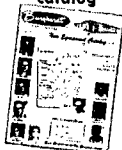
DOW-KEY COMPANY • THIEF RIVER FALLS MINNESOTA

four popular Viking units READY FOR FAST DELIVERY!

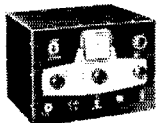
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Top dollar value . . . solid communication power . . . advanced new features—just three of the many reasons why Johnson transmitters are first choice among the nation's amateurs! No matter which Johnson unit you want, you'll buy best at Burghardt's. We always have a really complete stock of Johnson equipment ready for immediate delivery—and whether you buy a small accessory or a complete station you can be sure you'll get prompt, friendly service and close, personal attention. When you buy Johnson you know you've invested in the finest—and for top terms, trades, and service on all Johnson equipment you'll do better at Burghardt's.



VIKING ADVENTURER

Completely self-contained 50 watt CW transmitter used to earn the first novice WAC! Instant bandswitching 80 thru 10 meters—crystal or external VFO control

—TVI suppressed. With tubes, less crystals.

ADVENTURER KIT

\$54.95 NET



VIKING CHALLENGER

Perfect transmitter for fixed station or portable use. 70 watts phone input 80 thru 6; 120 watts CW input 80 thru 10—85 watts CW input on 6 meters. Fast tuning—excellent keying system—TVI

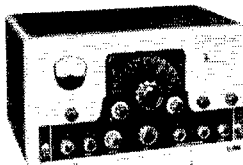
suppressed—wide range pi-network output. For crystal or external VFO control. With tubes.

CHALLENGER KIT

\$114.75 NET

Wired

\$154.75 NET



VIKING VALIANT

Real power in a compact desk-top transmitter! 275 watts input CW and SSB (P.E.P. with auxiliary SSB exciter) and 200 watts phone. Bandswitching 160 thru 10. Built-in VFO or crystal control—wide range

pi-network output. With tubes, less crystals.

VALIANT KIT \$349.50 NET

Wired \$439.50 NET

VIKING THUNDERBOLT

A power-packed, self-contained desk-top amplifier. Rated at maximum legal P.E.P. input SSB and CW; 800 watts AM. Continuous coverage 3.5 to 30 mcs—instant bandswitching—wide range pi-network output. With tubes.



THUNDERBOLT KIT

\$524.50 NET

Wired

\$589.50 NET



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Your direct line to every manufacturer

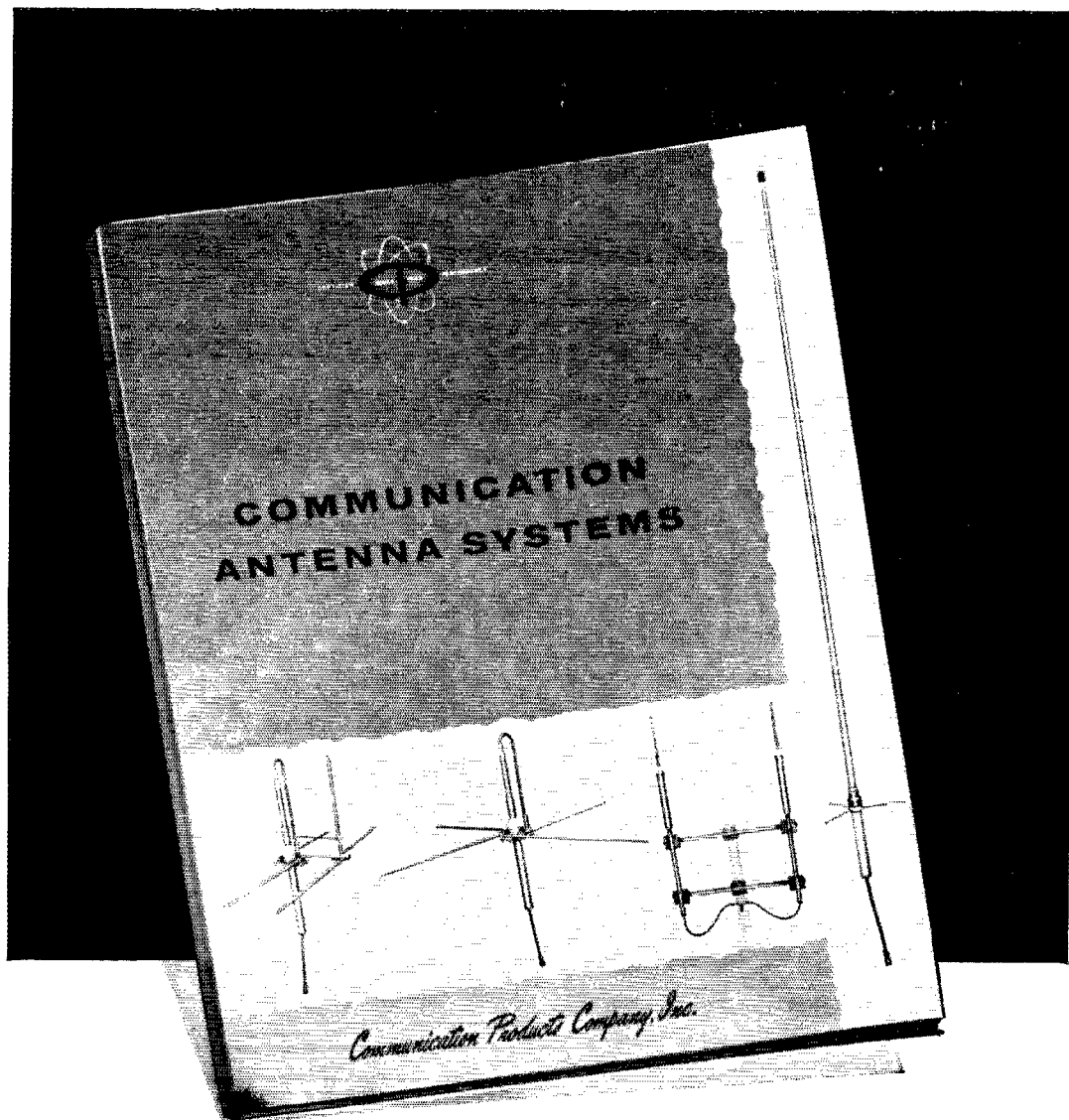
MAH took first place in the 10-meter transmitter hunt after leaving his loop at home and building one on the spot. The NARA scored 2082 points on Field Day, had a successful c.d. drill from Virginia City to Reno, and provided communication for Reno's Independence Day Parade. MAH is holding skeels with W6GDO in Sacramento on 2 meters and is going to try RTTY on 2 meters next. CZZ is in the Vets Hospital and is keeping 2 meters active. IWT made the CD Party. Traffic: K7CWV/7 80, W7VIU 65.

SANTA CLARA VALLEY—SCM, W. Conley Smith, K6DYX—Asst. SCM: Frank Pacier, W6VMY, SEC: W6NVO. PAM: W6ZLO. RMs: W6PLG and K6EWY. Vacation time and the summer doldrums mean club picnics and hamfests, traffic nets working with skeleton crews, and those who aren't taking trips playing host to those who are. K6VQK has been entertaining friends from the East which, with his other hobby of painting doesn't leave much time for ham radio. W6GJZ, of Gilroy, also is quite a painter. W6CLT reports a number of visitors and transients in the section, including KL7CRB, K7HOB and K7DEM. W6GTC and son W6GTW, of Alarina, are heard on 40 meters. W6RFF has a new 80-meter antenna. The same with W6JCG who is back on the day shift again and ready for traffic. W6QVP and K6GID have both modified the RTTY for "Conference" operation. K6EWY installed a 500-cycle filter in the HRO. K6TEH has a new flattop for 40 meters. W6RSY is working on a new transmitter and antenna matching network. K6GZ plans to move to Belmont, which will be no small operation with all his gear. K6RIM is the new editor of QRM, club paper of the San Mateo RC. New members of the SCARS include W6VCNU, W6PEY and W6EFY. W6CJA took another crack at the F.M.T. with results well within Class I OO tolerance. W6CBX again made really outstanding accuracy in the F.M.T. New appointees: K6HCF and K6HCQ as QESs. Traffic: (July) W6RSY 1134, K6GZ 570, K6DYX 210, W6YVB 447, W6AIT 115, K6GID 80, W6HC 69, W6OII 63, W6DEF 44, K6DHO 18, W6RFF 14, K6VQK 11, K6TEH 10, W6CLT 3. (June) W6PLG 38.

EAST BAY—SCM, B. W. Southwell, W6OJW—Asst. SCM: Mary Gwynne, W6PIR, SEC: K6DQM, ECs: W6LGW, W6IUX, W6ZZF, K6EDN, K6JNW and K6ESZ. K6UJS is recuperating from a month's stay in the hospital. K6OKK acquired a whole series of cavities for the v.h.f. and s.h.f. bands. K6JES is president of Cal. Poly Radio Club. K6GK is trying to get his new QTH in order. K6TWT had his appendix removed. K6ZYZ is traffic man on NCN. RN6 and PAN. K6UHE gave the Novice test to W6GIQ. New officers of the Oakland Radio Club are W6ELW, pres.; K6KQD, vice-pres.; W6YJJ, secy.; K6DOQ, treas.; K6AUD, chief op.; K6YSS, Sgt. at arms; K6LWA, public relations; W6UTX, EC; Mark Jennison, Asst. EC; K6CCG, Asst. EC; K6VQP, director at large. K6UIE has an HQ-110 and a Hy-Gain 12A-V vertical. W6BKIM passed the General Class exam. The Oakland Radio Club's 6-meter gang led by K6JFH had a picnic at Roberts Area which was attended by nearly 300 from the Bay Area. K6SZT (XYL K6LWA) and W6BKIM attended the Santa Barbara Hamfest. The CCRC held its July meeting in the San Jose Hq. of the C. D. communications building. The MDARC made 6219 points in Field Day. W6DOP is a new Novice in the Walnut Creek Area. K6OBB, K6KYT, K6ZNH and the XYL of W6OGW won prizes at the ARRL San Jose Convention. K6JER, JES, JPR, QNY, KWX, DEL, IMV, OBB, TPO, KRF, KYT, ZWJ, ZNH, W6AM, YKM, PEL, BEP, QEN, LGW, EPI, W6DTR, ADAM and W6DDO, of the MDARC, attended the S. J. Convention. W6GXC is the new editor of MDARC's *Carrier*. The HARC held its hamfest July 26 at Hunter's Hideaway, Niles Canyon. W6CQP and W6CSJ are organizing a 6-meter net on 50.55 Mc. K6QXR and his XYL have a new jr. operator. Congrats, W6IIF is now K7IDH. K6AHW and W6WSH won first prize in the 75-meter hidden transmitter hunt at the S. J. Convention. W6FKJ, W6FLL and W6FFQ are new calls in the HARC. W6CSK has a converted ARC-5. The Mission Trail Net Roundup at Mt. Shasta was a roaring success. W6OJW got his DXCC and WAC-phone sheepskins. W6KG has a 271/285 DX score and W6TI has 279/278. W6OJW vacationed in VE7-Land. W2TNB, ex-W6GGG, is coming back home to the land of the kilowatts after 18 years as a W2. Traffic: (July) K6ZYZ 219, K6GK 132. (June) K6GK 290, K6ZBL 10.

SACRAMENTO VALLEY—SCM, Jon J. O'Brien, W6GDO—Asst. SCM: William Van de Kamp, W6CKV, SEC: K6IKV, RM: W6CMA. PAMS: W6ESZ and W6PIV. The Sacramento Amateur Radio Club had a very nice dinner meeting on July 22 with many prizes and good food. The Yuba-Sutter Radio Club had an FB steak barbecue at the home of K6HVM on Aug. 1. W6WLI now has an air-conditioned ham shack. W6NQA

(Continued on page 100)



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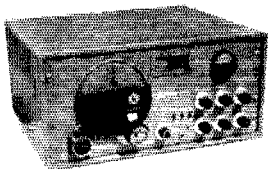
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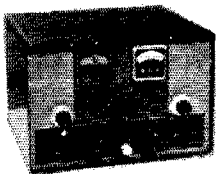
Send us a post card or letter today with your bid on either or both pieces of used gear described below. No bids postmarked later than midnight, October 31st, 1959, will be considered. Send your bid to our Ham Shack in TACOMA.



Hallicrafter SX 42 Receiver (with R-42 Speaker)

540. Kc to 108 Mc. Bandspread—Tone
6 Bands—RF gain S-meter—Volume
Xtal Phase—BFO

(This receiver is on display in our TACOMA Ham Shack tagged at \$192.50 with speaker. It is in excellent condition except for a few cabinet scratches.)



Johnson "Viking Challenger" Xmtr.

80-40-20-15-10-6 mtr.
One xtal. for each band
VFO input socket

(This transmitter is on display in our TACOMA Ham Shack tagged at \$105.00 with Xtals. It is in good condition except for cabinet scratches.)

Both of these units are guaranteed to be in satisfactory operating condition.

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Ask for our USED EQUIPMENT bulletin too!

has a new jr. operator. Judging from the lack of reports received this month, many of the Sacramento Valley hams have undoubtedly been enjoying summer vacations. Several of you no doubt operated portable from your vacation spots and had your own private Field Day; we would like to have reports about your activities. In order to keep this column interesting for you to read I must have reports from you. If each one reading this right now would please remember to send me a card at the beginning of each month with news of your previous month's activities and traffic, it would help me considerably and make much more interesting reading for you. Traffic: W6QNI 16.

SAN JOAQUIN VALLEY—SCM, Ralph Saroyan, W6JPU—K6OZL got his General Class license and is having a good time on 40 meters. The Hanford Radio Club meets the 2nd Mon. of every month at Coe Park and is starting a code class for beginners. W6BRAI is looking for 8-meter signals on the 1st Wed. of each month at 8 p.m. K6ROU got his General Class license and is chasing DX on 20 meters. The new officers of the Turlock Radio Club are W6HAB, pres.; K6LRE, vice-pres.; K6DAIH, secy.; and W6USV, sgt. at arms. The Turlock Radio Club had a very fine barbeque at Hatfield State Park on July 7 with 35 club members attending. K6GOX finally made WAS on 6 meters, just under the line. W6ADB says the DX40s must go. W6WTM is in Dos Palos now. W6VVU is now located in Fresno. K6EIL is working portable in Alpine County. K6IMN is on s.s.b. W6COP got his General Class license and is running 10 watts on 75 meters. W6ZFN is working with the Forestry Division handling traffic via telephone company radio phone. The San Joaquin Valley Net had 23 sessions, 434 check-ins, 12 messages and 60 contacts. W6PXP had an operation but is now on the mend. W6LOS is hitting the sack early these days. W6QON is heard working s.s.b. stations. W6NKZ is working over Q5 receivers. W6URK got a new v.t.o. and is back on 20 meters with his roommate. W6JPU still is looking for W4GJR on 20 meters. Traffic: W6USV 34, K6EJT 28.

ROANOKE DIVISION

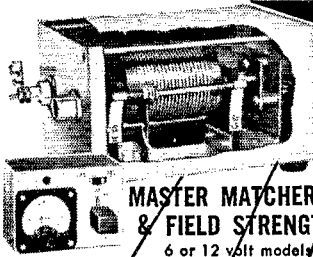
NORTH CAROLINA—SCM, B. Riley Fowler, W4RRH—SEC: HUL, PAM; DRC: V.H.F. PAM; ACY, RM; PNM. With the V.H.F. Field day behind us and the experience gained by the Winston-Salem group and the Greensboro group I am of the opinion that we should seriously consider 2 meters as a mode of transmission on a state basis. I urge each of you to get busy in the various areas and contact your V.H.F. PAM giving him the benefit of your experience and the frequency on which your net operates. Maybe the V.H.F. PAM can work out a suitable State Net Frequency for all to work on during the coming fall. Two-meter operators, please contact ACY. Those of you who work 6 meters, please contact Phil also. This is too much neglected in the state. With both Technicians and Novices on these two bands some real activity should result. RRH and BLV were again appointed as District MARS Directors for the coming year effective Aug. 1, '59. RTTY was given a boost in the State by the Third Army. Three FRR/2ds were issued. Those active in RTTY in the State are AMY, BLV, BBZ, CVU, RRH and RVH. Others with machines include K4RRG, W4GHX, QVY, BHU and TLA. Please drop me a card telling me of your activity (see page 4 QST for the address). LOV has a machine but is not on the air. Traffic: W4DSO 120, SHF 96, BAW 81, RRH 63.

SOUTH CAROLINA—SCM, Dr. J. O. Dunlap, W4GQV—July activity for the S.S.B. Net was 417 stations reporting, 89 messages. K4GMV is recovering from a recent illness. The SCN's traffic for July totaled 233, average 7.5 per session in 31 sessions. Rock Hill was awarded a plaque for the best Field Day operation in the State with a total of 5256 for 580 contacts. The Palmetto RC was 2nd, Barnwell RC 3rd. The awards were made at the Columbia Picnic at Sesqui Park by SEC K4PJE after a few preliminary remarks by GQV. The S.C. Phone Net was congratulated by the FCC for excellent operation during Hurricane Cindy. PAM K4IE held a meeting of S.C. Phone Net NCS stations at Sesqui Park with a discussion of SOP, DX, BZX and K4CWK have been recommended for OPS appointment. CJD will be sorely missed by SCN when he leaves for overseas duty with the AF. TUN represented S.C. at the National Convention in Galveston, Tex. The SPARC presented Code Proficiency certificates to K4QZA and KN4ICG. TIC and VIW have been appointed OES. A meeting of net managers, League Officials and members will be held Oct. 10 prior to the R.H. Hamfest for panel discussions of net procedures and coordination. Traffic: (July) K4GAT 175, AVU 131, WCZ 112, W4FFH 104, AKC 87, K4PJY 44, W4CNZ 41, BWZ 24, GQV 13, K4IE 11, HQX 9. (June) W4BWZ 40.

(Continued on page 162)

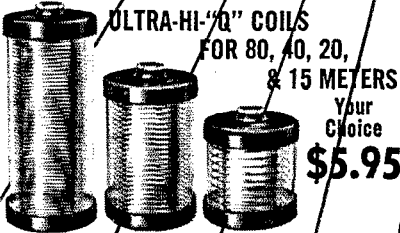
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SLIM-JIM**
ALL-BAND
BASE LOADING
ANTENNA COIL



**MASTER MATCHER
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6 or 12 volt models **\$24.95**

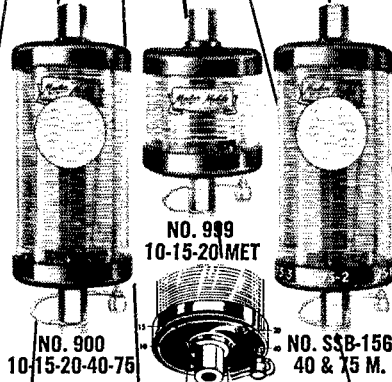
Automatic
tunes entire
band by re-
mote control



ULTRA-HI-"Q" COILS
FOR 80, 40, 20,
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Your
Choice
\$5.95

The coil with the highest "Q" ever obtained. Tested and found to have a "Q" of well over 515. Use with 36" base sect. 60" whip. 3" Dia.

MULTI-BAND ANTENNA COILS
New Plug-in type coils, designed to operate with std. 3' base and 5' whip.



NO. 900 10-15-20-40-75
NO. 999 10-15-20 MET
NO. 55B-156 40 & 75 M.

• Rigidly tested & engineered—found to have "Q" of 525 • Handles 500 Watts input
• Operates into a 52-ohm cable • Positive contact—noise free, trouble-free operation
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96" WHIP
FOR 10, 15, 20, 40, 80 METERS
SIZE 3 3/4" x 9"
NO. B-1020

Positive action, just slide whip in or out to loading point and lock nut into position.

\$1795

MASTER-MAGIC WAND

New easy-to-install, single band, top-loaded plastic covered fiber glass antenna provides maximum performance at the most useful radiation frequencies.

- 10 Met.- 5 Ft. L. \$8.95
- 11 Met.- 5 Ft. L. 8.95
- 11 Met.-35 In. L. 8.95
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- 15 Met.- 5 Ft. L. 8.95
- 20 Met.- 5 Ft. L. 8.95
- 40 Met.- 6 Ft. L. 9.95
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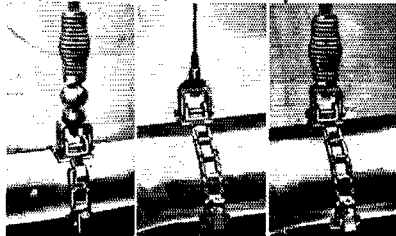
3 ELEMENT 11M. BEAM NO. SR-500

Provides a power gain of approx. 2 1/2 (8DB) in forward direction.

THE CITIZEN SR.

10 to 1 interference reduction from sides and rear. VSWR 1.1 to 1 at band center when fed with 52 OHM coax. . . **\$36.00**

BUMPER MOUNTS



No. 444 \$17.80 No. 445 \$7.95 No. 446 \$13.45
Adjustable to any bumper. No holes to drill.

FIBRE-GLAS WHIPS

The Feather-Weight Antenna with Spring-Steel Strength!

Completely weather proof, break-proof antenna with special flexibility that prevents accidental shorting-out against overhead obstructions which can cause loss of signal, serious damage to equipment.

- FG-60 60" \$4.95
- FG-72 72" \$4.95
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- FG-96 96" \$5.25
- FG-103 103" \$6.95

11M. CITIZEN BAND ANTENNA

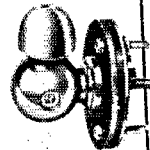
40" base loaded S.S. whip antenna. Fitted with a 1/4" dia. brass slug for use with a standard-broadcast 8-ball type cowl mount, also rooftop or trunk lid type mount. Low standing-wave ratio on most of band when fed with a 52 ohm coax.

88-27 \$12.95

MARINE LAYDOWN MOUNT

Can be mounted in any position. Adjustable swivel for all positions. Chrome-plated brass, water-proof phenolic insulator.

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SWIVEL-BODY MOUNT

Smaller version of Master Mobile Mounts, less spring. Swivels, mounts in all positions. 3/4" x 24 thread for Magic Wand, and all Master Antennas.

No. J-11 **\$2.95**

CITIZEN BAND ANTENNA

26.960-27.225 MC

VSWR under 1.5:1 at resonance. Complete with 50' RG 58/U Cable. Swivel type antenna base for flat or peaked roof installation.

GP 27-11 **\$34.50**

SUPER HI-GAIN CITIZEN BAND

Stacked coaxial antenna provides 5-6 DB gain. 42" high from ground plane. Furn. with 12" ext. for bumper mount.

460-465 MC No. CL-965 **\$21.95**

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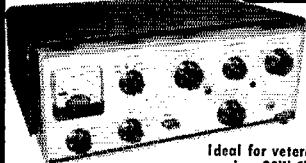
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**90-WATT CW
TRANSMITTER***
#720
KIT \$79.95
WIRED \$119.95

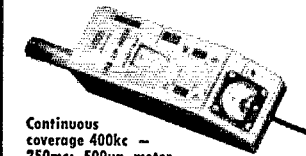
Ideal for veteran
or novice. 90W CW,
65W ext. plate mod. 80 thru 10 meters.

"Top Quality"—
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**HIGH LEVEL
UNIVERSAL
MODULATOR—
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KIT \$49.95
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Cover E-5 \$4.50

Delivers 50W undistorted audio. Modulates xmitters having
r.f. inputs up to 100W. Unique over-modulation indicator.



**GRID DIP METER
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KIT \$29.95
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Continuous
coverage 400kc -
250mc; 500ua meter.

Includes complete
set of coils for
full band cover-
age.

**COLOR & Monochrome DC to
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#460**

KIT \$79.95 WIRED \$129.50

5" Push-Pull Oscilloscope #425
KIT \$44.95 WIRED \$79.95

PEAK-to-PEAK VTVM #232
KIT \$29.95 WIRED \$49.95

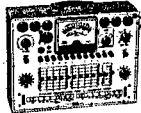
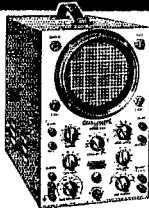
Vacuum Tube Voltmeter #221
KIT \$25.95 WIRED \$39.95

**RF Signal Generator #324
(150kc-435mc)**
KIT \$26.95 WIRED \$39.95

**TV-FM Sweep Generator
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**Dynamic Conductance Tube
& Transistor Tester #666**
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Tube Tester #625
KIT \$34.95 WIRED \$49.95



VIRGINIA—SCM, John Carl Morgan, W4KX—SEC: K4MJZ. The SVARC racked up another fine hamfest, a Sat.-Sun. affair this time, with about 350 registered. VFNers at the Lynchburg Picnic elected BGP net mgr. with AAI as assistant. IMP says the Division Convention (Richmond Oct. 3-4) is shaping up nicely. See you there. Convention co-chairman JUD was Virginia winner in the Vermont QSO Party for the third time. K4EZZL says he can't throw off the ham bug. He now is back in the nets full blast, is resuming management of ESN, and also drives a school bus 80 miles daily. (No mobile rig?) CGE is back in Virginia after foreign duty with the Navy. K4AET's son 3DAD also is back home and headed for Arizona. W4GJ moved to Fredericksburg from Tennessee. K4DWP, inactive since starting at M.I.T., now has a rig he can activate when home; he also reports a new Extra Class ticket. Awaiting his call is 12-year-old Bruce Rutherford, the son of K4THF, who passed the General Class exam. BRF and his XYL, IKA, keep nightly 80-meter c.w. skeds when traveling separately. K4QER and QES have entirely separate rigs, so both can chase BPLs simultaneously. QER says VSN is doing itself proud despite summer QRN, proving year-round operation is well worthwhile. K4VWK took his portable on vacation to Virginia Beach and BZE did the same to Nags Head, N. C. KX QNTed 4RN from K1BCS while vacationing in New Hampshire and visited ARRL Headquarters on the way home. K4GRY asks us to mention that AF MARS is having the big recruiting drive for members. Write him for details. SHJ reports the new directory of Tidewater, Va., hams is available. It lists over 350 hams in the southeastern part of the State, cross-indexed. For information write or contact SHJ, QDY or BGP. Traffic: (July) K4OES 581, AET 272, MJZ 267, QIX 184, W4SHJ 187, K4EZZL 132, W4CGE 107, CXQ 94, RHA 79, OOL 63, K4QER 58, TFL 50, VWK 40, IIP 33, W4PRO 27, BGP 25, K4YPR 24, KZU 10, W4AAD 7, K4VJB 7, W4DVT 3, K4HTA 3. (June) K4ADD 128, IIP 22, QIX 11, VWK 8, YPR 8, VJB 3, JRE 2.

WEST VIRGINIA—SCM, Albert H. Hix, W8PQQ—Asst. SCM: Festus R. Greathouse, 8PZT. SEC: HZA. PAM: GAD. RMs: GBF, HID, PBO and VYR. We all wish HZA a very speedy recovery. The Jackson Mills Hamfest was an outstanding success. It was extremely well planned and organized. Congratulations to the team of amateurs who worked hard to achieve this. QKW, formerly from Michigan, is now in Charleston. KN8PQC is a new ham in Charleston. K8CRM renewed his OPS appointment and is a new EC. MLX is getting a new HQ-145 receiver. He had W4WBK as a visitor recently. The Greenbrier Radio Club is doing a good job of organizing. GCN is leaving for Saudi Arabia soon and hopes to get on the air from there. IITLR, who is visiting in Charleston, will leave for Italy soon. SET is installing a 20-meter beam. K8CSG soon will be in his new home. He is building a new high-power rig. K8AXU QSOed W5RCI in Mississippi on 144 and 220 Mc. K8BLR has 30 states toward WAS. His XYL, K8HKW has 25. DDB made a trip to the West Coast recently. W8IBF is operating on 1215 Mc. with an 803-A oscillator. SMP has been in the hospital. K8HID is a new RM. Traffic: (July) W8JLF 560, K8KSK 120, W8NYH 26, K8CNB 17, FNI 15, CRM 11, GAG 6, BLR 2, CSG 2. (June) W8FNI 154.

ROCKY MOUNTAIN DIVISION

COLORADO—SCM, Carl L. Smith, W8BWJ—SEC: NTT. RM: WME and K8EDK. PAMs: CXW and IJR. Current appointments: OPS—W8 ANA, CXW, NVX, IA, IJR, K8s BCQ, DXF. ORS—W8 ANA, IA, KQD, WME, WVMK, K8s EDH, EDK, IIT, JTZ. OES—W8FKY, K8CLJ. OS—W8s OTR, RRV, TUT. The following have received letters of commendation from the U. S. Weather Bureau for their weather reporting services for more than 100 contacts on CWXN: W8s, ACH, APZ, BRU, DQN, DDM, IA, NVU, QBF, SHJ, TX, VLS, YMP. K8s ACJ, WAG, DXF, EOZ, IFT, IHN, JET, LME, MDT. From "K8QNH Splitter": EGJ and wife have a new daughter, and KLB won a scholarship to CSC at Greeley. The DAC Roundtable says a club member who is pulling his own weight rarely has any of it left to throw around! Mobiles BBN, VDY and OZV provided communications for motorcycle mountian-climbing races. The July Hamfest was a success for all who attended, especially K8EWU, who took home the top prize, and SX-101. Section Net certificates are being awarded to all net members on the basis of attendance rather than traffic volume. The Hi-Banders are building portable 6-meter transceivers centered on c.d. frequencies. K8BTO was elected secy.-treas. of the Mile High Highbanders Club. K8RTI is now Conditional Class. Traffic: (July) W8ANA 281, K8EDH 265, EDK 266, W8WME 133, TVI 112, K8DCW 87, DXF 83, EVG 28, JTZ 25, LCZ 16. (Continued on page 164)

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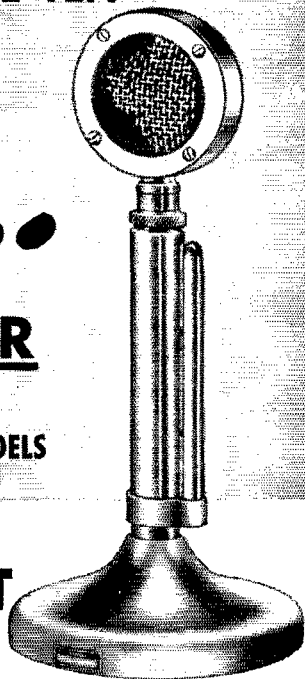
Prizes dear to the hearts of microphone fanciers will be awarded to ten winners.

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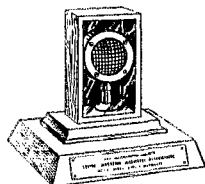
SECOND TO TENTH PRIZES: Choice of a new standard model D-104, 10-D, or 10-C, with G-stand.

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1—Check the serial number on your D-104. 2—Send this serial number along with your name, call letters, and address to: Astatic D-104 Worldwide Contest, The Astatic Corporation, Conneaut, Ohio. Specify, if possible, when and where purchased. Qualifying entries will be informed and requested to send their microphone, transportation insured, for inspection, after which it will be returned. Employees of the Astatic Corporation, their families, their advertising agency personnel and their families and sales representatives, are not eligible to enter. Final decisions regarding winners in the contest will rest with the Astatic Contest Committee. Contest entries must be postmarked no later than December 1, 1959. Winners will be announced in the April issue.



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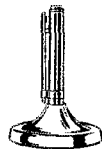


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Ceramic or 10-D
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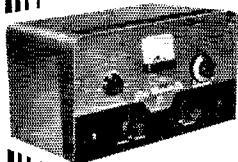
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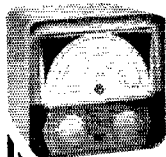
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Globe's AT-4 Antenna Tuner

Wired: \$79.50
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Combination tuner with built-in SWR Bridge. Handles any Xmtr. with final RF input power up to 600w, 80-10M. Fixed link counting in output circuit. Coax input, 2-wire balanced output. Built-in switch allows bypass of tuner circuits for coax input and output. SWR Bridge constantly in circuit.



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TMM 5, RTI 3, SLD 2, MNQ 1. (June) W0KQD 190, K0SLD 15, LCZ 11. (May) K0EDK 104.

UTAH—SCM. Thomas H. Miller, W7QWH—Asst. SCM; John H. Sampson, 70CX. SEC: FSC. PAM: BBN, V.H.F. PAM: SP. RM: JBV Utah now has a total of 60 AREC members. DQW has been appointed as EC for Salt Lake County, with NHY and K7BYR as his assistants. IBO has a Ranger and is having good results. K7AUM has a new vertical antenna up. OCX has been awarded the Master Traffic Handlers certificate. Traffic has been holding up very well for the summer time. IBO reports he really enjoyed the July C.W. CD Party. K7BYR is now a Net Control Station for the Colorado High Noon Net. ARRL appointees should have their certificates endorsed each year by the SCM. The Beehive Net still is going strong despite poor conditions. Of the twenty-five members on the Beehive Net, all but four hold the net certificate. Three of these fellows have just joined the net. Traffic: W70CX 231, QWH 10, K7AUM 1.

NEW MEXICO—SCM, Allan S. Hargett, K5DAA—SEC: CIN. PAM: ZU, V.H.F. PAM: FPB. RM: ZHN. The NMEPN meets Sun. at 0730 on 3838 kc, Tue. and Thurs. at 1800 on 3838 kc. The Breakfast Club meets Mon. through Sat. at 0700 on 3838 kc. The NMBP meets Mon., Wed. and Fri. on 7080 kc. at 2000. TWV meets Mon. through Sat on 7060 kc. at 1900. Meet as many of these nets as you can. A total of 63 pieces of traffic was handled on the NMBP for the month of July, a very good start for the new net. NCSs are K5LMJ Mon., K5VLG Wed., ZHN Fri. New appointees are K5RIT as OES and K5LMJ as ORS. There were 3 v.h.f. nets with a total of 16 check-ins and five RACES nets with a total of 10 check-ins. The Tularosa Basin 2-Meter Phone Net had 18 check-ins. WRO and K5JQU have moved to Oregon and California. Because of vacations during the summer months there is very little news with the exception of Albuquerque. ZU spent most of the summer in Ruidoso, also WPA. Traffic: (July) W5DWB 581, K5LMJ 71, LFE 49, VLG 28, DAB 25, KWR 14, CXN 13, DAA 13, IPA 9, W5CIN 5, GD 5, VC 5, K5QCP 2, IQL 1, VLH 1. (June) K5VSP 2085, LFE 59, LMJ 53.

WYOMING—SCM, Lial D. Branson, W7AMU—SEC: CQL. The Pony Express Net meets Sun. at 0830 MST on 3920 kc. The Wyoming Jackalope Net meets Mon. through Fri. at 1200 MST on 7255 kc. for traffic. The YO Net reconvened Labor Day on 3610 kc. at 1830 MST. LKQ has two new Novices at his house—Virginia and Linda. SCM AMU and SEC CQL attended the hamfest at Caribou Lodge west of Buffalo, Wyo. It was a very nice hamfest, with a good turnout and 83 persons were served a turkey dinner at the banquet and meeting. The Sheridan Club sponsored the hamfest and the Casper Club will sponsor next year's hamfest. SCM AMU attended the WIMU (Wyoming, Idaho, Montana, Utah) Hamfest at Big Springs, Idaho on July 31, Aug. 1 and 2. There was a registration of 218 hams. Assistant Directors BXS and QPP attended the hamfest at Caribou Lodge.

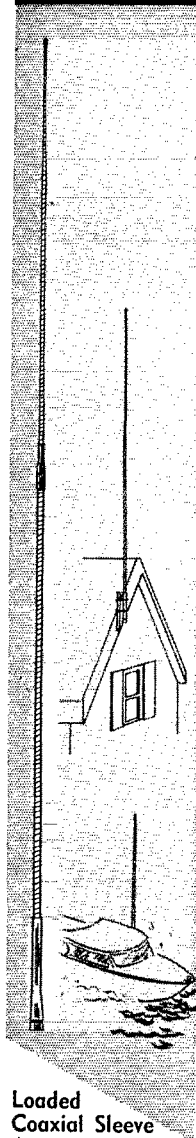
SOUTHEASTERN DIVISION

ALABAMA—SCM, Clarke A. Simms, jr., W4HKK—SEC: WJX. PAMS: K4BTO and PHH. RM: RLG. Congratulations to CIN, who has been elected as net manager for AENO, a 6-meter net in Alabama. What a celebration on July 4 for CJW and his XYL Peggy. Twin girls arrived that date. AENP has a new liaison captain, YRO. Welcome to new members of the AENB—K4EEG, YGS and EJI. It's nice to have CJW back from his new QTH. K4SSB goes up in the world with a new CP-25; he met AENB 23 times in June. K4VLA, of Jasper, has taken a bride. K4BTO worked K4BWR on 80-10 meters in the CD Party. Welcome to two new ones in Alabama City, KN4HVN and KN4KRA. Glad to hear KN4EDF passed the General Class exam. K4KJM has a new mobile installation, a Heath Cheyenne. The Selma Club now has station facilities in a downtown fire station and has ACQ in operation. K4CZZ is at a new QTH in Guntersville. KN4FTC has a new HQ-170 in his station. Traffic: W4RLG 224, K4PFM 184, W4PVG 41, MI 39, K4JDA 32, W4CIU 31, K4BTO 30, SSB 29, W4USM 29, K4AOZ 17, PHH 17, HJM 16, RIL 16, W4CFE 11, K4JPF 11, W4HKK 9, CIN 7, K4JSP 5, CZZ 4, HFX 4, K4JD 4.

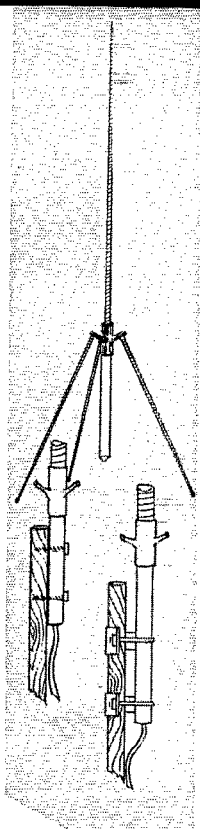
EASTERN . FLORIDA—SCM, John F. Porter, W4KGJ—SEC: IYT. RM: K4BY. PAM: TAS. V.H.F. PAM: RMU. Section Nets: FPTN, 3945 kc. 0700 Mon. through Sat.; FMTN, 7230 kc. 12 noon Mon. through Sat.; TPTN, 3945 kc. 1730 daily; FN, 7105 kc. alt. 3675 kc., 1900 Mon. through Sat.; GN, 7105 kc. 1000 Mon. through Sat.; FEPN, 3910 kc. 1830 Tue. and 7295 kc. 0900 on Sun. Let's give our support to this fine group of section nets. AHZ alerted the Miami Weather Bureau (Continued on page 168)

27 MC citizens band FIBERGLASS antennas

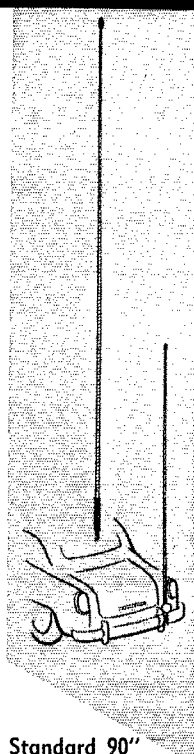
Shakespeare WONDERRODS



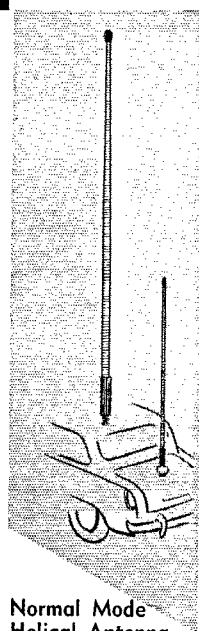
Loaded Coaxial Sleeve Antenna
Ideal for both marine and base station application. Antenna terminated with UHF connector. - STYLE 72-0 - \$46.00



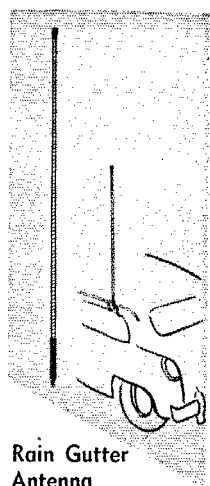
Ground Plane Antenna
High strength fiberglass radiating elements. Supplied to fit 1 1/4" water pipe. Antenna terminated with UHF connector.
STYLE 61-0 - \$41.60



Standard 90" Whip Antenna
Light - weight, -high flexural and impact strength, corrosion-resistant.
STYLE 10-3 - \$6.95



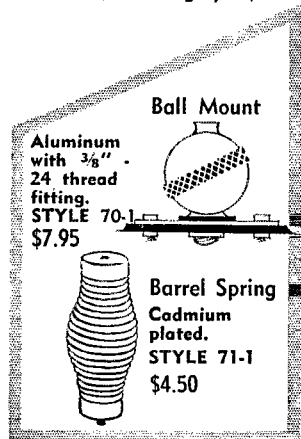
Normal Mode Helical Antenna
Distributed load antenna eliminates standard loading coils; four ft. length permits choice of mounting positions.
STYLE 62-0 Deluxe model, in white \$15.90
STYLE 73-0 Std. model, metallic gray - \$11.25



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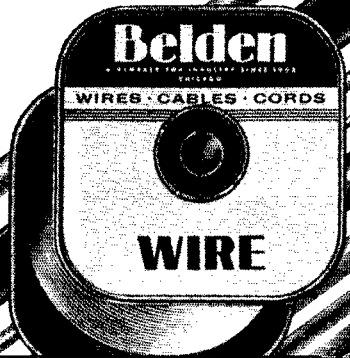
on tornadoes in the Broward County Area. The BARC helped supply communication for the Gold Coast Marathon again this year. The Annual JOCO drill held at Naples this year was a big success. K4DRO set a new record for E. Fla. in the C.W. CD Party by racking up 326 QSOs, 59 sections, for a total of 157,235 points. The Orlando RC turned in the highest Field Day score this year in Florida, 978 contacts with 7731 points and won the *Florida Strip Trophy*. The Miami Springs RC was runner up with 5373 points. The South Miami RC Field Day outing was shown on a WTVJ newscast. V.H.F. news: ENR now is shooting for WPX on 50 Mc. and has 21 contacts confirmed. Guess that 700 watts and seven-element beam is working out after all. DPD now has 60 watts on 144 Mc. with a homebrew rig using 5894s. New equipment: K4VFW, KEG and KIC all have new HQ-145Cs. K4JQI has a new HQ-170. K4PAC has a new Ranger. K4KKI has a new Mosley Tribander and an HQ-160. K4ILB has been appointed RACES Radio Officer for Manatee County and is now active on 6 and 2 meters. K4LCD has worked out an agreement with JGD to handle Western Fla. traffic. Let's get those reports in by the 5th of each month as I have to meet a 7th deadline. Traffic: K4AHA 534, KDN 224, BY 188, ILB 144, LCF 129, LCD 116, BLM 94, W5TKI 93, W4GJI 84, IYT 81, K4COO 64, ODS 55, IWT 48, BNS 39, W4BLT 31, K41DT 31, VEJ 24, W4TMU 19, K4MBB 18, OSQ 16, JZZ 14, W4TAS 13, KN4EHY 12, K4DRO 10, MTP 10, UGE 9, KN4EFR 6, GLI 5, K4ZVF 4.

WESTERN FLORIDA—SCM, Frank M. Butler, jr., W4RKH—SEC: PQW. RMs: AXP and BVE. A 75-meter phone traffic and emergency net has been started on 3840 kc. Meeting time is 1700 CST, with a late session at 1900, every day. Pass the word to all 75-meter hams and monitor the frequency whenever you can. Let's make 3840 kc. the West Fla. "party line." Tallahassee: BKV, YUU, ZAE and PVU staged a transmitter hunt on 2 meters which was won by ZAE. GAA is on s.s.b. and awaiting 100V. YUU has a 75A-4 and a kw. on 20 meters. IZB and JKZ are new Novices. FSU, Demo. School, has a new club with K4VLE as sponsor. Perry: KN4KVI is a new ham; NJH is now Conditional Class. Madison: PBO is equipped with emergency power. Blountstown: DSH has moved here from Defuniak. Port St. Joe: Efforts are being made to equip the AREC Net members with emergency power. Ft. Walton: K2-BAW has WAS 32 on 6 meters now. UBR got 60,000 plus in the CD Party. Pensacola: MS is WAS 48 on 6 meters, plus 15 countries. HYL worked K4RSD and K4BFA, of Pensacola, on a DXpedition to FPR-Land. PFI made one of the first 6-meter contacts with Honduras. EQR worked Montana to complete 6 meter WAS. K4VD did an FB job with the first edition of *Parasitics*. The NAS Club is becoming a very active organization. Traffic: (July) K4UBR 95, PVU 58, W4GAA 14, MS 4. (June) K4PVU 74.

GEORGIA—SCM, William F. Kennedy, W4CFJ—SEC: PMJ. PAMs: LXE and ACH. RM: DDD. GCEN meets on 3995 kc. at 1830 Tue. and Thurs., 0800 Sun.; GSN, Mon. through Sun. at 1900 EST on 3595 kc., DDD as NC; 75-Meter Phone Net each Sun. at 1330 EST on 3995 kc. K4JTC as NC; Atl. Ten-Meter Phone Net each Sun. at 2200 EST on 29.6 Mc., KWC as NC; GTAN Sat. at 1000 EST on 7290 kc.; GPYL Net Thurs. on 7200 kc. at 0900 EST, K4CYV as NC; GAN on 7105 kc. at 1800 EST Mon. through Fri., K4KZP as net mgr. DND, of Warner Robbins, passed away on July 15. In July the Georgia Cracker Radio Club held its annual meeting in Valdosta and elected new officers for the next year with ZDP, pres.; K4BAI, 1st vice-pres.; K4QJH, 2nd vice-pres.; K4ZZS, 3rd vice-pres.; MZO, secy.-treas.; FCW, historian. We sure are happy to have UMM home from the hospital and we wish her a speedy recovery. K4AEJ is now General. IOF is the call of the Atlanta Teen-Age Radio Club. K4BAI enjoyed himself in the mountains during the month of August. K4EJI is Net Control of GSN Saturday nights. K4KZP received a certificate for placing first in Georgia in the Vermont QSO Party. K4BAI won first place in Georgia in the Sweepstakes. K4TEA, of Waycross, is moving to Atlanta. Sure glad that MV is recovering from his recent illness. We visited with the Rome (Ga.) Radio Club Aug. 7 and presented the club with its ARRL club affiliation certificate. Check the dates on your ARRL appointments for renewal as they must be renewed each year. Traffic: W4DDY 244, K4MCL 218, ZMT 192, K4-EJ 74, BVD 67, LVE 57, PEA 22, BAI 21, KZP 20.

CANAL ZONE—SCM, Ralph E. Harvey, KZ5RV—The QRM Committee of the Crossroads Radio Club solved a tough TVI problem in the town of Gatun in July. It was found that a hi-fi fan had connected two Bogen amplifiers up to a TV amplifier. One of the amplifiers was rectifying the 15-meter fundamental. Removal of one Bogen amplifier made everybody happy.

(Continued on page 168)



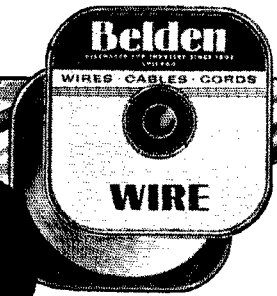
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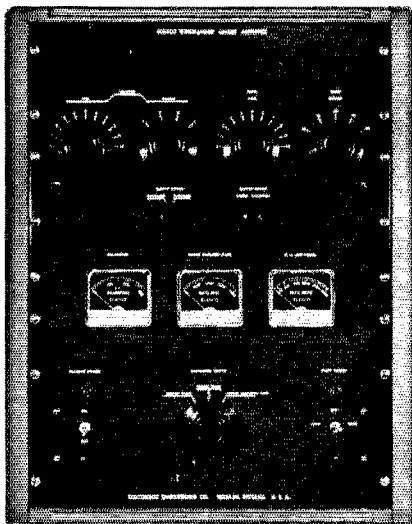


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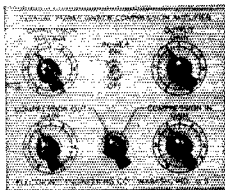
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Members of the QRM committee are CD, chairman, AD and KT. CJ operated a Globe Scout transmitter, portable, on 28.8 Mc. from Gorgas Hospital while she was a patient there in July. Joy used a random length of wire for an antenna and a 75A-2 as the receiver. FL has ordered a brand-new B&W 5100 with adapter for s.s.b. from the U. S. KZ5WA has ordered a Central Electronics 100 V. and expects to have it fired up on s.s.b. in October. Code classes have been started at the Crossroads Radio Club three days a week. Traffic: KZ5EL 78, AD 72, JL 71, OB 58, WA 30, HQ 24, VF 9.

SOUTHWESTERN DIVISION

LOS ANGELES—SCM, Albert F. Hill, jr., W6JQB—SEC: W6LIP. RMs: W6BHG and K6HLR. PAMs: W6BUK and W6RS. The following stations earned BPL in July: W6ZJB, W6GYH, K6HLR, K6PLW and K6GCC. Congrats, fellows! Nice going to W6ZJB for getting GMTHC! K6PLW vacationed in Colorado. K6EBL got 2 new states in the CD Party. K6TPL still is knocking off some good DX on 20 and 40 meters. New officers of the Pasadena Radio Club are K6OMU, pres.; K6GPJ, vice-pres.; W6MQM, secy.-treas. W6WPF is getting RTTY on 2 meters. Good scores in the CD Party were reported by K6TPL, K6CDW, K6GLS and W6CIS. W6AM reports working VE8QG/SU in Gaza Strip. New officers of the Rio Hondo Radio Club are W6UKC, pres.; K6TGE, vice-pres.; K6ACF, secy.; W6AHY, treas. The Inter County Net on 220 Mc. will be underway soon this fall. K6GLS moved to Montclair. W6SRE worked hard on the convention and basking at the beach! W6OIV is doing a nice job with DX on 15 meters. New officers of the Downey Amateur Radio Club are K6ABS, pres.; W6PNW, vice-pres.; K6MSL, secy.; W6HQR, treas. W6UL now is signing /MM on the Trans-Pacific Run. K2HNW/6 is heading back home to W2-Land. K6ZWS and W6UQD are getting the Covina High School Club in shape. W6OYM is running some fine antenna experiments. New officers of the Hamilton High School Radio Club are K6TZY, pres.; W6CDJ, vice-pres.; W6EOB, secy.; K6PZN, treas. New officers of the San Gabriel Valley Radio Club are W6MEG, pres.; K6DJO, 1st vice-pres.; W6ZPM, 2nd vice-pres.; W6MDA, secy.; W6AGK, treas. Support your section nets: e.w., the Southern California Net on 3600 kc. at 1930 P1DT daily, phone, the SoCal Six Net on 50.4 Mc. at 1900 daily. Traffic: (July) W6ZJB 1805, W6GYH 875, K6HLR 720, K6PLW 620, K6OZJ 415, W6WPF 306, K6JSD 298, K6GCC 278, K6PZM 215, K6OJV 180, W6BHG 142, K6TPL 120, W6AKS 88, K6YRM 61, W6KAR 57, W6CK 42, W6USY 40, W6NTN 31, K6SIX 20, K2HNW/6 18, K6EBL 15, K6PXQ 13, W6UQO 12, K6GLS 9, W6CIS 8, W6OIV 6, W6BUK 3, W6VGH 3, W6AM 2, W6SRE 1. (June) K6OJV 358, W6KAR 80, K6TJG 54, K6EA 34.

SAN DIEGO—SCM, Don Stansifer, W6LRU—K6ZCR and her OM K6HAH have departed from the Fullerton Area for the Bay Area. She was ORS and OO and he was the able secretary of the Fullerton Club. W6DFR was SCN Net Control during June. W4CGO, second operator at W6YDK, is awaiting orders for overseas duty. The Escondido High School Radio Club enjoyed Field Day at Lake Wolford. The South Bay Amateur Radio Society had its annual pot-luck dinner in August. W6ZVQ, vice-president of the San Diego DX Club, spoke at the Convair Astronautics Radio Club meeting in August on his favorite subject, DX. W6CAE and his XYL vacationed to the IRE show in San Francisco in August. W6ISQ, in Fullerton, is now up to 116 countries. W6CDF made excellent measurements in the last ARRL F.M.T. and has now applied for an OO appointment. The San Diego DX Club is the latest club in the section to receive ARRL affiliation. The San Diego DX Club has taken over the W6 QSL Bureau from W6TI. The mailing address for all sixth district cards will be Post Office Box 16,006, San Diego 16, Calif. This is a club project and an enormous undertaking. K6DBJ convened the San Diego Council of Amateur Radio Organizations in late July because of the absence of K6EC in Hawaii on business. The next meeting will be held the 4th Thurs. in October at Red Cross Headquarters, and all clubs are requested to have one or two authorized delegates in attendance. Traffic: W6LAB 2037, K6BPI 832, W6EOT 585, K6ZCR 105, W6DFR 89, W7YKN/6 88, K6ZRD 20, W6ELQ 4.

SANTA BARBARA—SCM, Robert A. Hemke, K6CVR—The Santa Barbara Radio Club had some very interesting slides about KL7-Land. K6RCL served a year on the DEW Line and operated a ham station with the call KL7AL. A new member of the SBARC is K5ONP, from New Mexico way. K6GHU and W6HUT provided a portable 2-meter link for *The Semana Nautica* from the judges' stands to the piers. Some of the Field Day reports were as follows: Ventura County Club claims 800 contacts. SBARC reports 7873 points, Raytheon Amateur Radio Club reports 2592 points.

(Continued on page 170)

EFFECTS OF NUCLEAR RADIATION ON MEN AND MATERIALS by T. C. Helvey (Director of Biophysics and Astrobiology Branch, Radiation, Inc.). Nuclear power for propulsion of military and civilian vehicles has become a reality. However, the application of nuclear energy in mobile units has presented a great many unexpected and unheard of technological and biological problems. This book discusses the basic nature of nuclear radiation—alpha, beta and gamma rays—and their physicochemical and biochemical effects. Radiation effects on man deals with details of ionizing radiation, dose tolerance, genetic effects of radiation, and air ionization and its biological effects.

In covering radiation effects on materials, the author discusses the effects of nuclear particles on materials such as textiles, adhesives, plastics, fuels, and inorganic materials such as metals, ceramics and glass.

A feature of this book is a chapter on shield configuration covering transparent shielding materials, partial body shielding, and special shields for gamma and neutron bombardment. #243, \$1.80.

FUNDAMENTALS OF RADIO TELEMETRY by Marvin Tepper. Telemetry makes possible the collection of data on which the improvement of existing rockets, missiles and aircraft is based. This exciting book explains its purpose and explores its techniques. Special sections are devoted to missile and satellite telemetry and hardware, and to data recording and processing. Specially prepared illustrations. #225, \$2.95.

R-F AMPLIFIERS (Volume 27 in the Electronic Technology Series) edited by Alex. Schure, Ph.D. An excellent discussion of the operation of amplifiers in the r-f portion of the radio frequency spectrum. The design and theory of operation of a wide range of r-f voltage and power amplifiers are covered. #166-27, \$2.40.

SHORTWAVE PROPAGATION by Stanley Leinwoil (Radio Frequency and Propagation Mgr.—Radio Free Europe). Of special interest to those concerned with radio communications, this text provides a modern, up-to-the-minute analysis of shortwave propagation. Ionosphere characteristics are discussed together with the nature of radio waves. The book then carries the reader into the sky wave, measuring the ionosphere, ionospheric variations, the sunspot cycle, and abnormal phenomenon. Sky wave propagations are covered and the preparation of MUF curves are discussed. There is considerable material of interest to the amateur radio operation. #231, \$3.90.

BUILDING THE AMATEUR RADIO STATION by Julius Berens, W2PIK. If you intend to buy the equipment for an amateur radio station, or build one, you will find this volume indispensable. This book is the next step for the beginner amateur radio enthusiast who has earned his operating license. A guide for construction of the beginner's transmitter and receiver. Also includes instructions for receiver and transmitter on-the-air operation. #221, \$2.95.

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LOW-FREQUENCY AMPLIFIER SYSTEMS (Volume 31 in the Electronic Technology Series) edited by Alex. Schure, Ph.D. A companion volume to **LOW-FREQUENCY AMPLIFIERS**, this text extends the study into the field of low-frequency amplifier systems including the d-c amplifier. Presented in a straightforward manner for the person who designs, builds, works with, or maintains these equipments. #166-31, \$1.80.

A report from the Monmouth Message, April 30, 1959. "Fort Monmouth—Student officers of the Radio Officer MOC Course, Section 3210, have made exceptional progress ... mastering Morse Code instructions utilizing the Rider 'Sound-N-Sight' method ... students have progressed much faster than all previous classes."

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The Ventura County RC Hamfest certainly was a real old-fashioned affair. K6KCD still is the best slingshot in the Tri-Counties Area. K6OFO gave KCD a tough time, but only to come in second best. WV6BGL is off the air waiting for his General Class license. Good luck, OM. W6BYQ has a new Apache working. He has a lot of ambition for a great-grandpa. Traffic: W6FYW 2.

WEST GULF DIVISION

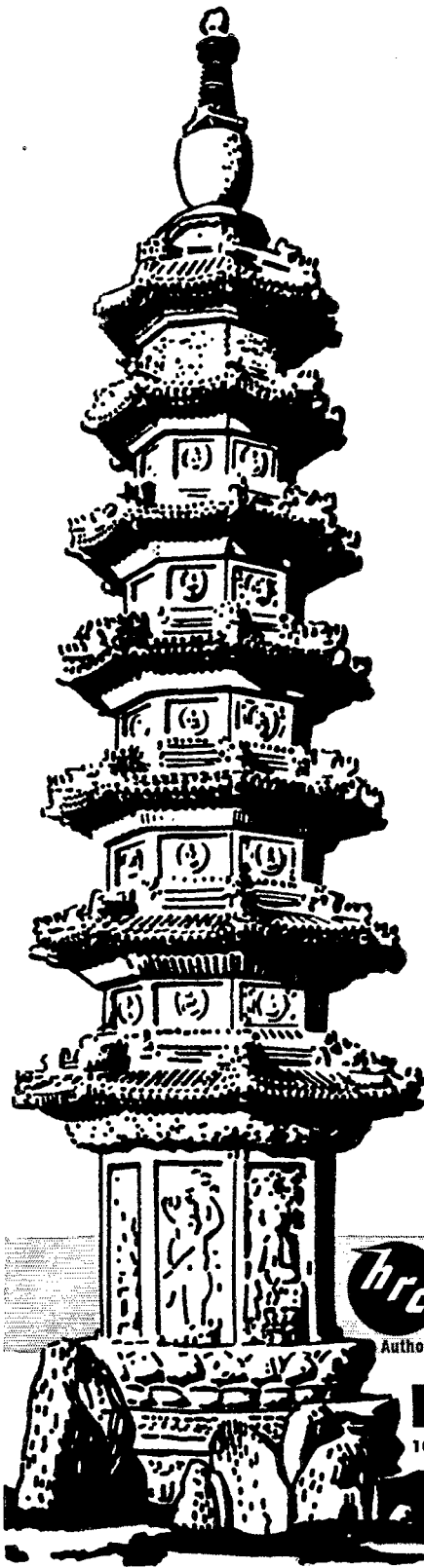
NORTHERN TEXAS—SCM, L. L. Harbin, W5BNG —Asst. SCM: E. C. Pool, 5NFO. SEC: K5AEX, PAM: BOO, RM: ACK. ACK reports the NTX is in full swing with two sessions each night. Full recognition should go to those boys who pull loads of traffic from RN5 for distribution in Texas. KYM likes to help youngsters get on the air because he thinks the more hams on the air means the fewer delinquents we will have. CZY is the new president of the Terry County ARC. Brownfield will hold its annual Swapfest Nov. 1. October 11 has been designated as Ham Day at the State Fair in Dallas. Ft. Worth will hold its hamfest Oct. 24 and 25. Preregistration date is Oct. 1. KN5UTN holds the distinction of being the first Novice to send me a traffic report. Keep it up, Jim, we need more traffic-handlers. The Muleshoe and Farwell Area has organized a radio club and needs a name for it. Any suggestions should be sent to DXT. Certificates for the following ECs have been endorsed for another year: K5LEZ, LGT, HWN, AXI, W5CC, FFX, FMY, KRZ, LGY, MBP, MJN, NFO, TWA, UAS, YJ and OGG. What is wrong with the other ECs in the section? Let's get on the ball and send those certificates in for endorsement. It should not be necessary for us to have to remind you of the expiration date of your appointment. Traffic: (July) W5UTW 374, SMK 302, BKH 278, GY 119, K5IPG 109, W5ACK 73, K5HGX 64, DOI 63, IDZ 60, W5LR 31, BNG 20, K5OJI 15, W5KYM 6, KN5UTN 3. (June) W5SMK 134.

OKLAHOMA—SCM, Richard L. Hawkins, W5FEC —SEC: K5KFS, RMs: JXM and VVQ, PAMs: DRZ and MFX, V.H.F. PAM: VCJ. Unofficial results of the Bartlesville-Muskogee Field Day competition show that Muskogee made more contacts but Bartlesville had the higher score. K5RIP journeyed to Kansas City and ripped out the "N!" A new Novice in Bartlesville is KN5WMX. By the time this is printed K5MRK will be in Korea. Oklahoma will miss you, Frank. MRK went on a canoe trip in Canada with a group of Explorer Scouts. PAA has the KWS-1 back in operation. AA and WLN have become "Registered Professional Engineers." This is my last report as your SCM. I have enjoyed the FB association with all you fine hams and am particularly proud of all the friends that I have made. I especially wish to thank all my appointees for the good work they did to make the SCM job easier. Let's all pitch in and help Preacher make this the best section in the organization. 73 to all. Traffic: (July) K5MBK 367, CAY 285, JGZ 69, W5VVQ 39, FEC 34, MGK 34, MPX 26, PNG 20, CCK 16, K5OJD 16, CBA 15, INC 10, W5WAX 10, WAF 9, K5IUR 7, JOA 5. (June) K5USA 537, MBK 531, W5JXM 24.

SOUTHERN TEXAS—SCM, Roy K. Eggleston, W5QEM—SEC: QKF, PAM: ZIN. RM: K5BSZ. DIW and EGD are moving to Baltimore, Md. We are sorry to lose them from Southern Texas. DIW is the only Radio Examiner I know who can make you feel good while he tells you that you failed the code. EGD is one of our best traffic and DX operators. Both will be missed in our area. It is with deep regret that we record FJF as a Silent Key. ETA, QKF and QEM visited the Sun City Amateur Radio Club. Southern Texas had a good turnout for Field Day, with stations and operators too numerous to mention. QEM, K5COZ and K5CPA have been vacationing in W7-Land. Congratulations to K5HTL on winning the savings bond in national competition with his science project "The Electro-Hydraulic Effect." New officers of the El Paso Amateur Radio Club are K5QVE, pres.; K5QFD, vice-pres.; OVH, secy.; and K5EJU, treas. New calls in the Lower Valley are K5UNC, KN5VUZ and K5WKN. MX is working DX with a new Collins S-Line, and Mosley Triband Beam. Congratulations to K5LGH on making BPL on his first try. I would like to suggest that the fellows working 75- and 40-meter phone take time to listen for distress signals. I had car trouble in the Desert of Arizona and 40 meters was loaded with stations, but I was unable to break any of them with my mobile. I had to catch a ride for 25 miles to find a mechanic. Traffic: (July) K5LGH 258, RYS 134, W5ZIN 78, K5-KBD 10. (June) K5OEA 222, W5ZIN 67, K5SPD 37, W5BHO 32, K5KBD 6.

CANADIAN DIVISION

MARITIME—SCM, D. E. Weeks, VE1WB—Asst. SCMs: A. D. Solomon, VE1OC, and H. C. Hillyard, (Continued on page 172)



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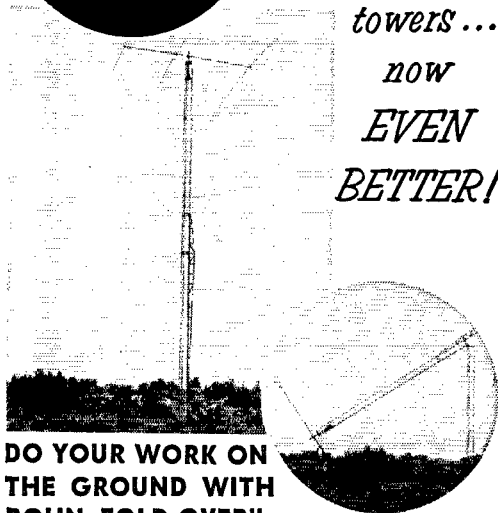
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QUEBEC—SCM, C. W. Skarstedt, VE2DR—Please support your traffic nets: OQN, 8535 kc. at 1900, and Quebec Fone Net, 3780 kc. at 1845. The annual hamfest of the RAQI was held at Cap Santé (near Quebec City) Aug. 2 with beautiful WX and a bumper turnout. At least 40 cars sported ham license plates. YA, QSL Mgr., surprised the boys by bringing along his card file and many old ones thus found their owners (a reminder to supply YA with those envelopes). ADA walked off with a Heathkit mobile transmitter. SC won the hidden transmitter hunt. This turned out to be a small battery-operated job hidden in an apple tree nearby. XYLs were treated to afternoon tea and presented with roses. UQ visited Frobisher Bay and had trouble landing VE2 stations but worked some nice DX. Aurora problems were encountered. AKM believes in QRP. With 8.2 watts and a 40-meter antenna he has snared many DX stations on 20-meter phone. Congrats to WT, who makes the EPL on originated messages. JE may apply for patent rights on his inverted flower pot which keeps his mobile antenna coil nice and dry. EC moved to a new shack but soon will be active again. Likewise DB, who now intends to try a 3-band vertical at his new QTH. GL, ex-SCM, is on spasmodically. LU now favors 20-meter s.s.b. and gets plenty of fine DX. AZI, at Magog, was a welcome visitor to the C.W. Net. Traffic: VE2WT 195, DR 133, EC 12.

ALBERTA—SCM, Gordon W. Hollingshead, VE8VM—PAM: PV. Plans are being formulated to organize a c.w. net in Alberta. Tentatively the net meets Tue., Thurs. and Sat. at 1830 MST on 3,600 Mc. All those interested in participating are cordially welcome to check in. The Alberta Hamfest was a roaring success netting 165 registrants. VK and SF walked off with the C. H. Harris C.W. Senior and Junior trophies. TM, age 16 years 3 months claims to be the youngest ham in Alberta. Any contenders? YW has returned from W8-Land where she visited Marge, KOZKH. NX and BY are proud possessors of 7544s. HM is visiting his son in Halifax. Traffic: VE8HM 51, ES 5, UK 4, OC 3, SE 3, SS 3, BL 2, VM 1.

BRITISH COLUMBIA—SCM, Peter M. McIntyre, VE7JT—Summer being here the activity is at a low ebb. Was pleased to meet and talk with a lot of VE7s at the Okanagan Falls Hamfest and was particularly pleased to see so many WTs present. Congrats again to KX for his WAC on RTTY. The BCEN has remained reasonably active during the summer, thanks to stalwarts AAF, AOT, AEC, WJ, AD and YB, with NJ checking 25 times out of 26 for July. Nice going, Frank. Two-meter activity is increasing. The DX club has its own net on 2 meters for intercommunication between its members. Reports are very few at any time but in the summer-time they hit bottom. Traffic: VE7AAF 112, AOT 39, NJ 26, AEC 21.

MANITOBA—SCM, James A. Elliott, VE4IF—Net activity took a terrible beating in this section during July. QRN was at its peak and interest at its lowest. Many of the 75-meter gang have QSYed to 20 for the summer. SA has been busy with skeds from VE8-Land. AY is back on 75 meters at Dead Horse Creek. MJ is back on the air with a commercial-looking rig and an FB signal. TT has been active on 20 meters and also active in obtaining information on call letter license plates. NW is spending the holidays at Gull Lake and has a DX-40 in operation. 3CMW paid us a visit on his way to his new QTH in Vancouver. KP has donned water skis while he is trying to find room in the new car for a mobile. PE has just returned from a holiday in the U.S.A. where she had some fine mobile contacts. SR has returned to the air on mobile after a long absence. Over 30 active mobiles were counted on the air in July. JP is back on the air and we are glad to have him with us. PA was a visitor to Winnipeg and while here transferred the mobile equipment from Larry Nelson's (ex-NN) car and soon will be operational. GB is back at his former QTH at Seven Sisters. Traffic: VE4JW 4, GE 2, IF 2.

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TAPEDCODE

BOX 31E, Langhorne, Pa.

Correspondence

(Continued from page 108)

and himself to have ten kw. and the rest of us to be stuck with low power so he could clobber us with no trouble!

But let's say we could have 10 kw.: it's obvious we would need more space because if you don't think 5 kw. of plate modulated audio isn't going to splatter, but good, you are badly mistaken, and your bandwidth would be so wide nobody would be able to hear anything but you for 10 kc. either side of your carrier.

Not only that, but what about TVI! That enters the picture, too, remember.

The expense for 10 kw. is one more thing. Perhaps a few can afford it, but I know I'm one who couldn't. I

(Continued on page 174)

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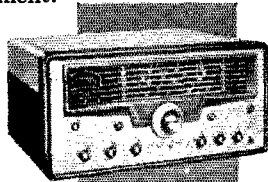
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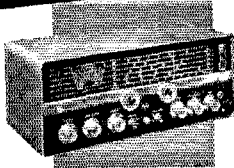
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Value! Broadcast band 540-1600 kc plus 3 short-wave bands covers 1550 kc — 34 mc. Slide rule dial; calibrated bandspread over the 10, 15, 20, 40 and 80 meter amateur bands. Separate bandspread tuning condenser, crystal filter, antenna trimmer, new-type "S" meter, one RF and two IF stages. Seven tubes plus rectifier. Power output 2 Watts. 18¾" W x 8" H x 10¾" D. Gray steel, brushed chrome trim. Ship. wt. approx. 32 lbs. 105/125 V, 50/60 cycle AC.

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Please quote an extra 20% allowance on my model.
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DISTORTION
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P & H COMPRESSOR-AMPLIFIER

It's a fact — 100% modulation on most ham rigs is a "sometime thing". Uncontrolled, instantaneous audio peaks can ruin an otherwise clean signal. THERE'S A SIMPLE SOLUTION — Install a P&H compressor-amplifier in the mike line of any AM, SSB, DSB or PM transmitter — Adjust audio gain for full 100% modulation and forget it! TALK POWER IS UP — FLATTOPPING IS GONE. The net result is the CLEANEST, MOST POTENT AUDIO your rig is capable of. Single knob control. Works on AVC principle — like broadcast compressors. TWO MODELS: The AFC-1 (3x3x5") requires an external power source and has a built-in 90-3500 cycle band pass audio filter . . . sells for only \$32.95. The AFC-2 (5x5x7") has a built-in power supply, a switch controlled (Broad-Medium-Sharp) audio filter and costs you only \$34.95. Also available the AFC-2CW, a sharp filter model for CW reception or mike input on filter exciters.

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am a high school student, and with my screen-modulated 6146, I chase a little DX and have a good time doing it. Of course, I curse at the high power boys when I'm robbed of a good catch, but after all, this is a hobby — not a business. Let's leave it at that!

— Elliott W. Cox, K1CZX

727 3rd Street
Brookings, South Dakota

Editor, QST:

The suggestion by W3SUR deserves some cautious consideration. The following points should be considered in any debate on legal limits on amateur power: 1. Equality among amateurs. 2. Mobile operations. 3. Emergency communications. 4. Cost of a competitive rig. 5. Effect of wide power range among amateur stations. 6. QRM. 7. Message handling. 8. DX. 9. Propagation conditions. 10. QRN.

The first five points argue for a legal limit well under 1 kw. Point 6 may be taken as evidence of excessive amateur power, especially if QRM is solid and much worse than QRN and front end noise. Points 7-10 argue for high power when needed to overcome unfavorable conditions, but a 10 kw. rig is hard to justify. I submit that the good done by 10-gallon hams in extending the use of amateur bands would be far outweighed by the havoc created by their competition with other amateurs.

— Volney Wallace, K8CWJ

614 46th Avenue
San Francisco 21, Calif.

Editor, QST:

I read W3SUR's letter and I agree 100% with the first part. However, I think that the only way a 10 kw. limit will help solve the QRM problem is by driving the fellows who can't afford 10 kw. xmtrs off the air.

— Ian Keith, WY6FKR

WHO'S ON FIRST . . .

95, Ramsden Road, Balham
London, S.W. 12, England

Editor, QST:

Perhaps, when you're explained W3JQF's "fixed portable" (p. 150 August QST), you'd get your teeth into "mobile in motion"!

— F. Allan Herridge, G3IDG

PLAUDIT

45 No. Elliott Place
Brooklyn 5, New York

Editor, QST:

Hooray for Jimmy Fitzgerald! I say, "Bravo!" for a fine-thought letter (Aug. '59 QST, p. 82). The words were spoken like I've always wanted to say them myself.

I'm mighty proud to be with you fellas (the ARRL) and that you're with me . . . for I'm ARRL too!

— Norman G. Gignac, WA2AFX

"MONOLOGUISM"

2382 Lincoln Road
Victoria, British Columbia

Editor, QST:

Wherever VOX systems are in use (s.s.b. or a.m.), you will hear the ubiquitous and iniquitous VOX drawl: "ah, er, ah" — an unforgivable method of preventing the VOX relay from muting the transmitter and activating the receiver. Much time and money is spent on sophisticated voice control systems which frequently end up producing wholly unsophisticated signals.

We are used to monologues on a.m. but surely there is no place for them on s.s.b. If a man can't think quickly enough to ensure a smooth and steady flow of conversation, why is he so reluctant to take his turn at listening?

— Stephen Jones, VE7XX

EARNING INCENTIVE

3339 Kenneth Drive
Palo Alto, California

Editor, QST:

I have just rejoined the fraternity of active amateurs after a eight-year absence. (I was overseas.) I have found, upon looking into the current regulations that my "Advanced

(Continued on page 176)

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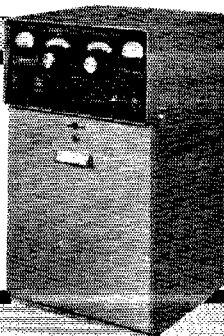
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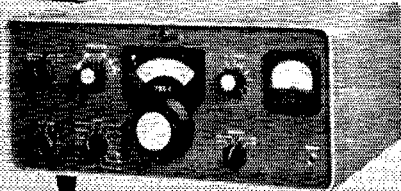
73,

Bil Harrison
W2AVA



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MAXIMUM
LEGAL POWER
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With desk-high
power supply.



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All the superlative features of the 75S-1, for general frequency coverage. In crystal controlled 200 Kc linear segments, with precise dial calibration to exact Kc, it can cover 3.5 to 30 Mc with appropriate crystals. Panel selection of twenty-eight 200 Kc segment crystals. 14 plug-in crystals furnished (specify). Additional crystals \$6.60 each. Ideal for commercial communications, laboratories, etc., or unexcelled short wave listening.

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With factory installed Noise Blanker—\$717.75

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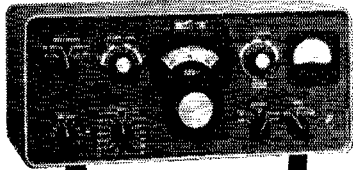


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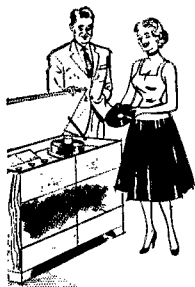
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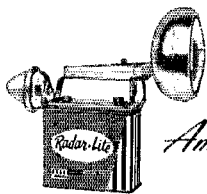
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SKYLANE PRODUCTS

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Class" ticket is *unique*, but that just about describes it. Privileges have gone by the wayside.

I see where there is a lot of conversation about scaring up some special privileges for the Extra Class boys which will include the *real* old timers by "squatter's rights." I'm in full accord here, but how about those of us who put out a little extra effort back in the period after 1917 but before 1950 to earn a Class A only to find it null and void through no fault of our own?

— Joe Hughes, W6FMD

123 Maple Ave.
Windsor, Conn.

Editor, QST:

Let's kill two birds with one stone. Give the Extra Class some mark of privilege and tackle the problem of diminishing spectrum in one operation. Leave the privileges of the Extra as they are and reduce the power limit on the Generals and Conditionals, like myself, to somewhere around 150 watts. This would help cut KW QRM and encourage more efficient use of power available. Those who still felt the need of a rock of crusher could do the obvious: get an Extra Class ticket. They would increase their knowledge to a point where they could better control the KW and would improve their operating ability in the process.

The test for a General requires far less technical know-how as well as less code proficiency than that for an Extra. There would again be an incentive for a better technical understanding of the wide field of amateur radio.

The idea of unlimited power for the Extra makes about as much sense as using gasoline to put out a fire . . .

— Leon R. Case II, K1GAW

808 Churchill Avenue
Pittsburgh 35, Penna.

Editor, QST:

It was with great interest that I read the editorial titled "Extra Class Status" in, "It Seems To Us," QST, August, 1959. The FCC was actually asking for the Amateur's opinion on an amateur matter. Here was my chance to express some ideas on a situation to which I have given considerable thought over the past few years. I could hardly wait to turn to page 67 to read the text of the Notice of Inquiry (continued on page 144. Why does QST spread these things out so?) Then I saw it . . . "an original and fourteen copies." How ridiculous can they get?

— William E. Higgins, W3VNE

P. O. Box 121
Melrose 76, Mass.

Editor, QST:

I agree in part with Mr. Goldstone's rejected petition.

I think now is the time for a maximum power reduction of all classes of amateur stations. This would not result in much less QRM but it should provide an incentive for advancement right up to Extra Class with maximum power.

We must keep in mind that to cause an increase of one S unit at the received end the power must be boosted four times at the transmitting end, but with some work on the radiating system at a small initial cost the result can be many S units increase at a big KWH saving.

Par: 12.233 of Amateur Rules Part 12, says in effect, that the lowest necessary power should be used. How many of you have effective means for QRP? (Pi-nets don't count!)

Let's cut power and increase incentive and efficiency at the same time. No, I'm not already Extra Class licensed.

— Samuel H. Beverage, W1MGP

How's DX?

(Continued from page 108)

merly used the call ZC3AC, contributes Christmas cheer around 14,082 and 14,110 kc. at 1100 GMT of an occasional week end. . . . VK5BV did his darndest to radiate CR1-0AA sideband QSOs this summer but the going was rough. . . . JZ0HA returns to Dutch New Guinea with 21-Mc. sideband plans. . . . VS5BY, due for New Zealand holiday, expects to resume Brunei business in February. . . . VR2DR is a fairly fresh Fiji candidate who welcomes W/K/VE contacts near 14,100 kc., 1200-1300 GMT.

Europe — The outcome of VERON'S 1959 PACC DX Test, relayed by W1DGL of ARRL Hq., lists Ws 1JYH 2EQS, K3AXH, Ws 8JIN 1AQE 3FY5 and 1WY as high

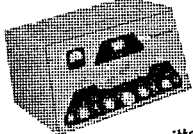
(Continued on page 178)

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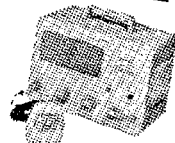


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Includes microphone, special power cords, and crystal.



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A high quality instrument made by international Instrument Co. (Model 100). Only 1" in diam. Ideal for limited space applications & transistorized circuits. A natural for transistorized grid dip oscillator as described in June '58 QST.

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2" round 0-500 microamperes. Bakelite case. Made by G. E. and Dejur.

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4 by. 250 ma. cased filter choke. Shipping weight 5 lbs.
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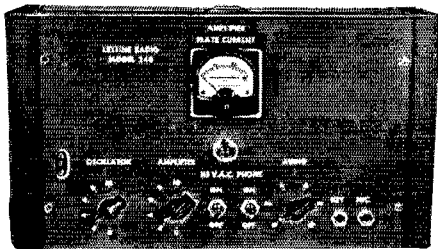
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The American Radio Relay League
West Hartford 7, Conn.

Stateside scorers, with VE3XK top Canadian. Other non-Netherlands whoppers were turned in by SM5AHJ, OH5RO, OK1MG, LA1K, HB9QH, G3IQE, DL1GN and F3ZU. The preceding was all c.w. sport — no North American entries showed for phone. In the homeland, PA9s VO YB LOU and VDV finished on c.w. in that order, PA9s HBO ADP HL and PN going 1-2-3-4 on voice. Say, on the 21st and 22nd of next month RSGB offers its annual 21/28-Mc. Telephony Test, gang. With 10- and 15-meter conditions due to get no better in the years ahead we suggest you chime in heartily. Rules next issue. OK1JX tells W1WFO of the ARRL DXCC Desk that OKs 1FT 1GV 1IH 3LA and 6CAV are equipped with s.s.b. gear, while OK1s ASF FF JX and others busily construct sideband equipment. K4IEX, acknowledging receipt of DUF-III c.w. certification No. 739, compliments F9LL on speedy and careful servicing. WA6EXJ, stationed in France, reports F7s BX CD CV DR EH and GC jointly manning a Thunderbolt, 20-A and 75A-4 nightly on 14 Mc. at APO 84. K7AWH finds that ON4LX has searched in vain for Wyoming and WAS for twenty years. Neighbor ON4GM welcomes W/K phone QSOs on 14, 21 and 28 Mc., preferring short and snappy contacts. Continental kernels courtesy DXCBL, VERON and WGDXC informants: F8EX scheduled more F8FX/FC action in August. GCs 3LXK and 5ZC bolster GC2RS's sideband offensive from the Channels. OHs 2XK 2YV 3PB and 3TH were recent Alands visitors. HB1CJ offered rare Uri canton to alert 7-megacyclers in August. LA1NG/p joined LA3SG/p on juicy Jan Mayen, 14,050 kc. around 0100-0200 GMT. Ex-JT1s AA and YL now sign OK1s KW and KX back home. Ludvik is putting the finishing touches on a new multiband sender.

Hereabouts — VE1LV will dispense Prince Edward Island QSOs on 15 and 20 c.w. till January for WAVE-seekers. K4TEA caught him on the latter range. W3DDV apparently took a liking to New England during his recent Vermont expedition as W3DDV/1. He's now K1LST in Connecticut. W2AYU comments that his town of Glens Falls, N. Y., with a population of less than 20 kilopeople, boasts three 200-country DXCCers: K2BU, W2TVR and himself. He wonders if any other similar-sized burg can beat or match that batch. K6CJF is highly suspicious of one HHZ recently worked. The character claimed to need California for WAS. W6TXL, with a 266/255 DX record, complied with the simple requirements of our April 1957 squib on the subject and lays claim to "1DXCC" No. 18. When not manipulating his own peanut whistle at home, Hal works for the VOA powerhouse at Dixon where rigs of up to 200 kw. abound. W8KX's 14-Mc. quad did not affront his Grand Rapids neighbors too severely. Wait eagerly raised it to its full horrible height gradually over a period of time. In conjunction with commemorative celebrations, the Quito Amateur Radio Club operated HClARE atop Pichincha volcano for a short spell in August. W8BTD understands that special 15- and 20-meter QSLs will ensue. Repulse Bay's VE8OM is happily rag-chewing his way toward WAS on 20 and 40 c.w. W8A7S, now equipped with a Swedish call book, is willing to answer lan (province) questions pertaining to SSA's WASM-II certification. He also has recent experience with DARC's WAE diploma. S.a.s.e.s, please. W6CHY wants leads on TPFWCY (1958) and UL7-FA's Andy, while W8KOS is interested in the present whereabouts of T. C. Ling, V06F, worked in 1947. SC-DXC and WGDXC supply hemispheric sundries: CO2QH/4 enjoys putting the Isle of Pines on DX bands from time to time. KG1FN of Fletcher's frigid floater and UA1-KAE of Antarctica, nearly at the polar antipodes, have been observed banging through only a kc. or so apart on 20. XE1B's summer Socorro sojourn spawned some 2000 QSOs with 45 countries — 365 on a.m., 884 s.s.b., 782 c.w. and a pair of RTTY jobs. (Hey, anybody sneaking up on a radioteletype-type DXCC?) Operators XE1s BI CV XX and XE2AM were on the island 96 hours and radio-active for almost 92, thus averaging about two contacts every five minutes. *Buenos!*

Ten Years Ago in "How's DX?" — Opening paragraphs of the October 1949 column discuss the rising frequency of overseas complaints concerning DX hogishness on the part of the W gang. Eighty c.w. perks up somewhat thanks to the efforts of LU7AZ, PY7WS, TG9RB, VP5BD and the VK/ZL contingent. Forty's tempo quickens likewise with EK4C, FG8AD, HA48A, HZ1KE, KH6TY/KJ6, KV4AA, OX3MG, PJ5ZZ, VP4TAQ and ZD3D leading the chorus. Twenty phone is the real smash of this month's DX show with fine performances by EK1MD, F9QU/FM8, FM8AA, FQ8SN, HL1s AE BJ, MD2AC, MF2s AA AC, PK6CS, VR3s 3C 4AC, W6ATB/KC6, ZC6-NT, ZM6AF and ZS6PE/ZS2 of Marion Island. On 14-Mc. c.w. we find AC4s NC RF YN, FE8AB, HS1SS, HZ1s AU LD TD, I1NU/Trieste, KG6GC/KC6, MDs 2G0 4CC, MS4UU, PKs 4DA 4KS 6NQ, TA3s FAS CVU, VK1s FE RA VUL VRs 4AA 5PL, VS7s AD CL RA, W6CRE/KC6, ZG1AR, ZD4s AM and AU. Ten phone's fall festivities are at hand with EK1s AR WX, PJ5KO and VP4TAY in the vanguard. W3MPM/C7 reports that he and other Yank hams are leaving the Chinese main-

(Continued on page 130)

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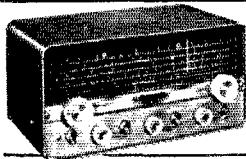
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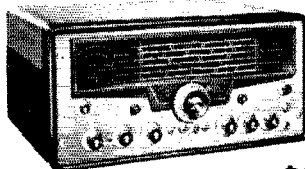
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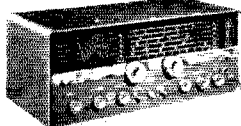
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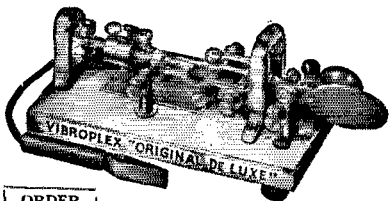
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land, and we note that FT-1s are switching to their new 3V8 label. — Jeeves tangles with an irate laundress, while pictures of 4X4BX, San Marino DXpeditioners W6IKQ, IIs ALU and SN complete the compendium. **QST**

Happenings

(Continued from page 79)

amateurs to handle messages and other communications between the two countries on behalf of third parties. The agreement, which stems from a visit of League officials to Mexico City last summer, is generally similar to those the United States has previously reached with Canada, Chile, Peru, Ecuador, Liberia, Cuba, Panama, Costa Rica and Nicaragua, and limits the traffic to conversations or messages of a technical or personal nature not important enough to call for use of the public wire or radio services. The agreement went into effect on August 30, 1959. Pertinent paragraphs from the notes exchanged by the two countries follow:

"Amateur radio stations of Mexico and of the United States may exchange internationally messages or other communications from or to third parties, provided:

- "1. No emolument may be directly or indirectly paid on such messages or communications.
- "2. These communications shall be limited to conversations or messages of a technical or personal nature for which, by reason of their unimportance, recourse to the public telecommunications service is not justified. Likewise in the event of disaster or that the public telecommunications service is not readily available for expeditious handling of communications relating directly to safety of life or property, such communications may be handled by amateur stations of the respective countries.
- "3. This arrangement shall apply to Mexico and its Insular Territories, and to the United States and the Territories of the United States.

It shall also be applicable in the case of amateur stations licensed by the United States authorities to United States Citizens in other areas of the world in which the United States exercises licensing authority." **QST**

Firing Up on 6 and 2

(Continued from page 25)

one who had trouble getting over the ten-per hump, take heart. You'll get encouragement and help from any real v.h.f. man, and practice will do it, eventually.

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(Continued on page 182)



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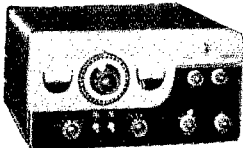
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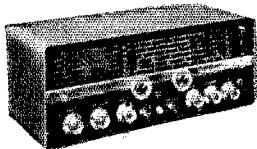


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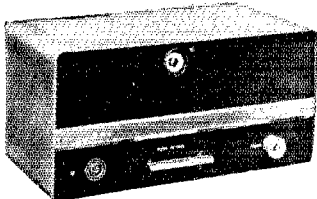
* The FCC permits a maximum of one kilowatt average power input for the amateur service. In NSB operation under normal conditions this results in peak envelope power inputs of 2000 watts or more depending upon individual voice characteristics.



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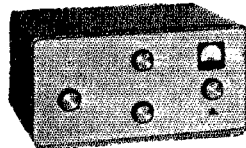
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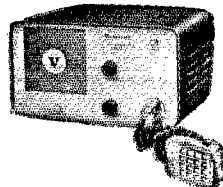


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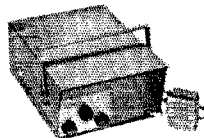


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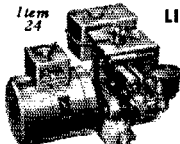
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is fun, once you learn how to do it. Even if it had no operational advantages, developing a degree of skill with the code is its own reward. Ask any c.w. operator.

Finally, learn effective operating techniques. Knowing when, where and how to call, what to say and how to say it, and when and where to listen are just as important on the v.h.f. bands as on any lower frequency. Study the techniques of the fellows who rank near the top in states worked, or the boys (and girls!) who consistently post the biggest contest scores. Some of the rules of operating are based on simple courtesy. Others are designed to expedite communication. Still others are required if you would avoid citations for illegal operation. All are worth study.

The fellow who has a good signal, well modulated or cleanly keyed, the best possible receiver and antenna system and some skill in operating to go with these attributes will do well on any v.h.f. band, even if his power is not 999 watts. Given high power and these things, he will be unbeatable. If he is lacking in any of these departments, when he goes to high power to try to improve his results he will succeed only in making himself more obnoxious to all his fellows.

V.H.F. Bibliography

A wealth of information on v.h.f. matters has run in *QST* over the years. The articles listed below are only those that have present-day applications. They do not include items that have been condensed for use in the ARRL *Handbook* and *Antenna Book*, so these two publications should be studied for additional ideas. The *QST* issues marked with an asterisk are still available from ARRL Headquarters for 50 cents each, postpaid. Others may be found in many libraries, or perhaps you can borrow them from a friend who has been in the ham game for some years. Photographic reproductions of articles may be obtained from Headquarters at a price of 25 cents per *QST* page.

Antennas

- "Long Long Yagis," January, 1956 *
- "Polarization Effects in V.H.F. Mobile," December, 1956 *
- "Six Elements on 6," October, 1957 *
- "Portable Beam for 50 and 144 Mc.," August, 1956 *

Conversion of Commercial Equipment

- Viking I, 50 Mc., December, 1952 *
- Heathkit AT-1, 50 Mc., May, 1957 *
- Heathkit DX-35, 50 Mc., December, 1958, p. 93 *
- Heathkit DX-40, 50 Mc., August, 1958, p. 146 *
- Viking Adventurer, 50 Mc., September, 1958 *
- Viking Ranger, 50 Mc., April, 1959 *

Propagation

- "Extending the Range of Ultra-High Frequency Stations," October, 1934 *
- "Notes on Ultra-High Frequency DX," December, 1934

(Continued on page 184)

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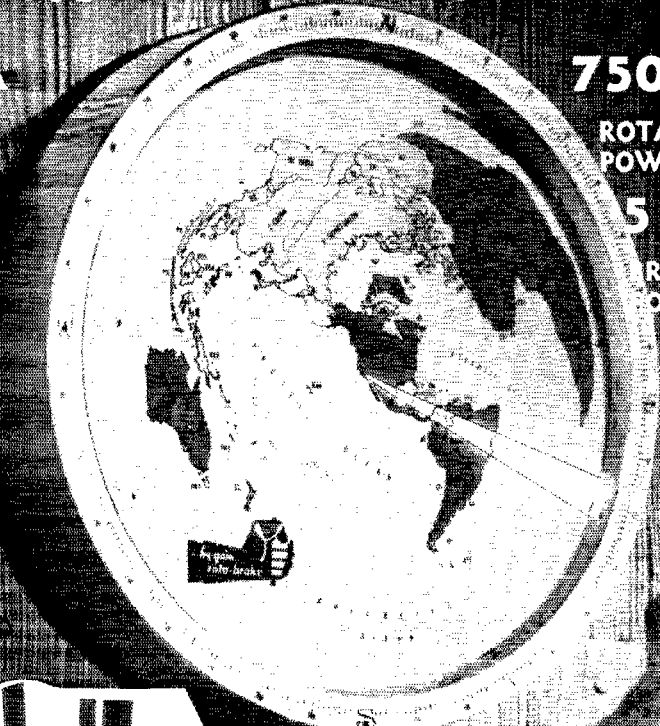
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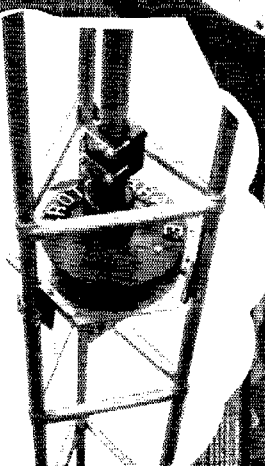


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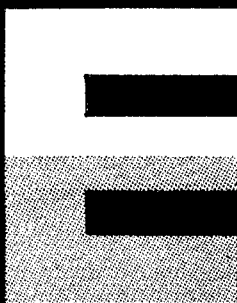
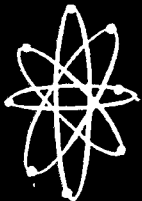
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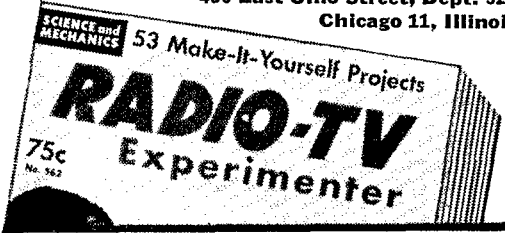
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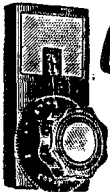


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- "Painless Prediction of 2-Meter DX," October, 1949 *
- "Aurora and Magnetic Storms," June, 1951 *
- "Over the Hills and Far Away," February, 1951
- "Lunar DX on 144 Mc.!", March, 1953 *
- "More About V.H.F. Auroral Propagation," January, 1955
- "Upper Air Conditions for 2-Meter DX," September, 1955 *
- "V.H.F. Scatter Propagation," March, 1956
- "Tropospheric Scatter Techniques," March, 1957
- "V.H.F. Meteor Scatter Propagation," April, 1957 *
- "Working Ionospheric Scatter on 50 Mc.," December, 1958 *
- "Obstacle Gain Techniques," March, 1958 *

Transmitting

- "Utilizing the 826," May, 1950
- "Linear Amplifiers for the V.H.F. Man," (Technical Topics), December, 1956 *
- "4X250B Amplifier for 144 Mc.," October, 1956 *
- "Using the 4X250B on 144, 220 and 432 Mc.," February, 1957

Receiving

- "Some ABCs of V.H.F. Receiver Design," January, 1953 *
- "Noise Generators—Their Uses and Limitations," July, 1953
- "Communications Receiver Hints for the V.H.F. Man," April, 1955
- "Notes on V.H.F. Converter Design," February, 1953
- "Design Considerations of 50-Mc. Converters," March, 1957
- "Low Cross-Talk Six-Meter Converter," June, 1957 *
- "Improving Performance of V.H.F. Converters," February, 1958 *
- "New Thresholds in V.H.F. and U.H.F. Reception," December, 1958 * and January, * February, * and March, 1959 *

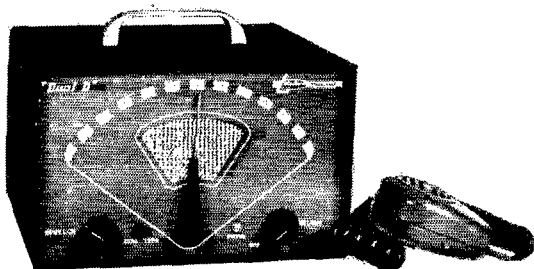
General

- "V.H.F.—How, Why, When?," January * and February, 1951
- "TVI Hints for the V.H.F. Man," April, 1953 *
- "50-Mc. TVI—Its Causes and Cures," June and July, 1954
- "Overtone Crystals—How and Where To Use Them," March, 1955
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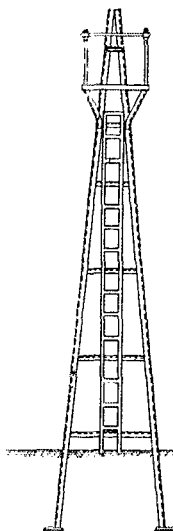
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Perseids Powerhouse

(Continued from page 38)

rent without r.f. drive. Plate modulation has not been attempted, though a position is provided for it on S_{1A} . The maximum allowable plate voltage when operating in this condition is 1500.

The author is indebted to Ed Tilton, W1HDQ, for a considerable amount of advice and assistance and, in particular, for his work in taming the beast during preliminary tests. When the amplifier was first constructed, the rotor of the grid tuning capacitor was grounded. Ed was able to eliminate oscillation in the amplifier in the 50-60-Mc. region only by isolating the rotor from ground. Some adjustment of the length of the grid lines improved stability in this region also.

The author is also indebted to Bill deWolfe, W0LVI, and Charles Massey, W0HNC, for the excellent photographs. 

The World Above 50 Mc.

(Continued from page 84)

opening and worked a number of stations with ease. Nothing remarkable about this — except that so few do it. The old 5-meter band, 56 to 60 Mc., used to provide plenty of DX back before World War II, and with equipment that would seem primitive today.

Wanted: Scatter skeds on 50 Mc., by Larry Vehorn, K9PED, 3640 Oleander Drive, Indianapolis 41. Larry works K8GND, Stevensville, Mich., 170 miles, regularly, and checks into a net at Angola, 155 miles away, so he has what it takes.

Rare countries department: Grand Turk and Caicos Islands are represented on 50 Mc. by VP5FP, who is also W1TBS. Fred got his 6N2 and VHF-152A going the night of Aug. 14. With just a piece of wire on the converter he began hearing signals from W2, 3 and 4. Hurriedly, Fred patched together a 300-ohm dipole, tacked it to the wall, and worked K4UKG at 2048 EST, before the band went out. By early morning of the 16th a 3-element beam was up. W5UQR was heard working locally, but Fred could not raise him. This may be a problem at times for VP5FP, since his location is off the path of most beams. Fred is on 50.022 and 50.768, c.w. and phone.

This could be one of those choice spots where DX is available most of the year. It is probably in the TE belt, which should make for easy work with South America, and the F_2 m.u.f. is very likely high enough for a long DX season. As to sporadic-E — who knows? Fred's considerable reception the night of Aug. 14 indicates that he should do well. If he stays with 6 VP5FP should provide much interesting information.

Here's a trip any 6-meter man would like to take. In his work as a field photographer for the National Park Service, W2PID visits almost all the hard-to-work states each year. Our National Parks being where they are, Jack is almost WAS on wheels. He has a converted Elmac rig on 6, feeding a halo during mobile operation. A 4-element fold-up beam sees service during stopovers. Jack deplores the lack of use of the National Calling Frequency. It would make life easier for him, and more productive for others, if he could park his receiver on a single channel while driving. We have the frequency (50.55 Mc.) allocated — it's just a matter of using it. Another frequency that is often used during dead-band periods is 50.1, which is where Jack hangs out when there is no DX coming through.

We hear a lot of wondering about the future of 220 and 420, with the Technicians now having use of 145 to 147 Mc. What reports we have at this early date indicate no harm done to the higher bands yet. W5AJG says that there is more 220 interest around Dallas than for a long time.

(Continued on page 188)

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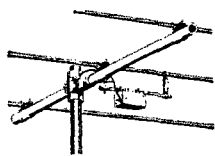
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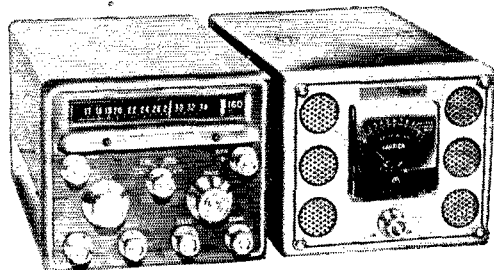
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Leroy has his 4X150 amplifier going again, and has been copied in Austin. Several stations are getting started in both cities.

W7JIP and W7LHL were just in time with their 10,000-Mc. DX work reported last month. Otherwise we would have lost the record to Europe. Only July 18 HB1FU and HB1JP worked over a distance of 139 miles. The 420-Mc. record went to Europe, as previously reported. Now, courtesy of G2AHL of RSGB, we hear of another DX QSO on 420. Only July 16, I1WAL, Genoa, Italy, worked FA9UP, Algiers, a hop of 612 miles. Our 50-watt power limit brings European u.h.f. workers to more even terms with us than on lower frequencies, where our generally higher power levels give us an advantage. This work, and the 650-mile contact of G3KEQ and SM6ANR, show that we have our work cut out for us if we are to bring the 420-Mc. record back to this country.

More detailed information of the 10,000-Mc. record came in from W7LHL after we went to press last month. Ernie says that he and W7JIP heard each other on 10,000 Mc. at 1800 July 25. By putting tone modulation on and then re-broadcasting the signals on 144 Mc. they were able to peak the dishes quickly for maximum level. Signals were weak up to about 1900, when they took time out for food. W7JIP left his 10,000-Mc. tone signal on, and W7LHL observed that it kept growing stronger. Resuming at 2000, signals were strong enough for voice, though varying from S1 to S9.

The QSO was terminated at 2147, and a schedule made for 0400, the following day. Signals were heard both ways at this time, peaking S8, but fading gradually weaker. By 0716 there was almost no 10,000-Mc. signal left. Both parties noticed considerable selective fading, due probably to small-scale irregularities in the inversion region. This caused marked distortion of the audio, and at times complete cancellation of the audio signal.

There are many ways to win a contest, but here is one sure-fire way to lose: don't send in a report. The Waltham Amateur Radio Association can guarantee this approach. When President WIOOP found no mention of W1MHL/1 in the QST summary of the June VHF Party he started checking, and found that after all the contest information was in order it was carefully placed in an envelope — and then never mailed. There is one virtue in this: it gives some other club or portable group a chance to be No. 1 in the country for a change!

W9JFP, Milwaukee, reports a phenomenal tropospheric opening on 220 Mc., but omits the date. It was about Aug. 24, by the mail schedule. Vic worked VE3AIB, Toronto, at 2250, for the first Canada — Wisconsin 220-Mc. work. Later, he worked W2EJO for the first Wisconsin-New York. Many Ohio and Michigan stations were coming through also.

Unusual 50-Mc. DX reported by W5LFM: KH6UK and KH6GTC heard (calling Australia!) by K5HVC, Aug. 14. Aug. 16 at 2030 CST, K5HVC worked KL7AUV. This could be one of the most interesting 50-Mc. Es QSOs in history, as it is very long for sporadic-E (3100 miles) and the first known Es work from Alaska to any W area. Hope we get more info on this!

KG1FN Breaks Loose!

How does sporadic-E work in the far north? We've had no amateur answer to this question until recently. Though numerous Alaskan stations have worked out well during F2 openings, there has never, to our knowledge, been any summertime 50-Mc. contact with State No. 49, or any other point that far north. Thus, when W1LJD sent us word that he and W1WFJ would have KG1FN in regular operation from Fletchers Ice Island this summer it was a matter of more than ordinary interest. Would anything come of it?

For a long time the answer appeared to be negative. On May 7 they heard unidentified signals on the low end of the 50-Mc. band for a short time between 2020 and 2055 PST. Their first contacts on 6 were not made until July 25, when KG1FN worked W9ADM, K9CIQ and VE4BJ (?) between 2030 and 2130 PST. At this time the floating island was about 620 miles northeast of Anchorage, Alaska. KL7AUV, Anchorage, had been heard regularly by KG1FN from July 6 on. He was worked at 1000 PST July 26, signals remaining in until 1145 PST. A schedule was made for 1000 to 1200 PST daily, and this resulted in QSOs on Aug.

(Continued on page 190)

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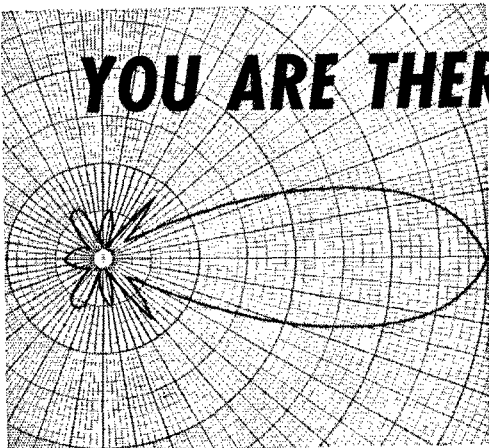
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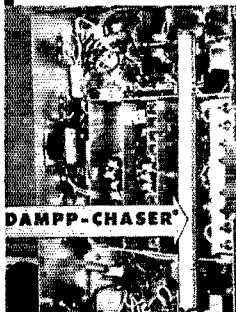
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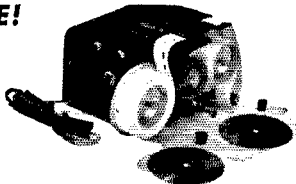
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NEW JERSEY

2, 3, 4, 6, 7 and 9, the latest report we have from KL7AUV. Jack also heard KG1FN S9 around midnight, Anchorage time, Aug. 3. KL7CDG (12 watts to a 2E26) worked KG1FN several times, as did KL7CJN.

Other reports on KG1FN: K9HKW, Fond du Lac, Wis., worked them 2320 CST July 31. Signals were S9, lasting some 25 minutes. Conditions were relatively poor at the time for Ws, and there was some aurora effect in evidence on signals from the NNE direction, K9DTB, Villa Park, Ill., heard KG1FN between 2230 and 2245 July 25. VE6UV, via W5BJI, reports KG1FN working into Minnesota and Wisconsin during the week of Aug. 9. K9KLU, Tinley Park, Ill., worked KG1FN at 0055 CST Aug. 11, at which time they were working the Middle West and VE4.

Club and Net Activities

An event much looked forward to by v.h.f. men of the Northeast is the Annual V.H.F. Roundup sponsored by the Syracuse V.H.F. Club. The 5th running will be held Oct. 10 (that's the meteor shower week end) at the Three Rivers Inn, 10 miles north of Syracuse, on Route 57. We have just heard from K2KPL that KH6UK will be among the guests. Your conductor will be there, and so will W1OOP and W1OUN. Tickets and additional information from W2OQY, 106 Hyland Drive, North Syracuse, N. Y. This is an all-day affair.

W8NOH, Grand Rapids, Mich., announces the Annual V.H.F. Conference, to be held in the Physics Department of Western Michigan University, Kalamazoo, Nov. 21. Long-time v.h.f. enthusiast, Prof. Walter Marburger, W8CVQ, will be chairman. Equipment and antenna talks by W8PYY and W8NOH. Registration is 50 cents, with a supper at \$2.50. Conference gets under way at 2 p.m.

Year 'round, there's no time like the early morning for consistently strong signals and good coverage on any v.h.f. band. Trouble is that too often there's nobody on to work when you roll out early. This deplorable condition should be corrected within the service area of the Early Bird Net, a Northern New Jersey 50-Mc. group meeting between 0530 and 0700 weekdays and 0730 on week ends and holidays. Charter members are K2VUU, K2UFY, K2CMG and K2VQR. Handsome Early Bird certificates are available to anyone working two of the above during the early-morning hours. Send QSLs and 10 cents with application, to cover the certificate and mailing cost.

Some time back a Chattanooga Choo-Choo Certificate was put up for working 50 residents of that city, on any band. As evidence of the growth of 50-Mc. interest, W4JVM was recently awarded the CCC No. 10 — for contacts made entirely on 6.

OES Notes

K1DPL, Farmington, Conn. — V.h.f. Traffic handling can work; originated a message for Jackson, Tenn., on 2 meters, and found later that it was delivered the same night. Good liaison with traffic nets on lower bands should make this possible in many areas.

W1HDQ, Canton, Conn. — Worked W4RMU, Jacksonville, Fla., on 144 Mc. long Perseids burst at 0709 EST Aug. 11. Had heard him each morning on his skeds with other Wis, though burst count and duration improved markedly after Aug. 9. Leisurely 1-minute transmissions each way produced QSO after only 9 minutes on 4th morning of skeds. Hope to make 220-Mc. tests Oct. 9-10.

W1LGE, Windsor Locks, Conn. — K1GHL reports hearing Bermuda station. Any information on legitimate VP9 activity on 50 Mc.?

W1LMZ, Concord, Mass. — K1JSB, operating from Texas Tower 3, off Nantucket Island, has f.b. signal on 145.03. Should be interesting spot during the fall inversion season.

K2AZT, Baldwin, L. I. — Activity increasing nightly on 220 Mc.

K2EGP, Union City, N. J. — Using 5-over-5 50-Mc. array tilted upward 15 degrees. Would like to make tests with others using similar arrangements, or learn of their experience.

K4EUS, Chester, Va. — Meteor skeds with W0QDH, Salina, Kan., July 27, 28 and 29, resulted in his reception of complete calls first night and even more the second. Results poor on third try. High noise level at my end held results down.

(Continued on page 102)

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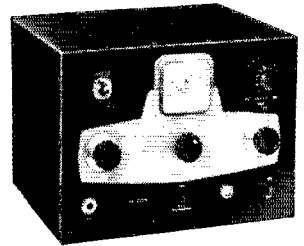
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Art Brown, W9IHZ



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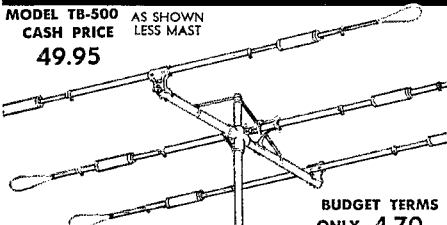
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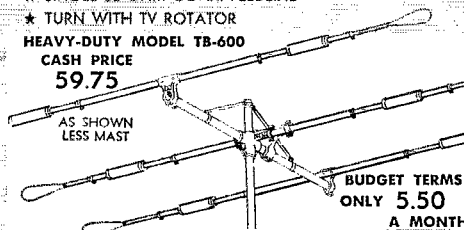


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	15m—7.5 db	15-18 db	15m—Unity
	20m—7.0 db		20m—1.1
TB-3	8 db Avg.	25 db	1.2 or less
TB-3B	8 db Avg.	25 db	Unity

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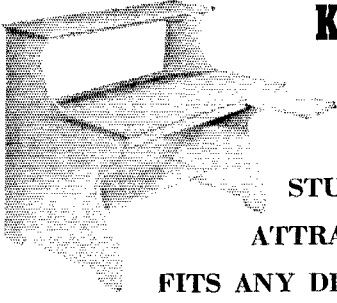
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W4FWH, Doraville, Ga. — Believe from limited comparisons of 144 and 220 that the higher band is just as good if equipment and antennas are comparable.

K4KYL, Knoxville, Tenn. — Heard KG1FN, Fletchers Ice Island, on 50 Mc. June 26, 2055 EST, S9. W1s had been in prior to this.

W4UVP, Johnson City, Tenn. — Had first 144-Mc. experience July 17. Worked W2CXY W9QV W9CUQ W1TDF W2AMJ and W4LTU. Heard many others. Rig is a Senca, with 10-element array.

W7MAH, Reno, Nev. — Working W6GDO regularly on 144 Mc. since July 10. Tests on polarization indicate horizontal superior for this mountain path.

K8AXU, Elkins, W. Va. — Caught fine tropo opening on 144 and 220 Mc. night of July 25. Worked several 144-Mc. stations in Chicago area and heard W0RSP, Marvin, S. D. Another good one the nights of Aug. 1 and 2. Worked W9EQC W9ZHI and W9RYM on 220, all S9. Need more activity on 220. Have worked across Indiana on 220 several times, but have yet to hear a signal from there.

W3NOH, Grand Rapids, Mich. — Two-meter net meets each Monday evening on 145.26 Mc., with over 28 stations in 24 communities. W8CVQ is NCS. W8PT organizing 220-Mc. net.

K9PGK, Indianapolis, Ind. — Heard 46 states on 50 Mc. in July 12 opening. Marion County now has 3 AREC nets in operation on 50 Mc.: 2000 Thursdays, 1000 Wednesdays and 1230 Thursdays.

QST

DX CONTEST RESULTS

(Continued from page 57)

W0EOZ.....360-10-12-C-2	W8ZZC.....24,420-74-110-B-28
	W8GMK.....12,150-54-75-A-29
South Dakota	K8BDS.....10,965-43-85-A-35
W0WUU.....600-10-20-B-4	K8HWH.....9870-47-70--
	W8AJH.....9246-46-67-B-18
Minnesota	W8BMX.....6405-35-61-A-37
W0VAF.....13,920-58-80-A-30	W8NCV.....5328-37-48-B-38
W0VLP.....3045-29-35-B--	W8FTN.....4704-36-43-A-15
W0RZU.....27-3-3-A-4	K8JFT.....4059-33-41-B-10
	W8MWE.....3150-25-42-A-7
	K8KHE.....3120-26-40-A-11
	K8LXJ.....2070-23-30-A-20
	K8AAG.....1500-20-25-A--
DELTA DIVISION	W8QYV.....1449-21-23-A-10
Arkansas	W8KC.....798-14-19-B-8
W5WEE.....72-4-6-A-5	W8LJZ.....714-14-17--
	W8BZG.....658-14-16-B--
Louisiana	W8DZG.....462-11-14-A--
W5KC.....40,230-90-149-A--	W8DWP.....90-5-6-A-2
W5KGM.....1449-21-23-C-11	K8ANX.....90-5-8-B-8
K5ESW.....1224-17-24-A--	K8JEO.....75-5-5-A-1
K5CTR.....585-13-15-A-10	W8JJD.....18-2-3-A--
W5LDH.....147-7-7-A-2	
Mississippi	
K5MDX.....146,080-160-305-B-33	
K5BQS.....14,258-49-97-A--	
K5EXW.....0270-38-55-B-17	
W0DBN/5.....714-14-17-C-13	
Tennessee	
W4NBV.....130,011-151-287-C-56	
K4PHY.....4368-28-52-A-20	
W4OQG.....75-5-5-A-2	
W4GQL.....27-3-3-B-1	

HUDSON DIVISION

Eastern New York

W2GBC.....18,900-60-115-B-22
W2VRE.....15,840-55-96-B-20
K2UTC.....15,736-56-95-A-28
K2JMY.....13,113-47-93-B-19
K2TJM.....3864-28-48-A-9

N. Y. C.-L. I.

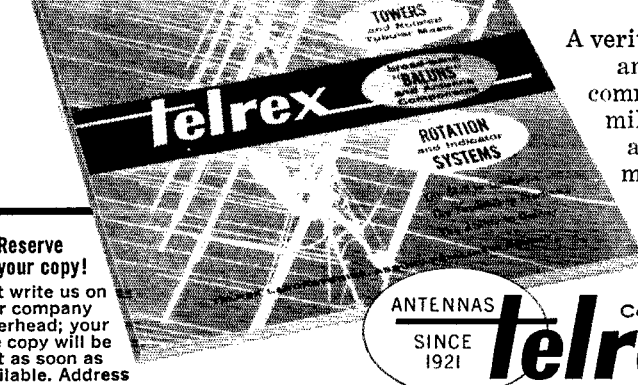
W2WZ.....30,240-80-126-C-16
K2TAP.....15,795-45-117-A-20
K2DZU.....1215-15-28-A-5
K2YOR.....1080-18-20-BC-5
W2NQR.....675-15-17-B-9
W2YKQ.....510-10-17-B-8
W2VDT.....103-5-7-C-1
K2CMDY.....75-5-5-A-2
K2QBW.....3-1-1--

Northern New Jersey

W2BFO.....18,481-61-101-A-20
W2FPQ.....16,215-47-115-B-38
W2JCT.....11,076-52-71-A-35
K2HLC.....5952-32-62-A-24
W8AJW.....72,011-107-225-A--
W2CGU.....5100-34-50-B-16
W8VOW.....61,491-103-193-B-53
K2PTJ.....2736-24-38-B-8

(Continued on page 194)

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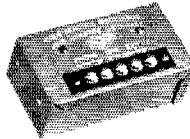
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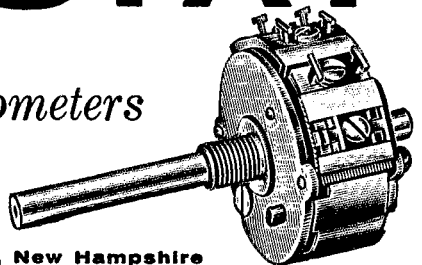


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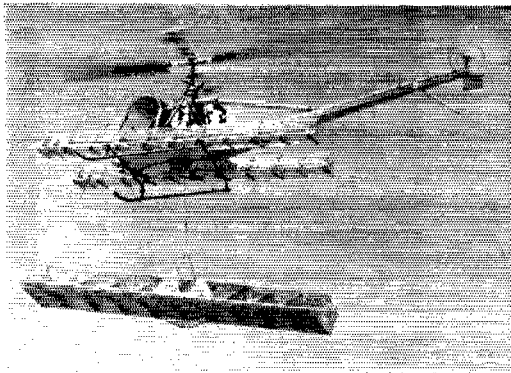
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W0DIB.....5010-35-49- - -
W0FDL.....1056-16-22- C-3

Kansas

K0RNZ.....40,488-84-162- A-49
K0ITF.....32,964-82-134- C-31
K0MNO.....19,154-61-105- C-32
W0ZXX.....17,550-50-117- - -
W0QMS.....9471-41-77- A-21
W0VBQ.....1584-22-24- C-6
W0SPF.....468-12-13- A-5

Missouri

W0GUV.....38,700-86-150- C-30
W0MCX.....26,280-73-120- C-25
K0LFY.....7548-37-68- A- -
W0PGL.....1539-19-27-AB-5
W0AUR.....1176-14-28- B- -
K0HJV.....780-13-20- B-5

Nebraska

W0AYR.....4806-34-48- C-16

NEW ENGLAND DIVISION

Connecticut

W1BIH.....111,537-153-244- B-39
W1ICPU.....16,416-57-96- B- -
K1CCA.....13,748-58-79- A-16
W1LKG.....12,201-49-83- B-17
W1AWY.....6771-37-61- C-12
W100S.....5945-41-49- B-30
K1EFT.....3813-31-41- A-11
W1NLM.....720-15-16- B-3

Maine

W1DIS.....50,385-87-195- C-48
K1ACR.....3726-23-54- A-10
K1CYJ.....1350-15-30- A-10
W1PCD.....1008-16-21- C-5

Eastern Massachusetts

W1ONK.....213,300-150-478-AC-72
K1ADH.....18,303-54-113- A-28
W1IUU.....12,831-47-91-AB- -
W1AOL.....1975-25-27- A-5
W1RWU.....1344-18-28- B-10
W1BOD.....1242-18-23-AB-8
K1GKF.....444-12-13- A- -
K1CRB.....288-8-12- A-5
W1PLJ.....147-7-7- A-10

Western Massachusetts

W1RF.....45,657-89-171- A-32
W1LIB.....27,759-57-163- A-22
W1JYH.....3776-32-40- C- -
W1WV.....273-7-13- A-7

New Hampshire

W1FZ.....96,624-122-264- C- -
W1KVG.....23,556-52-151- B-41

Rhode Island

W1PDF.....214,020-164-435- C-80
W1BFB.....51,480-88-195- B- -
K1EGH.....6913-31-75- A-10

Vermont

W1VVP.....276-6-16- A-4
W1SPK.....36-2-4- A-1

NORTHWESTERN DIVISION

Montana

W7FIN.....8190-39-70- A-35
W7HLH.....3696-28-44- A-24
W7CBY.....2700-25-36- A-16

Oregon

W7PJK.....9072-42-72- C-17
W7UGQ.....7680-40-64- A- -
K7GIE.....3264-32-34- B-9
W7DAA.....2025-25-27- C-40
W7DLR.....1650-22-25- C-11
W7JLU.....390-10-13- C-3

Washington

W7WDM.....95,121-117-271- C-62
W7ESN.....15,688-53-100- A-40
W7DQM.....1020-17-20- A-13
K7BSR.....297-9-11- - -

PACIFIC DIVISION

Nevada

W7YKQ.....3828-28-44- C-18

W7KOL.....810-15-18- A-8
W7VIU.....576-12-16- C-11
W7JLV.....330-10-11- H-7
W7JTW.....240-8-10- H-4

Santa Clara Valley

K6ERV.....11,938-47-86- B-31
W6BJH.....75-5-5- B-2

East Bay

W6PQW.....34,398-63-182- A-53
W6LDD.....33,534-81-138-ABC-50
W6KXG.....8160-40-68- C-13
W6DAC.....1440-20-24- C-10
W6KEK.....600-10-20- - -

San Francisco

W6YEJ.....4032-32-42- A-40
K6CZK.....198-6-11- A-9
W6JZG.....189-7-9- C-5

Sacramento Valley

W6AED.....146,016-144-338- C-72
W68IA.....66,768-107-208- C-55
W6SXL.....14,322-62-77- C-38
K6SXA.....11,808-48-82- -9
W6GDO.....9945-51-65- B-16

ROANOKE DIVISION

North Carolina

W4IEFX.....124,740-154-270- B- -
K4QJL.....101,640-121-280-AB-60
W4IAL.....98,532-138-238-BC-70
K4JQR.....64,125-95-225- A-68
K4ZCP.....39,436-64-116- B-19
K4SXR.....23,436-62-126- B-28
K4KXT.....15,666-58-90- A-37
K4QJE.....10,296-44-79- A-23
K4IEX.....1620-20-27- A-10
K4ZGM.....105-5-7- B-1

South Carolina

W4BHU.....5024-32-57- C-26

Virginia

W4BVL.....49,392-98-168- A-60
W4RLA.....37,422-81-154-BC-42
W4UBE.....6837-43-53- A-50
W4IUE.....1620-20-27- B-10
K4GMX.....1368-19-24- - -
W4NPT (K4JKN, K6JIC)
20,167-67-101- V-39

West Virginia

W8UMR.....20,460-62-110- A-15

ROCKY MOUNTAIN DIVISION

Colorado

W0GAA.....31,824-78-136- B-72

Utah

W7MFU.....3528-24-49- B-9
W7BAJ.....780-13-20- A-14

New Mexico

K5LMJ.....10,434-47-74- B-25

Wyoming

W7VBP.....2430-27-30- C-7

SOUTHEASTERN DIVISION

Alabama

W4KAC.....28,454-82-117- C-52
K4KQN.....9216-48-64- A-10
W4CGW.....6270-38-55-AB-16
W4HA.....4760-35-46- C-10
W4TKL.....3813-31-41- B-20
K4LNA.....279-9-11- B-15
K4KJD.....108-6-6- A-2
K4IPF.....27-3-3- A-2
W4DSJ.....12-2-2- A-1

Eastern Florida

W4LNE.....133,736-146-307- B-72
K4SJU.....22,230-65-114- A-35
W4HKJ.....21,942-69-106- B-19
K4UHF.....20,646-62-111- A-75
W4NYF.....4340-35-42- C-16
W4LVV.....3379-31-37-BC-7
K4LWI.....960-16-20- C-5
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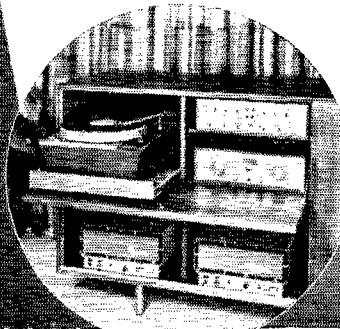
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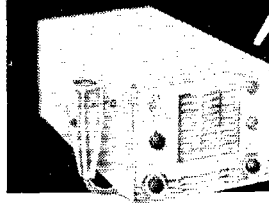
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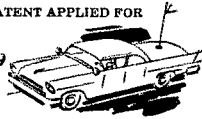
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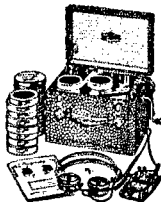
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W4DLG... 8360-44-64-B-16
K4M0F... 5250-35-60-A-14
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W6OSU... 31,680-80-132-C-38
W6MVK... 21,624-68-106-C-28
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K6VTQ... 10,437-49-71-C-11
W6LWY... 9768-44-74-A-51
W6AXW... 6732-34-66-A-54
W6AM... 6150-41-60-C-3
K6ZCL/6... 6120-34-60-A-30
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K6PBE... 2508-19-44-A-9
K6UFX... 1782-18-33-C-9
K6LAS... 1425-19-25-B-2
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W5SU... 7809-43-61-B-20
K5HJV... 4515-35-43-B-15
W5EDX... 27-3-3-B-
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VO1CZ... 2232-24-32-A-34
VO2NA... 468-12-13-B-10
VO2AW... 27-3-3-A-2

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VE2ACU... 13,700-50-94-A-32
VE2WA... 7656-44-58-B-10
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VE3UX... 33,810-80-149-A-25
VE3AHU... 30,600-75-136-B-48
VE3PV... 23,217-71-109-A-28
VE3BMB... 12,276-44-93-A-22
VE3DYB... 10,962-42-87-A-31
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VE6IN... 2808-24-39-A-22

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Eritrea

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EL8D... 4260-10-142-B-
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5A5TF... 15,594-23-226-A-21

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296,781-54-1832-A-85

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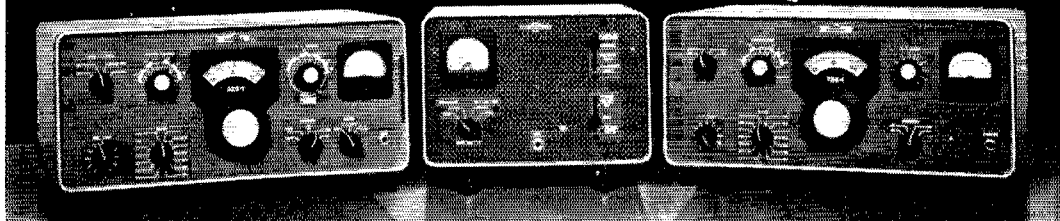


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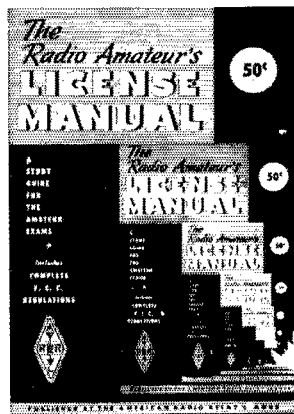
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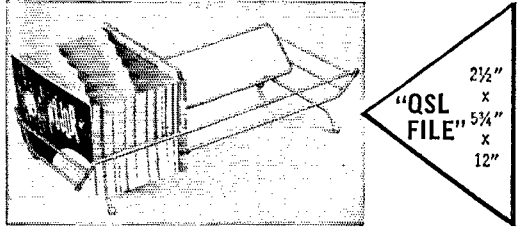


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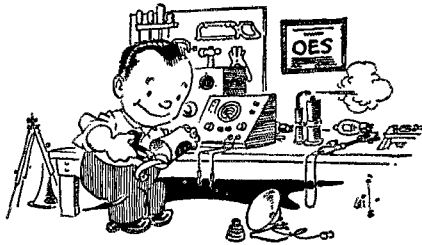
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<i>St. Lucia</i>	<i>Wake Island</i>
VP2LO.....952- 8- 40- A- 3	K6QPG/KW6.864- 9- 32- A- 3
<i>Turks & Caicos</i>	SOUTH AMERICA
VP5FP.....29,838- 33-302- A-14	<i>Argentina</i>
OCEANIA	LU2BN.....11,610- 18-215- B- -
<i>Australia</i>	LJ4EJ.....2827- 11- 87- A-10
VK3MX.....924- 11- 28- A- -	LU4DM.....546- 7- 26- C- -
<i>Fiji Islands</i>	<i>British Guiana</i>
VR2BC...32,967- 33-333- A-17	VP3HAG.197,830- 65-1018- A-70
<i>Hawaii</i>	<i>Chile</i>
KH6IJ.....421,245- 69-2035- C-66	CE2CC.....57,150- 50-381- C-15
KH6RR.....51,240- 35-488-AC-22	CE3HL.....26,622- 34-261- B-15
<i>Marshall</i>	<i>Juan Fernandez Arch.</i>
KX6CM...20,804- 28-249- B-14	CE0ZC.....2304- 12- 64- A- 6
KX6CJ.....1860- 12-135- A-12	CE0ZB.....1050- 10- 35- A- 4
<i>Midway</i>	<i>Paraguay</i>
KM6BP...30,294- 34-297- A-29	ZP5CG.....0348- 19-164- B- -
<i>New Zealand</i>	<i>Peru</i>
ZLING....81,312- 44-616- A-34	OA4V.....26,078- 26-335- B-13
ZLIMQ....81,180- 60-451- A- -	OA4DE.....20,434- 34-203- B-18
<i>Niue</i>	<i>Uruguay</i>
ZK2AB....11,625- 31-126- A- -	CX2CN.....23,944- 24-402- A-22
<i>Philippines</i>	CX9CO.....4914- 14-118- B-33
DU7SV.....6018- 17-118- B- -	<i>Venezuela</i>
	YV5ED.....2916- 12- 81- B- -

¹ Hq. staff — not eligible for award. ² WIWPR, opr. ³ LA50G, opr.

Check logs: C.w. — W2s DQN LNB NCV ODH RDD SHZ, K2QHL, WA2DJ, W3s NF QQR VD, W6HPB, K6s PBX ZMB, W2s FEM QQH TCT/8, W8VAF, K0HLL, CX1NE, DL1QSI, PA8RJ, G2s XG ZR, G3GXO, LA5R, OH1TF, OH2RD, OH5PG, OH7NF, OK1s AHN AMS GS LK, OK2s, KLN KRN QR, OZ7s BW ON, PA0s DN NIC ZL, PY4LW, SM6s BPJ CFC, VE1OM, VE3s EIL, JF, VE7WL, VE8MX, VE9NI, VK5AYR; Phone — W1s BTU HDK WY, W2s NOY NXZ ODH, K2ZAU, W3s MDO ML, W4IFN, K4s OVE RXQ, W6BGF, K6BPX, W7s BTH EYR RCV ZOH, W8QQH, K9BIE, EA2DT, G3DXO, LA6FA, OZ5SQ, PA0s UC VP, VE1OM, VE3s AMK CMY, VE6s HG RM, VE7VP, VE8s BX MJ, VK3XB.

Strays

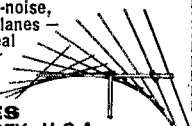
WV6FYD received his novice ticket on June 9 and his first contact was WH6DEX. On June 20, WH6DEX received his General, while in QSO with WV6FYD. "He was my first contact as a Novice and I was his last contact as a Novice on separate dates," says WV6FYD.

They start 'em young on the Morse Code in Humboldt, Iowa. A new elementary school wing sports "Taft School" spelled out in Morse by protruding bricks — an idea from the Des Moines architectural firm of Smith, Vorhees and Jensen to break up a plain brick wall.

The design was in stumbling bricks for at least one older amateur, however — W0VRB confessed that he'd never noticed the design until a newspaper story pointed it out although he passes the wall every day!

New! Telrex "Spiralay"®

Extremely high-gain, high signal-to-noise, practically no fade, all radiation planes — horizontal, vertical or oblique! Ideal for scatter-wave, satellite, mobile or point to point work! 50, 108 and 144 megacycle models available



TELREX LABORATORIES
ASBURY PARK 40, NEW JERSEY, U.S.A.

HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others. No Box Reply Service can be maintained in these columns nor may commercial type copy be signed solely with amateur call letters.

(3) The Ham-Ad rate is 30¢ per word, except as noted in paragraph (6) below.

(4) Remittance in full must accompany copy, since Ham-Ads are not carried on our books. No cash or contract discount or agency commission will be allowed.

(5) Closing date for Ham-Ads is the 20th of the second month preceding publication date.

(6) A special rate of 7¢ per word will apply to advertising which, in our judgment, is obviously non-commercial in nature. This, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, takes the 7¢ rate. Address and signatures are charged for. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising so classified takes the 30¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply.

(7) Because error is more easily avoided, it is requested copy, signature and address be printed plainly on one side of paper only. Typewritten copy preferred but handwritten signature must accompany all authorized insertions.

(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

Having made no investigation of the advertisers in the classified columns except those obviously commercial in character, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

NOTICE!

Commencing with the December issue of QST the Ham-Ad rate (paragraph 3) will be 35¢ per word. The special Ham-Ad rate (paragraph 6) will be 10¢ per word.

QUARTZ—Direct importers from Brazil of best quality pure quartz suitable for making piezo-electric crystals. Diamond Drill Carbon Co., 248 Madison Ave., New York City 16.

MOTOROLA used FM communications equipment bought and sold W5BCO, Ralph Hicks, 204 E. Fairview, Tulsa, Okla.

WANTED: Cash or trade, fixed frequency receivers 28/42 Mc. W9YLY Troy, Ill.

WANTED: Early wireless gear, books, magazines, catalogs before 1922. Send description and prices. W6GH, 1010 Monte Dr., Santa Barbara, Calif.

TRANSFORMERS (3) W2EWL Special. \$3.00 postpaid, SSB, latest diagram, template, 3 xfrms, disc ceramic Emica condensers, coils L1 thru L7 for W2EWL Special (Mar. 1956 QST). \$10.95 postpaid. Vitale, W2EWL, Denville, N. J.

COAXIAL Cable. New surplus RG-54A/U, 58 ohms impedance—30 ft., prepaid, \$1.00. Radio magazines, buy, sell, trade. R. Farmer, 3009 No. Columbia, Plainville, Texas.

ANTENNA 30-40-20-15-10, \$21.95. Patented. Lattin, W4JRW, Box 44, Owensboro, Ky.

WANTED: Battery receivers of 1920s, Eria, Acme, Radiola, Grebe, etc. Also UV199 thru UV206 tubes for electrical test. Buy or borrow. Grote Reher, Green Bank, West Virginia.

MICHIGAN Ham's! Amateur supplies, standard brands. Store hours 0830 to 1730 Monday through Saturday. Roy J. Purchase, W8RP, Purchase Radio Supply, 327 E. Hoover St., Ann Arbor, Michigan, Tel. NOrmandy 8-8262.

WANTED: High quality military or commercial test equipment, receivers, transmitters, tubes, etc. Will pay each or swap. Electroni, craft, Box 399, Mt. Kisco, N. Y.

SPECIAL! W2EWL SSB transformers, New. 95¢ (3 for \$2.50, 10 for \$7.50); T-17 mike, brand new, sealed package. Only \$4.95; Glas-Line, \$2.89 per hundred feet; Geiselo tape recorder, \$179.95. Brochure available. Ling Closed-Circuit TV camera, brochure available. Complete tube inventory, best possible prices. 2C51 \$1.50, 813, \$3.00; 829B, \$5.00; 837, \$1.00; 866A, \$1.50; 872A, \$2.00. Write for free tube price lists. Green sheet catalog on equipment and parts, 25¢. Wanted: Unused transmitting and receiving tubes. Send list for cash offer. Distributors for B&W, Elmec, Hammarlund, Johnson, Westinghouse and others. Barry Electronics Corp., 512 Broadway, New York City 12, N. Y. Tel WALKER 5-7000.

FILL Those peaks: capacitors 120 µfd. 3000 V. G-E Pyronol, used, top condition, \$35.00. Packing, \$3.00. Chimner, W8LTF, 831 Antoine, Wyandotte, Mich.

JOHNSON Thunderbolt, factory-wired, best offer over \$4.50; Hy-Gain Triband vertical with radial kit, \$15; Johnson power reducer, #250-29, \$9.00; Universal KW-4M 52 ohm SWR indicator, \$35. K7EPD, 3550 East Elm, Ploveris, Ariz. CR 9-2824.

ALL Aircraft or ground radios wanted for cash. Especially wanted units made by Collins Radio. Communications receivers, transmitters test equipments needed. Ted Dames, W2KUW, 308 Hickory St., Arlington, N. J.

DON'T Fail FCC tests! Check yourself with a time-tested "Sure-check Test". Novice, \$1.50; General, \$1.75; Extra, \$2.00. We pay the postage. Amateur Radio Specialties, 1013 Seventh Ave., Worthington, Minn.

QSL Samples dime. Sims, 3227 Missouri Ave., St. Louis 18, Mo. QSL-SWLS, High quality, reasonable prices. Samples, Bob Teachout, W1FSV, 204 Adams St., Rutland, Vt.

QSL, SWL'S VHF'S 8YL-OM'S. (Sample assortment approximately 9%.) Covering designing, planning, printer, arranging, mailing, eye-catching, comic, sedate, fatuous DX-attracting, prototypal, snappy, unparagoned, cards, Rogers, K3AA-3, 737 Lincoln Ave., St. Paul 5, Minn. Also clamorous, pulsating (Wow!)

QSL: Fast service, send stamp for samples, Koster, K2UAX Press, 2911 Ewell Place, Wantah, L. I., N. Y.

QSL-SWLS, 100 \$2.50, Samples 10¢. QSO File cards, \$1.00 per 100. Bus Jrint, Box 757, Kansas City 16, Mo.

QSL, Taprint, Union, Miss.

SUPERIOR QSLs, samples 10¢, Ham Specialties, Box 3023, Belaire, Texas.

QSL-SWLS that are different. Colored, embossed card stock and "Kromekote," Samples 10¢. K8AIA, Turner, Box 953, Hamilton, Ohio.

QSL: Send 25¢ (refundable) for samples, W6CMN, Schuch, 6707 Beck Ave., No. Hollywood, Calif.

QSL 3-color glossy, 100—\$4.50. Rutgers VarTyping Service, 7 Fairfield Rd., New Brunswick, N. J.

QSL samples, free, Spicer, 4615 Rosedale, Austin 5, Texas.

PICTURE QSL Cards of your shack, home, etc., Made from your photograph, 1000, \$12.00. Raums, 4154 81st St., Philadelphia 40, Penna.

QSL Special: \$1.75 for 100 cards, postpaid U. S. only. Glossy stock, red call letters, name and address. Green QSO information, etc. All orders mailed within 10 days. Free sample. Hobby Print Shop, Umatilla, Fla.

QUALITY QSLs, samples dime, EPC, 3401 W. B'way, Council Bluffs, Iowa.

QSL Samples, dime, Printer, Corwith, Iowa.

QSL Samples free. Phillips, W7HRG, 1708 Bridge St., The Dalles, Oregon.

SEND \$3.00 for 200 beautiful glossy QSLs. Samples free! Boltes, 7701 Tisdale, Austin 5, Texas.

QSL Cartoons, colors, something different. Samples, 25¢. Chris, W9PPA, 365 Terra Cotta, Crystal Lake, Ill.

RUBBER Stamps for hams, sample impressions, W9UNY, Hamm, 542 North 93, Milwaukee, Wis.

QSL Stamp brings samples, Eddie W. Scott, W3CSX, Fairplay, Md.

QSL, SWLS, Samples 10¢. Onondaga Press, Onondaga, Michigan.

QSL-SWLS, Samples 10¢. W4BKT Press, Wilson, Main St., McKeanie, Penn.

QSL Silver Flash, samples 10¢. The Printing Laboratory, 4441 Hyscuth Ave., Oakland 9, Calif.

WANTED: 6 to 12 304T1 tubes, Caltanan, W9AU, P. O. Box 155, Barington, Ill.

FOR SALE: Prop pitch motor, Curtiss 24v., \$15; rec. mod. RD2 200-400 Mc. \$25. W4GCHB, 1015 Palms Verdes Dr. West, Palms Verdes Estates, Calif. Tel. FRontier 5-1539.

KWMI wanted. Also few high plate dissipation tubes 304T1, 4-1000 etc., Ted Dames, W2KUW, 64 Grand Place, Arlington, N. J.

KWI and spare tubes, cash on the line. Take it away for \$2050. HT32A, brand new, never used; \$595. H. Langerman, W2LB6J.

BACK Issues QST-CQ bought, sold. Tagan, Radio Co-op, Box 5938, Kansas City 11, Mo.

K6UK will be one of the many prominent men attending the 5th Annual VHF Roundup on October 10th. The place is 3 Rivers Inn, 10 miles north of Syracuse on Route 57. You'll find the DX men and the boys you want to meet at the never-to-be-forgotten VHF Roundup. Contact W2OQY, 106 Hyland Drive, No. Syracuse, N. Y.

SAVE On Electronic, Radio and Communication Components and equipment for Hams and commercial use. See thousands of parts in stock usually more coming in daily—too numerous to catalog, all at unusual savings. If you live in or near Philadelphia, visit our new warehouse, Electronics, 1206 S. Napa St., (at 31st and Grays Ferry), Philadelphia 46, Penna. or phone HOward 8-4645.

HAMS! Learn Calculus. Powerful mathematical tool. Easy practical lessons. First four \$1.00. Mathco, 4256-2 Mmmor, Cincinnati 17, Ohio.

"FIG-IN-A-POKE"? Not if you visit Ham Headquarters, USA and see and choose from the hundreds of "Like-New" bargains in the world-famous Harrison Trade-In Center. More for your money, because tremendous turnover makes lower overhead terms, trades, send postcard for mouth-watering photograph and price list Q-6. For the best in all new and used equipment, it pays to come to "Ham Headquarters, USA"! BCGNU, 73, Bil Harrison, W2AVA, 225 Greenwich St., New York City, N. Y.

LEECE-NEVILLE 6 volts 100 amp. system—alternator regulator and rectifier, \$45; also, Leece-Neville 50 amp. system, \$50; 12 volt 100 amp. system, \$85, guaranteed no ex-pole car units. P.E. 75 D gas generator 250 watt a.c. 120 volt, 60 cycle used 10 hrs. \$250. Herbert A. Zimmermann, Jr., K2PAT, 115 Willow St., Brooklyn 1, N. Y. Teis. ULster 2-3472 or Jackson 2-2158.

FOR SALE: R28/ARC 5 revr. cont. tuning 100-156 Mc. New, unconverted, with manual. \$50. W2DDB.

TOROIDS: Uncased 85 mhy. like new. Dollar each. Five, \$4.00. P. P. DaPaul Co., 101 Starview, San Francisco, Calif.

HAM TV Equipment bought, sold, traded. Al Denson, W1BYX, Rockville, Conn.

CASH for your gear. We buy, trade or sell. We stock Hammarlund, Hallicrafters, National, Johnson, Gossel, Globe, Hy-Gain, Mosley and many other lines of ham gear. Ask for used equipment list. H & B electronic supply, Inc., 506-510 Kishwaukee St., Rockford, Ill.

SAN FRANCISCO and vicinity: Communications receivers repaired and realigned. Guaranteed work. Factory methods. Special problems invited, any equipment. Associated Electronics, 58 South P St., Livermore, Calif., W6KF, Skipper.

DX QSL Co-op, Box 5938 K. C. 11, Mo. Save time and \$\$\$, DX QSL'ing. Only 2¢ per card after membership, \$2.00 for 5 years.

WANTED: Grebe receivers, amplifiers, catalogues, state price and condx. W8JVD, 500 Church St., Mason, Ohio.

JOHNSON KW, No desk. Gud condx, \$895. Jolley, W9TVE, Fenton, Iowa.

FOR Sale: Viking II and VFO (factory-wired) National NC183D revr and spkr. Extra tubes for both, \$525. Will deliver to Anchorage or Fairbanks. Tom Clark, K1L7BXJ, A.A. Northway, Alaska.

FOR Sale: NQ129X with speaker, \$125; 75-watt 80-10 meter 6146 transmitter with VFO, cathode modulator, but, \$60. Both for \$160. Edward Westbrook, 226 Lawrence St., New Haven 11, Conn.

DELUXE Call letters: engraved polished black phenolic laminated 2 1/2 inch white letters on 3 1/2 x 1 1/2 inch. Beveled blank, \$1.95 P. P. J. Mude, W8LWW, 3701 Germaine Ave., Cleveland 9, Ohio.

WANT KWM-1 with power supplies. Will sacrifice commercial one KW SSB rig, also other ham gear and guns to trade. W4IWA, 105 Lynnhaven Drive, Hampton, Va.

CHICAGO/LAND Amateurs' Factory authorized service for Hallcrafters, Hammarlund, National, Globe. Service all amateur equipment to factory standards, Heights Electronics, Inc., 1145 Halsted St., Chicago Heights, Ill. Tel. 8KYline 5-4056.

CASH for commercial or surplus transmitters, receivers, test equipment, particularly aviation type Collins, Bendix, ARC, etc. Ritco, Box 156, Annandale, Va.

QSL'S SWL'S? Finest and largest variety samples 25¢ (refunded). Callbooks (Fall issue), \$5.00 postpaid. Religious QSL samples, 10¢. Calendars 1960 (desk), 25¢. "Rus" SAKkers, W8DED, P. O. Box 218, Holland, Mich.

C. FRITZ Says "If it's worth a QSL, let's do it right!" QSL-SWL'S in '59 try mine! Samples 25¢ deductible. 1213 Briargate, Joliet, Ill. QSL'S. Glossy 2 and 3-colors. Attractive, distinctive, different. 48-hour service. Samples 10¢. K2VOB Press, 62 Midland Blvd., Maplewood, N. J.

QSL'S "Brownie," W3CJ1, 3110 Lehigh, Allentown, Penna. Samples. 10¢ with catalogue, 25¢.

QSL-SWL'S, 100, \$2.35 up. Samples 10¢. Griffith, W3FSW, 1042 Pine Heights Ave., Baltimore, Md.

QSL-SWL'S. Samples 10¢. Maigo Press, 1937 Glendale Ave., Toledo 14, Ohio.

QSL'S. Twenty exclusive designs in 3 colors. Rush \$3 for 100 or \$5 for 200 and get surprise of your life. 48-hour service. Satisfaction guaranteed. Constantine Press, Gladensburg, Md.

QSL'S. Reasonable. 10 days delivery. Catalog dime (coin). Dick Crawford, K6CJM, Box 807, Whittier, Calif.

CREATIVE QSL and SWL Cards. Are you proud of your card? If not let us print your next order. Write for free samples and booklet. Personal attention given to all requests. Bob Wilkins, Jr., KN5ZMT, Creative Printing, P. O. Box 1064-C, Atascadero, Calif.

QSL'S Samples, 10¢. Refundable. Also Net Award Certificates and Membership cards. W3KJP Press, 1806 Water St., Wesleyville, Penna.

QSL'S catalog, samples, stamp. Paye, W4ZKK, 824 Avondale, Coroa, Fla.

QSL'S, SWL'S samples 5¢. Nicholas & Son Printery, P.O. Box 1184, Phoenix, Ariz.

QSL-SWL'S. Samples free. W4BKT Press, 123 Main, McKenzie, Tenn.

QSL'S! Printed Circuits! Screen print on your own. Illustrated manual, \$2.00. WAT, Box 1, Freeksville, Ohio.

QSL-SWL'S, 3-colors, 100 \$2.00. Samples dime. Bob Garra, Lehighton, Penna.

QSL'S: Quality samples, 25¢. (Tatum.) W6LKI, 1451 Raymond Avenue, Glendale, Calif.

QSL-SWL'S, 100 4-colors, \$3.50; glossy cards, nice selection. Samples 10¢. Dick, W8VXK, 1018 Arthur, Mt. Pleasant, Mich.

QSL'S, 500 cards, \$7.00. 100 special quality Novice cards, \$3.00. Samples, 25¢ refundable. All orders plus tax, postage. Gary Grant, K6CQZ, 3461 Angelus Ave., Glendale, Calif.

QSL'S 8-day service, samples 10¢. Don, K5OWT, 738 Gardenia, Ada, Okla.

QSL'S. Reasonable, nice designs, samples dime. W2DJH Press, Warrenton, N. Or.

POSTPAID: Viking Adventurer; pair BC-611s, dynamotors 6V and 12V; 100 ft. new RG-59U; BC-359A; BC-455B; oscilloscopes. Dumont and Trumping; new Mobile chrome antenna mount w/ant; UTC-8-18; UTC-8-5; SBP1; SBP1; postal card for price and description. W2RUK, 202 Franklin St., Auburn, N. Y.

PROFESSIONALLY Wired Apache, \$250; brand new Eico #720 transmitter, \$79.95, both perfect. F.O.B. Poughkeepsie, N. Y. Donald Wilson, West Marshall Drive, R.D. #1.

HRO60T A,B,C,D, AC coils, crystal calibrator, speaker, excellent, \$350. Viking Vallant, factory-wired, excellent, \$325.00. Inspect and take. Prices firm. K2BHL.

FOR Sale: National NC-109 receiver, matching speaker, \$135.00; Gonset 6 meter Communicator III, case scratched, used 3 hours, \$250. Write or call Norwood 7-3346. J. Frucci, K1GUN, 35 Elm St., Norwood, Mass.

SELVSYNS - Navy 115 volt 60 cycle AC size 5. Removed from new equipment, tested and guaranteed operating. Use for remote antenna direction indicator, rotating VLF antennas, remote tuning, etc. \$12 per pair postpaid in U. S. No C.O.D.s please. C. R. Beatty, W3CQD, 523 E. Judson Ave., Youngstown 2, Ohio.

HAMMARLUND HQ-129X receiver, late model, in excellent condition, with speaker, \$95. Paul MacCarthy, K2MMR, 1 Hawley Terrace, Youkers, N. Y. Phone GR 6-1930.

FOR Sale: National NC-125 receiver, \$50; no speaker. In gud condx. Write me. R. S. Parks, 310 North Illinois St., Indianapolis, Ind.

MONITORAIDS wanted, or police and fire low and high frequency receivers of other types. W2ANB.

ELECTRONIC Kits assembled, tested, 50% of kit price plus shipping. Highest quality work guaranteed. Free credit certificates equal to assembly charges. Use as cash on equipment or merchandise. Write for shipping instructions before sending kit. National Autotronics, 210 Fifth Ave., N. Y. 10, N. Y.

KWS-1 Serial 981, 75A Serial 3569. \$601 either or both, \$1850, like new. Also have like-new, 75A2, \$300, W9BEN, Box 105, Kearney, Nebraska.

CRYSTALS Airmailed: Mobile, Net, SSB, commercial, Citizens, etc. FT-243, custom finished, .01%, any kilocycle 3500 to 8600 \$1.49, novice 99¢, 1700 to 21,600 \$1.95. Add 60¢ per crystal for HC-6/7U hermetic holders, SSB Package, June 1958 QST, SSB Handbook, - mixer sets, FT-243 \$9.95, HC-6/7U, \$12.95, matched filter sets \$6.90. Airmailing 9¢ per crystal. Crystals? Ask us, we have them all. Crystals since 1933. C-W Crystals, Box 2065, El Monte, Calif.

HAM Licenses, resident courses. Novice and General classes, 3 evenings weekly. Deleahanty Institute, 117 East 11th St., New York City 3, N. Y. Tel. GR 3-6900.

NAMEPLATES! Hams. Your call letters photoengraved. Raised letters with black background. The nameplate is brass, 2" x 11/16" x .025", \$1.00 each. Three of one call, \$1.50. Additional 35¢ each. Everett Laboratories, 235 E. Jackson, Lansing 6, Mich.

HF32. Like new condx. \$500. F.O.B. R. Yeager, 1455 Wilson, Chicago 40, Ill.

NREED Money bad! HQ-129X in gud shape, new Globe Chief (May '59), factory-wired, instruction books, \$145 both or \$135 and FB HC-453. Buyer pays transportation. Richard Gannon, 8 Halstead Ave., Owego, N. Y.

SELLING Out! Come see! Come save! WIRO.

SALE: 75A1, #7479, \$540 and HT-32, \$490. Both perfect. Going to line. Johnny Wood, K4JEY, Box 5042, High Point, N. C.

SELL: SX-101 with H-46B matching speaker, \$350; Standard 26 V, 77 relay rack, \$15; Millen 500 watt final No. 508R1 with coils for 80, 20 included, \$60. John Morgan, K9BCX, Tel. EM 2-9107, 3621 Newark St., N.W., Apt. 101, Washington, D. C.

WANTED: HRO50T1, 15 meter coil. W9IUB, 5019 Gramar, Wichita, Kans.

GLOBE Scout 65A, like new, for quick sale: \$50. F.O.B. Elgin, Ill. Send certified check or money order. Rev. Everett Battin, W9OWD, 616 Glenwood Ave., Elgin, Ill.

HAMMARLUND HQ140X receiver, \$180; Telex 503A, 3-el, 20-meter beam, \$85, Ernest Ruda, K2CFN, 3206 Walden Ave., Depew, N. Y.

MOSLEY Trap vertical Model V-4-6, with coax connector, \$20 or best offer. W1JLH, 68 Avaton Rd., Waban, Mass. Used few months in exc. condx. W1NJL.

NATIONAL AC - 240-CS receiver w/spkr, like new. Covers 200 Kc-400 Kc and 1 Mc - 30 Mc in six bands. \$99 with instructions manual. Kirkrman, W9ZHL, 2444 "D" St., Lincoln, Neb.

CLEANING Shack! Reasonable 6 meter Terafit converter, 6 meter converter with 417A front end and power supply, Elidco antenna-coax ant. relays 110V AC, 2 Panadapters, Jones MicroMatch, 2 new 4D32, 2 new 832, Turner Model 80 mike and stand, D-104 and stand, E-V V15 mike and stand, Command set converted to 2 & 6 mtrs. VFO with pwr supply. Dick Hill, W9FAN, 2116 Ewing Ave., Evanston, Ill.

MECHANICAL Filters, Collins type F455D-31, 3.1 Kc at 455 Kc. Two for sale, \$30 for one, \$50 for both. W2FTY, 738 Parker Blvd., Buffalo 23, N. Y.

LINESMAN safety belt, new, for climbing poles, towers, \$10; set of 6 heavy duty screw-in guy anchors, \$20. F.O.B. Titusville, Fla. John Link, W4BME, Box 47A, Rte #1.

SX-101 MK III with speaker, in perf. condx. Offer a local deal. Cost \$415 but will sacrifice for \$280 O.N.O. WA2CMF, Bryan Sheldell, 127 Harding Ave., White Plains, N. Y. Days call WH 8-9940 ext. 433 or 421. Nights RO 1-8542.

HEATHKIT MR-1, MT-1, 110V heavy duty ps to match all perf. condx. B&W 10-pair cables, 2 and 4 free grid dipper, \$325.00. W9EQU, 150 Oak Ridge, Iowa (City, Iowa).

SKILL: Complete Heathkit mobile rig, 12 volt. Completely assembled. MT-1, MR-1, MP-1, AK-6, AK-7, Master Mobile 36" chrome base section, 60" SS top section. Ultra HI-Q 40 and 80 meter coils. Best offer over \$300. Will deliver within 200 miles my address. Ship express charges collect elsewhere. Grossenbacher, K5OFS, Box 340, Eagle Pass, Texas.

FOR Sale: Viking II, Matchbox, VFO, sequence keying, push-to-talk, speech clipping, low-pass filter, coax relay, like-new condx. Matching 100 watt 6 and 2 meter RF sections plug into power socket on Viking, \$298 finals. Complete above plus 6 meter VFO, \$295; Collins 75A3, latest model built with 3 and 6 kc. filters, matching speaker, xtal calibrator, vernier knob. Immaculate condition, \$415. 500 watt 6 meter final, 1A, and bias supplies, 100TFS, \$40. Morrow Conelrad CM-1, \$15; Heath DX-35 and VFO, \$65. W. J. Moulton, W9DSP, RFD 4, Chippewa Falls, Wisconsin, Phone 3-3000.

SURPLUS Ampheno RG11/U 72 ohm coax guaranteed perfect, 5¢ per foot. No C.O.D. R. C. Martin, 3016 Surrey Lane, Chamblee, Georgia.

GONSET Twins, Johnson whipload six, Master Mobile Mount and whipl, all mounted in 1958 Pontiac Starchief hard-top, full power, 5 new tires, 14K miles. All in excellent condition. \$2850. W1ZQA.

WANTED: Hamlicrafters 27 or 36 type recvr. Frank R. Van Sant, 15 Salem Ave., Spring Lake, N. J.

FOR Sale: SSB station - SX-42, \$135, 10A, Q1T, VFO, coils 10M-30M, \$90; 837 GQ linear, 1200V power supply, etc. Send for list. Joseph E. Hawkins, K9JAO, Box 157, Syracuse, Nebraska.

CLEANING House! Pr. BC-611 walkie-talkie chassis, \$4.50 ea., FB condx AT-1, \$22; some 1 µfd 1500 VDC condensers, 45¢ ea.; single 833A, guaranteed, make offer; also some transformers, tubes, other equipment. Write for list. K9IRP, 720 So. Jasper, Decatur, Ill.

MOVING West. Sell Thunderbolt with attenuator, \$425; 6 volt 100 amp. alternator complete, \$25; 85 ft. Tristate crank-up tower with guy wire, \$150; 30 amp 110 volt Variac, new \$45; Jones MicroMatch, complete, \$25; 30 µfd 3000 volt condenser, \$30; Tapetone XC144-C4 converter and P.S., \$90; Telex 8-el, 2 mtr. beam, \$10. 20 hrs. 500 Ma. choke. K9CAZ, Bunker Hill, Ill.

SALE: Globe Chief 90A, perfect condition, \$45. R. Tyson, 2762 Windsor Dr., Cornwallis Falls, Penna.

FOR Sale: Central Electronics Model 600-1, amplifier, Astarc D-104, Cesco relectrometer CM52 1956-1957 QST, 1956-1957 QG, Collins 75A4 spkr. 270G-3, all in like-new condx. A. Martinka, 3723 Magnolia Ave., Chicago 13, Ill.

TRADE: 6 inch swing, 18 in. centers. Atlas metal lathe, with 3 and 4 jaw chucks, with complete tooling, new condition, work \$550. Need Viking hamper, Yelland 32V, etc. Matchbox Panadator, or HQ-170, HRO-60, 75A4. Will answer all inquiries. Ray Jarrett, W7RXN, Deer Park, Wash.

TRADE or sale: Banjo and case. Prefer VFO or Q multiplier Johnny Dean, Box 400, Alma, Ark.

HOMEBREWERS Attention! Guaranteed like new surplus parts: Meters, \$2.00, tubes, 866A, 756, octals, 25c, oil condensers 50c; 200 watt resistors 50¢ transformers and chokes, potted 25c per pound you name it. Send for list. Need modulation xfrms. W7HNV, 3113 Rocky Point Rd., Fremont, Wash.

FOR Sale: Collins 310-3 with 6146 final and all-band tuner A-1, \$149 or best offer. Gonset Tri-Band converter, \$19; guaranteed 4-125As used, \$3.00, new, \$16. Will ship. W6SKF, R. W. Davis, 1204 N. Alamo, Anaheim, Calif.

SELL: Sonar 120P xmt'r with VFO and three xtals; 120W power, 150W c.w., brand new final amplifier tube. Full directions. A little power house! \$85.00. Dr. C. R. Crosby, W1QP, Chatham, Mass.

SELLING Out: 75W c.w. and AM, complete, station, new condx. K7EZZL, Parma, Idaho.

CANADIANS! Selling complete station: Hallicrafters SX-101 in exc. condx. \$375; Heath DX-35, \$50; Heath VFO, \$15; Heath reflected power meter, \$15; Tecraft 2 meter converter and power supply, \$45; 522 transmitter perfect condx. \$35; Johnson Matchbox, \$55; Johnson 5c sentry, 75¢; 50 ft. Spaulding tower, \$30; CDR Ham-Motor, \$110; G4ZU beam, \$75. All equipment guaranteed in new condx. Homer Abraham, VE3BUT, Welland, Ont., Canada.

COLLINS remote control unit. Local control box includes AC on-off push-to-talk, stage of Audio and power supply. Transmitter site box includes AC on-off relay, push-to-talk relay and power supply. Both have audio matching transformer wire connected up to 5 miles. Brand new sealed box with instruction book and spare parts, \$25.00. W. J. Futch, W3ZJT, Rd. 3, Wyoming, Penna.

75A4 with 3 ft. filter, Vernier knob, original carton. Never modified or repaired. Excellent. \$495. Also my standby equipment: National NC-183 rack model with calibrator less crystal and Heath Q-Multiplier, DX-35 and VFO, \$200. K6TWW, W. Clarke, 1014 Hilltop Drive, Chula Vista, Calif.

FOR Sale: Hallicrafters receiver SX-101, Mark III, like new, in original carton. \$285. Dr. H. Slutsky, 1801 N. Natoma Ave., Chicago 35, Ill.

SLX Meter kilowatts: page 24 July 1959 Q-57; parts, kits, complete; Reichcraft Engineering, Sterling, Va.

FOR Sale: HQ-110C, 2 mtr. Gonset 12 volt, xtals, 2 mtr. conv. 1F 292 Me. Best offer. W1OJLV.

WANTED: Manual for Navy RAS-3 receiver (Navy HRO with 6V tubes) used. With key, rent or borrow. W. M. Jackson, W1LLZ, Box 51, Savannah, Tenn.

MUST Sell Melssner 150-B, 813 xmt'r and VFO, \$75, or best offer. DX-35 and VF-1, \$50. Also NC-173 revj with Heath Q-Xer, \$130. First check over \$300 takes all. K1DJG, 262 Arnold Road, Newton, Mass.

SALE: DX-40, c.w. monitor, Lightning bug, NC-98 with speaker and Q-multiplier. All: \$186. Bruce Wells, 2023 Hemlock Rd., Norristown, Penna.

SELL Globe Scout 680A, 3 months old. In excellent condx. Best offer over \$80. Send stamp. James McCarthy, 56 Oak St., Floral Park, N. Y.

TRADE Six meter Gonset Deluxe Communicator II, for 2-meter C Communicator. C. D. Burgess, 402 S. First St., Trenton, Ohio K81GJ.

SEND For list of good buys at bargain prices. Box 575, New York 8, N. Y.

DUFF For the amazing lack of offers for my DX-100, with modified keying and push-to-talk, which I offered earlier, I am now re-offering the transmitter for only \$159.95; also I am offering for sale a perfect NC-300 receiver with crystal calibrator and squeel, for only \$259.50. Both for only \$399.95. Send your offers to: Steve Pakula, K9BIB, 7661 Oxford Drive, Clayton 5, Mo.

HQ150X. Best offer, several hours use. W0MBH, Yankton, So. Dakota.

SWAP: New Leica M3, F2 Summicron, F4 telephoto, exposure meter, lens hoods, filters, misc. accessories for KWM-1 or S line. I. Seidman, W2GNZ, Park Towne West, W1202, Phila. 30, Penna.

FOR Sale: Hallicrafters HT-9, Hallicrafters 3-106 receiver (six meters), LW-50 six meter transmitter, and Super Pro BC779 with power supply. Best offer. B. A. Kramer, KS1TW, 2950 East Wallings Road, Brecksville, Ohio.

KWI for sale. R. Van Wuyckhuysen, W2CR, 412 Humboldt St., Rochester 10, N. Y.

SELL: Drake 1A, 3 months old, perfect, unmodified, with instruction booklet, no scratches. \$260. K4KIN, 730 So. 41st St., Louisville, Ky.

CRYSALS, 2 through 80 meters. Send for list of frequencies. 25¢ each. Power transformer, Stancor PC-8414; 1200V CT with filament windings, \$4.75 each. Ronald White, W61MC, 210 Alden Rd., Hayward, Calif.

FOR Sale: 1 SX-101 Mark III with speaker; 1 Heath Apache xmt'r, 1 Mosley TA-33 JR Tri-band beam, 1 C.D.R. rotorator, 1 Vibroplex bug, all equipment only 6 months old. W5WAL.

SX-100 \$195, HT-32A \$595, NC-300 \$245, NC-183-D \$249, HRO-50 \$1 \$249, HRO-60 \$385, NC-66 \$385, SP-600 \$400, MC-4, \$395, BC-74B \$159, 75A-1 \$249, 75A-4 \$595, 511-3 \$375, SX-101 \$255, HQ-160 \$295, Teletype converters, printers, perforators, etc. Write Tom, W1AFA, Alltronics-Howard Co., Box 19, Boston 1, Mass. (Richmond 2-0048) (Store: 60 Spring, Newport, R. I. Fred W1JFF).

CAREFULLY Built—"Ocean Hopper" coils (155 Kc. to 35.5 Mc.) earphones and manual. Offer? Shipped prepaid. Careful packaging. Jos. Mocker, Jr., 47 Prospect, Taunton, Mass.

SELL: Heath OM-2 oscilloscope, \$30; Heath SG-8 signal generator, \$15; Gardiner & Co. type S automatic code sender & 10 tapes, \$20; Pennwood Numechron 24 hour numerical clock, \$10. All are in excellent condx. A. Schweigard, 15 Forest Ave., Old Tappan R.D. #1, Westwood, N. J.

NEW HC-10, \$110. Thordarson modulator, for DX-40, BC-459, etc. Universal output. Modulate to 150 watts, \$40. Offers? W3BQS, 709 Main St., Kingston, Penna.

HALLICRAFTERS SX-99, \$110; matching speaker, \$12. DX-20 300, Knight kit, \$25. All for \$160. In like-new condx. K9JNT, Dick Sharpy, 38 College Campus, Lake Forest, Ill.

COMPLETE 600 watt S&S station. Includes 20A with QT-1 driving Gonset 500W linear and Heathkit VSWR all rack cabinet mounted with coax antenna switch and deluxe 458 VFO. Receiver NC-300 with 100 Kc. xtal calibrator and special 88B speaker, shure reluctance mike plus stand included. First offer over \$600 takes entire outfit with all instruction books. Will box and ship at your expense. K4JRW, 217 Rodman Rd., Norfolk, Va.

FOR Sale: NC300 skr. cal. \$200; 20A-QT1, BC458, 10F160, \$200; 3 meter converter, 600A-PR, new, \$50; CE Slideband Slicer Mod. B, \$50; AF2 adapter for NC-300, NC300CA, 6 meter conv. \$25; CE MM2, \$65; B&W Model 600, \$25; B&W Model 425, \$8; Hy-Gain 12A V, \$20; Radio Spec. 3 Bander 10-15-20, \$50; D-104, \$10. Complete package \$650. Frank Gaudiosi, BO 8-4654, K2RQG, 68-33 Fleet, Forest Hills, L. I., N. Y.

SELL-Trade: Heath Q multiplier, \$8; 2 complete 10-watt mobile transmitters for 75 and 40, \$30 each; 9 plate modulators for following units: Knight, Adventurer, DX-20, AT-1, Globe Chief, Navigator \$10-\$18 each. Push-pull 6146s, 125 watt modulator, \$25; supplies: 1000-600-300V/250 Ma., \$18; 750-325-6.3v/275 Ma., \$15; 400V/100 Ma., \$7; 600-300-3.6/250 Ma., \$12; 2 meter xtal converter, \$10. Several 80-40 meter low-pass filters, \$3.00 each. Above either in new or like-new condition. Stan, W84KQ, 2748 Meade st., Detroit 12, Mich.

10 MTR. 12W mobile xmt'r, \$12.50; 10 mtr. converter, \$8.50; 10 or 15 meter Preselector, \$5.00; Heath Q multiplier, \$7; 108MTR converter, \$10; F.o.b. San Diego, Calif. Bill Deane, W6RFT, 8831 Sovereign Pk.

HAMS! In central Illinois, it's Knox Electronic Supply, Inc. Where your trade-in is always worth more. 67 N. Cherry St., Galesburg, Ill. W. E. Trans. 850V CT 250 Ma. 3-6V & 2-5V windings 110V 60 cyc., \$5; chokes 3H 350 Ct, 30 ohms sealed case, \$1; Advance DPDT 10 amp ceramic ant. relay, 110 VAC, \$1.75; Kerman sensitive keying relay .015 watts, ant. 150; 8-8-8-8-600V oil cond., \$1. 8-8-8-800V oil plug-in, 75; 8ylvania 274B (Navy 504) 40c; 5 CPI, \$1. Everything brand new and guaranteed. Minimum order, \$10. Send postage. Foreign O.K. Write for catalog. W. C. North, 4682A W. Pt. Loma Blvd., San Diego 7, Calif.

FOR Sale: Gonset Communicator III (2 meter). In A-1 condx. 2 xtals and instrum manual included: \$199. KN5TVQ, F. Van Cleave, 3317 Chaparral Lane, Ft. Worth, Texas.

REVERE Lane recorder, 1-1100, in exc. condx: \$95 or will trade for Globe Scout 680A or its equivalent. Jim Jordan, Rt. 2, Americus, Ga.

SELLING Heath MT-1, power supplies, ARO-c, miscellaneous parts. Send stamp for list. Ted Wade, Pennet, Nebraska.

HQ-170 with clock and spkr. 8 hours, \$400; Viking II, VFO, P.P.T. grid block keying, professional wired, \$225; 35 ft. triangle TV tower, \$20. Above rig with all relays, co.-ax, mic. \$500. R. Williams, W5CFB, 2750 Southwestern San Angelo, Texas, 2532-3.

SELL Junk box (\$50 list) — \$30! Kathy Blume, Sauk Trall, Mattoon, Ill.

DX-20, exc. condx, with 3 xtals, \$30; Jack, 609 Steuben St., Wausau, Wis.

NATIONAL NC-125, immaculate, seldom used, \$115. Ed Gamret, 28-D Longfellow Drive, Homestead, Penna.

SELL: Viking Challenger, new, \$125; 8-76 Hallicrafters, \$125, NYC area. W2BDH, Stafford, 2420 Seaside Ave., N. Y. 68, N. Y.

TELELEX 5-element 20 M, beam, Mod. 605, brand new, \$150. Shipped F.o.b. Bob Loos, K9TEV, 2093 Carter Rd., Dubuque, Iowa.

HQ-129-X, Super-Six, cleaning house. Irwin Wallman, 248 West 105 St., New York City, University 4-5146.

WANTED: Q87, August 1920, Laird Campbell, W1CUT, Box 1, West Hartford 7, Conn.

WANT: Johnson Matchbox antenna coupler, 250 watt, make offer. Homer J. Kohli, W8DXB, Spencer, Ohio.

MOBILE For sale: Gonset 66B with power supply, Elmac AF 67 mounting rack and dynamotor, press-to-talk mike, stainless steel, Master Mobile Mount and antenna, 40-20-15M coils, Dow relay, filter, switchbox with pilot lights and RG8U co-ax with connectors. Like new at half-price. K2PKH, Great Neck, N. Y., Hunter 7-3440.

SELL: Hy-Gain Mini Triband beam: 40 ft. Spaulding self-supporting tower with culturb base (no concrete necessary); C.D.R., TR-4 rotorator; 150 ft. RG8U U co-ax; 150 ft. rotator cable. \$125 takes all. Karl Seidel, 2730 Keller Parkway, St. Paul 9, Minn.

RTTY: Two TG-7B printers for sale, excellent condx. Communication keyboard, synchronous motor, \$125; Weather keyboard, Governed motor, \$100. Dan Castrorale, W9WFN, 6312 Wolf Rd., LaGrange, Ill.

DX-100, \$140; SX 25 with spkr, \$60; Super Six, \$28; 75 ohm B&W low pass, \$10; home brew trap ant. 50 ft. coax, \$40; 80 mtr. Command rer, \$4; K8GHY, 408 W. Ionia, Lansing, Mich.

SELL: Factory wired EE-2 keyer, \$300; 54 ft. crank-up Price Products tower, \$75; AR-22 rotorator with control, \$20. Cal Braddock, W5TDO, 20, 5 Bermuda Dr., Shreveport, La.

SELL: Harvey-Wells T-90 transmitter with APS-90 110v. power supply, ideal for home or mobile station, \$160; NC-125 receiver with speaker and 2 Q-multipliers, \$170; D-104 Astatic mike, \$8; Gotham all-band vertical, \$10. All in vy gud condx, complete cost new, \$540; vertical and mike free with first, \$330 for complete outfit. K2PCN, 81 E. 51st St., Brooklyn 3, N. Y.

FOR Sale: DX40-VF1 combination. Very neatly wired. Works perfectly. An excellent buy at \$94. K2OGN, Robert Bernstein, 248 Ridge St., New Milford, N. J.

SELL: 75A3, perf. condx, two filters. Reduction tuning knob. \$385. K5KKW, 2417 Ave. G, Bay City, Texas.

HAMMARLUND HQ-110C, clock and speaker, \$200, Regency transistor, all-band mobile converter, \$50. Myron Caplan, 312 Hedgerow Lane, Wyncote, Penna.

W8MZW passed away. Estate sale: 75A-4, serial 5673, used 2 months, \$575; HT-32, barely used, \$500. Mrs. Arnold Hoyng, 1011 Superior, Dayton 7, Ohio.

SELL Separately or complete Novice, General station: HQ-100 with stal B.F.O., exceptionally stable, clean c.w. reception, 2 QFIs, DX-40, VFO regulated power supply, relay, hand-key, Novice xtals, \$225. Just add antenna. Equipment built and serviced by holder First C1 fone. Reason for sale: going up to Apache; HQ-170, Jerry, WAZPFP, 700 Ocean Pkwy, Brooklyn, N. Y. Tel. GE 4-5431.

FOR Sale: Collins 3101-B exciter, factory TVI suppressed and overhauled. \$175 F.o.b. D. F. Frippe, WAALDQ.

SELL: Elmac AF67 with connecting cable and Dow-Key relay, \$115; SX-99 revr. Used one month. \$110. K4LYB, Clinchburg, Va.

GO-SET Owners: Rack for mounting Communicator I, II or III over transmitter, built to order or adjustment, in and out in seconds. Just the right position for convenient operation. \$4.95 post-paid. Strid electronics, 234 Washington St., North Easton, Mass.

SALE: Good HQ-129X w/spkr. \$115; exc. Viking II w/VFO. \$195; also exc. Viking mobile w/VFO, \$90. Martin Zimmerman, W9PYU, 2909 Farwell, Chicago 45, Ill.

SACRIFICE: BW-5100, SP-600, mint condx, Rion microphone, WRL VOX 10, Change-over relay, Hy-Gain vertical 40-10, \$550 or best offer. Test gear, tube tester, signal generators, scopes VTM, VOMs. New pair 4-250A, variable vacuum, HV plate transformer, future HV, battery 300 miles. All the above, \$630 or best offer. John Erickson, Rte 1, Box 96C, Mountain Home, Idaho.

SELL: A-54, \$70; two 813s, \$7 each; new 304TL, \$20; two brand new 4-125A, \$20 each; 2K4s, 0-130 VAC, 15 amp, autotransformer, \$25; QF-1, never used, \$8; FL-8; PE-103, bare, \$15; bumper mount plus heavy-duty spring, \$10; Kenyon transformer, S13483 115/3200, offer. Want: DX-100(B). All F.o.b. Carson, 506 Newberne St., Lynchburg, Va.

SWL Station: Collins 75A2, matching speaker, xtal calibrator. Recent factory reconditioned and realigned. Viking II, push-to-talk with Johnson VFO, Matchbox, low-pass filter, relay and SWR bridge. 3-element (W3DZZ type) beam with 2 ft. boom, all 61ST aluminum, 48 ft. tower, 4 leg, self-supporting. Grid dip meter and antenna scope. All equipment presently in operation and guaranteed to be in A-1 condx. Open for inspection. Make an offer. All inquiries answered, E. H. Knox, W9SWI, 2313 Meadow Lane, West Des Moines, Iowa.

SELLING: DX-100 with mike, \$180; HQ-129X with matching speaker \$120; Hill dells, 10 to 100 mile radius of Boston, K1DHK, 15 Harvard Ave., Burlington, Mass.

SELL: DX-100, wired by electronics engineer, \$175; BC654-A, 50M port rig, w/PE103, ant. mike, phones & manual; \$50; BC-459A converted in cabinet, w/pwr supp., meters, etc., \$30. Seeburg 70W audio amp, \$20. All F.o.b. John P. Weber, Jr., K6STZ, 1895 Valleyview Dr., Littleton, Colo.

FOR Sale: Excellent matching station in brand new compact Elmac receiver cabinets. Receiver is well-known Elmac PMR-7A, transmitter is W1LQJ mobile RF assembly also w/electronically protected input amplifier. Front panel volume control, frequency tuning, low audio requirements (1 volt approximately, high impedance), gated buffer and 6146 final amplifier. Full 80-10 meter coverage, xtal-controlled (included provisions for tubeless VFO). Would like to sell transmitter and receiver together, \$190. Welcome and gladly answer all inquiries. Complete instrux, manuals and schematics. Will correlate geographic location with speed of arrival of your inquiries. Bob Newhall, c/o Putnam Residence Hall, University of California, Berkeley 4, Calif.

FOR Sale: Useful gear in excellent condx: (1) Heath V7-A VTM, perfect condition, \$19.50, (2) Heath C-3 condenser checker, \$15.50, (3) electronically regulated power supply 300v at 150 mls, \$18.75; (4) Heath GD1-B grid dip meter, also with extended range coils, \$16.50; (5) Knight miniature broadcast transmitter with very cleanly modulated BC654, \$35.00. Complete instruction manuals and schematics for all the above gear. Will gladly answer all inquiries. Ken Overoye, 1402 La Vista Rd., Santa Barbara, Calif.

SELL Tennaball 3-element 20-Mtr beam, RG11U co-ax, TR-4 rotor and Tele-Vue 30 ft. crank-up tower, \$75. Worked 280 counties, K2GFQ, Paul Hallingry, Jr., 76 Hewlett St., Rye, N. Y.

FOR Sale: Scott Receiver Model SLR-12-B, \$35; PE-103 motor generator 6-12 V inp., 500 v outp., \$8; Bud xtal calibrator, \$12; 6 meter Terafit converter broadcast I.F. \$18; pwr supply 110V to 7.7A, \$10. Send for list. Chris Williams, WA2ZCL, Clinton Road, Hewitt, N.J.

WANTED: Collins 75A4 in top condition. Give serial No. and filters included. All letters answered, WITF Elmer Turner, 2 Virginia Circle, Reading, Mass.

MORROW MBR-5 receiver with RVP/250 6/12VDC supply, instruction manual, \$150; Gonsel 6M converter, \$30. Both in excellent condition. Lt. Messinger, K6QMI/1, Box N150, 509BW, Pease AFB, New Hampshire.

SELLING: Globe Scout 616, \$65, VPI, \$15; parallel 811A linear 450 watts, \$75; parallel 6146 120 watt final, \$30 with pwr supply \$38, \$20, QF1, 7; K4LXT, Conetoc, N. C.

GLOBE KING 400C, with factory push-to-pull talk and speech clipper, coils for 7.5, 20, 15 and 10 M. Heathkit VFO. First check for \$40 acts in Wayne, Southweld, 101 Daniels, Wilmington, Ill.

SELL: 10M 12V factory modified Transcon with dynamotor, mike, noise limiter, 100 W, 450 watts, c.w. xtal, \$315 w/220 v 50, xtal, P. P. 6A05 mod, \$20; Heath G-multip, \$7; Alan H. Rose, K2RHK, 23 Schenck Ave., Great Neck, N. Y. ELV. 2-5571.

NO-183D for sale, excellent, 6 months use, \$210. W5FHU, 2509 Terrace Ave., Midland, Texas.

FOR Sale: Viking Mobile, \$75; Morrow Conelrad Monitor, \$29; RME ID-23, \$34.50; Viking Matchbox, \$45; Heathkit VFO, \$15; Viking Adventure, \$45; NC01, \$90; DX-40, \$54.50, 8-38D, \$39.50; Heathkit AT-1, \$25; Elmac PMR-6A with 6 volt pwr supp., \$95; DX-35, \$45; HQ-110C like new, \$224; Collins 32X2, excellent, \$350; 10B with 45XVFO, \$150; Viking I TVI shielded, \$125; CE 10B, \$125; Viking II with Johnson VFO, \$195; Globe LA-1 Linear, \$95; K5C-101, \$265. Write Art Brown, W9HIZ, Brown Electronics, Inc., 1032 Broadway, Ft. Wayne, Ind.

PALCO Bantam 65 mobile transmitter, \$129; Gonsel G-66B, \$139; 12V 100 amp. L-N alternator comp./with rectifier, regulator, wiring ammeter, pulley bracket, and directions, \$65. Postal money orders only! K4ZSA, P. O. Box 131, Belmont, N. C.

SELL: KWM-1 and 516F 1 AC supply like new, original boxes, \$650 or best, Shure 55B mike, \$30. K4SIX, 2644 Fisk Rd., Montgomery 6, Ala.

COMPLETE Station: For sale: SX-100 with speaker, \$195; home brew 400 watt transmitter cabinet mounted on casters, with 3 meters, 2 extra 8-20As; excellent condition, \$195; 50W Lysen w/VFO exciter, \$60; amplifier \$20; 15-meter 50W transmitter with built-in pwr supply, \$25; 40 ft. self-supporting tower with boom, disassembled at ground, \$80; Hy-Gain Triband with extra 10 meter element in original carton, \$30; CDR rotor, \$25; many small items: meters, tubes, condensers, resistors. See to appreciate. K9HPK/2, Palmer, 218-11 Union Turnpike, Bellerose 26, N. Y. F1 7-7620, FI 7-3103.

HEATHKIT AF-1: with antenna coupler/low pass filter, in gud condx, \$26. John Welch, 54 Crescent Place, Wilmette, Ill.

VIKING Mobile and VFO, Elmac PMR-6A, PSR-6 power supply, PE 103 and all connecting cables. Viking aligned by Johnson Company. In excellent condition. All with manuals, first \$195 takes all.

VIKING II with Viking VFO. Commercially wired and in excellent condition with manuals. \$195. W6NJJ, 3545 Mayfair Drive, Sacramento 25, Calif.

SALE: Transmitter DX-100, pre-wired and tested by Heath, kit with mike and balun coils, \$175; cubical quad antenna, complete with bamboo; Model AR-22 rotor with lead-in wire, CDR indicator for antenna, \$70; Harvey-Wells Bandmaster Deluxe TBS 50D with xtal control VFO, \$75; Instructograph machine and 12 tapes on code Signatone and key for practicing code, \$55, S. Bedell, 260 Autumn Ave., Brooklyn 18, N. Y.

SALE: 5-200 amp, 12.5 Kv, UC8 Jennings vacuum variable condenser, 25 microfarads, 1-1M77, 300W multimotor modulation transformer, never used, \$15. Byron E. Fortner, W9FYM, RFD #10, Box 486, Indianapolis 19, Minn.

32V3, not a scratch on it. Used very little, complete set spare tubes, original packing box, \$380; Johnson Matchbox, \$35. George Comstock, W7CJ, Potlatch, Idaho.

SURPLUS Measurement Model 78 or 80 Signal generators. Also Federal 804. State quantity, price and condition. Communications Service, Inc., 3209 Canton St., Dallas, Texas.

INSTRUCTOGRAPHIS Wanted: used, A.C. models, complete with parts. For use in Amateur Radio class. Stage age, condition and price. G. E. Taylor, VE3FDG, 2835 Isabella St., Ft. William, Ont., Canada.

FOR Sale: SX-101 Mark III in perfect condition, without a scratch on it, \$290. Jim W2YLS, 145 Ackerman Ave., Ridgewood, N. J.

FOR Sale: Gonsel G50 6-meter Communicator, \$260; Hammarlund HQ-101, \$140; Amec 6-meter converter, \$25; Eldred wire-watt transmitter, \$25; 115-volt transformer 12-volts, 400 at 140, \$7; others for: D-104, DX-12, T-17B, T-26 microphones; 132, 446 Master Mobile mounts; Carter dynamotors; 625-volts with filter, 425-volts. John Bradley, 41 Cedar, Montclair, N. J.

2 add 4000V DC capacitors, \$5.00 each, or 2 for \$9.00. F. G. Dawson, 5740 Woodrow Ave., Detroit 10, Mich.

REDUCING Inventory — Bargains, brand new in factory sealed unopened cartons, Central Electronics TRI 20A and 458 VFO, factory-built, both for \$269; Hy-Gain Trap Tribander beam, new, \$78; Collins 75S1 revr, demonstrator, used less than 7 hours, \$429; Caryn 75, new factory warranty, \$675. Will ship upon receipt of cashier's check or money order on money back guarantee. Moory's Wholesale Radio, 12th Jefferson St., DeWitt, Arkansas. Phone WH 6-2820.

CLEANING Shack: 304TLES, 10V 12A fl. trans., Bassett 15 meter coil, Gonsel Super-Six, many others, send for list. All good items, cheap. E. S. Ensign, W8FGZ, RR 4, Bowling Green, Ohio.

VHF News Bulletin — 10 issues, \$1.00. "QSO," 67 Russell, Railway, N. J.

GONSET (factory-overhauled) 6 meter Communicator III \$215, linear amplifier, \$125; Hallcrafters 8-107, \$70; Viking mobile transmitter, \$75; RME (10-20-75) converter, \$25; TNS, \$35; L-N volt alternator, new, \$20; ammeter, \$25; Eldred wire-watt transmitter, \$25; 115-volt transformer 12-volts, 400 at 140, \$7; others for: D-104, DX-12, T-17B, T-26 microphones; 132, 446 Master Mobile mounts; Carter dynamotors; 625-volts with filter, 425-volts. John Bradley, 41 Cedar, Montclair, N. J.

GONSET G66B revr with 3-way power supply and Gonsel G77 xmtr with power supply — modulator, mounting racks, connecting cables and all instruction manuals. Complete — \$325. This is my personal rig. It is in excellent condition both appearance and electronically. Will ship James C. Stevens, W9XXY, Chief Engineer, KASI, Ames, Iowa.

HEATH RF Signal generator, \$15; Heath Electron Switch, \$15; Heath VTM, \$10; Collins 75-A xtal calibrator, \$12.50; National MB4OSL all-band tank, \$7.50; Johnson 229-2 rotary coil, \$7.50; dial and counter for coil, \$2.50; Turner microphone and stand, \$10; 15 amp. powerstat, \$15; 3000 volt 1/2 amp. UTP potted xfmr, \$20; 500 ufd vacuum capacitors, \$1.50; high capacity high voltage capacitors, 1 in 3 dollars. All items in excellent condition with manuals. Frank Loren, W7EBG, 6840 East Windsor Ave., Scottsdale, Ariz.

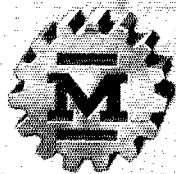
TRILREX Model 503, 3-el 20-meter beam, full size, outstanding performance, and price, \$129.50. 2A, 75 and 20 meters, \$10; Millen grid dip meter, Cata. No. 90651, all coils, instrument as new, \$35; Dumont oscilloscope Type 224, with instruction book, \$35; the above equipment is offered without reservation as to quality and worth. Also 522 transmitter, converted with xtal, mike, 5-el. beam and power supply, all in working order, \$15. Wilcox single channel rack mounting receiver, suitable for Conelrad, not working, \$5.00. E. S. Grainger, W2NXXZ, Box 186, Brightwaters, L. I., N. Y.

INSTRUCTIONS for building an 800 watt grounded grid amplifier using three 811A tubes. Using ferrite filament choke and band switching coils in plate circuit makes band changing fast and easy. I use mostly surplus parts and wind coils which makes cheap construction. I give instructions with pictures and circuit and names of firms I got material from. All this I will mail to any amateur for \$2.50. For the sample, send for suitable station. W4ALG, Mcade Johnston, 2625 Broad Street, Tuscaloosa, Alabama.

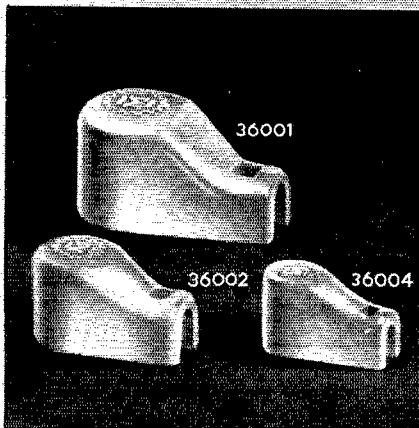
SELL: Harvey Wells Z-Match antenna coupler, excellent condition, \$50. Also Johnson Signal Sentry, \$3. K9KRH, 3625 Spring Trail, Madison, Wis.

SELL — AT-1; Heath VFO, 150 Watt amplifier, modulator, and 2 power supplies all for AT-1, \$125. Will trade for good Heath Seneca, K5KNR, 2220 Avenue "O", Huntsville, Texas.

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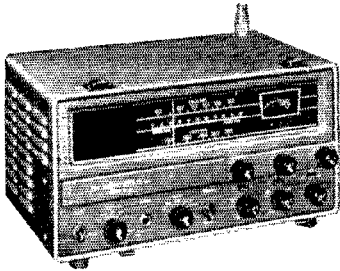


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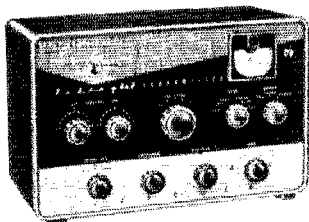
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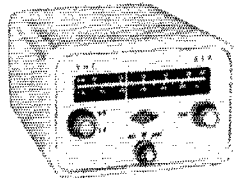
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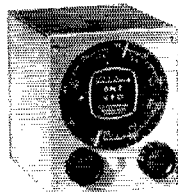


VFO'S



GONSET VFO

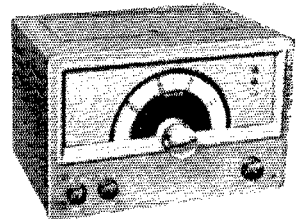
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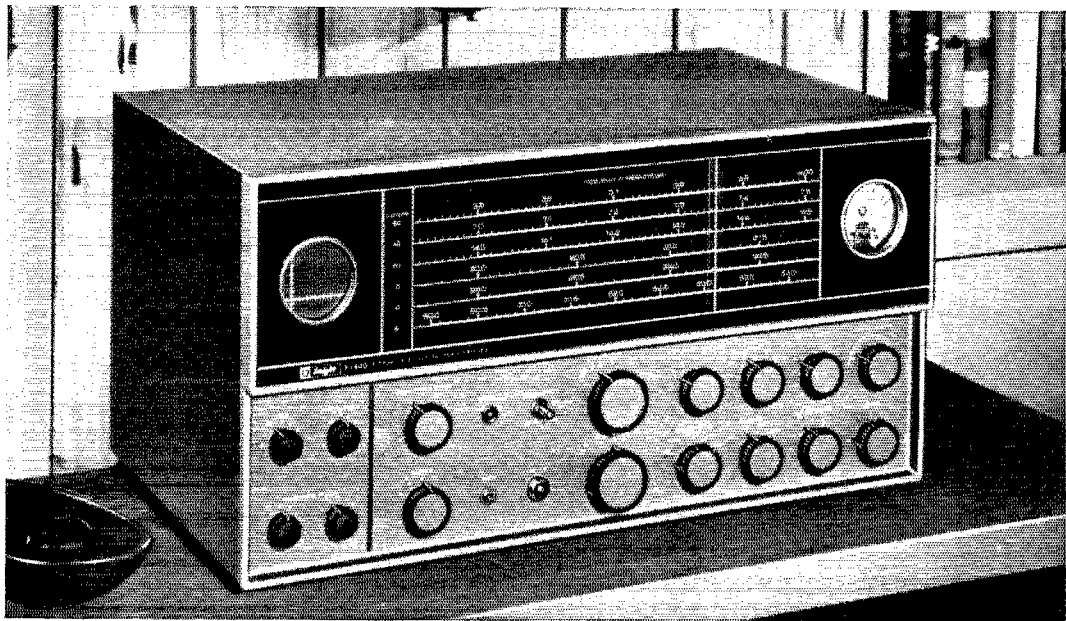
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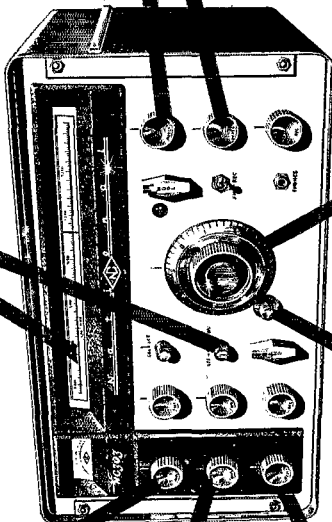
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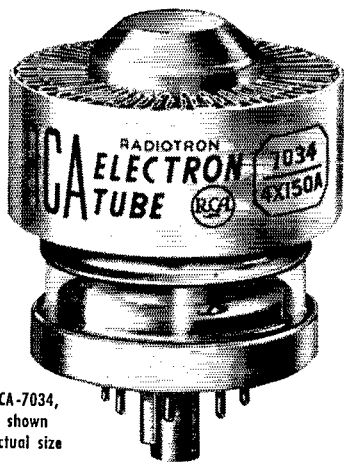
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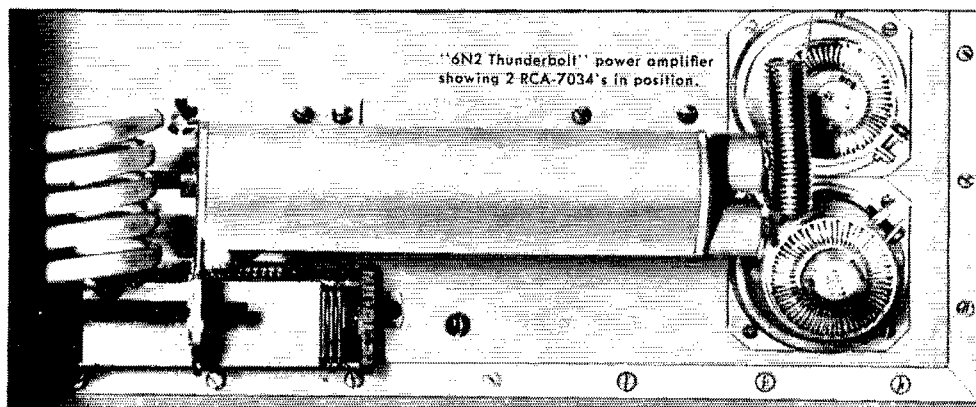
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