

June 1955

50 Cents

55¢ in Canada

QST

devoted entirely to

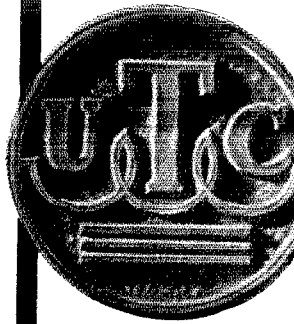
amateur radio



Don't Miss It! - ANNUAL A.R.R.L. FIELD-DAY, JUNE 25th, 1955

LARGEST PRODUCERS IN THIS FIELD FOR TWO DECADES...

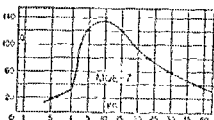
HIGH Q INDUCTORS FOR EVERY APPLICATION



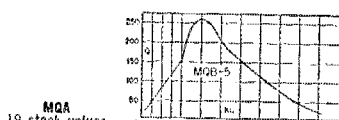
FROM STOCK... ITEMS BELOW AND 650 OTHERS IN OUR CATALOGUE B.

MQ Series Compact Hermetic Toroid Inductors

The MQ permalloy dust toroids combine the highest Q in their class with minimum size. Stability is excellent under varying voltage, temperature, frequency and vibration conditions. High permeability case plus uniform winding affords shielding of approximately 80 db.



MQE
15 stock values
from 7 Mhy.
to 2.8 Hy.



MQA
19 stock values
from 7 Mhy.
to 22 Hy.

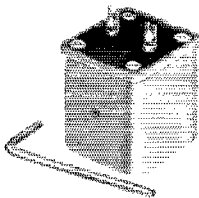


MQB
12 stock values
from 10 Mhy.
to 25 Hy.

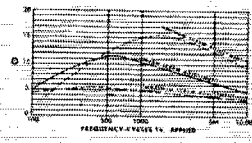


MQ drawn case structure

Length	Width	Height	
MQE	1-7/16	1-1/16	1-7/16
MQA	1-7/16	1-3/16	1-33/64
MQB	1-5/16	2-5/16	2-33/64



VIC case structure
Length Width Height
1-1/4 1-11/32 1-7/16

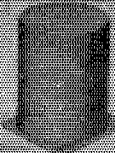


Type	Mean Hys.	Type	Mean Hys.
VIC-1	.0085	VIC-12	1.3
VIC-2	.013	VIC-13	2.2
VIC-3	.021	VIC-14	3.4
VIC-4	.034	VIC-15	5.4
VIC-5	.053	VIC-16	8.5
VIC-6	.084	VIC-17	13.
VIC-7	.13	VIC-18	21.
VIC-8	.21	VIC-19	33.
VIC-9	.34	VIC-20	52.
VIC-10	.54	VIC-21	83.
VIC-11	.85	VIC-22	130.

VIC Variable Inductors

The VIC Inductors have represented an ideal solution to the problem of tuned audio circuits. A set screw in the side of the case permits adjustment of the inductance from +85% to -45% of the mean value. Setting is positive.

Curves shown indicate effective Q and L with varying frequency and applied AC voltage.



MQL Low Frequency High Q Coils

The MQL series of high Q coils employ special laminated Hipermalloy cores to provide very high Q at low frequencies with exceptional stability for changes of voltage, frequency, and temperature. Two identical windings permit series, parallel, or transformer type connections.

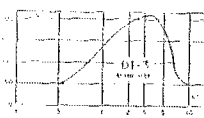
MQL-1	2.5-10 Mhy.
MQL-2	5-20 Mhy.
MQL-3	20-200 Mhy.
MQL-4	100-400 Mhy.

MQL case
1-13/16 dia. X 2-3/2" H

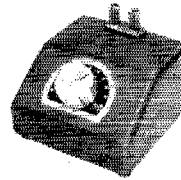


DI Inductance Decades

These decades set new standards of Q, stability, frequency range and convenience. Inductance values laboratory adjusted to better than 1%. Units housed in a compact die cast case with sloping panel ideal for laboratory use.



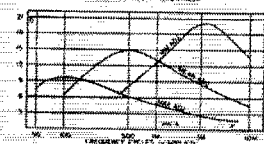
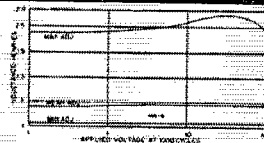
DI-1	Ten 10 Mhy. steps.
DI-2	Ten 100 Mhy. steps.
DI-3	Ten 1 Hy. steps.
DI-4	Ten 10 Hy. steps.



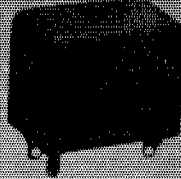
DI DECADE
Length .412"
Width .438"
Height .216"

HVC Hermetic Variable Inductors

A step forward from our long established VIC series. Hermetically sealed to MIL-T-27... extremely compact... wider inductance range... higher Q... lower and higher frequencies... superior voltage and temperature stability.



Type No.	Min. Hys.	Mean Hys.	Max. Hys.
HVC-1	.002	.005	.02
HVC-2	.005	.015	.05
HVC-3	.011	.040	.11
HVC-4	.03	.1	.3
HVC-5	.07	.25	.7
HVC-6	.2	.6	2
HVC-7	.5	1.5	5
HVC-8	1.1	4.0	11
HVC-9	3.0	10	30
HVC-10	7.0	25	78
HVC-11	20	60	200
HVC-12	50	150	500



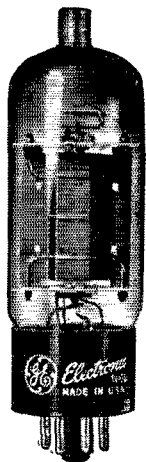
HVC case structure
Width Length Height
25-32 1-1/8 1-7/32

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Send your specifications in prices.

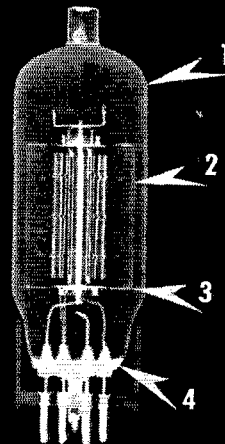
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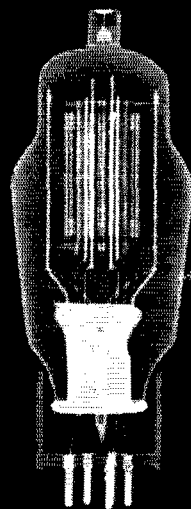


NEW SERVICE-DESIGNED 6BG6-GA

Diameter 24% less than prototype! Seated height 13% less! See X-ray pictures at right for standout design improvements in General Electric's new tube—priced same as the 6BG6-G it replaces!



NEW 6BG6-GA



OLD 6BG6-G

1. New bulb is straight-side, much smaller and sturdier.
2. Redesigned, more shock-resistant tube structure.
3. Bottom mica, as well as top, now contacts the glass envelope, for greater rigidity.
4. Button-stem base gives shorter, better-separated leads, for improved heat conduction and superior tube r-f characteristics.

For mobile work, choose G.E.'s all-new 6BG6-GA... compact, sturdy, high-voltage tested!

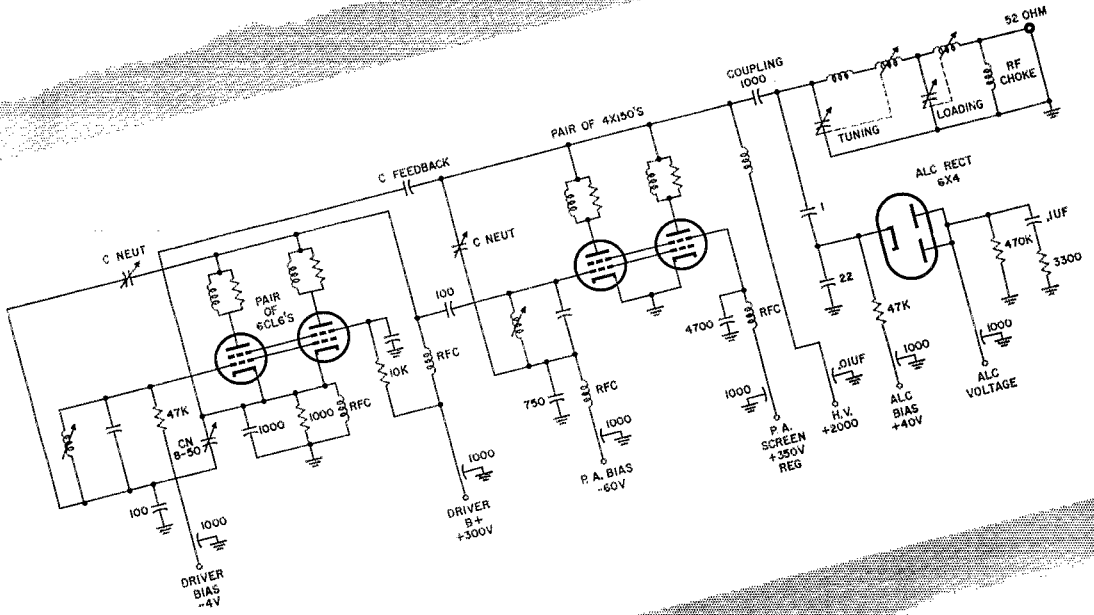
ONE tube or push-pull, the 6BG6-GA is ideal for your new mobile or portable rig—final-amplifier or modulator service.

General Electric's new beam power pentode is streamlined in size, and as rugged as they come. The tube takes tough mobile operating conditions in stride. A high peak plate voltage rating means you'll have little or no tube arc-over from voltage fluctuations. To further assure this, every G-E 6BG6-GA is factory pulse-tested at absolute maximum voltage.

20-watt plate dissipation per tube helps you get the power you need out of a small rig . . . and at a budget receiving-tube price. Also, here is a tube specially designed and built to perform, to last—one of General Electric's famous Service-Designed types, which TV technicians coast-to-coast are installing in critical sockets.

Your local G-E tube distributor has the new Service-Designed 6BG6-GA. See him today! *Tube Department, General Electric Company, Schenectady 5, New York.*

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at its finest *Collins* **KWS-1**

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See your nearest Collins distributor





JUNE 1955

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• MORE COMPLETE • MORE RUGGED • MORE RELIABLE

More complete—Engineered with a wider range of antenna impedance—50 to 600 ohms.

More rugged—Components surpass even the most rigid commercial specifications. Heavier transformers for less heat, and an exclusive Hallicrafters feature, a blower to further reduce heat!

More reliable—on-the-air tests assure you of dependable performance.

Here in one compact package is a full band switch power amplifier covering 80-40-20-15-11 & 10 meters that's easy to drive, highly stable, extremely versatile, and engineered to Hallicrafters world-famous quality.

SPECIFICATIONS

Plate Power Input—500 - 510 watts.

Power Output—330 P.E.P. on 80 meters with slightly less on 10 meters.

Drive Power for 80 meter input 10 watts P.E.P. maximum on lowest frequency.

FEATURES

1. Continuous frequency coverage from 3.4 Mc. to 30 Mc.
2. Pi-network output for efficient harmonic and T.V.I. suppression.
3. Major T.V.I. suppression built in.
4. Does not require an antenna tuner as will feed loads from 50 to 600 ohms.
5. Full power capabilities available on CW because high stable, time proven circuitry does not require trick overload protective devices.
6. No special selection of R.F. amplifier tubes required.
7. Total tube replacement cost including high voltage rectifiers, amateur net only \$14.20.
8. Full metering of all important circuits.
9. Power input in watts shown on meter.
10. May be mounted in relay rack.

CIRCUIT DETAILS

This power amplifier employs two 811-A zero bias triodes in parallel. The input system is designed to be fed from a 50 - 70 ohm unbalanced line and requires a maximum of 10 watts drive on 80 meters. The grid tank circuit is balanced to provide all band neutralization. The output tank circuit is a continuously variable pi-network which provides a high degree of harmonic suppression.

TUBES

2—811-A Triode amplifiers

2—866-A Rectifiers

POWER OUTPUT

P.E.P.—330 watts

CW—275 watts

PLATE POWER INPUT

P.E.P.—500

CW—450

FRONT CONTROLS

Grid Range

Grid Tuning

Meter—Plate/Grid/Power Input
Watts

Plate Voltage On/Off

Power On/Off

PA Tuning

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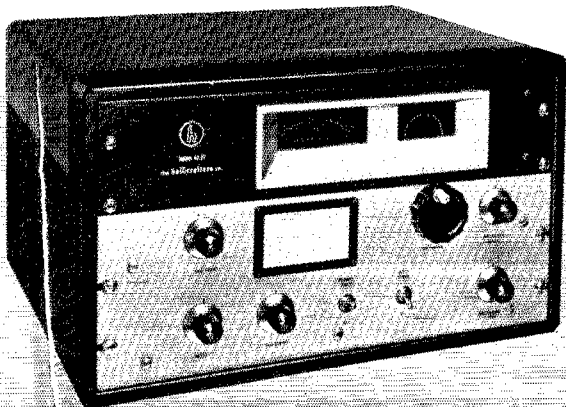
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THE AMERICAN RADIO RELAY LEAGUE, INC.,

is a noncommercial association of radio amateurs, bonded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio art and of the public welfare, for the representation of the radio amateur in legislative matters, and for the maintenance of fraternalism and a high standard of conduct.

It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. The League is noncommercial and no one commercially engaged in the manufacture, sale or rental of radio apparatus is eligible to membership on its board.

"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.

Inquiries regarding membership are solicited. A bona fide interest in amateur radio is the only essential qualification; ownership of a transmitting station and knowledge of the code are not prerequisite, although full voting membership is granted only to licensed amateurs.

All general correspondence should be addressed to the administrative headquarters at West Hartford, Connecticut.



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"It Seems to Us..."

THE WOUFF HONG

In an institution as old as amateur radio, traditions and symbols of the art appear and become a part of it. Our traditions are many, among them our long record of self-policing, our dedication to public service in emergencies, our amazing versatility in experimentation, our instant response to the call of our country in time of war. But of the symbols, only one — aside from the ARRL diamond — has become a part and parcel of the framework of amateur radio, the symbol of its finest traditions, its long and glorious history.

That symbol is the Wouff Hong.

Every ham should know its origin. It seems to us that it is time to retell the story of this famous and beloved part of the very fabric of amateur radio. Even though we told the whole story in exactly these words only two years ago, we find — in club meetings, at conventions, and in correspondence — that whenever the Wouff Hong is mentioned there is the inevitable question, "Say, just what does that mean and where did it come from?"

It started back in 1917, in the very earliest days of ARRL and *QST*, when an anonymous amateur, writing under the title "The Old Man," created a wonderful series of humorous stories in the magazine. In a pithy, irascible style he assailed all that struck him as criticizable about ham radio operation of the period in his famous "Rotten Radio" series, beloved to this day by all who read them. He pitilessly exposed the poor operating practices of the day, yet did it in a way which drew chuckles even from those recognizing themselves as the special targets of his ire.

In one of those stories, "Rotten QRM," he launched forth with examples of some of the poor sending cluttering up the band in a particular QSO to which he was listening. The

gibberish included the words "wouff hong" which, apparently, was being used by someone on somebody else.

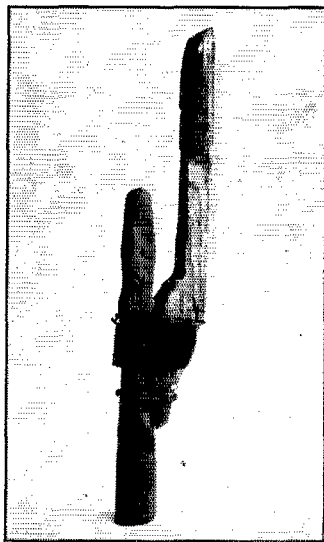
It turned out to be one of those priceless pieces of spontaneous word invention. Instantly, it caught on with the gang. Although T.O.M. himself admitted at the time he didn't know exactly what a wouff hong was, it quickly

became something with which both to attack bad operating practices and to discipline their perpetrators. Within three months, the editor of *QST* found it necessary to write an editorial on the growing demand from the gang for wouff hong. How rapidly this situation might have developed had not World War I intervened is a matter of speculation. But the tradition had been established, the Wouff Hong created in the minds of thousands of amateurs as some mythical instrument of torture to be used in enforcing good operating practices in amateur radio.

When *QST* resumed after the war, one of its first contributors was T.O.M. In an early 1919 issue he contrib-

uted an article on "Rotten Starting" to work off steam on the slowness with which our government was getting around to let us operate again. At the conclusion of this article appeared the following: "In the meantime . . . I am sending you a specimen of a real live wouff hong which came to light out here when we started to get our junk out of cold storage. Keep it in the Editorial sanctum where you can lay hands on it quickly in an emergency. We will be allowed to transmit soon and then you will need it."

The object was duly received at Hq. The Editor, fully mindful of the historic significance of the occasion, took the instrument to one of the first Board meetings in New York, May 3, 1919, subsequently duly reporting in *QST* that "each face noticeably blanched when the awful



Wouff Hong was . . . laid on the table." By an action still a part of the League's official records, that Board voted that the Wouff Hong be framed and hung in the office of the Secretary of the League. There it remains to this day.

We know the significance of the Wouff Hong. We don't know the significance of its weird shape. Not even the beloved T.O.M. (revealed, after his death, as none other than our first president, Hiram Percy Maxim) ever explained that. Nor was the precise manner of its use ever prescribed, although it perhaps may be guessed with a little imagination. But as the years passed, it continued to grow in the affections of amateurs the country over, old-timer and youngster alike. It became the inspiration of the Royal Order of the Wouff Hong, the amateur secret society of ARRL conventions. Today, it is thoroughly entrenched in the lore of amateur radio as its most sacred symbol.

The Wouff Hong! — see it when you next visit ARRL Hq.

A.R.R.L. CONVENTIONS

WEST GULF DIVISION

Fort Worth, Texas — June 10th-12th

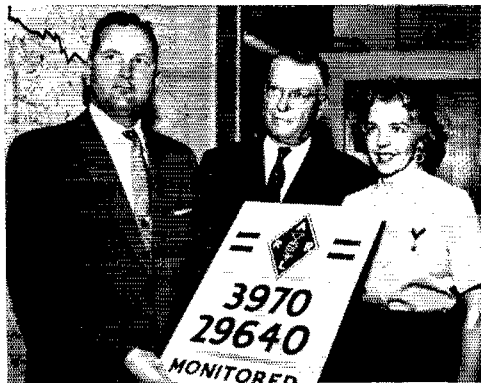
A typical "cow-town" welcome is assured all radio amateurs and others interested in amateur radio who attend the 24th Annual Convention. Your hosts will be the Kilocycle Club assisted by the Convair Amateur Radio Club, who are all out to provide a most enjoyable and instructive visit.

The air-conditioned Hotel Texas is Convention headquarters and all sessions will be held there, as well as the entertainment. The Pre-Convention party and dance on Friday will be held in the Pioneer Palace.

Speakers from ARRL, FCC, and manufacturers will feature practical talks rather than technical papers, and there will be interesting displays of some of the very latest equipment. Chief among the activities will be a hidden transmitter hunt, mobile contest, code contest, and of course, a Wouff Hong initiation.

A luncheon for the ladies will be held in the Hotel Texas Keystone Room, followed by a style show, sightseeing tours

Thirty of these enameled signs will call attention to the frequencies monitored for the convenience of West Gulf Division Convention-bound hams. Displaying the sign, *l to r*: Jordan A. Jones, W5KVA, ARRL Director Cowan, W5CF, and Mrs. Jones.



COMING A.R.R.L. CONVENTIONS

June 10th-12th — West Gulf Division, Fort Worth, Texas

June 11th-12th — North Dakota State, Bismarck, N. D.

June 11th-12th — Southeastern Division, St. Petersburg, Fla.

July 30th-31st — Canadian Division, St. John, New Brunswick

August 12th-14th — Roanoke Division, Old Point, Va.

October 15th-16th — Central Division, South Bend, Ind.

October 22nd-23rd — Midwest Division, Omaha, Neb.

and complimentary coffee for all. Licensed YLs will have a breakfast Saturday morning without extra cost, and six group luncheons are planned for Saturday.

Pre-registration is \$8 prior to June 1st and \$8.50 thereafter. All checks should be made payable to Kilocycle Club Convention Account, and should be mailed to Kilocycle Club, 1125 Fort Worth National Bank Bldg., Fort Worth, Texas.

SOUTHEASTERN DIVISION

St. Petersburg, Fla. — June 11th-12th

The St. Petersburg Amateur Radio Club welcomes you to the biggest and best convention ever held in the Southeast. There will be entertainment for everyone in the family every minute. Two full days of fun and activities for the entire family have been planned.

Featured will be a picnic, catered banquet, contests, auction sale, MARS demonstration, mobile hunt, Wouff Hong ceremony, fishing, swimming, lectures and demonstrations on c.d., s.s.b., RACES, MARS, TVI, etc.; ladies style show, beach party, meetings, tour of TV station, amateur TV program, technical and nontechnical films, sightseeing, Merit Award presentation and manufacturers' displays. Many interesting speakers.

Convention headquarters will be the Suwannee Hotel, 5th Avenue and 1st Street North, St. Petersburg. Rates per day are \$4 single, \$7 twin bedroom, \$9 triple bedroom. Motel accommodations will also be available at approximately \$3.50 per couple. Reservations will be made upon request. For reservations, write to Bob Spiers, SPARC, P. O. Box 4026, St. Petersburg, Fla. Tickets, \$7 for adults, \$1.50 for children under 12, do not include the banquet.

NORTH DAKOTA STATE

Bismarck, N. Dak. — June 11th-12th

The big ham event of the year in North Dakota, June 11th-12th, starts with a banquet on Saturday at 7 P.M. Stags \$3, ladies \$2.50. All the chicken you can eat, entertainment, a brief program and dancing at the Bismarck Municipal Country Club. There will be a Wouff Hong initiation for those who are interested.

The Convention session will be held at St. Mary's Central High School Gym on Sunday. Tickets per family \$2.50; food and refreshment at share-the-cost prices. Time 9 A.M. to 5 P.M. Advance registration may be made for both events. For reservations and other information write A. L. Anderson, 911 Crescent Lane, Bismarck.

ARE YOU LICENSED?

- When joining the League or renewing your membership, it is important that you show whether you have an amateur license, either station or operator. Please state your call and/or the class of operator license held, that we may verify your classification.

A Broadband Antenna for 75 Meters

Impedance Data on a Fan-Type Dipole

BY CHARLES C. CAMILLO,* W9GZJ, AND RICHARD M. PURINTON,** WISX

ORDINARILY, the mention of TV to the amateur inspires thoughts of interference and irate neighbors. However, the design of TV antennas has focussed attention on antenna measurements and antenna characteristics to a degree that merits the attention of amateurs interested in antenna design.

The writers have been interested for several years in the design of TV antennas. Both are active on 75-meter 'phone and both were interested in finding an antenna design which would perform in a uniform manner over the range from 3800 to 4000 kc. There also is considerable interest in c.w. operation, and therefore a design was sought which not only would perform well in the 'phone section of the band but would also work satisfactorily over the range of 3.5 to 4 Mc.

The most obvious solution to the problem of designing a good broadband antenna was the conical type using the minimum number of wires possible to produce the effect of a radiator of large conical section.

Some time ago, the Collins Radio Company suggested a simple conical- or fan-type dipole as a good broadband antenna for an amateur transmitter.¹ Other references to such an antenna are to be found in the literature, but nowhere were there any measurements to indicate what might be expected from a fan or conical design at 3.5 to 4 Mc. Modern literature is extensive on conical-type antennas in the v.h.f. and u.h.f. ranges.

To determine what might be expected of a conical design having reasonable dimensions, an antenna was constructed in which each half of the dipole consisted of two wires joined together at the center of the dipole and fanned about 8 feet at the extreme ends of the antenna. A beginning was made with an over-all length of 120 feet and tests were made while the antenna

• This article describes the results of measurements on one form of broadband dipole, constructed in the thought of reducing load variations throughout the 75-meter 'phone band. Other approaches are suggested for the amateur interested in experimenting with antennas for use on 80, 40 and 20.

was pruned until resonance at 3900 kc. was achieved with an over-all length of 107 feet. The Collins literature mentioned earlier had indicated a length of approximately 110 feet for the 75-meter 'phone band. During the pruning operation the standing-wave ratio of the 52-ohm RG-8/U transmission line was observed using a Millen r.f. bridge. After the resonance point had been reached, measurements were continued with a General Radio 916A r.f. bridge.

The antenna height for all the measurements was about 35 feet, which is a common height for many 75-meter antennas.

The photographs illustrate the configuration of the antenna, and the wire saddle and weight employed to hold the wires in a horizontal plane. The spreader is an 8-foot length of light-weight aluminum tubing flattened and pierced at the ends for attachment of the antenna insulators. The two wires were individually insulated on each side of the dipole at their outer ends.

Tests were made with the fanned wires in both the horizontal and vertical planes, with no noticeable difference in operation or in the measurements for either plane.

* 4358 South Artesian Ave., Chicago 32, Ill.

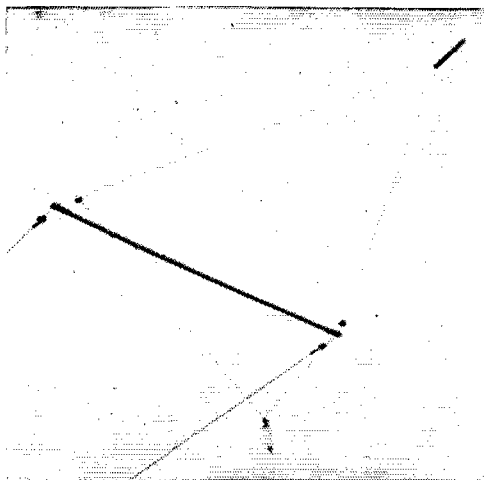
** 12 Oakland St., Lexington 73, Mass.

¹ "Antennas with 52 Ohm Coaxial Feed Lines," published by Collins Radio Company, Cedar Rapids, Iowa.



The "biconical" or fan-type 75-meter antenna at W9SZ, on which the measurements discussed in this article were made.





Saddle and weight arrangement used to hold the spreader in a horizontal position.

The characteristics of the antenna were found to be quite suitable for 75-meter 'phone operation and for c.w. operation between 3.8 and 3.5 Mc. It had been estimated that the antenna might be expected to perform reasonably well on the 20-meter band, also. Measurements were taken on the 75- and 80-meter bands, the 40-meter band and the 20-meter band. The results and actual operation confirmed the estimate that 20-meter operation might be obtained with this design.

Table I gives the values of impedance at the terminals of the antenna. The values of resistance and reactance are shown, along with the v.s.w.r. that would be exhibited by these values in reference to a 52-ohm coaxial transmission line such as RG-8/U. The table indicates that the antenna is very close to resonance at 3.9 Mc. as was found

² The rise in the resistance component of the fan dipole impedance in the lower part of the frequency range is contrary to the theoretical behavior of radiation resistance as the antenna is progressively shortened. It is possibly the result of the presence of other conductors in the vicinity, or may be associated with the antenna height, which was 0.15 wavelength in these tests.

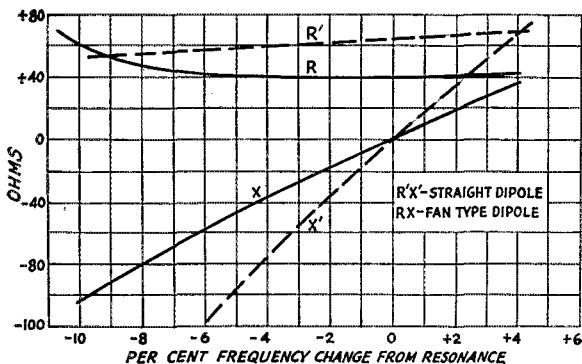


Fig. 1 — Impedance characteristics of fan-type dipole as compared with a conventional wire dipole. Fan-dipole values are measured; conventional-dipole values are theoretical.

with the Millen s.w.r. bridge. However, throughout the 3.5- to 4.1-Mc. range the values of reactance are of such magnitude that they can be tuned out easily by any of the conventional methods. Measurements were carried up to 4.1 Mc. to determine the effect of an additional increase in frequency beyond 4.0 Mc.

Fig. 1 gives a comparison of the characteristics of the fan-type dipole and a conventional full-length dipole with a single wire each side of center. The resistance and reactance characteristics of the fan-type dipole are plotted on the basis of the measurements made.² Data points for the conventional dipole were obtained by calculation from information in the *ARRL Antenna Book*. Resistance and reactance are shown for percentage departure above and below the resonant frequency. While the resistance values for each

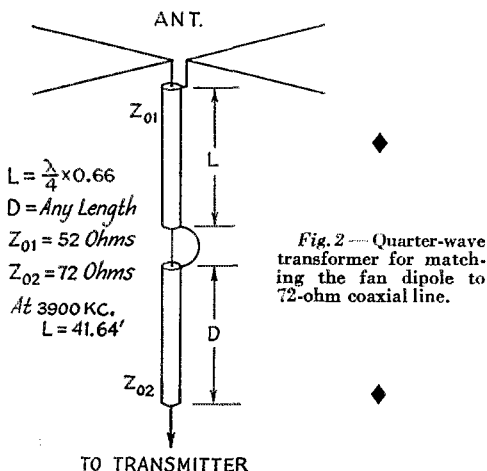


Fig. 2 — Quarter-wave transformer for matching the fan dipole to 72-ohm coaxial line.

type of dipole remain fairly constant over the frequency range, there is a very noticeable difference in reactance variation. The fan-type dipole shows a more gradual reactance slope than the conventional dipole over the entire 75-80-meter band. Actual numerical comparison of the slopes shows that the reactance of the conventional dipole changes twice as fast as the reactance of the fan-type dipole.

Other Bands

Table II gives the values of resistance and reactance of the antenna in the 40-meter band. Although the reactance appears to be large, the antenna can be successfully tuned for operation within this band. However, it must be pointed out that if connected to a 52-ohm coaxial line, the resistive values of the antenna indicate that this type of operation would represent a poorer compromise than is usually acceptable.

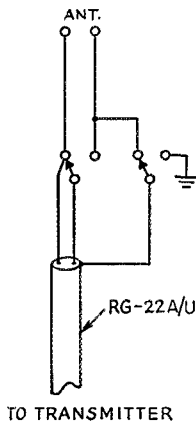
Table III gives the measured values of resistance and reactance on the 20-meter band. In this case it is found that the reactance is small and the values

of resistance are much closer to the 52-ohm impedance of the transmission line. Therefore, operation of the antenna in this band would be much more practical than on 40 meters. Thus, it is apparent that the antenna operates well on the 75- and 20-meter bands, whereas on 40 the performance would not be acceptable.

Matching Possibilities

The tables indicate that a better match for 75-meter operation might be obtained with a quarter-wavelength transformer. A quarter-wave section of RG-8/U coaxial cable inserted between

Fig. 3—Suggested switching arrangement for changing the characteristic impedance of the shielded transmission line to give a better match on different bands. Switches are thrown to the right for 7 Mc.; to the left for 4 and 14 Mc.



the antenna terminals and an RG-11/U 72-ohm coaxial cable would match approximately 37 ohms at the antenna. It is obvious that such a transmission line and matching transformer would provide optimum matching conditions for operation between 3800 and 4000 kc. It will be noted that below 3800 kc. the resistance of the antenna rises and more nearly matches a 50-ohm transmission line than the combination of a 72-ohm coaxial cable together with the quarter-wave matching section of 52-ohm cable. Fig. 2 shows the 72-ohm coaxial feed system with the 52-ohm matching section dimensioned for operation at 3900 kc. Another suggestion which would provide a close match at 75 and 20 meters, and at 40 meters as well, is indicated in Fig. 3, in which RG-22/U or RG-22A/U coaxial cable can be used with a simple d.p.d.t. relay to provide 95 ohms impedance for 40-meter operation and approximately 47 ohms transmission line impedance for operation at 75 and 20 meters.

General

In all of the measurements, the antenna was fed with a single RG-8/U coaxial line of 52-ohm characteristic impedance. The data, however, are referred to the antenna terminals. It is well to point out that in order to reduce unbalanced currents on the surface of the shield braid, the feed line must be brought away from the antenna at a right angle.

The antenna was installed and tested at W9SZ near Lemont, Ill., and was operated over a period of several months. During that time it was found

TABLE I
Impedance of Fan-Type Dipole—
75-Meter Band

Frequency, Mc.	R, Ohms	X, Ohms	V.S.W.R.
*4.10	42.85	+37.90	2.2
4.00	39.75	+14.55	1.5
3.90	39.00	-9.36	1.4
3.80	39.00	-32.20	2.1
3.70	43.65	-58.50	3.2
3.60	50.90	-88.40	4.8
3.50	78.00	-114.3	5.2

* Listed only to show change with increase in frequency.

that numerous other amateurs were using similar antennas for broadband operation on the 75-meter band. W9AOV and several other members of the Illinois Emergency Net were found to be using antennas based on the Collins suggestions. Another was W9DKU, and W8PUN reported that he had been using such an antenna since 1937. All of the amateurs contacted were very much interested in the measurements which were being made, and reported that excellent results had been obtained. With this general type antenna the end spreading varied among the users from 8 feet to 12 feet.

Incidentally, the shortening which is achieved by the spreading of the ends of the fan-type dipole may be helpful to the amateur who must install

TABLE II
Impedance of Fan-Type Dipole—
40-Meter Band

Frequency, Mc.	R, Ohms	X, Ohms
7.0	177	+260
7.1	140	+234
7.2	104	+218
7.3	114	+208

his antenna in a restricted space, whether he is interested in broadbanding or not. It could be expected that the length reduction of approximately 10 per cent which applies at 75 meters would apply also at 40, 20 and 10 meters and permit the antenna to be installed between two appropriately spaced trees or within the amateur's lot lines.

TABLE III
Impedance of Fan-Type Dipole—
20-Meter Band

Frequency, Mc.	R, Ohms	X, Ohms
14.00	22.8	-46.7
14.10	34.8	-62.4
14.20	29.6	-48.3
14.30	29.6	-52.0
14.35	31.2	-55.6
14.40	31.2	-56.7

Parallel 6146s in the Mobile or Fixed-Station R.F. Assembly

Increasing Power Input to 180 Watts C.W. or 135 Watts 'Phone

BY C. VERNON CHAMBERS, W1JEQ

• The addition of a second 6146 to the "R.F. Assembly for Mobile or Fixed-Station Work"¹ converts the unit into a full-fledged fixed-station transmitter. As modified, the rig retains the original features of appearance, compactness and operating convenience found usually only in more expensive commercial gear. And, of course, if you're interested in using it for that purpose, the rig can still be operated mobile.

FEBRUARY, 1955, *QST*¹ made reference to the addition of a second 6146 to the mobile or fixed-station transmitter.² The modification, now completed, should interest those who wish to operate with parallel 6146s in the final.

When converted, the transmitter loses none of the original features except for the addition of one tuning control. The new dimensions are $6\frac{1}{4}$ by $7\frac{7}{8}$ by $9\frac{1}{16}$ inches and the permissible power input level has been increased to the full ICAS ratings of a pair of 6146s. One very impor-

¹ Chambers, "Supplementary Data on the R.F. Assembly for Mobile or Fixed-Station Work," *QST*, Feb., 1955.

² Chambers, "An R.F. Assembly for Mobile or Fixed-Station Work," *QST*, Oct., 1954.

tant consideration is that in spite of its small size, the unit is not difficult to construct — even when starting from scratch — nor does it require any special constructional aids or practices. Modification is not expensive. Very few of the original parts need be discarded or routed to the junk box and the cost of new parts — other than another 6146 — is a minor item.

In the text to follow, frequent reference will be made to the original schematic diagram of the transmitter. Therefore, Fig. 1, page 12 of *QST*, October, 1954, should be on hand as the following material is studied.

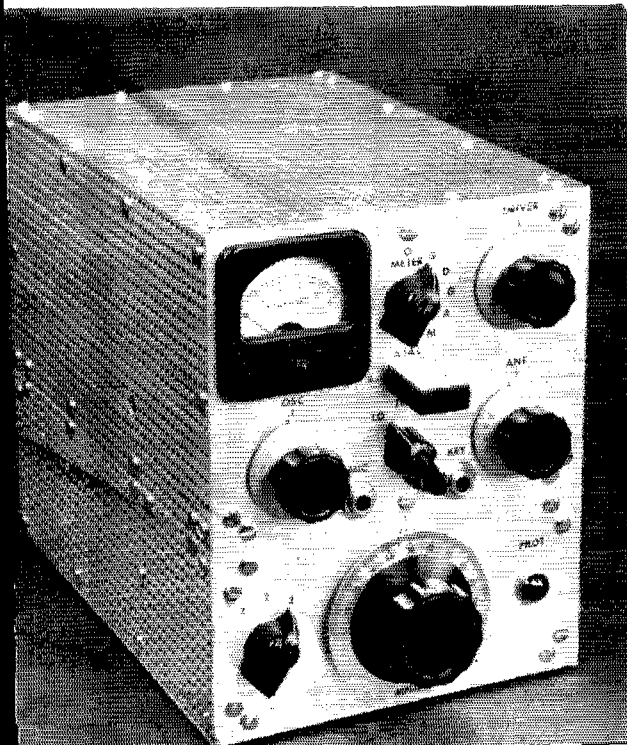
The basic problems in increasing the power were those of getting enough excitation for the 6146s without adding to the original 5763 tube line-up, and in redesigning the amplifier plate circuit for the higher power level.

Oscillator Circuit Modifications

Originally, the oscillator plate circuit, C_2-L_1 , tuned no higher than 7 Mc. and, as a result, it was necessary to operate V_2 as a quadrupler when driving the final at 28 Mc. This did not give adequate drive for two 6146s. Therefore, the arrangement shown here in Fig. 1 was devised. The inductance of L_1 has been reduced to 2.2 μ h., and will tune, with C_2 and S_3 adjusted, to either 7 or 14 Mc. Thus, with the tank resonated at 14 Mc., it is only necessary for V_2 to double frequency for output at 28 Mc.

The oscillator plate circuit works as follows: With S_3 set at position 1, both C_7 and L_1 are out of the circuit and the circuit is the familiar choke-coupled arrangement. Then, with a 3.5-Mc. crystal in use, the

Front view of the modified r.f. assembly. The tuning control for the amplifier plate circuit is centered on the extension at the bottom of the panel. The oscillator plate switch, S_3 and the pilot-lamp jewel are to the left and right of the tuning dial. Strips of perforated aluminum are used to increase the height and depth of the cabinet.



QST for

3.5-Mc. output from V_1 may be used to drive V_2 either as a straight amplifier or as a frequency doubler. Substitution of a 7-Mc. crystal gives

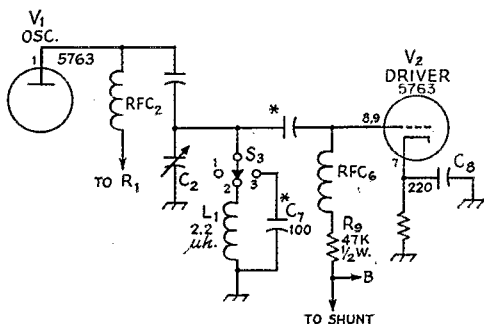


Fig. 1. — Schematic diagram of the revised oscillator plate circuit for the 6146 transmitter. C_7 , RFC_6 , and S_3 are additions to the original circuit. Values for C_8 , R_9 and L_1 have been altered in the new arrangement. * Indicates a mica capacitor.

L_1 — 12 turns No. 24, $\frac{3}{8}$ inch long, $\frac{5}{8}$ inch diam. (B & W 3008). See text.

RFC_6 — 0.5 mh.

S_3 — 1-pole 5-position (3 used) ceramic switch, wired for progressive shorting (Centralab PA-10 section mounted on PA-300 index assembly).

7-Mc. drive for V_2 . With crystals in the 3.4 — 3.5-Mc. range, S_3 at position 2, and C_2L_1 resonated at 10.5, 13.5 or 14 Mc., adequate drive is supplied for doubling in V_2 to 21, 27 or 28 Mc., respectively. A 6.8-Mc. crystal and position 2 of S_3 may also be used when driving V_2 as a doubler to 27 Mc.

Position 3 of the oscillator switch and capacitor C_7 are required because the C_2L_1 combination will not otherwise cover the complete 7- to 14.85-Mc. range required. The operating range of the circuit is shifted to include 7 Mc. when C_7 is switched across L_1 .

Driver Circuit Revisions

In reworking the driver circuit, it proved desirable to reduce the grid lead (R_9 of the original circuit) to 47K. With this change, it seemed advisable to employ the r.f. choke

now shown as RFC_6 , to prevent loading of the circuit by the lower value of resistance.

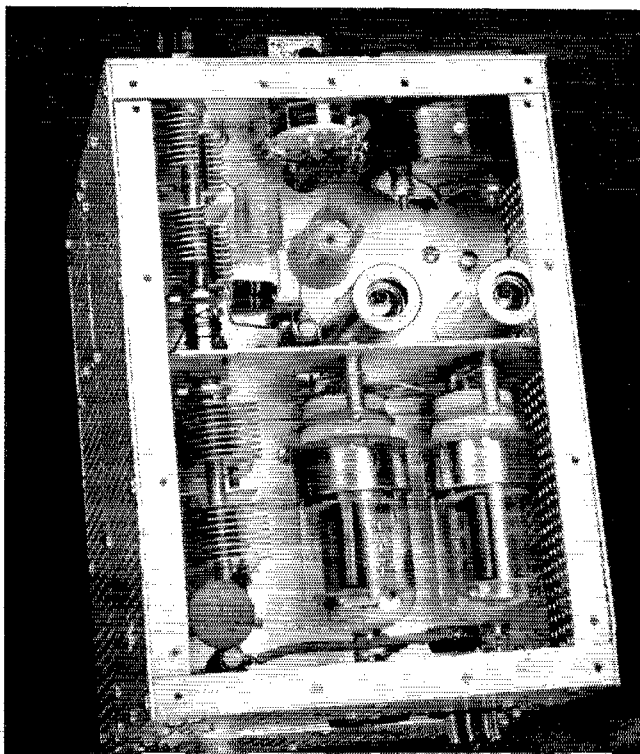
Not quite so obvious in the new Fig. 1 is the reason for reducing the by-pass capacitance (C_8) to 220 $\mu\mu\text{f}$. This value allows the driver stage to function normally at frequencies above 14 Mc. On the other hand, it also makes V_2 somewhat degenerative at the lower frequencies where instability may otherwise be a bit of a problem. The degeneration stabilizes the circuit when working V_2 as a straight amplifier, and may be employed in this instance because there is an abundance of output from V_2 at the lower frequencies.

On the plate side of the driver tube, it was necessary to use new values of inductance in the multiband tuner to compensate for the additional shunt capacitance introduced by the grid of the second tube. Heretofore, we had aimed at values that would result in low C at 28 Mc. However, with a tuning capacitor of reasonable size, this results in relatively little separation between 7- and 21-Mc. resonances. In other words, when operating at 7 Mc., there may be some danger of output also at 21 Mc. To make the separation between resonances as great as possible, the frequency ranges were shifted so that 14 Mc. comes at maximum capacitance, and 7 Mc. near minimum capacitance.

Just how well this system works out is shown by the dial calibration (see tuning chart) for C_3 . Notice that 7, 28 and 21 Mc., in that order, resonate at dial settings of 10, 28 and 54, respectively. In other words, there are at least 18 dial divisions between any two of the three adjustments. At the high-capacitance end of the tuning range there are 8 dial divisions between the 3.5- and 14-Mc settings.

The layout and the wiring of the driver plate circuit remains unchanged. L_3 is now 6.8 μh .

Top view of the parallel-6146 transmitter. The new 6146 is located at the bottom right-hand corner as seen in this view. The metal shaft coupler originally used for ganging the split-stator capacitors now serves as a pulley for a string drive for the amplifier plate tuning capacitor. L_5 is mounted on the plate caps of the 6146s.



22-turn length of B & W type 3012 Miniductor. L_4 now has an inductance of $1.8 \mu\text{h}$.

Loading resistor R_3 in the first model has been retained for the original reasons. However, a value of 7.5K , obtained by connecting two 1.5K 1-watt resistors in parallel, is now used.

To make initial adjustment less critical, the two multi-band tuners are no longer ganged. A separate control is installed for the output tuner.

The Modified Amplifier Circuit

The addition of another 6146 to the final amplifier made necessary several major, but not difficult, alterations.

The four inductors, L_6 through L_9 , must be replaced. New values of inductance are required, as in the grid circuit. Dimensions are given in Fig. 2.

A high-frequency parasitic oscillation was suppressed by the center-tapped choke, L_5 . All attempts to utilize the original parasitic choke were ineffective.

A set of $0.001\text{-}\mu\text{f}$. disk ceramic capacitors for the cathode and the screen terminals of the 6146 should be installed directly at the new tube socket. The original capacitors will not serve both 6146s.

The control-grid, heater and screen terminals of the 6146s should be connected in parallel. Ground returns for the new tube are made directly to chassis as were those of the first tube. Connecting the cathodes together allows both 6146s to be keyed through the original keying

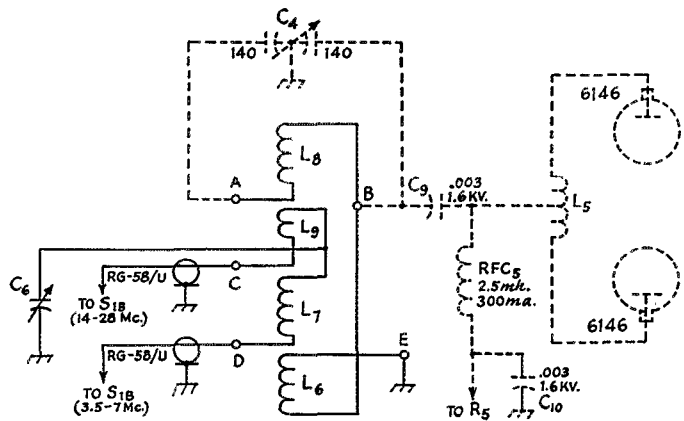


Fig. 2 — Schematic diagram of the amplifier plate circuit for the parallel 6146 transmitter. Dashed lines indicate components located in the amplifier tube compartment. Terminals A and B, the feed-through insulators used originally to support the L_8 - L_9 assembly, now support L_8 . C and D are $\frac{1}{2}$ -inch cone insulators and E is a metal post. The physical arrangement of the terminals is similar to that shown in the bottom view of the transmitter.

C_9 , C_{10} — Centralab DD16-302 or DD30-302.

L_5 — Parasitic choke: 14 turns No. 18 enam. on 1-watt resistor (any high value) as form, tapped at center.

L_6 — $6.6 \mu\text{h}$. — 13 turns No. 14, $1\frac{1}{4}$ inches long.

L_7 — $5.2 \mu\text{h}$. — $10\frac{1}{4}$ turns No. 14, $1\frac{1}{8}$ inches long.

L_8 — $1.7 \mu\text{h}$. — $4\frac{1}{4}$ turns No. 14, $\frac{1}{2}$ inch long.

L_9 — Inductance and length adjustable; $1\frac{1}{2}$ turns No. 14; see text.

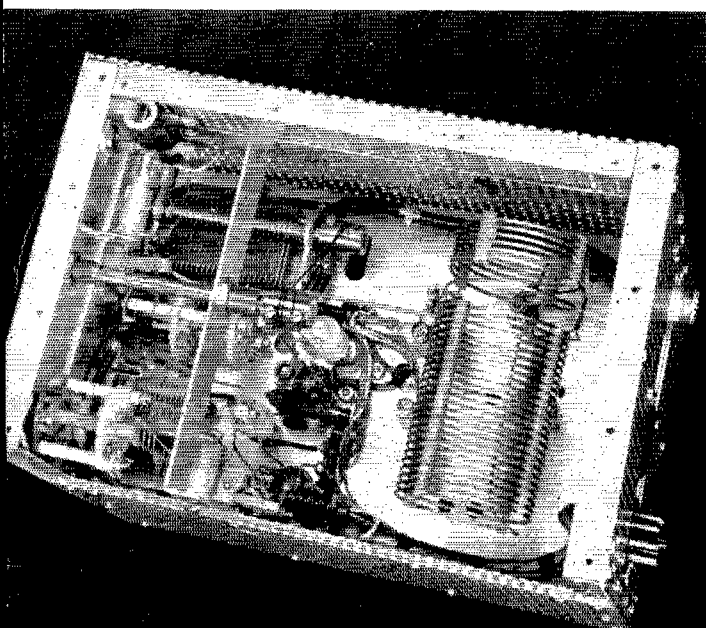
NOTE: L_8 through L_9 made from 2-inch diam. coil stock (B & W 3900). See text for additional data.

RFCs — National R-300S.

jack, J_1 . The variable padder capacitor, C_5 , has been removed from the plate tuner. No replacement is required.

The following is a list of component changes:

- 1) Grid-leak resistor, R_{11} : now 15K , 1 watt.
- 2) Screen-dropping resistor, R_4 : now 20K , 25 watts.
- 3) Plate r.f. choke, RFC₅; must be rated for at least 300 ma. d.c.
- 4) Plate-meter shunt, R_5 ; resistance reduced to provide 50 times multiplication for the 10-ma. milliammeter.



As seen in this bottom view of the transmitter, L_8 is located at the upper right-hand end of the chassis, just above the $1\frac{1}{2}$ -turn coupling coil, L_9 . The L_8 - L_9 assembly is directly below L_5 . The cold end of L_7 , located approximately at the center of L_6 , is grounded to a metal post to the right of the coils. R_4 is mounted on the panel extension at the upper left-hand corner of the unit and S_3 is below the drive shaft for C_4 . The oscillator plate coil, L_1 , is mounted on the side wall to the right of C_2 . A metal bracket, mounted between walls of the cabinet, $3\frac{1}{2}$ inches to the rear of the panel, supports a bearing for the drive shaft. The oval slot to the rear of C_6 provides through-chassis clearance for the drive string.

5) Plate blocking capacitor C_9 , and by-pass capacitor C_{10} in Fig. 2: now 0.003- μ f. high-voltage disk ceramics.

General Circuit Changes

Not shown on any of the diagrams of the transmitter is a 6.3-volt pilot lamp now connected to the heater line, installed principally to balance the new panel arrangement.

The plate-voltage input terminals of the transmitter have been by-passed for TVI. A 0.001- μ f. 1-kv. disk is connected between pin 4 of J_4 (original circuit diagram) and ground, and a 500- μ f. 3-kv. disk is connected between pin 3 of J_4 and ground.

Construction

Before starting construction — either a modification or new — the supplementary data¹ for the first model should be reviewed. In addition, a comparison of the photographs of both versions will clearly illustrate that most of the original construction remains intact.

The cabinet is 3 inches higher than before. Strips of perforated aluminum, attached to the sides and the rear of the box, provide the increase in height. These extensions and the original members should be overlapped on the inside by narrow strips of aluminum held in place by machine screws, lockwashers and nuts. If a 3-inch extension is added to the panel as shown in the front view of the transmitter, the crack between sections may be sealed by bolting a narrow strip of aluminum (inside the unit) in place. The bottom view shows how $\frac{1}{2} \times \frac{1}{2}$ -inch angle is used

at all outer edges of the cabinet and the panel extensions.

As shown in the top view of the transmitter, installation of the second 6146 requires no displacement of original components. The method of mounting the new tube socket is identical to that described for the first. A row of $\frac{1}{4}$ -inch ventilating holes should be drilled in the chassis plate below the envelope of each 6146. The metal shaft coupler, used originally to gang the split-stator tuning capacitors, C_3 and C_4 , is no longer fastened to the tail shaft of C_3 . Instead, only the setscrew at C_4 is tightened; the setscrew at C_3 is loosened so that it can turn freely on the shaft of C_3 . The coupling is now used as a pulley for a drive string for C_4 . Before mounting L_4 on the terminals of C_3 , free the outside end turns of the coil from three of the four support bars so that they may be spread for adjustment.

The lengths of the three pieces of No. 34 enameled wire used as the plate-meter shunt, R_5 , should be shortened to approximately 18 inches. This gives a full-scale meter reading of 500 ma. with the meter switch set at position $E-E_1$ in the earlier circuit.

A bottom view of the transmitter shows the mounting of the amplifier plate coils, and Fig. 2 identifies the supports for these inductors. The L_6-L_7 assembly is made from a single length of coil stock clipped, without breaking the support bars, to provide windings of 13 turns (L_6) and $10\frac{1}{4}$ turns (L_7). Start with a 27- or 28-turn length of material, to provide extra wire at each end that may be straightened out and used

(Continued on page 150)

Tuning Chart for the 6146 Transmitter

Oscillator — V_1					Driver — V_2				Amplifier — V_3, V_4					Link Cir. — C_6, S_{1B}			
Xtal. Mc.	Sw. Pos. S_3	Dial C_2	I_p Ma.	Out-put Mc.	I_g Ma.	Dial C_3	I_p Ma.	Out-put Mc.	$I_p I$ Ma.	Dial C_4		I_p		Out-put Mc.	Sw. Pos. S_B	Dial — C_4	
										50-Ohm ¹	Bulb ²	50-Ohm ¹	Bulb ²			50-Ohm ¹	Bulb ²
3.5	1	0	19	3.5	0.5	90	9	3.5	5.5	90	90	220	175	3.5	LO	100	100
3.5	1	0	19	3.5	0.5	10	11	7.0	4.8	24	21	225	205	7.0	LO	46	36
3.5	3	55	16	7.0	2.6	98	12	14.0	4.1	98	100	225	225	14.0	HI	58	22
3.5	3	55	16	7.0	2.6	54	12	21.0	3.9	54	58	230	230	21.0	HI	8	100
3.5	2	42	14	10.5	2.7	54	12	21.0	4.2	54	58	230	230	21.0	HI	8	100
3.4	2	14	20	13.5	2.5	30	12	27.0	3.8	35	33	220	215	27.0	HI	100	70
3.5	2	10	16	14.0	2.5	28	12	28.0	3.5	32	29	240	225	28.0	HI	100	75
6.8	2	14	17	13.6	2.9	30	12	27.0	3.9	35	33	220	215	27.0	HI	100	70
7.0	1	28 ³	22	7.0	0.1	10	14	7.0	5.5	24	21	225	205	7.0	LO	46	36
7.0	3	55	14	7.0	2.7	98	12.5	14.0	4.4	98	100	225	225	14.0	HI	58	22
7.0	3	55	14	7.0	2.7	54	12.5	21.0	3.5	54	58	230	230	21.0	HI	8	100
7.0	2	10	14	14.0	3.0	28	13	28.0	3.9	32	29	240	225	28.0	HI	100	75

¹ Bank of Ohmite type D-101 resistors used as dummy load.

² 150-watt lamp used as load.

³ C_2 used as excitation control.

Better Selectivity in Mobile Reception

The R23/ARC5 as an I.F. Amplifier

BY RAY A. TELL,* W2TZI

• To improve receiver selectivity in his mobile installation, W2TZI has replaced the usual car-radio i.f. with the 85-kc. i.f. of a surplus Command receiver. In this article he describes the conversion that gives better performance at little expense.

ALMOST everyone who has operated mobile, especially on the 75- and 40-meter bands, using the regular car radio as an i.f. amplifier for a converter, has soon come to the conclusion that such a system is far from ideal. In looking about for something better, I hit upon the idea of substituting the 85-kc. i.f. of a surplus

circuit was converted to crystal control at a frequency appropriate for frequency conversion from the converter output frequency to the 85-kc. i.f. of the R23.

Fig. 1 shows the new r.f.-input, r.f.-mixer coupling, and h.f. oscillator circuits. The Pierce oscillator circuit is used.

To convert the 1430-kc. output frequency of the converter to 85 kc., an oscillator frequency of 1515 kc. is required. Crystals for this frequency are not available, except on special order. However, I found that surplus crystals for 1525 kc. can be obtained for 99¢ (U. S. Crystal of Los Angeles). Changing the output frequency of the converter from 1430 to 1440 changes the calibration of the converter by only 10 kc. and, if you are fussy, the oscillator circuit can easily be re-

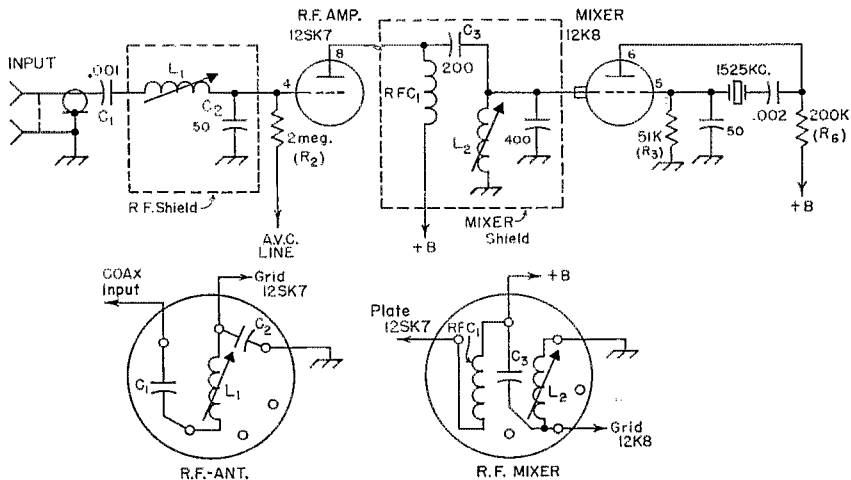


Fig. 1 — Revisions in the r.f. and mixer circuits. Capacitances less than 0.001 μ f. are in μ f.

L1 — 100 turns No. 38 e.s.c., scramble-wound $\frac{3}{8}$ inch long on CTC LS5 $\frac{3}{8}$ -inch iron-core form.

L2 — 56 turns No. 34 enam., close-wound on CTC LS5 $\frac{3}{8}$ -inch iron-core form.

Resistors are those already in the R23 unit. Lower diagrams show connections to r.f. and mixer receptacles.

R23/ARC5 receiver for the broadcast tuner. The R23 will be recognized as the unit that has been so popular as an inexpensive Q5-cr. These units are still available at reasonable prices on the surplus market. The converter in this case is a Gonset, having a 1430-kc. output.

New Circuits

To adapt the R23 for use with the converter, several changes were made. The original r.f. input and r.f.-mixer coupling circuits were replaced with circuits tuned to the output frequency of the converter. The high-frequency oscillator cir-

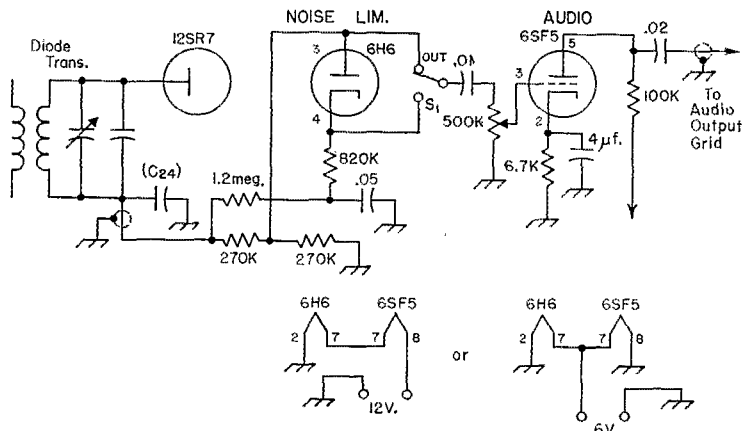
trimmed by this amount. (Instructions are included in the Gonset instruction manual.)

A noise limiter and vibrator supply with a voltage-regulated tap for the oscillator of the converter were added. An additional stage of audio was inserted between the diode detector and the audio output tube, and the output transformer was replaced by one suitable for feeding a loudspeaker. The output with the original arrangement is rather low for loudspeaker operation in a car. Fig. 2 shows the circuits of the noise limiter and audio stage. Fig. 3 shows the rectifier and filter circuit for the vibrator power supply.

* 240 Yarmouth Rd., Rochester 10, N. Y.

Fig. 2 — Diagram showing circuits and connections for the noise limiter and audio amplifier.

Capacitances are in μf . Resistors are $\frac{1}{2}$ watt. S_1 — Toggle switch.



The supply, minus the filter, was salvaged from a defunct car b.c. receiver.

Fig. 3 also shows the plug-and-receptacle connections between the i.f. chassis and car battery, and between the i.f. chassis and the converter. Fig. 3C shows how a plug may be wired to operate the receiver and converter from an independent 250-volt supply. In this arrangement, the vibrator pack is disconnected when the plug for the external supply is substituted for the battery-supply plug of Fig. 3A. If a supply delivering more than 250 volts is used, a suitable dropping resistor should be inserted in series with the No. 2 terminal.

Removing Unneeded Parts

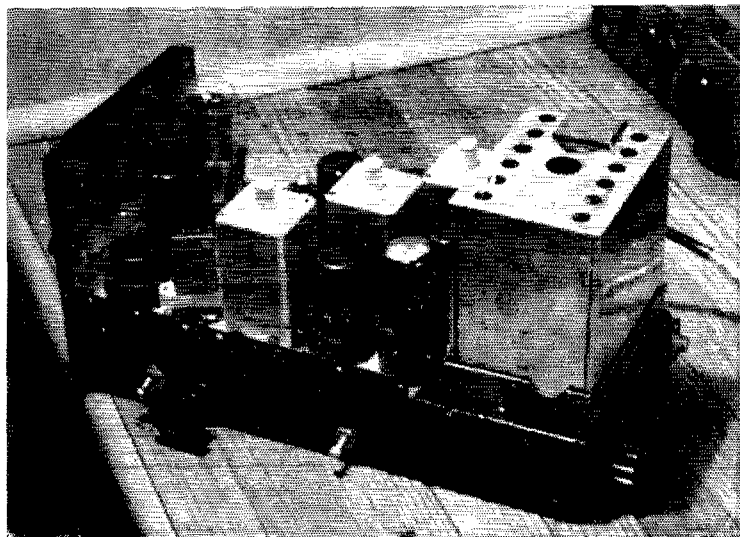
The first step in the conversion is to remove the components that will not be used. The tuning-capacitor gang, dial assembly, antenna connectors, and the antenna-coupling capacitor should be removed. The $100\text{-}\mu\text{f}$. capacitor (C_3)¹ on the r.f. plug base to the left, and the $200\text{-}\mu\text{f}$. capaci-

¹ Symbols in parentheses indicate those shown in the original schematic of the R23.

tor (C_8) on the oscillator plug base to the right (as viewed from the front) are not needed. The 51K resistor connected to (C_8) should be removed and reconnected directly from Pin 5 on the 12K8 socket to ground, as shown in Fig. 1.

Underneath, the area nearest the panel is cleared by removing the plug-in r.f. coil assembly (No. 9630), the front control connector, the variable antenna trimmer and its neon tube, and the $3\text{-}\mu\text{f}$. by-pass to the left. The tubular capacitor (C_{11}) from Pin 6 of the 12K8 socket to ground, should be removed. Before disconnecting wires to the front connector, the wires going to Pin 1 (r.f. gain), and Pin 5 (b.f.o. switch) should be labeled for future reference.

At the rear of the chassis, both dynamotor and power-control connectors should be eliminated, and the following components associated with them removed: the filter choke (L_{15} , No. 5634, right rear corner, as viewed from the front) and the capacitors connected to the ends of (L_{15}); the triple capacitor (No. 5413 in metal can next to L_{15}); the metal-can choke between (L_{15}) and the audio output transformer (No.



A surplus R23/ARC5 converted for use as a mobile i.f. amplifier. The new tubes and crystal are near the panel. A vibrator pack is mounted in place of the dynamotor. R.f. connection to the converter is made through a short length of coax cable.

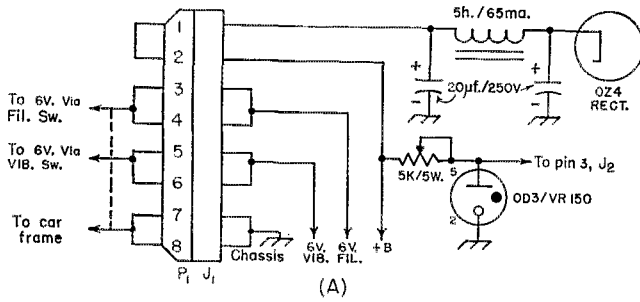
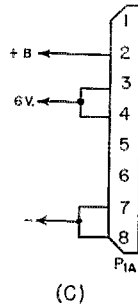
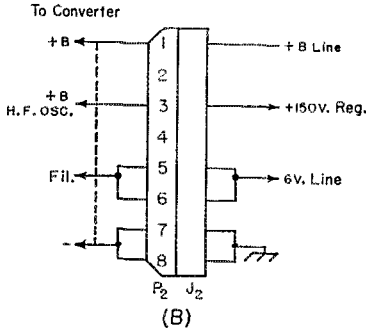


Fig. 3 — Connections to power-supply receptacles and plugs.
 J₁, P₂ — Male octal.
 J₂, P₁, P_{1A} — Female octal.
 The filter choke is Triad C6X.



from the front) is for the 6H6 noise limiter, the one in the center is for the new audio tube (12SF5 or 6SF5), and the one to left is for the OD3/VR150 voltage-regulator tube. An octal socket, an octal male connector, a coax connector, and phonograph connector should be set in the rear edge of the chassis.

5631); the output transformer (No. 5631) and the capacitors and neon bulb connected across its windings. Before disconnecting the control connector, the wire to the central pin, Pin 7 (B+) should be labeled. Also, after removing the connections to Pin 5 (screen voltage) these connections should be transferred to the B+ lead.

Also to be removed are the two resistors (R_{18} and R_{19}) to which the diode transformer secondary is connected, and the 12A6 cathode by-pass (C_{30} , No. 5416, on the left side of the chassis, center metal can).

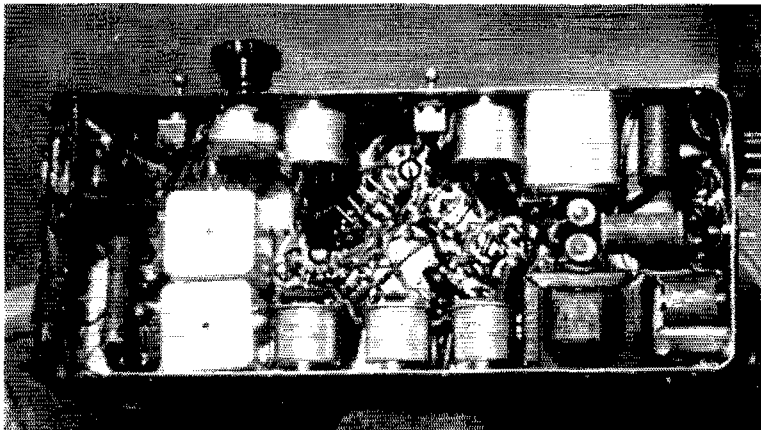
Reconstruction

The first step in the reconstruction is to mount three octal sockets in line across the chassis in the space formerly occupied by the tuning-capacitor gang. The one to the right (as viewed

the left-hand side of the chassis for two toggle switches (b.f.o. and noise limiter) and the audio volume control. Individual preference may, of course, place these controls elsewhere. (After installation, I brought a flexible-shaft control for audio gain out to the instrument panel). The holes in the panel are covered by fitting a piece of aluminum sheet over the panel.

The tubes in the original model have 12-volt heaters, and these are wired in series-parallel for 24-volt operation. Rewiring of the heater circuits will not be necessary in the case of a 12-volt car system, if 6-volt equivalents are substituted for the original tubes. The 6F6 is a suitable replacement for the 12A6. The original tubes may be used in a 12-volt car system by rewiring the heaters in parallel, of course. A 6-volt car system will require both wiring the

(Continued on page 154)



Bottom view of the converted unit. Power-supply filter components are tucked away at the rear end of the chassis. The audio gain control and two toggle switches are mounted along the upper edge in this view.

This clever linear amplifier uses four parallel-connected tetrodes in a grounded-grid circuit. It can be driven by an s.s.b. exciter capable of 20 watts peak envelope power output. The cabinet is only 14½ by 9 by 10 inches deep.



A 200-Watt Grounded-Grid Linear Amplifier

Unusual Design Using Four Modified 1625 Tetrodes

BY E. L. HOOVER,* W9SAR, AND R. L. PECK,** W9MOW

• Here is the design for a compact self-contained linear amplifier that shows considerable ingenuity. Some of the old hands in ham radio will be taken back to the "good old days," when it was the custom to operate on the available vacuum tubes by de-basing them or sawing slots in the base. In this case, the authors show how to get a new tube type from a conventional design.

GROUNDED-GRID amplification in linear service has several advantages over conventional circuits. The amplifier is degenerative, which adds to its stability. It has been found that it produces slightly better linearity than conventional circuits using the same tubes.¹

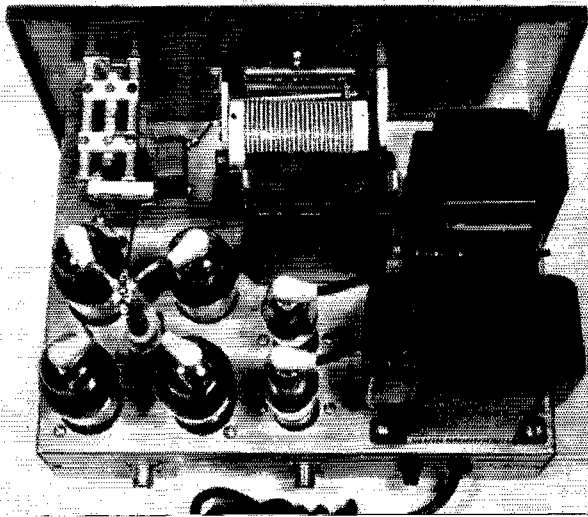
* 1311 South 28th St., Lafayette, Ind.

** 5 North Earl Ave., Lafayette, Ind.

¹ Puckett, "Notes on Grounded-Grid R.F. Power Amplifiers," *QST*, Dec., 1954.

A top view of the linear amplifier shows the r.f. tubes at the left, clustered around the r.f. choke. The two small tubes are the 816 rectifiers used in the 1200-volt power supply. The variable inductor will be recognized as the antenna loading coil from a BC-458 Command transmitter.

And, of course, the greater part of the power required to drive the grounded-grid amplifier appears in the output along with the amplified signal. The disadvantage of using the 807 or 1625 in this type of operation is that the beam-forming plates are connected to the cathode. The signal appears on the cathode, and the beam-forming plates form good coupling capacitors to the plate. This couples the input and output circuits and causes instability. We thought that we would be able to stabilize an amplifier with these tubes if there were only some way to ground the beam-forming plates directly, since this would help to isolate the input and output circuits. Checking various makes of 1625s showed that, in many instances, the beam-forming plate lead was attached to the cathode lead in the cathode pin. Bases were removed by applying



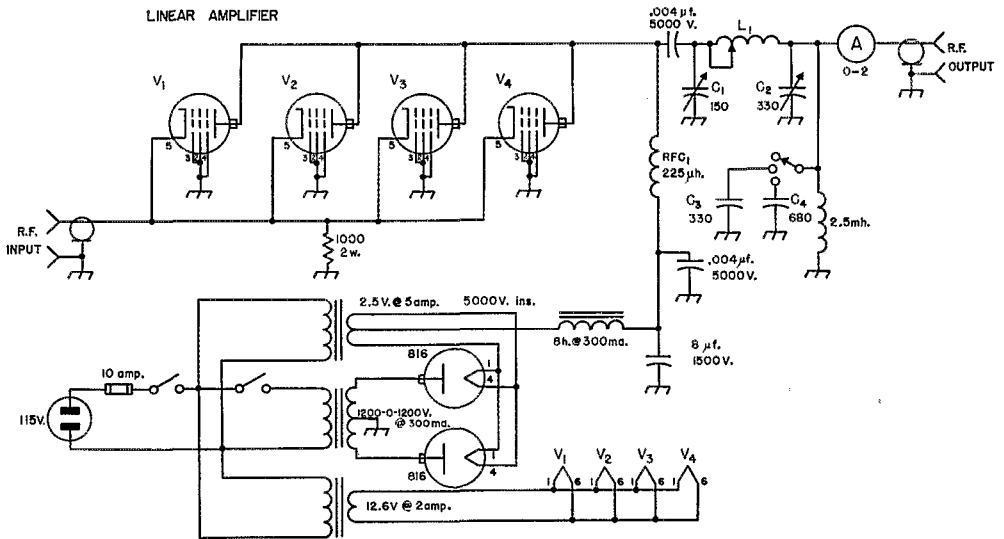


Fig. 1 — Schematic diagram of the grounded-grid amplifier. Capacitor values in $\mu\text{f.}$ unless otherwise specified. C_3, C_4 — 600-volt silvered mica capacitor. L_1 — 2.0 $\mu\text{h.}$ roller-type variable inductor (from BC-158). RFC_1 — National R-175A. V_1, V_2, V_3, V_4 — Modified 1625 — see text.

heat from a large torch. The cathode and beam-plate leads were then separated and new 6-pin bases reinstalled, using the same cement that the manufacturer uses. They were then baked in an oven at 90 degrees C. to harden the seal.²

The modified tubes were found to do an excellent job, and further simplification of design was now possible. Using four of the tubes in parallel brought the cathode impedance down to about 50 ohms, so it offers a good load for most popular exciters.

Since the input circuit of the grounded-grid amplifier is a low-impedance load for the driver, it is possible to do away with any input tuned circuit; the d.c. return for the 1625s is made through the exciter output tap or link. A word of caution here — be sure there is no d.c. on the exciter link, because the 1000-ohm safety resistor would short it to chassis.

We found that no bias or screen voltage was

² The modified tubes can be obtained from P & H Electronics, 5 N. Earl Ave., Lafayette, Ind. Cement for doing the job yourself can be obtained from the same source.

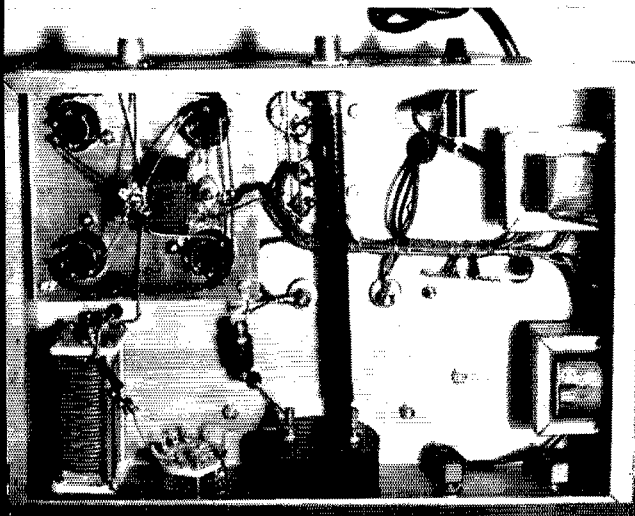
required at 1200 volts on the plate. Each tube draws about 10 ma., so the power supply is constantly bled with 40 ma., thus eliminating the need for a bleeder.

Now, with no screen and bias supply and no input tuned circuit, it was possible to design and build a compact amplifier. We chose the pi-network output circuit with variable inductor to cover 75, 40 and 20 meters. We felt that 15- and 10-meter operation was impractical because of the high output capacitance of the four tubes used in parallel. The circuit diagram is shown in Fig. 1.

Construction

The unit is constructed on a 10 × 14 × 3-inch chassis, and a 5¼ × 5¼-inch subchassis on which are mounted the plate r.f. choke and four 6-pin tube sockets. This subchassis is mounted 1¼ inches below the main chassis deck. The cold end of the r.f. choke is by-passed through a 0.001- $\mu\text{f.}$ capacitor to a soldering lug

(Continued on page 128)



This bottom view shows how the four r.f. tube sockets are mounted on a small platform. The 2.5-mh. choke across the output circuit is to prevent accidental shock from the antenna system in the event that the plate-blocking capacitor should short circuit. Filament transformers are mounted on the side of the chassis.

Elementary TV Trouble Shooting

Practical and Simple TV Set Testing

BY JAMES KENNEDY,* W7MID

FROM experience in the field of television servicing, plus personal acquaintance with many amateurs, we've realized that lots of hams don't understand the basics of what cooks in a TV set. This article is offered with the hope that it may present a better understanding of their operation and spare someone a service bill once in a while. Not too often, though; we're still in the business!

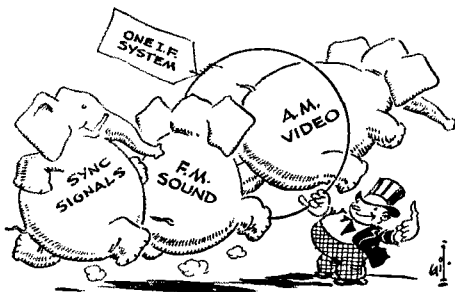
This isn't going to be one of those articles which tells you the microseconds of each pulse; we won't even show you a picture of a pulse. So long as the pulses are in your set, be happy!

The Signal

The signal from a TV station is pretty much a conglomeration. The sound is f.m., and the picture, or video information, is a.m. The two carriers are always separated by exactly 4.5 Mc., with the sound carrier always the higher in frequency.

Along with the picture information there are pulses that lock the receiver with the transmitter. These pulses are given a much higher percentage of modulation than the video signal so the two can be more easily separated at the proper time. The video information never exceeds 75 per cent modulation of the carrier, while the synchronizing pulses rise up to 100 per cent. A clipper, like your noise limiter, is used to separate them.

Oddly enough, all this stuff — the f.m. sound, a.m. video and synchronizing signals — can be passed through one i.f. system, but it's gotta be wide! A width of 4 Mc. is the aim, but many sets settle for 2.5 or 3 Mc.



The Receiver

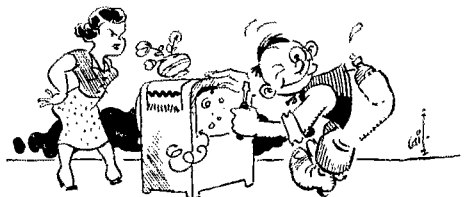
A TV set, from antenna to second detector, is quite like a superhet, except for the bandwidth of the i.f. strip. There's an r.f. stage (usually a

* Kennedy Radio and TV Service, 4511 N. 8th St., Phoenix, Ariz.

• No, we haven't forgotten that our cover says, "Devoted entirely to amateur radio." We're making an exception in this case because W7MID is passing along some good, sound practical hints on how to size up TV receiver troubles, and most hams are called upon at some time or another to "Take a look at this set and tell me what's wrong." Even if you don't plan to lift a finger ever to help a TV looker, we're sure you will find this article entertaining and helpful.

cascode type in modern sets), a mixer and a local oscillator. The output of the mixer is either around 25 or 45 Mc., depending on set design, with the higher-frequency i.f. being favored in the newer sets, since the 4-Mc. bandwidth of the 25-Mc. i.f. puts it next door to our 21-Mc. band.

The i.f. amplifier consists of three or four stages, with each stage tuned to a slightly different frequency within the desired range of, say, 21 to 25 Mc. The net result is to amplify uniformly the desired bandwidth of 4 Mc. This is the "stagger tuning" you hear about, unless the



-ANOTHER KIND OF "STAGGER TUNING"

NYL uses the term when you retune the set after a few quick ones.

The output of the i.f. amplifier goes to a second detector, which is usually a 6AL5 or a crystal such as the 1N64.

You can spot the foregoing sections of the receiver easily, because the tuner is behind the knob which you use to change channels, and the i.f. stages are usually in a row right behind the tuner. The i.f. amplifier uses miniature tubes like the 6CB6, 6AG5, or 6AU6, and the i.f. coil trimmers are generally seen as brass screws sticking up through the chassis. Note we say "generally," because this article is being written without any particular set in mind. Some sets may have the i.f. coils above the chassis in cans just like those in your receiver, but most of them use the cheaper method.

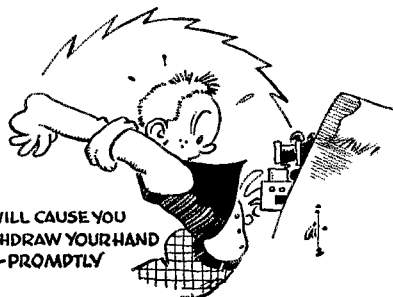
The video, or picture information from the

second detector, goes to the video amplifier, which is simply a voltage amplifier designed to amplify uniformly from zero to 4 Mc. It is usually one stage, but may be two, and the tube may be a 6AC7, 6CB6, 12BY7, or almost any tube the manufacturer happened to have lots of. The output of the video amplifier goes to the picture tube.

Trouble Shooting

We've now followed the video information from the transmitter right up to the picture tube. While it's still fresh, let's consider some of the troubles in this section. Nearly all cases of trouble in the tuner, i.f. or video stages of a TV are tube failures. These tubes all have about 150 volts applied to the plates and screens, which is fairly conservative, so they give a lot less trouble than the tubes in the deflection circuits which are pushed to what in some cases seems to be "super ICAS" ratings. The tubes in the tuner, i.f. and video sections generally have about the same temperature to the touch, so when you're looking for trouble, a cooler tube, even though its heater is lit, may indicate that it has given up the ghost.

Now, if you're going to start putting your sticky fingers inside the set, let's have a word of caution. If you have lots of time, the safest way is to turn off the set before putting your hand inside. If the picture tube is glass, the high voltage is fed to it through a rubber section cup on the side of the tube. The wire carrying the high voltage is supposed to be well insulated, but keep your hands away, nevertheless, as it may be old and worn. If your set has a metal picture tube, practically the entire section of the tube inside the set is at high potential. If you're in doubt, turn off the set and short out the picture tube to the chassis. If the side of the tube is "hot" electrically, there will still be a respectable spark even with the set turned off. The voltage on the picture tube is pretty high, from ten to fifteen thousand volts, but the current is very low. Still it wouldn't do you any good to get hit with it if you have a bad heart. Moreover, it will cause you to withdraw your hand so promptly



you'll leave plenty of skin on anything that gets in the way. So watch your step.

To continue with the front end and i.f.: The r.f. amplifier, if a 6BQ7 or 6CB6, often shorts out and puts 60-cycle hum on the screen, which

causes the bottom half to be dark and the top half light, or vice versa. The i.f. tubes may cause the same trouble, but not as often. If the oscillator tube quits in the tuner, there will be no sound or picture getting through, but there will be plenty of noise on the screen from the i.f. tubes. This appears as snow. The oscillator tube is often half of a 6J6 or 12AT7, with the other half being the mixer. The tuner must be operating properly to give enough signal to override the noise generated in the i.f. stages, so if the picture is unusually snowy, look into the condition of the r.f. amplifier and mixer tubes.

If one of the i.f. tubes fails in a strong signal area, there may be enough signal leaking through the internal capacity of the bad tube to put a weak, snowy picture on the screen, while the sound may be nearly normal. The best bet is to substitute tubes you know are good, one at a time, until you hit the right one. If the set has series heaters, you should turn off the set before unplugging any of the tubes, because some sets have resistors shunting the heaters, and if the tube is out of the circuit too much current will flow through the shunt resistor and burn it out. If the set has selenium rectifiers and you can't see anything that looks like a power transformer, it more than likely has the heaters in series.

Most sets nowadays are of intercarrier design, which means that the f.m. sound and the a.m. video signal are amplified in the same i.f. system. Since, as mentioned earlier, the sound carrier is spaced exactly 4.5 Mc. above the video carrier, any place the two get together they'll produce a beat-frequency equal to their difference frequency, and in most sets this beat of 4.5 Mc. is trapped out somewhere along the i.f. system or in the video amplifier by a circuit turned to 4.5 Mc. The resulting f.m. sound is amplified through one or two sound i.f. stages at 4.5 Mc. It goes then to a ratio detector and the audio amplifier. The sound i.f. coils are generally in shielded cans; the sound i.f. tubes are nearly always 6AU6s, with the ratio detector being either a 6AL5 or the diodes of a 6T8. Either a 6AV6 or the triode section of the 6T8 is the usual first audio amplifier.

The main service trouble with the sound system, aside from tube burnouts, is mushy sound, caused when the ratio detector transformer drifts out of adjustment. This transformer is an i.f. can right next to the sound detector tube, and you can correct the mushiness by adjusting the bottom slug of this transformer with an alignment tool. A half turn should be enough. Some manufacturers have thoughtfully bored a hole in the bottom of the cabinet so you can reach in and make this adjustment, while the others have put the extra hole down as an unnecessary expense.

Of course, the sound i.f. tubes burn out occasionally, with resultant loss of noise. In some sets the audio output tube is used to drop the voltage down to 150 volts for other tubes in the set, instead of using a dropping resistor. That is, about 360 volts is applied to the plate and screen

of the audio output tube, but instead of grounding the cathode of this tube, it is heavily bypassed and run to the plates and screens of the other stages, perhaps the i.f. stages, so that the voltage drop through the 6V6 or 6L6 reduces the voltage down to the proper value for the i.f. stages. You can see, then, that if anything goes wrong with the audio amplifier, it can affect the picture in this kind of circuit. The only way we can prepare you against this type of thing is to suggest you get a look at the schematic of the set before knocking yourself out. The first time we bumped into one of these we measured the voltage at the grid of the audio output tube and found it to be a positive 150 volts. This would seem to indicate a leaky coupling capacitor from the first audio stage, but such wasn't the case. When we finally got the schematic, we found the set used just such an arrangement as described above, and the grid *was* at 150 volts positive with respect to ground, but not with respect to the cathode, which is what counts. It's a constant stream of things like this which keeps one from ever getting much of an ego built up about TV servicing ability!

Power Supply

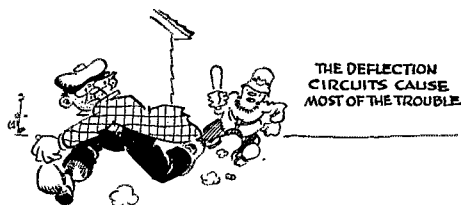
The low-voltage power supply hasn't been covered thus far. Filter capacitors *do* short out but not as often as you would expect. You will find capacities of 40 and 80 $\mu\text{f.}$ at 450 working volts to be common sizes. The main item of failure is the 5U4G rectifier; they're usually good for a year of operation unless the set is an especially "economical" type. Some sets use two 5U4Gs in parallel, which is what is really needed. A weak 5U4G can cause complete loss of picture if it's very weak. We've found sets where there was enough voltage to operate the sound system, but not enough to operate the high-voltage power supply, so there would be sound but no picture or brightness on the screen. Generally, when the picture starts shrinking, either from the sides, or from top and bottom, or both, a new 5U4G should be tried. The same thing holds true for selenium rectifiers, except that they are more trouble to change.

Deflection Circuits

Now we've covered just about everything but the deflection circuits, which cause most of the trouble. The electron beam has to be moved across the screen from side to side as well as up and down, and changing currents in the deflection coils, or yoke, are what do the trick. To have the beam move properly, the waveforms have to be steep sawtooth types, with high peak voltages, which puts quite a strain on any parts associated with the deflection circuits.

The horizontal deflection system moves the beam quickly across the screen from side to side, while the vertical deflection system moves the beam slowly down the screen at the same time, to paint a quick picture on the screen. Where there is a dark spot on the scene being transmitted, the electron beam is cut off so the

screen is dark, and where there is a bright spot in the scene the beam intensity is increased, so more electrons hit the screen and cause it to fluoresce. This is done so rapidly that the eye sees the com-



plete scene instead of the individual dots or dashes that paint the picture.

Now consider the vertical and horizontal deflection circuits as a couple of transmitters, the old-style "Master-Oscillator Power-Amplifier" type. The electron beam moves slowly down the screen, while being swept rapidly back and forth horizontally. The vertical oscillator operates at a low frequency of 60 cycles. It's nearly always a triode, such as a 6C4 or half of a 6SN7, and the oscillating circuit is usually an RC multi-vibrator. The oscillator drives the vertical amplifier, which is connected through the vertical output transformer to the vertical deflection coils around the neck of the picture tube. If something fails in either oscillator or amplifier, you'll have just a straight line horizontally across the face of the screen, or if the thing is working just halfway the screen may be filled just part way vertically, or the picture may have the top half folded on top of the lower half, or it may be impossible to lock in the picture at any setting of the "Vertical Hold" control.

Just about any part in the vertical deflection circuit can give trouble, and does. But, just as in any trouble-shooting attempt, try changing tubes first. The vertical output tube may be a 6K6, 6AH4, 12BH7 or 6S4, all connected as triodes. They have a pulse of around 1000 volts on them, which is a strain for any receiving type tube. A 'scope is the best instrument for determining whether the oscillator is driving the amplifier properly, if the trouble can't be cured by changing tubes.

Things are not as simple in the horizontal deflection circuit, which operates at a frequency of 15,750 cycles, or about 15 kc. The same type m.o.p.a. circuit is used, but the economizers figured out a way to develop the high voltage for the picture tube from this circuit. The picture tube won't light up without the ten or fifteen thousand volts needed to make the electrons tear down and hit the screen on the face of the tube, and there won't be any high voltage developed unless the horizontal deflection circuit is working properly. So, if the horizontal oscillator or amplifier fails, you don't just get a white line running vertically down the screen as you'd expect. You don't get a darned thing on the screen, because there's no voltage being developed to make it light up. Besides this, to make matters worse, there is also a "boost" voltage developed

from the same circuit, which is fed back usually to the vertical amplifier tube, so that if the horizontal section is cutting up, the voltage in other parts of the set may be off quite a bit, just to add to the general confusion.

The horizontal oscillator is usually a 6SN7 or its smaller counterpart, the 12AU7, and the coil for this circuit may be mounted in a can like an i.f. coil, or it may be a slug-tuned coil on the back of the set, marked "Horiz. Hold." The oscillator feeds the amplifier, either a 6BG6 (in the older sets) or a 6CD6 or 6BQ6. The plate coil for the amplifier, called the "flyback transformer," is usually one of the components mounted inside a cage to keep bugs and kids out. The horizontal amplifier tube looks like an 807 or 2E26, and they've been used in a number of ham rigs.

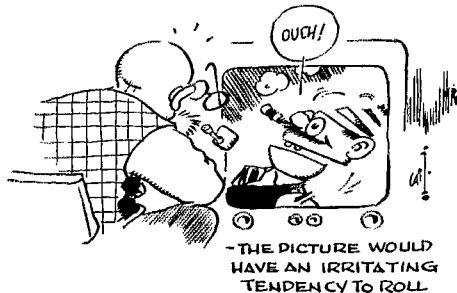
Also inside the cage is the high-voltage rectifier, which is either a 1B3 or 1X2. These tubes are rated about 15,000 volts at half a milliampere or so, and they have a very low drain filament, which makes it feasible to light the filament by coupling a one- or two-turn loop over near the horizontal output coil to pick up the 15-ke. r.f., thus avoiding the expense of a filament transformer insulated for 15,000 volts. The horizontal output coil, or flyback transformer, matches the output tube to the horizontal deflection coils in the yoke just as an audio output transformer matches an audio amplifier tube to a 'speaker. But at the same time, the flyback transformer steps up the 15-ke. signal and applies it to the plate of the high-voltage rectifier, which changes it to d.c. This d.c. is then sent up to the picture tube. Since the frequency is 15 kc., instead of 60 cycles, the ripple frequency of the d.c. is high, and therefore very easy to filter. All that's needed is a 500- μ f. 20,000-volt ceramic capacitor, plus the capacity of the picture tube itself, which amounts to another 500 μ f.

We mentioned the synchronizing, or "sync" pulses at the beginning of this article; at the second detector, the sync pulses are picked up and fed into a sync amplifier and/or sync separator. This part of the set may be just one tube in the cheaper sets, or up to half a dozen tubes in the more complicated versions.

There are two sync pulses, one to trigger the horizontal sweep circuit and the other to trigger the vertical sweep circuit. When both sweep circuits are in step with the sweep circuits in the camera at the station, then the electron beam in your picture tube is right in step with the scanning beam at the station and, assuming the video information has come through your set in good shape, your picture will correspond with the one being televised.

The vertical sync pulses are relatively long compared with the horizontal sync pulses, which simplifies the problem of separating them. A weak sync-separator tube may cause the picture to "roll" at the slightest provocation, or to fall over sideways and break up into pieces. You can see the vertical pulse on your screen by reducing the contrast, turning up the brilliance, and operating the "Vertical Hold" control so the pictures roll

slowly. The vertical sync pulse is the black mallet-like form between the frames of the picture. It should be darker than any portion of the picture, because it has a much higher percentage of modulation than any of the picture portions, and the greater the modulation percentage, the darker the picture. If the sync pulse isn't much darker than any part of the picture, it indicates that the pulse is being reduced in amplitude by trouble in the set, and the picture would have an irritating tendency to roll every time the refrigerator went on, or when you flipped on the rig.



Trouble-shooting the sync sections of a television set can be plenty tedious unless you have a good 'scope and know what you're looking for. Again we say, try the tubes first. Even a defective picture tube can cause poor sync operation in some sets, by overloading the video amplifier.

The first worry of just about everyone who calls us, and we don't blame 'em, is that the picture tube may be bad. We find quite a few with open heaters, which respond by heating the pins on the base with a soldering iron. Apparently, oxidation may develop after even a year or so, causing the heater to fail to light. Usually, though, picture tubes gradually get dimmer and dimmer, until finally you have to turn out all the lights to see the picture. And you may notice the picture turns negative when you turn up the contrast or brilliance. A picture tube "booster," costing a few dollars, will often prolong the useful life of these tubes. It's a transformer that steps up the normal 6.3 volts to 7 or 8 volts for the heater. You don't have to make any wiring changes to install it.

As you probably gathered from our discussion of the horizontal sweep circuits, there are a number of tubes and parts which may cause the picture tube to remain dark, so don't go getting heart failure until the set has been checked over.

Another word of caution: Don't turn the i.f. or tuner adjustment screws inside your set. You may think the picture is getting better, but you may at the same time be changing the i.f. response curve of the set so the sync pulses are lost or attenuated, or any of a number of other unhappifying troubles may develop. We get a set like this once in a while, and the only thing to do is follow the factory alignment instructions all the way through. This isn't such a tough job, by any means, but it costs you money!

(Continued on page 136)

Modifications in the Viking II

Notes on Improving the Quality of C.W. Signals

BY CHARLES C. MILLER,* W2RDK

Few serious objections can be made to the performance of the Johnson Viking II transmitter. One valid criticism, however, is the frequently-heard one about the keying.

'Phone men, and c.w. men who just don't care how many other people are annoyed by their signals, can stop here; the modifications to be described do nothing for the speech and don't add a single watt to the output. Those who have been awakened by *QST* articles during recent years to the difference between barely-acceptable and good keyed signals may find something to interest them, whether or not they own Viking transmitters.

Much of the criticism to be leveled in this article applies equally well to transmitters of other manufacture, and is particularly applicable to most homemade VFO rigs. Reference is made here to the Viking transmitter because a large number of these deservedly-popular machines have been put into amateur service in the past couple of years, and because a great opportunity existed to see what could be done toward improving their signals.

Several owners of Viking transmitters, aware that they caused trouble up to 100 kc. off the transmitted frequency, have tried "key-click filters," vacuum-tube keyers, etc., to no avail. As practically everybody knows by now, it is practically impossible to get good quality signals while keying the oscillator. This is true in the Viking even when keying the crystal oscillator, and the situation is even worse when using the Johnson 122 VFO.

The manufacturer points out in the instruction book on the 122 VFO that performance is improved if the oscillator is not keyed and if the VFO is not made to run on the transmitter's output frequency. Toward this end, key jacks in the 122 VFO and in the Viking transmitter are so wired that (a) the VFO may be keyed alone in its cathode lead, (b) the VFO and the first stage in the Viking may be simultaneously keyed in their combined cathode leads, or (c) the first stage of the Viking may be keyed, allowing the VFO to run continuously during transmission periods. The desire to operate as few switches as possible and the notorious ham proclivity for ignoring instruction books are doubtless responsible for the universal tendency to pass up (c) in favor of (b), or even worse, (a).

For something over a year, I've been exposed to some of the noise generated by a Viking II operated by method (a) above, at about a mile from my place. There are also other Vikings in town, at slightly greater distances. My advice

• If you're a real ham, we think you will benefit from this article. In the first place, it tells how to make something operate better without too much trouble, and that's something any real ham likes to hear about. And, secondly, we think you will be interested in this account of the diplomatic aspects of keying problems.

was solicited, and a number of "over-the-air" tests were conducted with various waveshaping components and sets of tuning adjustments, without producing any satisfactory solution to the problem of thumps, clicks and chirps. I like to spend time chasing DX on 40 and, unfortunately, so does the owner of the Viking nearest me. I couldn't chop down his antenna, since he is a fellow-member of the Order of Boiled Owls; so I decided to get hold of his machine and see if I couldn't improve the signal quality. He brought over the Viking, the 122 VFO, and the two instruction books, being a tolerant and slightly gullible type. I promised I wouldn't impair the resale value of the equipment too much.

His transmitter (serial No. 6875) was purchased "wired and tested," and the manufacturer had incorporated Modification A (addition of a 6AQ5 clamp tube with positive bias bleed), and had furnished the parts for Modification B. The latter has to do with changing the second 6AU6 speech amplifier to triode connection, removing the inverse feed-back, "building out" the modulation-transformer primary, removing a v.h.f. choke from the screen lead to the 6146s and replacing it with a 56-ohm resistor, replacing a v.h.f. choke in the lead to the VFO heater with a choke wound from heavier wire, and swamping the buffer tank, L_{5A} , with a 10K resistor. The owner had not done this work, so I did it for him, following the instructions of the manufacturer.

Preparation

First, however, before undertaking any work I made a thorough study of the equipment and the two instruction books. I spent three evenings on this. (Owners of Vikings who have already made such a study need not repeat it nor charge the time to the project.) This study brought out several interesting points.

One was that SW_3 , the crystal-VFO switch, was a single-pole 11-position affair, connecting the grid of V_6 selectively to any one of 10 crystals or to the RC-59/U VFO line. The other side of the 10 crystals was connected together and to the

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screen of V_6 , which is fed from the 300-volt line through a 33,000-ohm resistor. The configuration is thus the "electron-coupled" or "modified" Pierce oscillator. Enough capacitance exists from grid and screen to ground to permit dispensing with any additional lumped capacitance. On switching to VFO, when V_6 becomes a first buffer/doubler, the screen of V_6 is left "hot" for r.f. by 33,000 ohms, as there is no provision for switching in a screen by-pass capacitor. I felt that this could be a contributing factor to the instability I thought must exist in the rig and which prevented it from responding to the conventional attacks on keying transients. I also suspected that the arrangement of the crystals could cause pulling of the VFO whenever the VFO frequency approached that of one of the ten crystals, as a finite capacitance exists across the switch on the grid side, and the screen side of the crystals is common, as noted.

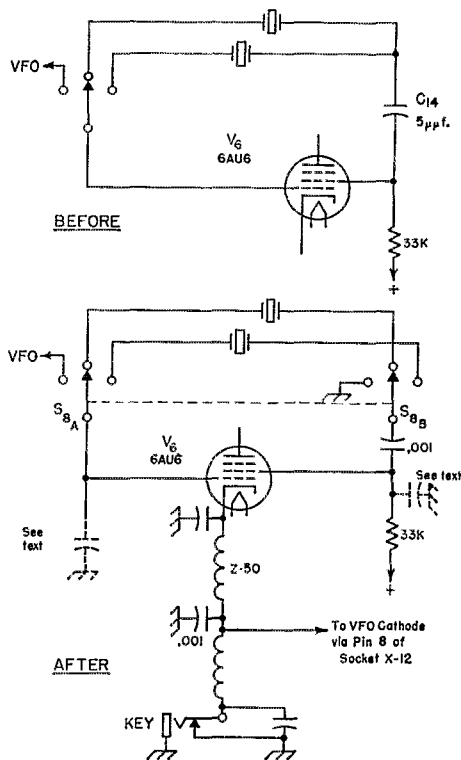


Fig. 1 — The "before" and "after" of the Viking II oscillator/buffer stage.

Examination of the 122 VFO unit showed that its enclosure is not an r.f. shield as we have come to think of shielding since TVI. The lead filtering into the 122 VFO unit also leaves something to be desired. Since the inter-unit wiring is immersed in the strong r.f. field from the antenna, there is the possibility that r.f. can get back into the oscillator circuit, to contribute to instability or perhaps a poor note. Some thought should be given, I felt, to improving the shielding; and certainly something should be done for the lead

filtering, particularly in the heater circuit, which is completely unprotected on the VFO end.

Perrine showed a long time ago¹ that variable-frequency oscillators did better with high resistance grid leaks, if the tube was good enough to continue oscillating. I felt that the 47,000 ohms in the 122 VFO was too low and decided to raise it to at least 100,000 ohms.

Goodman reported so long ago I can't give him due credit that B-minus keying is faster in an oscillator than cathode keying² and should be used whenever the oscillator is to be turned on and off. Speed is enhanced by a minimum of series resistance and shunt capacitances in the supply leads. I felt there was room for some improvement in this direction in the 122 VFO.

Everyone knows that the series-tuned (Clapp) Colpitts does better with a high-transconductance tube. It is almost automatic to see a 6AG7, 5763, or 6AU6 in published designs, in more or less that order of occurrence. That these may not necessarily be the best of all possible tubes for the purpose seems so far to have occurred to only one serious investigator.³ Since it was easy to "acquire" a 6AH6, I decided to use one in the VFO. (The socket connections are the same.)

The Work

I therefore sent the lucky owner of this Viking to the local store for a 6AH6, a half dozen 0.001- μ f. disk ceramic capacitors, a few Ohmite Z-50 r.f. chokes, and a Centralab PA-2004 miniature two-pole twelve-position shorting selector switch. I offered to furnish the wire, 2 feet of No. 18 enamel, and 6 feet each of green and orange vinyl-covered stranded hook-up wire. I also had available a standard 100-watt soldering iron, one of the "pencil" type with a $\frac{1}{8}$ -inch tip long-nosed, and diagonal-cutting pliers, a "soldering aid," wire strippers, Allen wrenches, and large and small screwdrivers.

Access was gained to the underside of the Viking II by removing a number of binding-head screws holding the perforated metal cover plate in place, and to the top by removing three knurled-head screws holding the top cover.

Step 2 consumed most of one evening, and consisted of attempts to get good clean keying without modifying anything. The 5R4GYs were removed — to prevent their rectifying stray r.f. and applying it as plate voltage to the final, thus putting a signal on the air even with the plate switch in the off position — and I tried all keying combinations, with and without waveshaping. The keying was unsatisfactory under all combinations of tuning of the 6AU6 and 6AQ5 stages in the Viking. More from curiosity than for any

¹ Perrine, "An Answer to the ECO Problem," *QST*, Sept., 1939.

² Not exactly. He said B-minus oscillator keying could be shaped on "break" without regard to the grid-circuit time constant, whereas cathode oscillator keying could not. Either can be keyed fast if the grid-circuit time constant is short, which means a small value of grid condenser. — Ed.

³ R. A. Egbert, W2QMO, in personal communications to the author during an investigation carried out during the course of a project. I hope he will see fit to publish an account of this soon.

practical value, since crystal and VFO are not simultaneously used. I put a shorted plug in the VFO key jack, put the "crystal-VFO" switch in crystal position, and tried to bring the VFO

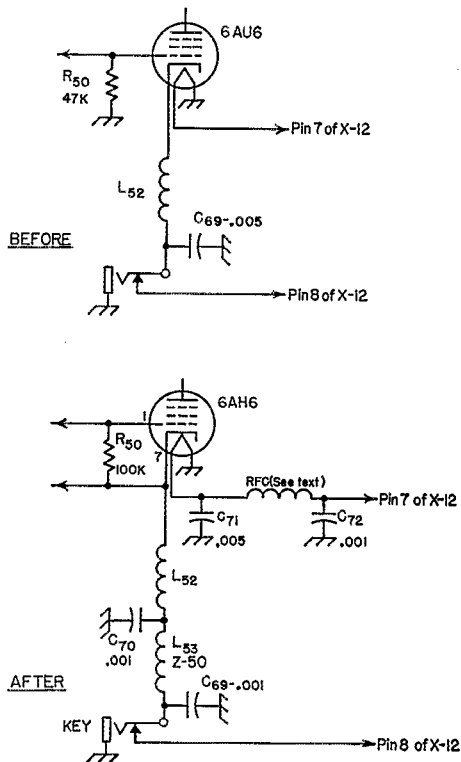


Fig. 2—Changes in the Model 122 VFO circuit to speed up the keying and also improve the r.f. filtering.

to a low beat note with the crystal oscillator. The pulling of the VFO was plainly audible in the 75A-3 receiver. The VFO abruptly jumped into lock with the crystal as soon as their frequencies were within a few hundred cycles of each other. This occurred with either 3.5- or 7-Mc. crystals and in the first few positions of the crystal switch.

Step 3 is the actual project. If anyone other than my wife bothers to read this far, he's probably fairly serious about wanting to improve the performance of his transmitter. He'll have to spend most of one evening on it, but his locals will thank him for doing the job.

1) The wiring from SW_3 to X_{15} is removed, as is the lead from Pin 1 of the 6AU6 (V_6) to the switch rotor. The RG-59/U VFO input cable is also carefully removed from the switch. C_{14} , a 50- μf . mica from Pin 6 of V_6 to the common lead of crystal socket assembly X_{15} , is also removed. The coupling on the shaft of SW_3 is loosened and the switch is removed. In its place will be used the Centralab PA-2004 two-pole switch. Put the shaft, cut to 1-inch length, through the bracket, but do not draw up the mounting nut, as wiring is easier with the switch dangling. Cut 11 pieces of green wire 6 inches long and solder one

end of 10 of them to one side of each of the crystal sockets. Similarly, cut 11 pieces of orange wire 6 inches long and solder one end of 10 pieces to the other side of each crystal socket. Number the switch points 0, 1, 2 through 10, 11 clockwise around the switch, viewed from the shaft end. Note that the rotor clip is on the opposite side of the wafer from the terminals. Designate the front wafer SW_{8A} and use it for the grid connections (green wires). The rear wafer will be called SW_{8B} and will be used for screen connections (orange wires). Cutting the wires to length at the switch end, solder the leads from the crystal sockets (green wires) to Terminals 1 through 10 of SW_{8A} . Note that the crystal sockets on X_{15} are numbered down the board and back, rather than both rows in the same direction. Run a green wire from Pin 1 of V_6 to the rotor of SW_{8A} . Similarly, bring the orange wires from X_{15} to Terminals 1 through 10 of SW_{8B} , cutting them to length at the switch. Install a 0.001- μf . disk ceramic capacitor from Terminal 11 of SW_{8B} to the rotor terminal. Run an orange lead from Pin 6 of V_6 to Terminal 11 of SW_{8B} , and run a short heavy ground lead from Terminal 0 of SW_{8B} to the nearest chassis ground. Mount the switch and lock it in place, and connect the center conductor of the RG-59/U to Terminal 0 of SW_{8A} . This change, when correctly made, causes both sides of the crystals to be switched, puts 0.001 μf . either in series with the crystals (where it has no effect) when they are in use or shunts it to ground as a screen by-pass for VFO operation, eliminating one possible cause of instability. Some experimenting will have to be done with good/mediocre/poor crystals of both the 3.5- and 7-Mc. variety and an assortment of small (10- to 470- μf .) capacitors, to determine how much capacity should be added from grid/screen to ground to get the most reliable operation of the stage as a crystal oscillator. In this unit, 22 μf . was required from screen to ground with nothing between grid and ground, but this will vary with activity of the crystals and possibly from transmitter to transmitter. The pulling of the VFO was cured by this change, as evidenced by the ability now to set the VFO to a low beat note with the crystal oscillator or to tune smoothly through zero beat.

2) The cathode lead of V_6 was opened at a point between the negative lead of meter shunt SH_3 and the connection of the lead from Pin 8 of the VFO power socket, X_{12} . An Ohmite Z-50 v.h.f. choke, by-passed on the cold end by a 0.001- μf . disk ceramic, is installed here. If Modification B has not been made on your Viking, replace the molded-body v.h.f. choke, L_{15} , connected to Pin 7 of X_{12} , with a homemade unit of 15 turns of No. 20 or larger enamel wire close-wound on $\frac{1}{2}$ -inch diameter.

3) In the 122 VFO unit, replace R_{50} with a grid leak of 0.1 megohm or more, connected directly between Pins 1 and 7 of the oscillator tube socket. Put a two-terminal tie point under the hexagonal nut near the end of r.f. choke L_{52} .

(Continued on page 138)

Lightweight 40-Meter Ground Plane

Simple Construction Using Unguyed Aluminum Tubing

BY PHILLIPS SMITH,* W2OTC, EX-WIENI

• W2OTC is another who has found the ground-plane antenna to be an effective arrangement for 7-Mc. work. This one is easy to build and uses a matching system not often applied to this type of antenna.

THIS ground-plane antenna is described in the thought that it might help some other poor character who might be contemplating erecting a somewhat similar structure.

The writer, being basically lazy like most hams, decided to make the antenna as simple as possible. Several beams had been built since the war, and by drawing on this background as well as KH6LJ's experiences with light-weight structures, the neighborhood eyesore described below resulted.

Electrically, the antenna is per the *Handbook*. Performance over the 40-meter band from 7000 to 7300 kc. is achieved with a v.s.w.r. of 1.6 to 1 or less. Four horizontal radials are used, each radial having a length of 34 feet 2 inches. The vertical element is 33 feet 4 inches in length.

Construction

It was desired that no guy wires be used on the vertical element. This unguyed vertical element

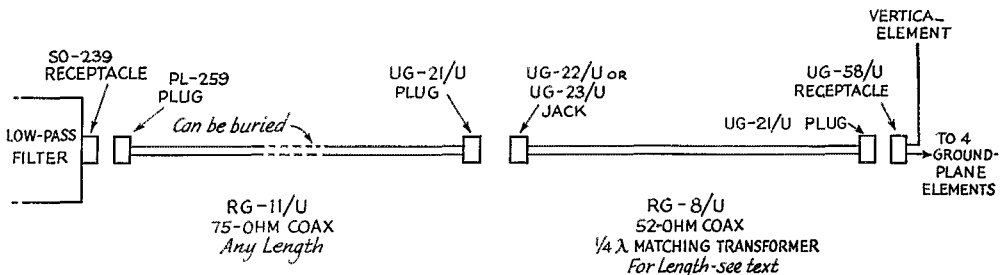


Fig. 1 — Cable arrangement for feeding the 40-meter ground-plane antenna. The construction of the antenna itself is described in the text.

consists of three 12-foot sections of aluminum tubing, type 61S-T6, telescoped and bolted together. At the joints, it is best to use bolts and nuts, and not hose clamps. Two $\frac{1}{4}$ -20 bolts spaced at least 6 inches and running through the tubing at right angles to each other are used at each joint. These are tightened just to the point where the tubing begins to flatten. While physically adjusting the over-all length, the top section is left unbolted, and temporarily clamped within the center section by means of a C clamp. The bot-

tom element is $1\frac{1}{4}$ inches outside diameter with a wall thickness of 0.058 inch. The center element is 1-inch outside diameter tubing again with a wall thickness of 0.058 inch. The top 12 ft. is $\frac{7}{8}$ -inch o.d. with a wall thickness of 0.035 inch. These sizes are readily available from warehouse stock, and telescope together nicely. The total weight of the three is just under 6.5 pounds.

The elements are fastened to the top of a 2 by 4 which in the writer's installation is 20 feet in length and attached to the side of a garage. The 2 by 4 need not be guyed if bolted to the side of a building. In fact, guy wires anchored to trees may prove troublesome during storms, while if anchored in the ground they usually present obstructive hazards around most yards. The elements are held to the 2 by 4 by two homemade aluminum clamps spaced 3 feet apart; the bottom section of tubing is insulated from the clamps with sheet teflon. The radials are made of No. 14 wire and are conventional, except that screen door springs are inserted where attached to trees. Needless to say, these springs are insulated from the radials. It was learned from hurricane experience that if the tree swings with particular violence two springs in series should be used.

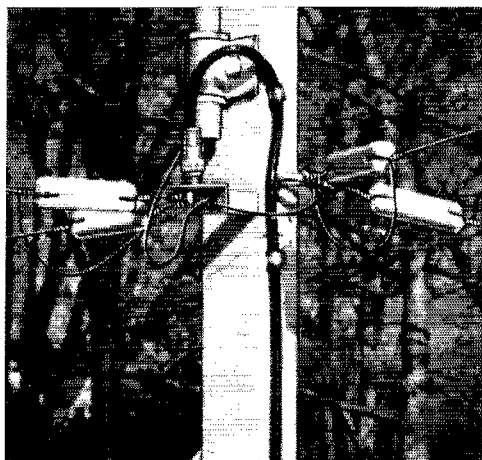
Feed and Matching

The antenna is fed through RG-11/U 75-ohm coaxial cable with a quarter-wave matching

section of RG-8/U 52-ohm coax located at the antenna end. This method of feed was chosen because it presents no weatherproofing problems and eliminates messy coils and matching networks. The length of quarter-wave section was adjusted to give a reasonable v.s.w.r. over the whole band. To do this, it had to be cut to a slightly higher frequency than the antenna itself, the antenna being resonant at approximately 7050 kc.

The antenna resonant frequency is quite broad when measured with a grid-dip oscillator. For

* 70 Woodside Ave., Northport, N. Y.



The four radials are anchored to the post at the bottom of the vertical tubing. This photograph also shows the method of terminating the coax line that serves as a quarter-wave matching section.

the vertical element and radial lengths given above, the matching-section length ended up at 22 feet 11 inches (per formula this should be resonant at 7100 kc.; however, this was not actually measured). Table I shows v.s.w.r. measurements with and without the matching section. The measurements were made with a standard 75-ohm Micromatch.

Fig. 1 shows the various connectors used along the line. Waterproof JAN types are used at all outdoor positions. Sometimes the SO-239 and PL-259 u.h.f. types will act up outdoors in wet weather with a kilowatt. Actually, the UG-21 type is much easier to assemble to cable than the PL-259 type.

General

Electrically, the antenna loads a kilowatt final with a three-turn shielded link, and also works well with a Collins 32V-3. In respect to TVI, no trouble is encountered with neighbors with this mess of tubing when using an unshielded kilowatt final. Interference does exist on the writer's TV receiver, on Channel 2 only, even with the 32V-3 and a good low-pass filter, but is believed due to local ground currents with the unbalanced feed of the ground-plane antenna.

TABLE I

Voltage Standing-Wave Ratio Measurements

Frequency in Kilocycles	75-Ohm Coax	
	Direct	With Quarter-Wave 52-Ohm Matching Transformer
7000	3.6	1.6
7015	3.6	1.45
7050	Not taken	1.3
7100	3.3	1.1
7150	3.0	1.03
7200	2.9	1.13
7250	2.8	1.35
7300	2.6	1.6

Performance has been compared with that of a horizontal antenna of two half waves in phase. The ground-plane antenna is slightly inferior to the horizontal type in the latter's two favored directions. In other directions and for long-haul work this ground plane is superior and seems to play as it should. It has been noticed in working VKs in the morning that the ground plane offers noticeable attenuation to midwestern U. S. stations on receiving. It is excellent for working mobiles, and also better for daytime short-hop work than the horizontal antenna.

In spite of the writer's elevated location and the dire predictions of several members of the mechanical engineering profession, the darned thing withstood 1954 hurricanes Carol, Edna and Hazel even though the vertical element was at times bent into an approximate 90-degree arc.

Strays PROV

While operating W1AW, Chuck Bender, W1WPR, formerly W3ODU of Pittsburgh, Pa., worked W3ZSP of the same city. During the course of the QSO it was found that they both had lived in the same section of town, had gone to the same high school and had been in the same graduating class — but — they never heard of each other!

The CAA has immediate employment opportunities for electronics maintenance technicians to work at points throughout Alaska. Generally, new employees are started as GS-7s (\$4205 per annum), plus a twenty-five per cent cost-of-living differential. Selected applicants are given a 12 weeks' course of instruction at the CAA Aeronautical Center in Oklahoma City. While training, employees receive a subsistence allowance. Interested persons should complete Standard Form 57, which may be obtained from any first- or second-class post office, and forward it to the CAA Aeronautical Center, P.O. Box 1082, Oklahoma City, Okla.

Hams who like to draw inside straights, or who try for jackpots, might be encouraged by this incident. There are some 40,000 auto tags issued annually in Hamilton Co., Tenn. It's impossible to reserve a number as they are issued on a first come, first served basis. W4PL paid ten bucks at the registration window and out came tag 7373 — a 40,000 to 1 shot!

Dr. William A. Koontz of Gas City, Indiana, was recently licensed as WN9POX!

**SWITCH
TO SAFETY!**



Happenings of the Month



NOVICE FILING

In response to League petition, the Federal Communications Commission has proposed the expansion of the 7-Mc. Novice segment so that it would become 7150-7200 kc. In April, ARRL filed comment urging the speedy adoption of the proposal, as follows:

FEDERAL COMMUNICATIONS COMMISSION
Washington, D. C.

In the Matter of
Amendment of Part 12 of the
Commission's Rules Concerning } Docket 11263
Novice Class Operating Privileges }

COMMENTS OF THE
AMERICAN RADIO RELAY LEAGUE, INC.

Pursuant to Paragraph 6 of the Notice of Proposed Rule Making in Docket 11263, the American Radio Relay League files these comments. The League endorses the adoption of the proposed amendment to permit Novice operation, employing A-1 emission in the band segment 7150-7200 kilocycles.

1. The present rule-making grew out of a request filed with the Commission on August 3, 1954, pursuant to a decision of the Board of Directors of the American Radio Relay League, Inc., arrived at its meeting in May, 1954. As the Commission is aware, the ARRL Board of Directors is composed of sixteen amateurs nominated and elected by more than 45,000 licensed amateurs to represent them in the formulation of League policy.

2. On April 18, 1952, the Commission released a Notice of Proposed Rule Making, Docket 10073, which among other things proposed to make the segment 7175-7200 kilocycles newly available for radiotelegraph operation by Novice Class licensees under the usual equipment and power restrictions. On July 1, 1952, the League filed comment in this matter in considerable detail, endorsing the proposal but requesting that a larger segment, 7150-7200 kilocycles, be made available to Novices. On December 29, 1952, the Commission released its order in Docket 10073, saying with respect to the above matter:

"... consideration of providing a larger segment for Novice operation in the 7 mc amateur frequency band than that proposed preferably should be deferred until such time as experience with Novice operation in the space proposed has indicated the necessity for additional space . . ."

The Commission made final its original proposal for a 7175-7200 kilocycle segment for Novices effective February 20, 1953.

* * *

3. In its earlier comment, the League said:

"It is, of course, fundamental that adequate privileges

must be made available to accommodate the newcomers to amateur radio in the Novice Class. Yet, if the purpose for which the Novice license was created is to be served, 'adequate' privileges must not be so great as to cause such licensees to lose incentive for graduating to a higher and permanent grade of license. It is the League's belief that present low-frequency Novice privileges are not adequate by the above standards."

With more than two years of experience with Novice activity in the abbreviated segment of 7 Mc., the League believes the above comment to be still applicable. The low-frequency Novice bands are crowded, more than comfortably so. The rate of influx of newcomers to amateur radio via the Novice route continues high. The 7-Mc. amateur band has traditionally been a popular one, and accordingly occupancy by Novices in this band has been great. The space available to Novices is simply not sufficient to permit useful training in order to meet the objectives of the Novice license.

4. Aside from mutual interference between Novice amateur stations in the 7175-7200 kc. segment, another major difficulty is disruption of communication by strong signals of high-frequency broadcast stations, mostly in Europe. As the Commission knows, in Europe the frequencies 7100-7300 kc. are available for broadcasting, and indeed considerable such use is made. With high powers, and especially under present propagation conditions, these stations put signals of extreme magnitude throughout the U. S. A. in afternoon and evening hours. It becomes necessary for Novice amateur stations using the 7175-7200 kc. segment to attempt to locate a usable channel in between broadcast carriers. When one considers that only two broadcast stations can thoroughly occupy most of a 25-kc. subband, the present difficulties of the Novice licensee become obvious. Expanding the frequency range available to Novices will permit them more freedom in finding "holes" in the European broadcast band through which to conduct their amateur communication training. The increased spectrum space will alleviate the present congestion to a degree and permit greater training benefits to the Novice class licensees.

The League, therefore, urges the early adoption of the proposed amendment.

AMERICAN RADIO RELAY LEAGUE, INC.
By PAUL M. SEGAL
Its General Counsel

A. L. BUDLONG
General Manager
April 15, 1955.

MINOR RULES CHANGES

FCC has amended the amateur rules to provide that the holding of a commercial radiotelegraph third-class operator permit will, inasmuch as the required code speed is 16 w.p.m.,

(Continued on page 156)



This neat layout is K2CWX at the Albany, N. Y. VA hospital. In street clothes are volunteer instructors KN2JQZ and W2EOM. With them are patients KN2JCM and K2ABX. The VA has shown an interest in encouraging amateur activity in its hospitals; one of its publications currently contains an article, prepared with the cooperation of ARRL, explaining the use of amateur radio in recreational programs. Amateur clubs near VA hospitals should be able to assist by helping to set up stations and by conducting classes in code and theory for patients.

QST for

Guys for Guys Who Have To Guy

Calculating Load of Rotary Beam Supports

BY LEWIS H. ABRAHAM,* W6FHR

• This article tells how to calculate the wind load on a mast or tower supporting a beam antenna, and the amount of guying required to make the installation safe. In his spare time from ham radio, W6FHR is a structural engineer for one of the major aircraft companies.

EACH YEAR, as the competition for available amateur space has become keener and keener, antennas have grown steadily higher and higher. Time was when a wire a few feet above ground would cut a healthy swath across the bands. The average ham was usually satisfied with a wire between a 2x4 on the roof and the old oak tree in the yard. If the thing came down, you were off the air for only a few days, and nothing more. Then some enterprising fellow found he could do better if he raised his wire, and the race for height was on. Today, some installations rival the Tower of Babel.

For sticks of 20 or 30 feet, almost any sort of guying usually will be sufficient. But as we start reaching for heights of 50 feet and upward, with beam arrays, the problem becomes magnified, involving the element of danger to life and property. After listening on the air to some descriptions, one can only take comfort in the old adage, "The Lord protects fools and drunks," which, it appears, should also include hams.

Beam Load

In designing a system of guys, the total wind load on the antenna and tower for some safe value of wind pressure must be determined. Contrary to general opinion, the weight placed on the top of the tower is relatively unimportant compared to the wind load. The top load will usually take care of itself when the wind load is compensated. In fact, the vertical components of the tension load of the guys themselves will, in all probability, exceed the top weight of the average amateur installation.

In calculating the wind load for which the guy system should be designed, the requirements of the local building codes should be observed. While the figure will vary from community to community, a general allowance of a unit wind

load of 30 lbs. per square foot of exposed area will meet most regulations. For round cross sections, such as beam elements or round poles, two thirds of this value, or 20 lbs. per square foot is permissible.¹ In hurricane belts or localities where abnormal winds or icing can be expected, your local building department should be consulted for recommendations.

The total wind load will be

$$L = PA,$$

where P is the unit load in pounds per square foot, and A is the total projected area in square feet.¹ The projected area of members of round cross section is the length times the diameter; for rectangular cross sections, it is the length times the diagonal of the cross section.²

Let us take a typical 20-meter beam, such as sketched in Fig. 1, as an example. The projected area of the elements is calculated first. Since the elements are made up of sections of different dimensions, the areas of each section must be calculated separately, and then added. The area of the three 12-foot center sections is

$$(12) \left(\frac{1\frac{1}{2}}{12} \right) (3) = 4.9 \text{ sq. ft.}$$

The projected area of the outer sections of the elements is

$$(34.8 - 12) \left(\frac{1\frac{1}{2}}{12} \right) = 2.3 \text{ (reflector)}$$

$$(33 - 12) \left(\frac{1\frac{1}{2}}{12} \right) = 2.6 \text{ (driven element)}$$

$$(31.4 - 12) \left(\frac{1\frac{1}{2}}{12} \right) = 2.4 \text{ (director)}$$

$$\overline{\hspace{1.5cm}} \text{ 7.8 sq. ft. total.}$$

The total projected area of the elements is
 $4.9 + 7.9 = 12.8 \text{ sq. ft.}$

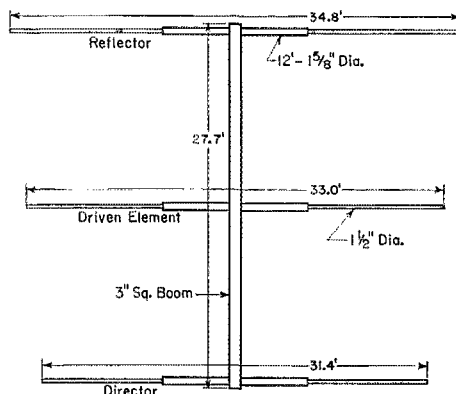
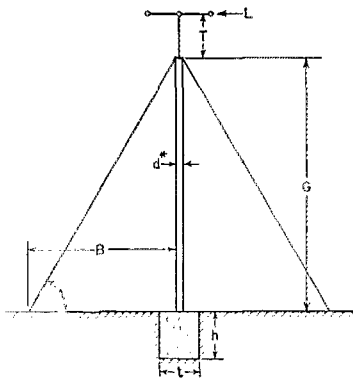


Fig. 1—Typical 20-meter parasitic beam whose dimensions are used in a sample calculation.

* 11339 Gladwin St., West Los Angeles, Calif.

¹ Wind load on a flat surface is about 50 per cent greater than on an equivalent surface of a member of round cross section.

² Although the wind load on a member of square cross section with a corner pointing into the wind is less than on an equivalent flat surface, this fact is neglected in most building codes, and the projected area is treated as though it were flat.



Round Section
Guy Load = $KM[20(\frac{Gd}{2}) + L(1 + \frac{T}{G})]$
 $S = 10Gd - \frac{L^2}{G}$

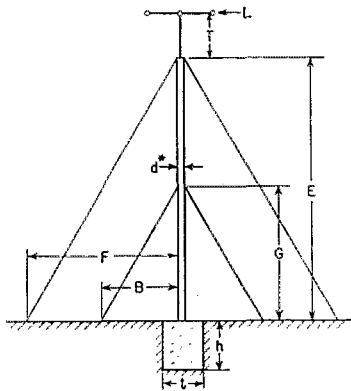
Square Section
Guy Load = $KM[30(\frac{Gd}{2}) + L(1 + \frac{T}{G})]$
 $S = 15Gd - \frac{L^2}{G}$

Fig. 2 — Diagram and formulas for a system using a single set of guys. *See text for calculating d for lattice masts. All dimensions should be in feet. Dimension T should be held to a minimum.

Using a unit wind load of 20 lbs. per sq. ft. (because the elements are round), the wind load on the elements is

$$(20)(12.8) = 256 \text{ lbs.}$$

The boom in this example is square, so we must use the diagonal of the cross section in



Round Section,
Upper Set
Guy Load = $KM[20d(\frac{E-G}{2}) + L(1 + \frac{T}{E-G})]$

Lower Set,
Guy Load = $KM[20(\frac{Eg}{2}) - (\frac{L^2}{E-G})]$
 $S = 15Gd$

Square Section,
Upper Set
Guy Load = $KM[30d(\frac{E-G}{2}) + (1 + \frac{T}{E-G})]$

Lower Set
Guy Load = $KM[30(\frac{Eg}{2}) - (\frac{L^2}{E-G})]$
 $S = 20Gd$

Fig. 3 — Diagram and formulas for a system using a double set of guys. *See text for calculating d for lattice masts. All dimensions should be in feet.

³ Under certain circumstances, the total wind load on elements and boom, with winds at angles other than a right angle might be somewhat greater than either of the two calculated loads. However, this design is sufficiently conservative to permit the simplification.

computing the area, and a pressure of 30 lbs. per sq. ft. in calculating the load. The diagonal of a 3-inch square is 4.25 inches, so the projected area is

$$A = \left(\frac{4.25}{12}\right)(27.7) = 9.8 \text{ sq. ft.,}$$

and the boom load is

$$(9.8)(30) = 294 \text{ lbs.}$$

Thus the critical load is on the boom, and it is this load that is used for the load L in Figs. 2 and 3.³

Tower Load

Having obtained the antenna wind load, the load of the tower should now be calculated. The dimension d in Figs. 2 and 3 is the diameter of a pole of round cross section, or the diagonal of a mast of square cross section.

If the tower is of latticed construction, the resulting load will be conservative if the surfaces are considered to be solid. Alternatively, if the actual area is used, it should be increased by

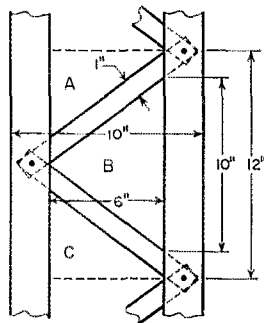


Fig. 4 — Typical section of lattice mast discussed in the text.

50 per cent. If the latter is used, an effective d must be determined. This is the diagonal cross section of a solid mast having the same total surface area. If, for example, the construction is that shown in Fig. 4, the total area for each bay is

$$(10)(12) = 120 \text{ sq. in.}$$

The actual area is the total area minus areas

(Continued on page 14E)

Angle A	B/G or F/E	K
59°	0.6	1.94
51°	0.8	1.60
45°	1.0	1.41
40°	1.2	1.30
36°	1.4	1.23

Guy's in Set	M
3	1,150
4	1,000
5	.619
6	.578
7	.457
8	.415



Hints and Kinks

For the Experimenter



POWER-CONTROL KINK FOR MOBILE OPERATION

In mobile installations using a dynamotor plate supply, the *carry-over* voltage that lasts for a short interval after the dynamotor primary power has been turned off will frequently prevent real rapid break-in operation. This can easily be prevented in installations that employ a d.p.d.t. relay for antenna and plate-supply control by wiring the relay circuit as shown in Fig. 1. In this arrangement, R_1 (approximately 100 ohms) is

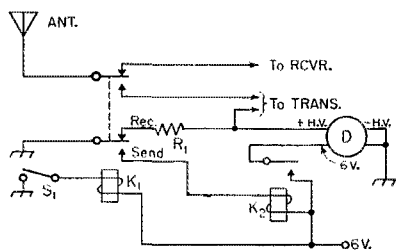


Fig. 1—A transmit-receive hook-up that prevents holdover of the dynamotor output voltage. K_1 and K_2 are the antenna changeover and dynamotor starting relays, respectively. R_1 is the dynamotor grounding resistor (see text) and S_1 is the push-to-talk switch.

connected between the output terminal of the dynamotor and ground whenever the relay is tripped to the *receive* position. This action bleeds the supply output to ground almost immediately.

— Fred Nazar, WSRNA

CONVERTING THE "SIAMESE PADDLE" FOR BUG-TYPE OPERATION

The simple and inexpensive keying mechanism, "The Siamese Paddle," described in *QST* for July, 1952, and again in *Hints and Kinks*, Volume Five, can be converted to a first-class bug with a minimum of additional cost and effort. The simple modification which provides for bug-type operation of the key is shown herewith as Fig. 2.

The vibrating arm for the bug is made from a hack-saw blade or a length of spring steel. A hole drilled in the front end of the arm allows

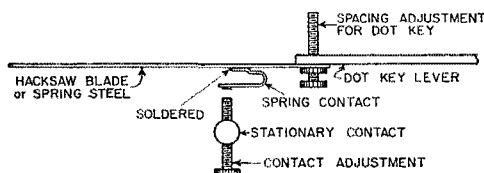


Fig. 2—A simple system for converting the "Siamese Paddle" to a bug.

it to be attached to the *dot* lever of the Siamese Paddle by means of the original spacing adjustment screw. A homemade spring contact is soldered to the vibrating arm as shown in the drawing. In a fancier version of the bug, this contact could be made adjustable along the arm. The stationary contact and the contact adjustment for the dot arm may be made from a binding post and a 6-32 machine screw.

The vibrating arm for the key must be weighted down to slow the dot rate down to a reasonable speed. This may be accomplished by wrapping wire-type solder around the arm. An ordinary clothespin will serve the same purpose for some speeds of operation.

Because the two levers of the bug are not mechanically linked, it is possible to strike a dash character before a dot action has been overcome. However, this tendency can easily be avoided after a little practice.

— Jack Gjovaag, W7UKI

CONSTRUCTION HINT

THE mounting and the wiring of small components can be simplified and made extremely appealing in appearance by employing the hint shown in Fig. 3. The length of No. 16 tinned wire which runs between center posts of each pair of



Fig. 3—The wire bridge between sockets as suggested by W1HXQ.

miniature sockets can be used for both support and connection at the ground ends of resistors, capacitors, etc. Filament and other power wiring follows the chassis as usual. Remember to ground the center post of each socket to the nearest convenient point.

— Ralph J. Kempton, W1HXQ

NOVEL VENTILATING SYSTEM FOR MOBILE UNITS

ADEQUATE cooling for some of those compact under-the-dash units can be provided for—without blower—simply by running wiper hose to the wiper line or to the manifold. Frequently, enough air will be drawn in through crevices around the cover, shaft openings, etc., of a unit to make unnecessary the drilling or punching of any special ventilation holes or louvers.

— Harry E. Adams, W9JX

A 5-Over-5 for 50 Mc.

A Stacked Array of Unusual Design

BY WILLIAM A. TYNAN,* W3KMV

WHILE a great deal of good work can be and is being done on 50 Mc. with fairly modest antennas, the full capabilities of the band are not being realized by amateurs using single Yagi antennas of four elements or less. Much of the excellent coverage on 144 Mc. and above is the result of the very elaborate arrays in use. One may argue that it is easier to construct multi-element beams for the higher bands than it is for six meters. This is true if you are referring to a particular number of elements, but it is not true when referring to physical size. If anything, an antenna of a fixed

frequency, it can be seen that the same inverse frequency relationship holds for any particular configuration of elements, not just for dipoles. Thus, if one uses a 4-element array on ten meters, it would be logical to use an 8- or 10-element array on six meters and a 16- or 32-element array on two meters in order to maintain the same general performance on receiving. It is admitted that these are not necessarily comparable antennas, but this illustration is used only as an example.

From the foregoing, it can be seen that a large antenna on any band is advantageous. Six meters, especially, has suffered from the general use of small antennas. On 28 Mc. and below, antennas have to be rather large in order to resonate. On 144 Mc., the more serious workers have gone to quite large arrays with notable results. It is the writer's opinion that the same procedure on six meters will yield results which would surprise many amateurs. It should be possible for stations using high power and large antennas, such as the one to be described, to communicate on 50 Mc. over distances of 800 to 1000 miles on a regular year-round schedule basis. This might have to depend on c.w. most of the time, but it would be communication nevertheless. The basis for this statement is the work being done on 49.8 Mc. by the National Bureau of Standards on a 775-mile path between Cedar Rapids, Iowa, and Sterling, Virginia. While this work is being conducted with a transmitter output power of about 25 kw. and transmitting and receiving rhombics with gains of 18 db. over a dipole, signals of 10 to 20 db. over one microvolt are common. Amateurs can copy much less than this with low-noise narrow-band receivers; probably enough less to make up for the approximately 30-db difference in power and antenna gains involved.

An antenna for 50 Mc. should have good power gain, and fairly large size, but should not be too complicated electrically or ponderous mechanically. Such an antenna is the one to be described. It consists of two 5-element Yagis vertically stacked with a spacing of $\frac{5}{8}$ wavelength between bays. Each Yagi uses 0.2 wavelength spacing between elements. Using this spacing as a starting point the element lengths on a single 5-element array were adjusted for maximum forward gain over a half-wave dipole without regard to front-to-back ratio. Each time element lengths were adjusted, the v.s.w.r. of the transmission line was checked and if necessary, matching adjustments were made. Dimensions worked out as follows: reflector — 115 inches; driven element — 108 inches; first director — 107 inches;

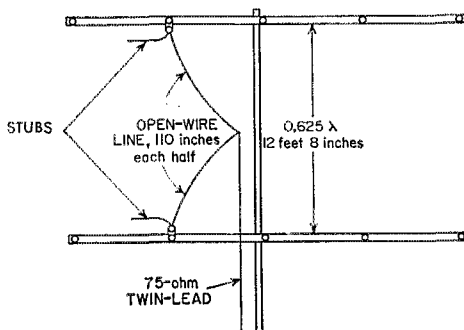


Fig. 1 — Stacking and feed details of the W3KMV array. Closed-end extensions of the phasing lines tune out the reactance of the "T" section on each driven element; see Fig. 2.

physical size is simpler for 6 than for the higher bands. The large 50-Mc. array has fewer elements and is, therefore, easier to feed.

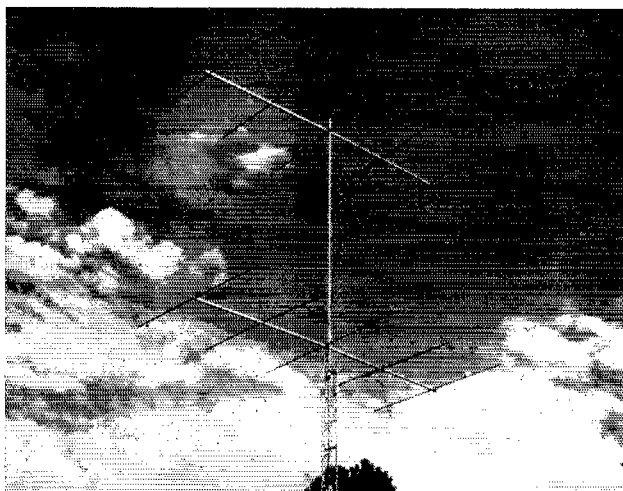
Why all the emphasis on physical size, one might ask? Isn't the important thing the power gain and isn't that dependent on the number of elements? The answer is "Yes," but there is an additional factor which must be considered: the performance of the antenna on receiving.¹ An antenna with a certain gain on transmitting will give the same gain on receiving. This gain figure, however, is in reference to a dipole cut for the frequency in question, and it can be demonstrated that the efficiency of a dipole as a receiving antenna is inversely proportional to frequency. Dipoles for the higher frequencies are smaller and therefore intercept less wave front and consequently deliver less voltage to the antenna terminals of the receiver.

Since the gain of a certain type of antenna is expressed in terms of a dipole for the same fre-

* 9417 Jones Mill Road, Chevy Chase, Md.

¹Beers, "The Wavelength Factor," *QST*, February and May, 1952.

The 10-element stacked 50-Mc. array at W3KMV, Chevy Chase, Md.



forward directors — 105 inches each; element spacing — $47\frac{1}{4}$ inches.

Details of the stacked array are given in Fig. 1. The phasing line is 1-inch spaced open-wire TV line, 450 ohms impedance, 21 feet 6 inches overall. Each bay is fed through a "T"-Match, made as shown in Fig. 2. The T sections are connected to the phasing line at points about 110 inches

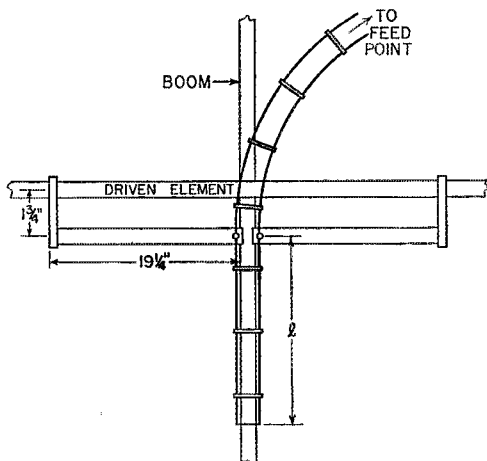


Fig. 2 — The "T"-match used on the driven elements in the 50-Mc. stacked array. Length "L" is 19 inches for antenna dimensions given.

each side of the center. This point was found to give the lowest s.w.r. experimentally, but instead of presenting a pure resistance the antennas showed a capacitive reactance. This reactance could have been tuned out with inductors, but a superior method, both mechanically and electrically, was to continue the line beyond the T section, using a shorted line as an inductor.² The optimum length was determined experimentally to be about 19 inches. The minimum s.w.r. was found to be 1.35 to 1 at 50.2 Mc. The

main feed line is 72-ohm transmitting Twin-Lead.

The mechanical construction of the antenna is quite simple and straightforward. Each array is constructed of $\frac{3}{4}$ -inch aluminum tubing for the elements and $1\frac{1}{4}$ -inch steel tubing for the booms. The elements are fastened to the booms by "U" clamps which are available at any TV wholesaler. Two $\frac{1}{4}$ -inch holes are drilled in the center of each element to receive the "U" clamps. The steel tubing for the booms is also standard TV hardware, while the aluminum tubing was purchased from a wholesale metal distributing concern. The vertical support is 1-inch water pipe, the outside diameter of which is approximately $1\frac{1}{4}$ inches, so it fits standard TV hardware including the rotator. The booms are fastened to the vertical support by the same type "U" clamps that are used to fasten the elements to the booms. Holes are drilled in the vertical water-pipe support to receive the "U" clamps.

The supporting structure is a Channel Master tower of triangular design, using 1-inch aluminum tubing for the main vertical members. The tower is well cross-braced and is equipped with a climbing ladder. At W3KMV the antenna uses three sections giving a tower height of thirty feet. The bottom of the tower is fitted into three pipes of slightly larger diameter than the tower members, and bolts are run through holes drilled in these pipes and matching holes in the tower legs to support the vertical load. The three pipes are set about one foot into concrete.

No guys are used in this installation. Instead, the tower is located next to the house and a bracket built of 2 by 4s is fastened to the house with 4-inch lag bolts. The tower is in turn held to this bracket with "U" bolts around two legs of the tower. As a precaution against crushing the tower members, small sheets of aluminum were bent to fit between the "U" bolts and the tower legs. The support is at the 22-foot level or about two feet from the bottom of the top section. This seems to give adequate support as the

(Continued on page 144)

² *The Radio Amateur's Handbook*, page 317 in 1954 edition; page 308 in the 1955 edition.

Six Meters for the Beginner

Part II † — Receiving Equipment; a Simple Converter

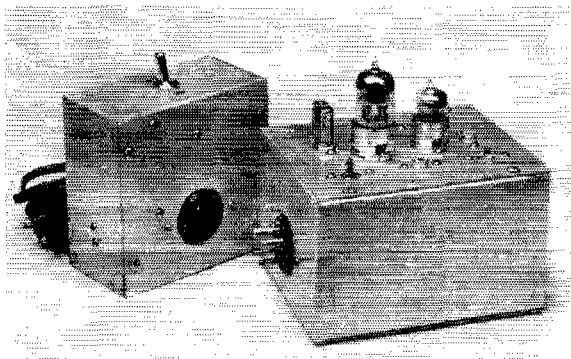
BY EDWARD P. TILTON, WH1DQ

IF YOU'RE breaking into the ham game on 80 and 40 meters, as so many newcomers do, you can take care of the receiver problem in several ways. Possibly you'll build your own, though not many do, these days. You may buy one of the new low-priced jobs, or invest the same amount of money in a used receiver that probably cost considerably more when it was new. Unless you're much better fixed financially than most of us, you'll take one of these alternatives to the purchase of a strictly first-class receiver.

And you'll make out all right, whichever way you choose. There'll be moments when you'll

To be sure, receivers selling all the way from \$39.50 to \$997.50 have been built with 6-meter coverage, but the sad fact is that not one of them does a completely satisfactory job of receiving on the band. A few, very few, have come close, but every wide-range receiver needs something additional in the way of ham-made gadgets to make it fill the bill on 6.

This is no fault of the receiver manufacturer. To build a receiver that would do a first-class job on 50 Mc., he'd have to put in characteristics that would hamper performance on the pay-off bands lower in frequency. The designer must work to



The 50-Mc. crystal-controlled converter and its selenium-rectifier power supply. Power may be drawn from the receiver with which the converter is used, if it is convenient to do so.

yearn for a mechanical filter, and you may get pretty well fed up with that none-too-good dial, but you'll have fun. You will nearly always be able to work someone, and while he may not be the choice DX you'd like to snag, he's a brother ham, and you'll enjoy talking with him.

Things are a little different on 6, however, and on the higher v.h.f. bands, too. Here the best receiver is none too good, and one that is much less than the best is an abomination. The difference lies in the nature of the bands concerned, and in the way we use them. You have to be able to hear the weak ones on 6; if you can't, you'll miss the basic appeal of operation on the band. A small receiving deficiency can easily cut your operating radius in half, and under those conditions there's just not much fun in it. Take the word of any experienced 6-meter man: Be sure that you have good receiving facilities, right from the start.

The Manufactured Receiver

"Can I buy a good 6-meter receiver, and if so, who makes it?" This question is asked again and again, but there is no good answer, at least for the fellow who must have coverage from the broadcast band through 50 Mc., in one package, right hot off the production line, ready for use.

† Part I of this article appeared in *QST* for May, 1955.

satisfy his largest group of customers, so the high-frequency end of the coverage suffers.

The addition of a low-noise preamplifier will make a satisfactory receiver out of some of the jobs that tune the 50-Mc. band. How then to tell the usable ones from those that are hopeless so far as 6 is concerned? Here are the main considerations: The receiver must have double conversion; otherwise it will suffer from either of two bad failings. It will have a high intermediate frequency, which means inadequate selectivity and poor signal-to-noise ratio. Or, if it has a low (455-ke.) i.f. it will have little or no image rejection, and signals will repeat 910 kc. away from their main tuning point. There is no simple cure for these faults.

Here are some of the double-conversion receivers that tune the 50-Mc. band: SX-73, SX-71, NC-183D, HRO-60 (with extra coil set, optional, at extra cost), SP-600. Any of these, with a low-noise preamp. added, will do a passable job on 6.

The Converter Approach

Any decent receiver does quite well on the frequencies below 14 Mc., so the best way to receive 50-Mc. signals is to use a converter ahead of a communications receiver tuned to 14 Mc. or lower. With a 6-meter converter, we can design

our tuned circuits and select our tubes for optimum performance at the frequency we're interested in, and this makes a tremendous difference. Fortunately, converter design and construction is a fairly simple matter. You can make a converter for 6 that will work better there than the fanciest communications receiver on the market.

V.h.f. converters fall into two general categories. There is the tunable kind, in which an oscillator is tuned across a frequency band above or below the signal frequency. Output from this oscillator beats with the signal and produces a resultant (or intermediate) frequency, which is then fed into the communications receiver. This i.f. is usually between 7 and 14 Mc., for 50-Mc. converters, though anything down to 2 Mc. can be used. Such a converter must have a good dial, and its oscillator must be highly stable. These factors don't come easily, so the tunable converter is losing favor among v.h.f. men.

The alternative is the use of a crystal-controlled oscillator or multiplier voltage to mix with the signal. The difference frequency (or i.f.) must then be varied across a 4-megacycle range, to cover the 50-Mc. band. This approach introduces some problems, too, but the advantages outweigh the adverse factors. The crystal-controlled converter is rapidly becoming almost standard equipment in v.h.f. work today. Fortunately, it is now possible to build a crystal-controlled job at relatively low cost, and with a minimum amount of complicated adjustment procedure. Here's how:

The "Simplest" Converter

If you've looked over the converter descriptions in the *Handbook* you may be a bit confused about what constitutes a suitable design. If the basic minimum of one tube will do the job, why go to two — or three, or even more? Why i.f. and r.f. amplifiers, if a dual triode working as a combined mixer and oscillator will receive signals? We won't go into these questions at length here, except to say that there are good reasons for the complications you find in the *Handbook's* chapter on v.h.f. receivers. What we'll consider right now is the minimum that we can build and still do a good job of receiving; a better job than any wide-range communications receiver alone will do on 6.

Every converter must have a mixer and an oscillator. These functions are performed in our set-up by a 12AT7 dual triode. Looking at the middle of the schematic diagram, Fig. 1, we see that these portions of the converter could hardly be simpler. The mixer (upper half of the 12AT7) doesn't even have any tuned circuits. A resistor in the plate lead takes the place of the usual plate coil. This makes it necessary to mount the converter close to the receiver antenna connections, but it keeps down the number of parts needed, and simplifies adjustment procedure.

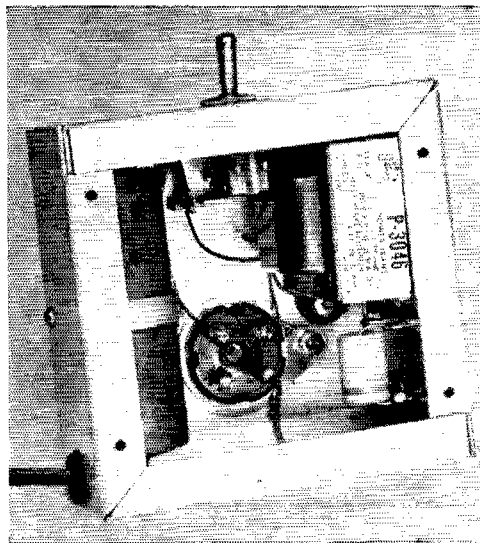
The crystal oscillator makes use of a v.h.f. overtone crystal on 43 Mc. This one was obtained from the International Crystal Mfg. Co., Okla-

• Since the 50-Mc. band was opened to Technician Licensees April 12th, Headquarters mail has contained many letters from newcomers asking about 6-meter gear and antennas. This series of articles for the beginner on 6 was prepared in anticipation of just such requests. Part I (May *QST*) described the nature of the band. This one discusses the 6-meter receiver problem and presents a simple solution. Part III will cover transmitters and antennas, and describe a transmitter especially suited to the beginner's needs.

homa City, and similar crystals are available from most manufacturers. A crystal on the required injection frequency eliminates the necessity for multiplier stages, and makes possible the use of an oscillator circuit of elementary simplicity. The communications receiver is tuned from 7 to 11 Mc. in covering 50 to 54 Mc. with the converter.

We could receive signals with only this one tube, but adding an r.f. stage improves the performance in several ways, therefore it is well worth the slight extra complication. Its input and output circuits help to minimize interference from outside the converter's intended tuning range, and the added stage will increase the effective sensitivity many times.

Our r.f. amplifier tube is a 6AK5 pentode. Lower noise, for about the same gain, could be obtained with a cascode-type dual-triode amplifier, but the performance of this pentode stage is satisfactory, and its circuit and parts requirements are considerably simpler than the triode amplifier. Tuning is done by adjusting the slugs in the grid and plate coils; there is no capacitance



Interior of the converter power supply. The transformer is in the upper right corner. Below it is the selenium rectifier. The dual electrolytic filter capacitor is at the left.

across the coils other than that inherent in the tube and associated components and wiring. The slugs may be set so that the converter will work well across the entire band, or its response can be peaked for any part of the band in which the operator may be particularly interested.

It is often possible to draw the small amount of power needed for the converter from the receiver power supply. This is easily done if the receiver has any accessory socket on the rear wall, or inside the cabinet. If there is no such socket on your receiver, you can tie into the receiver directly with little trouble. A plate voltage of about 150, at only a few milliamperes,

side of the tubes. The crystal socket is one inch in from the end, in any position that may make mounting and wiring convenient.

If the converter is to be run from the receiver power, through the accessory socket, the power connector, J_3 , may be mounted so as to plug directly into the socket, if space is available. The type and position of the connector will then be determined by the receiver socket. If it is more convenient, the converter may be connected to the accessory socket through a detachable cable.

Fittings of the phonograph connector type are used for the antenna and i.f. output connections. The more expensive and more satisfactory con-

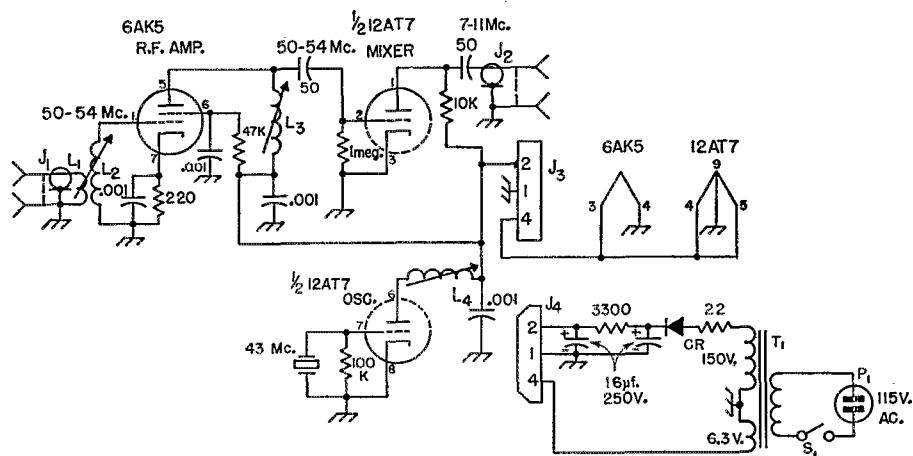


Fig. 1 — Schematic diagram of the 50-Mc. converter and its power supply. All resistors $\frac{1}{2}$ watt. All capacitances less than 0.001 μ f. in μ f.

- L_1 — 4 turns No. 28 d.s.c., close-wound over ground end of L_2 .
- L_2 — 12 turns No. 24 enamel, close-wound on $\frac{3}{8}$ -inch diam. iron slug-tuned form (National XR-91).
- L_3 — 8 turns No. 24 enamel, close-wound on XR-91 form.
- L_4 — 14 turns No. 24 enamel, close-wound on XR-91 form.

- J_1, J_2 — Phono jack.
- J_3 — 4-contact male chassis fitting (Amphenol 86RCP4).
- J_4 — 4-contact female chassis fitting (Amphenol 78RS4).
- P_1 — 115-volt line plug.
- SR — 20-ma. selenium rectifier (Federal 1159).
- T_1 — Power transformer, 150 volts at 25 ma.; 6.3 volts at 0.5 amp. (Merit P-3046).

will do the trick. If you're dubious about digging into the receiver, we have made a little power supply for the converter that can be built in as part of the converter, or made as a separate unit as shown. The latter approach is recommended, as the supply will then be available for other purposes that may arise.

Construction

Our converter is assembled on the top cover of a standard aluminum utility box, 3 by 4 by 5 inches in size. The tube sockets and antenna input socket are along the center line of the plate. The antenna socket is one inch in from the edge, the r.f. amplifier socket $\frac{7}{8}$ inch farther, and the two tube sockets are $1\frac{1}{4}$ inches apart. The input circuit slug-tuned coil, the i.f. output connector, J_2 , and the oscillator coil, L_4 , are mounted along a line one inch in from the long side of the plate, with their centers $1\frac{1}{2}$ inches apart. The r.f. plate coil, L_3 , is at the center of the plate lengthwise, and is also one inch in from the edge, on the other

ventional coaxial connectors may be substituted. The antenna input may be a crystal socket, if the antenna system to be used is fed with Twin-Lead or open-wire transmission line. If either of these lines is used, the low side of the antenna pick-up coil, L_1 , should be left ungrounded.

With the physical arrangement shown, it may be necessary to file out small notches in the bent-over portion of the case, to make room for parts that are mounted near the edges of the top plate. Leads to the power fitting, J_3 , should be made long enough to permit removal of the converter from the case without disconnecting the leads. This will simplify making changes in the main wiring, if this should become necessary.

Neatness and short leads are made possible through the use of two single-lug tie-point strips. One, mounted under the nut that holds the 6AK5 socket in place, supports the junction between the low side of L_3 , the 47,000-ohm screen resistor, and the by-pass capacitor. The other, on the opposite side of the 12AT7 socket, supports

the junction of L_4 , its by-pass capacitor and the plate load resistor of the mixer.

Power Supply

Use of the receiver power is recommended. No specific connections can be given, as the accessory sockets on the various receivers have no standard terminal arrangement. Check your instruction book or schematic diagram. If the socket is on the rear wall of the receiver, the connector of the converter may be so placed as to plug directly into it. Operation from a regulated source is fine, if the regulated supply in your receiver is brought out to the accessory socket, and if it will stand the extra current. Apply the voltage to the converter and see if the regulator tube continues to glow. If the tube goes out it is loaded too heavily, and you'll have to take the converter voltage from the unregulated terminal.

The small selenium-rectifier power supply shown in the photograph, and in Fig. 1, is adequate for the job, if you want a power supply that is independent of the receiver. It is built in a $2 \times 4 \times 4$ -inch aluminum utility box. Parts may be arranged to suit one's own convenience. The power output fitting, J_4 , is positioned so that connection can be made to the converter with the unit resting on one of the 2-inch sides. The on-off switch is on the top surface. The a.c. cord is brought out through a rubber grommet in a hole in the main part of the case, near the bottom.

Adjustment & Use

The first step in firing up the converter is to check the operation of the oscillator. This is simplified if plate voltage is applied to that section only. Connect a plate milliammeter (0 to 10 ma. or higher range) to read the oscillator plate current, insert the crystal, and adjust the position of the slug in L_3 . There will be a drop in plate current as the coil is tuned to resonance. In the original model the crystal oscillated over the entire tuning range of the plate coil, with the current dropping to 4.5 ma. at resonance.

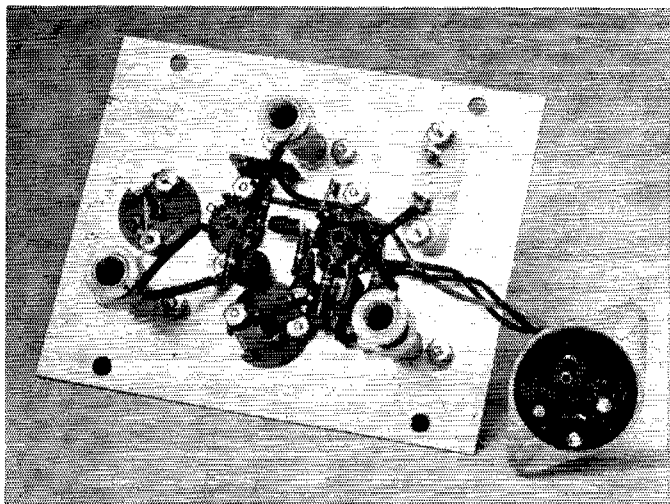
If the rest of the converter is wired correctly, you should be able to receive signals by connecting an antenna to J_1 , and running a short coaxial cable from J_2 to the antenna terminal of the receiver. If your receiver has three terminals on the antenna connection strip, two of these should be connected together to the outer conductor of the coax. The inner conductor goes to the third, which is the terminal intended for the antenna when end feed or single-wire antennas are used.

For the final adjustments you will need signals, a signal generator, or a noise generator, the last being the best of all. If you want fairly uniform reception across the entire band, set the communications receiver at 9 Mc. Peak the slugs in L_2 and L_3 for maximum response at 52 Mc. If response drops off markedly at either end, the slugs may be stagger-tuned slightly to bring up the response as needed. For peaked response over the first megacycle of the band (where most of the activity is currently) set the receiver at 7.5 Mc., and peak for maximum response at 50.5 Mc.

Merely peaking the coils for maximum response will give you somewhat less than optimum signal-to-noise ratio. After they have been peaked in this way, then checking with a noise generator for lowest noise figure will give the best possible reception in terms of signal margin over noise. Adjustment for best signal-to-noise ratio can be made on received signals, but it is somewhat more difficult than the noise generator method. Use a relatively weak signal, and then adjust the slugs in L_2 and L_3 so that the signal shows the greatest rise over the residual noise. This may be at a slightly different setting of the slugs than that which produces the highest S-meter reading or signal volume.

When the converter is working properly there should be a considerable increase in noise when the antenna is connected, even in a location that is remote from man-made noise. This test will show up just about any commercial receiver on the 50-Mc. band, except for a few that were designed especially for v.h.f. use.

All the parts of the 50-Mc. converter are mounted on the utility box cover plate. At the left are the antenna socket and input circuit. Next is the 6AK5 socket, with the i.f. output socket at the lower center, and the r.f. plate coil above. The oscillator coil and crystal socket are at the right side of the 12AT7 socket.



• Recent Equipment —

The Hallicrafters SX-96 Receiver

ALTHOUGH the new SX-96 is a compact receiver (18½ by 8½ by 11 inches deep), it can hardly be called a "little" one. Any double-conversion receiver that tunes 0.54 to 34.0 Mc., provides for selectable-sideband reception and has five degrees of selectivity, is not a "little" receiver.

It is an easy matter to visualize the receiver electrically if you look at the block diagram in Fig. 1. The front end, consisting of the 6CB6 r.f.

receiver of this type following a crystal-controlled converter, 7 revolutions of the tuning knob are required to tune 7 to 11 Mc., and 4½ revolutions tunes 14 to 18 Mc. On the bandspread dial, the knob revolutions and tuning ranges are: 19 for 3.5 to 4.0 Mc., 9½ for 7.0 to 7.3, 9½ for 14.0 to 14.35, 3½ for 21.0 to 21.45, and 6½ for 28.0 to 29.7 Mc. The tuning knobs are counterweighted and drive their respective tuning capacitors through gear mecha-

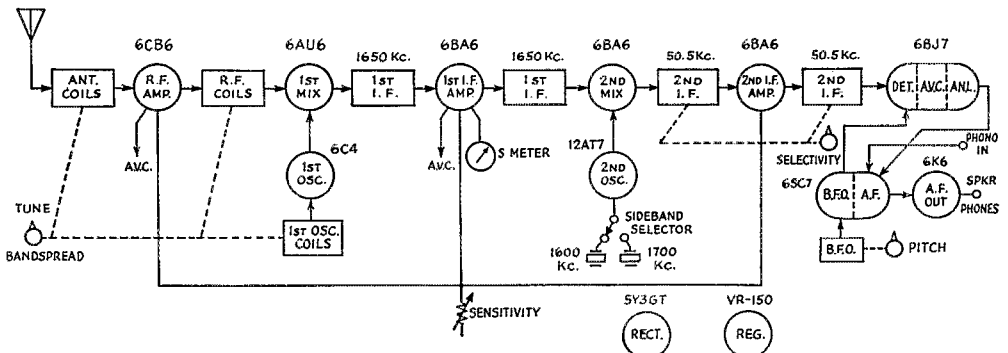
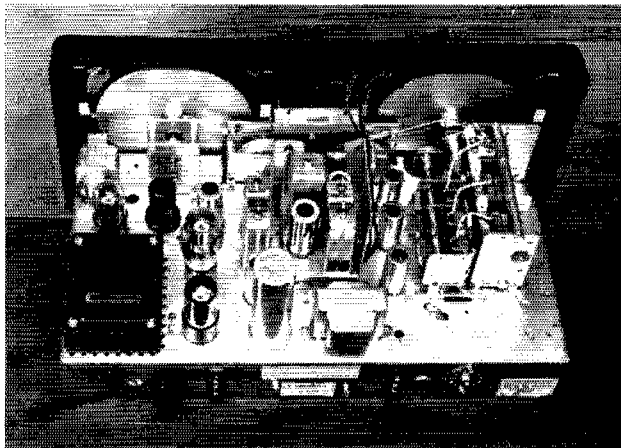


Fig. 1 — Block diagram of the SX-96 receiver.

stage, the 6AU6 first mixer (cathode injection) and the 6C4 oscillator, provides for bandset and bandspread tuning through the use of two sets of ganged capacitors. The tuning ranges for the bandset dial, with the bandspread dial set at the minimum capacity end, are 0.538–1.58 Mc., 1.72–4.9 Mc., 4.6–13 Mc., and 12–34 Mc. For the v.h.f. men who use general-coverage tuning of

nisms and, on the bandspread tuning, a metal cable.

Following the first mixer, the signal passes to a 1650-ke. i.f. stage and then to a 6BA6 second mixer. Here again, cathode injection is used, but the second oscillator is a 12AT7, of which one section is crystal-controlled at 1600 ke. and the other at 1700 ke. A panel switch



Removing the chassis from the cabinet permits a better look at the SX-96. Here one can see the tuning condensers at the right, with the r.f., mixer and oscillator tubes alongside. The subassembly at the center of the chassis is part of the selective 50-ke. second i.f. amplifier, and the audio and power-supply tubes are at the left. The two large disks against the panel are the gears driven by the bandset and bandspread knobs.

marked "Response" controls the selection of one or the other of these oscillators to give selectable-sideband reception.

The second i.f. amplifier is at 50.5 kc. and uses four high-*Q* tuned circuits. The selectivity is

receiver for anyone who might want to play a few records through the receiver while waiting for the 10-meter band to open up.

The front-panel controls, other than the band-set and tuning controls already mentioned,

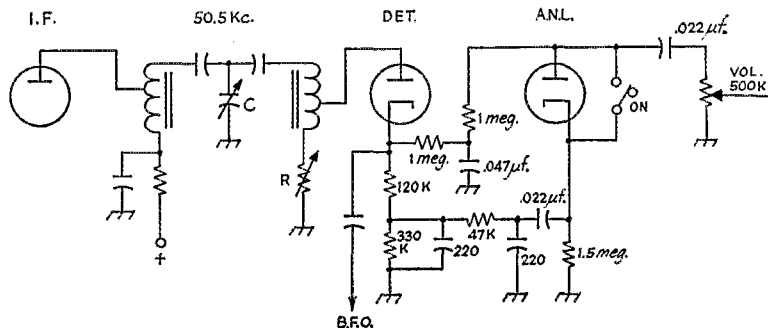


Fig. 2 — Simplified schematic diagram of part of the i.f. amplifier, to show how the selectivity is varied, and the automatic noise-limiter circuit that is used with a.m. and c.w. reception.

In the i.f. tuned circuit, the capacitor *C* couples the two circuits — lower values of capacitance increase the coupling. The resistance *R* varies the *Q* of one tuned circuit. The combination of coupling and *Q* changes permits the selectivity to be varied over a wide range.

The noise-limiter circuit is a variation of the self-adjusting series-limiter circuit. Its diode conducts as long as the cathode is negative with respect to the anode, and signals can pass. If the cathode is driven positive instantaneously, as by a noise peak, the diode is non-conductive during the interval, and that portion of the signal is not passed to the audio amplifier.

varied in approximately the same way that it is in the SX-88, by switching in various coupling capacitors and resistors. The ranges are nominally 0.5, 1, 2, 3 and 5 kc. — the manufacturer's curves show the 0.5-ke. position to be 500 cycles wide at 6 db. down and 3800 cycles wide at 60 db. down. In c.w. operation this gives quite good "super-selective c.w." performance and no trace of an audio image on the other side of zero beat. The 3-ke. position is shown as 12-ke. wide at 60 db. down, and the 2-ke. position is 10 kc. wide at that attenuation — these two selectivities are the ones most likely to be used by s.s.b. operators and for a.m. reception under bad QRM conditions. As in the S-76 and SX-88, the bandwidth "grows out" in one direction from the sharpest position mid-frequency, and the operator must understand this condition to explain what will happen to the carrier of an a.m. signal sometimes when switching to a sharper i.f. condition.²

A diode detector is used following the 50-ke. i.f. This diode is one of the three diodes in the 6BJ7 tube — the other two diodes are used for a.v.c. and automatic noise-limiter functions. The noise limiter is a modification of the series-type circuit and works on both 'phone and c.w. — its circuit is shown in Fig. 2, along with a simplified diagram of part of the variable selectivity i.f. amplifier.

A 6SC7 dual triode is used for the b.f.o. and first audio stage, and the output tube is a 6K6, providing speaker or headphone output. A "Phone" jack is available at the rear of the

are Sensitivity, Volume, and Pitch. The rotary switches include Band Selector, Selectivity (and Phono), Response (upper/lower sideband, treble cut), with toggle switches for AVC, BFO, Noise Limiter and Receive-Standby. The S meter is calibrated in both uv. (across 300-ohm load at receiver terminals, at 14 Mc.) and in S points and db. above S9 (50 uv.).

The receiver is equipped with the usual 3-terminal antenna connection, but the chassis is punched for a coaxial-cable fitting if the owner wants to modify the input connection for coax line. This is desirable if a 6- or 2-meter converter is used ahead of the receiver, as well as in the more obvious case where coaxial line is used throughout the shack and antenna system. A socket at the rear of the receiver permits operating the receiver in an emergency from batteries or a vibrator supply. This socket also provides two leads to the Receive-Standby switch, for remote operation of one's transmitter or other circuit. In the receiver, the Standby position of the switch throws a high bias on the tubes controlled by the Sensitivity control (see Fig. 1). Since this lead is also brought out to the power socket, it becomes an easy matter to provide for silencing of the receiver in voice-controlled break-in operation, without the need for digging into the receiver wiring.

— B. G.



Frank L. Brittin, W9DCX, radio and electronics editor of *Popular Mechanics* magazine for the past 35 years, recently passed away. Licensed since 1915, Mr. Brittin was a real pioneer in amateur radio.

¹ McLaughlin, "The Selectable Single-Sideband Receiving System," *QST*, June, 1941. Also, "Exit Heterodyne QRM," *QST*, October, 1947.

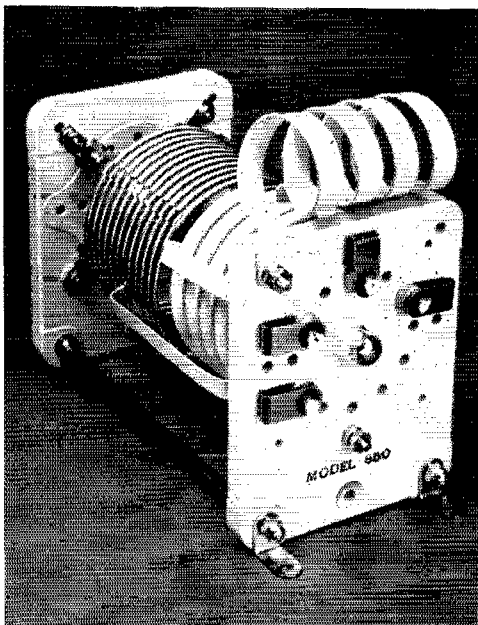
² As explained in "The SX-88 Receiver," *QST*, June, 1954.

New Apparatus

The B & W Model 850 High-Power Pi-Tank Inductor

THE Barker & Williamson Model 850 is a tapped inductor designed for use in high-power pi-section multiband tank circuits. The taps, one for each of the amateur bands from 80 to 10 meters, are selected by a built-in heavy-duty five-position rotary shorting switch controlled from the front by a $\frac{1}{4}$ -inch shaft.

The inductor is made up in three sections all connected in series. The first section used



alone for 10 meters, is flat-wise wound with $\frac{1}{2}$ -inch silver-plated copper strip. For 15 or 20 meters, the switch adds part or all of a winding of $\frac{5}{16}$ -inch silver-plated copper tubing. For 40- or 80-meter operation, the switch adds part or all of a third section wound with No. 10 wire and supported on heavy plastic bars. The other two sections are self-supporting. The switch short-circuits all unused portions of the inductor.

The taps are preset (not adjustable) to give inductances that, with appropriate input and output capacitances, will provide a match between tube load resistances of 3000 to 4500 ohms and output loads of 50 to 75 ohms. Over this range, the tank-circuit Q will be between 10 and 15 on the 40- and 80-meter bands. At the higher frequencies the usual tube and stray capacitances limit the minimum tank Q . The tube load resistances correspond to plate-voltage/plate-current ratios of 6 to 9.

The inductances provided are approximately 13.5, 6.5, 1.75, 1 and 0.8 uh., requiring approximately 150, 80, 70, 55 and 50 uuf. (including

tube and stray capacitances) respectively, for the 80-, 40-, 20-, 15- and 10-meter bands. The manufacturer recommends a 170-uuf. variable for the input capacitor, and some combination of fixed and variable capacitors that will provide output capacitances up to 1200 uuf. The inductor has a rating of 1 kw., and may be used at plate voltages up to 2500 or 3000.

Except for the 10-meter section, the inductor is mounted between two heavy ceramic end plates $4\frac{1}{2}$ inches wide and $5\frac{1}{2}$ inches high. The 10-meter section is mounted across the rear end plate, at right angles to the other sections. The switch is also mounted on the rear end plate, the control shaft running through the axis of the low-frequency portion of the winding to the front end plate, where a heavy ball-bearing detent is provided. The switch shaft carries wide wiping contactors at both ends and separate terminals at each end. All switch parts are silver plated. The shaft requires a well-insulated coupling.

The over-all length of the unit is 10 inches, and the height, including the 10-meter inductor, is $7\frac{3}{4}$ inches.

Strays

Here's one for the book. Ken Rasmussen, WN3ZWY, writes that every time he keys his rig, his neighbor's radio-controlled garage door goes up and down. Such a problem could be classified as GDI — garage door interference!

Silent Keys

IT is with deep regret that we record the passing of these amateurs:

- W1CS, William O. Hegvig, Worcester, Mass.
- ex-W1IBO, Alfred J. Sette, Stamford, Conn.
- W1YWO, Judson L. Chapman, Rockland, Me.
- W2CHK, Gilbert E. McDonald, Freeport, L. I., N. Y.
- W2FGU, Alvin A. Ferber, Lakewood, N. J.
- W2FK, Carl E. Rosen, Rye, N. Y.
- W2IZ, Dr. Melville G. Kilborn, West Orange, N. J.
- W2MX, Joseph P. Hunter, Maple Shade, N. J.
- W2ULT, Frank D. Miller, Buffalo, N. Y.
- W2VQY, Felix L. Ghirlando, Williston Park, N. Y.
- W3AD, Robert E. Corey, Lancaster, Pa.
- W3UAS, William Caravello, Philadelphia, Pa.
- WN4IGU, William P. Elders, Bessemer, Ala.
- W5CP, William C. Ellis, Dallas, Texas
- W6GHD, George S. Bennett, Orinda, Calif.
- W6HH, William H. Craig, Oakland, Calif.
- W6LJK, Harlon G. Stoddard, San Francisco, Calif.
- W6MWS, Roscoe E. Hoyt, Santa Cruz, Calif.
- W6UKN, Warren W. Brooks, San Leandro, Calif.
- W8CYN, Arthur M. Shoemaker, Kent, Ohio
- W8IOF, William H. Leineke, jr., Flint, Mich.
- ex-W8KY, Norman W. Haley, Novato, Calif.
- W8RJE, Elroy H. Mace, Cleveland, Ohio
- W8VRK, Max C. Kohl, Avon Lake, Ohio
- W9DCX, Frank L. Brittin, Chicago, Ill.
- W9YVY, James G. Lehmer, Champaign, Ill.
- W8IKK, ex-W9YCU, Richard R. Elliott, St. Paul, Minn.
- VE2AEE, Omer E. Gauthier, St. Jean, Que.
- H18FG, Dr. Francisco G. Moya, Ciudad Trujillo
- LA2SA, Leif Ofners, Oslo

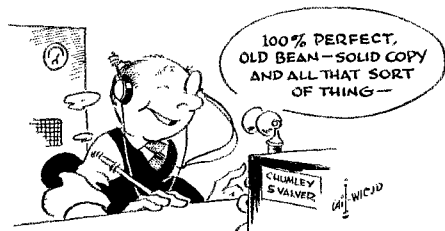
The "Wun-Oh-Wun" Code

By O. J. RUSSELL,* G3BHJ

A FEW YEARS ago a number of British amateurs decided to streamline operating procedure in accordance with modern needs. Thus the inevitable preamble "good evening, OM, very pleased to meet you" and its counterparts become condensed into a new signal—"101." By the same streamlining, the long, drawn out "final" is reduced to "102."

Unfortunately, this laudable application of communication procedure (the mostest words in the fewest) has not been accepted to any great extent. This is of course regretful because so many branches of amateur radio still await attention; i.e., working Podunk Hollow with one-watt input, making DXCC on 160 meters in one week, or breaking the 'phone gabfest marathon on 75 meters.

Progress in amateur radio can only come about by neglecting the brick wall of theoretical limitations. Yagi arrays, Schelkeunoff's theorems, Fourier transforms, magnetrons, klystrons, transistors, etc., were all contrived by non-amateur "experts." The true amateur could evolve all this stuff in much less time but for the fact that QSOs are unnecessarily of long duration. It is this crippling deadweight of "airtime" that has been a detriment to advancement. By



"--THIS CRIPPLING DEADWEIGHT OF 'AIRTIME'— A DETRIMENT TO PROGRESS."

the alleviation of this drawback, doors to new developments, inventions, and discoveries will open wide.

Accordingly, the original ideas have been completely modified, streamlined, reorganized, and petrified into a system meeting every and any requirement of amateur communication procedure. The time-wasting drudgery of "radioese" is eliminated by the "Wun-Oh-Wun" code, now proudly offered for the salvation of Hamdom. To ascertain if a station understands the new code, the question "RUA-1?" should be used. Fellow amateurs in the forefront of progress will automatically use this highly effective system in their reply.

Here are the abbreviations and their meanings. No excuse is good enough for not immediately adopting this watt-saving, bug-key-bearing conserving system.

*15 Recpham Rd., Norwich, Norfolk, England

Wun-Oh-Wun Code

101— Good evening, OM. Thanks for the call. It's a pleasure to work you. Your signal is *pounding* in!

102— Thanks for the QSO, OM. I enjoyed it very much and can *hardly* wait to work you again.

103— Okay and 73 to you and yours, OM. Trust your mother-in-law will be in the hospital for some time. So lots of luck and DX. Cheerio!

104— Sorry, OM, lost most of that because of QRM. Your signal is *really* fine business, especially for a low-power station. Really enjoying this contact, OM. Incidentally, I can find out from your QSL my report, details of your rig, your handle, and QTH. So see you again, — don't bother to come back as I am going to call CQ right away.

105— Dear OM, your key clicks are easily the best on the band. Thanks a lot for ruining that DX QSO!

106— Hello stranger! I just love a call from across town to my CQ DX — especially since it just blotted out AC7XX coming back to me. You know, OM, I get a big kick out of reporting on your squelch-tube modulation experiments. Feel free to call me any time. Incidentally, your 'phone is easily the most ghastly I've ever heard!

107— Okay, OM, bust in now as there is only a low-power lid on the roundtable frequency. Seems like a good time to tell you the really funny one about old Jumbo's latest gag. It's a killer! Pour it on pal — it's all yours!

108— Yes, OM, perfect copy. It is incredible that you are only running 800 watts and you're only a mile away. The cuckoo clock, barking dog, hollering children, and your grandfather's belching all came through fine business. It's hard to understand how you can't get out with a rig like that.

109— You have a whale of a signal, OM. I have never worked a station in Jumbololand before, and would certainly appreciate a QSL. I'd like to help you seeing that you are out in the "boondocks." How about an HRO, a case of scotch, or anything you fancy? I'll be overjoyed when I get your QSL. Just pencil your requirements on the back.

For the convenience of those who operate really *rare DX* stations, this special signal is reserved:

000— Listen you lot of tin-eared lids. This is *my* band. This is *my* party. Anyone calling within 100 kc.

(Continued on page 150)



1955 ARRL Field Day Rules

Annual Test for Emergency-Powered Stations, June 25th-26th

ALL set for the 1955 Field Day? Just about every amateur in the ARRL field organization already knows that this annual test of emergency-powered portables packs more enjoyment into one week end than any other event in the operating calendar. On Field Day, clubs and other organized groups function as teams in setting up and operating multi-transmitter stations independently of normal power facilities. But if you aren't able to take part with a group, you can get on with your mobile rig or set up a one- or two-man station afield and enjoy the fun. Hundreds of amateurs will be searching the bands for your signal!

Amateurs with mobile gear are especially urged to test it in the FD. Clubs should get every member-owned mobile unit into action and report their aggregate scores to ARRL. Our increased showing by way of individual mobile reports and Club Aggregate Mobile scores is important since such units are considered indispensable in civil defense planning.

The rules and entry classifications are just as usual. Once you're on the air call "CQ FD" on c.w. or "CQ Field Day" on 'phone. Then give the station you work a signal report and your ARRL section or specific location, and stand by to receive similar information.

Read the rules carefully. Then look at these examples designed to assist club secretaries and individual participants in tallying their scores.

Example 1

Assume a 25-watt rig wholly on batteries, not originating or relaying any messages, and not having more than two operators.

$$\begin{array}{r} 40 \text{ points (40 stations worked)} \\ \times 3 \text{ (power below 30 watts)} \\ \hline 120 \\ \times 3 \text{ (all radio equipment independent of commercial mains)} \\ \hline 360 \\ \times 1.5 \text{ (If Class B or C and everything on batteries)} \\ \hline 540 \text{ claimed score} \end{array}$$

Example 2

Same as Example 1 but one Field Day Message to the SEC or SCM is originated and passed in good form.

$$\begin{array}{r} 65 \text{ points (40 QSOs + 25 points for FD message)} \\ \times 9 \text{ (3 } \times 3 \text{ — power multiplier multiplied by independence-of-mains multiplier)} \\ \hline 585 \\ \times 1.5 \text{ (everything on batteries)} \\ \hline 877.5 \text{ claimed score} \end{array}$$

(Copies of all messages originated and relayed must accompany Field Day reports.)

Example 3

Assume the Podunk Hollow Radio Club (or, alternatively, any group of three or more licensed operators), portable at its FD site, operates two transmitters simultaneously. Each rig runs 75 watts input and batteries or generators furnish power. One message is started in good

1955 Field Day

Starts 4:00 P.M. Local Standard Time,* June 25th
Ends 4:00 P.M. Local Standard Time,* June 26th
* Not Daylight Time
(If in Hawaii or Alaska, see Rule 5)

form (25 points), 1 is received and relayed onward (2 points), and 230 stations are contacted.

$$\begin{array}{r} 257 \text{ points (230 QSOs + 25 + 2)} \\ \times 2 \text{ (power input over 30 and under 100 watts)} \\ \hline 514 \\ \times 3 \text{ (all gear independent of mains)} \\ \hline 1542 \text{ claimed score} \end{array}$$

(No battery multiplier for either clubs or groups.)

Convenient reporting forms are now available from League headquarters upon request. You may make up your own forms, but please don't forget to include bands used, dates and contact times, calls of stations worked, signal reports sent and received, and sections or locations of stations worked. Reports must also show power inputs and power sources, location and call of station, number of transmitters in simultaneous operation, number of persons participating, club name (if any), and score computations. Get your summary in the mail by July 23rd to have your results appear in *QST*.

We suggest that you review the December, 1954, *QST* report for hints and kinks relative to the last FD. You may wish to challenge other groups nearby with similar set-ups! Start your preparations now!

Rules

1. **Eligibility:** The Field Day is open to all radio amateurs in the sections listed on page 6 of this issue of *QST*.

2. **Object:** For portable and mobile stations to work as many stations as possible; for home stations to work as many portable and mobile stations as possible.

3. **Conditions of Entry:** Each entrant agrees to be bound by the provisions of this announcement, the regulations of his licensing authority, and the decisions of the ARRL Contest Committee.

4. **Entry Classification:** All entries will be classified according to number of transmitters in simultaneous operation. They will be further classified as follows: "A," club or nonclub group portable stations; "B," unit or individual portable stations; "C," mobile stations; "D," home stations operating from emergency power; "E," home stations operating from commercial power sources. Thus a club or group running three transmitters simultaneously will be in the 3A classification, or a mobile station with one transmitter will be in the 1C classification.

Portable stations are those installed temporarily, for FD purposes, at sites away from customary fixed-station locations. Portable equipment or units must be placed under one call and the control of one licensee, for one entry. All control locations for equipment operating under one call must lie within a 1000-foot diameter circle.

Group participation is that portable-station work accomplished by three or more licensed operators.

Unit or individual participation is that portable-station work accomplished by either one or two licensed operators.

Mobile stations are complete installations including power source and antenna, mounted in or on vehicles and capable

of being used while in normal motion. If they utilize antenna supports not normal or suitable for use during motion, installations must be classified as portable instead of mobile. Each mobile entry call must be different from any other FD station participating.

Home-station participation is that work by fixed amateur stations not operating portable or mobile.

A transmitter used to contact one or more stations may not subsequently be used under more than one other station call during the Field Day period.

5. Field Day Period: The Field Day starts at 4:00 P.M. Local Standard Time (not Daylight Time) June 25th and ends at 4:00 P.M. Local Standard Time (not Daylight Time) June 26th. (Hawaii and Alaska sections use Pacific Standard Time). All contacts must be made during this period. Class C stations may cross a time-zone line but may not receive credit for more than 24 hours of operation if they do so.

6. Bands: Each 'phone and c.w. band is regarded as a separate band. The following (and additional u.h.f.-s.h.f. bands) constitute separate bands: A1: 1.800-1.825 1.875-1.900 "east" or 1.900-1.925 1.975-2.000 "west," 3.5-4.0, 7.0-7.3, 14.0-14.35, 21.0-21.45, 26.96-27.23, 28.0-29.7, 50-54 and 144-148 Mc. A2: radioteletype and frequency-shift keying are grouped with A1, in the bands where they are allowed. A3: 1.800-1.825 1.875-1.900 "east" or 1.900-1.925 1.975-2.000 "west," 3.8-4.0, 7.2-7.3, 14.2-14.3, 21.25-21.45, 26.96-27.23, 28.5-29.7, 50-54, and 144-148 Mc. All forms of voice transmission will be grouped with A3, in the bands where they are allowed. (In Canada and Cuba, their respective 'phone bands apply.)

The use of more than one transmitter at one time in the same band is not allowed.

7. Exchanges: Signal reports and ARRL section (or specific location) must be exchanged in proof of contact.

8. Valid Contacts: In Class A, B and C, a valid contact is a completed exchange with any amateur station. In Classes D and E, a valid contact is a completed exchange with any station in Class A, B or C. Cross-band contacts are not allowed. Contacts by mobile stations may be made in motion or from any location(s). A station may be worked more than once only if the additional contacts are made on different bands.

9. Field Day Message: A Field Day Message is one originated by a Class A, B or C station and addressed to the SEC or SCM (see address in *QST*, p. 6) stating the number of operators, the field location, and the number of AREC members at the Field Day station. Only one Field Day Message may be originated.

10. Scoring:

Points: Each valid contact counts 1 point.

Message Credit: Credit for handling messages may be obtained only as follows: 25 points for originating one Field Day Message to SEC or SCM. In addition, each Field Day Message received for relay will score 1 point when received by radio and 1 point when sent onward by radio. No FD Message may pass through the same station twice. There will be a deduction of 10 points for omission of handling data or for defects in form. Copies of all messages originated and relayed must accompany Field Day reports.

Multippliers:

Power: Output-stage plate input under 30 watts: 3. Output-stage plate input over 30 and under 100 watts: 2. Output-stage plate input over 100 and under 1000 watts: 1. The plate input of a grounded-grid amplifier is its plate input plus the plate input to the driver stage.

Independence-of-Mains: All radio equipment independent of commercial power source: 3. All radio equipment not independent of commercial power: 1.

Battery Power (applies to Class B and C only): 1.5. The battery capacity or size shall in all cases be adequate to permit one hour's continuous operation of the station. Charging batteries from commercial mains while batteries are connected to transmitter or receiver voids the "independence-of-mains" and "battery power" multipliers.

Multippliers do not apply to Class D and E entries.

Final Score: The final score equals the total "points" multiplied by the "power multiplier" multiplied by the "independence-of-mains" multiplier (multiplied by the "battery power" multiplier, if applicable). Where different multipliers apply during the Field Day period, points are multiplied by the multiplier in effect at the time the points were earned.

11. Club Aggregate-Mobile Scores: Entries under Class C may be combined to form a "Club Aggregate-Mobile Score." The club name must be noted on the individual re-

ports, and the club secretary must submit a claimed aggregate score. Credits to the extent supported by the reports submitted to ARRL will be allowed. Only bona fide members of the club, residing in the club territory, may contribute to the aggregate-mobile club listing.

12. Reporting: Mail reports or entries on or before July 23rd. Reports must show bands used, dates and contact times, calls of stations worked, signal reports sent and received, and ARRL sections or locations of stations worked. Reports must also show power inputs and sources of power, number of transmitters in simultaneous operation, location of station, number of persons participating, class of entry, and score computations.

A Problem in Higher Mathematics

or "Is Higher Mathematics a Problem?"

BY FRANK H. TOOKER*

The methods of representing mathematical notations in some of our more technically advanced electronics journals can be a little confusing to the Novice, unless he understands certain fundamental principles. For instance, in such notations it is considered neither proper nor rigorous to represent an equation such as $1 + 1 = 2$ in the form:

$$\text{Any Ph.D. knows that: } 1 + 1 = 2 \quad (1)$$

$$1 = \log_{10} 10$$

$$\text{and that: } 1 = \frac{Q^m}{Q^n}$$

$$\text{if: } m = n$$

$$\text{and: } Q \neq 0$$

Therefore, Equation (1) may be more clearly expressed in the form:

$$\frac{Q^m}{Q^n} + \log_{10} 10 = N \quad (2)$$

$$\text{where } N = 2$$

The value of N may be expressed in its expanded form. Thus

$$\begin{aligned} \text{since: } \sqrt{R^2} &= R \\ \text{and: } R^{x+y} &= 1 \\ \text{when: } y &= j^2 x \\ j &= \sqrt{-1} \end{aligned}$$

Equation (2) may be rewritten:

$$\frac{Q^m}{Q^n} + \log_{10} 10 = 2 (\sqrt{R^2})^{x+y} \quad (3)$$

or:

$$2 (\sqrt{R^2})^{x+y} - (Q^{m-n} + \log_{10} 10) = 0 \quad (4)$$

Equation (4) may seem a far cry from Equation (1) but, obviously, Equation (4) is by far the more clearly stated and easily understood notation. Of course, there are numerous other representations for Equation (1), but this brief explanation should give the Novice an inkling of just how it is done.

* P.O. Box T, Lakehurst, N. J.

21st ARRL Sweepstakes Results

Part II — 'Phone and Club Totals

BY PHIL SIMMONS, WIZDP

WHILE the brasspounders reaped points via their chosen mode, as recounted last month, the 'phone brethren weren't idly twiddling their thumbs. No indeed; they too were roundly jostling the megacycles and running up accumulations of previously unheard-of magnitudes. Altogether, summaries were turned in by 402 voice enthusiasts, 68 of whom will forthwith receive handsome certificates acknowledging their sectional leadership.

Peering momentarily at the tabulation on the facing page, one finds 63 per cent of the triumphant 'phones settling for the low-power multiplier, the others sacrificing it for that extra r.f. "oomph." Average power: 250 watts. As might be suspected, 20-40-75 meters found favor with most; a flat 75 per cent worked these three, or more, bands. But spectral versatility was the keynote as (1) ten and 15 got a big play, (2) three men QSY'd to what the Gs call "the top band" and made hay on 160, and (3) two Southern Californians shrewdly tapped the dense v.h.f. population out there, W6AM uncovering almost 200 144-Mc. QSOs. The itemized tube line-ups and transmitter-receiver types, we think, will provide fascinating reading, even for those not contest-minded.

Centrally-located hams vying for DX with coastal stations sometimes find the going slow, but it's a different story in the Sweepstakes! Here ability to work all compass directions often gives mid-U. S. A. residents the nod. Witness that half of the tallies over 50,000 hail from W8, W9 and W0: W6AM 181,551, W4HQJ 141,480, W3JNN 111,362, K2AAA 108,864,

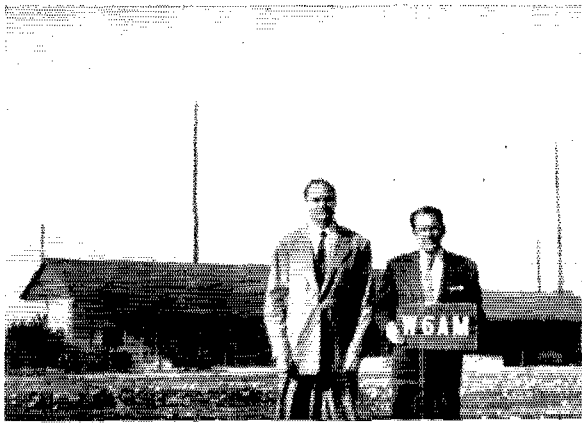
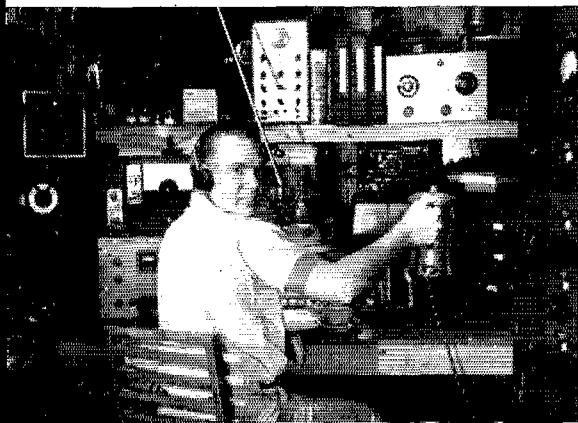
¹ Multioperator station.

W0GDE 94,170, W9WHN ¹ 89,460, W0QCX 87-117, W2HJR 86,520, W3VKD 86,140, W0MLY 82,824, W0PRZ 80,519, W0SBE 78,192, W8AJW 76,883, W6CBE 73,982, W6CHV 69,300, W0NPR 66,861, W0QCC 66,030, K4ARU 65,193, W9YWL 64,512, W8DPA ¹ 61,008, W1TRE 58,403, W0OMG 58,357, W8MLR 58,328, W9OMM 58,032, W1FZ 57,834, W4SOV 57,216, W9AVJ ¹ 56,916, W4YTO 55,296, W0BCF 54,810, W2SKE 54,002, W2SZ ¹ 51,832, W5UBN 51,557, W1VYI 50,337. Mirror of the rising activity: 32 scores over fifty grand this time to 17 in 1953.

Six heard all 73 sections come back. They were W3JNN, W3VKD, W6AM, W0EHF, W0GDE and W0PRZ. Three others, W4HQJ, W0SBE and K2AAA, made a grand stab but missed one somewhere along the line. So near and yet so far!

There are other inducements besides the section and Novice awards and the desire to make the "clean sweep." ARRL passes out a lovely silver-banded gavel to the club whose members turn in the highest aggregate score, and certificates to the modal leaders in each club meeting the three entries minimum. The 76 qualifying outfits and the calls of their winners appear in the club box. Forty-nine entries, including 16 over 100,000 points, brought the Potomac Valley victory string to five consecutive SS gavels. Frankford, Ohio Valley and El-Ray broke one million points and likewise rate a doffing of our chapeaux. First participation by the Northern Alberta, Central Utah and Ventura County groups effectively boosted everybody's section multiplier. Now, how about you clubs in Idaho, Hawaii, VE5 and VE8 organizing for 1955!

Meet the fellows who caused two new scoring records to slip into SS archives. On the left, we have c.w. king Don Chesser, W4KVX, Ohio Valley club and Kentucky section winner. Don has traveled quite a piece down SS road since he rolled up 58 QSOs with a TNT rig in 1934. His astounding scoring feat precisely two decades later, a scoring 209,353 points by virtue of 1147 exchanges in 73 sections, offers a rugged target for future challengers. In addition to the coffee pot, Don swears by such operating accouterments as a time stamp, a QSO numbering machine, and a card index system for avoiding duplicates. . . . On the right, Dawkins Espy, W6FRW (holding sign), and Don Wallace, W6AM, pose at latter's "dream" location. Dawkins whirled the W6AM set-up around five bands and put the Sixes back in the limelight in the 'phone competition with 835 contacts in all sections, 181,551 points. Twelve rhombics and two curtains, most of reversible directivity, enabled him to sew up the Los Angeles certificate and a new single-operator high in the tonsil tussel.



Sidelights

W6QEU's most-QSOs-on-'phone title of 1950 still holds. W6FRW, the talker at W6AM, didn't upset the apple cart but he jiggled it a little. . . . Scribe W2QMO and Wizard W2RDK of the newly-affiliated Order of Boiled Owls, Levittown, N. Y., are delighted with the club's initial contest showing. Though two members are recently-graduated Novices, their seven c.w. entries averaged 75,000 per

man. . . . All certificates for SS winners are scheduled for mailing June 15th. . . . W5SQI, who earned 'phone plaudits for New Mexico and Louisiana in the last two SSES, prefers that damp Louisiana ground, has a 33-foot vertical perched on a Coca Cola bottle there. Paul's secretary blistered a finger typing up his log and is glad he did no better. . . . Mississippi voice pace-setter W5WZY recalls that XYL W5WZZ took 1953 section honors. In another switcheroo, Barbara, W1TRE, lead W1 'phones,

'PHONE WINNERS, 21ST A.R.R.L. SWEEPSTAKES CONTEST

Section	Call	Score	Transmitter	Watts Input	Receiver	Bands Used
E. Penna.	W3GHS	38,440	813s p.a.	500	75A2	15, 20, 40, 75
Md.-Del.-D. C.	W3JNN	111,362	VFO-6AG7-6AG7-2E26-813	100	HRO	20, 40, 75
S.N.J.	K2CSC	34,068	VFO-Viking II	100	HQ140X	15, 20, 40, 75
W.N.Y.	W2ICE	40,200	VFO-810-810a	150; 1000	HQ120X, HRO	20, 40, 75
W. Penna.	W3VKD	86,140	KW1	1000	75A3	10, 15, 20, 40, 75, 160
Illinois	W9YWL	64,512	Viking II	90	HQ140X	20, 40, 75
Indiana	W9UTL	32,198	VFO-Viking II	100	NC98, Q5er	40, 75
Wisconsin	W9WMM	58,032	Viking VFO-Viking II	100	SX71	15, 20, 40, 75
No. Dakota	W9NPR	66,861	Viking II	100	S76	15, 20, 40, 75
So. Dakota	W9GDE	94,170	32V3-813s	900	75A2	15, 20, 40, 75, 160
Minnesota	W0TTV	25,137	Viking II	100	RME60, converter	15, 20, 40
Arkansas	W5ZBC	9113	VFO-Viking II	90	SX25	20, 40, 75
Louisiana	W5SQI	41,292	Millen VFO-Viking II	90	HQ129X, NC46, DB20	15, 20, 40, 75
Mississippi	W5WZY	14,362	6AG7-1614-2E26-813	270	HR050	75
Tennessee	W4VFL	44,631	Viking II	90	HQ140X	20, 40, 75
Kentucky	W4CDO	10,920	VFO-6AG7-6L6-807-81a	250	NC173	20, 40, 75
Michigan	W8MLR	58,328	HT20	95	SX71	15, 20, 40, 75
Ohio	W8AJW	76,883	32V1	95	HQ120X	10, 15, 20, 40, 75
E.N.Y.	W2ESE	15,327	Viking II	95	NC183D	15, 20, 40, 75
N.Y.C.-L.I.	K2AAA	108,864	Collins PTO-TRITV-4-65A	96	75A3	15, 20, 40, 75
N.N.J.	W2HJR	86,520	KW1	800	75A3	15, 20, 40, 75
Iowa	W9MLY	82,824	32V2	90	75A3	15, 20, 40, 75
Kansas	W8LXA	39,930	5100	75	Super Pro	20, 40, 75
Missouri	W9OMG	58,357	Sig. Shifter-6L6s-35Ts	500	HQ129X	20, 40, 75
Nebraska	W9EHF	47,450	6AU6-802-4-250A	1000	HRO60	20, 40
Connecticut	W1YWU	44,973	VFO-Viking I	100	S76	10, 15, 20, 40, 75
Maine	W1GKJ	25,090	Viking VFO-Viking I	100	HRO60	10, 20, 40, 75
E. Mass.	W1TRE	58,403	6AU6-6AG7-6V6-829B	100	HRO60	10, 15, 20, 40, 75
W. Mass.	W1KJV	39,000	VFO-Viking I	100	HQ140X	10, 15, 20, 40, 75
N.H.	W1FZ	57,834	Viking I	96	75A2	15, 20, 40, 75
R.I.	W1TRX	18,928	Globe King	400	HQ140X	15, 20, 40, 75, 160
Vermont	W1SEO	19,928	5100	120	75A2	20, 40, 75
Alaska	KL7BFR	2607	Viking VFO-Viking II	90	Super Pro	20, 40
Idaho	W7NGA	23,436	75A	94	SX43, 5BR, Super Pro	20, 40, 75
Montana	W7NPV	30,150	32V1	95	SX28	15, 20, 40, 75
Oregon	W7OVA	17,820	Viking I	90	75A1	20, 40, 75
Washington	W7SFA	82,962	32V3	90	75A1	10, 15, 20, 40, 75
Hawaii	KH6CD	1248	32V1	100	75A2	15, 20
Nevada	W7JUO	11,776	VFO-4E27-250THs	1000	75A1	20, 40, 75
Santa Clara V.	W6MKM	27,848	Sig. Shifter-829B	99	NC125	15, 40
East Bay	W6BXE	48,246	4-250As p.a.; 813s p.a.	800-1000	SX28, 75A2	20, 40, 75
San Francisco	W6CBE	73,982	6AG7-2E26-4-125A	500	HRO60	15, 20, 40, 75
Sacramento V.	W6GDO	42,224	Ranger-814s	500	HQ129X, DB22	15, 20, 40, 75
San Joaquin V.	W6NDP	41,580	32V1	100	75A2	20, 40, 75
No. Carolina	W4HUW	35,526	BC696-T40-833A	1000	NC183	20, 75
So. Carolina	W4EZF	1425	BC696-211s	350	SX71	75
Virginia	W4HQN	141,430	VFO-4E27	100	75A1	20, 40, 75
W. Virginia	W8WHR	7128	ARC5-RK36s	450	NC81X, DB22A, BC453	40, 75
Colorado	W9QCX	87,117	5100	100	NC183	15, 20, 40, 75
Utah	W6SLF/7	42,387	KW1	375; 1000	75A3, DB22A	15, 20, 40, 75
Wyoming	W7VBP	5694	VFO-Viking II	125	HRO50T	20, 40, 75
E. Florida	K4ARU	65,193	Viking II	100	SX71, SX43, HQ129X	15, 20, 40, 75
W. Florida	W4SOQ	19,875	Viking II	100	NC183, Q5er	15, 20, 40, 75
Georgia	W4SOV	57,216	32V2	100	SX88	10, 15, 20, 40, 75
Canal Zone	K25KA	4320	VFO-807Ws; VFO-4-65As	120; 250	HRO60	15, 20
Los Angeles	W6AM	181,551	Communicator; VFO-4D32	10; 90	Communicator; RME50, 75A3, HF10-20, DB23	2, 15, 20, 40, 75
Arizona	VE1LL/W7	26,586	6AG7 VFO-6AG7-1614-812As	375	HRO60	15, 20, 40, 75
San Diego	W6CHV	69,300	VFO-6V6s-812; VFO-6AU6-813	100	SX28	15, 20, 40, 75
Santa Barbara	K6CKU	2327	5814-5763-6146; Viking II	90	Homebuilt (2 mtrs.), HQ129X	2, 20, 40, 75, 160
No. Texas	W5COF	11,408	Viking II	96	S53A	15, 20, 40
Oklahoma	W5CYQ	19,845	811s p.a.	250	SX71	75
So. Texas	W5UBN	51,557	Viking I	100	75A3	10, 15, 20, 40
New Mexico	W3WVW/5	14,108	VFO-6AG7-6146	40	NC98	15, 40
Maritime	VE1VN	7560	Viking II	120	AR77E	15, 20, 40, 75
Quebec	VE2AFC	11,016	Viking VFO-Viking II	100	HRO50T	20, 40, 75
Ontario	VE3BVI	20,592	5763-6C4-5763s-6146-813	100	HQ129X	20, 40, 75
Alberta	VE6MJ	456	6L6-807s-812As	200	HQ129X	20, 75
B.C.	VE7MW	10	807 p.a.	20	Super Pro	20

Southern New Jersey

CENTRAL DIVISION

Indiana

South Dakota

K2CSC.....	34,068-220-52-A-34	W9YWL.....	64,512-336-64-A-37
K2BWR.....	19,228-220-44-B-35	W9VOB.....	29,475-199-30-A-34
K2WAO.....	6216-74-24-A-16	W9QND.....	20,550-141-50-A-35
K2BNB.....	4761-74-23-A-9	W9PBM.....	15,458-116-45-A-29
W2WE.....	98-26-13-B-2	W9LQF.....	14,930-136-27-A-29
W2VUM.....	882-23-14-A-5	VE1V/W9	13,588-165-43-B--
Western New York			
W2ICR.....	40,200-300-67-B-20	W9FVU.....	12,485-102-41-A-16
W2PEB.....	19,305-166-39-A-54	W9DXU.....	4230-71-30-B-8
K2BHP.....	18,960-108-45-B-22	W9KLY.....	2808-54-26-B-13
W2GSS.....	15,624-124-42-A-14	W9NLF.....	1728-36-16-A-11
W2CZT.....	13,630-145-47-B-20	W9YUN.....	1728-36-24-B-13
W2BYJ.....	8613-100-29-A-25	W9DLH.....	1647-31-18-A-8
W2DRN.....	8324-91-31-A-16	W9YTS.....	900-25-12-A-7
K2DFD.....	6080-94-32-B-18	W9FPC.....	875-27-11-A-6
K2DMA.....	5873-70-29-A-10	W9TPA.....	798-19-14-A-4
W28NI.....	3161-56-29-B-9	W9PCB.....	722-19-13-A-2
W2FUP.....	504-14-12-A-3	W9KMN.....	48-4-4-A-1
W2RLN.....	432-18-12-B-11	W9IDO.....	18-3-2-A-1
W2PFF.....	347-17-7-A-2	W9ZSQ.....	18-6-1-A-1
K2ELK.....	220-11-16-B-1	W9WHN.....	938-101P-KVQ
W2FXA.....	6-2-1-A-1	W9WLD.....	89,460-42-71-A-40
Western Pennsylvania			
W3VKD.....	86,140-590-73-B-37	W9AVJ (W9s (VZM PKW))	56,916-429-68-B-20
W3YCN.....	27,848-236-59-B-28	W9VYD (W9s VYD WBE)	50,908-916-27-A-28
W3SYW.....	60-5-4-A-3	WDR).....	7488-78-32-A-12

W9UTL.....	32,198-206-53-A-35	W0GDE.....	94,170-645-73-B-40
W9PCA.....	6197-77-27-A-9	W0PRZ.....	80,519-558-73-B-30
W9MCM.....	4992-67-29-A-12	W0QCT.....	66,030-357-62-A-40
W9AQR.....	4307-60-29-A-12	W0SQC.....	4389-67-33-B-17
W9WU.....	351-19-9-A-5	Minnesota	
W9WU.....	3-1-1-A-1	W0TIV.....	25,137-150-52-A-20
Wisconsin			
W9OMM.....	58,032-313-62-A-38	W0QJV.....	3360-35-32-A-18
W9V3Z.....	24,975-167-50-A-14	W0RGO.....	1830-32-20-A-18
W9LNX.....	15,708-110-44-A-27	W0RGO.....	1485-33-15-A-7
W9NUV.....	11,915-88-47-A-15	W0RLT.....	234-13-9-B--
W9ZDU.....	1964-40-17-A-12	W0QDI.....	12-2-2-A-1
W9RZD.....	1660-33-24-B-15	DELTA DIVISION	
W9DKH.....	782-23-17-B-2	Arkansas	
W9VWX.....	759-23-11-A--	W5ZBC.....	9113-113-27-A-12
W9VDT.....	668-17-13-A-1	Louisiana	
W9FTY.....	560-20-14-A-4	W5SQL.....	41,292-222-62-A-24
W9UDK.....	429-13-11-A-2	W5ZAK.....	2700-38-24-A-14
W9ZDM.....	297-11-9-A-2	W5KC.....	1344-28-16-A-2
W9QGR.....	112-8-7-B-1	Mississippi	
W9AEM.....	27-3-3-A--	W5WZY.....	14,362-175-43-B-26

DAKOTA DIVISION

W0NPR.....	66,861-323-69-A-40	W4VFL.....	44,631-263-57-A-38
W0KZZ.....	31,241-183-59-A-32	W4PHW.....	13,554-252-61-A-40
W0NGO.....	570-19-15-B--	Tennessee	

CLUB SCORES

Club	Score	Entrtes	C.W. Winner	Phone Winner
Potomac Valley Radio Club.....	3,698,555	49	W4KDC	W4HQN
Frankford Radio Club.....	2,529,178	37	W3GHM	W8JHX
Ohio Valley Amateur Radio Assn.....	1,739,969	32	W4KXV	W4HQK
El-Ray Amateur Radio Club (Mass.).....	1,084,862	28	W1IAP	W1JNX
York Radio Club (Ill.).....	721,348	12	W9YRV	.....
Nassau Radio Club (N. Y.).....	561,946	12	W2VVS	.....
Hampden County Radio Club (Mass.).....	559,543	15	W1JYH	W1KJV
Richmond Amateur Radio Club (Va.).....	535,367	40	W4BZE	W4VUF
Order of Boiled Owls (N. Y.).....	533,463	7	W2RDK	.....
Chicago Suburban Radio Assn.....	479,792	12	W9WFS	W9LQF
Denver Radio Club.....	400,327	10	W0CYT	W0QXC
Buckeye Short Wave Radio Assn. (Ohio).....	390,046	12	W9YRV	.....
Cleveland Brasspounders Assn.....	369,641	6	W8WTF	W8OMK
Tri-County Radio Assn. (N. J.).....	343,775	15	W2TWC	.....
Milwaukee Radio Amateurs' Club.....	326,500	15	W9VOD	W9VBZ
Lake Success Radio Club (N. Y.).....	325,991	20	W2TUR	K2AED
St. Louis City Amateur Radio Club.....	319,211	8	W0TUB	.....
South Jersey Radio Assn.....	290,046	1	W2CAC	.....
Connecticut Wireless Assn.....	286,685	7	W1BIB	.....
Aero Amateur Radio Club (Md.).....	285,115	10	W3QQQ	.....
Central Connecticut Contest Club.....	281,132	13	W1ZDP	.....
Garden State Amateur Radio Assn. (N. J.).....	248,182	5	W2TPE	.....
Detroit Amateur Radio Assn.....	248,152	11	W8CB	W8ALLR
Central Utah Contest Club.....	238,572	6	W7QDM	W8SLR/7
Johnson County Radio Amateurs Club (Kansas).....	221,607	14	W0BCI	W0MEF
Westpark Radiops (Ohio).....	203,195	15	W8DAE	W8AJW
Dayton Amateur Radio Assn.....	203,019	5	W8ZJM	.....
Pottstown Amateur Radio Assn.....	201,731	7	W3BIF	.....
Philadelphia Wireless Assn.....	188,182	6	W2VVS	.....
Mid-Island Radio Club (N. Y.).....	185,294	5	W2RTF	.....
Niagara Radio Club (N. Y.).....	167,496	11	W2JVO	.....
Wisconsin Valley Radio Assn.....	161,818	5	W9RQM	.....
Somerset Hills Radio Club (N. J.).....	159,248	4	W2GND	.....
North Suburban Radio Club (Ill.).....	159,009	6	W9VJW	.....
South Lyme Beer, Chowder & Propagation Soc. (Conn.).....	158,182	7	W1KBE	.....
Hampsters Radio Club (Ill.).....	151,562	18	W9MRQ	W9PBM
Richmond Amateur Radio Club (Calif.).....	151,105	4	W6LEF	.....
Ventura County Amateur Radio Club (Calif.).....	151,432	4	W6YK	.....
Tri-State Amateur Radio Society (Ind.).....	144,664	6	W9UWU	W9MCM
Nortown Amateur Radio Club (Ont.).....	140,182	11	VE3DRD	.....
MIT Radio Society.....	139,080	7	W4YEL/1	.....
Coronado Radio Club (Calif.).....	133,021	7	W6JVA	.....
West Seattle Amateur Radio Club.....	129,897	4	W7AJS	.....
Canton Amateur Radio Club (Ohio).....	121,021	14	W8DNC	W8IKM
Raritan Valley Radio Club (N. J.).....	114,150	5	W2CWK	.....
Northwest Amateur Radio Club (Ill.).....	114,892	5	W9NJZ	.....
Central High Radio Club (Iowa).....	103,499	9	W0CYT	.....
Northern Alberta Radio Club.....	99,590	7	W6ZR	.....
Hartford County Amateur Radio Assn.....	91,155	5	W1UFW	.....
Rochester Amateur Radio Assn.....	90,158	10	W2YGW	W2ICG
Queens Radio Amateurs (N. Y.).....	89,516	3	W2LPI	.....
Harmonic Hill Radio League (N. Y.).....	89,580	5	K2BTU	.....
Columbus Amateur Radio Assn.....	89,913	6	W8DWP	.....
Lewistown Amateur Radio Club (N. Y.).....	75,266	9	W2AEV	.....
Santa Clara County Amateur Radio Assn. (Calif.).....	75,067	6	W6YIM	.....
Northeast Radio Club (Penna.).....	69,616	5	W8SOH	.....
York Road Radio Club (Penna.).....	67,831	4	W3LFF	.....
Case Institute of Technology Radio Club (Ohio).....	66,866	3	.....	.....
Springfield Amateur Radio Club (Ohio).....	65,746	5	W8JRG	.....
Chillicothe Amateur Radio Club (Tenn.).....	63,588	3	W4WQT	.....
Point Radio Amateurs (Wis.).....	63,202	9	W9KCK	.....
York Amateur Radio Club (Penna.).....	59,788	3	W3RAF/3	.....
Toledo Radio Club.....	56,575	5	W8MQQ	.....
North Penn Amateur Radio Club.....	50,491	8	.....	W3RSC
Southern Nevada Amateur Radio Club.....	49,500	4	.....	.....
Stratford Amateur Radio Club (Conn.).....	47,979	3	W1GVK	.....
Swain Amateur Radio Club (Ill.).....	46,879	6	W9KMN	W9YUN
Goose Bay Amateur Radio Club (Labrador).....	43,958	7	W4KVM/VO6	VO6U
St. Louis University Amateur Radio Club.....	43,738	6	W0FTW	W0TCP
Browning School Amateur Radio Club (Wis.).....	42,336	3	W0VAN	.....
Cascade Radio Club (Wash.).....	41,664	6	W7FY	W7KWX
Eagle Rock Teen Age Radio Club (Calif.).....	39,908	5	W6UED	.....
Wilson High School Radio Club (D. C.).....	37,096	4	W3YIV	.....
Morristown High School Radio Club (N. J.).....	20,708	3	K2GLQ	.....
Full River Amateur Radio Club.....	13,881	6	W1TXG	.....
Los Angeles Mobilers.....	2076	3	.....	K6BRQ

W4WIJ.....9177- 82-38-A-16
 W4BQQ.....3607- 76-38-A-16
 W4TDZ.....4480- 70-32-B-16
 W4TYV.....1305- 29-15-A-17

GREAT LAKES DIVISION

Kentucky
 W4CDO.....10,920-141-39-B-24
 W4AUC.....10,345-105-33-A-20

Michigan
 W8MLR.....58,328-360-55-A-37
 W8CLR.....34,567-250-59-B-25
 W8ZXC.....12,008-180-59-A-31
 W8LXC.....8010- 90-30-A-25
 W8RGU.....2200- 44-25-B-11
 W8QGP.....1298- 30-22-B-1
 W8MNZ (W88 MNY MNZ) 41,412-241-58- -38

Ohio

W4RAJW.....76,883-384-67-A-37
 W8RXM 3.....45,576-318-48-A-35
 W8OMK.....39,591-260-59-A-34
 W8KZF.....30,447-205-51-A-38
 W8SRF.....27,195-185-49-A-18
 W8LZT.....28,187-198-59-B-39
 W8KDJ.....28,890-113-60-A-26
 W8NOS.....16,848-156-36-A-1
 W8OMY.....16,434-126-44-A-17
 W8PLQ.....14,934-135-38-A-22
 W8HJK.....14,550-148-30-B-34
 W8OAC.....11,472-120-45-B-12
 W8JSW.....9,126- 78-38-A-13
 W8UON.....7008- 73-32-A-14
 W8IKM.....6210- 69-30-A-12
 W8RWZ.....4920- 60-41-B-11
 W8FNUX.....3538- 62-29-B-7
 W8TWT.....3519- 61-28-A-7
 W8IQN.....2308- 54-27-B-4
 W8IVE.....2700- 50-27-B-12
 W8SOL.....2550- 34-25-A-13
 W8BFH.....1811- 37-17-A-10
 W8PC8.....1500- 26-20-A-2
 W8AEU.....1334- 21-18-A-22
 W8INW.....390- 13-10-A-3
 W8KXP.....160- 10- 8-B-2
 W8VUV.....60- 5- 4-A-2
 W8GHT.....33- 11- 1-A-1
 W8DIB.....12- 6- 1-B-2
 W8JJP.....1- 1- 1-A-1
 W8DPA (W88 DPA J8H JSJ, W8FUP) 61,008-334-62-A-37

HUDSON DIVISION

Eastern New York
 W2ESE.....15,327-135-39-A-24
 K2ZAV.....4092- 63-22-A-8
 K2DQH.....3744- 48-26-A-7
 W28ZT (W28 KJG KRL, W0NFR) 51,832-427-62-B-40

N. Y. C.-L. I.

K2AAA.....108,864-504-72-A-37
 W2SKE.....54,002-436-62-B-19
 K2CUN.....39,576-181-61-A-22
 K2AED.....15,855-152-35-A-23
 W2EEN.....12,054-147-41-B-21
 K2AKZ.....11,136-116-32-A-36
 W2SGK.....10,320-130-40-B-6
 K2DZE.....4284- 60-24-A-14
 W2GJX.....3031- 71-29-B-8
 W2DLO.....1748- 46-19-B-4
 W2JDN.....358- 22-13-A-5
 W2IAW.....616- 23-14-B-3
 W2NNH.....615- 22-10-A-8
 K2DEM.....380- 16-10-A-2
 W2QAN.....108- 22- 3-A-11
 W2YHP.....98- 8- 4-A-4
 W2KTF.....48- 4- 4-A-1
 W2DKI.....12- 2- 2-A-1

Northern New Jersey

W2HJR.....86,520-623-70-B-38
 W2JJI.....31,122-274-57-B-36
 W2PEV.....13,365-135-33-B-33
 W2JYV.....907- 11- 9-A-9
 K2EHR.....48- 4- 4-A-1
 W2LSX.....34- 4- 2-A-1

MIDWEST DIVISION

Iowa

W0MLY.....32,824-406-68-A-37
 W0EY.....24,473-320-56-B-34
 W0QLJ.....12,330-148-45-B-35
 W0PLC.....300- 10-10-A-5
 W0LNI (W08 MGM NA) 40,068-330-63-B-1
 K0WAD (W08 BVX MHM STU UHZ) 5814- 80-38-B-17

Kansas

W0LXA.....39,930-242-55-A-36
 W0MEF.....15,608-154-51-B-21
 W0LZX.....3630-110-45-B-35
 W0QMS.....3788- 51-25-A-20
 W0PFB.....520- 20-13-B-5
 W0PYK.....273- 13- 7-A-5
 W0YGO.....243- 9- 9-A-2

Missouri

W0OMG.....58,357-441-67-B-39
 W0BCF.....54,810-400-70-B-30
 W0JAH.....14,586-143-51-B-27
 W0PLN.....6942- 91-39-B-28
 W0PFC.....4365- 49-30-A-13
 W0PKV.....3868- 52-25-B-6
 W0TGI.....6- 2- 1-A-1
 W0IYJ (W08 GEC IYJ) 25,475-167-51-A-31
 W0QON (W08 MUM SBO) 10,200-131-40-B-26

Nebraska

W0EHF.....47,450-333-73-B-19
 W0CYM.....22,116-194-57-B-18
 W0BTG.....10,206- 82-42-A-14
 W0CMD.....1044- 29-15-B-6
 W0JJK.....24- 4- 2-A-1

NEW ENGLAND DIVISION

Connecticut

W1YWU.....44,973-264-57-A-40
 W1BAN.....21,945-202-55-B-23
 W1YEW.....14,766-110-46-A-14
 W1YFH.....9968-124-27-A-22
 W1NPL.....9460-135-35-A-22
 W1ULY.....4758- 92-20-B-13
 W1RDV.....3924- 55-24-A-8
 W1WLY.....1624- 68-14-B-1
 W1QJM.....1248- 26-16-A-2
 W1WEL.....561- 17-11-A-4
 W1ZDP.....324- 12- 9-A-1
 W1ZMB.....153- 9- 9-B-3
 W1BOB.....50- 5- 5-B-1
 W1ICP.....32- 4- 4-B-1
 W1AW 4 (W18 WPR YYM) 26,620-245-55-B-16

Maine

W1GKJ.....25,000-195-43-A-29
 W1WTF.....20,631-150-46-A-24

Eastern Massachusetts

W1TRE.....58,403-300-65-A-38
 W1VYI.....50,337-331-51-A-34
 W1LYL.....23,186-190-41-A-34
 W1JNX.....22,140-164-45-A-28
 W1FKV.....12,099-109-37-A-12
 W1MPL.....5122-101-29-B-15
 W1YHY.....180- 10- 6-A-4
 W9VJD/1.....162- 9- 6-A-1
 W1WJR.....114- 10- 6-B-5
 W1RSR.....30- 5- 2-A-1
 W1MX 4 (W18 Y8W VKS, WAYHD, W5ZID) 37,300-343-56-B-38
 W1AF (W18 KZN SYV) 3335- 75-23-B-13

Western Massachusetts

W1KFD.....39,000-250-52-A-35
 W1ZD.....36,603-291-63-B-36
 W1MNG.....14,840-140-53-B-16
 W1UKR.....5366- 85-33-A-19
 W1CJL.....4836- 62-26-A-5
 W1RLQ.....1050- 25-14-A-9
 W1YK (W18 UBC VAH VVO WMH YFY, K2CHM) 405- 15- 9-A-1

New Hampshire

W1FZ.....57,834-307-63-A-30
 W1HSC.....25,394-149-57-A-26
 W1ZCH.....9315-104-30-A-16
 W1WS.....3498- 53-22-A-7
 W1ZTW.....1596- 39-14-A-10

Rhode Island

W1TRX.....18,923-182-52-B-18
 W1SVQ.....40- 5- 4-B-1

Vermont

W18EO.....19,926-187-54-B-32
 W1NHJ/1.....5332- 86-31-B-1

NORTHWESTERN DIVISION

Alaska

KL7BFR.....2607- 40-22-A-6

Idaho

W7NGA.....23,486-160-51-A-24
 W7IY.....5994- 74-27-A-29

Montana

W7NPV.....30,150-169-60-A-29

Oregon

W7OYA.....17,820-165-36-A-30
 W7AZK.....12,880-140-46-B-18
 W78YF.....270- 15-11-A-11

Washington

W7SFA 5.....82,962-419-66-A-39
 W7EYD.....30,375-205-50-A-16
 W7KWX.....6816- 71-32-A-20
 W7BLX.....2064- 66-16-A-3
 W6VUW/7.....48- 4- 4-B-3

PACIFIC DIVISION

Hawaii

KH6CD.....1248- 27-16-A-5

Nevada

W7JJO.....11,776-128-46-B-10
 W7RKE.....126- 7- 6-A-4

Santa Clara Valley

W8MKM.....27,848-199-47-A-27
 K6BAM.....21,866-170-43-A-30
 K6BBD.....216- 12- 6-A-2
 W6UW (K6BBD, KN6HCP) 444- 18- 8-A-2

East Bay

W6BXE.....48,246-368-66-B-28
 W6VER.....47,895-361-62-A-35
 W6BSY.....18,705-145-43-A-27
 W6TRA.....3664- 56-22-A-14
 K6DVA.....1680- 35-16-A-7
 W6VVZ (W68 JIQ VVZ) 46,592-368-64-B-10

San Francisco

W6CBE.....73,982-521-71-B-40
 W6ATO.....13,550-140-50-B-17
 K6ALJ.....1283- 29-15-A-11
 W6LQN/6.....48- 4- 4-A-3

Sacramento Valley

W6GDO.....42,224-378-56-B-39
 W6YBI.....32,160-288-60-B-36
 W6HIR.....1148- 24-17-A-2

San Joaquin Valley

W6NDP.....41,580-227-63-A-31
 W6GQZ.....12,400-155-40-B-26
 W6TZN.....11,000-111-50-B-31

ROANOKE DIVISION

North Carolina

W4HIU.....35,526-286-62-B-25
 W4ZWF.....8016- 84-32-A-10
 W4CVX.....1566- 31-17-A-4

South Carolina

W4EZF.....1425- 38-19-B-3

Virginia

W4HQN 6.....141,480-655-72-A-40
 W4CIBQ.....48,100-385-65-B-38
 W4843.....39,845-344-56-B-33
 W4ULV.....29,988-295-51-B-22
 W4KMS.....20,520-180-38-A-30

W4VUF.....17,982-162-37-A-30
 W4PRK.....14,266-170-27-A-1
 W4AYO.....12,771-132-33-A-16
 W4YUJ.....12,700-127-50-A-15
 W4IMP.....9332-151-32-B-10
 W4ZVE.....7452- 92-27-A-7
 W4YTZ.....7250-145-25-B-20
 W4BLO.....5772- 83-37-B-10
 W4UJL.....4088- 73-28-B-8
 W4KUF.....3400- 68-25-B-10
 W44MP.....2932- 36-21-A-8
 W4UTE.....1584- 33-16-A-3
 W4RSB.....1428- 28-17-A-4
 W4OSR.....419- 17- 9-A-3
 W4MZR.....204- 17- 4-A-3
 W4UTM.....60- 10- 2-A-7
 W44TE.....36- 4- 2-A-8
 W4VPU.....21- 4- 3-B-1
 W4BXL.....10- 2- 2-A-1
 W4ZLH.....9- 3- 1-A-1
 K4WAL.....7- 1- 1-B-1
 W4ACA (W48 AYC CBM LNX OLD 88Z 22Z 22V) 34,935-348-51-B-29

West Virginia

W8WHR.....7128-108-33-B-13

ROCKY MOUNTAIN DIVISION

Colorado

W0QXC.....87,117-409-71-A-40
 W08BE.....78,192-362-72-A-35
 W0OYS.....42,569-243-59-A-34
 W0TUF.....20,798-148-47-A-22
 W0BVG.....18,825-127-50-A-22
 W0LCO.....15,328-136-49-B-22
 W0WFD.....136- 50-29-A-12
 W0BON.....3892- 70-28-B-9
 W0MYB.....270- 10- 9-A-3

Utah

W68LF/7.....42,387-300-71-B-36
 W7QWH.....25,132-207-61-B-19
 W7VJJ.....5549- 70-27-A-11
 W7QDJ.....819- 20-14-A-2

Wyoming

W7VBP.....5694- 73-39-B-6
 W7QPP.....297- 12- 9-A-6
 W7PSO.....12- 2- 2-A-1

SOUTHEASTERN DIVISION

Eastern Florida

K4ARD.....65,193-352-62-A-39
 W4BVE.....12,672-132-52-A-31
 W4843.....147- 50-29-A-12
 W4NEK (W48 CNC CNL, K2BQH) 24,898-215-59-B-23

West Florida

W48OQ.....19,875-133-50-A-23
 K4AMU.....533- 21-13-B-6

Georgia

W48OV.....57,216-301-64-A-37
 W48YU.....55,296-289-64-A-40

Canal Zone

KZ5KA.....4320- 61-36-B-13

SOUTHWESTERN DIVISION

Los Angeles

W6AM 7.....181,551-835-73-A-39
 W6V88.....45,848-387-59-B-40
 W6NJU.....33,900-226-50-A-34
 W6WLY.....7301- 78-31-A-22
 W6PEF.....2100- 50-14-A-17
 K6BEQ.....1680- 35-16-A-7
 W68QY.....750- 25-10-A-4
 K6GLS.....384- 16- 8-A-2
 K6HGF.....354- 66- 2-A-10
 W6LIT.....285- 19- 5-A-3
 W6TRB.....258- 16- 8-B-1
 K6ASL.....108- 6- 6-A-1
 K6BSV.....44- 21- 1-A-1
 K6DFC.....12- 2- 2-A-1

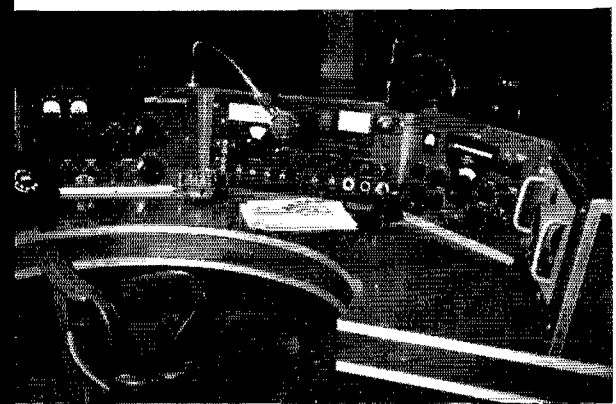
Arizona

VE1LL/W7 26,586-213-63-B-1
 W7VMP (W78 VMO VMP VMQ) 74,621-532-71-B-40

San Diego

W6CEV.....69,300-350-66-A-37

(Continued on page 140)



All equipment is within easy reach at the neat, console-type operating position of N.Y.D.-L.I. awarded K2AAA. Don, lucky holder of a call which doesn't need phoneticizing, was one of the four 100,000-point mike men.

QST for

QST—Volume III

Part III † — Foreword to Sumner B. Young's (WØCO) Index

OF INTEREST to those who wish to follow other legislative incidents covered in Volume III are the following citations: the editorial called "Warning!" at 26, April 1920; the companion editorial entitled "New Legislation" at 27, April 1920⁸²; and the editorial found on pages 24 to 25, in the July (1920) issue, called "Legislative Affairs."⁸⁴

The fraternal and gregarious instincts of the amateurs were asserting themselves; and a large convention, called "The First Annual Third-District Amateur Convention," was held at Philadelphia on May 8, 1920. (For an account of it, see 37 to 38, June 1920.) This gathering evidently was inspired by an earlier meeting staged by the New England Division Amateurs.⁸⁵

"The Philadelphia Idea" was praised in an editorial published at 21 to 22, June 1920:

. . . What we want to direct attention to is the scheme of our Philadelphia and Third District brothers. It is a good one. They say, let us not have a meeting of some club, but instead let us have a convention of amateurs from all over the District. Let all the clubs take part and send as many of their members as they can. And let the unattached come and join hands and get acquainted with the splendid brotherly spirit of amateur radio. In order to make things solid, our Third District brothers organized on the spot the Third District Convention. The Convention elected officers and voted to have a big rousing meeting once a year. They affiliated with

our ARRL and did the whole job up in finished style.

We cannot help but point out that this would be a mighty good plan for the other districts to follow. It would be a stepping stone to that one grand ambition we have here at headquarters, which is some day to be strong enough to have a grand National Amateur Radio Convention, at which all the districts would be represented from the entire country, and where we could meet face to face our friends of whom we have heard so much but whom we have never seen. Read the story of the Philadelphia Convention, fellows of other districts and talk the thing over. We will help from Headquarters. . . . (Italics added by S.B.Y.)

Another outstanding feature of Volume III of QST is its story of the so-called "fading tests."

There were two kinds of "fading tests" run during the period of time covered by Volume III. Both grew out of an idea first mentioned in an editorial found at 23 to 24, May 1920, entitled "Fighting Fading." After stating that the amateur stations were in a position to organize a systematic study of the problem, the editorial stated (at 24, May 1920):

. . . While we were thinking of all these things, along came the Radio Section of the Bureau of Standards and wanted to know if the ARRL would cooperate with them in the collection of data on transmission phenomenon. . . . We went right down and talked it over with them, and as a result arrangements are now being made whereby a

† For previous installments see following QST references: Part II of "QST—Volume III," April, 1955; "QST—Volume I," October, 1954; "QST—Volume II," February, 1955; Part I of "QST—Volume III," March, 1955.

⁸² An extract from it reads: ". . . the RCA seems to have fixed it up with our Uncle that if he'll give them transoceanic business for their own playground they'll boost Sam's aspirations to control all the rest of it. So it looks like there's fun ahead."

⁸⁴ Among other things, this recounts the Secretary of Commerce's appointment of a prominent amateur, Charles H. Stewart, of St. David's, Penn., to serve on an advisory committee of "the best technical radio men," engaged in a study of needed radio legislation. This, in part, was to prepare for U. S. A. participation in an International Communications Convention.

⁸⁵ See Service's report, at 26, May 1920. ". . . Following the example of the New England amateurs, those in and around Philadelphia are planning to hold a convention and banquet, at which will be represented all the individual amateurs, radio associations, schools and allied-interest within a wide range. Prominent speakers from the ARRL, Department of Commerce, Navy and others will be on hand. . . ."

Also in the August (1921) issue, Glenhurst Research Labs (at Omaha) offered 3 receivers with a bottom tuning limit of 150 meters. See 112, August 1921 (Volume V).

At 55 to 56, December 1920 (Volume IV), a letter from Scott complains that very few amateurs could tune their receivers down low enough to receive 180-meter spark sigs from his station.

The famous Reinartz C.W. Receiver (tuning from 150 to 450 meters) was not described in QST until June, 1921. See 6, June 1921 (Volume IV).

The "improved" Reinartz C.W. Receiver, described in

the March (1922) issue, had a bottom tuning range of approximately 130 meters. See 9, March 1922 (Volume V).

Jensen's Report (47, July 1922, in Volume V) declares that in the Dakota Division, at that late date, many receivers could not tune below 250 meters.

At 25, March 1922 (Volume V), Phelps complained that lack of stations equipped to receive waves below 200 meters was still hampering the development and use of such waves.

A "Stray" at 50, February 1922 (Volume V), announced that some stations had attempted to operate on 100 meters, but had found that nobody had a receiver capable of picking up their signals.

At 67, April 1922, a letter from McClung served notice that he wanted somebody to work with him, down on 150, 175, and even lower. (This item, too, is in Volume V.)

A letter from Canadian 3GN (see 62, April 1922, in Volume V) declared that very few receivers would get down to 140 to 170 meters; although a few actually would receive down as low as 170.

In the January (1922) QST, Kruse (in a letter) declared that manufacturers should produce a tuner having a normal range of 100 to 200 meters, and capable of being loaded to 400 meters. See 63, January 1922 (Volume V).

Of course, many amateurs built their own receivers; but no data are available on such equipment.

At 48, February 1920, in the article entitled "Auto-Modulated C.W. Telegraphy," mention is made of the possibility of dropping a v. t. transmitter down on 175 meters, to avoid QRM; but the accomplishment was not reported.

In the winter of 1920-1921, S. Kruse (at Washington, D. C.), with 3RP (at Hyattsville, Md.), and 3ABI (also at Washington, D. C., I believe) successfully operated some tube transmitters on wavelengths around 170 meters, for QRM avoidance. See article by Kruse ("Exploring 100 Meters"), at 12, March 1923. This is in Volume VI.

limited number of transmitting and receiving stations are going to make readings for ARRL-Bureau of Standards tests this summer.³⁶ . . .

The same editorial indicated that a much more extensive set of tests would be run, later, under the supervision of the League; and that *many* amateur stations — not simply a few — would participate. Final arrangements for this ARRL series were to be worked out and announced in *QST*, at a later date.

At 5 to 6, 16, June 1920, it was stated that schedules for the entire country had not yet been finally settled. But complete transmitting schedules were promised for July publication; and a form of "ARRL Fading Report," similar to the one used in the "Bureau of Standards" series, was printed.

In the meantime, the ARRL-Bureau of Standards fading tests commenced, on June 1, 1920, and ran through July 17, 1920.³⁷

Evidently many amateurs failed to understand that the fading tests which were being made in June and July of 1920, in cooperation with the Bureau, were *wholly different* from the more widespread tests which were being planned by the League. The Editor, at page 5 of the July (1920) issue, attempted to "set them straight":

. . . Let us explain again, to clear the air of confusion, that the tests which started June 1st are being conducted for the Bureau of Standards and are participated in by a very limited number of ARRL receiving stations especially chosen on account of their location. These stations are supplied forms and instructions by the Bureau and are reporting their results weekly direct to the Bureau for analysis.

The transmitting stations in this test are using a wavelength of 250 meters by special authority, and their transmitting schedule is at the following hours

on Tuesday, Thursday and Saturday of each week.

1AW, Hartford, Conn.	10:10 P.M. EST
2JU, Woodhaven, L. I.	10:20 P.M. EST
NSF* Washington, D. C.	10:30 P.M. EST
8ZK, Pittsburgh, Pa.	10:40 P.M. EST
9ZN, Chicago, Ill.	9:50 P.M. CST
9LC, St. Louis, Mo.	10:00 P.M. CST

* 3ZW on 250 meters, or WWV on 370 meters, may substitute for NSF.

As announced in June *QST*, the ARRL has enlarged upon the idea originating in the Bureau tests, and schedules are being arranged in each Division whereby all of us may participate in the collection of fading data, and it is this scheme which is holding our interest so closely just now. Independent schedules are arranged in each Division, and everybody is invited to join. . . .

The schedules of the transmitting stations, in the following Divisions, were announced, at pages 6 to 8, July 1920: Central, Midwest, Dakota, East Gulf, Atlantic, New England, Delta, Roanoke, West Gulf, Northwestern, and Pacific.

Most of the transmissions were "slated" (in these schedules) to begin in the middle of July, 1920, and to end anywhere from August 14th to September 14th, 1920 (6 to 8, July 1920). "Special fading analysts" were appointed, in each Division, to receive the reports and to see what information could be derived from them.³⁸

In the first number of Volume IV (August, 1920), it was announced that the Bureau tests had ended and that the League tests would begin (as scheduled); but that the first series of League tests would end on August 31, 1920 — conflicting arrangements to be cancelled.³⁹

The League series of fading tests were a failure; and no attempt to run a second League series was made on a country-wide basis.⁴⁰

³⁶ Mr. S. Kruse (Asst. Elec. Engineer, Bureau of Standards) was one of the originators of the idea of the Bureau of Standards-ARRL fading tests. See 57, June 1921 (Volume IV), and 6, November 1920 (Volume IV).

For details of the first meeting between Maxim and Warner and the Bureau of Standards people, held on April 7, 1920, see 6, November 1920 (Volume IV). Commander A. Hoyt Taylor, U.S.N.R.F., in charge of the radio laboratory, Naval Air Station, Anacostia, D. C., was also present. From the Department of Terrestrial Magnetism, Carnegie Institution, Washington, D. C., Dr. S. J. Mauchley and Mr. A. Sterling were in attendance. Maxim offered the use of station 1AW, and Commander Taylor (subject to Navy Department approval) offered the services of station NSF. Dr. J. H. Dellinger, Mr. L. E. Whittemore, and S. Kruse represented the Bureau of Standards.

Earlier in 1920, an editorial in *QST*, called "Swinging Signals" (15 to 16, January 1920) had described the effects of fading, and had asked: "Is there nothing we can do to solve the problem?" J. O. Smith (Traffic Manager of the League) published an article entitled "Variation of Strength of Amateur Station Signals," at 17, April 1920. He mentioned "dead pockets," on land and on sea, along with "fading"; and he asked all amateurs to turn over to the League any information which they might possess, on these things, so that the data could be studied. Some examples of fading, observed on 600-meter ship-to-shore channels, at a British coastal station near Halifax, N. S., were given by Chas. A. Lowry (of Toronto, Canada), in a letter published at 47 to 49, April 1920. He added: "I think the amateurs should get together and try by comparing notes to see if we can't arrive at some definite law that may perhaps cause these strange swinging signals to act as they do."

³⁷ See 5, November 1920 (Volume IV). For Kruse's analysis of the first "ARRL-Bureau of Standards Fading

Tests," see 5 to 12, 37, November 1920; and 13 to 19, 22, December 1920.

A second series was run in cooperation with the Bureau of Standards during October, 1920. This series was announced at 11, October 1920 (Volume IV).

On station performance, during the first Bureau series of fading tests, see Kruse's article at 11 to 14, September 1920 (Volume IV).

³⁸ Again, see 6 to 8, July 1920. The appointees included some very prominent amateurs.

³⁹ 5, August 1920 (Volume IV).

⁴⁰ At 14, September 1920 (Volume IV), it is said: ". . . The ARRL QSS Tests will have been concluded when this appears in print. It is too early to forecast the results, but they seem none too favorable as viewed at this writing. In the southern states QRN has been so terrific as to make them practically a flat failure. They have been run at the very worst time of the year for every locality, and coupled to this is the fact that August is the great vacation month and hundreds of stations have been idle which would otherwise be on the job. All these features are combining to result in a dearth of reports, but it is still expected that information of decided value will be obtained. — Editor."

I have found mention of some "Delta Division ARRL QSS Tests," to be started on November 4, 1920, and to continue during that month. See Clayton's report, 41, December 1920 (Volume IV).

R. H. Pray, at 25, October 1920 (Volume IV), says: ". . . The fading tests in this Division were almost a complete failure, due, I think, to the fact that there was not enough interest. Although the transmitting stations were on nearly as scheduled, there were no recording stations and no reports. . . ."

W. T. Gravely, at 24, October 1920 (Volume IV), states:

By contrast, the Bureau series of fading tests of June and July, 1920, were of such interest that the Bureau of Standards, in cooperation with ARRL, planned three further series for October, 1920; January, 1921 and April, 1921.⁴¹ At least two of them were carried out, in due course;⁴² and I believe all three were run off as planned.

Turning now to the magazine itself, it is interesting to note that after World War I, the arrangement with The Radio Club of America was renewed, providing for publication (in *QST*) of papers presented before that organization.⁴³

Edwin H. Armstrong's famous paper on the superheterodyne, "A New Method for the Reception of Weak Signals at Short Wave Lengths," was the first one published under this pact. See 5 to 9, 15, February 1920.

An interesting method of grounding an antenna system was disclosed in an article by H. E. Rawson,⁴⁴ at 14 to 15, in this same issue (February, 1920). This was "Round's Round Ground" devised by Captain H. W. Round, chief engineer of Marconi, Ltd., London, England. The ground plates were arranged in a vertical position in a circular trench. Insulated leads of identical length were run from a central post to the top of each ground plate. The idea was to deliver all of the r.f. energy to the earth at one and the same instant and to avoid a multiplicity of high-resistance paths to ground of diverse lengths and characteristics.

Readers of the "Index to Volume III" will be interested in the following miscellaneous matters:

(a) *Amateur Regulations:*

At the "reopening," all amateur licenses had expired. So, in all cases, exams for an operator's license were necessary. The code speed requirement was raised from the old 5 w.p.m. standard, to 10 w.p.m. Also, a "clean start" was made, on the issuance of calls. Furthermore, Special-Station licenses became very hard to obtain.⁴⁵ Even small transmitting stations which were incapable of sending a radio signal across a state line were required to take out licenses.⁴⁶

Use of initials, as call letters, by unlicensed small stations, became illegal.⁴⁷

Even licensed amateurs who communicated with unlicensed amateur stations faced trouble out on the Pacific Coast.⁴⁸

In England, however, the amateur regulations issued by the Postmaster General were fantastically stringent:

. . . Aerial not to exceed 100 feet in length for single-wire aerial; or 70 feet for two-wire aerial; operator must be a British national and over 20 years of age; diagram of receiver to be submitted for approval, and valves shall not be used without special authority; power of transmitters not to exceed 10 watts.⁴⁹ . . .

(b) *Aurora Borealis (or Similar) Effects:*

A big "blackout" of radio signals, on December 17, 1919, was noted.⁵⁰

In an editorial at 23, May 1920, a period of "wide spread aurora" is mentioned; troubles extending over two-thirds of the month of March, 1920, were recited.

J. O. Smith's report, at 26, May 1920, speaks of widespread auroral disturbances on March 22, 1920. He observed these while on a visit to St. Louis, Missouri.

Service's report, found on 27, May 1920, states:

. . . How about those Northern Lights on March 22nd? There seems to be a pretty general agreement from all parts of the Division that long distance was knocked unconscious and took three or four days to recover. Some got peculiar kinds of QRN, hissing, sparks, etc. . . .

(c) *Eclipse Effects:*

See the letter by Mr. A. L. Groves, dated from Brooke, Virginia, on May 3, 1920 (page 51, June 1920). The moon was in total eclipse at that location on the night of May 2, 1920. He observed certain phenomena on the 200- and 600-meter bands.

(d) *Emergency Work:*

I have found only one instance recorded in Volume III. This is under "Strays," at 25, December 1919. Unfortunately, there are "gaps" in the account:

. . . During the tropical storm which swept the

" . . . The QSS tests in this division were a complete failure, due, mainly, to the lack of recording stations. The transmitting stations were heard, and their sparks went out on normal radiation, but reports were so few that the data aren't worth reporting. Mr. Groves, fading analyst for the Division, will cover the ground in his report to *QST*, so I shall refrain from making further comments. . . ."

J. O. Smith, Traffic Manager of the League, makes a more optimistic (but completely undocumented) statement, at 26, September 1920 (Volume IV): ". . . The QSS tests of the League have been carried on very successfully . . . aside from the tests made by the League for the Bureau of Standards, this is the first attempt ever made to collect definite data on abnormal and fading signal strength. . . ."

Frank M. Corlett reported receiving only four reports, in the ARRL QSS Tests conducted in the West Gulf Division. See 29, September 1920.

No article analyzing the League fading tests, comparable to Kruse's articles on the Bureau tests of June and July, 1920, ever appeared in *QST*.

⁴¹ See 13 to 14, September 1920 (Volume IV).

⁴² On the October (1920) tests, I have found only the announcement, at 11, October 1920 (Volume IV).

On the January (1921) tests, see 25 to 26, April 1921 (Volume IV).

On the April (1921) tests, see 25 to 26, April 1921 (Volume IV), as above; and also see April QSS Schedules, at 23, April 1921 (Volume IV).

⁴³ 16, January 1920. It was there announced that Armstrong's paper on the *superheterodyne* would be the first one published.

⁴⁴ The title was: "Speaking of Grounds."

⁴⁵ On all this, see the editorial called "The Lid," at 13 to 14, August 1919.

⁴⁶ See J. O. Smith's report, at 16, September 1919.

⁴⁷ See the editorial called "Unlawful Transmitting," at 22, June 1920.

It is true, however, that the outstanding amateur station of Louis Falconi, at Roswell, New Mexico, operated under the call "LF," for a while, before receiving his Special-Station License. But he must have had some written authority to do this. See 39, February 1920; and 40, March 1920.

⁴⁸ See Seefred Bros.' report, at 40, February 1920.

⁴⁹ See "Strays," at 43, July 1920.

⁵⁰ See editorial called "A Lesson," at 17, February 1920.

lower Texas coast in middle September resulting in the destruction of Port Aransas and immense loss of life at Corpus Christi, Clifford W. Vick, sometimes CV, of Houston, Texas, rose to sudden fame and overnight became a celebrity in his home city. Vick is a typical American amateur and of course was on the job at his station, and gave the Houston papers the surprise of their lives when he was able to get more real news on the hurricane than any of the national news agencies. In fact he gave to the people of Houston the first authentic information of the storm's location and of the destruction taking place. . . .

This account leaves us completely in the dark as to how, and from whom, Mr. Vick picked up his information. No amateur station within the storm area is mentioned. Did Vick "listen-in" on Government hurricane warnings? Maybe so. But how did he obtain his information concerning the amount of destruction taking place? And why was this information superior to whatever news the national news-agencies were able to gather? Did he "overhear" some 600-meter "gossip" by ship operators? Or What?

This certainly is a "shining example" of how not to report an event of this type.

(e) *League Affairs:*

J. O. Smith, Traffic Manager of the ARRL, departed (on October 23, 1919) on a journey which took him to 20 states. He visited many amateur stations during this trip.⁵¹

An editorial, "Our New Directors," published at 23 to 24, March 1920, contains this interesting passage:

. . . We've never had a meeting at which all the members of our Board could be present, for it takes considerably longer than the speed of radio waves to get up this way from Texas or Florida or California . . . but we do like to think of all the fun we would have when we can succeed in rounding up all our organization to a convention to be held in some central point, such as Chicago. Think of all our officers and all our operating organization meeting face to face. . . .

Amateurs were urged not to shut down their stations during the Summer of 1920, but to continue operating. See "Don't Give Up the Station!" (8, July 1920).

(f) *Radiophones:*

Robert F. Gowen, radio engineer for DeForest, operated a powerful v.t. 'phone transmitter at his home in Ossining, New York, on 750 meters. His call was HRL. He also operated on c.w. and m.c.w. See "Strays," at 24, December 1919.

Service's Report, at 26, May 1920, speaks of "recent" radiophone tests being conducted by the Western Electric Company, on wavelengths

between 450 and 1,800 meters.

Walter S. Lemmon, in an article at 7 to 11, 16, June 1920, described the "Recent Development of Radio Telephones." The apparatus described was mostly W.E. and G.E. gear, furnished to the armed services. At 16, June 1920, Mr. Lemmon described some of the ship-to-shore work conducted between the USS *George Washington* and the big shore station at New Brunswick, New Jersey.

The Alexanderson high-powered long-wave alternator, at New Brunswick, was modulated (by some undisclosed means); and a "telephone patch" connected that station with Washington, D. C. A 3½-kw. v.t. transmitter, rigged for "duplex" operation, was used aboard the *George Washington*. Very good two-way conversations, between this vessel and Washington, D. C., via the 'phone patch, were interchanged up to a distance of 400 miles from New Brunswick.

(g) *Firsts, or Near Firsts:*

At 6 to 7, August 1919, the first published "bid" for the affiliation of radio clubs with the ARRL appears.

A letter from *QST's* cartoonist, Donald A. Hoffman (ex-8ADU), published at 29, August 1919, gives a suggested form of QSL card.

At 29 to 30, August 1919, there appears what I believe to be the first published suggestion that the government appoint amateurs to "police" the air, and thus to minimize QRM. Hubert Woods, of Glendale, California, wrote the letter in which the idea is set forth.

The first regular "calls heard" lists to be published after World War I will be found at 14, December 1919.⁵²

A system of installment buying of radio apparatus (called RVA Service) is noted, under "Strays," at 24, December 1919. J. Donald Vandercook, of Lombard, Illinois, conducted it.

The first "transcon" to be sent across the country after World War I is recounted at 13, January 1920. It occurred on the night of December 4th to 5th, 1919.

It is not clear who had the distinction of being the first amateur to handle a message with the famous Navy transatlantic plane, "NC-4," when she was on a recruiting trip which took her to some Gulf ports, and up the Mississippi river. It was either C. W. Vick, of Houston, Texas, or Mr. Crowds (9BR), of St. Louis, Missouri.⁵³

The first instance of the use of amateur field stations, to "time" motor-boat races, is recited at 38 to 39, July 1920. The Radio Club of Burlington (Iowa) set these up, at a regatta held at that city under the auspices of the Mississippi

⁵¹ See "A Little Journey," 15 to 16, 18, March 1920.

⁵² At 22, November 1919, Charles A. Service, jr., had reported reception of 5 local amateurs, at 3QZ, on some unnamed date; but he had not listed the calls themselves.

⁵³ J. O. Smith's report, at 34, February 1920, says: ". . . The Houston, Texas, newspapers record the fact that one of the League's traffic officers, Mr. C. W. Vick, 1918 Smith St., Houston, had the distinction of working the NC-4 on her recent flight between New Orleans and Galveston. It is stated that Vick was in communication with the

plane during the entire flight. . . ." See, also, Autry's report at 39, February 1920.

At 44, February 1920, under "Strays," we find the following: ". . . In late November, the Navy Seaplane NC-4, of transatlantic fame, made a trip up the Mississippi river on a recruiting tour, and the enterprising Mr. Crowds of 9BR, St. Louis, arranged to establish communication with her operator, Lt. Rodd. From St. Louis to Hannibal, the next stop, uninterrupted communication was maintained . . . *This is the first time we have heard of an amateur station working a plane. . . .*" (Italics added by S.B.Y.)

Valley Power Boat Assn.

In addition to the timing stations, the club operated station 9ACZ, to relay messages, free of charge, for persons attending the regatta, and to broadcast race results.

(h) *Wit and Humor*:

"S.O.L.," by Irving Vermilya, found at 6 to 7, 25, December 1919, reflects his first impressions of life in the U.S.N.R.F., during World War I. It also tells us how "old" WCC (at South Wellfleet, Mass.) was "taken over" by the Navy, and dismantled.⁵⁴

M. Adaire Garmhausen, in "How to Build a Wireless Station," gave us a good record of a lady operator's attitude toward the problems of ham radio. See 55 to 56, July 1920.

(i) *War Service Records*:

In Entwistle's Report, at 17, August 1919, I find this passage:

... Radio Inspector Mr. Arthur Batcheller, at a meeting of the New England Amateur Wireless Association, said that out of about 2400 amateurs in the First District about 1100 were in some branch of the service. . . .⁵⁵

(j) *Curiosities*:

Present day collectors of old issues of *QST* will weep over this one: At 36, August 1919, an ad by the League reads as follows:

Back Copies of *QST*

Have your *QST* files complete. Some numbers are already exhausted. December, 1915; January, March, April, and September, 1916, available at 25 cents per copy, postpaid. All issues after September, 1916, 15 cents postpaid. . . .

At 30, September 1919, an item under "Here and There" announced:

... Mighty good chances in the commercial game, right now. A good operator can get \$125 and up a month, and food, and all the schools are enjoying a huge business. . . .

The "Otter Cliffs," Maine, station of the U. S. Navy was referred to as the busiest coast station in the country."⁵⁶

An item in Entwistle's report, at 17, October 1919, is rather startling:

... We have already begun negotiating with British amateurs and amateurs in the Azores for a proposed transatlantic relay. What can you do to help us? . . .⁵⁷

A letter from Henry Klaus, at 29, October 1919, gave "hams" who were located in the country towns something to think about:

... I wonder how many radio enthusiasts realize

the many possibilities of amateur wireless, particularly in the country districts.

For instance, before the war W. S. Taylor of Minonk, Illinois, and the writer at Eureka, Illinois, exchanged news items by wireless for each edition of the local papers where this "press service" was printed under the pretentious heading "By Radio."

Before the closing of amateur wireless the board of supervisors offered to pay us to keep the courthouse clock set right. On the last presidential election we kept out a bulletin board almost all night. . . . (Italics added by S.B.Y.)

Some items published about F. H. Schnell gave a few of the interesting incidents of his U.S.N.R.F. career, during World War I, and in the months just following it. Schnell certainly was "around" at historic moments:

... While in uniform several incidents befell him which any radio man would cherish: While at Belmar he copied the first message from Rome (LDO) to President Wilson; copied the armistice acceptance message from Nauen (POZ) while at Washington; and his was the honor of transmitting to POZ the first message since our entrance into the war.⁵⁸ . . .

He also made three trips with the presidential party, on the USS *George Washington*.⁵⁹ On one of them (when President Wilson landed at Boston, Massachusetts), the vessel exchanged heavy traffic with WBF (Boston), which was then in charge of E. A. Gisburne, another famous amateur, and the holder of the Congressional Medal of Honor.⁶⁰

Mr. A. H. Wood, jr., at Winchester, Massachusetts, began broadcasting music via radiophone, on 200 meters, from his home. Concerts were scheduled at 3:00 P.M., on Sundays, and also on week-day evenings at some undisclosed time.⁶¹

C. D. Tuska began playing records, and reading scientific papers, over his radiophone (at Hartford), to entertain local "hams."⁶²

During radiophone tests between the USS *George Washington* and the long wave station at New Brunswick, New Jersey, in the summer of 1919, the ship's signals were fed into a transmitter at the shore station, and were reradiated on a wavelength of 13,600 meters. This was also done on 8000 meters.⁶³

9ZN and NSF transmitted the "moves" in a championship chess game, on waves below 275 meters, on the night of April 14, 1920. Mr. Norman T. Whitaker, of the Capital City Chess Club, played Mr. Edgar Lasker, of Chicago. The players remained in their respective cities, and battled for 5 hours, via the ether waves.⁶⁴

(Continued on page 158)

⁵⁴ See, also: 33, February 1920 (letter); and 16 to 17, August 1920 (Volume IV).

⁵⁵ The figures don't "sound right" to me.

⁵⁶ 3, October 1919, in "Building Your Own C.W. Apparatus."

At 20, January 1920, this same station was said to be "the premier receiving station of the Navy during the war." (Entwistle's report.)

⁵⁷ I have been unable to pick up the "thread" of this particular story anywhere else in the first 5 volumes of *QST*. Apparently Mr. DeSoto's "Two Hundred Meters and Down" is silent on the point, also.

⁵⁸ 30, November 1919.

⁵⁹ 30, November 1919.

⁶⁰ See note on 24, February 1920, in the account of the "Boston Conference" (Entwistle). Also, see 20, January 1920, as to how Gisburne won the Congressional Medal, for bravery under fire during the Vera Cruz (Mexico) troubles, prior to World War I. He lost a leg down there. (Entwistle's Report.)

⁶¹ See "Strays," at 44 to 45, February 1920.

⁶² See 37, May 1920 (Radio Club of Hartford).

⁶³ See letter from Theo. A. Gaty, 3CV, at 46, April 1920.

⁶⁴ 19 to 20, June 1920. The account concludes with these words: "... Chess by wireless is of course not new but this is probably the first time it has been done over these distances and on amateur waves. . . ."

YL NEWS and VIEWS

BY ELEANOR WILSON,* W1QON

KL7 YLs

There are approximately thirty licensed women amateurs in Alaska. To some of these YLs, ham radio is not only an interesting and pleasurable hobby, it is often their only link with the rest of the world.

When one is completely isolated for weeks during "freeze-up" and "thaw-out" periods, as KL7OT, Lydia "Buddy" Clay, has been many times, amateur radio assumes new importance and one appreciates more deeply what fellow Amateurs are able to do.

A book could be written about the experiences of KL7 YLs. We are able to introduce only a few of them at this time, but hope to bring others to the fore later.

KL7ARU — Celia Hunter; licensed in 1952; manager of a Fairbanks travel agency and part owner of a summer camp at Camp Denali, deep in the bush country; has a commercial pilot's license and instructor's permit; lives alone in a veritable "do-it-yourself" log cabin. Her chief interest in amateur radio is local (intra-Alaskan) communication — "this is a big country, and telephone service is virtually nonexistent." She operates mostly on 75 with a Lettine transmitter and an SX-71.

KL7ZR — Rose Cowles; Fairbanks; licensed 1948; OM KL7AN; had the first dog mobile in Fairbanks driven by nine Samoyed dogs using the Alaska Amateur Radio Club call, KL7KC. "While proceeding up Second Avenue calling 'CQ', we were heard in Massachusetts." Rose was president of the Alaska ARC in 1952. She operates 10-meter 'phone with a 45-watt home-built transmitter.

KL7AVO — Virginia Saxon. OM KL7AVK is a doctor in charge of the Alaska Native Service Hospital in Juneau. Virginia's third harmonic was born during a howling blizzard on St. George's Island, one of the seal-famous Pribiloffs in the Bering Sea.

KL7AX — Verna St. Louis; Kodiak; licensed in 1938.

*YL Editor, QST. Please send all contributions to W1QON's home address: 318 Fisher St., Walpole, Mass.



KL7AVO and KL7AVK with their harmonics.

KL7OT — Lydia "Buddy" Clay; licensed 1947. During flood periods Buddy and her OM KL7EM have provided the only communications for the area around Aniak. She writes that "signals have been very poor up in KL7 land for the past several years so activity on any other band except 75 has been curtailed. Even 75 has been poor, but it is opening up and getting back to normal."

KL7BEW — Thelma "Jean" Baker; licensed 1954; lives with her OM, KL7ASQ, at a v.h.f. repeater station in Kaltag. "Our nearest neighbor is 5 miles up river, so if I want to chat with anyone other than our family, it has to be via radio. It is fun to talk to the various YL operators in Alaska, and we can have coffee together, tho' not in the same room. Radio is vital to anyone in this part of the country. We order supplies, fresh produce, etc., via ham radio (to say nothing of hi-fi and radio gear!). I teach our eight-year-old boy, and when signals are good, the teacher lets school out early or declares recess."

KL7RN — Jeanne Collins. Her experiences in the north country could provide a Hollywood script writer with background material for a thrilling movie. KL7ARU writes of her — "She isn't afraid to tackle anything — she can wire a house, fly a plane, or run a diesel snow-go with the same competency." Jeanne is now at Lake Minchumina with OM KL7IS. She is active on 75 and 20 with a home-brewed 500-watt rig, a Collins 75A1, a V antenna and a 3-element rotary. She recalls her five years at a CAA station when her rig was virtually the only contact with the world. Mail arrived there only ten times a year.

KL7ANG — Nancy Walden; Anchorage; licensed 1952. OM KL7BK; operates 75 and 80; is particularly interested in mobiling.

KL7BKA — Bernice Helen Hane; Anchorage; licensed 1955.

KL7BHA — Blanche Drake; Anchorage; licensed 1951. OM KL7BGH; operates 3995 kc.

WL7BKS — Mary Tresidder; Anchorage; licensed 1955; operates 80 and 40 c.w.; OM KL7BES; 2 jr. ops.

WL7BKQ — Patricia Lorentzen; Anchorage; licensed 1955; operates 3706 and 7187 kc.; OM W0KSA/KL7.

KL7ARU



KL7BEW



WL7BJD



KL7AZI — June Welling; Anchorage; licensed 1948; operates 80, 40 and 20; OM KL7MS.

KL7AYA — Doris Edwards Staley; Anchorage; licensed 1950; operates 75; OM KL7AXZ, 3 jr. ops.

KL7ALZ — Geraldine LaVonne Nichols; Anchorage; licensed 1951; operates 75; OM KL7MZ; 4 jr. ops.

KL7YG — Marge Sappah; Anchorage; licensed 1949; operates several bands; OM KL7PJ.

KL7CY — Flo Hart; Anchorage; licensed 1938; operates several bands; OM KL7BN.

WL7BJD — Mary Olendorff; Anchorage; licensed 1955; son KL7BCH.

Margie B. Reich; Anchorage; awaiting Novice call; OM KL7AVV.

Mary, WL7BJD, has reported the organization of a YLRL unit at Anchorage during February of this year. Twelve Anchorage YLs attended the first meeting. KL7YG was elected Pres.; KL7AZI, V.P.; and KL7ANG, Secy. Treas. WL7BJD and KL7AYA were appointed Field Day Chairmen. The club's charter will be held open until July 22nd, date of the Anchorage Amateur Radio Club annual Hamfest, in order to give all of the YLs in the territory a chance to become charter members.

Our salute to the YLs of KL7 land. Many of them express a desire to work Ws more frequently. Let's try to get together with them as often as conditions permit.

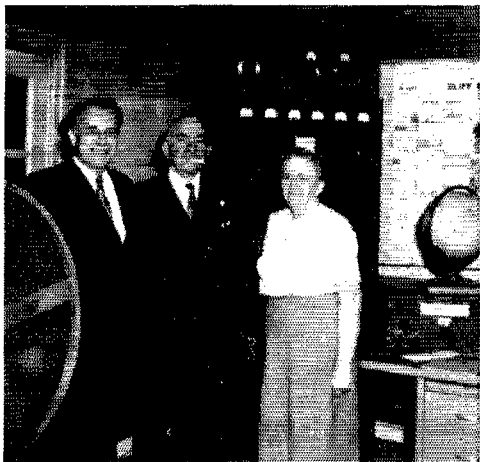
Pre-YLRL Convention Notes

General information concerning the First International YLRL Convention appeared in this department for February. The following additions and corrections have been received from the Convention committee:

John Reinartz, K6BJ, Director Amateur's Service Bureau of Eitel-McCullough, Inc., will be a guest speaker. Banquet tickets for OMs are \$6.00 (not as originally given). YL tickets, to include luncheon and banquet, remain \$10.00 each. Plans for the family picnic on June 26th have been discarded. Reservations should be made by June 15th.

YLRL members and interested amateurs wish the Convention Committee every success in

L. to r., C.D. Director Livesley, Gov. Grunning, and Rose Cowles, KL7ZR.



June, moon,
tune, soon,
Field Day!

It doesn't rhyme, but it is fun and makes sense — to *participate* in one of ARRL's most interesting annual activities. Past FD records reveal comparatively little YL participation. Take it from those who did meet the challenge — there's nothing like it!

How about it, girls? Whether you join in as a single op or member of a team or club, let's reserve June 25th and 26th for Field Day only.

Those YLs who plan to attend the First YLRL International Convention scheduled the same week end are of course excused. Plans for the affair had gone too far before the Convention committee realized that the two events coincided.

See page 46, this issue, for complete FD rules.

sponsoring the First International Convention of the Young Ladies' Radio League.

Keeping Up with the Girls

The 75-meter YLRL 'Phone Net conducted by W4HLP, Arlie, will have its second annual picnic on July 31st at Big Meadow, Skyline Drive, Va. All licensed YLs and families welcome. . . . Newly-licensed JA6KH, Miss Kazuko Hiraki of Kyushu, Japan, is the sixth JA YL reports K6DV. . . . W5VXX, Dolores, was televised by a local TV station from her hospital bed while reporting the arrival of her new daughter to W5YKF on 75 meters. . . . W0Q1W is a thirteen-year-old YL in Denver who received her Novice in '53 and her General in '54. Anne works 40 and 20 c.w. Her dad is W0HXX. . . . The *Reporter Dispatch* of White Plains, N. Y., carried an article about exchanging Girl Scout information via radio. From K2DYO, a troop of 12-year-old Valhalla Girl Scouts queried another troop gathered at the QTH of W1BCU, Peg, Foxboro, Mass., about patrols, badge work, and camping activities. . . .

Two highly active KL7 YL operators are (l. to r.) KL7CY and KL7RN.





Twenty-two YLs were among the 600 amateurs who attended the mid-winter hamfest in Grand Rapids, Michigan, on March 19th. The YLRL photograph album and scrapbook were reviewed and plans for forthcoming conventions were discussed. Those in the photo are: (seated, l. to r.) W8LIV, WN8UVV, W8EPT, W8ATB, W1YLP (ex-KH6TD); and W8MBI; (standing, l. to r.) W8s SJF, QOQ, ORP, WN8UAU, W8s UAP, RIR, W9AOB, W8s KLZ, ONI, NDS, QOM, and W9LOY. Four others who were present, but not shown, are W8EIR, W8s QOX, QOY, and QPT.

DL4HO and DL4BS are new calls of ex-W5RFK, Deloris, and OM W5RFJ, formerly of Holloman AFB, N. M., for the past seven years. . . . WNI's EEW and EJJ, Laurie and Ada of Wrentham, Mass., and WN9MXI, Helen, of Chicago, are new Novice licensees. . . . WN1CKO is proud to be a YL after "so many years just being an XYL." Helen and sister Vermont YLs WNI's CML, CMY and DAP are studying for General Class tickets. . . . Some 300 articles on YLRL members written by YLRL Publicity Chairmen W9YBC, Gloria, and W6LBO, Mary, were released to newspapers throughout the country on May 1st as part of a YLRL program to publicize amateur radio for benefit of the hobby in general and the YLRL Convention in particular. . . . OM G3IDG writes that GM3JGU, Freda, of Glasgow, should be added to the list of YLs in the United Kingdom. . . . The Texas Medical Center News Service publication lauded W5ZPD, Cindy, for the efficient way she and EC, W5SMK, handled traffic for a patient in a Houston hospital. . . . For winning a LARK contest for the third consecutive time, W9LOY, Cris, keeps

the club cup she has held temporarily. . . . During the six months she was a Novice, W5ERH worked and confirmed 46 states. Immediately after becoming General Class in Nov. '54, she made up the lacking 2 states for her WAS — all on 40 c.w. using 35 watts and a vertical antenna. Lillian also has WAC. . . . K2AMZ, Alda, is NCS for three sessions weekly of the SRN and IPN. . . . Fourteen-year-old W3UKJ is NCS for the Pennsylvania 'Phone Net on Friday. Mena received her Novice ticket when she was just eleven. . . . W4CZZ, the OM of W4BAV, Catherine, passed away on March 1st. . . . K6DLL/W4STU, Marcia, has joined her OM, W4SWF, in Japan. She recently paid a visit to W4VCB, Ev., who is also residing in JA land. . . . W4TFM, Alice, has been elected Treas. of the Pensacola RC; W4UMM, Sara, is Secy. of the Confederate Signal Corps RC; and VE3ABT, Doreen, is Pres. of the Fredericton RC. . . . K4APF, Ann, has dropped her Novice "N" and is now active on 75 meters. . . . VE3AJR, Dell, has built a preselector which she feels greatly improves the performance of her receiver.

The 5th annual W1 YL luncheon held in Boston on April 23rd marked the largest gathering of YLs in New England to date. Of the 74 who attended, all but 10 were licensed YLs. The 6 New England states, New York, and New Jersey were represented. Attending a ham gathering for the first time in her 22 years as an amateur, guest of honor W1HUH, Sister Mary Emiliana, R.S.M., delighted the audience with an account of her activities. See QST for December, 1954, for further information about her. Luncheon Secy.-Treas. Barbara, W1TRE, announced that a New England YL club will be organized. All licensed W1 YLs are invited to the initial meeting scheduled for September 24th in Boston. (Photo by W1UPL)



• On the TVI Front

TVI IN NEW ENGLAND

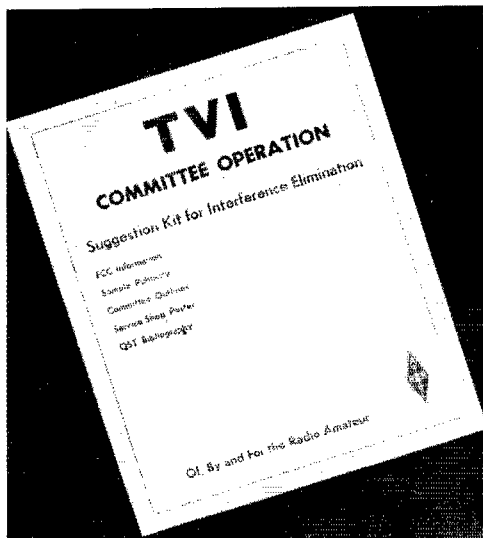
As a result of a survey of New England amateurs conducted by ARRL Director Philip S. Rand, W1DBM, the following information concerning TVI was derived. Figures given are based on data received from approximately 50 per cent of those to whom questionnaires were sent.

- 59 per cent had no TVI
- 32 per cent had slight TVI
- 7 per cent had medium TVI
- 2 per cent had bad TVI

These findings are a good indication that modern TVI reduction techniques are paying off and that TVI is well on the way to becoming a minor problem.

GUIDANCE MATERIAL FOR TVI COMMITTEES

Prospective interference committees, as well as those currently active, may wish to note the availability of a completely revised assortment of guidance material for interference elimination. This ARRL "suggestion kit," tailored to the



needs of TVI committees, contains FCC information, publicity samples, committee outlines and forms, a service-shop poster, QST bibliography, and other material. Your committee's copy of this "TVI Committee Operation" kit is ready for the asking from ARRL headquarters.

TVI BOOK

Phil Rand advises that the stock of the 3rd edition of his TVI book is now running low and no further reprinting is contemplated. If you don't have a copy, you'll probably want to join the thousands who already have it. Simply write

Miss Ann Smith, Remington Rand, Inc., 315 Fourth Ave., New York, N. Y. Please include twenty-five cents to cover mailing costs.

INTERFERENCE FROM VFO COIL

After trying to eliminate TVI by using shielded wire, shielding, and other *Handbook* methods, W1YYB discovered that interference was caused by a coil in his VFO resonating around Channel 4. The problem was solved by removing 3½ turns from the inductor, thereby shifting the harmonic of the unwanted resonance point outside of the channel.

HAMFEST CALENDAR

CONNECTICUT — June 19th, at the club grounds at the New Haven Airport. A full day of events and food has been planned for you by the committee of the Fort Hale Mobile Radio Club. Registration begins at 10 A.M., and there will be speakers, displays, and contests throughout the day. XYL activities also. The \$3.00 fee includes light lunch and supper. Make checks payable to Fort Hale Mobile Radio Club.

KANSAS — The Central Kansas Radio Club, Inc., is holding its annual Hamfest at Kenwood Park, Salina, Kansas, on June 5th. Bigger and better than ever. Price 75 cents per registration. Licensed hams and XYLS are eligible for registration.

MISSISSIPPI — The second annual ham picnic staged by the Cleveland (Miss.) Amateur Radio Club will be held at the Firemen's Club on Lake Beulah near Beulah, Miss., Sunday, June 5th.

OHIO — The Ohio Valley Amateur Radio Association Picnic will be held at the Cincinnati Police Firing Range, Evendale, Ohio, Sunday, June 12th. Bring the family and enjoy a basket picnic. Special activities for the ladies; games of all kinds. Admission fee \$1.00 for adults and 25¢ for children.

PENNSYLVANIA — The Sixth Annual Gabfest of the Uniontown Amateur Radio Club will be held Saturday, June 11th, at the clubhouse on the Old Pittsburgh Road, 2 miles north of Uniontown, Penna. The program will include an auction of radio gear, movies of interest to all, horse-shoes, and card games. W3PIE will operate 'phone on 80, 40, and 10 meters. Refreshments at nominal cost. Free coffee, baked beans, potato salad, potato chips and pretzels. The clubhouse will be open at noon, so come early and stay late. Auction will begin at 7 P.M. and will end with movies. This is a stag affair. Registration fee \$1.50. For additional information, write Uniontown Amateur Radio Club, P. O. Box 849, Uniontown, Penna., or phone GE 8-8146.

TENNESSEE — The Mid-South Amateur Radio Association will hold its 3rd Annual Hamfest at Ellendale, Tenn., near Memphis, on June 19th. Mobile units will monitor 3980 kc., 29.627 and 145.5 Mc., to offer road guidance. Supervised play for the children, good food and drink. Advance reservations \$1.75, at the gate \$2.25. For tickets and motel or hotel accommodations contact Melvin Jerkins, W4STI, 2709 Skyline Dr., Memphis, Tenn.

SASKATCHEWAN — The Saskatchewan Hamfest will take place in Saskatoon, July 1st, 2nd, and 3rd. There will be an ARRL meeting, c.w. contest, etc., with banquet on the evening of July 1st. Tours and lectures and general get-together on July 2nd. Field Day, hidden transmitter hunt and sports on July 3rd. Special events are being arranged for the whole family. For reservations and further details contact Mrs. Madolyn Sinclair, Hamfest Mgr., 411-33rd St., W., Saskatoon. Registration \$3.00 single, \$5.00 a couple.



Correspondence From Members -

The publishers of *QST* assume no responsibility for statements made herein by correspondents.

RADICAL RAPP

1161A Irving Avenue
Glendale 1, Calif.

Editor, *QST*:

I have just finished reading Mr. Rapp's article (April *QST*) concerning, "A Radical Approach to Single Sideband." Last April, I read his article about a radical new receiver. Not until I finished this year's article did it become apparent that both articles were feeble attempts at April Fools' Day hoaxes.

Perhaps I am naïve, but I was thoroughly taken in by last year's receiver article. Working for an engineering firm, there is nothing that seems completely impossible to me. A fellow employee read that article and found considerable merit in the idea. We discussed the article at some length. On further investigation, it does not seem as farfetched an idea as you might at first imagine. . . .

Whether or not you intended these articles as complete hoaxes is still not clear to me. One thing, however. You have caused me to wonder if anything appearing in the April issues is ever to be taken seriously. For example, I am very interested in building one of the new two-meter beams, as described on page 23 of the April issue. I am frankly afraid to do this, however, for fear that following my many hours of labor in getting the antenna constructed, I would find that here again was a *QST* fraud, and that the beam would work out about as good as a nonresonant length of sewer pipe.

I would like to stress one thing: that you have in your vast reading audience a number of Novices who hang onto every word in *QST* as though it were a word uttered by the Almighty himself. Many Novices — and obviously, even those who are not Novices — are apt to believe in articles of this type. A Novice is inclined to discuss *QST* articles with older amateurs in an attempt at clarification, and it would certainly be a demoralizing and degrading thing for a youngster if he were to be laughed at and ridiculed for taking seriously something that the older hams promptly regarded as pure fiction. Publishing the articles is fine; I enjoy them. But the manner in which they are presented reflects some rather shallow editorial thinking. Let's label a hoax a hoax. Let's face the fact that while to some it might appear immediately as a gag, others need to be hit over the head with a hammer to know that they are being taken in. And still others will dig more deeply into the project and actually attempt to build the darned thing!

Perhaps, after all, that is your aim. Maybe you understand that there is some technical merit in the article and use it as "food for thought." But, whatever your thinking is, I would appreciate knowing it a little better, and believe that there are others like me who resent the implication (whether true or not) that we are so dull that such an April Fools' joke can be so perpetrated.

I believe that you have, in all other respects, an excellent magazine and that you are rendering a fine service to amateurs.

— R. F. Van Wickle, W6TKA

22021 Martinez St.
Woodland Hills, Calif.

Editor, *QST*:

. . . It seems to me that you boys as technical editors should be ashamed to let a thing like this appear. If it were intended as humorous fiction, it should be so labeled, because I believe it is sufficiently misleading to be taken by our more gullible neophytes as the "straight dope."

It is committing intellectual and professional heresy to even remotely associate "old fashioned s.s.b." with Rapp's scheme. To dream that a positively or negatively restored (d.c.) signal on a reactance tube modulator will produce anything resembling a s.s.b. signal is the wildest reasoning

I have ever seen — much less to intimate that it has advantages (ouch!) over it. Unless Rapp doesn't believe in the validity of the Fourier expansion theorem (or is ignorant of it), such an arrangement would produce an f.m. signal in which the carrier frequency would wander always higher or lower (depending upon restoration polarity) of the quiescent (no modulation) frequency in proportion to the average value (d.c. component) of the modulating voltage. The a.c. components of the modulating voltage couldn't produce anything other than the normal symmetrical (double) sideband frequencies with spectrum bandwidth depending upon the index and centered about the particular instantaneous carrier frequency which is certainly *not* stable! Contrary to popular belief the carrier frequency remains fixed and varies in amplitude in f.m.; neither the frequency nor amplitude of the carrier varies in a.m. It is basically physically impossible to have an f.m. s.s.b. system with suppressed carrier because the carrier must vary in amplitude with modulation, making reinsertion at the receiver impractical. N.b.f.m. is only a special case where the index is small enough so that the carrier variation (amplitude) is small and the first-order sidebands are roughly proportional to the modulating voltage.

It is indeed difficult to estimate the enormous potentiality Rapp's idea has for producing unnecessary QRN. There are already many so-called n.b.f.m. rigs on our bands at present, and the most obnoxious ones approach operation under this condition. This comes about where the reactance tube is excessively biased, causing a large variation in d.c. plate current as a function of modulation amplitude (akin to plate rectification in amplifiers). These signals give an idea of what should be avoided in modulation systems.

If I'm wrong about this, please straighten me out, but if not please square Rapp away and see if you can prevent anyone from building a mess of this type and thinking it has anything to do with s.s.b.!

— Dave Mann, W6HLY

330 N. W. 191 St.
N. Miami, Fla.

Editor, *QST*:

I would like to have Mr. Larson E. Rapp's, W1OU, address. April '54 *QST* (page 37) gave it as Kippering-on-the-Charles. My letter came back — no such P. O. in state named.

— John H. White

4525 Beach Ct.
Denver, Colo.

Editor, *QST*:

The Call Book lists W1OU as Robert J. Slagle, Poplar Point, Wickford, R. I. Now who is Larson E. Rapp? . . .

— Larry Daily, W0V111
[EDITOR'S NOTE: OM Daily has an old Call Book.]

129 Ranchitos Road
Albuquerque, N. M.

Editor, *QST*:

ADDITION OF OPPOSITE AND NEGATIVE CLIPPER WILL REMOVE UNWANTED CARRIER ALLOWING 100 PER CENT SUPPRESSION OF CARRIER. REGARDS.

— Thomas F. Marshall, W5RFF

1607 Susitna St.
Anchorage, Alaska

Editor, *QST*:

It was with intense interest that I studied the rather technical aspects of Larson E. Rapp's recent article con-

cerning single-sideband f.m. It appears, however, that Mr. Rapp overlooked one feature in his investigation, which should solve a problem which, from the conversations one overhears on the phone bands, is widespread.

How many times have amateurs heard the complaint "your modulation has too much bass!" or "your audio doesn't appear to have any 'highs' in it!" For those hams who desire to hear the higher frequencies, the way to accomplish this is amazingly simple, when one recalls that the second pair of sidebands of an f.m. signal spin around the carrier frequency at twice the frequency of the first pair, the third pair at three times that of the first pair, and so forth. Ergo, if we use wideband f.m. in this process, we end up with all kinds of sideband pairs.

Assume we utilize wide-band f.m. with Mr. Rapp's technique, and an operator is working someone on the first sideband who, in his opinion, has "too much bass." This problem is immediately solved by the operator tuning his receiver not to the first sideband, but the second. The detected signal is now raised an octave. In the event this is insufficient, he can tune up (or down, depending on whether we are utilizing "positive" or "negative" modulation) to the third, fourth, fifth, etc., until the received signal is at the desired pitch. The ultimate, of course, is tuning to the sideband far enough removed from the carrier that will result in the detected frequency being inaudible to the human ear, but will encourage the St. Bernard to move from your favorite easy chair in front of the rig.

There are, admittedly, a few insignificant details which are not quite ironed out at the present time. However, the groundwork for this idea is being sent along to Mr. Rapp, together with permission to use this brief engineering report in any way he sees fit.

— Jack Wichels, KL7ADQ

212 N. Maple St.
Mt. Prospect, Ill.

Editor, *QST*:

Mr. Rapp's ideas were so striking I decided to give the system a try. Using a Hewlett-Packard Harmonic Analyzer, Altec-Lansing Intermodulation Analyzer and a Panoramic Analyzer, I set up a phasing system at 450 kc., and to be sure the sideband was suppressed, combined it with a Collins Magnetostriction filter. The results were amazing! Do you suppose this was the first application of a "phasitler"?

In *hock veritas*, indeed! In fact, I don't even know where my next electron is coming from! *S.s.s.c. est omnes in partes duos divisal*

— Walter C. Werner, W9RFK

POOR SPORTS

8301 No. 28 Ave.
Omaha, Nebr.

Editor, *QST*:

Apparently the FCC is still issuing a poor-sport class license. Last evening while listening to a few of the boys on s.s.b., a holder of the poor-sport class license was sitting on the s.s.b. freq., swishing a VFO back and forth for about 10 minutes, keying at times, but of course forgetting to give a call.

Some of the fellows have been complaining loud and long about the way s.s.b. tears up the band for 20 to 50 kc. Perhaps these fellows should reconsider. My receiver is only a little NC-98; however, I don't have this trouble. It would seem that there is a great need for a little practice and information on the art of using a receiver properly, then I doubt if there will be all this talk of incompatibility. My receiver is certainly not the ultimate; however, I find no difficulty in copying a.m. signals within 4-5 kc. from a strong s.s.b. signal, a feat I often find difficult on two a.m. sigs. Of course there are poor a.m. and s.s.b. sigs, though I believe the greatest trouble is poor use of a good receiver.

We are just in a hobby so why all the poor sports? If someone QRMs me I just close shop. I don't sit on the freq swishing a VFO. The boys didn't do this when an a.m. sig QRMed them before; why now? Other poor sports and such are the ones out of the band chasing DX, cussing and a terrific number of both have been heard at this location recently. Novices running over 75 watts and an endless number of others. Poor sports take notice! If you can't participate in a hobby according to the rules, stay off.

— Alan McMillan, W0JJK

NEW STANDARD

1238 S.W. 137th
Seattle, Wash.

Editor, *QST*:

It is unfortunate that *QST*, in order to conform to standardization, must forego its own policy. I refer to the new American Standard for graphical symbols in April *QST*. Is one to suppose that the omission of the "hook" where one wire crosses another without making a connection in schematics will result in more errors and confusion in future issues of *QST*?

In the January 1954 issue of *QST* in "Technical Topics" the following appears on pages 43 and 44 under the heading of "Crossovers and Long Leads":

"In the matter of crossovers, there are again two schools of thought. A common practice in industry is to show a connection with a dot and no connection with no dot, as in Fig. 6A. This developed quickly during World War II, since it saved the draftsman's time not to make the crossover loop of Fig. 6B. Admittedly, it is fast, but it is more prone to error than the method of Fig. 6B, because leaving out the dot means no connection at the required point. *QST* uses the second method, as better insurance against errors and for, we think, better readability."

The school of thought to which *QST* formerly belonged will probably die out quite slowly even though a victim of standardization.

— A. L. Jennings, W7EZJ

COMPLETE RIG

Nipper's Hr.
Notre Dame Bay, Nfld., Can.

Editor, *QST*:

For two years I have been reading, with interest, the correspondence section of *QST*, and note with dismay that some correspondents would like to acquire a 'phone license, but despise c.w. To me, this doesn't seem logical; for who would want to lose out on the thrills of a good c.w. QSO? Personally, if I had not learned International Morse and acquired my Proficiency Certificate in advance, my A3 license would not be worth two cents in my estimation. If Mr. getter-of-an-easy-license was suddenly requested at any time to handle some urgent traffic by International Morse, would he feel happy in saying "I do not know the code"? I think not. After all, his priceless receiver has built into it a beat-oscillator section, which is mainly for copying c.w. Surely he wouldn't want it to rust out.

To really appreciate ham radio, first be a brass-pounder; for whether your rig be factory or home-built, it would not be complete without a key, an active key.

— Reg. Lush, V0SH

EXAM FEED-BACK

230 Harrison St.
Passaic, N. J.

Editor, *QST*:

I never before sent a letter to any editor, but W8EOY's sarcasm (page 150, April *QST*) has prompted this one.

I think there are many, like myself, whose vocations are entirely unrelated to radio; who enjoy QSOing and regard radio as a fascinating hobby, not as a means of demonstrating our superiority. On behalf of these unfortunates, I wish to apologize to those who have a technical education in electronics or television, and feel as the above mentioned gentleman, when we don't appreciatively oh and ah after he spends $\frac{3}{4}$ of an hour describing how he connected his variable thingamabob to a reverse inverse feed-back circuit and then proceeds to describe his rig to the last bolt.

I, for one, would be delighted to instruct Mr. Davis in one or two of the minor complexities of the legal field just to watch him squirm on an exam in which his background was limited to what he could pick up in hard-to-come-by spare time.

I would also like to thank those hams who give of their time, in the true spirit of fraternalism (which it has been my delight to find in hamming), to help fellows like me to gain experience and get that coveted General even though we don't have the time and experience to build our own rigs.

— Ron Levine, KN2JXB

NEW BOOKS

How To Locate and Eliminate Radio and TV Interference, by Fred D. Rowe. Published by John F. Rider Publisher, Inc., 480 Canal St., New York 13, N. Y. 128 pages, including index. 5½ × 8½ inches. Price, \$1.80. Paper cover.

This practical handbook outlines the general problem, describes methods of locating interference sources, and discusses means for eliminating or reducing the interference when the source is found. The book covers power-line noises, interference from electrical appliances, fluorescent lamps, and TV. A model interference ordinance is contained in an appendix. Tracking down interference sources often can be a tedious job, and the amateur who has the noise problem on his hands will find helpful suggestions here.

Ameco Amateur Radio Theory Course, published and distributed by American Electronics Company, 1203-05 Bryant Ave., New York 59, N. Y. 275 pages and appendices and sample examination papers. 6¼ × 8¼, paper cover. Price, \$3.95.

Condensed elementary electrical and radio theory arranged in course form. The book is divided into three sections, the first covering direct current, magnetism, and alternating currents; the second, tube fundamentals and amplifier operation; the third, transmitting and receiving principles. Each of the fourteen lessons is followed by questions in the multiple-choice form used by FCC, and each section is followed by an "FCC-type" examination on the material contained in that section. Answers are given in an appendix. The ground covered is that necessary for all of the various classes of amateur operator licenses, plus such additional material as is necessary to round out the picture.

A Dictionary of Electronic Terms, published by Allied Radio Corporation, Chicago 80, Illinois. Edited by Gordon R. Patridge, Ph.D., Purdue University. Over 150 illustrations and diagrams of components, equipment and electronic circuits. 72 pages, 6 × 9, paper cover. Price, 25 cents.

The new edition of this well-known "Dictionary" contains definitions of over 3500 terms used in radio, television and electronics. Over 150 illustrations and diagrams of equipment and electronic circuits are included.

Radio Receiver Servicing, by John T. Frye. Published by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. 5½ × 8½ inches, paper cover, 186 pages. Price, \$2.50.

Three main divisions cover the problems of no reception, unsatisfactory reception, and intermittent faults. This book does not go into the theory of radio receivers or servicing, but describes typical symptoms and cures. Full of practical "hints and kinks," and highly readable. Should be very useful as a general trouble-shooting manual to the amateur as well as service technician.

Electronics for Everyone, by Monroe Upton. Published by The Devin-Adair Company, 23 East 26th St., New York 10, N. Y. 370 pages, including index, schematics, 5 × ¾ × 8½, cloth cover. Price, \$6.00.

Written for the layman in easy-to-read style, this is a "popular science" type book introducing the reader to electricity, electronic phenomena, radio and television. Historical development plays an important part in the method of treatment.

Preview — DX Contest High 'Phone Scores

Nineteen Statesiders braved the heterodynes of the 21st ARRL International DX Competition to the tune of over 100,000 points claimed. Note that W1ATE, W2SKE/2 and W2SAI appear to share honors in shattering the latter's all-time 'phone high of 313,200 points registered in 1949. In this listing of leading W/VE scores, multipliers and contacts, an asterisk indicates a multiplier operator station:

W1ATE	497,182	238	695	W8RLT	89,916	127	236
W2SKE/2	451,130	229	664	W8LKH	88,832	123	232
W2SAI*	314,265	205	614	W3JNN	86,580	117	249
W4KWY	281,937	203	463	W3GHM*	75,864	109	232
W6YY	235,544	148	526	W8NWO*	74,466	126	197
W3DHM	230,640	186	414	W4NHF	68,526	94	243
W4OM	216,594	189	382	W8DUS	67,041	117	191
W2WZ	178,710	161	370	W3CUB	64,842	107	202
W3GHS	155,925	165	318	W6KBP	62,306	112	186
W7ESK	151,200	120	420	W6IDY	59,040	96	205
W9AJ*	142,242	157	302	W7DL	57,978	76	242
W9EWC	138,600	154	300	VE3RCS*	56,244	86	220
W8BK*	133,569	153	291	W4CBQ	55,872	97	192
W6AM*	124,526	113	368	VE4RO	49,404	92	178
W3ECL	124,200	150	278	W8ZOK	40,860	90	152
W4DQH	118,224	144	277	W4TWW	38,184	86	148
W3VRD	115,040	145	306	W3BZ	37,248	83	182
W8NXP	101,762	146	234	W1DLQ	35,076	74	160
W4EEB	100,602	138	243	W8YHO	32,385	85	127
W6VSS	99,231	97	341	W6CHV	31,275	75	139
W8NG*	91,332	129	236				

Reports from overseas are just beginning to roll in. Here's what we have at press time:

VP7NX	148,665	53	935	ZL1MG	17,427	37	157
PJ2AF	100,595	55	421	OE13USA	16,527	21	263
KH6PM	90,576	48	629	KZ5DJ	16,302	26	209
EL2X	81,675	45	605	HK0AI	15,694	23	229
HP3FL	69,939	57	429	T19MHB	14,580	30	162
VP9L	66,223	44	471	P161	14,540	20	243
KH2AX	59,040	40	492	W3DLE	13,978	22	186
KG4AJ	55,044	44	417	CO2BM	13,338	26	171
Y4NCB	49,995	45	370	CT3AE	12,716	44	99
VP5AE	47,538	38	421	F8SK	12,012	14	286
CT18Q	46,080	40	389	G2PU	9,774	18	181
KH6MG	35,100	35	325	Z2ZKB	9,675	25	129
VH8N	25,100	35	274	D11RB	8,211	17	161
KH6SP	25,248	32	263	ON4OC	7,196	14	173
ZB2A*	23,177	43	183	G3DO	5,814	17	115
VPI6G	22,904	28	273	CE2GG	5,478	22	83
LU7BQ	17,496	36	162				

Final results of the contest will be featured in *QST* the moment the sorting and cross-checking of the entries has been completed. In the meantime, watch for a preview of the c.w. doings next month.

WWV-WVVH SCHEDULES

For the benefit of amateurs and other interested groups, the National Bureau of Standards maintains a service of technical radio broadcasts over WWV, Beltsville, Md., and WVVH, Maui, Territory of Hawaii.

The services from WWV include (1) standard radio frequencies of 2.5, 5, 10, 15, 20 and 25 Mc., (2) time announcements at 5-minute intervals by voice and International Morse code, (3) standard time intervals of 1 second, and 1, 4 and 5 minutes, (4) standard audio frequencies of 440 cycles (the standard musical pitch A above middle C) and 600 cycles, (5) radio propagation disturbance warnings by International Morse code consisting of the letters W, U or N, together with digits from 1 through 9, indicating present North Atlantic path conditions and conditions to be anticipated. (See recent ARRL *Handbooks* for details on interpretation of forecast symbols.)

The audio frequencies are interrupted at precisely one minute before the hour and are resumed precisely on the hour and each five minutes thereafter. Code announcements are in GCT using the 24-hour system beginning with 0000 at midnight; voice announcements are in EST. The audio frequencies are transmitted alternately: The 600-cycle tone starts precisely on the hour and every 10 minutes thereafter, continuing for 4 minutes; the 440-cycle tone starts precisely five minutes after the hour and every 10 minutes thereafter, continuing for 4 minutes. Each carrier is modulated by a seconds pulse, heard as a faint clock-like tick; the pulse at the beginning of the last second of each minute is omitted.

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

Hoo-oo-oo:

Say, OMs — ever hear tell of the OBO? No? Well, flip off your B-plus for a moment, hitch up your specs, and be briefly briefed on DXdom's somewhat neglected Patron Bird. . . .

'Twas 'way back in the dim dawn of amateur radio when the first DXer began to burn midnight oil. And in those spark days it soon became

breakfast time! Then he recalls how Boiled Owls really came into their own during the ARRL Transcons and Transatlantics shortly after W.W. I. Many allusions to the Owl constituency appear in *QST's* for that period, one of which puts it quite nicely (p. 51, May 1921):

Ever suddenly become aware some good radio night that in the last ten minutes all signals have curiously become weaker, and looked over your shoulder to discover that the sun was coming up? If you have you are eligible for admission to the Boiled Owls — fellows who have sat out a "night" until there was nothing left to it. . . .

Ah, but W0CO's deepest delvings turned up the source we should have counted on all along. The Old Man, ARRL's beloved late Hiram Percy Maxim, 1AW-W1AW, doubtless was prime inspirer of all *QST* Boiled Owliness that trickles down through the years. His typical T.O.M. yarn, "Rotten Hours," pp. 7-8, March 1920 *QST*, goes, in part:

. . . Now, what I want to know is just this: How do these other night-owls work it? Don't their stomachs ever go back on them? They were still going in like mad when I hit the dust. How much later do they sit up? Do they never feel like a boiled owl when they get around in the morning? . . . Take Mrs. 8ER for example. She interests me. Do she and Mr. 8ER bunk at the key? Do they never sleep at all? Do they have a day and a night shift, or does she cook the victuals while he operates and she operate while he feeds his face or how do they work it? . . .

Those italics are ours, and there, by the way, undoubtedly are the first Boiled Owls to be so characterized — Mr. and Mrs. 8ER of 35 years ago. A toast, then, in hottest, blackest, dreggiest coffee to shades of T.O.M. and one most venerable DX-minded group and institution; to the OBO!



obvious that one didn't work much 200-meter DX unless one had the stamina or insomnia to outlast local competition far into the wee wee hours. A browse now through early *QST's* will turn up spontaneous mentions of a curious and informal organization constituted by such nocturnal individuals, rugged birds who could bat their keys from dusk to daybreak with gay electronic abandon. This outfit became famed far and wide as the Order of the Boiled Owl.

Inasmuch as today's crop of DX hounds render stout service in perpetuating principles of Boiled Owlism, Jeeves thought it would be of interest to dig the ancient origin of OBO lore. So we arrayed him in pencil, paper and portfolio and whisked him off to consult with astute *QST* historian Sumner B. Young, W0CO, a logical sage to seek out in such matters. Mr. Young came through with flying colors.

Firstly, W0CO emphasizes the fitness of the term itself: An owl is nocturnal and certainly is tough enough to be called hard-boiled. You've got to be tough to ride static from supper till



* New Mailing Address: Effective immediately, please mail all reports of DX activity to DX Editor Newkirk's new address: 4128 North Tripp Ave., Chicago 41, Illinois.

What:

20 c.w. gives the night shift a better break these balmy summer days. K2GMO (ex-VE7ACN-DL4OZ) made hay with improving conditions and scored with CP3CA (72) 23, DUs 1SCS (79) 14, 7SV (92) 10, EAs 6AU (63) 20, 8BC (20) 21, 9DF (72) 15, EL2s L (23) 22, X (87) 19, F9YF/FG (41) 20, FB8BR (12) 19, FF8AC (32) 18, FY7YE (50) 17, HK8AI (80) 19, JA8AQ (47) 13, KA2s GE (22) 22, USA (17) 22, KR6LJ (42) 23, MP4s QAL (60) 16, JO (45) 18 who gets QSLs via W2PCL, OQ5GU (25) 19, OY2Z (85) 15, ST2AR (3) 21, VQs 2RH (19) 19, 4BNU (57) 19, 4FM (35) 19, 4FO (52) 15-19, 2AS (22) 21, ZC4s GF (39) 19, 1P (83) 12-16, ZD6EF (50) 19, ZE5JL (47) 19, 4X4s DF (85) 17, FS (65) 21 and 5A4TX (58) 19, all times here and hereafter in Greenwich. K2GMO, who rooms with W2OHF, runs 1000 watts to a homebrew arrangement plus 3-el. spinner. W3TYW caught up with FASRZ 22, PJ2AR, TF3s NA 19, MB (102) 14-21, TT2PZ and 3V8AB (42) 20. EA8BF (35-100) 14-21, OE13USA 12 and ZE3JO 19 ran up against W4YZC. W2ZYW, about to be signed up by Uncle Samuel, reached 173/166 by way of F9QV/FG (93) 22, FM7WP 17, HA5KBA 16, OD5s AF 18, AV 19, SP9KAS (50) 14-15, UB5s KAB (55) 14, KBE (80) 20, UO2AN (60) 20, VS6DC 12, YO5LC 13, ZD3A (60) 20 and a ZD6. Dixie notes more frequent comebacks from U.S.S.R. amateurs lately but most US still are shy. EA8AI, ET3LF, FR7ZA, KC6ZB of Yap and KT1EX hoist HZ1AB's score to 136/121. The baseball season and 433-Mc. work cuts into W1OJR's DXing but Vic managed CN8HK (28) 20-21, FG7XB (100) 21, FFRJC (100) 15, HA5BL (20) 18, HZ1HZ (30) 18, LJ2F (58) 17 just Norway, LUs 1ZV 2ZV (70) 22, OQ5VD, OX3UD (52) 16-17, SL3AG (35) 18 just Sweden, SP5s AA (50) 17, BC (50) 23, VP5AE (10) 15 of Turks, ZE6JB (50) 23, ZP6CR (40) 23, ZS3K, 4X4FK (82) 21, 9S4s AZ (40) 18, BE and BN (30) 16. JAs ICF ICR 4BB, KAs 2KS 2OJ 7DM, KG4AJ, KM6AX (5) 0, VP8 7NM 8BD and VS2DW (20) 17 swapped 73s with W6UED. W3VOS used 150 watts and folded dipoles to pick off CP5EP, CS3AC, CT3AB, EA6AF (33) 17, GC2CNC, HB1MX/HE (see Whence), KT1UX, PZ1QM, SP2KAC, VP3VN, YOSCF, ZBs 1JRK (61) 15-16, 2A, 4X4BR (60) 19 and 3V8AC. Spring fever and a king-sized lawn limited K2BZT's 20-meter c.w. activity to jousts with OY7ML (80) 13, SU1C (73) 17 ZP5GM (30) 1 and a batch of H-22 Test Swiss portables. W5CAY comes through with VP7s NI NS and YV5AE. 20-meter c.w. luck here and there, at W1TVJ: CH1CB, one year to the day since their previous QSO. W2SVC: a Gambian ZD3, K2GFQ: EA0AB, ZD2FFB, W4OGI: PJ2, VP6GT, VQ1, W6ZZ: JA3LK, K8ENX: HC1PJ (90) 2, LU4XQ (40) 1 of Tierra del Fuego, VP1KT (15) 22, W7EWR: DU7, KA2OJ (38) 3, TI2BX (110) 0-1, W8DLZ: FY7, ZD2DCP (40) 23, W8YIN: MP4, HK6, W9AKV: ZD8AA (4-80) 23-0, W9EU: JZ0AG (55-79) 7-13 of Dutch New Guinea, W0P8M: KG6AFT, DL4ZC: MP4QAK (30) 13-15, VESYT. W7FE, aboard *USNS Marine Serpent* at Saigon, reports such local QRM as F8s BA BG, KR6PT, VSs 1B3 2CV, 4S7s NX and WP working 14-Mc. stuff like CR7AD, FB8BE and VQ2FL around midnight Saigon time. W7MO. KJ6AZ (95) 11-12 answered the hopeful CQ of Hq. YL W1YYM. W0VFM specifies CN8ED 21, an FG7, I1BNU/Trieste (85) 19, FI1TAI 20 and HR1MC 17. The *DX Bulletin* of the West Gulf DX Club mentions 14-Mc. radiotelegraphers GE7ZJ (54) 1, CR6BP (165) 21, EAs 8BK (30) 21, 9AP (25) 21, ED4BD, FF8s AJ (62) 22-23, GB (89) 19, FY7s YB (5) 22, YC (7) 23-0, HZ1AB (12) 16-17, KC6CG (75) 16, KS6AB, LUs 1ZT (33) 1, 3ZG (73) 0, 9ZT (15) 1, LZ1KAA (75) 21, MP4BBS (110) 16, ST2s AR (45) 16-20, GB, SUICN (34) 15, TA3US (93) 21, UAs 2KAW (98) 14, 9AA (80) 13-14, WSJ (48) 14, UR2AO (70) 14, VK1EM (55) 13, VP8AP (40) 0, VQs 2HR (50)

19-20, 2SP (61) 19, 3FN (110) 19, 4FW (37) 19-20, 8AG (12) 16, VS6AG (57) 14, YO3RD (53) 16, ZB1s BJ (13) 21, GBF (70) 22-23, ZEK6J (93) 20, ZP9AY (70) 0, 3V8ES (10) 16, 4S7GE, 4W1AB 11-12, 4X4GY and others.

20 'phone is DXceptional sport if one isn't short on db. in the forward gain department. K2CJN made it 105/90 thanks to ET2MZ 18-19, HB1MX/HE 14-15, OD5AB 19, SV0WM 18-19, Z1C1M 20-21, 4X4s BR 19 and DC 19-20. A flattened rotary held W4CBQ down to CP5EP, FY7YE (132) 0, Swan's KS4AW (207) 16, PJ2MA (PJ2AA) and VP8AQ (106) 1 of So. Shetlands fame. 117 on 14-Mc. A3 for Bob. VS2BD calls attention to the availability of Brunel's VS5CT (190) and ZC3AC, Christmas, (163). QSLs for both stations are handled by the VS2 bureau. VS2BD observes improved 20-meter conditions: "W6 and W7 heard almost daily from 1430 to 1630 GMT." HK8AI 23 of San Andres, HI6EC and 5A1TA worked W3VOS. 14-Mc. radiotelephones AG3SQ 12, CRs 4AF (118) 21, 6AL (152) 20, 6CK (180) 20, EA9AR (137) 21, ET2XX (179) 16, FF8s BM (112) 20, FQ (133) 20, FM7WN (125) 14, HC8HM (317), HZ1TA (195) 10, JZ2AG, KC6s UZ (214) 14-22, ZB (200) 14-15, KG6AA (260) 14, W2SPP/KG6 (200) 14, KM6AX (250) 0-2, KX6AF (250) 14, MP4OAM, OD5AF (230) 18, SP5AH (164), SUIAS (250) 18, SV0VO (135) 18, VK9s RC SP, VQs 3FN (162) 19, 4EU (138) 18-20, 4FG (153) 19, 5DM (100) 19-20, VS6CL, YK1s AA (260) 8-17, AK (110) 11, ZDs 2JDB (147) 23, 8AA, ZPs CF (152) 23, GB (109) 0, ZSs 2MI (160) 14 of Marion Isle, 7C, 3V8s BB (170) 20, BL (310) 19, 4X4s AS (110) 18 and BC (139) 16 are stalked by WGDXC sharpshooters. FK8KZ (130) and ZM6AR (164) 6 show up in So. Calif. DX Club's *Bulletin*. Newark News Radio Club listeners raked in this assortment of 20-meter 'phones: CP6YB 22, CR4AG, CR6s AC 22, AG AJ BH (166) 22, CS, CTs 2AG 3AF 12, EAs 8AP 20, 8AX 9AW 9BC 21, 9DF, ELs 1FI/MM (180) 20, 2X 23, ET2US, FAs 3JY (135), 8BG (185), FF8s AH (105) 20, AP, FM7WQ, FO8AB, FP8AP 19, FQ8AK (120) 22, FY7s AC 19, YA (115) 20, GCs 3EBK 17, 6FQ 18, HC8GI (175) 4, HH2s G JK LR PR (263) HH3DL, I1BNU/Trieste, IS1BV (190), JAs 1ME 4BB, KAs 2YM 1, 6EI (400) 15, 7LJ 8RK, KR6Ks, KS6AB (223) 3-4, KT1s CH LU RF 22, WX 21, KV4s AA AQ (255), BI (260), KW6BS 3, OD5s AF (117) 15, AY, OQ5s AO CC ER FN FO (138) 20, PE, OX3GW, PI1J (250) of Holland, PJ2s AF 0, AG AO AT CE (140), CL (120), CX 21, TF6SV 22-23, TG9s AI AU KF (165), MB MQ (90), TI8RA, UB5KBE 13, VP1s AE OJF SD ZU, VP2s AD DA DL DN KM GW VA (110) 14, VP3s HAG LF, VP5AE (150) 19, VP7s NSNW NX, VQs 2DT (160) 23, 2HJ, 4EZ 4FK 22, 4RF, VSs 4HK 0, 9GV 21, Y1ZAM (170) 19, YNs 1RA 4CB, YS1MS, YU1GM 20, YV9BZ (140) 23, ZBs 1AJX 20, 1GBF 22, 2A 18, ZC3AA 1, ZD3BFC 10, ZEs 2KI, 6JI (170) 20, ZP5s CG CS GK PF (130), ZS3s AH 16, E, W, 3V8AS, 4X4s CX BJ DP FS 17, 5As 1TA 3TR (125) and 4TK.

40 c.w. is worth a v-e-r-y careful inspection, even in hours of bright daylight. W8GB, with 120 watts to a 33' vertical, had a nice 35-minute chat with VK5KO on the long path around 5 P.M. local time on 7020 kc. Carl, up to 93 countries on 40 since 1953, heard VSI and VS9 stations sneaking through at the same time. K6ENX QSOd GR7CI (15) 5, DUs 1SCS (20) 15, 1VQ (10) 16, F9QP (28) (15) on ship off Indo-China, LU9ZE (20) 8, OQ5GU (15) 2, VS1s BJ (40) 15, GO (35) 15, ZD6BX (20) 15 and ZSs galore on the long path including ZS2X whom K6ENX contacted in the '30s while signing W8NHC and XU8MI. W5CAY, erroneously labeled W4CAY last month, got the goods on DUs 7SV (30) 13, 9WX, EA9DF, JAs 2LC 9CU, JZ0DN of Biak (13) 13-14 and VP2SE. CE3DZ, HK4s BD DP, JAs 1VE 1VX 3BP 4BB 6BO, KC6CG (4-12) 13, KG4AM, W6TMM/KG6, KR6LJ, KV4s AA BK and VS2EL came back to W6UED

What a spot for Field Day! At left, the cool Greenland pastoral viewed from G3AAT/OX's 1953-1954 back yard. At right, through the window of a Weasel, Lt. Cmdr. R. Brett-Knowles who made many contacts from G3AAT/OX while roughing it with the British North Greenland Expedition which terminated activities late last year. You may recall other G3AAT DX activity as KV4AAT, British Virgin Islands, circa 1950.



CR7CI represents Mozambique on several c.w. DX bands and currently is one of the most active of the Laurencio Marques ham gang. Surplus Command gear really gets around! (Photo via W8YJB)



..... K6AUD and W6QUV pooled talents to assemble GR6AC (25) 4, FO8AK (25) 5, HRIAT (7) 4, KM6AX (25) 15, KR6KS (25) 15, JA9CQ (10) 16, a JZ0, TG9AZ (5) 6, VK9WZ (12) 15, VPs 4LZ (10) 4, 8AZ (20) 6, 8BA (15) 5, VSs 1BJ 2CR (17) 16, 6CG (10) 4, 8AZ (20) 6, Wake Island Novice WW6BN (180) 7, YU3BC (10) 16 and ZS7D (27) 15..... CR6AI 3, EA9AP 3, FG7XB 2, FK8AL 10, an OQ5 and a VQ2 entered W4YZC's collection..... W3VOS worked GR4AL, FP8AP, HH3DL, ZS3HX and others..... W4TFB's Viking captured CR7CN, IIBNU of Trieste, KG6GX, KR6KS, LUs 8HAM (1), 8ZC and 9ZT..... CT3AB (40) 1, EA5 6AF (25) 23, 8BK 0, 6AC (6) 2, F9QV/FC (18) 23, FF8AJ (22) 23, KTIUX 1, OQ5RU (12) 5, TF3MB (15) 1, VOs 2GW (18) 19, 2HR (4) 6, ZD2HAH (20) 19, ZEs 3JO (16) 4, 5JA (30) 4 and 4X4DK (38) 0 clicked with W4YHD..... 7-Mc. c.w. happenings hither and yon, at W1PJK: FA9RJ (4) 2, KG4AN (87) 5, YU2HV (5) 1, 9S4BF (19) 22-23, W4UWA: KH6ARA, W3TYV: sundry VKs ZLs, W4VZ: KR6LJ, DU KC6 QX 4X4, W6RZS: CP5BS, DU JZ0, W0VFM: LUs 5XA 7, 9ZC 8, DL4ZC: F9YP/FC 7-8, W5 W6 W7, VP7NAM: HK6AI, LZ1KAA..... WGDXC adds VK9s AU (7) 9-12 and BW (23) 13 to the 40-meter c.w. grab bag.

40 'phone features a few DX items here and there among the s.w.b.c. sidebands, splatter and thermal-noise jammers. NNRC browsers logged EL2s 1A (195) 9, X, DU7SV, HKs 4BD 0AI, HP3FL, JAs 1ACC 1AEA 1AGE 1AGU 1ANR 1GP 1KK 2AF 3CF 3MD 8CT, KJ6FAA, KL7GO, KV4AQ, LUSAAD, OA5G, PJ2s, TTs 2BX (190), 5JCH, VPs 1PS (265) 7, 2GW (85), 2LN (100), 3HAG, many VKs including 4IC of Willis Isle, YN4CB (80), YVs 4BT 5BV 5DE (190) and numerous ZL stations..... SWL Ben Adams of New York has logged 62 VKs and 31 ZLs on 40 'phone since January.

15 'phone steadily rolls along. W6ZZ accumulated CE3s SQ QK, HClER, HR3HH, KV4BJ, OA5G, PVs 2DQ 5DW, TI2GC, VK3YT, VP7NK, ZL2AJB and ZP5AM..... CS3AC, EA8AX, FA8RJ, FP8AP, OD5AB, SV0WO, VQ4s EU 8Z RF, ZS9G, 4X4CX and 5A2CL hooked W4NQM, temporarily a refugee from 28 Mc..... W4WVM needs but 30 watts to flag down stuff like CN8MT, CP5BK, FA OD5 SV0 VQ4 and ZB1AJX on 15..... NNRC 15-meter A3 archives reveal EA8AI 20-21, EL2X, ET2XX 16-17, HClFS, HKs 1KC 5AC, HP3FL, JAs 4BB 9BA, KA8s AK AR KR (245), KG4AR, KV4s AQ BB BD, OQ5s 5VP 0DZ, PJ2s AF (190), AP, SV0WK, TI2PE, VPs 5AE 6GT 6WR (250), 7NX VQ2DT, VR2s CG 20-21, CJ, YN1RA (420), YU1GM, ZB1DK, ZC4RX, ZE2KR 20, ZSs 3E 3G (175), 3K and 9F (200) 19-20.

15 c.w. won't get a huge play until the 21-Mc. 'phone band becomes more saturated. Nevertheless, K6ENX encountered CE3AB (60) 18-19, JA3AB (90) 23, KG4AN (60) 21, LUSAE (120) 20 and ZL1BY (75) 23 of multiband fame..... W4YZC raised EL2X 15 FA9RW 15, FF8AJ 17, LUSBX 16, KV4s AA AQ 15-17, VP7NM 17, VP2GW 17 and ZS2A 16..... W6ZZ's code efforts netted CE3s 3AG 6AB, LUs 2DAW 8AB, 8AE 8EE, PY1LZ, VKs 2GW 3XK, ZLs 1ADU 1MQ 2GS and ZP9AY..... OQ0DZ, VOs 2HR 4RF, ZD6BX and ZB3JJ chatted with W3VOS..... W6UED hauled in CE3DZ, DU7SV, HK4DP, KA2KC, KG4AW, W6TMX/KG6, a flock of KP4s and TI2BX..... ZP6CR and 4X4FQ raise W1CTW to 66 countries on 21-Mc. c.w., the Israeli being Cal's first Asian in decades of hamming.

80 c.w. ails from atmospheric noon up our way but DX remains workable. EA6AU, OE3SE and 9S4AX made it 64 ARRL DXCC Countries List items on 3.5 Mc. for KP4KD..... W4KFC managed CX1KB (1), EA9DF (8), F9QV/FC (15), HISEW (12), OQ5GU (5) and ZB1BF (6) to boost his 80-meter score to a healthy 106..... Dutch weather ship Cumulus PHILC, KV4AA and numerous Europeans will be receiving K2BZT QSLs..... W3EIS worked EAs 8BF 9AP, FAs 8DA 9RW 9RZ, HK4DP, OE13USA, KTIUX and EL2X..... FP8AP 3, VP7NM 8 and several ZLs answered W4YZC..... W6UED annexed JA1CJ, while DL4ZC worked several W/K customers as far west as Illinois.

10 'phone should be turning Es short-skip somersaults around here now. This phenomenon builds up 28-Mc. activity in general which in turn raises chances of intercontinental DX contacts. G3IDG, a ten-meter observer

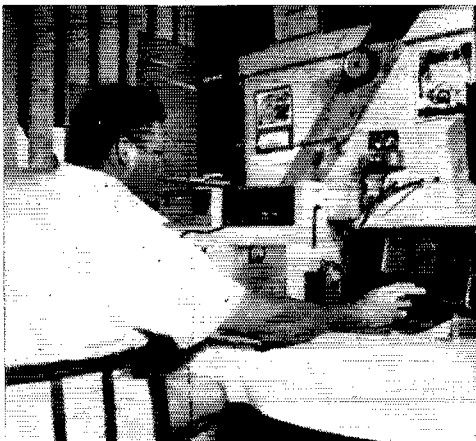
of long standing, notes that CXs 2CE 2CF 2CO 4CS 7BA 7BH, LUs 3AA 3CM 5DC 6DJY 7QB 8DDI, OQ5RU, PVs 4PQ 7DD and 7XQ were heard, heard called, heard worked, or worked by Gs 2YZ 3BE5 3DZS and 1DG. G3IDG keeps his c.w. 10-watter ready for action on 28,056 kc..... VE3DNE used 100 watts and a 100-foot-high 3-el. spinner to capture CE2GG, HClEP, PJ2AF, VP6WR and others. Buffalo's Channel 20 poses quite a problem for Martin, but so far so good..... W9OQI has no trouble working LU1QG solidly..... W6ZZ bumped into CEs 4AD and 6AB on, of all places, 10 c.w.

160 c.w. finally came through for W6KIP/6 and VS6CQ! W1BB passes the good word that those two persistent chaps accomplished the first U.S.A.-VS6 two-band two-way on April 3rd at 1305-1325 GMT after many months of tedious effort. VS6CQ, sometimes accompanied by buddy VS6CZ, appears on 2000 kc. with a mere ten watts. Congratulations, gentlemen!..... W1BB reports the 1.8-Mc. range wide open on the capricious north Atlantic path as late as mid-April when Gs 3ERN 5JU and G3IOS were worked..... HB9CM (30) and HK4DP (72) increased W4KFC's 160-meter countries total to 21..... Climaxed by that W6KIP/6-VS6CQ contact, the 1954-1955 top-band season stands recorded as an unusually outstanding DX session. "How's DX?" thanks all reporters, W1BB in particular, for excellent grapevine co-operation. What will next year bring? In view of accelerating sunspot activity, that's an interesting question!

Where:

Jan Mayen's LBSYB, now intermittently active from Greenland, tells K2CD that all QSLs for his Jan Mayen work will have been forwarded by this September..... Via W6PRM, 9S4AX confirms the Saar QSL bureau address as Box 310, Saarbrücken, and personally offers to QSP QSLs to 9S4s whose QTHs are unavailable..... W0DIB recently obtained a KF3AB Fletcher's Ice Island confirmation and thinks that the address to follow may be beneficial to others so in need. Remember, however, that KF3AB had other operators..... VP7NM, QSL chief down Bahamas way, stresses that legitimate VP7s have the letter "N" after the numeral. Thus VP7s MD and MI are, and the recent VP7s NB and NY are clandestine, too, because the real NB and NY closed stations some time ago. VP7NM adds: "Legitimate calls up to date are VP7s NF NG NH NI NJ NN NL NM NP NR NS NT NU NV NW and NX. VP7s NK and NQ packed up at the end of 1954." VP7NI, ex-ZL1MP, is a late arrival and is setting up a 32V-75A combo at Governors Harbour, Eleuthera Isle..... HZ2AEH (W3MGL) tells W6UE that stamped self-addressed envelopes should accompany all QSL requests via his APO 616, N. Y. N. Y. QTH..... W1s OJR UED WPO YYM ZDY, W2s GND ZVS, W3TYV, W4s HA YHD YZC, W9s CFT EU, W0DIB, HZ1AB, T. Gallagher, NNRC, SCDCX and WGDXC collected these individual items for you:

AP20, 121 Gar Wood Road, Quetta, Pakistan..... AP2U, 6 Roberts Market, Quetta, Pakistan..... G3WV, % U. S. Embassy, Formosa..... CN81Q, 8706 E. Forest St., Detroit 14, Mich..... CO2U, P. O. Box 250, Havana, Cuba..... GR6CS, P. G. de Almeida Lopes, Box 19, Calulo, Angola..... ET2PA, Box 379, Asmara, Eritrea..... ex-F8FW/FC, (HB91A) Box 31, Lausanne 19, Switzerland..... F8WT/FC, A. Dobak, Airport de Bastia, Corsica..... F8FBK, A. Groblimbin, Box 38, Seguela, Ivory Coast, F.W.A..... FK8AJ, Al Jerome, Box 104, Noumen, New Caledonia..... GC3KAV (QSL via RSGB)..... IITCI, F. Lecco, San Marco 2790, Venezia, Italy..... ex-JYIOG, G. Stevenson, 320A, AMQ, RAF, Henlow, Bedfordshire, England..... JZ0AG (QSL via PA6KOP)..... KC6AI, E. Kohler, USCG Depot, Box 3, Navy 926, NPO, San Francisco, Calif.

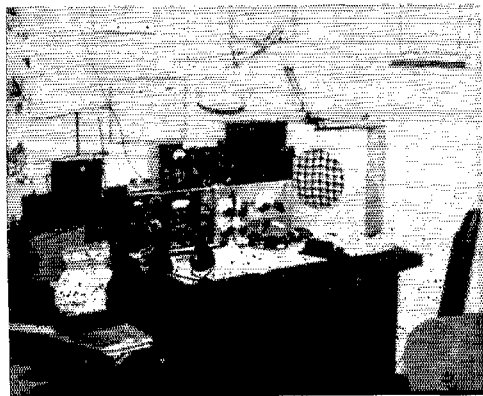


VPIGG's 25-watt rig leaves its mark on all 'phone DX hands as operator G. B. Gregory throws his big British Honduras switch for U. K. leave and probable reassignment to Fiji. A 550-watt a.c. generator powered the transmitter and the Eddystone 680 receiver at right. Three-element rotaries radiated on 15 and 20 meters with a long-wire available for other bands.

..... KC6AJ, D. R. Waldron, Yap Island, Western
Carolines KC6ZC (QSL via KC6AJ) ex-
KF3AB, M/Sgt. C. L. Hull, 804th Opns. Sqdn., Box A5,
Hunter AFB, Savannah, Ga. ex-KG6AAE (QSL
to W0VII) KI7BHL, Cpl. C. W. Wratford, Det.
A, C/R Co., Box 10, 8th Divn., Navy 230, FPO, Seattle,
Wash. MP4BBS (QSL via RSGB) OD5AF,
Box 150, Tripoli, Lebanon OD5AY, Box 3647,
Beiruth, Lebanon OQ5VD, Box 195, Coquilhatville,
Belgian Congo OY4XX, Henning, Box 195, Thor-
shavn, Faeroes Islands PY7OU (QSL via LABRE)
..... ex-SV0WC (QSL to K6DLA) TF2WAC,
Box 111, Salem, N. H. UB5KBE, Box 74, Odessa,
Ukraine, U. S. S. R. ex-VK1AC, A. C. Hawker,
VK3IB, P. O. Box 35, Dimboola, Victoria, Aus. ex-
VP1GG (QSL via VR2AS) VP1OJF (QSL via
VP1SJC) VP7NJ (QSL via VP7NM) VP7NK
(QSL via VP7NM) ex-VP8AA (QSL via G3JFD)
..... VO2KR, Mrs. K. C. Ritchie, Box 589, Bergenhill,
No. Rhodesia VO2RR, H. Ritchie, Box 589, Bergen-
hill, No. Rhodesia VO3FN, % Williamson Diamond
Mines, Ltd., Nairobi, Kenya VSIAD (QSL via
SARTS) ex-W6ODD/GR8/F18, Box 776, Camarillo,
Calif. YK1AL (QSL via YK1DF)
YN0YN (QSL to W0EIB) YU2AE, Box 9, Rijeka,
Yugoslavia YV9BZ, L. Alegrett, Box 3208, Caracas,
Venezuela ZA1B, Box 60, Tirana, Albania
ex-ZD1LQ (QSL to VQ6LQ) 5A1TA, Box 372,
Tripoli, Libya 5A5TA, R. Morgan, Box 372, Tripoli,
Libya.

Whence:

Asia — XZ2ST, in lines to NNRC veep Ben Adams, tells of his intended U. S. A. visit this summer. Sway runs 150 watts to an 813 modulated by 805s and employs a 2-element 135°-phased array. "It has been almost three years since we XZs have been able to work consistently with the U. S. A." Vice versa, we might add VSIAD, inspired by the March 1952 QST article on the subject, has been doing scatter-sounding work and has an interesting collection of echo photos to show for it From



K6DV via W1QON we learn that JAs 8AA and 1FA are the first postwar Japanese nationals to be signed up in ARRL's RCC Power difficulties, noise troubles and generally poor propagation conditions haunted HZ1AB's early '55 hamming but op W6CRV hears talk of a possible air-conditioned shack with rhombics to match being put at HZ1AB's future disposal. OE13USA donated 300 QSLs to help handle the HZ1AB backlog while a Statcside order for 900 cards dallies en route. W6CRV has about three months left in Saudi Arabia WGDXC Asianograms: MP4QAM swaps Trucial Oman for Qatar return. Nepal mountaineering expedition radio LU0MA is reported QSO'd by JA stations.

Africa — ET3s GB LF and S join in a petition protesting the poor operating ethics of over-avid W/K countries chasers. Many of the offenders are otherwise competent operators apparently in the throes of a second lidhood. The ET3s maintain a hoppen list, incidentally, and those who would receive rapid Ethiopian confirmations would do well to tread lightly and politely Another sad example of overwrought supply and demand is that of ZD8AA. Pp. 60-61 of March, '55 QST lists a few appropriate operating don'ts suggested by another Africa twosome, VQ4EI and ZD6BX WGDXC notes: FA9AR looks forward to possible Ifni operating with rig courtesy CO2BL. Besides extensive 14-Mc. c.w. fun, FB8BR goes for ham TV and has a 435-Mc. video outfit a-building.

Oceania — KC6s AA AJ ZB and ZC continue active on the island of Yap. KC6AJ is a recent addition to the amateur ranks there and does his hamming with 35-watt c.w. and 125-watt 'phone rigs on 40 and 20 W1ZCH, now at 17A Stanley Avenue, Mosman, N.S.W., expects to be operating as VK2ZE before long with his Viking rig, NC-183D receiver and midget 14-Mc. beam. S.s.b. work with the U. S. A. is anticipated The W0YDZ/KG6 landscape shot in March QST brought nostalgia to W0VII who designed, built, and used such a 10-element 10-meter beam in 1951 as W7JDB/KG6 and KC6AAE. Strictly speaking, the beam really is an 8-element affair with spread reflector DU7SV now concentrates mainly on working eastern U. S. A. stations on 80 c.w. and 15 'phone. His usual spots are 3520, 7020, 7040, 14,080, 14,200, 21,250 and 28,500 kc., the 80-meter frequency around 1000 GMT.

Europe — K6EUV, doing a European tour with the RCAF, attended a Luxembourg radio club meet with LX1s on hand by the roomful. DXers among them expressed desires to work more W5 W6 W7 and VE4-through-VE8 stations. V.h.f. and s.s.b. interest also was rampant W1ZDF relays word from HB1MX/HE that the local P. & T. chopped the "/HE/" off his call sign. His future Liechtenstein operations may occur as HB1MX period. HE9 calls are reserved for Liechtenstein citizens of whom only HE9LAA is active W1OJR finds that LB3OD is a shipboard affair with no Jan Mayen or Svalbard implications "Vatican DXpedition cancelled. No possible hope of operating from that country. Reasons given, cold and dry." This from DL4QR to F7ER, so the world's smallest country (108.7 acres) remains a colossal ARRL DXCC country. List enigma PX1YR should have a sturdy A3 signal from now on thanks to a WGDXC-sponsored rotary beam reported en route Andorra.

South America — Add Navassa Island to your WAA award countries list, advises PY1ACY of LABRE (Brazil). Plans for the 4th LABRE DX Contest are under way, an increasingly popular September activity W6UED nominates OA5G's QSL as a collector's item. It measures 10 by 13 inches and will go well next to one of those midget Scotland gag QSLs CE3AG, ex-CE0AA, embarks on a U. S. A.-Europe summer tour that will cover a good part of this country and many DX spots on the Continent.
(Continued on page 160)

OY7ML's Faeroes c.w. activity makes a big hit with DX hunters world wide. A 15-watt crystal-controlled transmitter, 12-tube home-built superhet, and a few dipoles do the job. (Photo via W4QCW/KCAAB)

I.A.R.U. News



R.S.G.B. SECRETARY HONORED

John Clarricoats, General Secretary of the *Radio Society of Great Britain* for the past 25 years, was appointed to be an Officer of the Most Excellent Order of the British Empire by Her Majesty, Queen Elizabeth II. To our knowledge, G6CL is the only person to have been so honored for service to amateur radio.

John M. Reed, HC2JR

Many of our readers probably noted, with great regret, the listing of John Mark Reed, HC2JR, President of the *Guayaquil Radio Club*, the IARU Member-Society for Ecuador, in the Silent Keys for March. OM Reed died suddenly while traveling in the United States. DX fans will remember him as a member of the HC8GRC expedition¹ to the Galapagos Islands in April, 1950. With XYL HC2TR, he was instrumental in providing emergency communications for a two-week period in August, 1949, when much of Ecuador was rocked by severe earthquakes.²

OLYMPIC GAMES

The Victoria Division of the *Wireless Institute of Australia* plans to organize International Ham-fests and other events for amateurs attending the Olympic Games at Melbourne in November, 1956. The Olympic Games Committee of WIA, 191 Queen Street, Melbourne, C.I., would like to know, by August 1, 1955, the approximate number of hams and their families planning to attend. Though this may seem to be a very early date, those who have been active in convention planning can appreciate the difficulties in arranging housing for such an event.

QSL BUREAUS OF THE WORLD

For delivery of your QSLs to foreign amateurs, simply mail cards direct to the bureau of the proper country, as listed below. (Bold-face type indicates a recent change from previous listings.) *W, K, and VE amateurs may send foreign cards to A.R.R.L. headquarters for which no bureau is here listed.*

For service on incoming foreign cards, see list of domestic bureaus in most QSTs (page 43 of May) under the heading, "A.R.R.L. QSL Bureau."

Algeria: Via France

Angola: L.A.R.A., P.O. Box 152, Luanda

Argentina: R.C.A., Avenida Libertador General San Martin 1850, Buenos Aires

Australia: W.I.A., Box 2611 W, G.P.O., Melbourne

Austria: DVSV, Kierlingerstrasse 10, Klosterneuberg

Austria: QSL Bureau (U. S. Occupation Forces), APO 168, % Postmaster, New York, N. Y.

Azores: Via Portugal

Bahamas: C. N. Albury, Telecommunications Dept., Nassau

Barbados: VP6PX, Wood Goddard, Bromley, Welches,

Christ Ch., Barbados, British West Indies

Belgian Congo: P.O. Box 271, Leopoldville

Belgium: U.B.A., Postbox 634, Brussels

Bermuda: VP9D, James A. Mann, The Cut, St. Georges

Bolivia: R.C.B., Casilla 2111, La Paz

Brazil: L.A.B.R.E., Caixa Postal 2353, Rio de Janeiro

British Guiana: Desmond E. Yong, VP3YG, P.O. Box 325,

Georgetown

British Honduras: D. Hunter, Box 178, Belize

Bulgaria: Box 830, Sofia

Burma: B.A.R.S., P.O. Box 376, Rangoon

Canton Island: H. B. Johnson, KB6BA, U.S.P.O. 06-50000,

Canton Island, South Pacific.

Ceylon: P.O. Box 907, Colombo

Chile: Radio Club de Chile, Box 761, Santiago

China: M. T. Young, P.O. Box 16, Taichung, Formosa

Colombia: L.C.R.A., P.O. Box 584, Bogot4

Cook Islands: Ray Holloway, P.O. Box 65, Rarotonga

Costa Rica: Radio Club of Costa Rica, P.O. Box 535, San Jose

Cuba: Radio Club de Cuba, QSL Bureau, Lealtad No. 660, Havana

Cyprus: Mrs. E. Barrett, P.O. Box 219, Limassol

Czechoslovakia: C.A.V., P.O. Box 69, Prague I.

Denmark: P. Heilmann, OZ4H, Vanlose Alle 100, Copenhagen

Dominica: VP2DA, Box 64 Roseau, Dominica, Windward Islands — *Dominican Republic:* Calle Duarte #76, C. Trujillo

East Africa: (VQ1, VQ3, VQ4, VQ5): P.O. Box 1313, Nairobi, Kenya Colony

Ecuador: Guayaquil Radio Club, Casilla 784, Guayaquil

Eire: I.R.T.S. QSL Bureau, I. Morris, EI6U, 9 Shanrath Rd. Whitehall, Dublin

Fiji: S. H. Mayne, VR2AS, Victoria Parade, Suva

Finland: SRAL, Box 306, Helsinki

France: R.E.F., BP 26, Versailles (S & O); (F7 calls only) F7 QSL Bureau, APO 163, % Postmaster, New York, N. Y.

Germany (DL2 calls only): Via Great Britain

Germany (DL4 calls only): DL4 QSL Bureau, APO 757, % Postmaster, New York, N. Y.

Germany (DL5 calls only): Via France

Germany (other than above): D.A.R.C., Postbox 99, Munich 27

Gibraltar: E. D. Wills, ZB2I, 9 Naval Hospital Road

Gold Coast: ZD4BL, Box 47, Accra

Great Britain (and British Empire): A. Milne, 29 Kechill Gardens, Hayes, Bromley, Kent

Greece: C. Tavanotis, 17-A Bucharast St., Athens

Greenland: APO 858, % Postmaster, New York, N. Y.

Grenada: VP2GE, St. Georges

Guam: G.R.A.L., Box 145, Agana, Guam, Marianas Islands

Guantanamo Bay: William Hamm, KG4AF, NAS, Navy 115, Box S, F.P.O., New York, N. Y.

Guatemala: Manuel Gomez de Leon, P.O. Box 12, Guatemala City

Haiti: Roger Lanois, % R.C.A., P.O. Box A-153, Port-au-Prince

Hong Kong: Hong Kong Amateur Radio Transmitting Society, P.O. Box 541, Hong Kong

Hungary: H.S.R.L., Postbox 185, Budapest 4

Iceland: Islenzkir Radio Amatorar, P.O. Box 1080, Reykjavik

India: Box 1, Munnar, Travancore, S. India

Indonesia: P.A.R.I., P.O. Box 222, Surabaya, Java

Israel: I.A.R.C., P.O. Box 4099, Tel-Aviv

Italy: A.R.L., Via San Paolo 10, Milano

Jamaica: Thomas Meyers, 122 Tower St., Kingston

Japan (JA): J.A.R.L., Box 377, Tokyo

Japan (KA): F.E.A.R.L., P.O. Box 111, APO 500, % Postmaster, San Francisco, Calif.

Kuwait: Doug Taylor, MP4KAA, Box 54, Kuwait, Persian Gulf

Lebanon: R.A.J., B.P. 3245, Beyrouth

(Continued on page 148)

¹"A New Country Calls CQ," Reed, July, 1950, QST.

²"Earthquake in Ecuador," Reed, Oct., 1949, QST.

V.H.F. QSO Party

June 11th-12th

ARRL takes pleasure in announcing another of the popular V.H.F. QSO Parties, open to all amateurs who can work any band or bands above 50 Mc. With June one of the best months for v.h.f. DX, here's a great chance to contact some new states and give the equipment and antennas a real work out. The contest will be held during a 33-hour period starting at 2:00 P.M. your Local Standard Time, June 11th, and ending at 11:00 P.M. Local Standard Time, June 12th. Technician licensees can use their new 6-meter privileges during this week end of peak activity. But every v.h.f. enthusiast, whether old-timer or newcomer, is urged to get in on the fun!

How To Take Part

Call "CQ Contest" or "CQ V.H.F. QSO Party" to get in touch with other contestants. During contact, operators must exchange names of their ARRL sections for full point credit. It's also a good idea to swap signal-strength and readability reports, although this is not required.

Scoring

Work as many stations on as many v.h.f. bands as you can. Count 1 point for successfully confirmed exchanges of section information on 2 or 6 meters, 2 points for such QSOs on 220 or 420 Mc., and 3 points on 1215-Mc. or higher bands. Then multiply this sum of station points by your section multiplier, which increases by one when the same section is reworked on another band. A station may also be reworked for credit on additional v.h.f. bands. See Rules 4 and 5 for complete information on how to figure your score.

Certificate Awards

Certificates will be awarded to the top scorer in each ARRL section. In addition, a certificate will go to the high-scoring Novice, Technician, and multiple-operator station in each section from which three or more valid entries are received in these three special categories.

Reporting

Submit your results as soon as the competition is over. All that is required is a simple tabulation of stations and sections worked, as shown on page 60 of June, 1953, *QST*. Write ARRL for free convenient reporting forms.

Rules

- 1) The contest starts at 2:00 P.M. Local Standard Time, Saturday, June 11th, and ends at 11:00 P.M. Local Standard Time, Sunday, June 12th. All claimed contacts must fall within this period and must be on authorized amateur frequencies above 50 Mc., using permitted modes of operation.
- 2) Name-of-section exchanges must be acknowledged by both operators before either may claim contact point(s). A one-way exchange, confirmed, does not count; there is no fractional breakdown of the 1-, 2- or 3-point units.

3) Fixed-, portable- or mobile-station operation under one call, from one location only, is permitted.

4) Scoring: 1 point for completed two-way section exchanges on 50 or 144 Mc.; 2 points for such exchanges on 220 or 420 Mc.; 3 points for such exchanges on the higher v.h.f. bands. The sum of these points will be multiplied by the number of different ARRL sections worked per band; i.e., those with which at least one point has been earned. Reworking sections on additional bands for extra section credits is permitted. Cross-band work does not count.

5) A contact per band may be counted for each station worked. Example: W2GLV (S.N.J.) works W1DBM (Conn.) on 50, 144 and 220 Mc. for complete exchanges. This gives W2GLV 4 points (1 + 1 + 2) and also 3 section-multiplier credits. (If W2GLV contacts other Connecticut stations on these bands, they do not add to his section multiplier but they do pay off in additional contact points.)

6) Each section multiplier requires completed exchanges with at least one station. The same section can provide another multiplier point only when contacted on a new v.h.f. band.

7) Awards: A certificate will be awarded to the high-scoring single-operator station in each ARRL section. In addition, the high-scoring multiple-operator station will receive a certificate in each section from which three or more valid multiple-operator entries are received. Certificates will also be given to the top Novice and Technician in each section where three or more such licensees submit logs. Award Committee decisions will be final.

8) Reports must be postmarked no later than June 29, 1955, to be eligible for awards. See the box on page 60, June, 1953, *QST*, for correct form, or a message to Headquarters will bring a lithographed blank for your contest report.



June 1930

... Editor Warner suggests that U. S. amateur clubs take up transmitter hunting, an activity carried out by many British amateur societies. In a second editorial, comments are made about commercial interference in our bands.

... "Advanced Transmitter Design," by James J. Lamb, presents a method that will give a rig 3.5-Mc. performance on 10 meters.

... Howard F. Anderson tells how to convert the old broadcast receiver to a modern high-frequency superheterodyne in "The Band-Box Superhet."

... In keeping with increased interest in 10-meter activity, Clark C. Rodimon, W1SZ, tells of some interesting accomplishments in "More Progress on 28 Mc." Asia works U. S. A., preparation for June tests, and a report on RSGB experiments are highlights of the article. An excellent description is included of active DX station W2JN, operated by C. K. Atwater.

... A résumé of the practical aspects of rectifier and filter design is offered by George Grammer, W1DF, in "Getting That D.C. Plate Supply."

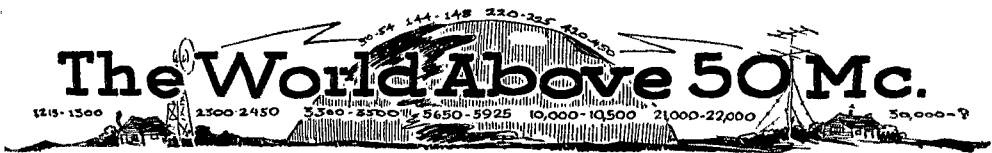
... Clinton D. DeSoto, W9KL, arrives at League Hq. to assume duties as Assistant to the Secretary. He fills the position formerly held by A. L. Budlong, who is now Assistant Secretary.

... W9XAM transmits time signals on 4795 kc. with a crystal-controlled 500-watt rig.

... The Experimenters' Section contains some good information on coupling the single-wire feeder antenna to a push-pull transmitter.

... A report of the ham phase of the Second Roumanian Arctic Expedition is found in the Communications Department section. H. M. Bassett, W6BSB, was operator for this venture.

... The RMA Convention and Trade Show will be held this year in the Municipal Auditorium at Atlantic City. The Convention will be of unusual interest because there will undoubtedly be much discussion of the pentode and its relation to manufactured receivers during the coming year.



CONDUCTED BY EDWARD P. TILTON, WIHDQ

In all the years that no-code and slow-code amateur licenses were under consideration it was said that there were thousands of technically-trained experimenters who would populate our higher frequencies if we made it easy enough for them. They would snap up the idea, if only they didn't have to learn the code. This was the basic idea in back of the "Class D License" argument of the '40s, and it finally took form in the Technician Class ticket, announced along with the Novice license in 1951.

The Technician Class license doesn't quite eliminate the job of learning the code, but developing the ability to send and receive at 5 words per minute should be no serious stumbling block to anyone with the technical know-how needed to pass the rest of the exam. There have been nearly 15,000 Technician tickets issued to date. Where are those u.h.f. and microwave experimenters?

We have a few. Scattered around the country we find honest-to-goodness technicians (small "T") who are doing the best they know how to promote interest in 220, 420 and higher bands. But at least 99 per cent of the "Technicians" are fellows who took the General Class technical exam in their stride, but couldn't quite make the code requirement. The Technician license gave them a foot in the FCC's door; a permanent ticket that could be renewed, if at the end of five years they still found it hard to master 13 w.p.m.

Actually, practically all of today's Technicians are not technically trained at all. They simply latched onto the technical side of ham radio a little faster than they handled the operating side. They are very frankly in a transitional state between the Novice and General Class. Do they have any real interest in v.h.f. or u.h.f. hamming?

So long as using the Technician license meant making use of the frequencies above 220 Mc., there was just about one in a thousand who gave it more than passing thought. "Where can I buy a transmitter and receiver for 220 or 420 Mc.?" was a common inquiry in the months after the Novice licenses began to run out. "Please send me plans for a one-tube transceiver for 220 Mc." "Is there anyone in my area who is working on 220 Mc.?" Much ARRL staff time was spent in developing gear that would appeal to the newcomer who was breaking into the game via the Technician route. This helped some, we hear. Certainly there is appreciably more use of the 220- and 420-Mc. bands today than there would have been without the Technician influence. But it is far from the impressive swing to v.h.f. and u.h.f. experimentation that was supposed to be waiting for this approach to amateur radio.

Will opening the 50-Mc. band to Technician licenses change the picture? Not nearly so much as many wishful thinkers would have us believe, we'll wager. The night of April 12th saw more stations on 50 Mc. in W1 than we've had in quite some time. It was a good night, weatherwise, and everyone was looking for the newcomers. They showed, and they have been popping up since, with perhaps a dozen new calls appearing in W1 before the end of April.

The story around the rest of the country seems about the same. If the Technicians-on-50-Mc. move brings us 200 new 6-meter stations in 1955 we'll be very happy. How many it does net will depend a good deal on what those of us who are already there do about it. For the prospective 50-Mc. Technician is no technician at all. He is a beginner of uncertain age, with the same frustrations, technical and economical, that most of us encountered in getting started. He will need help; over the telephone, in the radio club, or

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Six-meter men of Philadelphia and Washington areas get together. Lined up at home of W3OTC, Silver Spring, Md., are (standing): W3MXW, W3CUB, W2ORA, W3GGR, W3YHI, W3KMY, W3WOD. Front row: W3CGV, W3UJG, W3OJU, W3RQT, W8NRM/3, W4UMF. Missing when picture was taken, W3JES. (Photo by W3OTC.)
◆



over the air, just like any other newcomer. And he'll need activity to keep him interested, once he actually fires up on 6.

In the last analysis, the advent of Technicians on 50 Mc. will be just a steppingstone, at best, to increased utilization of this most interesting 4-megacycle slice of the radio spectrum. It will not end the responsibility that all v.h.f. men have; the selling of their product to the thousands who are primarily interested in lower frequencies.

Here and There on the V.H.F. Bands

The June V.H.F. Party should be fun this year, if half the expeditions now being planned materialize. As announced last month, W8GUZ and W8JWV will be operating

from the highest spot east of the Mississippi River, Mt. Mitchell, North Carolina, during the Party. There is also the possibility that they may hit Sassafras Mountain, highest point in South Carolina, a day or two before. They will be using a frequency around 144.5 Mc., a 16-element array, and about 75 watts input, operating as W8JWV/4. They will QSL all contacts, but they warn the gang not to be over-eager in that respect. Suitable cards will be made up following their return.

That Sassafras Mountain location is one that might bear more investigation by expeditions. It is between Routes 178 and 276, just over the line from North Carolina, not far from Greenville, S. C. With 3560 feet of elevation, it might be the spot for some enterprising expedition to make a name for itself in providing a state almost nobody has worked on 144 Mc.

West Virginia will be represented by W3PGA/8, the Aero Amateur Radio Club of Baltimore, who will set up at an elevation of nearly 4000 feet above sea level near Elkins, W. Va. Operation will be on three bands. A 50-watt rig will feed a 5-element beam on 50 Mc. On 144 there will be a 4X150 coax-line amplifier, running 160 watts input, feeding a 16-element array. The 220-Mc. job will have an 832A running 25 watts input, also with a 16-element beam. All arrays will be horizontal. They will also have a 75-meter rig, for use until the v.h.f. contest gets under way.

An expedition that just missed last month's copy was conducted by W6UID, who with several companions operated /7 at Wilson Pass, Nev., March 26th. Many stations in the Los Angeles area thus acquired a new station on 144 Mc., including W6WSQ, who now leads the W6s with 4. W6DNG, who got No. 3, reports that he has worked W7LEE, Parker, Ariz., at least 23 times, most of these with only 100 watts input. He now has 500 watts on c.w., a 32-element horizontal beam, and is building for a kilowatt.

Looking for a simple way to receive signals on 50 Mc.? W8DZM, Minneapolis, says that he's been doing all right with simple mixer-oscillator (1 tube) jobs. An important factor in getting good noise figure, he points out, is keeping the mixer plate voltage down. This is true with either pentode or triode mixers, when no r.f. amplifier stage is used. With a 6J6 push-push mixer the noise rose faster than the signal when the plate voltage was increased above 40. It's really the plate current that makes the difference. In a tetrode or pentode mixer this can be controlled by the value of the screen resistor, but in the case of triodes it is best merely to lower the plate voltage. They'll often work well with as little as 8 to 10 volts, and he had one that worked best with only 4 volts on the plate!

Here's a mass-production job on 6-meter gear. W3YHI reports that the club at Andrews Air Force Base recently embarked on the construction of ten 6-meter rigs, complete with modulators. Transmitters have 2E26 finals, running 20 watts, with two 6L6 AB₁ driven directly from the carbon microphone transformer. With the pilot model, that's 11 new 6-meter stations due in the Washington area around May 1st.

Displaced Persons Department—W2QED, late of Seabrook, N. J., is now working 2-meter mobile in the Los Angeles area. It will be some time before he has a home station set-up, but meanwhile he's enjoying the 2-meter activity around Glendale. He and W6QKI (ex-W3QKI) promise to infiltrate the predominantly vertical Los Angeles gain with a little horizontal antenna propaganda. Reports have it that W8WJC and BFQ are destined for Athens, Tenn. (Third-hand report, not from the Headquarters of High Antennas, Inc.) W2UK, New Brunswick, N. J., will be taking down those big antennas soon and heading for KH6-land. DX on 2 from Hawaii coming up!

Northwest going horizontal? The April issue of *The Oregon Scanner*, edited by W7OAY and W7JIP of Milwaukie and Portland, reports tests going on in Portland and Tigard, Ore., and Seattle and Spanaway, Wash. While the checks are inconclusive so far, results indicate stronger and more consistent signals with horizontal polarization. We understand that the VE7s to the north favor horizontal and would be glad to go along with a shift to that as a standard. Could be that this would do what changing to horizontal has done for the East—step up the consistent operating range of the average 2-meter station. In checks made years ago, your conductor was sold on horizontal by the way it brought up signals over the medium-length paths where the terrain was irregular. Horizontal arrays for 144 Mc. may be seen in the Portland area at W7VS

2-METER STANDINGS

Call			Call				
States	Areas	Miles	States	Areas	Miles		
W1RFU	19	7	1150	W6NIZ	3	2	360
W1HDQ	19	6	1020	W6MMU	2	2	240
W1CCH	17	5	670	W6DNG	3	2	230
W1IZY	16	6	750	W6GCG	3	2	210
W1EDU	16	5	475	W6QAC	2	2	200
W1UIZ	15	6	680	W6EXH	2	2	193
W1KCS	15	5	600				
W1AZK	14	5	650	W7VMP	4	3	417
W1MNF	14	5	600	W7JUJ	3	2	247
W1BCN	14	5	650	W7LEE	3	2	240
W1DKL	14	5	520	W7YZU	3	2	240
W1MMN	14	5	520	W7JUJ	2	2	140
				W7RAP	2	1	165
W2ORI	23	8	1000				
W2UK	23	7	1075	W8BFQ	29	8	850
W2NLK	23	7	1050	W8WNV	28	8	1200
W2AZL	21	7	1050	W8WJC	25	8	775
W2QED	21	7	1020	W8RMH	22	8	690
W2BLV	19	7	910	W8DX	22	7	675
W2OPQ	19	6	660	W8SVI	21	7	725
W2DWJ	17	5	632	W8REW	20	8	850
W2AOC	17	5	600	W8SVI	20	7	775
W2UTH	16	6	880	W8WRN	20	8	670
W2PAU	16	6	740	W8RAN	20	8	685
W2PCQ	16	5	650	W8JWV	18	8	650
W2LHL	16	5	550	W8SEP	18	7	800
W2CET	15	5	525	W8ZCV	17	7	970
W2DFV	15	5	550	W8RWW	17	7	630
W2AMJ	15	5	550	W8WSE	16	7	800
W2QNZ	14	5	400				
W2BRV	14	5	590	W9EHX	23	7	725
				W9FVJ	22	8	850
W3RUE	23	8	950	W9EQC	22	8	820
W3NKM	19	7	660	W9KLR	21	7	690
W3IBH	19	7	650	W9UOH	21	7	750
W3BNC	18	7	750	W9ZEL	21	7	750
W3FPH	18	7	750	W9BPV	20	7	1000
W3TDF	17	6	720	W9KPS	19	7	660
W3KWL	17	6	720	W9MUD	19	7	640
W3LNA	16	5	570	W9REM	19	6	—
W3TDF	16	5	570	W9LFF	19	6	—
W3GKP	16	6	800	W9ALJ	18	7	800
				W9IGA	18	6	720
W4HHK	26	8	1020	W9WOK	17	6	600
W4AO	23	8	950	W9MB1	16	7	660
W4PCT	20	8	—	W9GAB	16	6	750
W4JFV	18	7	830	W9BQV	15	6	—
W4MKJ	16	7	665	W9LEE	15	6	780
W4UMF	15	6	600	W9DSE	15	6	760
W4XUJ	14	5	500	W9JNZ	15	6	560
W4JHC	14	5	720	W9DDG	14	6	700
W4WCB	14	5	740	W9FAN	14	7	680
W4TCR	14	5	720	W9QKM	14	6	620
W4UBY	14	5	435	W9UJA	13	7	540
W4IKZ	13	5	720	W9ZAD	11	5	700
W4JFU	13	5	720	W9GTA	11	5	540
W4ZBU	10	5	800	W9JBF	10	5	760
W4UDQ	10	5	800				
W4DWU	8	6	625	W0EMS	26	8	1175
W4TLA	7	4	850	W0HED	24	7	870
				W0GUD	22	7	1065
W5RCL	21	7	925	W0ONQ	17	6	1090
W5JTI	19	7	1000	W0INI	14	6	830
W5AJG	11	4	1260	W0OAC	14	5	725
W5QNL	10	5	1400	W0TJP	13	4	—
W5CVW	10	5	1180	W0ZJZ	12	7	1097
W5MWW	9	4	570	W0WGW	11	5	760
W5ML	9	3	700				
W5ABN	9	3	780				
W5ERD	8	3	570	VE3AIB	20	8	890
W5VX	7	4	—	VE3DIR	18	7	790
W5VY	7	3	1200	VE3BQN	14	7	790
W5FEK	7	2	580	VE3DER	13	7	800
W5ONS	7	2	950	VE3EPB	12	7	715
				VE2OK	12	6	550
				VE3AQQ	11	7	800
W6WSQ	4	3	1380	VE1QY	11	4	900
W6ZL	3	3	1400	VE7FJ	2	1	365
W6BAZ	3	2	320				

(Twin 6), W71NX (16-element), W7SEZ (Twin 6), W7OKY (32-element), and W7JIP (20-element now replaced by a 24-element job made up from 4 6-element Yagis with $\frac{1}{2}$ wave spacing vertically and a full wavelength horizontally).

2-Meter Harmonics Endanger Aircraft Communication

Most 2-meter operators probably never give it a thought, but their second harmonics fall in a military aircraft band. W6RIU reports serious interference from near-by 2-meter stations, as the result of harmonic radiation on the auxiliary military air traffic control frequency of 291.6 Mc.

Even very low-powered rigs can cause trouble, if they are near fields where these frequencies (225 to 400 Mc.) are in use. Landing instructions have been fouled up by such interference, and this is very serious business. Fortunately it is a simple matter to prevent such trouble in most cases. With shielded rigs like the Communicator, for instance, the installation of a simple filter like the one described in *QST* for April, 1953, page 20, and repeated in recent editions of the *Handbook*, will do the trick.

Avoiding TVI is not our only responsibility in connection with harmonics!

● TRICKS WITH THE COMMUNICATOR

With the impact the Gonset Communicator has had on the v.h.f. scene, it is only natural that "improvements" for the little green-eyed dragon are a dime a dozen. Seems like everyone has a pet scheme for making the Communicator over into something else than what it was intended to be, a general-purpose transmitter-receiver for 2 or 6 meters. Some of the ideas involve considerable modification of the unit. These we'd prefer to steer clear of, because they tend to ruin the resale value of the rig as it stands. Others can be put on or taken off at will, and it is in this category that we feel the best work can be done.

Two factors seem to strike most modifiers as desirable: use of the Communicator receiver as a converter, and increasing the modulator audio gain to permit talking at lower voice level. Adaptation for c.w., both in transmission and reception, appeals to quite a few owners, too, but either may require some circuit changes. Here are ideas for accomplishing the first two.

More Modulation Without Shouting

The Communicator audio system more or less automatically prevents overmodulation, but it also requires high voice level, particularly when carbon or low-output crystal microphones are used. This is as it should be in portable or mobile operation, but in using the rig at home it is useful to be able to modulate it fully while talking at low level. W21UI, Linden, N. J., had a bright idea for doing this. Noting that the modulator uses the Heising (choke) system of modulation, in which a transformer with a low-impedance secondary is also used to permit operation of the rig as a p.a. system, he coupled the low-impedance output of a public-address amplifier into the p.a. jack on the Communicator. This allows his amplifier to be used as the modulator, without making wiring changes in the Communicator. The send-receive switch works normally, and the amplifier may be unplugged at any time and the rig used in its original form for portable or mobile work.

For best results, an amplifier output impedance of 4 to 8 ohms should be presented to the p.a. jack on the Communicator, but impedances as high as 16 ohms will work. The high-frequency attenuation of the Communicator

Method of taking off the i.f. signal, for using the Communicator as a converter. A coax fitting is mounted on a small bracket on the back of the receiver chassis, and a lead from it is capacitively coupled to the first i.f. tube plate lead.

RECORDS

Two-Way Work

50 Mc.: CEIAH — J9AAO
10,500 Miles — October 17, 1947
144 Mc.: W6ZL — W5QNL
1400 Miles — June 10, 1951
220 Mc.: W8BFQ — W5RCI
700 Miles — October 9, 1954
420 Mc.: W1RFU — W4VVE
410 Miles — June 12, 1954
1215 Mc.: G3QC/P — G8DD/P
100 Miles — July 26, 1953
2300 Mc.: W6IFE/6 — W6ET/6
150 Miles — October 5, 1947
5250 Mc.: W2LGF/2 — W7FQF/2
31 Miles — December 2, 1945
10,000 Mc.: W7JIP/7 — W7OKY/7
109 Miles — August 8, 1954
21,000 Mc.: W1NVL/2 — W9SAD/2
800 Feet — May 18, 1946

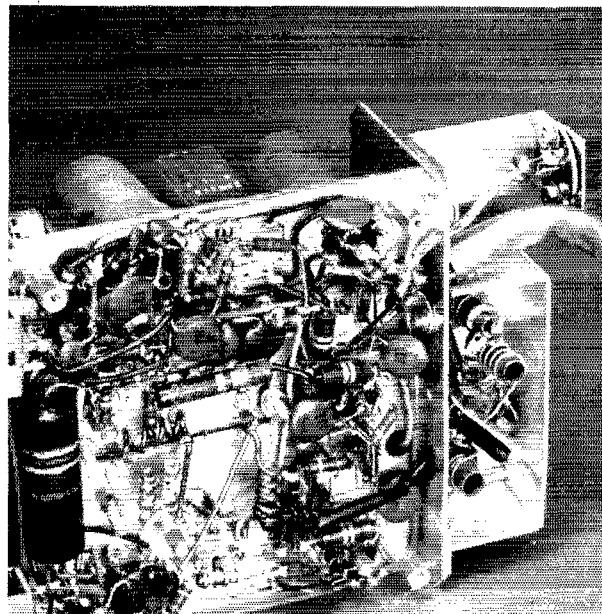
modulation circuit effectively reduces the wide frequency response that is common in high-quality amplifiers. Most such amplifiers also include bass and treble controls. Superior voice quality can be obtained without wideband response, if these controls are adjusted with care. The amplifier should be capable of 20 watts or more of normal output, in order to be most adaptable to this application.

Use as a Converter

The 2-meter Communicator lacks the selectivity needed for satisfactory operation in areas where activity is heavy. The bandwidth is just about right for mobile operation, where frequency instability in the oscillator would be troublesome if a much sharper i.f. were employed. But at the home station improvement in signal-to-noise ratio and better separation of stations can be obtained if the i.f. signal of the Communicator is fed into a communications receiver, converter fashion.

This can be done very simply, and in several ways that will not mar the appearance or operating quality of the Communicator. One extremely simple adaptation is shown in the adjoining photograph. A phono-type coax fitting is mounted on a small aluminum bracket attached to the rear of the receiver. Both the mounting screw and the hole for the i.f. lead are already there. A piece of shielded wire long enough to reach to the nearest i.f. transformer is run

(Continued on page 144)



of artificial awards but through the sheer operating experience which engenders fraternalism, brings added know-how and a field adventure within your reach, whether you go out with a team or as an individual. Operating participation, as always, will assure your success.

Even one contact can prove your field test a success from the workability standpoint. We stress (by points credit before multiplier) that each station file and send a message to demonstrate bona fide communications and not limit ability entirely to brief contacts. The message, and more contacts, will carry your success farther.

The lessons in a Field Day are numerous; many of them are of a practical nature. Let us stress that the invitation to take part is just as much for individuals as for clubs and groups; scoring plans are flexible giving a choice of ways to enter for all U. S. A. and Canadian amateurs. Compare your results with those similarly set up, or with your own earlier comparable score. Don't forget to start your (one only) FD message to SCM or SEC in this year's field operations. B C N U in the FD!

— F. E. H.

RTTY NOTES

Under this part of the sunspot cycle we often have superior north-south propagation conditions so that some of those South American teletype commercials in the 80-meter band are consistently heard. After dark signals are often QSA 5. A recent letter from W3PYW mentions that one evening at 1900 EST he logged commercial RTTY signals on 3567, 3587, 3630, 3651, 3657, 3920 and 3992 kc.

W3PYW also mentioned that at least three close friends have asked why amateurs on RTTY don't sign. All RTTY enthusiasts want it made clear that as bona fide licensed amateurs they do sign — every ten minutes and at the beginning and end of transmissions as required by FCC! They use RTTY and continental both as per FCC's Section 12.81. If they don't identify, you can be sure they are not our W/VE amateur friends.

The Amateur Radioteletype Society (New York) and Western Union cooperated in supplying RTTY facilities for a civil defense test held on March 22nd. RTTY facilities were set up in civil defense control centers in Brooklyn, Manhattan, Queens and Westchester County, New York. Among those amateurs furnishing equipment and participating in the drill were W2s AKE AWQ BFD DUP EBZ IRT MGN QGH TLY.

A number of prominent RTTY enthusiasts, many of them in town for the IRE convention, turned out for an informal meeting and dinner at RCA Exhibition Hall in New York City on March 21st. Among those present were W1s AFN BGW FGL RBF RGU, W2s AKE BDI EBZ JAV NSD OOG PAU PBG SPV TBD TKO, W3s CRO MHD PYW, W4ZC, W6AEE, W9s CNN TCJ, W0BP.

DXCC NOTES

Announcement is hereby made of one addition and one deletion to the ARRL Postwar Countries List. The addition will be that of Wallis and Futuna Islands (FW8). These islands are located approximately 1100 miles NNE of New Caledonia of which they are a dependency. The deletion will be Tannu Tuva.

DXCC credit will be given starting August 1, 1955, for creditable confirmations dated on or after November 15, 1945, for Wallis and Futuna Islands (FW8) contacts. Confirmations received prior to August 1, 1955, will be returned without credit.

In future ARRL DX Competitions, those making contact with amateur stations located in the Wallis and Futuna Islands may claim credit for a separate country in accordance with DXCC rules.

DX CENTURY CLUB AWARDS

HONOR ROLL

W1FTL 258	W68N 247	W3KT 245
W6VPR 254	W8NBNK 247	W6SYG 245
W6AM 253	W2P 247	W2AGW 244
W6ENV 251	W3GHD 246	W6M 244
W8HGW 251	W6MELK 246	W2BXA 243
W3BBS 250	W2CCK 246	W5MIS 243
W0YXO 250	W3JTC 245	W9NDA 243

Radiotelephone

PY2CK 239	W1MCW 215	W3JNN 209
W1FH 230	W1NWO 215	W9NDA 209
VQ4ERR 230	W1TAC 215	SM5KP 207
ZS6BW 224	W8HCW 214	W5BGP 205
W1JCX 216	W9RBI 210	W6DI 205

From March 15, to April 15, 1955 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

W7HQC 110	LA3DB 105	W4VNE 101
W4GCW 108	DM2ADL 103	DL9PN 101
VQ4FT 108	W1VWL 102	H9B5W 101
DL1ME 106	W0RME 102	W4SOV 100
	VE2OJ 102	

Radiotelephone

VE2GQ 112	G3XC 102	W8NWO 101
E13S 104	W1WQC 101	W4EEB 100
EA8AX 103		E2W 100

ENDORSEMENTS

W6RW 233	W3AXT 154	W6MUF 136
G8IG 211	W2AZS 150	W4TP 135
PY4IE 210	W4ML 150	OZ8SS 133
W4LVV 201	W7BT 150	W3EBR 131
W3KDP 200	W8REK 146	W6P 131
W1AB 192	W0QVZ 144	W9AL1 130
W2PRN 190	W1JOJ 142	CR6AI 122
W5EFC 188	W0DXE 142	W6SWG 121
W3ALX 180	W2TRV 140	G8AAE 121
W6MEL 164	W8TMA 140	W5HDS 115
W3AFW 161	W6NLY 140	X44DF 113
W3ECR 161	W1BGA 137	JA1AA 111
W6LYN 160	W2GVP 136	W2PES 110
ON4FL 157		SM3AKW 110

Radiotelephone

CX2CO 190	W2WZ 150	W3ECR 125
W5EFC 183	W3UIP 143	W8QJR 120
G8IG 180	W1GOU 140	LA5YE 117
CT1PKX 171	W8EX 140	W6CXE 110
W9RN 170	W8VDJ 130	W0BET 110
PY4CB 170	KT1WX 130	OD5BA 110

W/VE/VO Call Area and Continental Leaders

W4BPD 241	VE4RO 223	VE8AW 160
W7AMX 240	VE5QZ 140	VO6EP 190
VE1HG 150	VE6GD 108	4X4RE 210
VE2WW 181	VE7HC 209	ZS6BW 231
VE3QD 210		ZL2GX 235

Radiotelephone

W2APU 202	VE1CR 120	VE4RO 120
W4HA 180	VE2WW 102	VE7ZM 140
W7EA 181	VE3KP 163	OD5AB 170
W0ATW 179		ZL1HY 190

A.R.R.L. ACTIVITIES CALENDAR

- June 3rd: CP Qualifying Run—W6OWP
- June 11th-12th: V.H.F. QSO Party
- June 17th: CP Qualifying Run — W1AW
- June 25th-26th: ARRL Field Day
- July 2nd: CP Qualifying Run — W6OWP
- July 11th: CP Qualifying Run — W1AW
- July 16th-17th: CD QSO Party (c.w.)
- July 23rd-24th: CD QSO Party (phone)
- Aug. 5th: CP Qualifying Run — W6OWP
- Aug. 16th: CP Qualifying Run — W1AW
- Sept. 3rd: CP Qualifying Run — W6OWP
- Sept. 14th: CP Qualifying Run — W1AW
- Sept. 15th: Frequency Measuring Test
- Sept. 17th-18th: V.H.F. QSO Party
- Oct. 8th-9th: Simulated Emergency Test
- Oct. 13th: CP Qualifying Run — W1AW
- Oct. 15th-16th: CD QSO Party (c.w.)
- Oct. 22nd-23rd: CD QSO Party (phone)



On the fifteenth and sixteenth of June, 1955, the United States is going to get the worst theoretical pasting in its history, bringing about "Operation Alert 1955," a National Civil Defense Test Exercise. The test will start at 1100 EST. Fifty critical target cities will be the recipients of as many hypothetical atomic attacks by bombs ranging in size from 20 kilotons to 5 megatons. In addition, there will be seven atomic attacks directed at any seven of 49 "unknown" targets. Total assumed casualties will be over sixteen millions, of which about half will be assumed killed and half wounded.

Regarding communications, FCDA says: "The exercise will be played communications-wise on the basis of assumed communications channels available after analyzing the damage." Also: "Radio back-up through the use of amateur personnel and equipment should be utilized at all levels to the extent facilities are available at the time of the Exercise. Such amateur participation should be within RACES plans, approved and pending. Amateur participation will be encouraged through the American Radio Relay League." The italics are ours.

More details will be included in a forthcoming EC bulletin, which may be in the hands of ECs by the time this appears in print (we hope). This is just a reminder to all and sundry that once again we have to put in a performance to justify RACES. If you are not at present an AREC member, it is time for you to get signed up with your EC. If there is no EC, get one appointed, or volunteer for the job yourself. Then get in touch with your c.d. director quick and get a RACES plan in the works. Only if there is a plan pending can you take part in the June test, so better get going right away!

We ought to make clear that the RACES subhead on this column is not designed to further split the AREC and RACES. It follows logically along with our philosophy that RACES is one of the jobs of the AREC, and a darned important one. The "RACES" column is part of our "With the AREC" column. We hope you'll read it, whether you're "in RACES" or not. Items about civil defense and RACES which are of general interest, such as the above, will continue to appear in this part of the column.

On the evening of July 22, 1954, downtown telephone service in Farmington, N. M., was curtailed by flood waters. The police chief asked for and received the help of the amateurs when EC W5CIN stationed one mobile unit at the reservoir, two others at fire and police headquarters, and another on stand-by to be dispatched where needed. Communications were also maintained with Albuquerque when telephone facilities failed. For some time, radio was the only means of communication with the outside world. Amateurs participating: W5s GVB (then W7NZZ/5) PVB and CIN. — W5CIN, EC Farmington, N. M.

On February 1st, a severe windstorm swept a path across Northern Mississippi, causing considerable damage. EC W4BAQ alerted some of the Memphis AREC members to help Red Cross determine the need for assistance at Com-

merce Landing, Miss. W4VVQ and W4EPQ were dispatched, one to proceed to the area, the other to provide 2-meter relay. Experiencing difficulty maintaining contact, W4GQQ and W4VZU were dispatched for additional relay points. Memphis fixed stations assisting in contact with these stations included W4s BAO BAQ CV DIX IQX and OTJ. The following day the Red Cross asked for a check of the situation at Lewisburg, Miss., where the storm also struck. W4BAQ and W4IQX proceeded to the area and handled some Red Cross traffic via W4UDI, while W4HHK, operating W4UDQ, stood by. Both 2 and ten meters were used in this operation. — W4BAQ, EC Memphis, Tenn.

On February 14th, amateurs in Western and Northern Texas and adjoining states assisted the CAP and CAA in searching for the wreckage of a missing plane piloted by W5DM. W5DM was flying his own plane from Denton to Odessa to visit W5NW (ARRL Veep) when he crashed and was killed within twenty miles of the Odessa airport. The North Texas and the North West Texas nets combined on 3930 to help provide communications for the search, furnishing valuable information for the CAA and CAP. Many amateur mobiles were also out. W5DM's wrecked plane and body were found two days after he was reported missing. Officials of CAA and CAP, and Mrs. W5DM expressed great appreciation for the amateurs' assistance.

On March 14th K6BJO, a doctor of Dunsmuir, Calif., made an emergency call to a car wreck 5 miles south of Dunsmuir. K6BJO/m called W6ILY and W6WVW, both of Dunsmuir, to call hospital and make arrangements for the patient. All this was done by K6BJO while he was answering the emergency call on the way to the wreck, and enabled the patient to be taken care of promptly.

Cape Cod's worst blizzard of the year came on April 4th, wiping out all telephone, telegraph and power lines from south of the Cape Cod Canal to Yarmouth. The Cape Cod and Island Amateurs Net was activated by NCS WINXH at 0845, putting the net immediately on an emergency basis and dispensing with the customary roll call. Weather reports were collected from W3MAC, W1QJA, W2NQG, W2LWA and others to get a general picture of the storm. W1LYV reported in on emergency power at 0927 to say that all power and telephone cables were down, with a strong wind blowing. Twenty minutes later W1YXJ /m came on to report the disaster as they saw it. Stations continued to report in until almost forty were standing by. W1LYV reported being ready on two meters. Inquiries from newspapers started to pour in about noon, but the storm was still in full swing and not much information was available. At 1430, W1CLF took over net control and retained it until 2240, when the net was secured. Fifty-three stations participated in all, including the following not already mentioned: W1s AKN AVY AWD AXH BUN DFS DGJ DES DMI DNI DUN FZO GDT GIX GWL THL LPB LVJ MFI OQT SDT SGL SZU TJA TJU TVS UN OUW ORN/1 VSE VSZ WGP WTZ WUO WWZ YPT/1 YYW ZUR WZ CUA; W2s EYT ETS EMV KZ HOS WZ JWM JGV NQK; K2s EHI HOS LWA; W3MAC. — W1CLF, EC Norfolk, Mass.

On the morning of February 19th, EC W5UWA was informed of a missing TWA aircraft and asked if the amateurs would be available. He immediately offered the amateurs' services to the state police and put the Caravan Club on a stand-by basis. By 1400, four mobiles were engaged in the search, and at 1500 the Caravan Club was authorized to take part. Unsuccessful before dark on Saturday (19th),

Members of the Augusta (Maine) Emergency Amateur Radio Unit are conducting classes in radio procedure, with RACES operating standards as a guide, to train operators in the use of civil defense communications equipment. They will man equipment of the Augusta C.D. organization, the Kennebec County Control Station and the State C.D. Headquarters. Standing, left to right, we have Joseph Merlau, Augusta Civil Defense Director; Brian Spaulding, WIZAK; Rucl Ellis, Augusta Communications Officer. Seated: Harold Chapman, W1WTH; Carleton Miller, W1SIN, Club Secretary and Kennebec County Radio Officer; Theodore Gingrow, WIZAI; Charles Chapman, W1WTG.



the Caravan Club set up to do the job systematically. An area 30 by 72 miles was laid out in sectors, a member of the Caravan Club covering each sector, according to a plan previously devised by the EC. Five mobiles from Los Alamos also participated. W5ZSL/m operated as control from atop Sandia Crest. One mobile each was assigned to the state police, TWA, and the ground control point for the search aircraft.

Sunday morning while W5ZSL was en route to Sandia Crest, W5UCX controlled the net on 3838 kc. This net was then secured and W5UCX proceeded on his mobile assignment. W5OAI and W5UWA met the mobile group from Los Alamos, gave them maps and their assignments. At 1100 Sunday the wreckage was spotted in the Sandia Mountains and mobiles rendezvoused at the base of the mountain. They were unable to go up, however, because of road conditions, but assisted the Sheriff's Department and the various news agencies on hand. A great deal of help was given the mobiles by members of the New Mexico Emergency 'Phone Net, who helped keep the frequency clear. W5UWA lists the following as having participated in operations: Mobiles W5s FVY YDE OAI DAH WBG CTG UWA JAU HZG UAF GGJ ZSL UCX ECN LEF LGS AQQ GWJ RUV FHP TLI FIA SUO VDY ZMN YMA MYQ PDY; fixed stations W5s MEW PIZ KWR QPF ZU BXP VNZ K5WCF W0IWN. — W5UWA, EC Bernalillo Co., N. M.

— . . . —

Eighteen SECs reported February activities for their sections, representing 5348 AREC members, for the best February reporting record to date. New sections (SECs) heard from since last month: Los Angeles (W6QJW), Vermont (W1SIO), Montana (W7KUH), Oregon (W7WAT). Twenty-two sections have reported via their SECs already in 1955. This leaves only 51 more SECs to be heard from.

RACES News

FCC has announced that effective May 9th, Form 481 instead of Form 405A will be used when renewing a RACES station authorization. Since the term of such authorization runs concurrent with the regular amateur station license, this means that Form 481 and Form 405A with both have to be completed, the difference being that the former has to be signed and submitted by your RACES Radio Officer. This was the subject of an Official ARRL Bulletin dated March 31, 1955, and distributed throughout our Official Bulletin Station system. This is just an extra reminder, in case some of you missed it.



— . . . —

The Executive Assistant Administrator of FCDA, Mr. Harold L. Aitken, under date of March 22, 1955, has written to all FCDA Regional Communications Officers suggesting that attendance at ARRL Conventions by FCDA representatives is most desirable. This means that recognition is being given to the increased civil defense flavor of ARRL conventions and other amateur gatherings. If you are one of those amateurs who has stayed away from amateur gatherings because of too much emphasis on the purely social and DX aspects, you can step up emphasis on public service aspects by lending the weight of your presence — and chances are good that FCDA will be represented.

— . . . —

From the *Microvolt*, publication of the Utah Amateur Radio Club, we glean some information concerning RACES preparations in Salt Lake City. The city has seven control stations operating in the Disaster Communications Service. The amateurs are organized into three separate nets on the 75-, 10- and 2-meter bands. Weekly tests are conducted at 1930 MST Wednesday evenings. The present goal is to enroll all local amateurs in civil defense, although any amateur may check into the c.d. drill on 3995, 29,626 and 144,600 kc. C.w. as well as 'phone stations are needed.

— . . . —

We invite any and all amateurs to submit information on RACES. Naturally, we must insist on editorial prerogative to accept or decline any offering, but we are definitely on the lookout for RACES info, from short one-paragraph blurbs to complete up-front QST articles, including pictures and diagrams. If you have a story to tell about your RACES set-up, sit down and write us about it. We're interested.



Horace Luhn (left), W8HSY, and Jack Reith, W8HQK, work W8VVL at the amateur radio communications center in the Red Cross Building in Cincinnati. Members of the Queen City Emergency Net have operated here in the past and have cooperated with the Red Cross in several Ohio River flood emergencies. Equipment shown includes a 50-watt ten-meter rig and an all-band 'phone-c.w. kw. job.

FEBRUARY FMT RESULTS

The ARRL Frequency Measuring Test of February 8th brought entries from 180 participants who made 505 measurements. Each participant has received an individual report comparing the accuracy of his measurements of the special WIAW transmissions with those made by a professional frequency-measuring laboratory. In the standings of the leaders below, decimal fractions are shown only to establish a listing order, since the official readings can only be accredited to 0.4 parts per million. Sharing top honors equally, therefore, are Official Observers W4JUI and W5FMO and non-00s W8GQ, W4HER, W8CUJ, and W8HB.

Observers	Parts/ Million	Non- Observers	Parts/ Million
W4JUI	0.0	W8GQ	0.0
W5FMO	0.4	W4HER	0.3
W2FE	0.7	W8CUJ	0.3
W5QHK	0.9	W8HB	0.3
W3DVO	1.0	W9CBW	0.5
W1QHS	1.2	W9T CJ	0.6
W6OTR	1.2	W1TWJ	2.8
W6CK	2.0	W8KTM	2.8
W4FJ	2.5	W9CNN	3.0
W6RW	3.3	W6HDP	3.1
W3TFN	3.4	W8CXP	3.3
W8GBF	3.6	W3AHZ	3.4
W3QZP	5.0	TF3CJ	5.2
W4FR	5.7	W4ANK	7.2
W8GZ	5.8	W8JCC	7.2

The following ratings are based on a single measurement: 00s — W4IYC 3.0, W7BBK 3.0, W3QCB 3.8, W4VP 4.3; non-00s — VE3BAJ 3.8.

NATIONAL CALLING AND EMERGENCY FREQUENCIES (kc.)

C.W.: 3550, 7100, 14,050, 21,050, 28,100.
'Phone: 3875, 7250, 14,225, 21,400, 29,640.

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for March traffic:

Call	Orta.	Recd.	Rel.	Del.	Total
W3WIO	28	621	449	82	1280
W0SCA	16	613	600	1	1230
W6SWP	93	560	482	70	1205
W0BDR	11	572	542	21	1146
W0CPI	15	561	511	50	1137
W4PFC	19	502	495	17	1033
W2KLB	62	454	352	122	990
W9DD	9	447	438	18	912
W4PL	6	462	387	50	905
K5FFB	67	389	402	29	887
W9JUI	18	430	418	20	866
W7PCY	33	398	364	34	829
W2KCY	16	425	301	84	826
W9YWL	35	363	279	24	781
W7BA	15	368	366	17	766
W3CUL	73	346	251	82	752
K2BJS	35	345	301	31	712
W7FRU	4	352	310	40	706
W6MBW	30	344	319	16	699
W4UHA	140	259	255	6	656
W2LPI	18	314	293	21	646
W3WV	12	341	254	39	646
W5MN	12	319	267	48	646
W9CSW	5	315	35	280	655
W8YDK	20	297	322	65	614
W7APF	6	286	260	17	578
W9TT	9	334	229	1	573
K7FAE	27	247	260	22	556
W9IDA	115	216	199	10	540
K4WBG	127	232	142	47	558
W0BIA	9	261	253	3	526
W5BLA	35	241	254	5	525
W9NZZ	202	161	1	161	525
W8FYO	9	257	188	66	520
W4PHI	5	256	231	25	517
W2RUF	31	272	147	65	515
W4OZZ	116	192	180	12	500
Late Reports:					
K2BJS (Feb.)	22	285	269	25	601
W3WV (Feb.)	19	285	199	36	539

More-Than-One-Operator Stations

W6TAB	43	1996	1887	109	4035
KH6AJF	701	433	333	100	1567
K4ZGE	138	684	564	64	1394
K4EDY	40	495	438	36	1109
K6WAY	185	296	455	18	954
K4WAR	96	364	412	48	920
K4ZAK	119	369	341	28	857
K0FDL	7	257	0	252	517
Late Reports:					
KG6FAA (Dec.)	1298	5429	5189	240	12156
KH6AJF (Dec.)	2885	1044	895	129	4953
KH6AJF (Feb.)	811	666	675	89	2141
KH6AJF (Jan.)	909	477	438	75	2057
KR6KS (Feb.)	164	307	221	86	778

BPL for 100 or more originations-plus deliveries:

W3CVE	365	W0NYI	132	W4BWR	101
W8DAE	302	VE3NG	129	Late Reports:	
W4TYU	170	W4YIP/6	125	W3CVE	
K4ASU	162	W4ELS	122	(Feb.)	327
K6FDC	155	W4ALA	115	W3RV	
W8UEV	150	W4DRD	107	(Feb.)	111
W4DDY	141	V06N	106	W3WBJ	
W4ILB	135	W4KKW	104	(Feb.)	100

More-Than-One-Operator Stations

VE3BRR/3	425	Late Report:	
W4DFU	351	KA7LJ (Feb.)	169

BPL medallions (see Aug. 1954 QST, p. 64) have been awarded to the following amateurs since last month's listing: K2HZR, K5FFB, W7APF, W0GBJ.

The BPL is open to all amateurs in the United States, Canada, Cuba, and U. S. possessions who report to their SCM 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 ARRL form.

TRAFFIC TOPICS

There are times when one must bow to the inevitable. After years of plugging a standardized form for handling ARL-text messages, it now appears inevitable that the ARRL way will never be generally adopted. The question then becomes: how far need we unbend to accept common misuse as correct use?

The ARRL way of sending an ARL fixed-text message has been detailed in our booklet *Operating an Amateur Radio Station* (p. 12 in the latest edition). Once in a while we have actually heard ARL-text messages sent that way—but not very often. The chief non-compliance seems to be in insistence on the use of the symbol ARL in the text preceding the text number. Everyone uses the ARL, some both in the check and in the text, others in the text alone.

All right, then, let's make that correct. A message using ARL text number twenty-three will have a check of ARL 3 and the text will read ARL TWENTY THREE. All the other rules pertaining to the use of ARL text messages will still apply. We think it still *makes sense* to spell out the numbers to cut down the incidence of error, and we want to keep it that way.

All this comes about through a revision of our operating booklet, in which the above change is being made. We want you to know that this change was carefully considered and discussed before it was made, minor as it is, and that it is not a misprint in the new operating booklet.

A lot of you guys are getting awfully careless in your traffic work. We notice it more all the time. Maybe it's a result of trying to run up big totals, or of simply being overloaded, we don't know. Whatever it is, let's tighten up our procedure; because in being careless in haste we not only cause traffic to arrive at its destination badly garbled, but we actually slow down the amount of traffic we can handle. These points will be argued by those who are guilty of them, but we think they are all marks of sloppy traffic handling:

1) Failure to indicate a word count. Any station who passes a message without a word count is marking himself as a sloppy traffic man. If it comes to you without a check, that's no excuse; you should put a check on it before you relay it onward. If the check is incorrect as you receive it, you should indicate a corrected check. The check is *not* an optional part of ARRL message form.

2) Incorrect preamble heading. MARS-originated messages are no different from others—they should have a proper *amateur* heading. Some of the preambles we have seen are corks. All we want in the *amateur* preamble are number, station of origin, check, place of origin, filing time and date. The rest is extraneous and should be excised.

3) It is *proper* to correct the *form* of a message you are handling, but not its *content*. You don't have to repeat mistakes of the operator who sent you the message, just because "that's the way I got it." But be careful that in correcting form you don't change the content or meaning. For example: (1) If the place of origin reads "Boy Scout Exposition, Junkboro, Pa.," you can eliminate the first three words when you relay it, because they don't belong there; but (2) don't change "Watervliet" to "Waterville" because you never heard of the former and think it's a mistake.

4) Get in the habit of following standard procedure in amateur traffic. Failure to do this is another reason for message garbling. On c.w., use AA between the parts of the address, BT to separate the text from the address and the signature, AR to indicate the end of the message and either B (more to follow) or N (no more). Once not long ago we copied a message that ended up with LOVE TO ALL MARTHA TWO MORE K. It took us a little time to figure out that it should have been LOVE TO ALL BT MARTHA AR B. On 'phone, *say the words*.

5) How about using a little more break-in? Break-in does not mean that you stop for an okay every so often. It means, on c.w. (and it's a c.w. term), that you can hear the other fellow "break" while you are sending to him, so he can interrupt and make you back up if he misses a word. If you are equipped for break-in, send QSK before you start sending traffic to another station; if not, send NO BK, so he won't waste time trying to break you.

6) Improper procedure in sending repeats and getting fills can waste time and cause garbling. When you repeat something on 'phone, say "I repeat." On c.w., send a question mark (?) and repeat the word. If you repeat without the question mark, the receiving operator will naturally think the word is *supposed* to appear twice in the text. In getting fills, use WA (word after), WB (word before), AA (all after) and AB (all before). If you miss several words, use BN (between) followed by the last word received correctly before you missed, a question mark, then the first word you received correctly after the part you missed. On 'phone, of course just use the voice equivalents, not the abbreviations.

In other words, gang, *let's stop being so sloppy in our operating habits!*

Miscellaneous net reports: (1) The Early Bird Net reports a March total of 791, per WSAMI. (2) The College Net held eight sessions, 66 different stations reporting in, traffic total of 18; a meeting of the College Net was held at Yale University, New Haven, the week end of April 30th.

The American Legion Amateur Net held its annual business meeting recently in Bakersfield, Calif. Left to right, front row: W6QGX, W6UQL, K6ARZ, W6FEA, W6GRO. Rear row: W6PIB, W6KMY, W6OFJ, W6WJF, W6JEJ. ALN meets daily at 1900 PST on 3975 kc. (Photo by K6CZU)



(3) North Texas-Oklahoma Section Net reports 31 sessions, 1088 check-ins, 414 messages. (4) Transcontinental Relay Net reports 31 sessions, five stations, traffic total 1500.

National Traffic System. Usually in the May issue we make some caustic remarks about "Daylight Saving" Time and what it does to our NTS time schedule. This year we neglected to do so, and such remarks in the June issue would be anti-climactic — so we'll skip it, except to remind you that standard NTS procedure is to remain on standard time, and most NTS nets, even in the highly-civilized DST areas, customarily do so.

Not that we're prejudiced against DST, mind you. (Not much.) It's just that we have to maintain the NTS time schedule, and to do so we ought all to keep our skeds at the same time or all move them up an hour. If there is strong sentiment for the latter, let's kick it around a bit.

Summer QRN is the stuff that separates the traffic men from the traffic boys. As the sunspots continue to increase, our recollection is that skip will decrease and QRN during the summer will increase. If we expect the worst, we will be less dismayed if it comes to pass. Lets keep NTS rolling throughout the summer, come what may.

March reports:

Net	Sessions	Traffic	Rate	Average	Representation
EAN	26	705	0.85	27.0	92.3%
CAN	21	735	0.88	35.0	100
PAN	28	746	0.37	26.0	
IRN	27	315	0.49	11.6	88.0
2RN	54	439	0.36	8.2	96.3
3RN	44	419	0.77	9.5	88.6
4RN	17	117	0.23	7.0	37.0
RN5	50	627	0.87	12.5	60.2
SRN	36	194		5.4	80.6
TRN	31	67		2.1	72
Sections *	492	2845		5.8	
TCC Eastern		215			
TCC Central		225			
TCC Pacific		546			

Summary/High Net	826	8195	CAN	8.7	CAN
Prior Record 847	8493	1.26	28.6	100%	

* Section nets reporting: QKS, QKS-SS & QKN (Kans.); TLCN (Iowa); CN & MCN (Conn.); OLZ (Okla.); NTX (N. Texas); MON-SMN (Mo.); TENN (Tenn.); WVN (W. Va.); AENB & AENP (Ala.); NEB (Nebr.); MSN (Minn.); KYN (Ky.); WSN (Wash.).

Late Reports:

TEN	64	1539	24.0	66.4%
TCC Eastern		139		
TCC Pacific		332		

We regret to see reports falling off, but there have been several changes in net management recently, and a smooth transition is not always possible. Let's hope we get everybody squared away before the summer doldrums set in.

NTS Net Notes: The new manager of PAN is W7AFP, replacing W7NH who put in several years in NTS leadership roles. A total of 41 different stations participated in IRN during March. W3NRE is the new 3RN manager; 3RN certificates to W3MCG, W3OZV and W3UE. W4AKC has resigned as 4RN manager, and W4BVE is acting until the vacancy is filled. RN5 continues to plug along in good shape, with all sections but Southern Texas and Western Florida now well represented; net certificates have been issued to K4AKP and W4ZJY.

TCC: Things are going well, but there are still some rough spots. The TCC roster as of right now (mid-April) consists of some 33 stations fulfilling 54 of the 60 TCC functions. Transcontinental relaying is tough work and these fellows and gals deserve to be mentioned, so: Eastern Area (W8UPB, Director) — W1EMG W1AW WINJM W2RUF W3COK W4OCG W4ZFW W8FYO W8DSX W8MQQ VESGI VE3AJR VE3TM VE3RJV VE3VZ. Central Area (W9JUU, Director) — W5KRX W9JUU W8SCA W8BDR.

Pacific Area (W6HC, Director) — W4YIP/6 W5RFF W6ATB W6IPW W6ZRJ K6BDF W6YHM W6EFD W7CCL K0WB8 K9ANZ W0KQD W8BEN VE7QC. At this writing, TCC has six vacancies as regular station, and most of them need alternates. As we said, TCC work is tough, but it's a lot of fun because it's a challenge. Why not try your hand at it once a week?

WIAW OPERATING NOTE

The WIAW Summer Schedule, detailed on page 70 of May QST, will be in effect June 1st. See that issue for complete information on when and where to look for WIAW.

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 WIAW will be made on June 17th at 2130 EDST. Identical texts will be sent simultaneously by automatic transmitters on 1885, 3555, 7125, 14,100, 21,010, 52,000 and 145,600 kc. The next qualifying run from W8OWP only will be transmitted on June 3rd at 2100 PDST on 3590 and 7138 kc.

Any person may 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 will be made from WIAW each evening at 2130 EDST. Speeds are 15, 20, 25, 30 and 35 w.p.m. on Monday, Wednesday and Friday, and 5, 7½, 10 and 13 w.p.m. on Sunday, Tuesday, Thursday and Saturday. Approximately 10 minutes' practice is given at each speed. References 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.

- Date** Subject of Practice Text from April QST
- June 1st: The All-Electronic "Ultimate" Keyer, p. 11
 - June 6th: Graphical Symbols for Radio Diagrams, p. 16
 - June 9th: A Radical Approach . . . , p. 18
 - June 14th: Using the 6360 Dual Triode . . . , p. 20
 - June 16th: Director Beams, p. 23
 - June 22nd: The "Tiny Tim" Portable, p. 25
 - June 24th: Emergency Power Distribution, p. 28
 - June 27th: A 8-Band Antenna Coupler, p. 38
 - June 30th: 1955 V.H.F. Sweepstakes, p. 87

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.

Eastern Pennsylvania Clarence Snyder, W3PYF June 15, 1955
Iowa Russell B. Marquis, W8BDR June 16, 1955

In the Los Angeles Section of the Southwestern Division, Mr. William J. Schuch, W6CMN, and Mr. Robert G. Garner, W6YSK/W6EAJ, were nominated. Mr. Schuch received 484 votes and Mr. Garner received 278 votes. Mr. Schuch's term of office began April 18, 1955.

A.R.R.L. AFFILIATED CLUB HONOR ROLL

In accordance with the League policy for special recognition to all affiliated clubs whose entire membership consists of members of the League, it is a pleasure to present herewith the new 1955 Honor Roll of such clubs. The affiliates having 100 per cent ARRL membership are determined from data supplied in the 1955 Annual Report of Club Data. An additional QST Honor Roll will be published later this year to include clubs reporting results of ARRL membership drives being conducted currently. Such list will include consideration of full reports from affiliated societies whose questionnaires gave incomplete information and others that qualify for listing on completing their membership program. Each below-listed club will receive the handsome certificate "100% ARRL Club" previously described in QST.

Abington Township Amateur Radio Association, Jenkintown, Pa.
 Adirondack Radio Club, Glens Falls, N. Y.
 Aeronautical Center Amateur Radio Club, Oklahoma City, Okla.
 Batavia Amateur Radio Association, Stafford, N. Y.
 Boulder Radio Club, Boulder, Colo.
 Connecticut Wireless Association, Inc., West Hartford, Conn.
 Detroit Amateur Radio Association, Detroit, Mich.
 Door County Amateur Radio Club, Sturgeon Bay, Wis.
 Dryden Radio Club, Dryden, Ont., Canada
 Haven Radio Club, New Haven, W. Va.
 Inglewood Amateur Radio Club, Inc., Inglewood, Calif.
 Kingsport Amateur Radio Club, Kingsport, Tenn.
 Levittown Amateur Radio Club, Levittown, N. Y.
 Lilly Radio Club, Indianapolis, Ind.
 Milwaukee Radio Amateurs' Club, Inc., Milwaukee, Wis.
 Nanaimo Amateur Radio Association, Nanaimo, B.C., Canada
 Norfolk County Radio Association, Norwood, Mass.
 North Shore Radio Club, Little Neck, L. I., N. Y.
 Northbridge High School Radio Club, Whitinsville, Mass.
 Pacific Radio Club, Los Angeles, Calif.
 Picketts County Amateur Radio Club, Easley, S. C.
 Providence Radio Association, Inc., Providence, R. I.
 QSO and QRM Society of Iowa, Iowa City, Iowa
 Rappahannock Valley Radio Club, Fredericksburg, Va.
 Raritan Bay Radio Amateurs, South Amboy, N. J.
 Rome Radio Club, Rome, N. Y.
 Scott County Amateur Radio Club, Scott City, Kans.
 Sheridan Amateur Radio League, Sheridan, Wyo.
 Skagit Amateur Radio Club, Sedro-Woolley, Wash.
 South Lyme Beer, Chowder and Propagation Society, West Hartford, Conn.
 South St. Louis Radio Club, St. Louis, Mo.
 State Line Radio Club of New York and New Jersey, Upper Saddle River, N. J.
 Suburban Radio Club, Inc., Kirkwood, Mo.
 Sussex County Amateur Radio Association, Sparta, N. J.
 Tehama County Amateur Radio Club, Red Bluff, Calif.
 Valley Radio Club, Eugene, Ore.
 Windblowers V.H.F. Society, Paterson, N. J.

ELECTION NOTICE

(To all ARRL members residing in the Sections listed below.)

You are hereby notified that an election for Section Communications Manager is about to be held in your respective Section. This 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 mem-

berships, 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*	June 15, 1955	W. R. Williamson	Mar. 17, 1949
West Indies	June 15, 1955	William Werner	Aug. 15, 1952
Utah	June 15, 1955	Floyd L. Hinshaw	Feb. 18, 1954
Colorado	June 15, 1955	Karl Brueggeman	Feb. 18, 1955
San Joaquin Valley	June 15, 1955	Edward L. Bewley	June 15, 1955
Eastern Florida	June 15, 1955	John W. Hollister	Aug. 14, 1955
San Francisco	June 15, 1955	Walter A. Buckley	Aug. 14, 1955
Southern New Jersey	June 15, 1955	Herbert C. Brooks	Aug. 26, 1955
North Dakota	June 15, 1955	Earl Kirkeby	Resigned
Indiana	Aug. 15, 1955	George H. Graue	Oct. 14, 1955
Vermont	Aug. 15, 1955	Robert L. Scott	Oct. 15, 1955
South Carolina	Aug. 15, 1955	T. Hunter Wood	Oct. 15, 1955
San Diego	Aug. 15, 1955	Don Stansifer	Oct. 15, 1955
Northern Texas	Aug. 15, 1955	T. Bruce Craig	Oct. 15, 1955
Western Florida	Aug. 15, 1955	Edward J. Collins	Oct. 15, 1955
Western New York	Sept. 15, 1955	Edward Graf	Nov. 21, 1955

* In Canadian Sections nominating petitions for Section Managers must be addressed to Canadian Director Alex Reid, 109 Logan Ave., St. Lambert, Quebec. To be valid, petitions must be filed with him on or before closing dates named.

CLUB COUNCILS AND FEDERATIONS

British Columbia Amateur Radio Association, Ernie Savage, VE7FB, Secy., 4553 West 12th Ave., Vancouver 8, B.C., Canada.

Central California Radio Club Council, Edward J. Roussey, W6VCZ, Secy., 1510 Newlands Ave., Burlingame, Calif.

Chicago Area Radio Club Council, George M. Boyd, W9SPT, Secy., 3540 N. Seeley Ave., Chicago 18, Ill.

Cleveland Area Council of Amateur Radio Clubs, Inc., Andrew M. Gent, W8GCP, Secy., 1469 Elbur Ave., Lakewood 7, Ohio.

Eastern New York Council of Radio Clubs, George W. Tracy, W2EFU, Acting Secy., 1138 North Country Club Drive, Schenectady, N. Y.

Federation of Long Island Radio Clubs, Robert I. Lippman, K2CFH, Secy., 30-51 Hobart St., Woodside 77, N. Y.

Indiana Radio Club Council, Inc., Joseph A. Ceraszewski, W9GRA, Secy., 7441 Baring Parkway, Hammond, Ind.

Ohio Council of Amateur Radio Clubs, Ralph E. Cramer, W8VHO, Secy., 3989 Indianola Ave., Columbus 14, Ohio.

Sacramento Council of Amateur Radio Clubs, Walter H. Wade, W6LLR, Secy., 7014 — 28th St., Rio Linda, Calif.

Twin City Area Amateur Radio Council, Ben F. Swezey, jr., WØRAG, Secy., 3214 Benjamin St., N. E., Minneapolis 18, Minn.

Western Pennsylvania Amateur Radio Club Council, Ernest J. Hlinsky, W3KW1, Secy., 509 Beechwood Ave., Farrell, Penna.

• 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, W. H. Wiand, W3BIP — SEC: IGW, RM: AXA, PAM: PYF, E. Pa. Nets: 3610, 3850 kc. Two more Eastern Pennsylvania clubs are now ARRL affiliates, the Tamaqua ARC and the Wyoming Valley ARC of Wilkes-Barre. Another new club in the making is the Levittown ARC of Pennsylvania. QHF, NME, WVG, WUY, and UIL were instrumental in organizing the club. An invitation is extended to anyone in or near Levittown, amateur or non-amateur, to join or attend club meetings. Interested persons should contact Bob Powell, QHF, 65 Mallow Lane, Levittown. The West Philadelphia RA, using its club call, MKA, and under the leadership of OWK, will be shooting for top honors among the Philadelphia clubs on Field Day. RKP reports the Club has had the good fortune to obtain for its Field Day site, a late 18th century mansion located at Valley Forge Park. The Hill Top BTS of Red Lion has undertaken, as a club project, the building of a dozen 6-meter handsets. With the Club furnishing communications for the York County Golf Championship Matches later in the summer, the 6-meter handsets should prove very useful. The Pottstown ARA started a Novice training program several months ago which included "on-the-air" code practice each night and theory classes twice monthly. Along with the program, the Club offers a Novice frequency crystal and an ARRL log book to each Novice passing his exam as a direct result of the training he has received through the efforts of the Club. To date, the following have received their Novice calls: 3ASC, BVA, BVB, BWD, BWG, ZVY, and ZZX. UYH, now with Uncle Sam's Army, is operating portable 7 from Fort Huachuca, Ariz. He's looking for more 20-meter activity from Harrisburg, his home QTH. ZSH, newly-appointed OES, has rebuilt the modulator for his 220-Mc. rig. Congratulations to Mr. and Mrs. YPL; they are the proud parents of twin boys born Feb. 9th. In addition to YPL, Gettysburg has three more active stations: KGN, OLR, and WN3BCQ. WN3-BPT reports a new radio club is being formed at the Pennsylvania Military College, Chester. OZV is now a proud grandpappy. His daughter, SSW, had her first YL, jr. operator. Congratulations. Traffic: W3CUL 752, OK 165, TEJ 128, UKJ 120, DUI 119, AXA 106, OZV 61, BFF 43, PYF 38, YAZ 34, UWP 29, KAG 24, QLZ 21, OML 15, PDJ 10, VPY 10, PUY 9, YGX 2, TYW 1.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA — SCM, J. W. Gore, W3PRL — We are very humble in the honor conferred upon us by election as SCM for the Md.-Del.-D. C. section and will do our utmost to carry out the obligations of the office to serve one and all to the best of our ability. Any member of the Md.-Del.-D. C. section should feel free to contact us on any matters that they feel should be brought to our attention. A review of the activities in the section in the short time we have had reveals the following: WKB now has 120 watts on 2 meters. RE is blasting the ether with a new 6-meter transmitter. VAM is working on a 20-meter beam. OTC is assembling a kw. on 6 meters. VOS is building a cubicle quad for 20 meters. CVE is securing a 2.5-kw. emergency supply. WAF has received his WAS certificate. VOS reports he was the highest scoring W3 in the January CD Party with 74,725 points. NUM has completed his new VFO. FWR will have his new 125/140-watt transmitter on the air after assembly and test. We have been advised that the Woodrow Wilson Radio Club at Washington has just been granted a charter by ARRL. The Andrews Electronics Association has started its first 1955 project, which calls for the building of 13 identical 6-meter transmitters with 2E26 finals. OTC and KMV have been promoting 6-meter activity in their area and their 9-p.m. evening and Sunday morning skeds will usually find quite a number of the following busily chatting away: VHL, WOD, OJU, AHQ, JES, GGR, UJG, PCB, CGV, SL, and RE. The Chesapeake Club scheduled a tour of the WBAL-TV transmitter on March 28th with LZZ conducting. The Mountain Amateur Radio Club of Cum-

berland held a "Gab Fest" for the Tri-State Area hams on April 1st in the Herman Room of the Old German Brewery in Cumberland. HEC presented 4 reels of movies at the BARCS Club on April 4th, showing the erection of his 20-meter beam and mast, also his 40-meter beam and mast and the final product. Shots of the mast and beams of JNN and LOE were included as well as a number of other well-known DX greats. PRL gave a talk on "Hints & Kinks on TVI Prevention" to the Annapolis Radio Club Feb. 24th, and on March 10th, Prof. Leydorf gave a demonstration of characteristics of transmission lines and antennas at the U. S. Naval Academy Lab, for the Annapolis Club. The Rad-Lab Club of Baltimore held a transmitter hunt on March 20th. The transmitter was 13.25 airline miles from the starting point. LMC was first with 16.5 miles, VLL second with 17 miles, and VAG third with 23 miles. WAG, OBR, TYJ, YBP, NPQ, JQN, WZN, and RU participated in a radio demonstration at the Bethesda Trade Show March 25-26-27. The installation consisted of a 75- and 2-meter transmitter. During the three-day run, 174 messages were directed to 36 different states as well as the Philippines, Hawaii, Puerto Rico, and Canada. Considerable interest was shown by the public in attendance. The booth was decorated with sample certificates, awards, and reprints of articles from various magazines on amateur radio. ARRL supplied material which was used both in decoration and also for distribution. The station operated under the call RCN. HWZ and PRL walked many miles together at the IRE Show inspecting the new equipment just released and getting inside dope on new developments to be released in the near future. WG has been appointed EC for Calvert County. Traffic: (Mar.) W3WV 646, CVE 430, UE 361, WG 62, PQ 59, COK 47, PKC 45, NNX 8, OYX 6, JZY 5, (Feb.) W3WV 539, WBJ 376, CVE 347, RV 135, COK 71, MCG 60.

SOUTHERN NEW JERSEY — SCM, Herbert C. Brooks, K2BGJ — SEC: ZVW, PAM: ZI. LYL recently joined the Naval Reserve. BAY lost his 10-meter vertical in a storm. It is with regret that we report the passing of M.X. Please note that ZVW now is SEC. We welcome Ed knowing that his experience and ability will be an asset to the section. All ECs are requested to report activities to ZVW. MOM has moved to a new QTH and is busy with tower and antennas. HDW, Laurel Springs, now is ORS. The Delaware Valley Two-Meter Traffic Net meets nightly at 2000. BU now is located at Watchung. ADA has returned to work after a serious illness. SJRA members, please keep SDB posted on your DX activities. The SJRA is making Field Day plans, hoping for a better year than ever. DZU is the newly-elected president of the Southern Counties Amateur Radio Assn., and K2AML is secretary-treasurer. K2BWR, W2CGF, and K2AML handle the TVI complaints for the SCARA. Director Crossley visited the Tri-City Amateur Radio Club at Millville recently. W2BBG, BMC, and K2BET are 2-meter mobile in that area. The Tri-City members are aiding their local c.d. units, providing capable operators for emergency communication. Thanks to RUX for the Tri-City information and to K2CEF for Pleasantville news. K2BIQ, K2EB, K2ETG, W2HIR, NIC, QER, UAE, ZI, and ZQ have earned their Section Net certificates by consistently reporting into the New Jersey 75-Meter Emergency Phone Net. Congratulations, fellows, for having done a swell job. Traffic: (Mar.) W2RG 213, K2HZR 72, W2YRW 18, ZVW 18, K2BG 13, CPR 9, W2ASG 8, HBW 3, (Feb.) W2ZVW 12.

WESTERN NEW YORK — SCM, Edward G. Graf, W2SJV — Asst. SCM, Jeanne Walker, 2BTE, SEC: UTH/FRL, RM: RUF, PAM: NAI, and TEP. NYS meets on 3615 kc. at 0630 and 1630, 3925 kc. at 7 p.m. NYSS on 3595 kc. at 1730; NYS C.D. on 3509.5 and 3993 kc. at 9 a.m. Sun., TCPN 2nd Call Area on 3970 kc. at 7 p.m.; SRPN on 3970 kc. at 10 a.m.; ISN on 3980 kc. at 3 p.m. Please note the new time for NYSS as well as the morning session of the NYS C.W. K2BJS is net mgr. of NYSS, with K2DYB asst. mgr. The morning session of NYS C.W. is held at 0630 for those unable to QNT the evening session. K2HVZ is mgr. We regret to announce the passing to Silent Keys of FK and ULT. QLK has been appointed OBS. ECs renewed are QZB, GHU, ABC, CYD, TTY, QHL, TQ, and VEY. QHH worked TI9MHB on 5 bands. K2CEH now has a pair of 826s at 250 watts on 2 meters. K2CUQ graduated 3 more. Novices: New OOs are CZZ, SSC, and K2s EYP and CUQ. ZZG is Montgomery County EGO. CZT has a new Viking Ranger to push the 812s. BGC attended a Corning Club meeting with the local c.d. director. KN2LTT is a new ham in Syracuse. FDI had an antenna-raising party. K2GWW is coordinator of the Tri-State Net on 3687 kc. daily at 0700. The Watertown Radio Club purchased a code machine for its Novice training classes. 5ADR/2 now is K2LGN. A joint meeting of the Niagara Frontier Clubs was held

at Lockport with 1RDV, of ARRL; HNH, of General Electric; and 3YA, Atlantic Division Director, as speakers. K2DYC worked crossband 220 to 144 Mc. with QS. The Madison County Wireless Club gives Novice exams. Prospects should contact K2DYH. QBB worked TF3MB, YV1AD, and VP6RG all on 20 meters. RTX, YVI, and PH5 are on 2 meters. K2AMZ runs 250 watts to 812s on 75 meters. SJV has a Viking II. K2EJV is on 144 Mc. The RARA v.h.f. group conducted the RARA meeting with a discussion on receivers, transmitters, and antennas. The "Old Dog Bone" Trophy remains in the possession of QY. The RARA mobile group toured WHAM-TV under the guidance of TWO. TEX and his WYL are in Europe. UPH is discarding s.s.b. and going back to the kw. a.m. rig. We hear that BLP swapped a 32V-3 for a B&W with s.s.b. adapter. QY and ICE are on the program of the Delaware Valley Club to present the RARA OT Show. The ARAT, with OUI instructing, graduated 26 Novices. Ye SCM's son drew KN2LVF. WS is DXing on 20 but gets on 40 meters in the evening and early A.M. Traffic: (Mar.) W2RUF 515, K2DJN 109, DYB 92, W2OE 63, DSR 60, K2AMZ 59, HVZ 46, W2EAW 44, DSS 42, GBX 28, K2CQU 19, W2UTH 17, IEP 13, FEB 12, WS 12, QHH 11, K2DQ 9, W2RQF 8, COB 7. (Feb.) K2DYB 67.

WESTERN PENNSYLVANIA—SCM, R. M. Heck, W3NCD—SEC; GEG, RMs; UEN, NUG, NRE, and CEG, PAMs; AER and VKD. The WPA Net during March had 248 stations with 134 messages on 3585 kc. Mon. through Fri. at 7 p.m. Thanks to the WPA Net manager and all participating stations for a fine job. NDE reports the Boy's Club of St. Mary's station. KYR is active on 3620 and 7140 kc. with teletype. The West Able Net meets Sun. at 9 a.m. on 3920 kc. NCS are NRU, WGX, and QXF, LKJ, and MFO, with LFS, HUL, VRZ, VKD, and CTN as alternates. UVD is reorganizing the Upper Ohio Valley Emergency Net (URN). If interested report in Sun. at 9:30 a.m. on 3585 kc. The Indiana County ARC had NUG as guest speaker at its last meeting. His subject was "Radio Gadgets." The club has become affiliated with ARRL and the Western Pennsylvania Amateur Radio Club Council and has received the call BMD. The Beaver Valley ARC is planning to demonstrate its c.d. mobile gear to the County Commissioners. A code machine is available for members and BQB is conducting classes in theory. UJT is seeking 2-meter QSOs. VGR has a '35 Ford with 100-watt all-band mobile. RKX is mobile. QPJ was c.w. winner of the 3rd area in the YL Anniversary Party. NQA reports that the Warren County Emergency Radio System has elected OMK, pres.; UZB, secy.-treas.; WAQ and LFV, directors. The net holds local drills each night on 10 meters at 7 p.m. with WAQ, ZFB, YZR, YKL, UZB, VVJ, SQL, OMK, PHC, KYW, LRE, and NQA active. YUL has received his General Class ticket. The first session of the West Charley RACES Net 29, 490 kc., SVE as NCS, was attended by 34 stations. The Breeze Shooters Net traffic station meets Mon. at 8 p.m. on 29 Mc. The Radio Assn. of Erie YMCA code classes are currently covering theory. BFB and WRK recently attended the RAE meeting. WJA has graduated from the Novices. LKJ demonstrated the use of amateur radio in Red Cross work over one of the local TV stations recently. New calls are WN3BOW and WN3BPB. MED, YKJ, TMK, and TLA are participating in surveys being made to find ideal locations for ground wave communications. The Steel City ARC has Field Day plans completed. 9CWL keeps in touch with Pittsburgh on Sun. at 10:30 a.m. on 7280 kc. RIK is using a new Matchbox to put the antenna in the best working condition. MTP is in Philadelphia with the Bell Telephone Co. OKU is s.s.b. on 40 meters. ZDW is on the air from the new QTH with new Collins gear. The South Hills Brass Pounders and Modulators Hamfest Chairman, VKS, has everything going well. Watch for the affair and plan to be there. New calls are WN3AYT and club member WN3AEK. Traffic: W3WIQ 1380, LMM 225, YA 69, KUN 55, UHN 51, SIJ 29, NCD 19, KNQ 14, VKD 14, UTR 8, NMJ 3.

CENTRAL DIVISION

ILLINOIS—SCM, George T. Schreiber, W9YIX—Section Nets: ILN c.w., 3515 kc. Mon. through Sat.; IEN 'phone, 3940 kc. RMs: BUK and MRQ. PAM: UQT. EC: HOA. Cook County EC: HPG. Very little club activity was reported this month, with the exception of the Joliet Amateur Radio Society, which is encouraged by greatly-increased attendance at meetings the last few months. Officers of the Club are REA, HOD, and MHC. New Novice calls heard in the section are PRL, RSY, and RSZ (father and son), JMY, EWU, NPH, and NXY. The nine operators at the state police station KSB 47 in the Chicago Area are kept busy in their spare time giving Novice license exams. The station is, of course, 100 per cent amateur-manned. New General Class calls are EWL, ITV, and MWK. BQC, who has been operating portable zero at Luther College, is home for the summer months. He used his Christmas vacation to round out his WAS. RQR has a new 140-X and loves it. TCX has picked 2 meters as his favorite band, while ATU enjoys 15. ZYP is buying parts for a modulator and threatens to quit c.w., while GDI confesses he has already built "a small modulator"

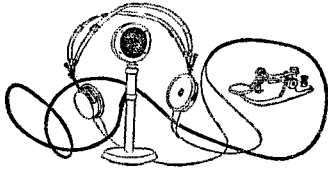
to get on the Tri-Town Club Net. Incidentally, the Tri-Town Club dinner for the XYLS was a great success and the gals are suggesting a repeat performance soon. The dinner committee consisted of OQN, ULB, YGM, CQG, and PFC. FRP enjoyed a trip to Yellowstone Park. EA, St. Clair County EC, has organized an auxiliary police net as part of the c.d. set-up in Belleville. He is brushing up on his c.w. on ILN. ZMJ gives ILN a long-needed outlet in Springfield, the State capital. EVB is the new Wayne County EC. OXS is coroner of Hancock County. Wonder how many public officials in the State also hold amateur licenses? The Kankakee Club gave a c.d. demonstration for the Boy Scouts with mobiles HKA, LCH, WZV, and KLD, and fixed stations QGO, NKR, and FMA participating. IDA plans a kw. on s.s.b. SKR likes morning operation before going to work. HPJ, who has been off the c.w. bands for years, has returned with a super signal because of a transmitter loaned him by your SCM. SXL and PRV really keep things humming on the Central Illinois Amateur operators' net, which emphasizes c.d. Brass Pounders certificates this month go to AA, DO, CSW, IDA, and YWL. Good work, fellows. ICF has been appointed deputy director of the City of Waterloo. CLH has fun with 40 watts on 20 meters. HJS has gone high power in his mobile, and 4VNN/9 has installed an Elmac. 5XUO/9 has been on a building spree; net result one receiver and two transmitters. The St. Clair Amateur Radio Club elected the following officers: DJB, TCX, ATU, ATF, RQR, and UWF. GJJ and 0VPH/9 now have overseas addresses. The Peoria-Area Amateur Radio Club, with IOG, HLF, and KM as officers, has code classes three nights a week; the club has 75 members and gives FCC exams as candidates "arrive." You will note that in the traffic listings at the end of this column there are a number of "phone stations named." Fellows, the column belongs to you; get in your traffic totals and your news items not later than the fifth of the month. See you at the Starved Rock Picnic. Everyone will be there. Traffic: W9DO 912, YWL 781, SCW 635, IDA 540, AA 336, SME 102, YIX 82, QQG 74, MRQ 73, BUK 66, VHD 44, STZ 27, CEE 24, OR 22, ZMJ 21, CTZ 19, LXJ 18, VER 16, HPG 11, ASK 10, CNF 4, FRP 3, CLH 2, JMG 2, KLD 1.

INDIANA—SCM, George H. Graue, W9BKJ—The Dayton Hamvention bestowed a coveted award to EHU, of Evansville, for outstanding leadership in club and c.d. affairs. The TARS has purchased a DX 100 Heathkit rig. UMS has a weekly sked with DL4CT. KVE and MWM have pi-network finals. New at North Vernon are N9SDS and N9SPA. MARC will hold a joint meeting with the New Albany and Jeffersonville Clubs. AQR is the new EC for Fountain County. High winds took down CBD's 20-meter quad. THC is building an s.s.b. exciter. EHH sports a new HT-9. PUB is mobile with complete Gossert gear. N9SAD is new at St. Stanislaus. EGQ hopes to be DXing on 2 meters. YWE has a new Globe Scout. BEZ reports CAEN activity on 1805 kc. as 23 sessions with a traffic total of 48. OLN, net manager of QIN, reports 62 sessions and a traffic total of 506. WWT reports for RFN with 145 traffic total. YIP, net manager for IFN, reports a traffic total of 243. CEA is a newly-appointed ORS. IMO is the new EC for Kosciusko County. LOE is the most consistent OBS in this area. Richard Elliott, 0IKK, a Silent Key, was buried at Seymour, his home town. JUJ has made BPL 49 times since February 1951. NZZ has made RPL 47 consecutive months. Congratulations to both. OZQ expects to be transferred to Penn. VNV again is planning a long vacation trip. CC is convalescing after an operation. YDA expects an uneventful recovery after major surgery. AZF is building a converter for c.d. work. NH has worked 21 countries on 160-meter c.w. RZS again made a good score in the February Frequency Measuring Test. FHA has dropped the "N." N9IYR is new at Princeton. ZIB is working on 2-meter gear. NZZ, at 6MPY, was QSO with CMT for 3 hours on 20-meter c.w. NTR has the 1-kw. working into a three-element beam 290 feet up on 20 meters. KLR started tower work for the 32-element beam on 2 meters. QZC wants a schedule in his area for 220-Mc. test. Traffic: (Mar.) W9JUJ 886, TT 573, NZZ 525, OZQ 467, TQC 173, WWT 163, TG 151, UPQ 132, EHJ 117, STC 94, WRO 73, QYQ 68, CTF 67, PQA 54, SKP 53, BKJ 46, WBA 45, VNV 38, CC 36, WUH 34, CEA 33, ZYK 29, EQO 28, NTA 28, YIP 26, ZRP 25, FGX 20, NH 20, SVL 20, DZC 18, YB 16, ZIB 15, AQR 9, PPS 9, CMT 7, BDP 6, YYS 6, DGA 4, GDJ 2.

WISCONSIN—SCM, Reno W. Goetsch, W9RQM—SEC: OVO. PAMs: ESJ and GMY. RMs: IXA, RTP, and UNJ. Nets: BEN, 3950 kc., 6 p.m. daily; WIN, 3685 kc., 6 p.m. daily; WPN, 3950 kc., 1215 Mon.-Sat., 0930 Sun. Wisconsin mobile and c.d. frequency: 29,620 kc. UNJ reports CCO, NQW, and VBZ are NCSs from Wisconsin on 9RN. RTP indicates that the new WIN frequency of 3685 kc. is working out 'B' with no RTTY to contend with; 340 QNI in 30 net sessions handled 222 messages. VBZ, UNJ, and CCO will graduate from high school in June. FCC is using a Phasemaster Jr. on s.s.b. with 50 watts while working on a p.p. 811A linear final. RQK needs 10 more QSLs for his WAS. SZR is up to 66 countries, with EA6 the latest. RKP rebuilt the final to a pair of

(Continued on page 90)

Something New In Single Side Band



A CHRONOLOGICAL history of ham radio could be summed up in a few words — spark, C.W., A.M., N.B.F.M., R.T.T.Y. and S.S.B. Forty or more years of tremendous technical advances exemplified by a few simple characters. Spark and arc are no longer on the air, and we certainly don't mean to imply that in only a few

years more the other forms of radio transmission will also be in limbo. We all should recognize, however, that new forms of radio transmission, having advantages over older forms, are bound to be developed, and the foresighted amateur should take the utmost advantage of them to further the enjoyment of this hobby.

IT is beyond the scope of this page to present a complete economic and engineering analysis of the two basic forms of single side band generation. We at Hallicrafters have spent considerable time and money arriving at the conclusion that the "filter method" is the more stable, rugged and reliable, and of particular advantage when higher powered amplifiers are also used.

AFTER the basic single side band suppressed carrier signal is generated, the second important consideration, for either the home constructor or the development engineer, is to produce a V.F.O. meeting the extremely high order of stability that is required for good S.S.B. operation.

THIS V.F.O. should not only have a high order of mechanical and electrical stability but should also have a tuning dial system which reads directly in kilocycles. We have found that a modified form of series tuned oscillator covering a 500 kc. band is eminently stable. To further improve stability of the oscillator, the basic frequency range of approximately 5.2 to 5.7 Mc. is not switched but heterodyned by crystal oscillators to various frequencies so more than one ham band can be covered by the exciter.

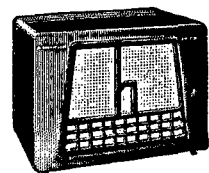
IN our opinion, next in order of importance in a side band exciter is a reliable and simple method of constantly checking its performance. Since a side band exciter deals with unwanted values of energy as much as 60 db. (10,000 times) below the desired energy, there is need for a simple rugged meter which will cover this range on one scale with no multiplying switches to operate. That's a pretty big order but a smart engineer came up with an amazingly simple method. With this circuit you can check your carrier level suppression down to 60 db. below the side band level almost instantaneously. The circuit also provides a constant indication of the output level on A.M., C.W. and S.S.B. Furthermore, it is the best method we have found for tuning up Class A amplifiers wherein a plate meter means practically nothing.

IN summary, then, three main points in S.S.B. are most important: clean, reliable side band generation, a highly stable, accurate V.F.O., and a simple means of tuning and monitoring the emitted signal. Just good basic engineering and amateur operating practices applied to a somewhat new mode of transmission.

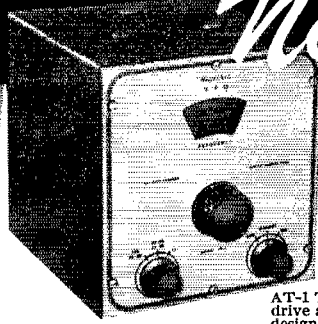
—Fritz Franke

Buel Ballgwin, Jr. *W. J. Halligan W9AC*

for **hallicrafters**



New Heathkit VFO KIT



MODEL VF-1

\$1950

Ship. Wt. 7 lbs.

- Smooth acting illuminated and precalibrated dial.
- 6AU6 electron coupled Clapp oscillator and OA2 voltage regulator.
- 10 Volt average output on fundamental frequencies.
- 7 Band calibration, 160 through 10 meters, from 3 basic oscillator frequencies.

Here is the new Heathkit VFO you have been waiting for. The perfect companion to the Heathkit Model AT-1 Transmitter. It has sufficient output to drive any multi-stage transmitter of modern design. A terrific combination of outstanding features at a low kit price. Good mechanical and electrical design insures operating stability. Coils are wound on heavy duty ceramic forms, using Litz or double cellulose wire coated with polystyrene cement. Variable capacitor is of differential type construction, especially designed for maximum bandspread and features ceramic insulation and double bearings.

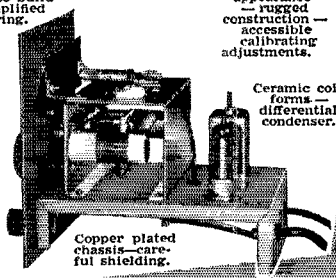
This kit is furnished with a carefully precalibrated dial which provides well over two feet of calibrated dial scale. Smooth acting vernier reduction drive insures easy tuning and zero beating. Power requirements 6.3 volts AC at 45 amperes and 250 volts DC at 15 mills. Just plug it into the power receptacle provided on the rear of the AT-1 Transmitter Kit. The VFO coaxial output cable terminates in plastic plug to fit standard 1/2" crystal holder. Construction is simple and wiring is easy.

Open layout—easy to build—simplified wiring.

Smooth acting illuminated dial drive.

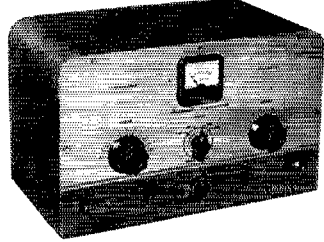
Clean appearance—rigged construction—accessible calibrating adjustments.

Ceramic coil forms—differential condenser.



Copper plated chassis—careful shielding.

Heathkit AMATEUR TRANSMITTER KIT



MODEL AT-1

\$2950

Ship. Wt. 16 lbs.

- SPECIFICATIONS:**
- Range 80, 40, 20, 15, 11, 10 meters.
 - 6AG7 Oscillator-multiplier.
 - 6L6 Amplifier-doubler.
 - 5U4G Rectifier.
 - 105-125 Volt A.C. 50-60 cycles 100 watts. Size 8 1/8 inch high x 13 1/8 inch wide x 7 inch deep.

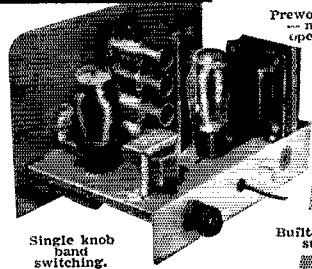
Crystal or VFO excitation.

Here is a major Heathkit addition to the Ham radio field, the AT-1 Transmitter Kit, incorporating many desirable design features at the lowest possible dollar-per-watts price. Panel mounted crystal socket, stand-by switch, key click filter, A. C. line filtering, good shielding, etc. VFO or crystal excitation—up to 35 watts input. Built-in power supply provides 425 volts at 100 MA. Amazingly low kit price includes all circuit components, tubes, cabinet, punched chassis, and detailed construction manual.

Rugged, clean construction.

Prewound coils—metered operation.

52 ohm coaxial output.



Single knob band switching.

Built-in power supply.

Heathkit COMMUNICATIONS RECEIVER KIT

Four band operation 535 to 35 Mc.

Six tube transformer operation.

Stable BFO oscillator circuit.

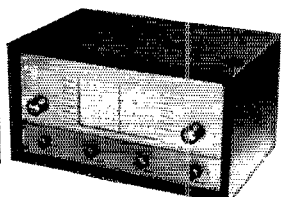
Electrical bandspread and scale.

RF gain control with AVC or MVC.

5 1/2 inch PM Speaker-Headphone Jack.

Noise limiter—standby switch.

- SPECIFICATIONS:**
- Range 535 Kc to 35 Mc
 - 12BE6 Mixer-oscillator
 - 12BA6 L. F. Amplifier
 - 12AV6 Detector—AVC—audio
 - 12BA6 B. F. O. oscillator
 - 12AGT Beam power output
 - 5Y3GT Rectifier
 - 105-125 volts A.C. 50-60 cycles, 45 watts.



A new Heathkit AR-2 communications receiver. The ideal companion piece for the AT-1 Transmitter. Electrical bandspread scale for tuning and logging convenience. High gain miniature tubes and IF transformers for high sensitivity and good signal to noise ratio. Construct your own Communications Receiver at a very substantial saving. Supplied with all tubes, punched and formed sheet metal parts, speaker, circuit components, and detailed step-by-step construction manual.

MODEL AR-2

\$2550

Ship. Wt. 12 lbs.

CABINET:

Proxylon impregnated fabric covered plywood cabinet. Shipp. weight 5 lbs. Number 91-10, \$4.50.

HEATH COMPANY
BENTON HARBOR 9, MICHIGAN

New HEATHKIT DX-100

PHONE AND CW TRANSMITTER KIT



MODEL DX-100

Shpg. Wt. 120 lbs.

\$189.50

Shipped motor freight unless otherwise specified. \$50.00 deposit with C.O.D. orders.

- R.F. output 100 watts Phone, 125 watts CW.
- Built-in VFO, modulator, power supplies. Kit includes all components, tubes, cabinet and detailed construction manual.
- Crystal or VFO operation (crystals not included with kit).
- Pi network output, matches 50-600 ohms non-reactive load. Reduces harmonic output.
- Treated for TVI suppression by extensive shielding and filtering.
- Single knob bandswitching, 160 meters through 10 meters.
- Pre-punched chassis, well illustrated construction manual, high quality components used throughout—sturdy mechanical assembly.

This modern-design Transmitter has its own VFO and plate-modulator built in to provide CW or phone operation from 160 meters through 10 meters. It is TVI suppressed, with all incoming and out-going circuits filtered, plenty of shielding, and strong metal cabinet with interlocking seams. Uses pi network interstage and output coupling. R.F. output 100 watts phone, 125 watts CW. Switch-selection of VFO or 4 crystals (crystals not included).

Incorporates high quality features not expected at this price level. Copper plated chassis—wide-spaced tuning capacitors—excellent quality components throughout—illuminated VFO dial and meter face—remote socket for connection of external switch or control of an external antenna relay. Preformed wiring harness—concentric control shafts. Plenty of step-by-step instructions and pictorial diagrams.

All power supplies built-in. Covers 160, 80, 40, 20, 15, 11 and 10 meters with single-knob bandswitching. Panel meter reads Driver I_p Final I_g, I_p, and E_p, and Modulator I_p. Uses 6AU6 VFO, 12BY7 Xtal osc.-buffer, 5763 driver, and parallel 6146 final. 12AX7 speech amp., 12BY7 driver, push-pull 1625 modulators. Power supplies use 5V4 low voltage rect., 6AL5 bias rect., 0A2 VFO voltage reg., (2) 5R4GY hi voltage rect., and 6AQ5 clamp tube. R.F. output to coax. connector. Overall dimensions 20 $\frac{3}{4}$ " W x 13 $\frac{1}{4}$ " H x 16" D.

Heathkit

GRID DIP METER KIT



MODEL GD-1B

\$19.50 Shpg. Wt. 4 lbs.

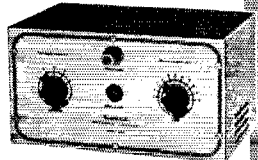
The invaluable instrument for all Hams. Numerous applications such as pre-tuning, neutralization, locating parasites, correcting TVI, adjusting antennas, design procedures, etc. Receiver applications include measuring C, L and Q of components—determining RF circuit resonant frequencies.

Covers 80, 40, 20, 11, 10, 6, 2, and 1 $\frac{1}{2}$ meter Ham bands. Complete frequency coverage from 2—250 Mc. using ready-wound plug-in coils provided with the kit. Accessory coil kit, Part 341-A at \$3.00 extends low frequency range to 350 Kc. Dial correlation curves furnished.

Compact construction, one hand operation, AC transformer operated, variable sensitivity control, thumb wheel drive, and direct reading calibrations. Precalibrated dial

with additional blank dials for individual calibration. You'll like the ready convenience and smart appearance of this kit with its baked enamel panel and crackle finish cabinet.

Heathkit ANTENNA COUPLER KIT



MODEL AC-1

\$14.50 Shpg. Wt. 4 lbs.

Poor matching allows valuable communications energy to be lost. The Model AC-1 will properly match your low power transmitter to an end-fed long wire antenna. Also attenuates signals above 36 Mc, reducing TVI. 52 ohm coax. input—power up to 75 watts—10 through 80 meters—tapped inductor and variable condenser—neon RF indicator—copper plated chassis and high quality components.

Heathkit ANTENNA IMPEDANCE METER KIT



MODEL AM-1

\$14.50 Shpg. Wt. 2 lbs.

Use the Model AM-1 in conjunction with a signal source for measuring antenna impedance, line matching purposes, adjustment of beam and mobile antennas, and to insure proper impedance match for optimum overall system operation. Will double, also, as a phone monitor or relative field strength indicator.

100 us. meter employed. Covers the range from 0 to 600 ohms. Cabinet is only 7" long, 2 $\frac{1}{2}$ " wide, and 3 $\frac{1}{4}$ " deep. An instrument of many uses for the amateur.

HEATH COMPANY

A SUBSIDIARY OF DAYSTROM, INC.
BENTON HARBOR 9, MICHIGAN

NOW a BROAD-BAND* LINEAR

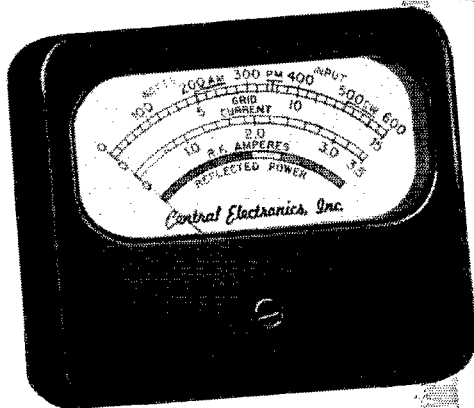
MULTIPHASE
600 L
NO TUNING
CONTROLS

SINGLE KNOB
BAND-SWITCHING
10-160



FOR USE ON
SSB, AM, PM & CW

WIRED, WITH TUBES AND
BUILT-IN POWER SUPPLY **\$349.50**



a new concept in linears

CENTRAL ELECTRONICS takes pride in presenting a product of intensive research — the new Multiphase 600L Broad-band* Linear. "It is destined to change the entire concept of RF amplifier design in the military, commercial and amateur fields." There are no tuning controls, servos or moving parts other than band-switch.

- Single 813 in Class AB₂.
- New band-pass couplers provide high linear efficiency: 60 to 65%.
- Designed for 50 — 70 ohm co-axial input and output.
- Easy to drive — Approx. 2 watts effective or 4 watts peak drive power required for 500 watts DC input.
- Built-in power supply — bias and screen regulation, 45 mfd. oil filled paper output capacitor. Excellent static and dynamic regulation.
- Extremely low intermodulation distortion.
- Automatic relay protects 813 and RF couplers.
- Excellent stability — complete freedom from parasites.
- Effectively TVI suppressed — RF compartments thoroughly shielded and Hypassed.
- Choice of grey table model, grey or black wrinkle finish rack model.
- Table model cabinet size — 17 $\frac{5}{8}$ " W, 8 $\frac{3}{4}$ " H, 13" D.

Another C. E. First!

METER FEATURES NEVER BEFORE
FOUND IN A TRANSMITTER

- Reads power input directly in watts
- Reads grid current
- Instantly reads output in RF amperes — no lagging thermo-couple
- Indicates reflected power caused by mismatched load
- Calibrated input levels for AM, PM and CW.
... and switch the meter to any position while transmitting!

*PATENT PENDING

WRITE FOR LITERATURE

MULTIPHASE

EQUIPMENT

Central Electronics, Inc.

1247 W. Belmont Ave.

Chicago 13, Illinois

Watch for early announcement of other new equipment.
CENTRAL ELECTRONICS



MODEL AQ



MODEL DQ



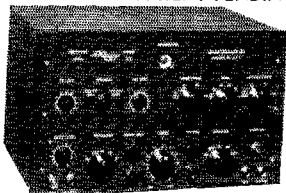
MODEL B SLICER

NEW MULTIPHASE "Q" MULTIPLIER AVAILABLE THREE WAYS

1. It's built-in the new Model B Sideband Slicer.
2. Plug it into your present Model A Slicer.
3. Attractive Desk Model, for installation directly into receiver.

The new Multiphase "Q" MULTIPLIER is a tunable IF electronic filter that provides tremendous receiver selectivity for peaking or rejecting a signal on AM, CW or SSB. It employs a new two tube circuit* with a special very high "Q" pot core inductor. Continuously variable selectivity from 60 cps to normal IF pass-band. Nulls out interfering heterodynes without affecting speech intelligibility. Peak the desired signal; interfering carriers are attenuated up to 50 db.

*PATENT PENDING



MODEL 20A

- 20 Watts Peak Envelope Output SSB, AM, PM and CW
- Completely Bandswitched 160 thru 10 Meters
- Magic Eye Carrier Null and Peak Modulation Indicator

Choice of grey table model, grey or black wrinkle finish rack model.

Wired and tested.....\$249.50
Complete kit.....\$199.50

458 CONVERSION KIT

Basic 458 Conversion Parts Kit, 15 to 160 meters, with dial, etc.....\$15.00
458 Deluxe Case and Panel Kit, matches size and appearance of Slicer...\$10.00

NEW — FOR 10 METERS

MODEL 458-10 xtal controlled converter package to extend 458 VFO into 10 meter band. For use with above 458 Conversion Kits.

Wired.....\$37.50
Kit.....\$27.50

MODELS

MODEL AQ

"Q" MULTIPLIER for installation in Model A Slicer. Includes new front panel. Power-IF cable plugs into accessory socket.

Wired...\$29.50 Kit...\$22.50

MODEL DQ

Desk Model "Q" MULTIPLIER for use with any receiver having 450 to 500 KC IF. In attractive case 5 1/2" W, 4" H, 5" D, with connecting power-IF cable. Power requirements, 225 to 300 VDC at 12 ma., 6.3 V at .6 amps, can be secured from receiver. Can provide added selectivity and BFO for mobile SSB or CW reception.

Wired...\$29.50 Kit...\$22.50

MODEL B

Sideband Slicer, same as Model A Slicer but includes built-in "Q" MULTIPLIER, AP-1 not needed.

Wired.....\$99.50
Kit.....\$69.50

SIDE BAND SLICER MODEL A IMPROVES ANY RECEIVER



Upper or lower sideband reception of SSB, AM, PM and CW at the flip of a switch. Cuts QRM in half. Exalted carrier method eliminates distortion caused by selective fading. Easily connected into any receiver having 450-500 KC IF. Built-in power supply. Reduces or eliminates interference from 15 KC TV receiver sweep harmonics.

Wired and tested.....\$74.50
Complete kit.....\$49.50

AP-1 ADAPTER

Plug-in IF stage—used with Slicer, allows receiver to be switched back to normal.

Wired and tested, with tube....\$8.50

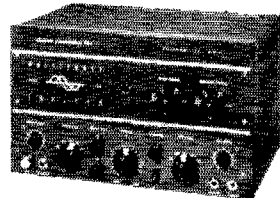
NEW AP-2 ADAPTER

Combined AP-1 and xtal mixer. Allows Slicer to be used with receivers having 50, 85, 100, 915 KC and other IF systems. One xtal suffices for most receivers.

Kit...\$17.50

Check These Features NOW IN BOTH MODELS

- **Perfected Voice-Controlled Break-in on SSB, AM, PM.**
- **Upper or Lower Sideband at the flip of a switch.**
- **New Carrier Level Control.** Insert any amount of carrier without disturbing carrier suppression adjustments.
- **New Calibrate Circuit.** Simply talk yourself exactly on frequency as you set your VFO. Calibrate signal level adjustable from zero to full output.
- **New AF Input Jack.** For oscillator or phone patch.
- **CW Break-in Operation.**
- **New Gold Contact Voice Control Relay.** Extra contacts for muting receiver, operating relays, etc.
- **Accessory Power Socket.** Furnishes blocking bias for linear amplifier and voltage for optional VFO (Modified BC458 makes an excellent multiband VFO.)
- **40 DB or More Suppression** of unwanted sideband.



MODEL 10B SUCCESSOR TO THE POPULAR MODEL 10A

- 10 Watts Peak Envelope Output SSB, AM, PM and CW
- Multiband Operation using plug-in coils.

Choice of grey table model, grey or black wrinkle finish rack model. With coils for one band.

Wired and tested.....\$179.50
Complete kit.....\$129.50

QT-1 ANTI-TRIP UNIT

Perfectd Voice Operated Break-in with loudspeaker. Prevents loud signals, heterodynes and static from tripping the voice break-in circuit. All electronic — no relays. Plugs into socket inside 20A or 10B Exciter.

Wired and tested, with tube....\$12.50

WRITE FOR LITERATURE

MULTIPHASE
EQUIPMENT

Central Electronics, Inc.

1247 W. Belmont Ave.

Chicago 13, Illinois

See Trade Publications on Multiphase "REJUVA-TUBE" — A New CRT REJUVENATOR



New!

FO-1

PRINTED CIRCUIT OSCILLATOR

For Generating Spot Frequency Signals with Guaranteed Tolerance between

**1000 KC
to
15,000 KC**

Since the operating tolerance of a crystal is greatly affected by the associated operating circuit, the use of the FO-1 Oscillator in conjunction with the FX-1 Crystal will guarantee close tolerance operation. Tolerances as close as .001 percent can be obtained.

USES

AMATEUR

- Net Operation
- Frequency Standards
- Close band-edge operation

COMMERCIAL

- Frequency Standards
- Signal Generators for alignment purposes
- Oscillators in new equipment

FREQUENCY RANGE: 1000 KC to 15,000 KC fundamental operation

FO-1	—Oscillator Kit (less tube and crystal)	\$3.95
FO-1A	—Oscillator, factory wired and tested with tube (less crystal)	\$6.95

Order Direct

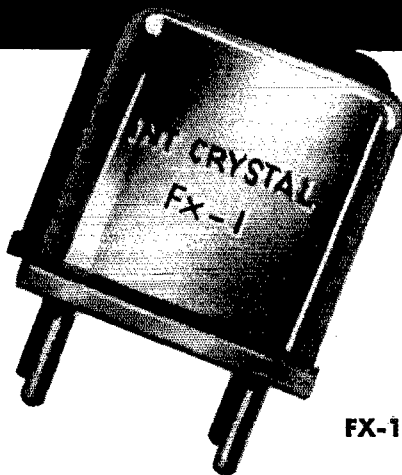
International **CRYSTAL Mfg. Co., Inc.** 18 N. Lee Phone FO 5-1165
OKLAHOMA CITY, OKLA.

FX-1 CRYSTAL

Companion to the FO-1 Oscillator

The FX-1 Crystal is designed for use only with the FO-1 Oscillator. For tolerances of .01% and .005%, any FX-1 Crystal can be used with any FO-1 Oscillator.

For tolerances closer than .005% the oscillator and crystal must be purchased together. The oscillator is factory wired, and the crystal custom calibrated for the specific oscillator.



FX-1

Tolerance	1000-1499 KC	1500-1999 KC	2000-9999 KC	10,000-15,000 KC
FX-1 .01%	\$5.25	\$3.75	\$2.50	\$3.25
FX-1 .005%	\$6.00	\$4.50	\$3.00	\$4.00
(.0025% and .001% tolerances are available only by purchasing the FO-1 Oscillator and Crystal together)				
FX-1 .0025%	\$6.75*	\$5.25*	\$3.75*	\$4.75*
FX-1 .001%	\$8.00*	\$6.50*	\$5.00*	\$6.00*

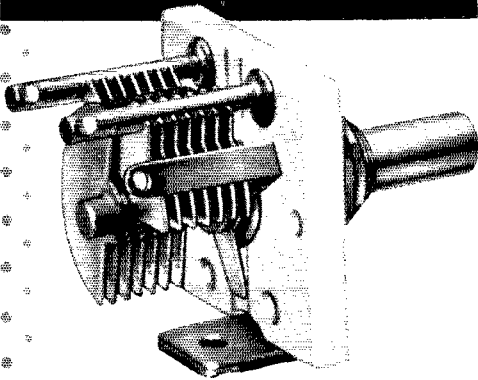
**Prices are for crystal only. To insure this tolerance crystal must be purchased with oscillator factory wired and tested. For total price add \$6.95 to price of crystal desired.*

HOW TO ORDER: In order to give the fastest possible service, crystals and oscillators are sold direct. Where cash accompanies the order, International will prepay the postage; otherwise, shipment will be made C. O. D.

All International Crystal products are available only by direct order to the factory.

International **CRYSTAL Mfg. Co., Inc.** 18 N. Lee Phone FO 5-1165
OKLAHOMA CITY, OKLA.

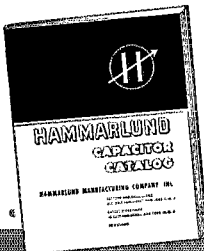
"HF" CAPACITOR



The Ideal High Frequency Tuner!

The "HF" is a single section tuning capacitor, employing the same rotor and stator design found in the famous Hammarlund "APC" which is still recognized after 20 years as the standard capacitor of its type. Extra long sleeve bearing and positive contact nickel-plated phosphor bronze wiper make the "HF" ideally suited to high frequency applications.

Silicone treated stearite insulation. Single hole or base mounting. Special spacing or capacity values, finishes and other modifications are available to manufacturers on special order.



For your free copy of The Hammarlund Capacitor Catalog, which gives listings of the complete line of standard capacitors, write to The Hammarlund Manufacturing Co., Inc., 460 West 34th St., New York 1, N. Y. Ask for Bulletin C6.

HAMMARLUND

(Continued from page 82)

4E27s at 600 watts. KKK sold his p.p. 813s and added a Matchbox to the Viking II. New officers of the Kenosha Radio Comm. Society are: UCI, pres.; ILR, vice-pres.; and BXB, secy-treas. Net certificates (WPN) were issued to YFW, UNL, C/O, DVM, IUK, UMJ, and UFW. SAA reports WPN had 1006 QNI and 184 messages handled in 26 sessions during February. FFC has a new three-element 15-meter beam, 1BUD, ARRL's Gen. Mgr., was guest speaker at a special meeting of the FLARC (Madison) April 4th. ZDU has a new SX-96. AEM has a new (Hobo Scout). A new club of hams at the Milw. U. of W. Extension has been formed. Attending the Extension are EFF, ZLD, YOX, UDK, AEM, and WVN. IMQ has his 30-element 144-Mc. beam back in operation after windstorm trouble. LEE reports 144-Mc. conditions improved. IYF has some 144-Mc. gear. REQ is back on 144 Mc. with DSP's flea-power portable. QGR worked CR7, ZS1, PY4, and CM2 on 7 Mc. YOS reports a pre-Field Day test run of all equipment in Kenosha. WZR uses an AP-1 and an S-38B. WN9KSB uses a Globe Scout at 50 watts. UFX, State RO, indicates RACES drills on 3993 and 3505.5 are being scheduled. Traffic: W9VBZ 413, CXY 356, UNJ 151, SAA 136, IXA 118, RTP 115, CCO 89, UIM 33, KWJ 29, FFC 27, YZA 24, RQK 20, SZR 14, GMY 11, BVG 9, RQM 6, SDK 3, OVO 1.

DAKOTA DIVISION

SOUTH DAKOTA — SCM, J. W. Sikorski, W0RRN — Asst. SCMs: Earl Shirley, 0YQR, and Martha Shirley, 0ZWL, SEC: GCP, PAMs: GDE, BNA, NEO, and PRL, RM: SMV, MPQ has accepted a position with Republic Steel at Youngstown, Ohio. GCP is operating a new Ranger, in addition to the s.s.b. rig. New tickets: KN0AOU, Sioux Falls; K9WBW, Mitchell; WCN, Fulton. After several years' absence K0NRU, of the USNR at Sioux Falls, again is licensed, with YWY in charge. 9GEU/0 has a new Buick and is installing a mobile. DTY is driving a new Ford. Five members were added to the AREC during March, including SDP as EC for Aurora County. Fire in his church destroyed BNA's study and library. CSD erected a downspout vertical on Mar. 27th and exactly one week later wind took it down. Officers of the newly-organized Ellsworth AREC at Ellsworth AFB are: WBW, pres.; IK, vice-pres.; ADM, treas.; XJY, secy. Net reports: NJQ, 18 sessions, 440 QNI, 75 traffic; c.w. 13 sessions, 114 QNI, traffic 44; 75-net, 31 sessions, 1457 QNI, traffic 279; 160-net, 31 sessions, 690 QNI, traffic 78. Traffic: W0GDE 103, ZWL 74, SCT 72, REN 49, DVB 42, SMV 40, PHR 37, BQH 21, PRL 19, BLZ 17, MPQ 13, TLD 6, GWS 3.

MINNESOTA — SCM, Charles M. Bove, W0MXX — Asst. SCM: Vince Smythe, 0GQK, MXX is vacationing in Hawaii and visited TQJ, also there. QVR reports XYL Marjorie now is QVQ, WN0ZEL is a new ham at Hutchinson. RLQ bought OMC's receiver. Ex-BOL, Bob Prehm, is now in Seattle with the call ZZEY. JNC reports inactivity because of family illness. VBD reports a new Viking II to lick TV. GBI had a nice front-page spread in the *Norwood Times* resulting from overseas traffic delivery. GTX has done a whale of a job as SEC and now has 522 AREC members. Congrats, George HEO, TUD, and SW are planning a s.s.b. meeting at Willmar for Apr. 24th. Minnesota now has 20 active in s.s.b. on 75 meters. JBS recently was married and is on again from Minneapolis. TJA has another high-power rig under construction. IKJ has junked f.m. in favor of screen modulation with excellent results. ZOB rebuilt and shielded his old rig to eliminate TVI. TUS, while recently hospitalized in Minneapolis, was able to keep in touch with his home while XYL, VPO, operated at the home QTH. PEV, GGI, HEO, and GGQ recently built new high-power linear finals. OBT is the proud papa of a new YL born on his XYL's birthday. Traffic: W0MVB 304, KJZ 174, KLG 146, IRJ 108, WMA 104, KFN 84, BQW 70, TUS 64, TJA 58, QDP 55, DQL 49, WVO 49, LUX 47, GTX 44, RVO 44, HIN 42, MBD 34, TKX 34, ALW 26, LIG 26, MVJ 26, SYN 23, BUO 21, OSJ 19, LST 18, KNR 17, VBD 14, UCY 13, OPA 12, QGD 11, GGQ 10, QVR 7, NTV 5, BZG 4, ZTB 4, OJP 3, PUO 3, RQJ 3.

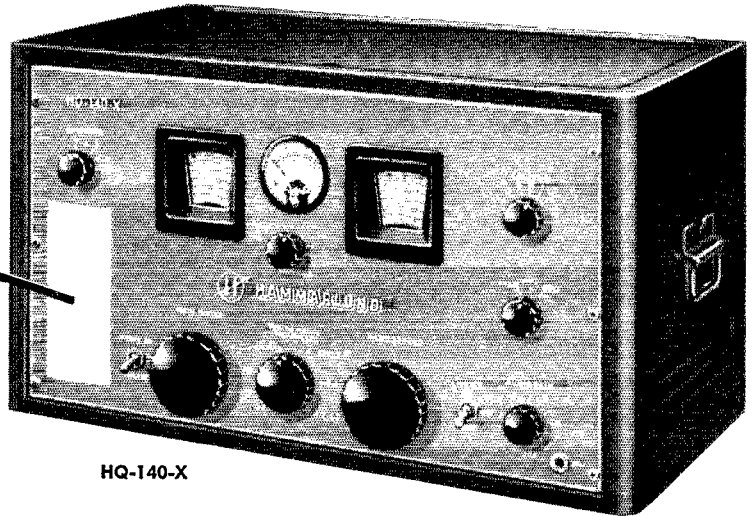
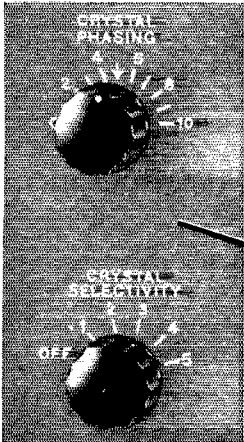
DELTA DIVISION

ARKANSAS — Owen G. Mahaffey, W5FMF — SXM spent two weeks duty with the Navy in New Orleans. WUN is attending a c.d. emergency first aid class two nights a week; he also reports the Little Rock High School Radio Club has a rig on 40-meter c.w. with the call RFS. The Texarkana Amateur Radio Club members provided communications between the scene of a drowning and De Kalb, Tex. Mobiles taking part were RLN, LGH, VAA, ZIT, and NKH. Others participating were DXI, RUS, RLM, VKX, BQJ, MWW, DGG, IQW/5, ILP, JFT, AZO, and HBD. The TARC has been active in two recent c.d. drills. The Club meets the 1st Tue. night of each month. Our PAM, HEE, did a good job in getting the Ozark Phone Net started and had 26 stations reporting

(Continued on page 98)

THE HQ-140-X...

SEEMS TO STRETCH THE BANDS



HQ-140-X

In these days, when the amateur bands are more crowded than ever, it's important to make sure the receiver you buy will bring in the desired signal with minimum interference from adjacent channels. That's why more and more 'hams' are turning to the HQ-140-X communications receiver.

The HQ-140-X's outstanding performance under today's difficult operating conditions is achieved because of the Hammarlund patented 455Kc crystal filter and phasing network. This circuit, identical to the one used in the Super Pro-600-JX professional receiver, is controlled by a front panel 6-position Crystal Selectivity switch and provides

an OFF position and five increasingly selective bandwidths.

The Crystal Phasing control is a differential-type variable air capacitor which permits precise adjustment of the crystal selectivity for extremely high attenuation of closely adjacent channel interference.

Because there is no interlocking effect, the Selectivity or Phasing Controls can be changed without de-tuning.

THE HQ-140-X IN ACTION AT SEA

The HQ-140-X is the receiver in the radio shacks of many American Merchantmen. Its dependability and ruggedness make it very popular with seagoing hams.

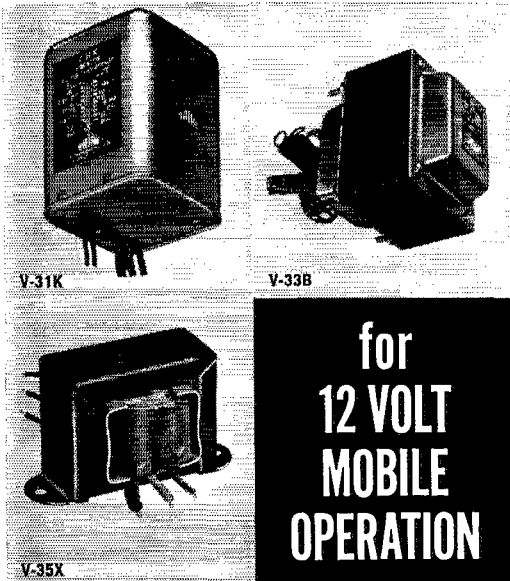
Get the details on these and other important advantages of the HQ-140-X. Write to The Hammarlund Manufacturing Co., Inc., 460 W. 34th St., New York 1, N. Y. Ask for Bulletin R6.



HAMMARLUND

SINCE 1910

New TRIAD VIBRATOR POWER TRANSFORMERS



Use these new TRIAD 12 Volt Vibrator Power Supply Transformers—designed especially for 12 volt automobile electrical systems—in your mobile rig. Where added performance is required buy TRIAD the Symbol of Quality in Transformers.

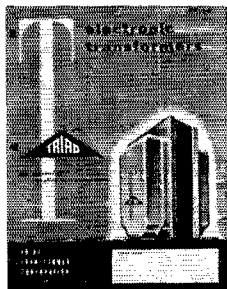
Type No.	List Price	Primary Volts	Secondary			Case Dim.- Inches			Mtg. Dim.- Inches			Wt. Lbs.
			AC Volts	DC Ma	H	W	D	MW	MD	LD		
V-31K	9.60	12-16	450 C.T.	65	3%	2 3/8	2 3/4	2 1/2	1 1/2	1 1/2	1 1/2	2 1/2
V-33B	7.50	12-16	390 C.T.	65	1 1/2%	2 3/8	2 3/4	2 1/2	1 1/2	1 1/2	1 1/2	2
V-35X	5.70	12-16	310 C.T.	65	2	3 1/4	2	2 1/4	1 1/2	1 1/2	1 1/2	1 1/4

AS LISTED IN

TRIAD'S
NEW 1955
GENERAL
CATALOG



4055 Redwood Ave. • Venice, Calif.



Write for Catalog TR-55D

in the first night. Congratulations, Art, and hope we can keep up the good work. LUX reports a new rig on 20 meters. Traffic: W5FMF 44, WUN 26, BUX 10, PX 4.

LOUISIANA — SCM, Thomas J. Morgavi, W5FMO — The crash of a B-47 that was coming for a landing at the Lake Charles AFB sent some of the local mobiles scurrying to supply emergency communications from the scene of the crash. BQH proceeded to the scene and passed traffic and the next day ZDV stationed his mobile at the scene and maintained communications with FEL. 4KJN/5, mobile, was standing by and was immediately available in case he was needed. ZML, ZJS, and BQH are new mobiles. CCD is starting work on an s.s.b. exciter. GFA, recently of Tulsa, now is at CAA, Lake Charles. FDC is installing mobile in the new car. UGJ is NC for the S.W. La. Emergency Net which meets Sun. at 2 P.M. on 3850 kc. HNS is working hard on his General Class. UGJ is now an OPS. The So. La. Emergency Net meets Sun. at 0800 on 3830 kc. WQX has the rig dismantled because of a change of QTH. EA is looking for traffic. The Ouachita ARC held a picnic in West Monroe on May 15th. Station Net certificates have been issued to most of the net members in Louisiana. If you have not received your certificate, notify the SCM through your NCS. FMO finally got the 20-meter beam repaired and now is back on 20 meters. HUT is a new EC in New Orleans. TRQ is an ORS. UQK, ex-EC for New Orleans, now is living in Houston and expects to be on the air soon to contact New Orleans stations. Prepare now for the coming June emergency test. Contact IUG, Louisiana SEC, for full details. Traffic: W5MXQ 69, EA 46, VIC 17, FMO 10, HNS 6.

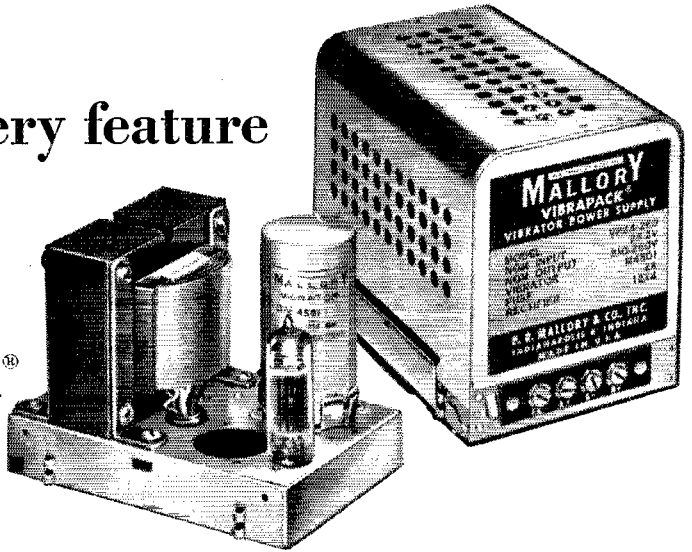
MISSISSIPPI — SCM, Julian G. Blakely, W5WZY — A close race is a good sign. We are grateful to have been elected and thanks. With a little help from each of you we can place Mississippi nearer the top. Congrats to PFC, our new SEC. Our joint goal is an active EC in each county. Appointments are open! A card to the SCM will bring you details and an application form. Even if you can be of service for an adjoining county having no active amateur, drop us a card. Let's have a "Mississippi Night" soon with every county checking into roll call by the SEC. The new Mississippi Rebel Net, NCS IGW, operates 7 days a week (7 P.M.) on 3785 kc. We need coverage on this net; consistent stations will be eligible for the coveted ORS appointment. JHS and his "Hurricaneers" are in there solid; to Norm goes the prize for the best disposition on the air. The Mississippi Magnolia Emergency Net meets Sun., 3870 kc., 1:30 P.M., IHP is NCS. The Cleveland Radio Club is planning a June 5th picnic at Lake Beulah. The Kessler Radio Club schedules s.s.b. lectures. PFC, with emergency gear on Lake Bruen, reports on fishing conditions to VQE. WZ is active on the Mississippi Rebel Net with his VFO. The Capiah Amateur Radio Club is getting lined up for AREC with 2-meter transceivers. ZML will be on 6 meters. All interested in this band drop a card to your SCM for a data sheet to give data on each station to send you. The Riverside Amateur Radio Club of Greenville challenges all clubs to compete in the '55 Field Day Contest. The fair grounds site will be used. GUU has a new Globe King. YAR finally has an antenna. Listen on the Hurricane Net for late hamfest dope. Traffic: W5IGW 105, EWE 93, JHS 64, KYC 39, WZY 18, TIR 13, RIM 12, YBH 12, LFG 11, GUU 10, OTD 8.

TENNESSEE — SCM, Harry Simpson, W4SCF — SEC: RRV. PAM: PFP. RM: WQW. UWA worked another VP7 on 160 meters, bringing his DX total on that band to three. WJF showed an ionosphere film at the Cookeville Club meeting. FLW raised his 6- and 10-meter beams 15 feet higher. He reports the Tri-County Club is doing fine. A new OPS is K4BKC. After doing a fine organizational job on the Novice Emergency Net CXY has resigned because of the press of other duties. WXL, E.E. student at Tenn. Tech., has a 3-watter built into a coffee can and QN1s KYN regularly. The Bays Mountain Club announces that SWLs are eligible for Hillbilly Net certificates. VUA directed the recent pick-up for the March of Dimus pledges in the Kingsport area, assisted by PID, UIO, TYV, BEV, TYT, and HKU. LNF is now on 75 meters. HKU is on with a kw. VFL has a new Elmac. VUA visited the Watauga Club, in Johnson City, and was much impressed. VZM worked a KH6 on 75 meters using merely 45 watts! ANN operated portable from Florida with 4 watts and worked VDN. VTV has moved to South Carolina. PRY reports the Nashville-Davidson County Area now has 22 mobiles on 10 or 2 meters. OEZ is C.D. RO for the Nashville Area. EAZ, CSO, CSY, and BFB earned Ten-Meter Emergency Net certificates. The Memphis Club will hold its 3rd Annual Hamfest on June 19th. TIE visited W5VAA. WOG and W5CAF visited OGG. SCF and AGC took a fast trip to Tampa and worked mobile from 5 states within 14 hours. Traffic: W4PL 905, OEZ 500, OGG 473, IIB 266, TYU 240, K4FEU 209, W4APC 140, PQP 132, PFP 108, WQW 89, ODR 81, BQG 75, TZD 71, HII 46, SCF 42, VNE 42, VJ 38, IV 33, YMB 25, SJ 22, TIE 18, UWA 17, RRV 16, HUT 10, FLW 6, HSB 6, PAW 6, YPG 6, ZJY 5, BAO 2, ZBQ 2, CLQ 1, DCH 1, IWH 1, WJG 1.

(Continued on page 94)

MALLORY HAM BULLETIN

You'll like every feature of the New MALLORY VIBRAPACK® Power Supply



Designing a battery-operated mobile rig? For the power supply, take a look at the features that are built into the new Mallory Vibrapack.

HEFT IT—the Vibrapack fits easily into the palm of your hand. It's less than $5\frac{1}{2}$ inches in its longest dimension.

CHECK ITS WEIGHT—it's barely 4 pounds.

LOOK INSIDE—its sturdy steel cover and bottom plate snap off quickly, without need for struggling with screws or complicated fasteners.

SEPARATE TAP for the rectifier filament assures instant restart after stand-by.

HOOK IT UP—there is a model for 6, 12 or 24 volt operation.

LOAD IT DOWN—each model is conservatively rated to deliver the power you need at high efficiency and with minimum battery drain. One model has taps for either 210 or 260 VDC at 60 MA; another has an output of 325 VDC at 100 MA. Both ratings apply when used with rated input voltage, and working into a minimum of 10 MFD input capacitance.

TRY it with a sensitive receiver. Its built-in wide range input and output RF filters provide hash-free performance.

LISTEN to its quiet operation. Mechanical hum is reduced practically to zero in the new Mallory Vibrator used in the Vibrapack.

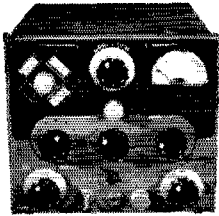
ASK any police radio engineer about the long life and dependability of its series-drive, heavy-duty communications vibrator . . . the same components used in police, taxi and utility 2-way mobile gear everywhere.

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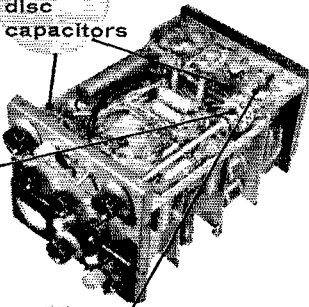
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GREAT LAKES DIVISION

KENTUCKY — SCM, Robert E. Fields, W4SBI — SEC: CDA, RM: KKW, Acting PAM: NIZ, OMW informs us that the OVARA picnic will be held at the Cincinnati Police Firing Range, Evendale, Ohio, June 12th. It is a family affair wherein basket picnic lunches will be brought for those attending. There will be plenty of prizes, especially for the ladies, all kind of games, etc. Admission is \$1.00 for adults, 25¢ for children. HSI reports that his traffic total is down because of flood conditions along the Ohio River during March. His trailer had to be moved four times. After the flood, high winds blew down his antenna. WNH says the HCARA has a club station now at its club house and is now an ARRL affiliated club. CDA, our SEC, again asks that clubs and communities designate an EC if they don't have one. We do not want to be late with too little. VP, FE, OMW, and JUI took part in the ARRL F.M.T. with JUI coming out with a high score. From reports from NIZ, RPF, and KKW we find that both the KYN (c.w.) and KYP (phone) nets are growing with a high percentage of net efficiency. Traffic: (Mar.) K4WBG 538, W4KKW 204, RPF 73, NIZ 68, SBI 64, JHU 59, CDA 55, ZDA 37, FGV 31, ZDB 31, JCN 27, SUD 17, SZB 13, JP 10, HSI 4, JUI 4. (Feb.) W4ZLK 39, IAY 8.

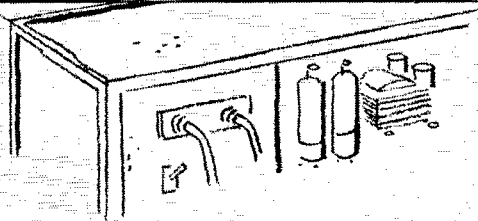
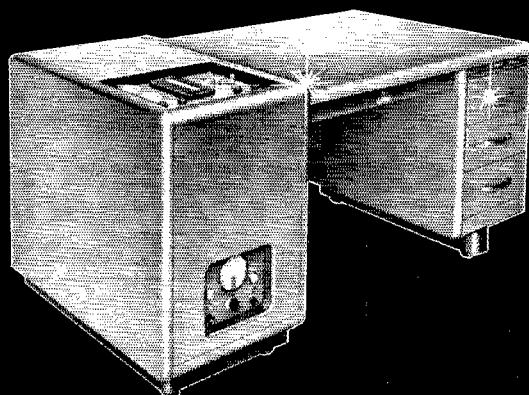
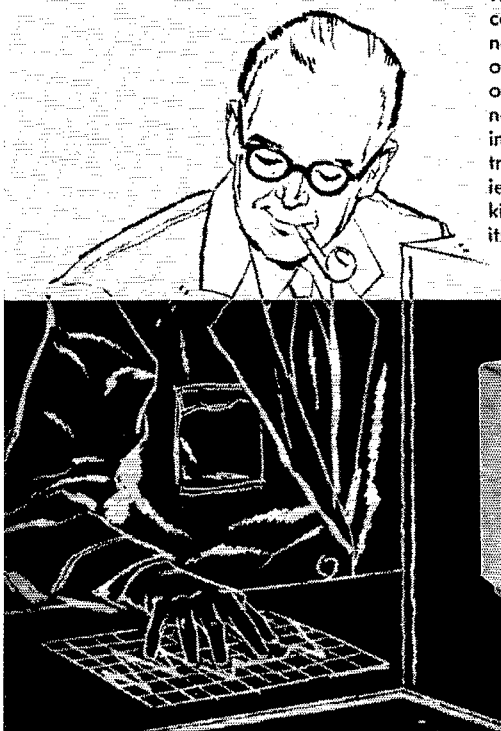
MICHIGAN — SCM, Thomas G. Mitchell, W8RAE — Asst. SCMs: (Phone) Bob Cooper, 8AQA; (C.W.) Joe Beljan, 8SCW. SEC: GJH. New appointees: AMT, Genesee Co., JUQ Allegan Co., MNQ Area 7, NSS Barry Co., PDC Cass Co., QOT Berrien Co. as ECs; MZN as ORS. QMN Net certificates for '54-'55 went to DAP, PHM, RTN, SCW, and SJF. The following OOs participated in the February F.M.T.: AYY, CXP, HPR, and SS. All qualified in Class I. Congrats to all. We're all proud of the Grand Rapids fellows for their work in putting on the fine convention. The AREC/RACES theme was in keeping with the latest developments in our SEC's department. Word from him is that the long-awaited approval of the Michigan COMPLAN is nearer at hand. Keep a watch on your newspapers for official announcement and, in the meantime, keep the AREC registrations coming in. HSG/MEX has introduced a rewrite on the license plate law (Senate Bill 1210) which will simplify the original when passed. Thanks for the fine job on our behalf. Cos. QMNER QIX has a new receiver with serial No. "3f663." All this and license plates, too? QAH is back to trusty triodes after trouble with tetrodes. DLZ is so pleased with his home-brew two-element VP 15-meter beam that he is scaling one for 20 meters. EGI is QRX while moving so reads QMN mail on the spare receiver at the airport. QOO is working on Field Day plans, which is a good tip for all of us. FX built and is using a "Q-Multiplier" and highly recommends same for others. It even helps his line-noise problem. TIC says the Muskegon gang is covering the county with 10-meter mobiles. Correcting Apr. club news in this column: officers of the GRARC are DLZ, pres.; HIW, vice-pres.; AQA, secy.; ZCH, treas. Lansing Amateur Radio Club officers are OCK, pres.; OPZ, vice-pres.; QOJ, secy.; CKK, treas.; TIJ and CPV, directors. CU on Field Day, gang. Traffic: (Mar.) W8NUL 284, PHA 221, ILP 153, RJC 111, SRK 103, RTN 97, ZLK 62, DAP 60, NTC 58, IUJ 57, JYJ 56, IKX 51, SWG 51, IBB 48, SJF 48, URM 48, OQH 46, QIX 46, SCW 43, IRO 38, NOH 38, QOO 34, IV 31, WVJ 31, FX 30, QOK/8 20, ZHB 17, DSE 16, RAE 16, AUD 12, HSG 12, DLZ 8, PHM 7, YDR 7, HKT 6, PDF 4, EGI 3, TIC 2 (Feb.) W8QAH 391, SCW 124, JEX 101, ZLK 100, IKX 50, IBB 36, SJF 26, INF 10, PUV 3.

OHIO — SCM, John E. Siringer, W8AJW — Asst. SCMs: J. C. Erickson, 8DAE; W. B. Davis, 8JNF; and O. V. Bonnet, 8OVG. SEC: IPB. RMs: DAE and FYO. PAMs: EQN and HUX. BPLs were issued to DAE and FYO. MVJ, QHW, and QXH have been appointed ORSs. ILC is now an OPS and CUJ, one of the Dayton F.M.T. wizards, has been made an OO. On April 2nd one of the greatest amateur radio conventions in the nation's history occurred at Dayton. The Dayton Hamvention drew approximately 2000 people. The headline banquet speaker was 1BUD, General Manager of ARRL, while other speakers included #PFO, BOH, #WOK, 10EX, HB, #EDX, 2KUJ, 2BDS, and SPF. FYW was awarded the trophy for outstanding service to amateur radio and/or the public during 1954, and 9EJU was awarded the honorable mention trophy. VE3AWQ won a 75A-4. Mr. Hamvention, ACE, and his able staff of assistants deserve considerable praise for what they accomplished. We regret to report the death of RJF, an old-time amateur in the Cleveland Area. ZJM has become a father for the third time — a boy again. GDQ made 45 points on 160 meters during the DX Contest. AQ lost his vertical in the recent big wind, while DG lost two masts. Winners in the March hidden transmitter hunt in Toledo with NBD, VLL, and OFG. The Fulton County Amateur Radio Club is the section's most recent ARRL affiliate. Our sensational JSEC, UPB, will monitor 3860 kc. at 2:00 p.m. EST and 3580 at 3:00 p.m. the Sunday of Field Day to accept Field Day traffic for QSP. The CACARC has arranged a technical talk to be given in early June in Cleveland. The Dayton *RF Carrier* reports that PQZ and ZOF are doing business with the USAF in the East; LFIH

(Continued on page 90)

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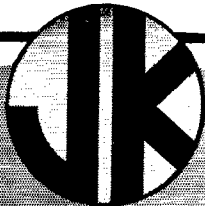
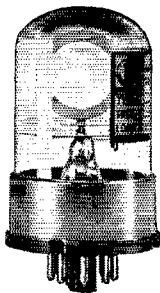
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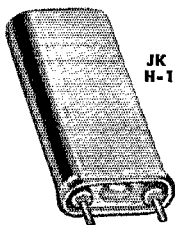


PRODUCTS

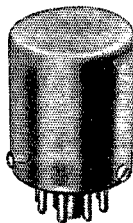
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is on s.s.b.s.c. mobile with 150 watts; RGH's call is being bootlegged on 7 Mc. and PGC is a new arrival on 420 Mc. The Cincy GCARA *Mike and Key* is running a monthly column entitled "About Our Members," with IVE being featured in the March edition. Newly-elected GCARA officers are GCR, pres.; SMQ, vice-pres.; EIB, 2nd vice-pres.; 4VLB, corr. secy.; PLB, rec. secy.; and NCV, treas. The OVARA *Ether Waves* has its own "Who's Who." In March the bulletin featured one of the very, very old-timers, SDJ. The DX column, edited by 4KVX, is truly top-notch. The Springfield Q-5 lists the following as speakers for the coming months: June, OKB; July, HBJ; August, HOL; Sept., HTE. Active in the Springfield C.D. Net, 3860 kc., 12:30 p.m. on Sun., are EQN, FSU, DCJ, VZE, WAU, HTE, JNU, KJP, GNZ, EBQ, and WXG. The FHARA *Feedline* mentions that new Hamilton Area Novices are WBQ (a YL), VQH, VST, and WCQ; and MWY, OUD, and QJO set up an amateur station at the local Boy Scout Exposition at Fenmont Center. The Columbus *Carascope* informs us that DTL has graduated from the Novice ranks; APF, Franklin Co. EC, has recovered from a long illness and has a new jr. operator, and RVK worked a YU on 7 Mc. Toledo's *Shack Gossip* states that BQ has worked 84 countries on 15 meters; RZQ has made General Class; new Toledo Novices are VMW, VNR, VBC, VOC, VFH, VBO, and VBT; RYK has upped his power to a husky 30 watts; and KPJ is knocking 'em over with 10 watts on 20 meters. Northeastern Ohio's *Ham Flashes* relates that DXO lost his beam in the recent tornado; LWG, of Alliance, passed away on March 8th; EDS, of Salem, is an ex-W1, having recently forsaken New England; USP graduated from Kent State U. in March; NMP recently was severely injured in an auto accident but is well on the road to recovery; and CUI, DXO, FRY, NXX, and KZS participated in the C.D. Net during the tornado of March 22nd. Traffic: W8FYO 520, DAF 447, LHV 138, MQQ 97, HNP 91, LLC 83, AMH 56, IIR 56, ARO 51, AL 40, AJH 26, AJW 22, LYD 22, LZE 19, HPP 18, GZ 16, RO 16, IFX 15, BEW 11, EQN 11, KDY 10, RN 8, WRL 8, QXH 7, FJV 6, HFE 6, HUX 6, HZJ 6, LMB 6, MGC 6, AQ 5, IAY 5, NZC 5, ET 4, LGR 4, NQQ 4, MEI 3, LER 2. (Feb.) W8REL 308, DL 9.

HUDSON DIVISION

EASTERN NEW YORK — SCM, Stephen J. Neason, W2ILL — SEC: RTE, RMs: K2BJS and W2TYC. PAMS: GDD and IJG. Through the efforts of K2BJS, NYSS has been reorganized. Jack is the new manager and reports that during March 16 sessions were held with 95 QNI and 80 pieces of traffic handled. We sure are proud to have you as our new RM, Jack, and congrats on making BPL again. CFU did a fine job in the recent F.M.T. Warren had an average error of 40.5 parts per million in three measurements. K2BPU is active on 144 Mc. KN2LRE is new in Yonkers. K2EOQ is going full blast on 144 Mc. with a 522 and a sixteen-element beam. AWQ traded his Viking II for a Gonet Communicator which is being used for mobile. K2AVZ has a 522 fired up on 144 Mc. and says the Mount Kisco gang will join him soon. The Armonk Boy Scout Merit Badge Show was a big success. The bouquets go to K2s GJC, GZM, and KN2HRQ. New in Katonah is KN2LPN. The gang is in hopes that Terry will be a contest man and win the Novice Roundup so that for the Eastern New York title will remain in South Salem for the third year. If you are interested in knowing the location of a radio club near your home, please drop a postcard to the SCM for information. K2HQJ, manager of the MHT, reports that net members would like to purchase some 3716-ke. crystals from former members who have no further use for them. NZE is general chairman for the SARA Field Day activity. MHE was appointed Field Day chairman for the IBM Radio Club. The Crystal Radio Club held its twenty-fourth annual dinner dance on April 16th, at the Silver Pheasant Inn located in Pearl River. The affair was a huge success. Traffic: (Mar.) K2BJS 712, EOQ 22, EHI 15, W2EFU 11, CFU 6. (Feb.) K2BJS 601.

NEW YORK CITY AND LONG ISLAND — SCM, Carleton L. Coleman, W2YBT — Asst. SCM: Harry J. Dannels, 2TUK. SEC: ZAI. PAM: JZX. RMs: VNJ and LPJ. ZAI reports another successful 10-meter hidden transmitter hunt in Nassau with 23 mobiles and 2 fixed stations participating. The Nassau 2-meter mobiles also enjoy hidden transmitter hunts and plan regular hunts every month. VNJ reminds all of the NLT Net on 3710 kc. Vic also requests amateur in N. Y. C., Brooklyn, and Queens interested in the N. Y. State RACES program to contact him. KEB, KFV, and LPJ once again made BPL, BTL and CRZ are active on 75 meters. AJR is DXing on 14 and 21 Mc. WH returned from W4-Land, where he kept skeds with the local gang. JPB/6 will be heard shortly on 20 and 40 meters. OBE has s.s.b. 75 running. IRY has returned to 2 meters. We regret to report that CHK and VQY have joined the Silent Keys. K2s LUB and LYD are new members on the Lake Success RC. QBS now signs 3BRG from State College, Pa. GG has 10A s.s.b. exciter on 20 meters. NYURC membership has doubled and the traffic total is climbing. K2HDD's traffic score is on the rise. IVS is replacing the old automatic key with a new electronic model. GPQ is building a 100-wattter for 2 meters. The newly-

(Continued on page 98)

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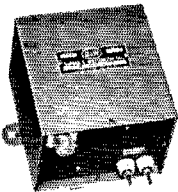
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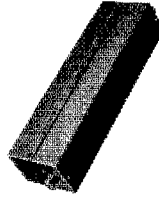
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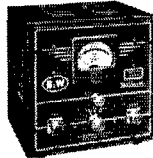
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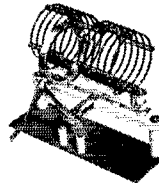
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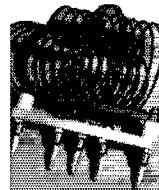
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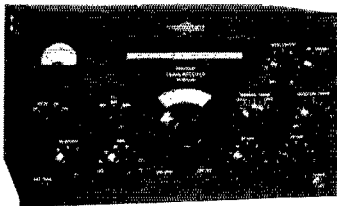
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formed Fieldstone HSRC has chosen K2GHS, pres.; KN2KVV, secy.; and K2HSZ, trustee. PF reports the Radio Club of Brooklyn is off to a good start in '55. AZS returned to the air after five months without a receiver. K2CMV is now interested in hi-fi but found time to add 8 new countries in the DX Contest. Watch your cycles, fellows and gals, 8 NYC-TI stations made Class 1 Observer and 3 made Class II in the recent ARRL F.M.T. K2ICU is building a new 813 rig but his 25-watt rig snagged 45 states and 15 countries before retiring. K2GGG is on the air with 100 watts. LGK would appreciate acknowledgment from those copying his ARRL bulletin transmissions. KN2LAG and OHV are new members of the NYRC. New members of the Fordham RC, which now boasts more than 90 members, are CWI, K2s IFE, 1FAL, KN2s KPG, LDO, and 1BZH. K2AMP is completing a 13-watt emergency rig. The Eastern Suffolk RC now has more than 30 members with K2EC, pres.; K2EGY, vice-pres.; KDN, treas.; R. Grooms, rec. secy.; K2ASB, corr. secy.; 5SZF/2, act. chairman. K2GXL needs a QSL from one of his many Arizona contacts to complete WAS. KN2KTP, active on 144 Mc. with a Communicator, now has ART-1 for other bands. The Levittown RC school program helped KN2s KMC, KMY, KNC, KNF, RRJ, KSE, and LCP on their way. Looks like lots of Field Day help for the club! Speaking of Field Day, gang, if you can't get out with a club or non-club group, give the boys and gals in the field a contact from your home station or mobile. See you in the Field Day and V.H.F. Contests. Traffic: (Mar.) W2KBE 990, KFY 826, LPJ 646, VNJ 454, DSC 156, JOA 156, OMD 140, MUM 124, K2HID 91, AMP 69, ABW 59, W2JVS 29, K2CRH 23, W2OBU 18, GPQ 14, K2GHS 12, W2GP 9, IN 9, AZS 8, PF 8, EC 5, K2CMV 2, W2ENW 2, JGV 1, (Feb.) W2CG 36, K2HID 33, W2LKG 16, GPQ 12, GP 7, JGV 3.

NORTHERN NEW JERSEY — SCM, Lloyd H. Manamon, W2VQR — SEC: IIN, PAM: CGS, RMs: NKD, CGG, and EAS. OGP is act. mgr. of the State Line Radio Club and chairman of his local civil defense communications committee. Plans are being made by the club for RACES activity in Upper Saddle River. This Club is 100 per cent ARRL and its officers are YVP, pres.; K2GSF, secy.-treas.; OGP, vice-pres. and act. mgr. LQP has made WAS on 3.5 Mc. Although he does not have much time for hamming his DX count is up to 57. The Irvington Radio Amateur Club is forming a YLRL branch. IQP, pres. of the NYC branch of the YLRL, is lending a helping hand in the organization of this important activity. AYP was speaker at the Apr. 4th meeting. His subject was "Operating an Amateur Radio Station." I personally think more of us should review this worthy subject. The Garden State Amateur Radio Assn. had John Van Dayne, eng. sect. mgr. in charge of color TV at Westinghouse, give a lecture on color television followed by an active demonstration where the members viewed a commercial program in color. The Club now meets at McGuire's Grove, Rt. 35, Middletown, the 2nd and 4th Wed. A very interesting program is promised on every meeting night so come on over, gang, there is no charge for admission. Thanks to K2GLS and all the others who responded to our appeal for the QTH of KN2JLQ. GTK has a new jr. operator, a boy, K2DOX is working on a new 250-watt final. K2CCI and K2EKU contemplate taking a portable rig on their high school senior class trip to Washington, D. C. K2GRU has started on a new kw, all-band rig. K2ETT is on 40 meters with 80 watts. K2CZX is on 20-, 40-, and 80-meter c.w. with a 250-watt rig. K2EKO is hard at work on a new mobile rig. KN2KLR is a new station in Teaneck. ZYM and his XYL, K2CYU are on a Florida vacation. K2GBP, new president of the Bogota Radio Club, advises the membership now totals 25, and meeting nights are the 2nd and 4th Tue. See GBP for further details. YVP has been discharged from the Navy. We would like to have him back as an OO. Please drop the SCM a line. N1Y keeps weekly skeds with IUYX of Longmeadow, Mass., formerly 2YOB of Teaneck. KN2KHZ is doing fine with his 65 watts on 3.7 Mc.; so far he has 17 states confirmed with a total of 23 worked. Thanks for the note, Dave, and let's hear from you regularly. NLN is a new member of the Windblowers V.I.F. Society. K2CMB is working hard to get his trailer "Windy," in shape for Field Day. K2EQP reports heavy traffic for March. VPL was guest speaker at the April 11th meeting of the Raritan Bay Radio Amateur Club. OGU has his sixteen-element beam up on 144 Mc. ACL, from Perth Amboy, is a new member of the RBRA. K2HXP received his General Class ticket Apr. 1st. JGP is finishing the construction and installation of RACES units in West Orange. K2DSW has just finished building up the Ranger kit, and is getting out FB with it. N1E has a new 20A s.s.b. exciter. GUM has a new Ranger on the air. LJR is back on the air. Traffic: K2GFX 94, EQP 49, DSU 48, BWQ 38, W2FPM 26, CFB 10, OUS 10, YVQ 4, CJX 2, CVW 2, N1Y 2.

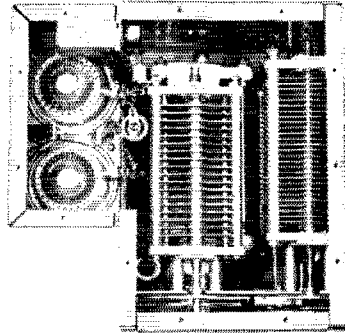
MIDWEST DIVISION

IOWA — SCM, William G. Davis, W0PP — SQE reports that he now is conducting code classes for beginners at the high school radio club. RYT reports that he now is SVQC at Marlette, Mich. QVA reports that UCE is now at Kellogg. PKT is building a Ranger kit, YKS has moved

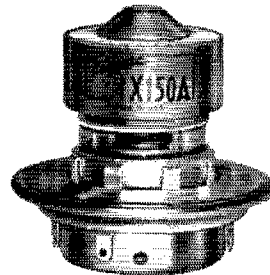
(Continued on page 100)

Collins versatile KWS-1 transmitter uses pair of Eimac 4X150A's in power amplifier...

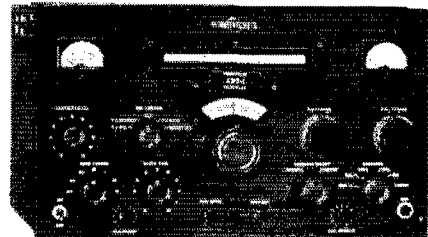
Another success in its history of communication equipment accomplishments has been realized by Collins Radio Company with the new KWS-1, one kilowatt amateur radio transmitter. Designed for versatility as well as reliability and top performance, the KWS-1 has a power input of one kilowatt peak envelope power on SSB, one kilowatt on CW and equivalent to one kilowatt AM when received on narrow-bandwidth receiver. Its frequency range from 3.5 to 30mc covers the 80, 40, 20, 15, 11 and 10 meter amateur bands. The modern engineering approach taken by Collins combines outstanding electrical characteristics with uncrowded physical compactness. The KWS-1 exciter and amplifier are housed in a single receiver-size cabinet suitable for placing on the operating desk or power supply cabinet. A pair of easily driven Eimac 4X150A radial-beam power tetrodes in Eimac 4X150A air system sockets are used in the final amplifier. In the words of Collins, Eimac-developed 4X150A's were selected "because of their superior performance as linear amplifiers, their small size and lower plate voltage requirements."



Top view of one kilowatt linear amplifier section of Collins KWS-1 single sideband, CW and AM transmitter, showing pair of Eimac 4X150A's.



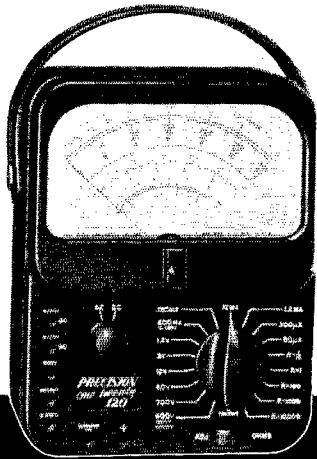
Eimac 4X150A radial-beam power tetrode and air system socket.



The exciter and power amplifier of Collins KWS-1 transmitter are housed in small, compact receiver-size cabinet.

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to Des Moines, KJV has a new SX-96, and LJW has a new HQ-140X on order. He also reports the following Novices in Burlington: KN0AFE, AFN, and AID. CQL is back on TLCN after an 18-month absence. UTD lost his Heathkit transmitter in a fire. PAN reports that he's getting a kick out of the traffic game. A new call in Jessup is KN0AGK. RQA has his General Class license. 9BQC/0 was elected president and trustee of the Luther College ham station and club. PRF has a class waiting for the RI's next visit and also is winding up another class for Novices. The Iowa 160-meter picnic is scheduled for June 19th at Charles City. New Novices in the Davenport Club are WN0s ZYK, ZYL, YCH, ZYE, ZYC, and KN0s AAK and AAL. These are the result of HMM's classes. Traffic: W0SCA 1230, BDR 1146, CZ 301, EHH 132, LJW 110, SQE 69, QVA 67, BLH 40, KJV 30, NGS 24, LFZ 21, LGG 21, PAN 21, PUR 9, HWU 8, RMG 8, W9BCQ/0 1, W0FDM 1.

KANSAS—SCM, Earl N. Johnston, W0ICV.—SEC: PAH, RM: KXL/NIY, PAM; FNS. A new club known as the Kaw-Blue Radio Club has been organized in Manhattan with PAH as pres.; CVB, vice-pres., and treas.; QVO, secy.; and NFX, act. mgr. At the annual banquet of the WARC in February certificates were presented to three outstanding amateurs in Wichita for 1954—YZB as the outstanding c.w. amateur, BVQ as the outstanding phone amateur, and MXB as the outstanding all-around amateur. The Radio Club of Leavenworth High, YVV, has one General Class and four Novice members. The Boot Hill Amateur Radio Club of Dodge City has received its ARRL affiliation charter. The CKRC of Salina will hold its 7th Annual Hamfest June 5th at the usual place in Kenmore Park with prizes and activities as usual. JFE has moved (2 meters and all) to Eldorado. KN0ADV, a new station in Eldorado, is on with Heathkit receiver, Q-multiplier, 1625, and Windom antenna. ADV's father-in-law is SAF and QGB is his brother-in-law. WN0ZNO and ZNP are new hams in Linn (Arno's QTH). YTR's YL is now KN0ABM. LOW now has the Johnson mobile transmitter kit his XYL gave him for Christmas on the air. Lookee! A new record has been set for traffic reports this month, thanks to you fellows. Traffic: (Mar.) W0BLI 526, K0FDL 516, W0OHJ 380, NIY 294, UAT 223, FEO/0 165, MFX 113, LOR 98, ABJ 66, ONF 52, FNS 51, FDJ 42, NFG 41, LOW 36, SVE 34, EOT 33, LBJ 29, LCQ 29, REP 29, VFC 28, NLV 27, ECD 26, SQX 26, ICV 24, LQX 24, LOW 23, SAF 18, KXB 15, UML 15, YJU 15, K0NAB 14, W0KRZ 13, KSY 13, TNA 9, QGG 7, IYF/0 6, LIX 6, YFE 5, YVM 5, DEL 4, PAH 4, WWR 1. (Feb.) W0OHJ 385, WXT 46, LCQ 29, LOW 23, ONF 17, SQX 16, UML 15.

MISSOURI—SCM, James W. Hoover, W0GEP.—SEC: VRF, PAM: BVL, RM: OUD and QXO. The MON evening session is back to 7:00 p.m. again. BUL was retained as net manager of MEN for another year. The Northwest St. Louis Radio Club held an emergency drill on Mar. 2nd in Normandy. Twenty-three participated with 7 mobiles and several fixed stations. GCL is back on the air with an 813 on all bands. SUV has a new speech clipper. WAP was on vacation in Amarillo, Tex. CPI attended a hamfest in Eureka Springs, Ark. HARC, Kansas City, held a Novice meeting with 48 in attendance. KN0AEU organized the meeting. EBE received his 2500 Traffickers Club certificate. SAK will undergo an operation at the Mayo Clinic. VTF received an ORS appointment. GAR's traffic dropped because of severe line noise. VTF is publishing *MONews* for distribution to regular net members. MON members received station location maps from SAK. TSZ is now running 300 watts. QMF is mobile on 2 meters. The Bandhoppers Radio Club is building ten 6-meter transmitter-receivers for 110 and 6-volt operation. ZXX is currently installing radar equipment for CAA in St. Louis. HUQ, EC for Kolla, is moving to the West. WPS is Chief of Communications and Radio Officer for St. Louis County Civil Defense. Traffic: (Mar.) W0CPI 1137, K0FBO 462, W0BYL 223, GAR 203, SAK 147, SUV 132, GBJ 128, VPQ 108, IIR 101, OMM 100, RTO 86, WAF 65, CKQ 64, QUD 63, VTF 59, KIX 49, HUI 44, VTW 38, EBE 25, QXO 18, BUL 17, GEP 13, KAI 12, RCV 10, QMF 7, MFB 6, VFP 4. (Feb.) W0QXO 6.

NEBRASKA—SCM, Floyd B. Campbell, W0CBH—Asst. SCM, Tom Boydston, 0VYX, SEC: JDJ. New ECs are DQN Potter, UFZ Alliance, VQR Scottsbluff (replacing JHI who went to Sterling, Colo.), MTI Kimball, UOB Sidney. WPB is on the air with S-38C and HT-17. Western Nebraska ECs are holding rag-chews and general discussions on 3977 kc. on Sun. with hopes of getting an EC Net going. New Novices from Scottsbluff: KN0AKB using a Heathkit HRO-50, KN0AUV with Heathkit HQ-140; KN0AKW with Globe Scout Hallcrafters receiver. RHL is using an 807 on 80 and 40 meters. YHN is working a lot of 2-meter DX. YUF is on 2 meters. CSW is on 80-, 40-, and 20-meter phone regularly. FLA is holding code practice for Crete Amateur Radio Club prospectives. BEA and AQQ can certainly be heard on 80 meters. BTB is cameraman at KOLN-TV. New officers for the Lincoln Amateur Radio Club are FTR, pres., BXX, secy. RNH finally got a Nevada QSL but lacks Vermont for WAS. RMO reports a new jr. operator; SZL and LZL each report new YL. LDP is NCS for the 160-meter Net, operating on 1987 kc. The 75-meter Phone Net had 53 QNIs for January, 56 for February, 48

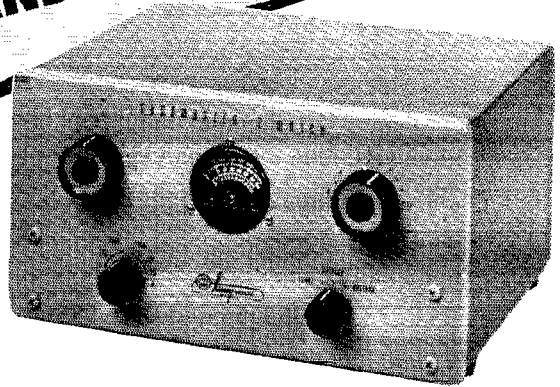
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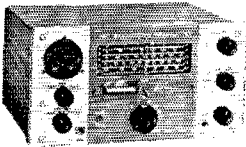
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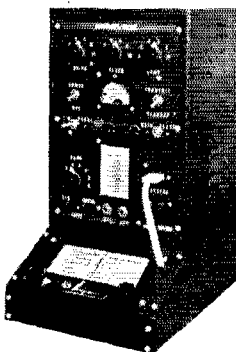
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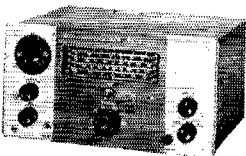
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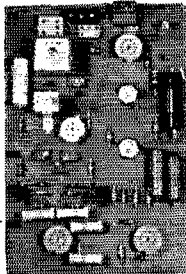
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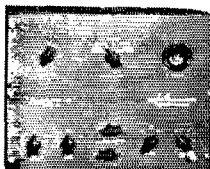


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for March. RIG is on with a cw. rig, Heathkit VFO, 173 receiver. ODB is on c.w. after a long time. Now is the time to make plans for the Midwest Division Convention to be held in Omaha, Neb., Oct. 22-23. Traffic: WGRDN 266, RNH 206, ZIE 178, DDT 77, AEM 70, FQB 60, KDW 51, HTA 44, K9WBF 44, W9HTQ 34, RIN 25, VYX 23, QM1Y 20, ORW 18, MAG 15, FMV 14, FXH 14, DDP 13, BEA 12, CBH 11, EGO 10, GDZ 10, COX 10, BOQ 8, K9FBD 8, W9SQA 7, GVA 6, KLB 6, KVM 6, QHG 6, QMZ 6, THX 6, FRS 5, DQN 4, NIK 3, PZH 3, FJV 2, NIS 2, NHT 2, POL 2, PQT 1, PUT 1, RJQ 1. (Feb.) W9DQN 3.

NEW ENGLAND DIVISION

CONNECTICUT — SCM, Milton E. Chaffee, W1EFW — SEC; LKF, PAM; LWW, RM; KYQ, MCN and CN 3640 (0645 and 1845), CPN 3880 (1830), CTN 3640 (Sun, 0900), CEN 29,580 kc. Traffic totaled higher this month on CN when they handled 237 in 26 sessions. QNI leaders: KYQ, RGB, and LV, MCN also had a better month, moving 151 in 26 sessions, with QNI honors to IBE, RGB, and LV. CTN needs more attention and will welcome more QNI stations. Even so, RFJ reports they handled 10 in 3 sessions. OO reports were made by GIX, RFC, VW, and BYB, WHO has a beam hooked to his Ranger and is scouting DX. ULY reports the HCARA enjoyed Johnson Chief Eng. WEDX as a speaker March 18th. WHL reports the Hamden Club is active with a facsimile talk by AYC. Cementing their liaison with c.d. a new group, the Bridgeport Radio Amateur Civil Emergency Society (BRACES), has been formed according to EJJ, the new EC there. New Novice EIW is the XYL of DML at Bridgeport. ECs note: The new QTH for LKF is 1853 Main, Newington. RFC is the new OO. APA renewed ORS and OPS appointments, while VW renewed OPS and OO. ZKQ received his General Class license. TD continues his OBS schedule on 146 Mc. TYQ is active on CN and MCN. CUB is sporting a new rig and EOB has new p.p. 813 final. JAO and son YUP are building new equipment to maintain schedules. CTB is busy with TV. BFS is ready to quit for TV. FLQ still is poking at 50 Mc. CJD has a new portable rig. The Middlesex Club has a new call, EDH. BDI presided at the CN/CPN dinner at Cheshire Mar. 26th, where DBM was guest and reported on the c.d. meeting at New York the same day. The meeting was attended by 53, who hashed over traffic and similar topics. Your SCM apologizes for missing it. EVC is the new call of the Southington Club. RQJ has forsaken a.m. and is having fun on s.s.b. DEK is the new Southbury EC. YNC has increased power and activity on CN. Don't forget annual renewal of your appointments. Traffic: (Mar.) W1YBH 146, CUH 143, NJM 137, LV 133, AW 122, KYQ 93, RGB 93, EFV 83, YYM 78, UED 75, HYF 69, LIG 65, ZDX 55, RRE 39, RFJ 34, BDI 29, AYC 26, BVB 26, EDA 24, KV 16, ULY 15, GIX 14, YNC 9, CJD 7, SJ 3. (Feb.) W1WHL 11.

MAINE — SCM election in progress. — SEC: TVB, PAM; WRZ, RM; OHT. The Sea Gull Net is off for the summer. The Barnyard and Pine Tree Nets will continue regular skeds but on DST. We have a new SEC. Chet kindly consented to take over from BYK, who was sadly overloaded with c.d. work. Chet's first mission was a trip to New York and an FCDA meeting. SIN is going to Alaska to work. QIH has been promoted and IOK has his job in the CMP Co. JTH is working for WRDO as an engineer.

Members of the section will be saddened to learn of the death of Bernard Seamon, W1AFT, on April 27th. Sympathy is extended to family and friends in this loss. We present herewith his last report.

TWR and AWN both are home from the hospital after surgery. BOK is recovering from an automobile accident. LHA is back from his cruise in southern waters. AMR is winding up work in Florida and returning to his Edgecomb estate. PS is working at the weather station high atop Mt. Washington and can be heard on 10 meters ground wave. After many years at Houlton, AEK has been transferred to Springfield, Mass. K2HBB, who is the operator at K1FCT, Dow AFB, recently visited WTG in Augusta. As my appointment as SCM expired on April 16, this may be my last report to you. At this time I want to sincerely thank all of you for the privilege of serving you and for your fine cooperation. A low bow to the amateurs who have assisted me in the offices of SEC, BYK and TVB; of PAM, BTY and WRZ; and of RM, LKP and OHT. Well done, gentlemen. Traffic: W1WTG 124, ZME 85, LKP 75, YVW 57, LYR 46, UDD 44, EFR 31, BX 22, AFT 18, BTY 18, NXX 9, UZR 8, WRZ 7, YVN 5, TKE 3.

EASTERN MASSACHUSETTS — SCM, Frank L. Baker, jr., W1ALP — New appointments: BFV Wrentham, KT Georgetown, DPO Chatham, AKN Sandwich, HSN Stoughton as ECs; AVY as OBS. Appointments endorsed: AWO Wenham, DDC Ayer, VIN Carlisle, RUU Easton, MKX Lowell, PAN Billerica, TVD Andover, DWY Beverly, JJJ National Guard Emergency Comm. Plan as ECs; JOJ and SPL as OBSs; JOJ as OES; WSN, QLT, and JJJ as ORSs; IIM and SCS as OPSs; WK and NF as OOs. ULJ is Sector Radio Officer for Sector 2B. The Hingham Radio Club elected AYG, pres.; WSH, vice-pres.; ONV, (Continued on page 104)

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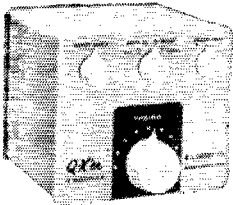
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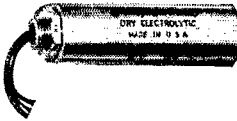
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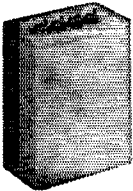
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secy.-treas.; VM, DMS, MD, AFR, and 4VXD, planning board. The Satuit Amateur Radio Club elected ZZZ, pres.; LCK, vice-pres.; YTA, secy.-treas. K2CBD is going to Greenland. The following took part in the February F.M.T.: BGW, CLF, MKW, THO, GDI, JNX, and TF3CJ/I. Heard on 2 meters: ARF, QCC, GYQ, LJJ, VKE, KXP, BJT, VXW, IPE, YRD, DYE, and CHS. On 10 meters: ADD, RRU, RUG, and CZB. Heard on 75 meters: TVC, ASN, TOP, VIW, LAO, and DPV. PIW has Key Jack modulator on 10 meters. QMU has the receiver going again. SXD will be on 2 and 6 meters with an 829. EK will be on 10 meters. RM has a 90-ft. aluminum mast for 2 meters. OOP has the beam pointed at DEO in Maine on 2 meters. LMU is on 10-15 meters with low power. The Scituat gang will be on 2 meters for c.d. work. YTA has an ARC-5 2-meter receiver and is on 40-80-meter c.w. NHH, now in Sharon, is on 40-meter c.w. PVJ is back on the air. AJU will be on 2 meters. Director Keating of Sector 1B called for a test and the following were on: KWD, DW, EKG, FWS, SH, QKY, GKN, VPR, TYN, CLF, HSN, WUV, LOS, MLJ, NGO, ALP, and MME. SC8 has had 500 contacts in the YL-OM Contest and she and IIM built a Ranger for a driver for the kw. on 20-75 meters. WN1BUR is a new ham in Chestnut Hill. The Brookline Amateur Radio Society and the Seacoast Amateur Radio Club now are affiliated with ARRL. AKN is on 2 meters with a Gonset and has a Viking and TBS-50C. The Wellesley Amateur Radio Assn. held a meeting with SX giving a talk on s.s.b. The South Eastern Mass. ARA has the call AEC in memory of Kenneth Dyer. HPH has a new HQ-140. BMQ has a new Elmac transmitter. AZU is putting up a rhombic antenna. AKC is Radio Officer for Carlisle. WXC has a new rig on 10 meters with a three-element beam on a 63-ft. tower. A new radio club has been formed in Littleton with a net on Wed. at 8 p.m. on 28,800 kc. Members are ODO, BAE, BVJ, QEY, QPU, BDM, WNO, IBY, TRD, CAN, MFF, SPU, KXP, PMZ, VQC, YXN, ZXE, ZML, UXX, VZL, SJC, NCO, WNP, ZNE, WME, UYK, DRY, WNR, WXC, ZVJ, BFA, BOI, CAM, 3PRS, K2CBD, 4GBE, 3TMV, BPR, and DEJ. ONK, QNC, and PMZ are working DX on 10 meters. TNO/1, on the summit of Mt. Washington, puts a nice signal into the Boston Area on 2 and 10 meters. WNP has a Viking Ranger. WNR is building an 813 rig for 10 and 75 meters. YYI has 800 watts on 75-meter s.s.b. Winthrop's drill had the following on: TTH, BOX, DQF, BDU, CMW, DEL, DJ, OIR, DLY, DPN, DRP, DUU, HFF, MQB, ZVO, NAMX, QA, TEO, BB, and EAJ. RVU reports that Easton has a TBS-50 and S40-B, 3 Gonsets, and a 500-watt generator. RUU has been on 75-meter s.s.b. and 2 meters. WNICFF has 39 states on 40 and 80 meters with 30 watts. The South Shore Club had WGM give a talk on mobile rigs. Ed Tilton spoke at the Framingham and South Shore Clubs. MEG has a 75A-2 receiver. TUI is operator at KH6AJF. Area 1 Radio Comm. held a meeting with BL, KTG, DFS, ZYX, TQP, ALP, QQL, DWT, and LN present. DPO is on 2 meters with a twelve-element beam. VFB, in Brockton, is on 10 meters at the new QTH. ABJ is on 20-meter 'phone. Mr. Carroll, the c.d. director, gave a talk at a special meeting of the Brintree Club in the new quarters at the Old Library Bldg. IBE has a new antenna for 75 meters. MX is on 2 meters. UE has a 522 on 2 meters. Radio Amateur Open House held a meeting. BWL, Attleboro EC, sent his certificate in for endorsement. Traffic: (Mar.) W1EMG 401, UKO 288, LM 165, EPE 74, IBE 55, NUP 54, SS 49, UE 40, AVY 32, TY 27, BY 9, ABJ 6, DUO/TYN 4, QLT 4, QJB 2, ZNQ 2, (Feb.) W1QLT 1, (Jan.) W1MX 2, (Dec.) W1BE 273, MX 18.

WESTERN MASSACHUSETTS—SCM, Osborne B. McKeraghan, W1HRV—SEC: RRX. RM: BVR. ZAM: QWJ. The WM C.V. Net meets on 3560 kc. Mon. through Sat. at 1900 EST. WMN continues to roll along very well. RM BVR and Asst. DVW did a splendid job on the net bulletin. Fine comments were received from all who read it. AJX worked portable from the High School Science Fair and won first award. He also is sponsoring an ARRL exhibit. The new EC for Pittsfield is BKG. HRV and MNG enjoyed the fine dinner meeting of the Pittsfield Club April 4th. New England Division Director Rand gave a very interesting talk on his questionnaire. New Novices are DWA and EJA. QPB is back on the air after a long layoff with s.s.b. LHY also resumes activity with a Viking II. The South Hadley C.D. Net has 7 active members on 29,620 kc. Sun. mornings. RLQ and QCC sent in very fine F.M.T. reports. EDV is a new ham in Westfield. ARA has acquired a Johnson Adventurer for summer camp. There is a new 20-meter three-element beam at NPL. COJ picked up some new countries in the DX Contest with his rhombics. Trustee BDV, of Northbridge High School Radio Club, reports it is a small club but growing with activity and interest high. The club station is ZPJ; YHU is president. The members appeared on a WWOR-TV program with modern home-built ham equipment and 1920 model rig and receiver owned by BDV, which created much interest. SPF reports c.d. nets are active in Worcester with good attendance. SEC RRX attended the New York meeting on the Area C.D. Test. TVJ is finding time from school work to get back on the traffic nets as well as doing a good job as OO. Traffic: W1HRV 127, BVR 116, MNG 83, ABD 76, DVW 72, AMI 23, AJX 18, YCG 11, TVJ 7.

(Continued on page 106)

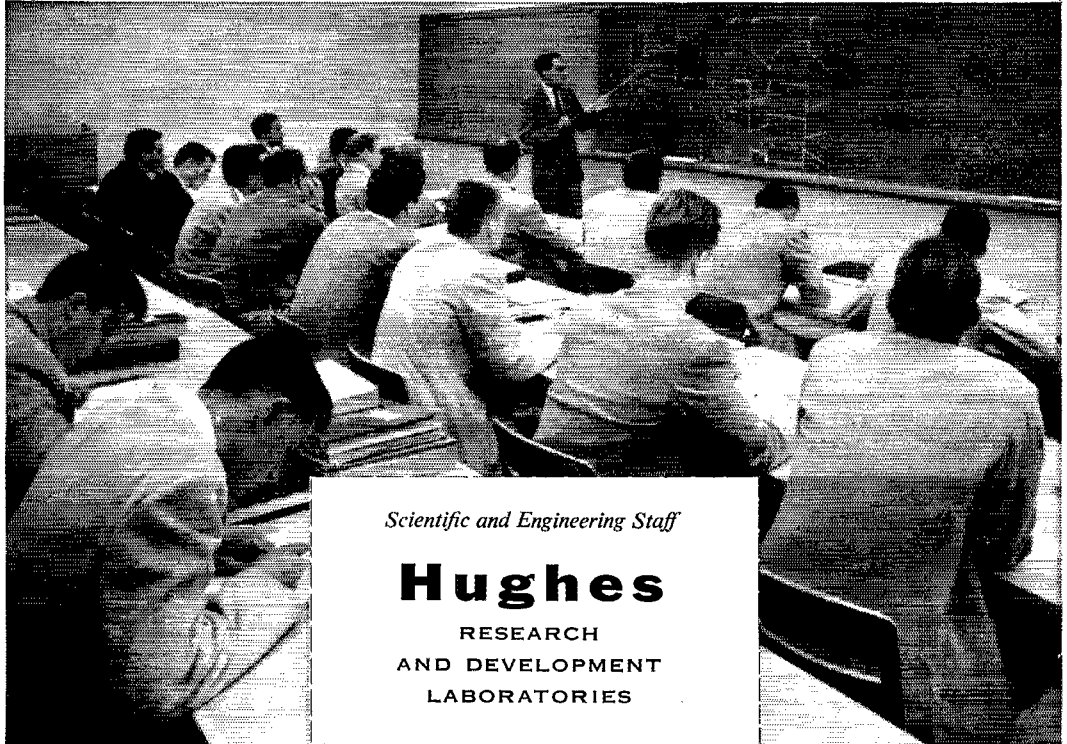
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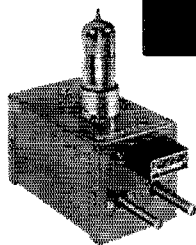
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NEW HAMPSHIRE — SCM, Harold J. Preble, W1HS — SEC: BXU, RM: CRW, PAM: AXL, Officers of the Port City Radio Club are JWJ, pres.; TWP, vice-pres.; YGV, treas.; YSU, secy. ZFP is the proud pop of a new jr. operator born Mar. 28th. QKK now is employed in the engineering dept. of Evans Radio. VE3IG was the first Canadian to earn WNH. WBM is now Stratford Co. EC. Congratulations to FZ's jr. operator Rick, now N1DYZ. YHI is on the air with 600-watt phone. TWP is working a terrific amount of rare DX. Applications for membership in the Concord Brasspounders are available from JNC or ZFP. It's good to hear GMH back on the air. YSU had a get-together at his QTH with LMD, CNR, TWP, TDV, IFT, and their XYLE. YGA has completed a new rig for 75 meters which sounds terrific. TDV is busy teaching radio. SSK has a new walkie-talkie of 10 meters. ZYK is on 2 meters. KPD's gallon really snows them on 75 meters. The NHN needs stations in Keene, Manchester, and Nashua. Welcome to Novices DAE, DEN, DFM, DFN, DHZ, DIN, DPP, DYE, and DYJ. BVM now is K4BHB, UCS now is W5IUF, ZNJ now is K2JZH, and ZNX now is K6HZP. PTB is active in c.d. communications. ZIW is a new voice on 10 meters. EAL has a potent signal on 75-meter phone. Traffic: W1ARR 160, CQC 37, IP 30, GMH 26, YHI 26, CDX 13, HS 11, FZ 5, WBM 4.

RHODE ISLAND — SCM, Walter B. Hanson, jr., W1KKR — SEC: TQW, RM: BTV, PAM: VXC. More than 15 new EC appointments and definite tie-in between AREC and RACES stations were made by TQW for the April 30th RACES test. Over 500 test messages were prepared. All sections of the State were covered and results should be revealing. VXC announces a new net on 29,260 kc. at 7:30 p. m. Mon. through Fri. Here's a chance to qualify for that OPS appointment. Your SCM visited the club at Mount Saint Charles Academy with SEC and BTV and ZXA. UTA is teaching a fine group of hams-to-be there. Also KKR, TQW, BTV, and ZFG visited DDD in Woonsocket and found the boys there making plans to affiliate with ARRL and join in with c.d. work. Your SCM finds that there is some confusion throughout the section with regard to RACES, AREC, and c.d. communications. It is for the best interest of the individual to acquaint himself with the existing set-up in his community. Some cities and towns have not taken initial steps to assure themselves of emergency communications. You can help your local c.d. people. Either KKR, NZR, or TQW will be glad to offer advice. Traffic: W1BXN 107, UTA 78, BTV 46, ZXA 43, VXC 21, CMH 18.

VERMONT — SCM, Robert L. Scott, W1RNA — House bill 285, license plates, still is in the house committee at this writing. Twenty-five hams met with the Committee on Highway Traffic at a public hearing Mar. 30th. At latest report there seems to be a fifty-fifty chance of coming out with a favorable report. The BARC and MARC are co-sponsoring the 4th International Field Day and Vermont Hamfest, Sun. 4th 12th, at Bayside, Malletts Bay, 7 miles north of Burlington. One of the featured events is a softball game between VEs and Ws. Registration fee is 75c per person 16 years and up. Bring your own picnic lunch. If you are looking for something different in hamfests, try this. One and all are welcome. A good time is in store for all. Contact the Vermont boys for the latest dope. Traffic: W1OAK 124, AVP 72, ZEW 41, RNA 39, IT 33, VZE 30, BJP 26, TAN 9, FPS 7, KJG 5.

NORTHWESTERN DIVISION

ALASKA — SCM, Dave A. Fulton, KL7AGU — The Anchorage Amateur Radio Club voted to present an annual award to the amateur in Alaska who contributes the most to amateur radio during the year. This award will be in the form of a cup or plaque and will be awarded annually at the hamfest. Nominations for 1955 should be sent to Box 211, Anchorage, from January through March, 1956. The first award will be made at the 1956 hamfest. A mobile club has been formed in the Anchorage Area, called the Anchorage Mobile Radio Club. The purpose of this club is to provide an emergency mobile radio net for local, territorial, or national use in the event of an emergency. The mobile frequency is 3986 kc, and the club will monitor this frequency for emergency calls. Meetings are held the 2nd Thurs. of each month at the Public Library. Officers of the new club are AGU, pres.; AUV, vice-pres.; and AMS, secy-treas. Members must have mobiles.

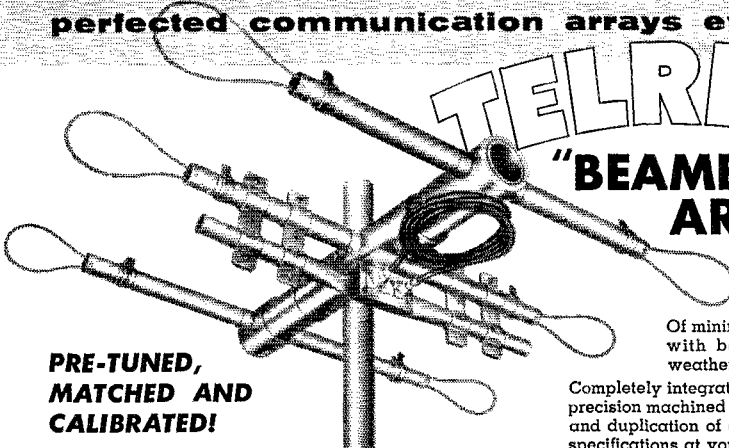
IDAHO — SCM, Alan K. Ross, W7IWU — Moyie Springs: VJK checks with RN7 at times and is rebuilding for break-in operation. Lewiston: GMC is applying for EC appointment and checks in with WARTS and American Legion Nets. Emmett: TYG reports that TPC is back in Idaho again. WN7ZEA reports that he is a charter member of the Emmett Valley Radio Club and is working on Conditional Class. Kellogg: RQG reports WHZ, HXN, and RSQ are on 144 Mc. Heyburn: We are very sorry to have to report that FT passed away on April 9th. Boise: NVO reports MARS appointed him contact station for the Governor of Idaho. New stations on 144 Mc. are OHM and RHN. Net frequency is 145.44 Mc. and 8080 crystals for SCR-522 and 6060 for ARC-4s are used. We urge all to incorporate this band for local emergency work. IWE is chairman of the

(Continued on page 108)

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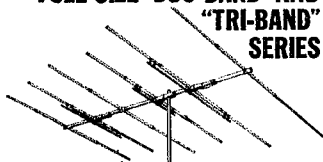
FIFTEEN METER ARRAYS

#153A	3-Element Array	"T" Transformers	110.00	AMATEUR NET
#155A	5-Element Array	and 1/2 wave	210.00	
#156A	6-Element Array	Coaxial "Baluns" included	235.00	

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10M-3	3-Element Array	"T" Transformers	67.50	AMATEUR NET
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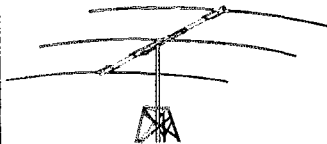
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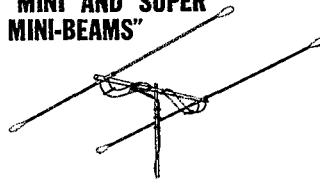


MODEL 403 Amateur Net 330.00
3-element Full Size (100% Aperture). Wt. approx. 92 lbs. Turning Radius 35½ ft.

MODEL 402 Amateur Net 275.00
2-element Full Size (100% Aperture). Wt. approx. 60 lbs. Turning Radius 33 ft.

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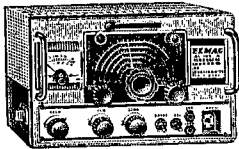
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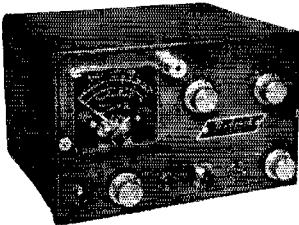
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Boise Club TVI Committee. VWS, of Gifford, visited with me while attending the YMCA Youth Legislature. Traffic: W7VJK 16, GMC 11, TYG 10, NVO 5, VWS 3.

MONTANA — SCM, Leslie E. Crouter, W7CT — The new radio club in Livingston, named Old Faithful after the Geyser in neighbouring Yellowstone Park, is showing lively activity. It is coming through in good form under the watchful eyes of KJX and FGB. RZY is cooking up big activities with a contest to see who first contacts HB9BQ, overseas honorary member of the Club. FGB puts out regular code practice on 10 meters for all interested. A dinner is scheduled along with ladies' night when all ham talk will be banned under penalty of a dime a word. LPL is revamping the shack using a rebuilt Navy rig and getting 599 reports from the West Coast. YPN is pleased with his new ticket and his voice has earned him the name, the Montana Grizzly. Billings Emergency Corps officials are planning for more activity in the Emergency Corps and will have drills and activities that should spark up a lot of new interest. OPM is about finished with his new rig. CT is very busy with his new job. Les has to travel the entire State so he plans to visit a lot of hams in person. Don't forget to send in your activities reports early each month. Traffic: (Feb.) W7MQI 28.

OREGON — SCM, Edward F. Conyngham, W7ESJ — WAT, our SEC, is changing QTH in April. APF is hunting Tennessee Valley Indians. PRA has the rig down for a general overhaul. THX and TUV are bringing lots of new life to the Astoria AREC. ADX and TH are working on new BC-669s for emergency rigs. QCCL is building a new Viking II. UZU is keeping MARS 2 meters hot. LNG is back on OSN using the club's transmitter. ZGT is not new, he is an old Oregon webfoot; the story in short is ex-3ZGT, 8PWB, F7BS, and W7AIC. BVH is back on after a California vacation. JLU will publish new OBS schedule. KAB is building new home and shack. JRU is helping new operators with building projects. QKX was elected new president of the Tualatin Valley Amateur Radio Club, with HTX as trustee of OTV. The Club is making big plans for Field Day. VBF is very active on MARS from 160 to 2 meters. New appointments issued: VJT, WLL, and UJ as OOs; THX and NFZ as OPs; APF, BDU, TIR, and BLN as ORs; WLL as OBS; NFZ as EC. Results of the February F.M.T.: PQJ top man, BUS second, WN7WKA third. Traffic: W7APF 578, BLN 127, WAT 92, QKU 76 AJN 57, ZGT, 37, WLL 32, BDU 31, ESJ 4.

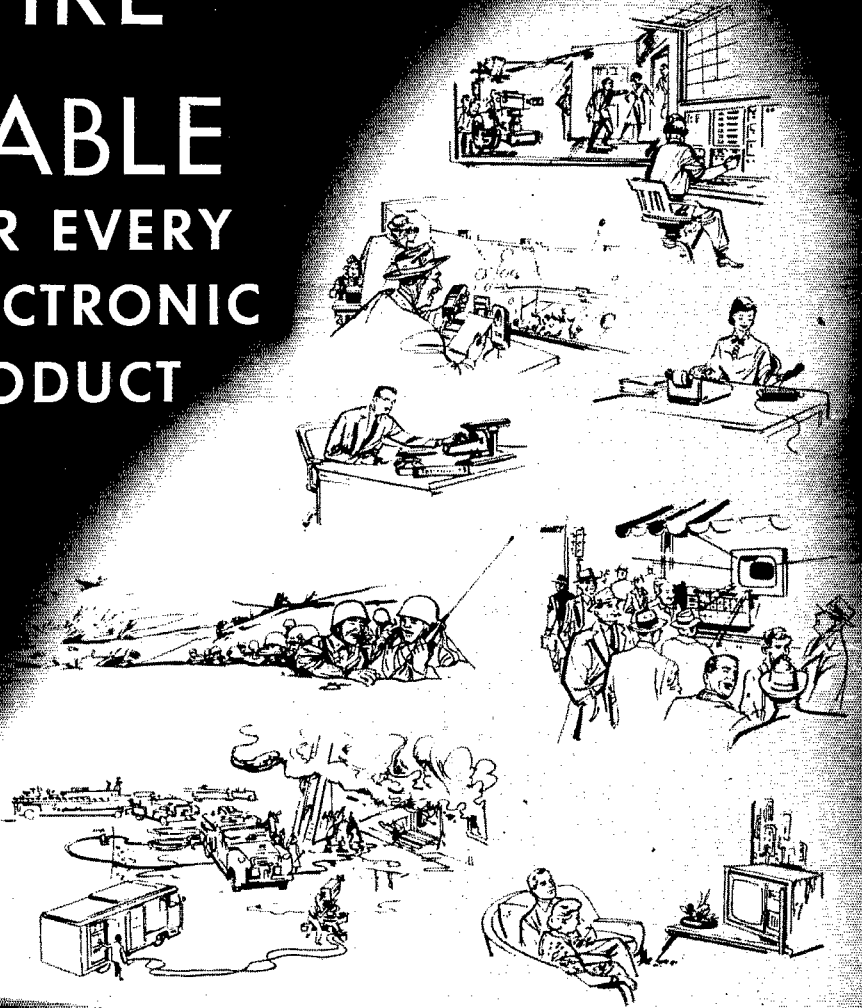
WASHINGTON — SCM, Victor S. Gish, W7FIX — VAZ is back from W4-Land. PGY lost his beam in a March wind but still had the vertical ground plane for 20 meters. VNZ, chief operator at K7FAE, gave a radio demonstration, to the Boy Scouts Mar. 26th. USO is a new ORS and NCSed WSN. K6BDF/7 is going to night school two nights a week. The Clark County Club is holding twice-weekly code classes with RML and SAP teaching. AIB is pleased with the Viking Ranger, but needs a decent ground system. ULK, now AF MARS, made 90 contacts in the YI-OM Contest and made YLCC by working daughter WN7VWU. EVW is trying to make the WARTS Net when he can get on early. PVF has a 6-foot rack and the kw. is finished — working RTTY. ULL worked KL7 on the first RTTY contact. FZB has a new antenna up. AVM now has a twin-six Gonset 2-meter beam but no time to install it. JEY is building mobile gear. UKI is a new OES on 420 Mc. HVM has twin jr. operators born Mar. 18th. The Tacoma Amateur Radio Society elected GVV, pres.; SGJ, vice-pres.; LIL, secy.-treas. UJA is QRT because of BCI. FM is getting a new mobile rig. OE has a Viking Adventurer for trips and a Ranger for the home rig. SOX still is with the USAF and is planning a visit to Seattle during the next couple of months. RCM, our SEC, mailed in his first report from ten ECs. A joint Washington-Oregon AREC drill will be held the 1st Sun. of each month at 1030 PST on 3585-kc. c.w. and 3900-kc. phone. All ECs are invited to send in their reports by radio. LVB is putting out SARC Relay for the Skagit Club. The Marysville High School Radio Club elected UKI, pres.; TWQ, secy.; VAN, treas. 6UVP wants the present QTH of MWP, formerly of Renton. CMX is building a new 20-meter beam; he also is on 2 and 15 meters. ILC is back hamming with a new Ranger. HPJ is recovering from a heart attack. JJK is Field Day chairman for the Puyallup Club. TGO is building a Field Day rig to beat them all. WN7VWH, Alice Young, made 168 contacts in 41 sections in the Novice Roundup and also worked a ZL. OIH got his gear in the living room by helping the XYL get her Novice ticket. CZY is playing around with 20 watts s.s.b. WN7YAQ has worked 40 states with parallel 1625s. Washington still needs more ECs. Traffic: (Mar.) W7PGY 829, BA 766, FRU 706, K7FAE 556, W7VAZ 155, FWD 104, OE 87, EHH 63, USO 57, K6BDF/7 52, W7RCM 49, RXH 48, UVL 40, APS 39, HKA 34, FIX 29, AIB 25, PQT 16, GVV 14, ULK 8, AMC 7, LVB 7, AHV 6, EVW 6, TGO 5, FZB 2, PVF 2, WN7YAQ 2, W7AVM 1. (Feb.) W7OE 59, WN7YAQ 2.

PACIFIC DIVISION

HAWAII — SCM, Samuel H. Lewbel, KH6AED — March was one of the busiest months for Hawaii hams. The volcano never did let up and the Hilo gang gave their all

(Continued on page 110)

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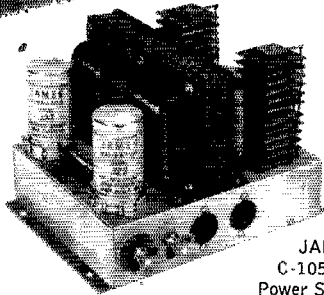
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for the c.d. 24-hour operation was the word at the eruption scene with daily traffic from there to the territorial Hq. in Honolulu. The Honolulu Amateur Radio Club adopted a new constitution and has taken a pledge to publicize ham activity in the Islands. AN is chairman of the committee. W0MXC, Minnesota SCM, visited in the Islands and attended a meeting of the Honolulu Mobile Club. This Field Day will have more KH6 clubs competing than ever before so sharpen up your gear and let's see if anyone takes over the HARC this time. Traffic: (Mar.) KH6AJF 1567, KA2GE 1394, KA2AK 857, KH6AVO 15, KH6AUTS. (Feb.) KH6AJF 2141, KR6KS 778, KA7LJ 462. (Jan.) KH6AJF 2057. (Dec.) KG6FAA 12,156, KH6AJF 4953.

NEVADA — SCM, Ray T. Warner, W7JU — SEC: WVQ. ECs: PEW, PRM, TVF, TJY, and ZT. OPSs: JUO and UPS. ORSs: MYP, PEW, and VIU. OBS: BVZ. Nevada State Frequencies: Phone, 3880 and 7268 kc.; c.w., 3660 and 7110 kc. WVQ, Las Vegas, is your new SEC. ECs: Please send your monthly reports direct to WVQ. Senate Bill No. 158 was killed in committee. Had this bill passed there would have been a definite decrease in ham activities. This bill may be rewritten and again presented at the next session of our legislature at which time we will be watching for it. WN7YNT is the YL of YCY. VIQ has moved to Henderson. YKQ is on 80 meters with an Elmac in Las Vegas. K6DAC received "Worked 25 Nevada" certificate No. 25. YAI, of Henderson, is all-band mobile. PC, of Reno, is active in the c.d. on 2 and 6 meters. JLN, of Paradise Valley, has a new 50-foot mast and will be active with an ART-13. ZT, RACES State Radio Officer, and his alternate, EJ, have an approved state plan and are now engaged in actual organizing.

SANTA CLARA VALLEY — SCM, R. Paul Tibbs. W6WGO — The newly-formed West Valley Radio Association held its fourth meeting at Campbell, Mar. 24th. John Reinartz gave demonstrations on inductance, capacitance and percentage modulation measurements. HC, Pacific Division Vice-Director, gave information on League activities. WGO outlined coming events for the Santa Clara Valley section. Officers of the Club are K6BYG, pres.; PIY, vice-pres.; GQM, secy.-treas.; EXX has a 150A working on 432 Mc. and informs us that the PAARA plans to give prizes for beating the SCCARA in Field Day this June. YHM, on a business trip to Washington, D. C., will visit West Hartford Headquarters and will listen for the gang from the West Coast at 20WK. K6BBD is busy working traffic and looking for a 14-Mc. beam to help with signals. 4YIP/6's F.M.T. results were very, very good, within 23 cycles. CBX also was good, within 44 cycles. HC reports nets on the NTS are working quite well. PAN is running smooth considering band conditions. There is need for more stations on NCN. It would help if those of you on A3-band nets would check into RN-6 to pick up traffic for delivery in your area. Stations from your nets could check in on PAN to clear your outgoing traffic east. How about it, gang? Traffic: (Mar.) W6YHM 466, W4YIP/6 443, W6ZRJ 188. HC 77, K6BBD 60, W6UTV 28, K6BAM 9. (Feb.) W6FON 90.

EAST BAY — SCM, Guy Black, W6RLB — Asst. SCM for V.H.F.: Ollie Nelson, 6MXQ. Asst. SCM for TVI Problems: Harry Cameron, 6RVC. SEC: WGM. Send all AREC applications to him at 199 Harrier Street, Vallejo. ECs: K6ERR, W6CAN, FLT, K6GK, ZZF, QDE. A select group of appointees are the Official Experimental Stations, all of whom are active on 50 Mc. or above. The OES gang consists of WGM, CAN, JZ, NDR, DOU, VSV, OHQ, SXX, MXQ, OJ, NNS, UHM, RLB, and the newest, member, K6DDT. Any other v.h.f. men interested in this fine appointment should contact your SCM at once. SXX reports hearing the 2-meter signals of K6GWE, five hundred miles out to sea on the SS *Hawaiian Kancher*. FZC has been appointed Class 1 Official Observer following his fine performance in the February Frequency Measuring Test. Both HBF and K6CCQ turn in outstanding regular monthly OO reports as prescribed by the conditions of the appointment. AKB has had two bad heart attacks recently. K6BBU is keeping the medics busy too. K6EK is active on DX with a three-element beam. CTL is back in business after a long lay-off. ORR is building a high-powered 432-Mc. rig. JHV is now located in Castro Valley. K6GK's XYL has been indisposed of late, but is back home from the hospital now. The fellows at K6FDG have been doing a pretty extensive overhaul job which has cut into their traffic totals. The Richmond Radio Club is running a contest among members to see who can build the best gear during a three-month period. The CCRC's April meeting was at the Richmond Radio Club. IBUD addressed a hastily-rounded-up bunch from the East Bay section on his way to Guam and the Far East Pacific Division Convention. VSV helped out on the program for the Pacific Division Convention. Traffic: K6WAY 954, W6IPW 187, K6FDG 155, GK 83, W6HBF 42, K6EPC 13, W6EJA 6.

SAN FRANCISCO — SCM, Walter A. Buckley, W6GGC — Asst. SCM; William T. Nakahara, 6GHL. The San Francisco Radio Club held its annual club auction at its March meeting. Club members were guests of the local telephone company, who treated 51 amateurs to dinner and toured them through the new Mission Exchange. The Sonoma County Radio Club elected the following new offi-

(Continued on page 112)

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	20 — 10	20 — 15	15 — 10	40 — 20
No. of Elements	3 El. "Shortbeam" on 20 3 El. Full Size on 10	3 El. "Shortbeam" on 20 3 El. "Shortbeam" on 15	3 El. "Shortbeam" on 15 3 El. Full Size on 10	2 El. "Shortbeam" on 40 2 El. Full Size on 20
Boom Length	16 Feet	16 Feet	12 Feet	12 Feet
Longest Element Length	16 Feet on 20 16 Feet on 10	16 Feet on 20 13 Feet on 15	13 Feet on 15 16 Feet on 10	33 Feet on 40 33 Feet on 20
Forward gain reference to full size dipole	4.8 db on 20 8.8 db on 10	4.8 db on 20 4.8 db on 15	4.8 db on 15 8.8 db on 10	4.4 db on 40 5.6 db on 20
Front to Back Ratio	20 db on 20 25 db on 10	20 db on 20 20 db on 15	20 db on 15 25 db on 10	15 db on 40 20 db on 20
Approx. Weight	30 lbs.	35 lbs.	28 lbs.	48 lbs.
Impedance match	52 ohms on both bands	52 ohms on both bands	52 ohms on both bands	52 ohms on both bands
Element Construction	61ST6 7/8"-3/4" dia. Alum. both bands	61ST6 7/8"-3/4" dia. Alum. both bands	61ST6 7/8"-3/4" dia. Alum. both bands	61ST6 1 1/4"-1 1/8" dia. Alum. both bands
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cers: OTW, pres.; K6CLV, vice-pres.; KN6HTC, secy.; KN6HWH, treas. The secretary and treasurer are the only licensed XYLs in Santa Rosa. Congratulations to both. The Mt. Tamalpais Radio Club was host to K6BJ, who gave a talk on his bag of tricks. As usual John drew a big crowd. Both JWF and GGC enjoyed meeting the fellows again. The Cathay Radio Club was extended an invitation to send a representative to the Asst. Directors' COM. and club representatives meeting in Berkeley. The HAMS is busy working on Field Day schedule and also getting the fellows on the air with 6 meters. The San Francisco Naval Shipyard Club is joining ranks with the HAMS on Field Day. The 29ers held its annual breakfast in April with approximately 40 attending. The Young Ladies Radio Club/SF sent out invitations to YLs and XYLs who have tickets to join the Club as associate members. The invitation was sent to ladies in surrounding counties. The Humboldt Radio Club has a new amateur in the club, KN6KGL. YQZ moved to Eureka from Los Angeles and also joined the club. Congratulations to SLX and his XYL on their new granddaughter. W7UQA won the booby prize at the last 29ers 10-meter transmitter hunt. The fellows were all happy to see K6ALF show up for the 29ers annual breakfast. He was in his new "suit of blue" and will be stationed at Treasure Island Navy Station until future notice. K6EGV is 6-meter mobile. AMH also is a new check-in on the net. URA is net control. SDN offers to help design and build gear at no charge. CTH is the proud owner of a new kw. Viking. FVK keeps daily skeds with his dad, JLV, on 40-meter c.w.; his mom, KN6EEE, is trying for her General Class ticket so she can get in the run. Gordon landed at the radio station at Litchfield Park, Ariz., so has nice gear to work home with. GHI finally has his Gonset beam on 20 meters. Of course K6GPX did all the installation on the beam for Bill. AWT pulled his "super vertical" down and added parasitic elements which are silver plated. GCV is asking for volunteers to help get the beam off the old QTH and on to the new one. SWP came through with a BPL total as usual. YC entered the DX Contest and worked 4 new countries. QMO holds 2 skeds daily with FEA to pick up McCan 4 traffic. Congratulations to GTY on winning the February National Contest Award. The prize was a National NC-88 and Curt now is one of four finalists in line for the grand prize of a \$1000 amateur station. Good luck, OM, LJK, who was a friend of many of the old-timers, has joined the Silent Keys. GQY reports that he's been on MARS conducting a math course, etc. PHT says "Cyn's TV" is going along fine. BIP had 250 contacts multi .107 in the DX Contest. Traffic: W6SWP 1205, GQY 206, QMO 173, GGC 53, PHT 40, BIP 4.

SACRAMENTO VALLEY — SCM, Harold L. Lucero, W6JDN — MIW, on 144 Mc., bought a Viking and will be on all bands. PIV is on 40-meter c.w. K6GDS is building a 100-watt rig. DEO is active on MARS. QDT is moving to Modesto. Luck, Tony, we will miss you. CMA, the Field Day chairman, is active on 75 and 160 meters. ASI and FW have new 20A s.s.b. unit. ATN is on s.s.b. 75 and 20 meters. JEQ is active on c.d. nets. KME has a new QTH in North Sacramento. QKJ has a new AR-88. ESZ has a new vertical and is active on MARS. CIS, after exhaustive tests with 30-foot vertical on all bands, declares it is the answer to city dwellers. ZF, active on MARS, says only a few more wires and the kw. amplifier will be ready. HTS-HSE are active in MARS, 75-meter 'phone and 80/40-meter c.w. ILZ is active daily in the Coffee Cup Net at 7 a.m. on 3880 kc. K6FR is buying a Johnson KW. QAC is now active in MARS. EII is active in the Sacramento C.D. Net. VBI is making Field Day preparations. GEC is on mobile, as is LSK. LLR is planning 2-meter operation. VYE is QRL because of business. UAF has a new receiver. K4AQQ/6 is a new ham in Susanville. K6KHZ is the new call of the Tehama County Amateur Club. TMP is on vacation. LJ is taking up golf. K6BHH joined the local guard unit to teach code. PYE is now on 500 watts. OEY is now on the air. KN6EYL and KN6JIG are trying to get on 40 meters. SBH is on 75 and 40 meters. Reports for this month were so large that the balance will follow next month, so bear with me, fellows. Last but not least, the Siskiyou County AREC Net is doing fine.

SAN JOAQUIN VALLEY — SCM, Edward L. Bewley, W6GIW — SEC: EBL, RM: K6EVM. PAM: WJF. You will notice that we have a new RM in the section. K6BGM and W6ZRJ moved to San Jose and had to give up their appointments. Doc and Ann will be missed in this section, as they both did a lot for traffic and club activities here. I hope the gang will give EVM the same support they gave Ann on CVN. Don't forget, gang, your c.w. traffic net is CVN on 3525 kc. at 1900. JZ and FYM drove from the Bay Area to attend the CVARC meeting in Turlock. Ray gave the new council a lot of help and suggestions in getting started. The Turlock gang, with the assistance of some from Modesto, furnished communications for the Junior Economy Run in Stanislaus County. Twenty-two hams participated in the operation, which gave a running account of the progress of the cars, which was broadcast over two b.c. stations. All participants agreed that it was the smoothest operation we have ever had in the County. The Fresno gang is busy with convention preparations. W6ONK reports that the 2-meter repeater for the Fresno Area should be in operation soon. Lots of new Communicators in the area are being

(Continued on page 114)

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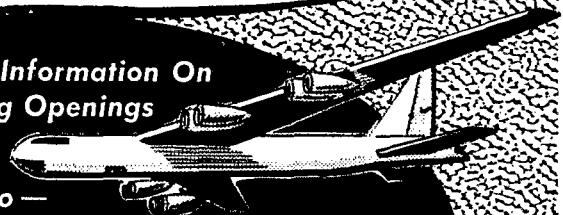
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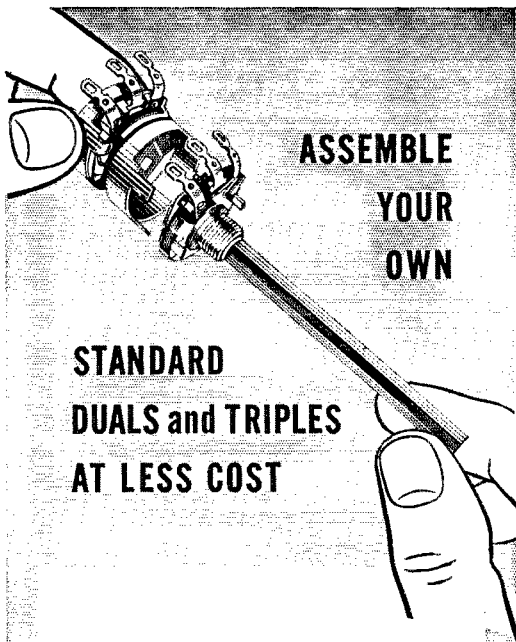
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heard on 2 meters, among them ERE, NSP, GYN, and NTV. FCC engineers from the San Francisco office, along with ATO, gave the Stockton Club a talk on TVI problems. Traffic: W6FEA 229, K6EVM 30, W6EBL 18, WJF 4.

ROANOKE DIVISION

NORTH CAROLINA—SCM, Charles H. Brydges, W4WXZ—SEC: ZG. RM: VHH. PAM: ONM. The Elizabeth City group is working on emergency equipment. Club meetings are held on the 3rd Wed. of each month. JZQ has a new c.d. generator. Everybody will be making plans for the convention to be held in Old Point Comfort, Va., Aug. 12, 13, 14. AH has new p.p. of 4-250s on 20 meters and is working lots of DX. AH has a 15-over-20 about 120 feet up. RHB has licked TVI. WDJ is working s.s.b. in Charlotte. OQQ and BVD also are working s.s.b. in the State. EJP and his XYL EJQ have antennas up and are working 20-, 40-, and 80-meter c.w. KN4AQY, in the eighth grade, is helping six of his schoolmates to get in shape for the Novice exam. PIC has a new mobile rig. Other new mobiles in Greensboro are DCI, MDD, and RFC. The Greensboro Club has an emergency program under way. Please send in reports by the first of the month. DRC is working traffic on all bands. CZR worked HR3HI on 75 meters with his 813. The Confederate Teenage Net meets on 3900 kc. Mon. through Fri. at 4:00 EST. You old-timers can check in also. AGI will be active in Winston-Salem this summer with YZC and YE from Virginia operating on c.w. and 'phone. AGI also qualified for the Old Timers Club. PIC will be on before long. You boys on 2 meters throughout the State can qualify for OES appointment. If interested, drop me a line and I will send the proper forms. RRH is working on 2-meter gear. DSO and RRH are going great guns on MARS. Traffic: W4DRC 185, ZWF 20, BUA 2, WXZ 2.

SOUTH CAROLINA—SCM, T. Hunter Wood, W4ANK—HMG reports that along with his mobile rig he has a complete BC-654 that works out nicely as a combination for emergency use. ZRH devoted 14 hours during March sending code practice and Official Bulletins on 3700 kc. ZRH begins code practice at 6:30 p.m. Mon through Fri. K4ADD works aeronautical mobile up and down the East Coast and reports many contacts. When at home he uses a 350-watt and when in his car it's a Viking transmitter. LXX reports from Florence that LXX and FGX paid a visit to 1AW. AUL, TSU, and LLH are planning high-power mobile rigs. ULH reports some damage to his 20-meter beam from high winds. VAM has a new mobile installation and is completing a kilowatt home rig. SMI is on 20-meter 'phone with 60 watts and is anxiously waiting for 10 meters to open. VOH is installing a mobile rig with the aid of AUL. NJG has moved to North Carolina. A new amateur club has been formed in Sumter with GFP, pres.; K4ANI, vice-pres.; GIT, secy. RPV reports fifty-six charter members. The South Carolina C.W. Net changed frequency to 3795 kc. on Apr. 1st and meets at 7 p.m. Mon. through Fri. Traffic: W4ZTZ 134, ANK 52, FML 52, RPV 40, KYN 14, FM 6, W9JBN/4 5.

VIRGINIA—SCM, John Carl Morgan, W4KX—This month's report must needs be done on a dead run. Ye SCM is still in the throes of breaking in at the new job and getting settled in a new QTH with all that both entail. Please note the new address on page 6, QST. Hope to have the rig back together and on the air by the time this appears in print. PFC complains that things are "slack," he handled only 1033 messages. BLR is back with a big total. Kay's been nominated for 4th district chairman at the YLRL. YZC has more than enough QSOs for DXCC, just short a few QSLs. OM YE is working on the kw. rig to keep up with Jr. KN4CAX, the third member of the family, keeps the shack humming. 3DWP says orders were cancelled so he'll continue pushing K4MC, and now is building a rig of his own. IA reports gal-chasing on both A-1 and A-3 in the YL/OM Contest. WYC reports Novice exams were given 16 of a class of 28 run by CVARC. VQZ is concentrating on the 2-meter rig. Cruises are cutting into the operating time of the Navy men, YKB, CGE, and K4BCT, among others. JUJ says he's nearing YLCC, WNH, and WANE certificates. SCM received the fine bulletin of the Alexandria RC. YHD still is boning at M.I.T. and operating IMX. Newcomers to Virginia include K4BNI and his XYL K4BNG, now in Warrenton. K4BHT (ex-ES3D, ex-K2GWY) now is on the air in Hopewell, but is having trouble with QRM from a nearby factory, and TVI. KFC still is recuperating from 87 hours in the DX Test. Vic worked HK4DP on 7 bands without prearranged skeds. The Emergency Corps Sunday Morning Net meets on 3835 kc. at 0800 EST. Traffic: W4PFC 1033, BLR 307, K4ASU 188, W4YZC 82, K4MC 54, W4AAD 37, IA 32, TVO 24, YKB 20, LW 15, DWP 14, IF 14, WYC 8, CGE 3, VQZ 2, K4BCT 1.

WEST VIRGINIA—SCM, Albert H. Hix, W8PQQ—SEC: YPR. PAMs: FGL and GCZ. RMs: DFC, GBF, JWJ, and HZA. Congratulations to GBF on making BFL last month and also on his excellent results in the last Frequency Measuring Test. TMI also participated in the Frequency Measuring Test. BWK has a new B&W 5100 transmitter and is very active now. TGL, in Fairmont, is very

(Continued on page 116)



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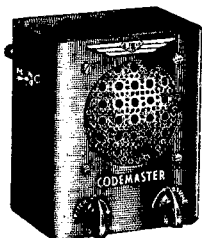
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active and is well on the way toward his WAS. He is building a 300-watt final and should be on with it soon. HTU is a new OPS. MLX and OIV are new General Class licensees. AFB, AHF, ORT, SFT, IWB, QHG, CLX, BKI, NYH, GGC, LLJ, EOJ, and PQQ attended the Dayton Hamvention. I would like to request the various appointees to send in their appointments for renewal when required. Maybe we can do better next time in getting the special call letter plates for our autos. Thanks to all for trying so hard to get the bill passed. Traffic: W8FMU 223, JWX 153, GEP 90, GBF 75, HZA 65, NYH 34, BWK 24, PZT 23, DFC 14.

ROCKY MOUNTAIN DIVISION

UTAH—SCM, Floyd L. Hinshaw, W7UTM—Good news! The State of Utah now authorizes amateur call auto license plates and thus joins the parade of other states recognizing the amateur fraternity! Hats off to NRV and all the others who helped spark the bill through the legislature. SAZ says the Ogden c.d. boys staged a simulated tornado drill. Participating in the test were GPN, SAZ, RQT, WQC, QNV, OCX, NXC, OSJ, YJK, YDZ, and W8FGO/7. QGD has nearly forsaken a.m. for s.s.b. SP is back on h.f. with his rebuilt gear but still is heard more often on v.h.f. UTM's work schedule is becoming more fouled up, which leaves even less time for hamming. JVU and OKA are planning extensive activities with radio-controlled model boats now that the ice is "out." Traffic: W7UTM 2.

SOUTHEASTERN DIVISION

ALABAMA—SCM, Joe A. Shannon, W4MI—A Novice net is in the making with EJZ as net manager. He would welcome comments from interested Novices as to crystals available and station information. Two Novices, KN4s APF and AOZ, now have General Class tickets and Viking Is. KN4CNA is new in Muscle Shoals. The Anniston Club now has a total membership of 42. The Huntsville Club is trying to raise money for a c.d. trailer. The Tuscaloosa Club was host to a group of mobiles from the Montgomery Club and the Montgomery Club staged a hamburger lunch; followed by a transmitter hunt. Several clubs in the section are making Field Day plans. TKL has a BC-654 and a Communicator on 2 meters for mobile in the new Chevy. WOG is wracking his brain for an idea for a good DX keywire for 20 meters and ZSQ has a new 20-meter beam all set to go for choice DX. EJZ is busy on the new rig for RYY, while CAH is trying to get on 2 meters. So far he has a converter and a beam but no transmitter. ZWE now has a half-gallon going full blast. HFK has a new Q multiplier and OR finally got the Q5-er and is working on a converter for 2 meters. Traffic: K4FDY 1109, W4UHA 656, COU 372, WOG 66, KIX 56, YRO 56, HKK 46, EJZ 45, YAI 39, TKL 36, ZSQ 28, ZSH 23, CAH 18, RLG 18, PWS 16, ZWE 16, TXO 11, OR 10, BMM 8, HYL 8, OAO 7, CEF 3, KN4BJY 2.

EASTERN FLORIDA—SCM, John W. Hollister, jr., W4FWZ—SEC: IM. Let's head for St. Petersburg and the ARRL Southeastern Division Convention in June. June is also for Field Day—let me have your reports. With over 500 members in the AREC we should have a big Field Day this year. And the hurricane season officially opens in June. Overhaul the emergency gear now, be ready and register with your EC. New ECs: BZI, HDU, and BWR. March publicity: The *Miami Herald's* "Magic Carpet Travelers" featured VYU and VZC stations, with IXT, PBS, and others in the act! The honorary DEN certificate has been received. Daytona: KOD is a new ham. Ft. Lauderdale: IEH's talk on s.s.b. is raising interest and hopes. EUV and BMR are trying to keep beams up regardless of woody woodpecker's proclivity for vertical raw wood. BEN reports excellent mobile attendance at drills. Gainesville: OGI reports the Engineering Fair at Florida U. was a big success and much traffic originated over Gator Club station DFU, which is Collins-equipped. Ye SCM visited TJU and the mobile gang of the AREC under WEE, the EC. Haleah: UIW reports the GDO built from a TV converter works up to 400 Mc. UIW and KQG are using Techeart type converters on 2 meters. FLH has 600 watts on 2 meters. The 144-Mc. gang includes RNV, KQC, and UIW. Key West: K4NCN is using a 75A-3. DRT expects official orders soon. Lake City: Congrats to YNM and his XYL on the jr. operator. YNM has CP endorsement for 20 w.p.m. Miami: PBS reports constructing a transistor F.S. meter that is a sensitive doll. The Dade Club had an interesting talk on beams by Mike Ercolino of Telrex. The new South Miami Club meets at the U. of Miami, according to CUR. Nels also says the prize idea for the Flamingo Net went over big. (His XYL was the lapidary who made the first prize offering won by WYR.) St. Augustine: KN4AHA is using an Adventurer and an S-77. Traffic: (Mar.) W4PIU 517, DFU 353, ELS 257, DRD 191, BWR 147, YJE 123, WEO 121, WS 88, IYT 59, LAP 46, FSS 30, BZI 27, TRN 27, ZIR 26, YOX 25, IM 23, K4ANJ 17, WAAVD 16, WHK 11, SVB 10, FWZ 9, PBS 3. (Feb.) W4DRD 98, SVB 2. (Jan.) W4SVB 11.

WESTERN FLORIDA—SCM, Edward J. Collins, W4MS/RE—SEC: PLE. ECs: MFY and HIZ. AXP lost
(Continued on page 118)

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his plate transformer and is rebuilding. RKH is ready to handle emergency work with mobile units. The Hair Net is getting ready for the hurricane season. SMM, MFY, CPE, RKH, and CAJ visited the Pensacola Amateur Club. UXW is acting as hideout for hidden transmitter hunts by the EARS group. The 29,560-cc. monitor signs in the Ft. Walton Area are noted with pleasure. YNA is using cubical quad on 21 Mc. ACB is rebuilding the entire station for 21 Mc. KN4ADY operates from the Sigma-Nu House at Florida State. GMS has an antenna supported by a palm tree and 11-story dormitory. KN4AEP has been getting up the code speed on 75 meters. KN4AGM is studying for the Tech. Class license. BGO is giving 14 Mc. a workout with s.s.b. MS keeps the big rig on 14 Mc. with s.s.b. The Pensacola Hamfest to be held June 5th is getting underway. QK has the VFO working 'B. UCY is happy with 10 meters opening up again. COY is active on all frequencies. UUF holds forth on 144 Mc. ZFL was seen operating mobile from his bicycle (no fooling). ZPN keeps skeds with Tampa. VR keeps 7 Mc. hot. MUX was heard on 21 Mc. SOQ is having antenna trouble, space that is. Traffic: K4AKP 111, KN4AGM 6, W4AXP 4.

GEORGIA—SCM, George W. Parker, W4NS—SEC: OPE. PAMs: ACH and LXE. RM: MTS and OCG. Nets: The Georgia Cracker Emergency Net meets on 3995 kc: Sun. 0830. Tue. and Thurs. 1830 EST. Georgia State Net (GSN) 3590 kc. Mon., Wed., and Fri. at 1900 EST. FGH, in Quitman has a new little YL. More than 35 charter members were signed up in Columbus when the Columbus Amateur Radio Assn. was reactivated. New officers are CVY, pres.; MNJ, vice-pres.; DDQ, secy.; WXW, treas.; VSW, act. mgr. New appointments: WXW, EC Muscogee County; CFJ, EC Fulton and DeKalb Counties; YTO as ORS and OPS. CFJ is shunt-feeding his tower on 75 meters. OVS is in Beatty Hospital in Rome, Ga. PIM is back on the air after a short absence. ZDP is Fri. night NCS for TCPN, 4th call area. ZDD and VKK are on with BC-699s. BWD is active on 40 meters. PMC now has a VFO on 80 meters. The Augusta-Camp Gordon hamfest will be held in Augusta July 23-24. OKL has his 32V-2 on the air portable from W2-Land. UFE, who writes that he always reads the Georgia report first thing when he gets his QST in Germany, has been made 1st lieutenant. PMJ has a new kw. on the air from Reidsville. The Atlanta Club is making preparations for Field Day. NS, ZD, MV, and FBH cleaned out the spring and trimmed the weeds away from the same old site. Reports must reach your SCM by the 5th of the month to be included in the report. Traffic: (Mar.) K4WAR 920, W4DDY 163, CFJ 151, ZDP 125, PIM 120, IMQ 78, OCG 77, YWP 67, MV 28, MTS 24, NS 24, BWD 22, ZD 18, ZUF 18, YTO 6, BXV 4, (Feb.) W4OCG 87, IMQ 51, DDY 44.

WEST INDIES—SCM, William Werner, KP4DJ—WT, new OPS, has an 813 transmitter. DV changed Official Bulletin transmissions from 1810 to 3559 kc. Mon., Wed., Fri. at 7:15 p.m. AST. RC signed up 47 amateurs in the AREC at the hamfest held at Ramey AFB. ZW erected an 80-meter antenna and meets the Early Bird Net at 5:45 a.m. AST. ABE has vertical antenna working on 80/40/20 meters. AAD built 15-meter single-element beam. W4VQN/KP4 put up a V-P 20-meter beam. WV, ZV, and ZW gave "jackpot" contacts on 15-meter 'phone in the DX Contest. WC is rebuilding to high power. New officers of the PRARC are HZ, pres.; MV, vice-pres.; DV, secy.; QA, treas.; DJ, KD, PW, RD, and WR, directors. DJ won a Tel-Rex beam at the hamfest. UT won an Elmec PMR6 receiver. TO now is W2LSB. WD, ill with a nerve condition and unable to move his hands, works 20-meter 'phone. ZN built a 30-foot steel tower for his 20-meter beam. RK is working out fine with three-watt 6L6 mobile on 3925 kc. EE wants 2-meter schedules around the Island. WR is holding code classes for Novices to attain General Class licenses. BV is back on 75 meters. W6CIW/KP4 is heard on 75 meters. W8DBD/KP4 is on 20-meter 'phone. UW, of FCC, is transferring to Idaho. Traffic: KP4WT 48, ZW 38, DJ 1, RC 1.

CANAL ZONE—SCM, Roger M. Howe, KZ5RM—LB has a rotary folded dipole on 15 meters. W6JGY, who grew up here in the Zone, was back for a visit. He and his charming XYL were the guests of honor at a very fine party given by KV and his XYL. The Crossroads Net has been reactivated on 14,153 kc. at 2100 EST on Mon. NM skeds W5TAF Sun. afternoons on 15 meters. DG has the 100 cards and becomes the first YL in the Zone to make the grade for DXCC. Congratulations, Grace. The Yacht, Toluca, was in port with W6FSF on board. He was met by DG, GD, WZ, and WZ's XYL. EP is in the process of erecting a 10-over-15-over-20 array with the help of the washer crew. It is rumored that the marites are going to put out a certificate to holders of the maritime mobile certificate who work the ten charter watches. Traffic: KZ5WA 126, DG 101, CF 54, NM 36, KA 28.

SOUTHWESTERN DIVISION

LOS ANGELES—SCM, Howard C. Bellman, W6YVJ—One of the big items of interest this month was the arrival of Col. Fred J. Elser, of the Signal Corps, on his way from Japan to Fort Monmouth. Nov. 1954 QST, page 63, has a
(Continued on page 120)

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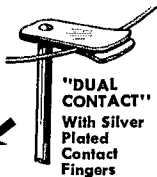
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picture of the Colonel, who worked portable from KA2DX and many other fascinating spots of DX such as TA3GVU. A large number entered the Frequency Measuring Test of Feb. 8-9. Those who made Class II include K6COP, W6NJU, K6HBY, and K6BEQ. Qualifying for Class I Observers are CBO, LIY, MUR, FAL, K6FA, W6YUY, RW (3.3 parts in a million average), and CK (2.0 parts in a million average). Congratulations are in order to the Alhambra District Radio Club on its affiliation with ARRL. About 50 hams attended the traffic breakfast at the Van Nuys affair, with USY officiating. From the *Riohon Listening Post* we learn that MUM will be mobile on top of the Montebello Hills was able to work CE3II, VK2AQF, KZ5DG, VP9L, and KL7BBK, all on 15-meter 'phone. HUI, chief night dispatcher at the U.P. yards, is sporting "The Simplest Modulator" as featured in the ARRL *Handbook*. The air is full of nets. However, we now have a new twist; the 75-meter Freeway crowd meets daily from 7 to 8 A.M. and from 4:30 to 5:30 P.M. at about 3935 to 3950 kc. Included are QVS, HAM, LVQ, MIT, and SOF, with K6CNY, CDX, and CRG. Speaking of clubs, I can now announce with pride that the gang at Pacific Division, Bendix Aviation Corp., finally has gotten a club going at the Development Laboratory in Burbank. Temporary officers are K6CUN, pres.; W6YVJ, vice-pres.; WGY, secy.-treas. and SCR, trustee. Code practice is given each noon lunch hour and the club is pledged to take part in Field Day. K6ELX uses a Viking II rig and a 75A-3 receiver with a vertical on 40 and another on 15 meters. NJU reports that the Pacific Radio Club officers now are KPM, HII, NJU, and BFD as pres., vice-pres., secy., and treas., respectively. BHG says that 2-meter MARS crystals are available from CK. LVQ has completed a new Ranger transmitter. AM states that his station, with KPC and QMC, made 124,526 points on 'phone and with GFE, KSF, and QMC made 173,000 points on c.w. in the DX Contest. ORS says that on 2 meters, UID/7, at Wilson's Pass, Nev., the week end of Mar. 26th worked W6NLZ, K6CAL, and others. Another new club, the San Bernardino Microwave Society, has been organized and meets the 1st Thurs. of the month at the home of VIX, Ontario. Traffic: (Mar.) W6MBW 699, USY 372, GYH 193, K6DQA 190, W6BHG 127, MLZ 101, HIF 70, KN6HOV 61, W6GJP 56, K6BWD 52, W6ORS 30, CK 27, K6COP 19, W6NTN 13, CBO 9, AM 4, K6BEQ 4, W6BES 4, (Feb.) W6GJP 246, CMN 40, NTN 27, K6ELX 1.

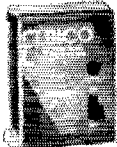
ARIZONA — SCM, Albert H. Steinbrecher, W7LVR — Asst. SCMs: Kenneth P. Cole, 7QZH; Dr. John A. Stewart, 7SX. SEC: VRB. PAM: KOY. Arizona 'Phone Net: Tue. and Thurs., 7 p.m. MST, 3865 kc. Arizona C.W. Net: Tue. and Thurs., 8 p.m. MST, 3690 kc. One outstanding activity in March was the formation of the Yuma County Radio Club with TJT, pres.; ACN vice-pres.; JNY, secy.-treas.; OFA, act. mgr. Meetings are held the 1st and 3rd Sun. Another outstanding activity of the month was the official visit of Walter Joos, 6EKM, Southwestern Division Director and Robert E. Hopper, 6YXU, Vice-Director, who addressed the meetings of the Phoenix and Tucson Clubs. Congratulations go to QW1, who is being sent to Ceylon and India by the Lowell Observatory to view the total eclipse of the sun. RUX advises that there is a newly-organized 10-meter net in the Phoenix Area, at 8 p.m. nightly on 28,700 Mc. and invites all who still have a 10-meter coil to join the ragchew. WUG has been appointed OO, ORS, and OBS. ZEP/7 has moved to Utah. UYE now is on 75 meters. LOC is the first Arizonian to receive the Maritime Mobile certificate for working 30 or more M/Ms. Traffic: W7LVR 31, WUG 31, HUV 4.

SAN DIEGO — SCM, Don Stansifer, W6LRU — Asst. SCMs: Tom Wells, 6E-WU, Shelley Trotter, 6BAM; Dick Huddleston, 6DLN. SEC: VFT. ECs: BAO, BZC, DLN, HFQ, HIL, HRI, IBS, KSI, KUW, and WYA. RM: ELQ. K6ILO is a new ORS. K6JYI is the call of the Pacific Beach Junior High station. KVB now is a member of MARS. K6BPI is checking into two nets daily and breaking into traffic-handling with a bang. The San Diego County amateur radio directory is nearly ready for distribution, according to the Coronado gang. K6ANV is new treasurer of the Gillespie Club. New members of the Upper Ten Club are AXV and AFO. The Club's annual picnic is set for June 19th at a place to be announced. The San Diego DX Club played host to three Swedish hams recently with a dinner meeting and visits to local ham shacks when the ship visited here on a round-the-world cruise. VAD, in Orange County, now is on 420 Mc. BQP now is on teletype. BZE and CAE are building kw. pi-network finals. PFD is experimenting with quad antennas. More activity was noted in the c.w. portion on the DX Contest this year from this section than any year since World War II. KN6JAF and KGS are new Novices at Silvergate Elementary School. LRU now is at 195 countries with EA9DF, FY7YC, and T9MHB. K6BEC sports new vacuum-type keying. CHV may be top man in the section for the 'phone contest. The continued lack of information from most clubs and the Imperial Valley keeps the San Diego section news short. If your club has no news in this issue, or pertinent information is missing, get it in the hands of your SCM prior to the 7th for printing. Traffic: (Mar.) W6IAB 4035, YDK 614, K6BPI 873, W6KVB 30, K6DBG 26, W6CHV 5, (Feb.) K6BPI 304.

(Continued on page 128)

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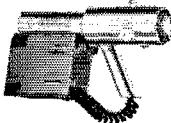
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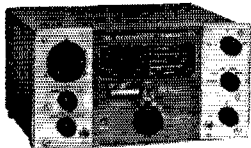
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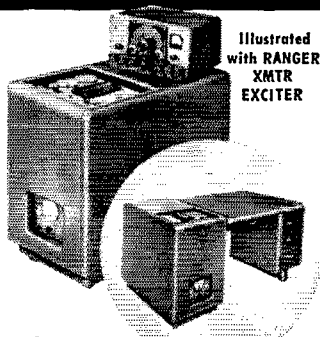
Portafone Model 73-B, per unit, including antenna and carrying case (less battery or power pack).....\$1299.50

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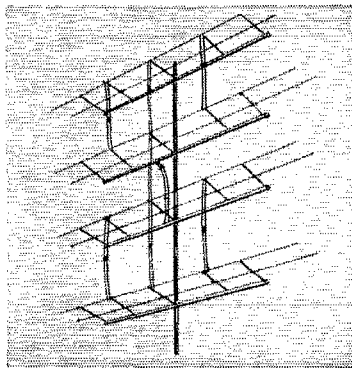
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SANTA BARBARA — SCM, Vincent J. Haggerty, W6IOX — The PAM report from IHD indicates KN6HBI is on 2 meters with an ARC-4. IHD has the a.s.b. rig going with p.p. 813 final, and REF/6 has the mumps! KN6BI came in with the section's largest traffic total ever. QIYW was a visitor at the Santa Barbara Amateur Radio Club's March meeting and he is now at the helm as our new SCM. FYW reports KN6INB operated a 2-meter station for the Paso Robles Club at the recent Paso Robles Hobby Show. This is the final report of IOX as SCM so may I thank all who helped me in our section's initial two years. Let's get behind QIYW, our new SCM, and help the section develop. Good luck, Bill, Adios and 73, Traffic: KN6BI 365, W6QIYW 70, YCF 14, REF/6 6, FYW 3.

WEST GULF DIVISION

NORTHERN TEXAS — SCM, T. Bruce Craig, W5JQD — SEC: RRM. PAMs: PAK and IWQ. RMs: PCN and QHL. Officers of the Kilocycle Club of Fort Worth are KVA, pres.; TDR, 1st vice-pres.; UXY, 2nd vice-pres.; URI, secy.-treas. The Tarrant Co. Disaster Net had a picnic Mar. 13th at Eagle Mtn. Lake. The Irving ARC organized and elected VSH, pres.; GT, vice-pres.; and WN5HHP, secy.-treas. Meetings will be held the 4th Sun. afternoon of each month. SMK, SYL, ICB, and LGY are sending traffic for sick folks. K5AEJ is a new XYL ham in Coleman. SQT and LGY cured LGY's low frequency harmonics and got a better antenna load. UUR, Wichita County EC, has started a 10-meter auxiliary net. MQW is AEC and NCS for this Net which meets Tue. nights. Members are UUR, TTY, PZS, DWS, TLW, MQW, GNE, DNY, GPO, and TTY, supported by AGE, GVA, and AVA. New officers of the Wichita Falls ARC are UUR, pres.; AVA, vice-pres.; DWS, secy.-treas. ZTB works portable with the Boy Scouts. ATR, IRZ, and KRZ report into NTFN from mobile. The Dallas 10-meter Net assisted the Dallas Red Cross in a drive for funds. The Fort Worth 10-meter Net and Dallas 10-meter Net had a joint picnic on Mar. 20th at Arlington City Park. The No. Tex. Emergency Nets report more activity on 2 meters. About 200 attended the Brownfield Swapfest. BPT is trying to get a club started in Palestine. ROTC Signal Corps Unit at Tech. in Lubbock announced a code and theory class for each Tue. and Thurs. nights. KN5AHJ is a new ham in Brownfield. HRF has worked 33 states with 23 confirmed. NOR reports the interest in amateur radio of a group in Muleshoe. The Blue Ridge 160-meter Net reports 92 per cent attendance, with 19 full and active members and 3 supporting members. ACK now works break-in on c.w. FJB is net manager of the Teen-Age Traffic Net. FCX reports he has MARS membership now. Traffic: K5FFB 887, W5DTA/5 525, KPB 299, BAT 229, UBW 226, PAK 190, AHC 149, FJB 86, CF 62, ASA 56, ACK 15, HKF 14, BPT 8, FCX 8.

OKLAHOMA — SCM, Dr. Will G. Crandall, W5RST — Asst. SCM: Ewing Canady, 5GIQ. SEC: KY. RM: GVS. PAMs: PML, SVR, and ROZ. Prospects are mushrooming for one of the biggest and best West Gulf Conventions in recent years. It will be held in Cowtown June 10-11-12 with headquarters at the Hotel Texas. Distinctive markers are being proposed to distinguish Oklahomans from Texans and New Mexicans. C.w. activity is on the increase mostly because of the sparks of RM GVS and JXM with the excellent OLZ bulletin put out by them. All Oklahoma amateurs are cordially invited to meet the OLZ Net on 3082.5 kc. at 1900. A new OO Class IV is CFG in Tulsa, so if you get a card from him it is just a friendly warning to watch your step so you won't get a QSL from the FCC monitoring station. Much credit is due the Will Rogers H.S. ARC in Tulsa for its activity and for being the only high school ARC in Oklahoma that we know of. The Okene Annual Rattlesnake Roundup was covered by portables setup by MFX with ZQU and HBL and ROZ with CXM and EJJ. Mobiles covering the field were PCQ, GIQ, SVR, AOX, VLV, and BNX. These events are excellent practice in emergency traffic-handling. The more experienced net controls and traffic handlers we can train the better service we can render to the public in case of disaster. Traffic: W5GVS 695, ADC 54, ZRK 56, FEC 47, CBY 34, PML 34, HCG 32, MGK 28, SVR 28, WTC 28, JXM/TC 26, SWJ 26, TNW 22, PNG 20, QAC 20, GXH 19, MQI 19, TRI 16, MFX 15, CXM 13, ITF 12, REC 12, CYQ 10, EHC 2, UCT 2, VAX 2.

SOUTHERN TEXAS — SCM, Dr. Charles Formaglich, W5FJF — The Houston ARC is starting to put up its new club house. FEK is doing a lot of high-frequency organization work. NOT is working out of town. LSE still is sweating out the stork. OUG is NCS of CERN. Officers of the HARC are RPH, pres.; URU, secy.; FDZ, treas.; PBX, membership chairman; UFG, vice-pres.; VWF, program chairman. ADZ is doing nothing but collecting guns and DXing. IX is busy, to quote ADZ, UFH also is collecting guns. In order to bolster the RACES participation in Houston, Harris County, the local c.d. men turned the entire amateur program over to FJF with a free hand. Classes are coming along and RACES nets are being formed. Amateur spirit is high and participation will be widespread. It is the amateur's duty to work in RACES and it seems to work out better when the amateurs are
 (Continued on page 184)

Call Henry

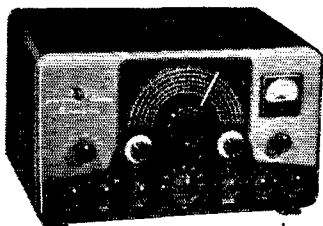
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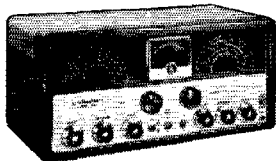
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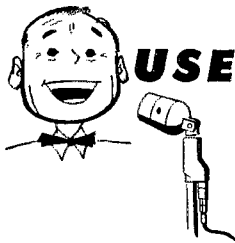
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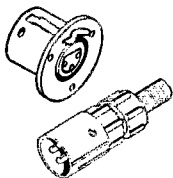


TO MAKE A GOOD RIG BETTER

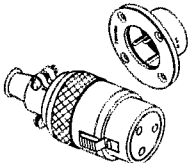


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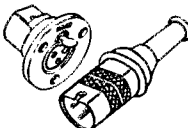
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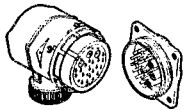
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doing the organization work. Fellow amateurs of Southern Texas, FJF has served as SCM for three two-year terms and declined to be nominated for a fourth term. He feels that it is time for some other amateur to take on the job. QDX was the only qualified nominee so he was declared your new SCM. It has been a great experience serving as your SCM. It has been gratifying to see the growth of ARRL in Southern Texas and the increased participation in club and League affairs. I am looking forward to continuing many friendships and will continue to visit around as I have done in the past. Traffic: W5MN 646.

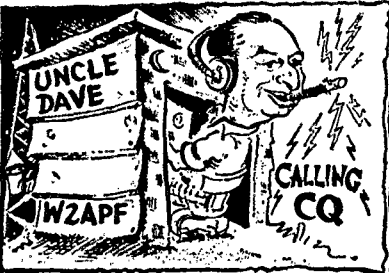
NEW MEXICO—SCM, G. Merton Sayre, W5ZU—SEC: KCW. PAM: BIW. V.H.F. PAM: FPB. RM: JZT. The NMEPN meets on 3838 kc. Tue. and Thurs. at 1700, Sun. at 0730; NM Breakfast Club every morning except Sun. at 0700-0830 on 3838 kc.; NM C.W. Net daily on 3633 kc. at 1900. The New Mexico RACES Plan has been approved, and the Albuquerque and Roswell Areas have forwarded their plans. It should be a matter of pride for all amateurs to sign up in RACES and participate regularly. SGC is C.D. Radio Officer for San Juan Co., and CIN for Farmington. NTN and AAU are establishing a u.h.f. TV station in Farmington. NSV spent a couple of months in Roswell. PBV has the 522 transmitter for sale. FPB reports increased activity on 144 Mc. in Albuquerque. VWU is back in Albuquerque from Florida. FAG has a kw. on 2 meters with a keyer wheel. FPB is NCS of the CAP V.H.F. Net. The Los Alamos organized chapter of the Amateur Radio Caravan Club of N.M. elected VDY, caravan master; BNJ, emergency car. master; YKZ, secy.-treas.; MYQ, prog. dir.; ZMN, asst. prog. dir. Don't forget the State Ham Picnic at Albuquerque June 4-5, the West Gulf Division Convention at Fort Worth June 10-12, and Field Day, June 25-26. Traffic: W5RFF 249, JZT 65, QR 64, CEE 31, ZU 23, HOE 18, BZA 17, WBC 12, BIH 10, ARD 9, CAZ 9, BZB 7, BXP 4.

CANADIAN DIVISION

MARITIME—SCM, Douglas C. Johnson, VE1OM—Asst. SCM, Fritz A. Webb, 1DB. SEC: RR. New ECs in N. B. are JP, EE, BL, VA, VC, and AEB. WB is a new RM appointee. Congrats to PF on winning the 1st Annual VE1 Contest. Runners-up were UT, AAW, and QM. WB reports 23 logs were received. DW is NCS of the newly-formed N.S. C.D. Net which meets Sun. at 10:00 a.m. on 3780 kc. All active N.S. amateurs are urged to report in. PF is building a new 14-Mc. quad beam, plus three rigs for the local AREC. His XYL, ABT, is active on 14-Mc. c.w. BL has a new all-band Elmac AF-67 transmitter. OM is getting good results with a new 14-Mc. ground plane. RR is back on the air with an all-band 30-watter and a Zepp antenna. OC has been giving 160-meter 'phone a whirl and gets out FB. Congrats to BN on the fine showing in the February Frequency Measuring Test. RO, GZ, KU, and YJ are active on 7-Mc. c.w. HG is just Maritime section DXer, with 150 countries confirmed. VO6AH requests all Maritime and Newfoundland stations to clear 3780 kc. daily between 1630 and 1730 AST during Labrador Net time. Traffic: (Mar.) VO6N 210, VE1FQ 136, VO6B 84, VE1AV 55, OC 52, QM 51, VO6S 41, VE1ME 24, OM 23, UT 19, HJ 17, GA 12, BL 11, WB 6, EK 5, DB 2. (Feb.) VE1DW 68.

ONTARIO—SCM, G. Eric Farquhar, VE3IA—With no advice from any net manager, we are assuming all nets are remaining on local standard time. The Gold Belt Net on 3750 kc. has changed its time to 1300 Sun. to accommodate more participants. The Northern Net operates on 3675 kc. Mon. and Fri. at 1900 and 3775 kc. on Wed. at 1915. Congrats are extended to the Nortown Club on making BPL from its station, BRR/3, operating at the Sportsmen's show, and to NG, its pres., for again qualifying for BPL. Thanks to Northbay for the fine bulletin, through which we learn that the annual banquet of the Scarborough Club was very successful! We would remind all of the Eighth Annual Northern Ontario Hamfest June 30th, July 1st and 2nd, again sponsored by the Gateway ARC. CAB reports some two-meter activity, snagging W2SHV some 150 miles airline. NG, DZA, and DFO were seen on TV in connection with amateur radio in emergency work. Also heard but not seen were AJA, ARF, and BUT. Late reports inform us that 150 attended the Marconi Field Day presentation to Nortown, 1954 winners. The Porcupine ARC of Timmins treated the gals to a fine chicken dinner. A joint picnic by the Oshawa, Peterboro, Belleville, and Kingston Clubs is slated for about Aug. 14th at Cobourg Beach. The Belleville Club is making progress on its trailer Field Day project. The Hamilton ARC enjoyed a splendid talk and showing of colored pictures by HI, of London. Because of bad weather KM and IA were unable to attend the e.d. meetings at Hanover. BZB is a new ORS appointee. DSX becomes Timmins Area EC. KM, in Hamilton, Ontario, received a card from a 14-year old SWL in Hamilton, Ohio! The Amateur Emergency Corps of Hamilton attended the Red Cross annual meeting and put on a demonstration. Uranium finds are keeping BUR busy these days. AJR lost his 40-meter antenna and pole for 80 meters in the big blow. The March meeting of the London ARC had six past-presidents present. YJ spoke on civil defense and its prob-

(Continued on page 126)



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National SW54	35.00
Hallicrafters SX62.....	195.00
Viking I, with VFO and TVI kit.....	225.00
National NC108 FM receiver	50.00
Meissner EX signal shifter (like new)	65.00
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Double conversion, Xtal controlled oscillator. AM-SSB-CW

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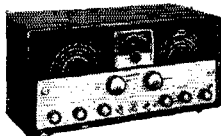
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600 L Broad band Linear Amplifier. Wired, \$349.50

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5100 transmitter..... \$442.50
515B - SSB Adapter for 5100 .. 279.50

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Speaker for above \$ 19.95
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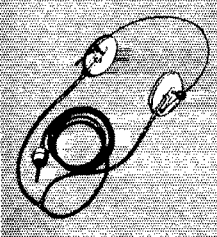
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Comfortable



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weight: (headset less cord) 3.5 oz.
sensitivity: 120 db above .0002 dynes/cm²/ 1 milliwatt of input
impedances: receiver 500 ohms, carbon mike 50 ohms
frequency response: up to 5000 cps.
part number: (complete unit) 9600



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The Tele-Set is as light as a pair of glasses—weighs only 1.6 ounces for lightweight comfort. Stainless steel headband is springy and strong—will not slip or pinch. Plexiglass air cushions are ball-joint mounted for perfect adjustment to ear. Sensitive receiver mounted in special plug saves weight. Long-life flexible tubing directs sound to each ear.

weight: 1.6 oz.
impedance: 128 and 2000 ohms standard. Other impedances available on special order.
plug: fits any standard PL-55 headphone jack.
part numbers: 8825 (128 ohm), 9316 (2000 ohm)

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lems. TO, London EC, discussed activities and invited recruits. Traffic: VE3BRR/3 429, BUR 198, NG 188, VZ 136, BJV 120, AJR 114, NO 44, AU 37, KM 33, AVS 18, AOE 11, DPO 11, PH 7.

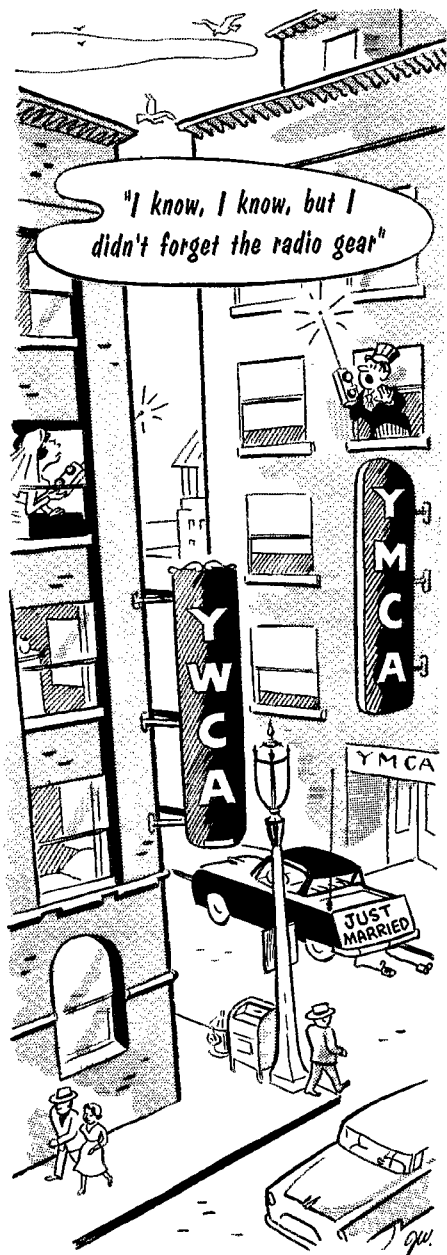
QUEBEC—SCM, Gordon A. Lynn, VE2GL—On March 19th some 115 Canadian hams and their XYLs gathered at Ruby Foo's in Montreal to honor Alex Reid, VE2BE, with a testimonial dinner on the occasion of his silver jubilee as ARRL Canadian Director. The guest speaker was President Dosland, W0TSN. W1BUD also spoke of his long association with VE2BE, and presentation of an s.s.b. 20A exciter was made to Alex on behalf of amateurs from the whole of Canada. LO is trying to work 75-meter 'phone with a 1154 transmitter. WK is active on 75-meter 'phone and has been working some DX on 160 meters. DK, in Scottstown, is experimenting with receivers and beams. II reports into PQN and is handling some traffic. SS is experimenting on 20 meters and working some DX and also is interested in 2 meters and would like to arrange skeds with possible contacts. AFK, in Lennoxville, is active on 80 meters. AOB, ACY, ADU, and EC formed an emergency net for the Red Cross during the recent fire in Nicolet when much of the town was destroyed. CA reports conditions have gone to pot to the north again, making traffic low. AEV is holding a weekly c.w. class in Malartic for the Scouts. BK reports his 20A exciter is on the air, as is BE's. Traffic: VE2DR 101, BB 60, II 54, EC 46, ATQ 24, LM 16, CA 10, CP 7, PL 7, UM 3.

ALBERTA—SCM, Sydney T. Jones, VE6MJ—PAM: OD, RM: XG. TG is the new EC for the Lethbridge Area. WC is having trouble with standing waves. OS is interested in obtaining a printer for RTTY operation. AL is busy moving the rig to another room and experimenting with screen modulation. A new club has been formed in the northern part of Alberta at Beaverlodge. ZDP, YGB, and VGU are operating portable from Beaverlodge. KL is building a new VFO. MJ has the moniscope completed. FF's mobile came in handy recently when one of his trucks was sideswiped on the Calgary Highway. Fortunately no one was injured but a request for assistance was relayed via the mobile by FF to MJ and prompt action was taken. EA is QRL with microwave survey. MM relayed information on the storm at Red Deer. HC was a recent visitor to Edmonton. PV is testing the new modulator. OC is testing the rig from the new Edmonton QTH. The hamfest dates have been confirmed as July 30th and 31st. All roads lead to Lethbridge. Let's go all out this year and support the Lethbridge Club in its efforts. Remember it's your Alberta hamfest. Traffic: VE6HM 126, AL 48, OD 23, WC 21, YE 11, MJ 8, IZ 7.

BRITISH COLUMBIA—SCM, Peter M. McIntyre, VE7JT—SEC: DN. AIO now has appointment as ORS and OPS and XY and OBS. During the past few months band conditions on 75-meter 'phone have been rather rugged which has made it difficult for everyone. On 3755 kc. where the BCAREC Net operates is a hot spot whether from design or accident, with QRM both unavoidable and seemingly deliberate, nevertheless the operation goes on. It has grown to a rather large net covering all sections of British Columbia and the western section of Alberta. We are all glad of the interest of all participating in its operation and their continued support of the net operation. In any net operation there is bound to be variances of opinions on how things should be done as far as control of the net is concerned. The number of check-ins, which averages about 70 stations, has a tendency to become unwieldy through no fault of those acting as control station or acting control stations. We would welcome any letters of comment, signed of course, on what you think of the operation of the BCAREC Net. I would appreciate any comments and I know the SEC, the net manager, and those acting as net control stations would accept constructive criticism in the light in which it is given. Traffic: (Mar.) VE7QC 123, ASR 115, AIO 33, ZV 15, ZF 14, (Feb.) VE7AQW 80, ASR 55, AIO 21, QC 17, DH 14, ZV 10, ZF 8, SW 4.

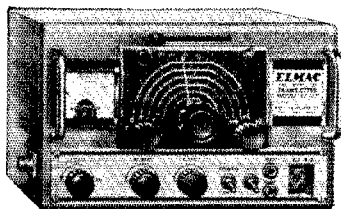
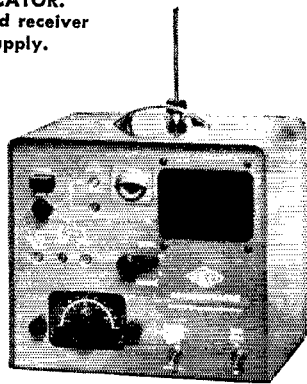
MANITOBA—SCM, John Polmark, VE4HL—Congratulations to Manitoba amateurs HL, NW, AI, JM, LO, JW, WS, GE, PE, MO, ZI, and AS on completing the civil defense communications course. We welcome to the amateur ranks AX, of Elm Flon. New stations on 'phone are JS and CJ. NW portable is moving to Gull Lake soon and will be looking for contacts. RB is sporting a new 24-hour clock. The ABEC got off to a good start but more outlets and ECs are required. Application forms may be had from the SCM. Drop us a card or get us on the air. XW did it again with a new modulator which sounds very nice. DI and HS sked twice a week on 20 and 6 meters at 2100 hours and are looking for anyone else interested in trying 6 meters. The total reported traffic was 773, a record for Manitoba. Keep it up gang. Traffic: VE4AI 179, JM 98, GE 96, IF 69, CB 44, QD 36, VE5DS 34, VE4KG 31, HL 28, JW 22, RB 17, YR 17, JY 14, EF 12, KL 12, NW 11, AY 10, VE5CM 9, VE4LO 4, OB 3, RF 3, AN 2, GB 2, VE5GO 2. SASKATCHEWAN—SCM, Harold R. Horn, VE5HR—KO is active in c.d. at Elrose. DZ has a new jr. YL. QL has a new QTH at Govan. TH and AJ have been doing wonderful work with polio victims in Saskatoon. Because of their efforts Trevor Jones soon will be heard on the air-lanes from Saskatoon and Dan Palynchuk hopes to become

(Continued on page 128)



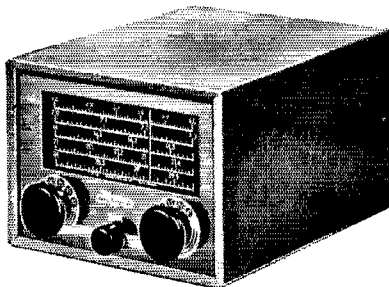
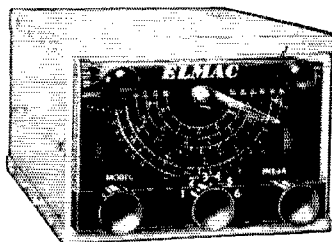
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520BS	12 @ 14 A.	500 @ 200 MA	52.19

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a VE7. AJ is recovering after a visit to the hospital. YF is pleased to report that two of her prize c.w. pupils are now pounding out signals on the air, to wit: VE5TX and PT. At this writing your SCM is in the hospital recovering from major surgery. This is Madolyn, YF, pinch-hitting for Hal and wishing him a speedy recovery. Don't forget that all roads lead to Saskatoon July 1st, 2nd, and 3rd for the Giant Jubilee Hamfest. Traffic: VE5BZ 22.

Grounded Grid Amplifier

(Continued from page 28)

at the center of the subassembly. The lug is mounted beneath a 1-inch stand-off insulator, and a single stud screw holds the choke and stand-off to the subchassis. A feed-through insulator on the subchassis feeds d.c. to the choke and also serves as a tie point for the "hot side" of the by-pass capacitor. The screen grid, grid, and beam plate are grounded to the subchassis as close as possible to each tube socket. The cathodes are connected at the central stand-off insulator, which is also the tie point for the r.f. input lead.

The cabinet is 10 by 14½ by 8¾ inches with a panel to fit. The rotor indicator of the inductor and input capacitor are mounted on the panel and the panel secured by the output rotor switch, meter and toggle switches. The 0.004-μf. d.c. blocking capacitor mounts on the rear of the input-tuning capacitor, C₁.

An r.f. choke was included across the output of the pi-network, so that in the event of a shorted d.c. plate blocking capacitor the power supply fuse would blow. This keeps 1200 volts d.c. off the antenna system.

If plate voltage were applied with no input connection for the cathode return, full plate voltage would appear between cathode and filament. A 1000-ohm resistor is connected from cathode to ground to prevent this from occurring.

Operation

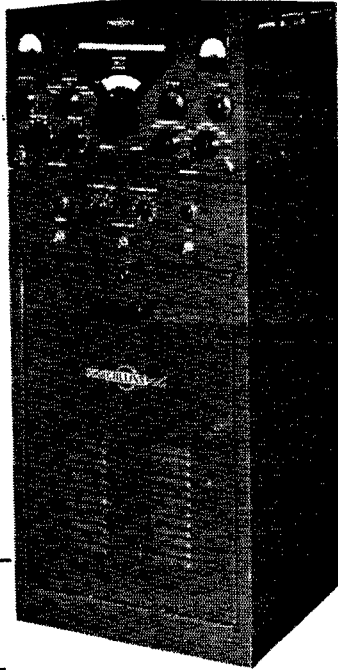
The tune-up procedure is the same as for any pi-network amplifier. The whole coil is used for 75 meters, about half for 40 meters, and one-fourth for 20 meters. Initial tuning adjustments are made with about half the available r.f. drive power. Twenty watts of drive will put a good signal on the air.

The input and output circuits in this design are well shielded by the grounded grid, screen, and beam-forming plates, and no trouble with fundamental or v.h.f. instability has been experienced. Although this amplifier is designed primarily for s.s.b., it may also be used to amplify a low-powered a.m. or c.w. signal.

FEED-BACK

In "A One-Tube Receiver for the Beginner," appearing in last month's issue: the rotor connection of C₁ should go to antenna terminal 2, instead of to the stator. The parts list should be changed to include a 500-μf. ceramic capacitor and the 0.01-μf. 250-volt paper capacitor should be 0.1-μf. 200-volt paper.

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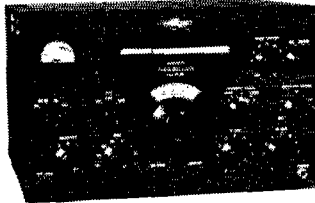
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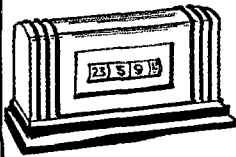


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Parallel 6146s

(Continued from page 17)

for the leads to Terminal B (Fig. 2) and C_6 .

The L_8L_9 assembly is also made from a single piece of stock. Allow an extra half turn or so at each end of the winding for leads to Terminals B and C. Free the last $\frac{3}{4}$ turn of L_9 (the end connected to Terminal C) to make the link adjustable with respect to L_8 . In the final construction, the output ends of both L_7 and L_9 are connected to the link tuning capacitor, C_6 , by a length of No. 12 tinned wire.

The 47K grid resistor for V_2 is now connected, at the meter end, to the tie point that supported one end of the original R_9 . The other end of the resistor is used to support one side of RFC_6 . Either Pin 8 or 9 of the socket for V_2 may be used to support the tube end of the choke.

The oscillator plate coil, L_1 , is the original inductor, reduced in size. A $\frac{1}{2}$ -inch cone insulator supports the inductor as in the previous model.

The new control for C_4 employs a panel-bearing extension shaft. A second bearing, mounted on an aluminum strip spanning the chassis (see bottom view) supports the rear portion of the shaft. A Millen 39003 shaft coupler is attached to the end of the shaft to serve as a pulley. Another shaft coupler of the same type is fastened to the tail shaft of C_6 . This provides a smooth surface for the dial cord to travel over on its route through the chassis. Two lengths of cord are used between the drive-shaft pulley and the pulley on the tail shaft of C_6 . When installing the cords, first tighten the coupler or pulley on C_4 so that the top end of the setscrew points toward V_2 when C_4 is rotated for minimum capacitance. Now tighten the pulley on the drive shaft with the setscrew pointing toward the right wall of the cabinet (as seen from the front view). In stringing the drive, use the pulley setscrews to anchor the ends of the cords. Allow a full wrap around the pulleys at each end of the cords and make sure that one set of turns travels in a clockwise direction while the other rotates counterclockwise.

As shown in the front view, the oscillator switch knob and the pilot jewel are each $2\frac{1}{4}$ inches from the amplifier tuning dial. A $2\frac{3}{4}$ -inch dial, E. F. Johnson type 116-262, is used as the amplifier tuning control. Note that the decal marking for C_3 at the top right-hand corner of the panel has been changed from AMP to DRIVER.

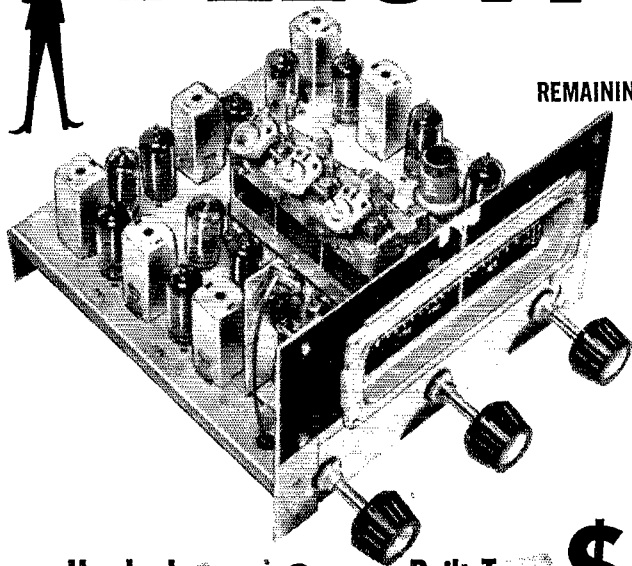
Testing

The heater power requirements for the complete r.f. line-up are 6.3 volts at 4 amperes. A supply delivering 300 volts at approximately 50 ma. should be available for the 5763s. Maximum ICAS ratings permit 600 and 750 volts to the 6146s for 'phone and c.w. operation, respectively. The tubes may be loaded to 225 ma. plate current with plate modulation and may be loaded to 240 ma. for c.w. work. In either case, the supply should be capable of delivering an additional 30 ma. or so for the screens.

(Continued on page 132)

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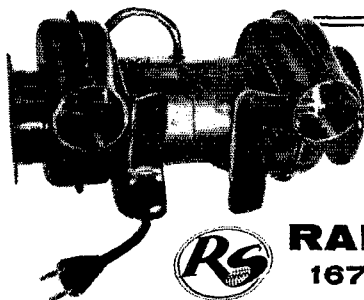
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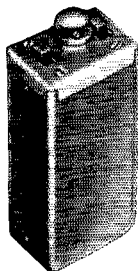
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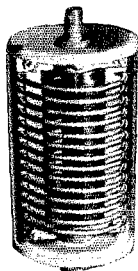
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A 150-watt lamp bulb or a noninductive resistor should be used as a dummy load while testing the transmitter. A 150-watt bulb and a bank of series-parallel connected Ohmite dummy loads were used to obtain the data shown in the accompanying tuning chart.

Plate and screen voltages should be removed from the power amplifier while the exciter is undergoing initial tests. Tuning of the oscillator and the driver stages is completely conventional, and the tuning chart lists typical current readings for V_1 and V_2 as well as settings for C_2 , C_3 and S_3 . Note that the oscillator plate tuning capacitor, C_2 , is to be adjusted for minimum capacitance when the circuit is operated at 3.5 Mc. When using a 7-Mc. crystal and straight-through amplification in the plate circuit, C_2 should be used as an excitation control; increasing the capacitance of C_2 reduces the drive to V_2 . In this case, the control may be properly adjusted only with the power amplifier in operation, of course.

If it is noticed that the dial settings for the driver plate circuit do not correspond with those listed in the tuning chart, it will be necessary to experiment with the inductance of L_4 . Adjust the inductance by varying the positions of the adjustable turns until the 14-Mc. setting of the dial coincides with that listed. The dial readings for all frequencies above 14 Mc. will fall into line with the 14-Mc. point properly located.

It is intended that the 6146 stage will be operated straight through at all amateur frequencies between 3.5 and 29.7 Mc. However, the circuit may be used as a frequency doubler with the usual decrease in efficiency.

The tuning chart lists tuning-dial and plate-current readings that may be expected when the amplifier is operated at 600 volts. Observe that nearly all readings depend to some degree on the type of dummy load in use. The spacing between L_3 and the adjustable portion of L_4 was approximately 3/16 inch while the readings were made.

The series-tuned output circuit is perfectly standard and is described in detail in Chapter Six of the '54 and '55 *Radio Amateur's Handbook*. The system is designed to work into a specific impedance — 50 ohms in this case. If the impedance of the antenna deviates from 50 ohms by any appreciable amount, it is necessary to employ a matching circuit immediately following the amplifier. The *Handbook* describes couplers designed for matching 50 ohms to higher values of antenna impedance and also explains how a s.w.r. bridge can be employed during the matching adjustments. Of course, antennas fed with 50-ohm coaxial cable may be coupled directly to the output circuit of the transmitter.

The new circuit may be used without further modification when a 300- or 400-volt plate supply is employed. The 6146s may be loaded to better than 100 ma. at the lower of the two plate voltages and with the 20K screen resistor in the amplifier. If the mobile supply has current to spare, and if R_4 is lowered in value to approximately 7K, the amplifier may be loaded to approximately 150 ma.

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Here is an ideal system for such applications as fishing boats, yachts, traffic control, sports events, construction crews, surveyors, carnivals, car owners, life-saving stations, or any place where handling of large crowds is necessary, and wherever convenient power line connections are not available, because unit operates from self-contained rechargeable 6-volt storage battery. Can also be used as a stationary or permanent system when used with charging rack, which is designed to hold entire portable amplifier and battery.

System consists of portable amplified electronic megaphone—operated by a trigger switch in the pistol-grip-handle—dynamic type microphone unit rated at 50 ohms at 1000 cps, and a reproducing unit, all contained in megaphone mouthpiece and housing.

A powerful 20 watt 6 tube amplifier, housed in a water-proof, two-piece, portable metal case (as illustrated), having compartment for and supplied with 3-cell 6-volt storage battery. Amplifier built with finest quality parts to rigid Navy specifications.

A UNIVERSAL BATTERY CHARGING RACK that operates from 110 volts AC 50-60 cycles, 110 volts DC, 12 volts DC, 24 volts DC, 48 volts DC, or 96 volts DC. The charging rack consists of a battery recharger with time switch and also provides a space for stowing the portable amplifier. Two pilot lights in the front panel of rack indicate a "Low" or "High" charging rate. Timing switch controls the rate of charging. Has separate On/Off switch.

Approximate Dimensions & Weight : Megaphone 20" long, diameter 1 1/2".

Amplifier dimensions—in 2-piece Portable Metal Case, housing 6 volt storage battery—13 3/4" H, 12 3/4" W, 9 3/4" deep.

Charging Rack 15 1/2" H, 13" W, 12" deep.

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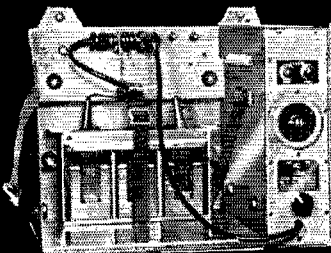
Complete System consisting of electronic megaphone, 20 watt portable amplifier with tubes and storage battery in case, as illustrated, Universal Battery Charging Rack with all necessary interconnecting cables and plugs and 30 page Instruction Book with schematic diagrams of all units. **Net 89.50**



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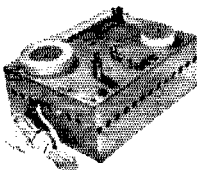
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Mobile Reception

(Continued from page 20)

sockets in parallel and the substitution of the 6-volt equivalents.

The b.f.o. switch should be connected between the wire previously labeled "b.f.o." and ground. The wire previously labeled "r.f. gain" may be grounded directly or, if an r.f. gain control is desired, through a 25K potentiometer. If your

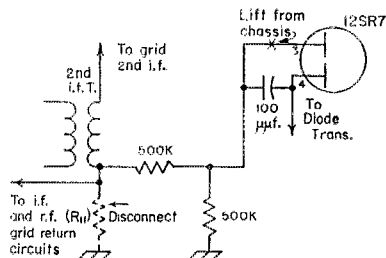


Fig. 4—Circuit revisions for adding a.v.c. to R23 units not so equipped. Resistors are $\frac{1}{2}$ watt.

particular model of the R23 doesn't have a.v.c., it can be added easily by following Fig. 4.

Fig. 1 shows how the r.f. and mixer coil units are rewired. The oscillator shielded unit is not used; the crystal socket is mounted above the chassis on the oscillator plug-in receptacle. Holes should be drilled in the other two receptacles, and the coils mounted so that the slugs can be adjusted from the top of the chassis.

The vibrator pack is mounted in the space formerly occupied by the dynamotor. The filter components and the new output transformer (Merit 2998) are mounted underneath. The original 12A6 cathode by-pass (C_{30} , previously removed) is replaced with a smaller 10- μ f. 25-volt electrolytic. The secondary of the transformer is wired to the phono connector used for plugging in the loudspeaker.

Adjustment

The i.f. transformers in the R23 should be adjusted to the loose-coupling position for high selectivity. This is done by removing the cap on each transformer and pulling the fiber insert out as far as it will go. Adjustment of the slug-tuned antenna and r.f. coils is easily done by tuning in a steady carrier, or by feeding a 1440-ke. signal directly into the R23 and measuring the a.v.c. voltage with a v.t.v.m., and adjusting for maximum voltage. The antenna coil and the output trimmer of the converter should be rechecked on outside signals after all connections between the R23 and the converter have been made. Also, the slider on the VR dropping resistor should be adjusted so that the VR tube glows with the converter connected and operating.

Although no curves were run on the performance of this combination, results seem to compare favorably with those obtained with an HQ-129 with the crystal in the first position.



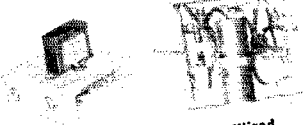
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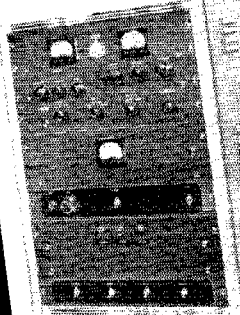


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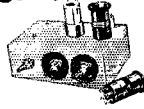
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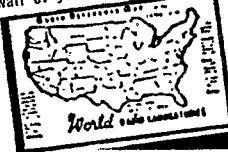
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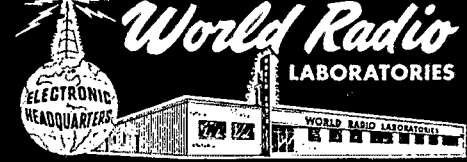
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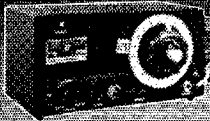


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TV Trouble-Shooting

(Continued from page 26)

There are controls on the back of the set which you might as well learn to adjust. The best time to do this is at test pattern time. The relationship between the top half and the bottom half of the picture is controlled by the "Vertical Linearity" control and somewhat by the "Height" control. These two are interdependent to some degree, so that a change in one may necessitate a change in the other. In addition, changing these two may cause the picture to roll, since the "Vertical Hold" control is in the same circuit. These first two controls are what you adjust when the legs are too long, or when everyone looks like something from Dick Tracy. Weakening of the tubes in the vertical oscillator or vertical amplifier may cause the linearity to change, and may make it impossible to restore things to their proper shape until a tube is replaced.

The "Focus" control is self-explanatory. You should set it so you can see the closely-spaced horizontal lines that cover the screen.

The "Horizontal Drive" control governs the grid drive to the horizontal amplifier tube. If it is misadjusted in one direction there will be vertical white bars on the left side of the screen, and if turned too far the other way the picture will fold over in the middle, or be narrow and dark.

Many sets have an "AGC" control, or "Range Setting." This sets the sensitivity of the receiver for the particular area in which it is installed. If the a.g.c. is advanced too far, the picture will black out, bend, or tear. If it is set too far counterclockwise the picture will lack contrast.

That finishes up our discussion of TV troubles. It doesn't make any difference, apparently, what brand of set you buy, or what you pay for it. Some folks have troubles, others with the same make and model don't. Even though our business is television servicing, we wish you good luck!

Happenings

(Continued from page 32)

grant credit for the code-speed requirement to any applicant for amateur license except Extra Class. The Commission has also amended the rules to provide that Form 481-1 will be used for renewal applications for RACES authorizations; until such time as a revised form becomes available, applicants should use the present form by entering the word "renewal" at line 3.

OHIO AMATEUR RADIO WEEK

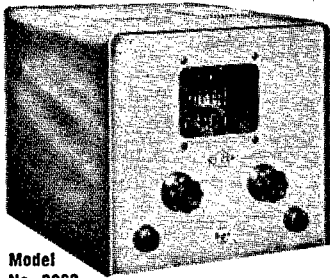
Again this year Governor Lausche, in response to representations by the Ohio Council of Amateur Radio Clubs, has proclaimed an Amateur Radio Week in that state. It is, of course, June 19th-25th, the week culminating in ARRL Field Day. The proclamation praises the amateur record in terms almost identical with last year's language (p. 45, September 1954 *QST*).



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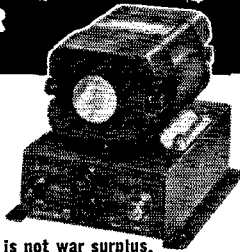
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This 6 Volt DC power supply utilizes the Carter 420A Generator, which delivers 400VDC at 200 ma., continuous duty rating. The base contains the filter, a starting relay, another relay for receiver disabling (N.C. Contact-N.O. Contact available but not wired in) as well as the Terminal Board, heavy duty 6 volt input posts and is used for both input and output. Don't be confused. This power supply is not war surplus.

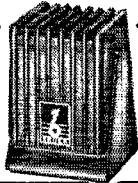


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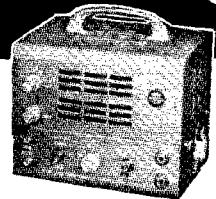


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Viking II Modifications

(Continued from page 29)

Dress L_{52} from its previous position on the key jack to the nearer terminal on the new tie point. By-pass the cold end of L_{52} to a shakeproof solder lug attached to chassis ground. From the cold end of L_{52} to the key jack, install an Ohmite Z-50 v.h.f. choke. Remove C_{29} , a 0.005- μ f. disk ceramic, from the terminals of the key jack and replace it with a 0.001- μ f. disk ceramic from the hot terminals of the jack to the solder-lug chassis ground just installed. The 0.005- μ f. disk ceramic just removed may now be wired with short leads between Pins 3 and 4 of the oscillator tube socket, by-passing the heater. Another two-terminal tie point is located in a convenient spot (I used the hexagonal nut just forward of L_{51}) and on this tie point is to be mounted a home-made heater choke. This was wound on the body of a 2-watt carbon resistor and consisted of about 18 turns of No. 18 enameled wire, close-wound. The heater wiring was opened to insert this new choke. Another 0.001- μ f. disk was used to by-pass the cold end of this choke. C_{68} was changed from 0.005 to 0.001 μ f. Lastly, a 6AH6 high- g_m pentode was substituted for the 6AU6 previously used as an oscillator.

The unit was allowed to warm up and was then recalibrated. The project was then complete, except for determining the constants of the waveshaping network.

Results

Attempts to key the VFO alone produced clicks that were slightly colossal. Keying the first stage of the Viking through a suitable filter, allowing the VFO to run continuously, produced good keying; but there was an audible backwave in the receiver, and one thing the owner of the machine said he wouldn't tolerate was any sound when the key is open. Now, with the wiring of the key jacks, this combination is a real-gone natural for a differential keying system.^{4,5} I got the man over at my place, showed him how small the backwave was, explained how differential keying would make it sound like real fine break-in, and demonstrated the sound of the keying of the Viking through the filter I had cooked up. He agreed to take home the transmitter and the filter, and to use it as I had instructed him, pending his constructing (or more likely, persuading me to build for him) a differential keyer.

Everyone knows by now how you check keying, so I'll go through it very fast and lightly: Receiver antenna off, receiver input shorted, b.f.o. off, a.v.c. off, limiters (if any) off, crystal filter out, audio well up, and r.f. gain up just far enough to hear a little "shooshing" when tuned to the signal. Tuned just off the signal, you manipulate the constants of the waveshaping filter

(Continued on page 140)

⁴ Goodman, "Chirp-Free Break-In Keying," *QST*, Oct., 1953.

⁵ Puckett, "'De Luxe' Keying Without Relays," *QST* Sept., 1953.



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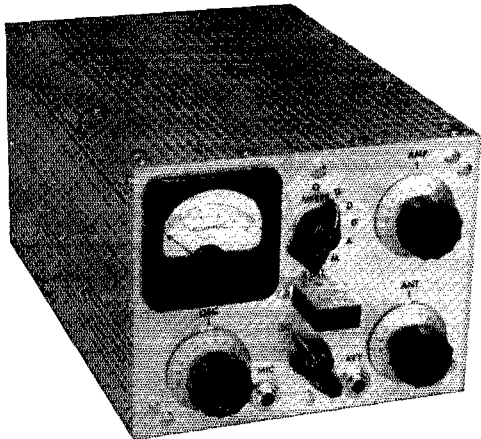


Fig. 20-16—Front view of the 6-band mobile transmitter... Power input to this neat and compact rig may be set at any level from about 30 to 65 watts. It's just one of the many transmitters described in the 1955 Radio Amateur's Handbook: 768 pages, plus hundreds of photos, diagrams, tables and drawings.

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or vacuum-tube keyer until you hear *nothing at all* on opening the key, and the very slightest of clicks, if anything, on closing the key. Then, just to make sure you haven't introduced a chirp or a bad terminal yoop (which you'll find, if you're keying an oscillator and know what to listen for), you tune in a harmonic of the signal — 14, 21, or 28 Mc. — beating against your frequency standard or some steady source, adjust the VFO for a low beat note (pitch, not volume) and send long slow dashes. If all is still well, quit; you're ahead of the game.

This particular rig took 0.01 μ f. right across the key, in series with the key a big old Thordarson choke heavy enough to have lots of henrys at quite a number of milliamperes, and 2 μ f. across the key leads on the transmitter side of the choke. W2— thought the signal was too soft as he listened to it on his own receiver, but after coming over here and listening, he was more than somewhat enthusiastic about the sound of his signals.

If your rig doesn't need this kind of treatment . . . if your locals can work DX through the edges of your signals . . . if all the problems of keying that plague the rest of us are simple to you, and if you *know* this from having swapped stations with one of your locals — well, congratulations; but would you *please* pass on the dope to some of the guys responsible for those *%\$# signals on the low end of 40?

Sweepstakes

(Continued from page 52)

W6SHY 29,106-201-49-A-32	W5BTB 7665- 70-37-A-17
K6BPH 24,192-168-48-A-28	
K6CAH 7632- 80-32-A- -	
K6AZW 4865- 71-35-B- -	
K6CED 2322- 43-18-A- 9	
W6WSS 325- 25-11-A- 5	

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K6CKU 3237- 83-13-A- 9

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Northern Texas

W5COF 11,408-100-39-A-26

W5ESR 7079- 72-33-A- 9

Oklahoma

W5CYQ 19,845-210-49-B-31

Southern Texas

W5UBN 51,557-261-67-A-35

W5HQR 36,462-206-59-A-30

W5RSN 30,857-272-59-B-32

New Mexico

W3WFFV/5.14.108-110-45-A-23

CANADIAN DIVISION

Maritime

VE1VN 7560- 84-45-B-24

VO6U 3333- 51-22-A-11

W4KVM/VO6.30- 6- 6-A- 1

VO6AH 2- 1- 1-A- 1

Quebec

VE2APC 11,016-102-36-A-20

VE2CB 10,919-130-29-A-17

Ontario

VE3BVI 20,592-156-44-A-31

VE3BSJ 528- 22- 8-A- 8

VE3DLS 135- 9- 6-A- 3

Alberta

VE6MJ 456- 19-12-B- 7

VE6HM 3- 1- 1-A- 1

British Columbia

VE7MW 10- 2- 2-A- 1

¹ K2IKS, opr. ² W3WPY, opr. ³ WR1LC, opr. ⁴ Hq. staff, not eligible for award. ⁵ W4JLW, opr. ⁶ W4NTZ, opr. ⁷ W6FRW, opr.

Strays

At a state prison in Georgia, a boner was pulled and some call-letter license plates came out with inverted Ms in about half the places Ws should have been. Particularly unhappy about the situation were hams who received tags on which both an inverted M and W appear.

THIS MONTH							NEXT MONTH							
JUNE							JULY							
S	M	T	W	T	F	S	S	M	T	W	T	F	S	
				1	2	3	4						1	2
5	6	7	8	9	10	11	3	4	5	6	7	8	9	
12	13	14	15	16	17	18	10	11	12	13	14	15	16	
19	20	21	22	23	24	25	17	18	19	20	21	22	23	
26	27	28	29	30			24	25	26	27	28	29	30	

WEDNESDAY

1

JUNE

Let's be honest

Everyone has the same equipment to sell ... equipment made by National, Hallcrafters, Elmac, Johnson, Collins, and many others. Why then do so many radio amateurs say, "You'll be far better satisfied if you buy from Stan Burghardt"?

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At BURGHARDT'S -- you'll do better on trade-ins ! You'll receive top dollar, and in most cases your trade-in serves as the down payment on new gear.

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At BURGHARDT'S -- I personally stand behind every sale, and your satisfaction is guaranteed or your money refunded after a 10 day trial. "At Burghardt's your confidence is our most valuable asset."

Sincerely, 73

Stan

Stan Burghardt - W0BJV

P.S. Write for our latest bulletins. We have hundreds of standard brand pieces of equipment in our trade-in department and prices are realistic !

P. O. Box 41, Watertown, South Dakota

Guy

(Continued from page 34)

A , B and C . $B = A + C$, so the area to be subtracted is $2B$. The area of B is

$$(6)(5) = 30, \text{ and } 2B = 60 \text{ sq. in.}$$

$$120 - 60 = 60 \text{ sq. in. actual area per bay.}$$

Increasing this by 50 per cent, as mentioned above, gives a figure of 90 sq. in.

A solid section 12 inches long, having an area of 90 sq. in., would have a width of

$$\frac{90}{12} = 7.5 \text{ inches} = 0.625 \text{ ft.}$$

Multiplying by 1.4 to obtain the diagonal gives

$$d = (0.625)(1.4) = 0.875 \text{ ft.}$$

This is the d that should be used in Figs. 2 and 3. Tables I and II give the values of K and M .

Guy Wires

Guy wires are usually set at an angle of 45 to 60 degrees with the horizontal, and unless absolutely necessary, this angle should never exceed 60 degrees. Table III gives the breaking strength of 6×7 galvanized sash cord which makes excellent guy wire. Other types of cable

TABLE III
6x7 Galvanized Sash Cord

Diam. (in.)	Breaking Strength (lbs.)
$\frac{1}{8}$	126
$\frac{3}{16}$	283
$\frac{1}{4}$	504
$\frac{5}{16}$	756
$\frac{3}{8}$	1035
$\frac{7}{16}$	1413
$\frac{1}{2}$	1836

will work equally well. However, regardless of the type selected, the guy should have a breaking strength of 4 times the calculated load. The loads calculated by means of Figs. 2 and 3 are, of course, the load on each guy.

Base

The cross section of the base supporting the tower may be calculated by the use of the following, referring to Figs. 2 and 3.

$$t = \sqrt{\frac{W}{100}}$$

where t is the side of a square base in feet, and W is the combined weight of the tower, beam and base in pounds. (Concrete weighs about 144 lbs. per cubic foot.)

The depth of the base is determined by

$$h = 1 + \frac{S}{200t}$$

where h is in feet and t and S are given in Figs. 2 and 3.

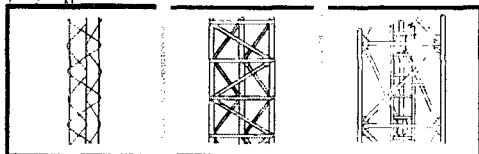
One last word of caution: Guys should have only sufficient tension to take up any obvious slack.

If the design principles outlined here are followed, your tower should withstand any of the elements with a minimum of maintenance.

TRYLON

Towers and Masts

Amateur radio types • Guyed towers for FM-TV antennas • Vertical Radiators • Microwave towers • Commercial Communication towers • Transmission line supports, etc.



SERIES 650

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Width—6.5"
10' section—
22 lbs.
Use—Mast for TV Amateur, Portable, and Wire type antennas

SERIES 2400

Height to 280'
Width—22.6"
10' section—
112 lbs.
Use—Tower for Trylon Rotary Beam, AM Broadcast, and Microwave antennas

SERIES 6000

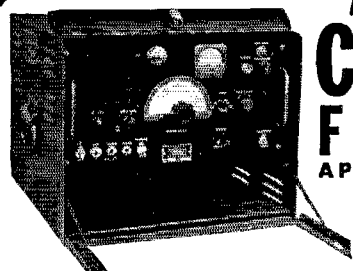
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Width—60"
10' section—
653 lbs.
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* Between CG of Tower Legs

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Measuring only 1 1/4" x 2 1/2" x 1 1/2", the chassis may be mounted inside receiver cabinet or in any convenient spot. (Overall height to top of tube is 3 3/8".) Power may be taken from your receiver or other source—requires only 6.3 volts at .15 amps. and 150 to 300 volts at 2 ma. Special clips are provided for tube prongs of equipment furnishing power take-off. Power cable and extension leads are included to permit remote mounting of switch. Furnished completely wired and tested with tube.

Cat. No. 250-28 CRYSTAL CALIBRATOR

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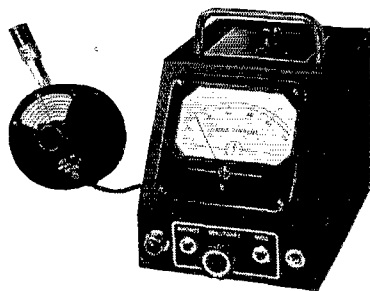
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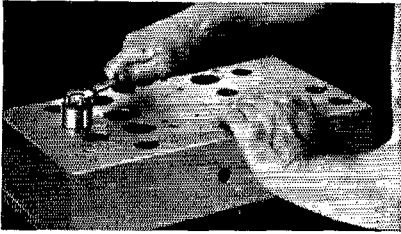
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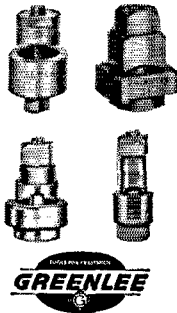
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5-Over-5

(Continued from page 37)

structure has withstood two storms with winds up to 70 m.p.h.

Hurricane Hazel proved, however, that water pipe does not have all the strength needed in an installation of this type. The 95-m.p.h. winds of this storm bent the water pipe about fifteen degrees, but the antenna stayed up. Other materials are now being considered as a replacement for the water pipe. As storms of the intensity of Hurricane Hazel are relatively uncommon in most areas, it is expected that water pipe would be satisfactory for most installations.

The rotator, a Leader Superrotor, is located about seven feet below the top of the tower. The $1\frac{1}{4}$ -inch o.d. water pipe fits into the sleeve of the rotator which has a built-in thrust bearing. A second bearing, consisting of a short section of $1\frac{3}{8}$ -inch i.d. water pipe, is installed at the top of the tower to take care of the side loads. The rotator is designed to withstand thrust loads of 150 pounds, which is about three times the weight of the antenna.

So far, the results with this antenna have been very gratifying. No long-distance schedules have been attempted as yet because of the low power in use (about 50 watts), but during the last E_{33} season five new states were added to the total which is fairly good when one is beyond the thirty-state mark. Ground-wave results have been good, with signal reports from stations in the 60- to 120-mile region usually equaling or slightly surpassing reports given fellows in this area who are running higher power in superior locations. Plans are under way to increase the transmitter power to somewhere near one kilowatt. When this is done, some DX schedules will be attempted. It is hoped that others will also build high-power transmitters and large antennas which will make consistent long-distance coverage possible.

A single-bay version of the basic 5-element yagi fed with 300-ohm Twin-Lead is in use at W3OTC. The matching system used for this beam is a folded dipole, using $\frac{1}{8}$ -inch rod for the fed portion. It and the unbroken portion of the dipole are $\frac{3}{4}$ inch apart, center to center. Results from this installation have been good and indicate that a worthwhile advantage is realized by using an antenna of this type instead of one with fewer elements.

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- R-1148—Clare Midget Telephone Type 6 VDC SPDT, Micalox Insulation for Antenna Keying and Pair of Normally Open Contacts to B+ Key and Pair of Normally Closed Contacts for Receiver Disabling... 2.75
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(Continued from page 73)

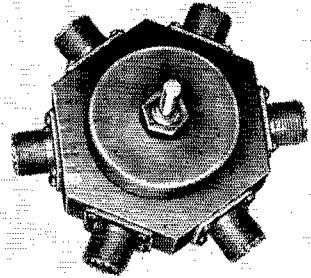
from the jack into the receiver, the shield being removed from the wire for the last inch or so. An insulated wire about 1 inch long is then soldered to the plate terminal of the i.f. transformer. (T_2 on the Communicator schematic. The terminal has a short bare lead running to Pin 5 on the first 6BH6.) These two insulated wires are then laid alongside one another for a length of about one half inch, and fastened together with Household Cement. There should

(Continued on page 146)

Take The Fuss Out of Switching Circuits

Now you can eliminate the fumbling and annoyance of screwing and unscrewing coax connections. With B&W's new Model 550 coaxial switch, you can instantly select antennas, transmitters, excitors, receivers, and other r-f generating devices merely by turning a knob.

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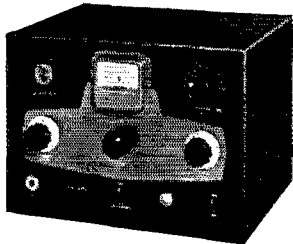


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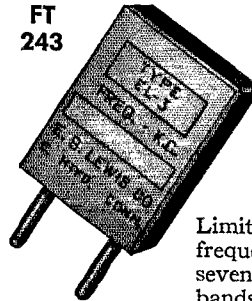
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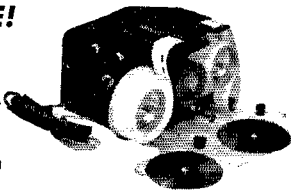
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be no electrical connection, of course; merely a small capacitance.

A coaxial lead fitted with a male phono-type connector carries the i.f. output to the antenna terminals of a communications receiver. The receiver is tuned to about 6 Mc. The Communicator can then be operated either as a converter or as a complete receiver at will, merely by turning up its audio gain or that of the communications receiver, whichever type of operation is wanted at the moment.

The oscillator stability of the Communicator does not permit T9 c.w. reception ordinarily, but its front-end noise figure is good and the signal-to-noise ratio on voice is considerably improved when it is used in this way. Signals that can be detected but not copied readily on the Communicator's own i.f. and audio system may come up to solid readability when the communications receiver's selectivity comes into play.

A slight retuning of the Communicator i.f. transformers may be necessary, but this is done readily enough. Just tune the i.f. screws for maximum eye closure on a medium-strength signal. Whether the receiver cable is plugged into the Communicator or not makes no difference in reception. Addition of the small jack on the back of the rig requires only drilling out a couple of the holes in the protective screen cover, so there is no disfiguration that would affect resale value involved.

W2IUI, who suggested the audio-amplifier stunt above, has a hint for a converter-type connection that requires no retuning of the i.f.s. He solders a short lead to the input terminal of the noise-clipper switch, bringing this out the back of the receiver through a 10- μ mf. coupling capacitor and an alligator clip, to which may be attached a lead to the communications receiver antenna terminal. The ground return for this circuit is through the receiver antenna coil, and separation of up to several feet is possible as long as there is a common ground for the two units. When the system is not in use the clip should be grounded to the Communicator case.

One more hint from W2IUI. To use a French handset or other combination unit, a lead may be soldered to the speaker connection on the send-recv switch and brought to the unused terminal on the microphone jack, for feeding the earphone unit of the handset.

All these ideas apply to either the 6- or 2-meter Communicator, except that the intermediate frequency is different for the two units. In the 6-meter model the i.f. take-off method shown in the photograph would involve working into the communications receiver at 11 Mc. Coupling in the Communicator should be at the first i.f. plate. If the noise-clipper method of W2IUI is followed, the i.f. will be 1500 kc. in the 6-meter model.

OES News

The OES file is getting fatter by the month. Without much promotion by the Headquarters Staff, the Official Experimental Station appointment is gaining stature steadily. Quite a bit of material for these pages is drawn regularly from the monthly reports of OES appointees. This month we're turning the file over to Ellen White, W1YYM, who gets out an OES Bulletin at intervals when she can find the time. Instead of using the reports in this issue of QST, they'll go into the miscellaneous news she has for the Bulletin.

If you're working on the v.h.f. bands regularly you should be enrolled in the ARRL OES program. You report activities regularly to your SCM, and you receive any news or ARRL bulletin mailings that have v.h.f. angles. For more detailed information, write your SCM, or ARRL headquarters.

GET INTO ELECTRONICS

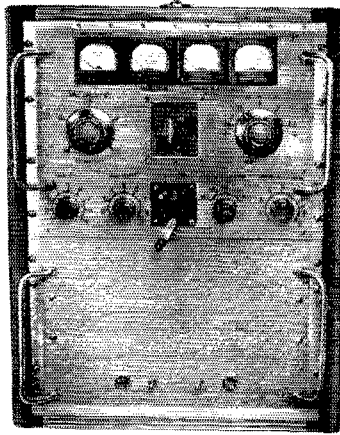
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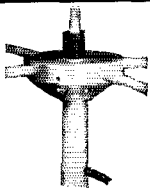
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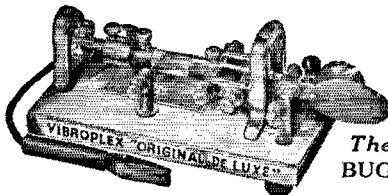
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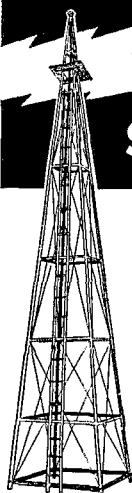


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IARU News

(Continued from page 69)

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Morocco: (Tangier International Zone only): P.O. Box 150, Tangier
Mozambique: Liga dos Radio-Emissores, P.O. Box 812, Lourenco Marques
Netherlands: V.E.R.O.N., Postbox 400, Rotterdam
Netherlands Antilles (Aruba): Postbox 80, San Nicolas, Aruba
Netherlands Antilles (Curacao): Postbox 383, Willemstad, Curacao
Netherlands East Indies: Hr. C. Loze, PK1LZ, Burg. Kührweg, 47 Bandoeng, Java
New Zealand: N.Z.A.R.T., P.O. Box 489, Wellington C1
Nicaragua: YN1RA, Apartado #926, Managua
Northern Rhodesia: N.R.A.R.S., P.O. Box 332, Kitwe
Norway: N.R.R.L., P.O. Box 898, Oslo
Okinawa: O.A.R.C., APO 331, % Postmaster, San Francisco, Calif.

Pakistan: Box 2002, Karachi
Panama, Republic of: L.P.R.A., P.O. Box 1622, Panama
Paraguay: R.C.P., P.O. Box 512, Asuncion
Papua: P.O. Box 107, Port Moresby
Peru: R.C.P., Box 538, Lima
Philippine Islands: Elpidio G. DeCastro, Philippine Amateur Radio Assn., 2046 Taft Ave., Pasay City
Poland: Polski Zwizek Krotkofalowcow, P.O. Box 320, Warsaw
Portugal: R.E.P., Travessa Nova de S. Domingos, 34-1, Lisbon

Roumania: A.R.E.R., P.O. Box 95, Bucharest
Salvador: YS10, Apartado 329, San Salvador
Siam (Thailand): Frank Speir (W6FUV), Saha Thai, 4th Mansion, Raja Damnoen Avenue, Bangkok, Thailand
Singapore: P.O. Box 176, Singapore, Malaya
South Africa: S.A.R.L., P.O. Box 3037, Capetown
Southern Rhodesia: R.S.S.R., Box 2377, Salisbury
Spain: U.R.E., P.O. Box 220, Madrid
St. Vincent: VP2SA, Kingstown
Sweden: S.S.A., Stockholm 4
Switzerland: U.S.K.A., Postbox 1203, St. Gallen
Syria: P.O. Box 35, Damascus
Trieste: P.O. Box 301, Trieste, F.T.T.
Trinidad: John A. Hoford, VP4TT, P.O. Box 554, Port-of-Spain
Tripolitania: 5A2TZ, Box 372, Tripoli
Uganda: P.O. Box 1803, Kampala
Uruguay: R.C.U., P.O. Box 37, Montevideo
U.S.S.R.: Central Radio Club, Postbox N-88, Moscow
Venezuela: R.C.V., P.O. Box 2285, Caracas
Virgin Islands: Richard Spenceley, Box 403, St. Thomas
Yugoslavia: S.R.J., Postbox 48, Belgrade

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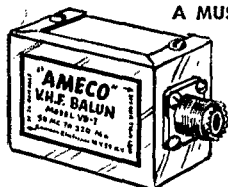
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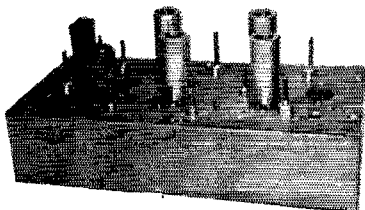
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YOUR present receiver and one of these **Tecraft** crystal controlled converters will do the job—ably and economically! During the past 3 years, operators have learned to rely on **Tecraft** for good, consistent performance on 2 meters. You will find the 6 meter model just as reliable.

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Any Model, any I.F. Complete **\$42.50**
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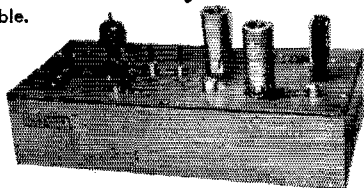
CC5-50 50-54 Mc.
CC5-120 CAP Intercom.
CC5-144 144-148 Mc.
CC5-148 CAP Intercom.
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Choose I.F. frequency—6-10, 7-11, 8-12, 10-14, 12-16, 14-18 or for COLLINS, 26-30 Mc. Model CC5-220 with I.F. 14 to 19 Mc. only. This is a Cascode model—4db noise figure. (144 Mc) Tube line up: 6BZ7, 2 6CB6, 2 6J6.

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Models CC3 and CC3
Any Model, any I.F. Complete **\$34.95**

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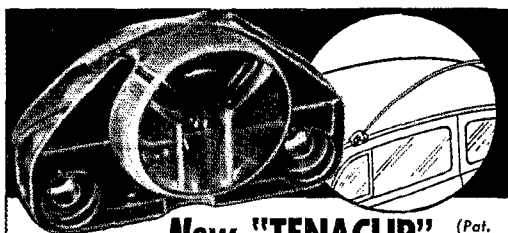
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Other I.F. frequencies on special order.



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New "TENACLIP" (Pat. Pend.)
attaches to car . . . stops antenna whipping

Clear plastic clip quickly fastens to rain molding . . . holds right or left antennas. Prevents damage to antenna from long hanging limbs or driving into garage. See your dealer or order direct. No C.O.D.'s please.

\$1.98

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Synchros & Selsyns, sizes 1, 3, 5, 6, 7; especially G.E. type 5G and size 3. Will pay top price. Advise full nameplate reading and condition. Also need Amplidyne with AC & DC output; Autosyns, Servo Motors; 400 cycle Inverters.

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Low Frequency—FT-2A1A for SSB. Lattice Filter etc., .093" Pins, .486" SPC, marked in Channel Nos. 0 to 79, 54th Harmonic and 270 to 389, 72nd Harmonic. Listed below by Fundamental Frequencies, fractions omitted.

49¢ each—10 for \$4.00		99¢ each—10 for \$8.00	
370	393	414	438
372	394	415	481
374	395	416	483
375	396	418	484
376	397	419	485
377	398	420	486
379	401	422	487
380	402	423	488
381	403	424	490
383	404	425	491
384	405	426	492
385	406	427	493
386	407	429	494
387	408	431	495
388	409	433	496
390	411	435	497
391	412	436	498
392	413	437	501
			522
			528
			480

99¢ each—10 for only \$8.00

CR-1A	FT-171B—BC-610
SCR 522-1/2	Banana Plugs,
Pin, 1/2" SPC	3/8" SPC
5910	7350
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6547	7930
6610	
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	3202
	3550
	2045
	2258
	2390
	3215
	3945
	2065
	2260
	2415
	3237
	3955
	2082
	2282
	2435
	3250
	3995
	2105
	2290
	2442
	3322
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AUTOMATIC CODE PRACTICE
SENDING AND KEYING OSCIL-
LATOR. 115 or 230 V @ 50-60 cycles. Portable. Built-in speaker and amplifier. Variable speed from 5 to 25 w.p.m. Uses inked tapes.
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FT-243—.093" Pin Dia.—.486" Pin SPC for Ham and General Use.

49¢ each—10 for \$4.00

4035	5500	5973	6800	7606	7900
4080	5660	6240	6806	7625	7906
4165	5675	6250	6825	7640	7925
4190	5700	6273	6850	7641	7940
4280	5705	6275	6875	7650	7950
4330	5725	6300	6900	7673	7973
4397	5940	6325	6925	7675	7975
4490	5750	6350	6950	7700	8260
4495	5773	6373	6975	7706	8273
4735	5780	6375	7450	7725	8275
4840	5805	6400	7473	7740	8300
4930	5840	6406	7475	7750	8325
4950	5852	6425	7500	7773	8630
5030	5873	6673	7506	7775	8683
5205	5875	6675	7525	7800	8690
5300	5880	6700	7540	7825	
5385	5905	6706	7550	7840	
5397	5925	6725	7573	7850	
5437	5940	6750	7575	7873	
5485	5950	6775	7600	7875	

99¢ each—10 for \$8.00

1015	6140	6606	7250	8125	8550
3655	6150	6625	7300	8150	8575
3680	6175	6640	7306	8173	8600
3735	6200	6650	7325	8175	8625
3800	6440	7000	7340	8200	8650
3885	6450	7025	7350	8340	8700
3940	6473	7050	7375	8350	8733
3990	6475	7073	7425	8380	
6000	6500	7075	7440	8400	
6025	6505	7100	8000	8425	
6050	6550	7125	8025	8450	
6075	6573	7140	8050	8475	
6100	6575	7150	8075	8500	
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Add 20¢ postage for every 10 crystals (or less). Indicate 2nd choice; subst. may be necessary.

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A Single ROBOT Antenna for ALL BANDS. 80 thru 10, with Automatic Impedance-matching on ALL BANDS — NO SWITCHING — NO COILS — with MAXIMUM OPERATING EFFICIENCY.

Erectable in small space — EVEN ON A ROOFTOP! It's the famous V-37 Electro-magnetic decoupled vertical from the laboratories and factory of the ANTENNA ENGINEERING CO. The price? V-37 deluxe, \$299.00 with TERMS AVAILABLE. The AEC also produces the V-72 at \$199 and the V-70 at \$99 covering ALL BANDS with the AEC SB-75A unit at extra cost.

We make antennae for MILITARY, COMMERCIAL and MARINE uses and our Laboratory is available for ANY Antenna Research, Testing and DEVELOPMENT. Write us for details and how we can help you.

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CONCORD, N. H.

How's DX?

(Continued from page 68)

Luis looks forward to meeting many amateurs he has communicated with regularly over the past three decades WGDXC Items del Sur; PY2CK speaks of renewed Trinidad Island DXpeditionary interest. . . . PZ1RM's recent multiband resurgence makes one rare area somewhat less rare. . . . South Shetlands mailboats show up but twice a year, in March and December.

Hereabouts — VP1GG takes stock of the British Honduras ham situation before heading home to England and declares it copacetic: "Several prospective amateurs here, VP1VR newly licensed, VP1s EK and PS soon to be, so B. H. will still be well represented." KL7BHL now boards with the Navy on Adak where he's rebuilding and refurbishing a cozy ham shack. . . . DXCCer KL7AFR hit the Alaskan news headlines when his digging for a water well turned into a natural gas strike. Friend KL7AI visualizes a new set of kilowatts and rhombics at the Seaton Service Station, Mile 1235, Alaskan Highway, but KL7AFR is unenthusiastic about the whole thing. All Bill wanted was a little H₂O. . . . Other complaints to the contrary, T2BX reports excellent cooperation from multiplier-hungry on-frequency folk during the A3 periods of the last ARRL DX Test. While W4GTH kept a schedule circuit open for word from T2BX's son, a Fort Bragg paratrooper, you could have heard a pin drop. But at schedule's end a terse T2BX "QRZ Contest" brought the roof down. . . . W0PRM and 9S1AX note that W1TED worked 53 new countries in the aforementioned Test — must have started near scratch! W6s ENV and QD dropped in at W4KFC during the Test homestretch to find Vic hovering wild-eyed over a stack of 75A receivers searching vainly for something he hadn't already worked. . . . W1FTX looks for a new Connecticut QTH to enlarge his DXCC tally while W9ABS, a 40-meter specialist, seeks to clinch his diploma at a new Rock Island, Ill. location. . . . W4ML would appreciate hints on how to catch up QSLwise with ZC6WF, '47; YA2AB, ZCs 1AZ and 6PR, '48. . . . DXers will find a flock of brother owls at the Ohio Valley Amateur Radio Association Picnic at Cincinnati on June 12th. For details check immediately with W4OMW. . . . Unless your receiver broke down you don't need to be told that YN0YN, operated by W0AIW & Co., made good a determined effort to put a rare Nicaraguan prefix on amateur bands from Corn Island in late April. The chain-reaction ruckus they stirred up kicked off the warm-season DXpeditionary programme with a capital "dah-di-dah." Many of the gang also logged QSOs with YN0YN/MM and YN0YN/BSA.

"Wun-Oh-Wun"

(Continued from page 45)

of my frequency is automatically blacklisted. When I assign a calling frequency, don't deviate by more than ten parts in a thousand million. I gotta work all the guys who financed this expedition — or else! Wataya think this is anyway, a hobby or something? All needing a QSL card mail ten bucks to DXPERITONS, Inc., Capone Memorial Building, 7373 Liddy St., Ilgokosha. And you boys back at the club if you are listening. I fixed the first day's log like what we agreed, so the cards I left with you are OK. Don't mail them in for DXCC right away as the mail outta these parts is supposed to be slow.

Well, fellows, now you've got it. The "Wun-Oh-Wun" code is as modern as a Mulligan transcription and as keen as Kenton — streamlined to eliminate the sheer drudgery from QSOs and enable you to enjoy other aspects of your hobby. Start using it today and see ham radio as it really ought to be!



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TURN COUNT DIAL

Registers Fractions to 99.9 Turns

FOR roller inductances, INDUCTOR TUNERS, fine tuning gear reducers, vacuum and other multiturn variable condensers. One hole mounting. Handy locking space. Case: 2" x 4" shaft: 3/16" x 3/8". TC 2 has 2 1/2" dial — 1 1/4" knob. TC 3 has 3" dial — 2 1/2" knob. Black bakelite.

TC 2 \$3.90 — TC 3 \$4.20 — Spinner Handle 75c extra Parcel Post Orders: Add 8¢ for dial

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POWER

Power Output: Single Side-Band 400 Watts Peak Envelope
C.W.—350 Watts

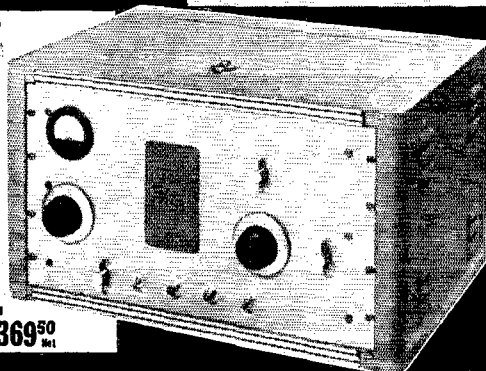
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HERE is an "honest to goodness" power-laden linear amplifier that comes right out of the design facilities of Transitron, Inc. So easy to operate, the Transitron 500 is a compact, fully shielded unit, ideally suited for single side-band operation.

IT HAS no plug-in coils, and features a minimum number of tuning adjustments. Field tests have proven the "500" to be of low harmonic output, free from parasitics, and with excellent stability on all bands.

- Single Side-Band Operation
- Continuous tuning from 3.5 to 30 MC
- No Plug-In Coils
- Driving Power Required: 5 watts
- Low Harmonic Output



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\$369⁵⁰
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Model TR-1000

The most practical and efficient answer to operation of amateur and commercial transmitters and receivers from a common antenna. Requires no tuning adjustments of any kind and has a power handling capacity of 1000 watts.

\$9.95

See the Transitron Line at your local parts distributor, or for more complete technical information write

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154 Spring Street New York 12, N.Y.



PROFESSIONAL KEY AT A LOW PRICE!

Combining the best features of many amateur and professional models, this semi-automatic key operates with a smooth, easy action. Heavy cast metal base 6 1/4" x 3" x 1/2", attractively finished in black wrinkle enamel. Adjustable from lowest to highest speeds—all hardware and vibrator heavily chrome plated, 1/8" coin silver contacts—rubber mounting feet—circuit closing switch.

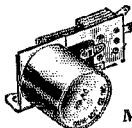
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MIDGET ALL-PURPOSE POWER RELAYS BY DOW

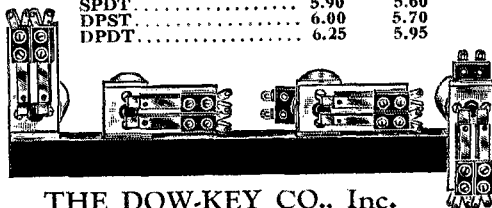


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Model DKP **DKP**

SILENT as a DC relay, rated at 25 amps non-inductive load at 110 V... mounts easily under a 1 1/2" chassis ... carefully engineered for control circuits, motor starting ... quiet, rugged ... linkage and lost motion eliminated by direct magnet thrust ... this versatile relay solves mounting problems; easily changed mounting foot allows combinations for chassis, bank or rack mountings ... heavy leaf springs and 3/16" coin silver contacts with operate time of 2 to 5 milliseconds put the DOW Midget All-Purpose Power Relay in a class by itself.

Contacts	Amateur Net	
	AC	DC
SPST	\$5.85	\$5.50
SPDT	5.90	5.60
DPST	6.00	5.70
DPDT	6.25	5.95



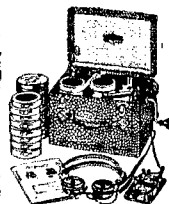
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XMTRS FOR 160 TO 2 METERS

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LETTINE MODEL 240 TRANSMITTER WITH MOBILE CONNECTIONS AND A.C. POWER SUPPLY

This outstanding transmitter has been acclaimed a great performer throughout the world. Air wound plug-in coils used for high efficiency. Takes any freq. from 1.6 to 30 mc. Ideal for General Class, Novice, CAP. CD. Industrial. Sold direct from our factory, ready to operate. 40 to 50 watts input. Phone-CW. Complete with 8 x 14 x 8 cabinet, 40 meter coils, xtal, tubes: 6V6 osc., 807 final, 5B4C7 rect., 6S17 xtal mike amp., 6N7 phase inv., 2-6L6's PP mod. Wt. 30 lbs. \$79.95. 80, 20, 10 meter coils \$2.91 per hand, 160 meter coils \$3.60.

MODEL 130 FOR 120 TO 130 WATTS — \$199.50
807 osc. 2-807's final, 6N7 xtal mike amp., 807 AF driver, 3-807's mod., 2-866A's rect., 6L6 clamper. Wt. only 47 lbs.

MODEL 242 FOR 2 METERS — 45 WATTS INPUT — 6146 FINAL. Complete with mobile connections, A.C. power supply, tubes, xtal, xtal mike input. Uses 8 mc. xtals. Swinging link matches 52 — 300 ohm antennas. Same cab. as 240. \$89.95. Also 6 meter model.

LETTINE VFO & ANTENNA TUNER IN STOCK
Send full amount or \$25 with order — balance C.O.D.

LETTINE RADIO MFG. CO.

62 Berkeley St. Valley Stream, N. Y.

QST — Volume III

(Continued from page 57)

A "Stray," at 43, June 1920, reads as follows: "5AO, Houston, Texas, sends time signals at 7 P.M. daily and Sunday, followed by a QST weather report; 200 meters, 1-kw."

An item at 44 to 45, June, 1920, announced that commencing June 4th, 1920, and for about 10 days thereafter, the stations of the Inter-City Radio Co. at Chicago, Detroit, and New York, would broadcast "free" I.N.S. PX-reports of the Republican National Convention at Chicago; and that these broadcasts would commence at 6:00 P.M., each day, and continue intermittently all evening. Amateurs were urged to copy these "dot-and-dash" news items, and to supply the same to their local newspapers.

On May 6th, 1920, the First Annual Aviators' Ball was held, at the Morrison Hotel, in Chicago; and between 10:30 and 11:15 P.M., the guests danced to music transmitted by radiophone, from Indianapolis. The Ravenswood Radio Association (of Chicago) set up the technical arrangements.⁶⁵

General Summary:

Volume III figuratively "dumped" a lot of facts into the laps of its readers; but too many of the important tales which it tried to tell lacked accuracy, completeness, and coherence.

Perhaps too many things were happening (and happening too fast) to be handled by the available staff.

The need for saving money must have been constantly felt; because there were ARRL bonds to pay off, League members to be gotten back onto the membership rolls, and some salaries to be paid — including that of the new Editor.

But whatever difficulties the lack of proper editing or reporting caused (both at that time, and in later years), the magazine found high favor with the amateurs of its day; and in consequence, it prospered. — S.B.Y., W0CO

R. R. 3, Box 94,
Wayzata, Minnesota,
February 25, 1954.

Part I of W0CO's index to Volume IV of QST will appear in a subsequent issue. — Ed.

⁶⁵ 43 to 44, July 1920. Apparently, this included the transmitter.

WANTED! Amateur or govt. surplus receivers, transmitters, radar, test equipment, teletype, perfs, manuals. Cash or trade for new Johnson Viking, Ranger, B&W, Hallcrafters, Hammarlund, Harvey-Wells, National, Central Elec., Gonset, Morrow, Elmac, RME, Telrex, Fisher Hi Fi, Pentron, etc.

Stores: 44 Canal, Boston, Mass.; 60 Spring St., Newport, R. I.

ALLTRONICS Write Tom, W1AFN, Box 19, Boston 1, Mass. for individual attention.

Be a Radio Ham or Commercial Operator. Pass FCC code test in few weeks. Fascinating hobby. Good pay, interesting work in Commercial field. Same system used by radiotelegraph specialists. FREE book explains how Amateurs and Operators learn code and develop amazing skill and speed. Candler System Co., Dept. 4-G, Box 928, Denver 1, Colo., U.S.A. and 52b, Abingdon Rd., Kensington High St., London W. 8, England

for HIGH POWER PI NETWORKS

VACUUM VARIABLES
10 KV . . . 10-400 MMF

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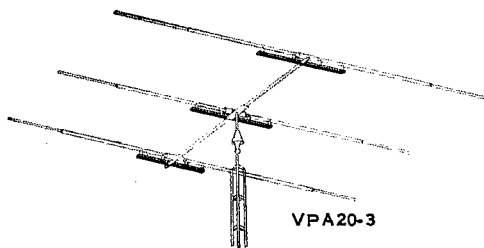
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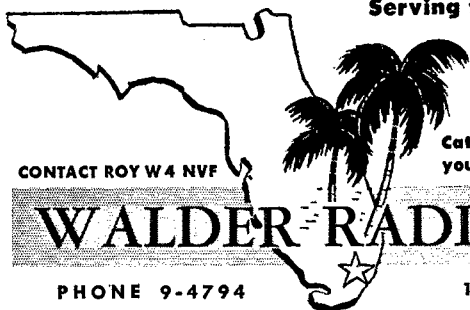
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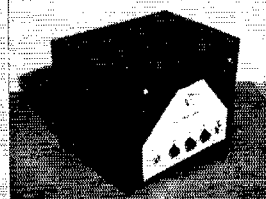
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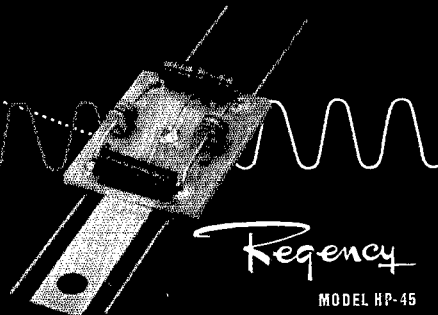
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QUARTZ — Direct importers from Brazil of best quality pure quartz suitable for making piezo-electric crystals. Diamond Drill Carbon Co., 248 Madison Ave., New York, N.Y.

MOTOROLA used communication equipment bought and sold. W5BCO, Ralph Hicks, 204 E. Fairview, Tulsa, Okla.

WANTED: Cash or trade, fixed frequency receivers 28/42 Mc. W9YIY, Troy, Ill.

WANTED: Early wireless gear, books, magazines and catalogs. Send description and prices. W6GH, 1010 Monte Drive, Santa Barbara, Calif.

CODE slow Fry new method. Free particulars. Donald H. Rogers, Ivyland, Penna.

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URGENTLY need AN/APR-4 items particularly tuning units for important defense contracts. New high prices. Engineering Associates, 434 Patterson Rd., Dayton 9, Ohio.

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DON'T Fail! Check yourself with an up-to-date, time-tested "Sure-check Test." Notice \$1.50; General, \$1.75; Amateur Extra, \$2.00. Amateur Radio, 1013 Seventh Ave., Worthington, Minn.

ANTENNA for bandswitching transmitters up to 300 watts input, approx. 120 feet long, centered with 75-ohm line, 70 feet included, low SWR, tunes 80-40-20-10 meter bands. U. S. Patent 2,535,298. Each one tested for resonance on all bands. Send stamp for details. \$18.95 each. Lattin Radio Laboratories, 1431 Sweeney St., Owensboro, Ky.

CALL SIGNS — Three color, reflectorized (glass-beaded), aluminum, 4" x 12", \$1.50 postpaid, includes mounting frame for car, rig or shack. Lackner, W9VFT, 2029 Bradley, Chicago 18, Ill.

MICHIGAN HAMSI Amateur supplies, standard brands. Store hours 0800 to 1800 Monday through Saturday. Roy J. Purchase, W8RFP, Purchase Radio Supply, 605 Church St., Ann Arbor, Michigan, Tel. 8-8696, No. 8-8262.

2-METER aluminum Brownie beams, \$22 and up. Write to H. W. Snyder, W3LMC, 4330 Glenmore Ave., Baltimore 6, Md.

WANTED: All types aircraft & ground transmitters, receivers, ART-13, RT18/ARC1, R5/ARN7, BC610E, BC221 mounts and parts wanted. Fairest prices possible paid. Dames, W2KUW, 308 Hickory St., Arlington, N. J.

WANTED: Bargains in transmitters, receivers, laboratory and test equipment, also miscellaneous and unusual gear, etc. What have you? Please state price desired. Especially interested in husky power supplies, large filter chokes and condensers, etc. Also need plate transformers putting out about 4,000 V or more each side center. Harold Schonwald, W5ZZ, 718 North Broadway, Oklahoma City 2, Oklahoma.

BC-348L modified 110 volt, \$65, with spaker LS-3; \$85. SCR-522 complete \$50. K. Horton, 26 Sherwood Road, Stamford, Conn.

FOR Sale: Complete station, Collins 30K1 transmitter, 375 phone 500 c.w., 1000 exciter, bandswitching 80 through 10; Astatic D104 mike, NC-181D rectifier, relays, spare parts, guaranteed perfect condition; \$995 takes all. Not sold separately. W5HEJ, F.o.b. West Monroe, La. 205 Circle Drive.

WILL Pay \$150 for good clean AN/ARC-1 20-channel preferred. Also BC-610F, BC-614E, BC-939, BC-729, BC-221, TCS and others. Cash for Sig. Corps, Navy, Air Force stock catalogs; maint. and instr. TM's for war surplus equipment. Amber Co., 393 Greenwich St., N. Y. 13, N. Y.

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QSLs of distinction! Three colors and up. 10¢ brings you samples of distinction. Uncle Fred, Box 86, Lynn, Penna.

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QSL! Taprint, Union, Mississippi.

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QSL.S. Postcard brings samples. Fred Leyden, W1NZJ, 454 Proctor Ave., Revere 51, Mass.

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UNUSUAL! Vivacious! Illustrated QSL.S. typolithographed. Free samples. WAT, Box 128, Breckville, Ohio.

ENGINEERING Degrees, E.E. major electronics, earned through home study. American College of Engineering, Box 27724 (D), Hollywood 27, Calif.

WANTED: SX-28A receiver. State price and condition. W8AKV, Kelch, 2857 Ambler Ave., Cleveland, Ohio.

NEW and used Motorola, Link, RCA, G-E, etc., FM commercial communications equipment bought & sold. Allan M. Klein, W2FOU, 95-33 225th St., Bellerose, L. I., N. Y. Phone FL 4-3304.

GIVEAWAY Prices! Army surplus, new radio gear: Dual rotary switch, 10 pole. 15¢; grab bag assortment, 5¢, 8¢; output transformer and low pass filter, P41 10,000 ohm Sec. 4 ohm, sample frequency from 410 to 2000 cycles. 50¢; copper antenna wire, single strand, outdoor covering, 100 Ft. 50¢. Cash with order or C.o.d. Army Surplus Outlet, 91 N. Second, Memphis 3, Tenn.

QSL.S. Something new — Different — All printed in 3 colors or more on glossy stock, \$3.85 per 100. Preference when ordering such humorous, plain or modern. Be surprised. Satisfaction guaranteed. 2-day service. Constantine Press, Bladensburg, Md.

SELL: Triplett Mod. 650 VTM. Practically new. In perf. condx. Will take \$50. Also: 25-watt mod. xrmtr, Sencor A3635, \$65 two filament xrmtrs. 5V, ct. 9A, 2500V insul., \$3.00 each; one filament xrmtr. 5V, ct. 3A, 2500V insul. \$3.00; two 6mu, 1500V filter condensers, \$2.00 each. All in perf. condx. I will pay shipping. All inquiries ans'd. Wallace L. Cook, W5LFB, 1614 Morson Rd., Jackson 9, Miss.

FOR Sale: Audion dated nineteen four. Price high. W1QZO, Harry Warner, 11 Berlin St., Quincy, Mass.

COMPLETE Station: Viking 1, TVI suppressed, S-40R, Viking VFO, all accessories: \$350. K2DQH, Chris Lane, North St., Harrison, N. Y.

TECHNICIANS: Get on six meters fast with Tecraft xtal control mini-converter, 3 tubes. Only \$24.95. Mail for details. N.R.M.I. Wholesale Radio, Inc. 280 Leaneck Rd., Ridgefield Park, N. J.

TELETYPE equipment: Sell Type 12 AH, 60 w.p.m., receiving distributor. W8EB, Aker, 717 No. Ninth St., Cambridge, Ohio.

TELETYPE: Microwave and Servo parts, Wilcox CW-3 receivers and much more for sale or trade for G/R, HP, Ferris, Etc. test gear 1940 or later, any repairable condition, if complete. Standards, Decades, Servo equipment, split and two-phase motors, solenoids and polar coordinate recording milliammeter. Tom Dale, W1TWP, Box 868, Portsmouth, N. H.

LETTINE Mod. 240, with mike, key, xtal, 10 and 40 coils; low-pass filter; \$50. Fred S. Eggert, 11853 Wisconsin Ave., Detroit 4, Michigan.

SELL: Collins 75A3, like new, \$375.00. Speaker, \$14.00, crystal calibrator, \$17.00; 32V2, \$400, All perfect. W4AHG, Byron, 1226 Wisconsin Ave., Washington 7, D. C.

MILLEN 90881 500 watt R.F. amplifier, improved. TVI-suppressed. I worked 153 countries with it. \$65.00, with coils for 40, 20, 10, pair of 812A tubes. Without power supply. Kenneth Caswell, K2BU, 10 Cunningham, Glens Falls, N. Y.

FOR Sale: HRO60, speaker and coils A, B, C, D, F; Viking II with VFO and Johnson Matchbox, all factory-wired. Also for sale cheap: portable mills, surplus communications receiver, code machine, 25 watt xmitter, office typewriter. K2GGR: Call days GR 7-1959, New York City.

FOR Sale: Collins 30-K transmitter, complete with exciter. Asking \$900. Elmer A. Capwell, WJIND, Anthony, R. 1.

HALLICRAFTERS S-77A, late model, like new, \$80; Viking Mobile with V.F.O., 75, 40, 20, 15, 10 meters; never been installed in auto; \$120.00. Shure 101C carbon mike, with coil cable: \$12.00. W0KXU, 1579 Milwaukee, Denver, Colorado.

HRO-5A1 (1947 model) wanted. Ed Preston, W5JNO, 6714 Gaston Ave., Dallas 14, Texas.

VIKING Mobile and V.F.O. Wired by professional. Cost \$185.00 six months ago. Sell complete for \$115.00. Langdon Thaxter, W1MSU, Cumberland Foreside, Portland, Maine.

SURPLUS Navy walkie-talkies with tubes, crystal, complete: \$15.00. Meter bargains from \$1.50. Free bargain list. Meshua Enterprises, 580 Lynn, Malden 48, Mass.

PITTSBURGH Hamfest Sunday, August 7, 1955, at Lotem Pole #1415 chokes. All are 500 Ma., F.o.b. Belvidere. One B & W #X70B Butterfly with disk neutralizers. One B & W 10HDVIL coil. Six never used 810s. Want: UTC S-49 power transformer, S-33, S-34 UTC 300 Ma. chokes, Triplet 3256 absorption frequency meter, Viking II transmitter or new Heathkit 125 watt transmitter. Milliammeters. Good communication receiver. Larry Kleber, Belvidere, Ill.

TRADE or sell: One Stancor #P8029 1500V, one #P8033 2000V power transformers, two Stancor #1405 chokes and two Stancor #1415 chokes. All are 500 Ma., F.o.b. Belvidere. One B & W #X70B Butterfly with disk neutralizers. One B & W 10HDVIL coil. Six never used 810s. Want: UTC S-49 power transformer, S-33, S-34 UTC 300 Ma. chokes, Triplet 3256 absorption frequency meter, Viking II transmitter or new Heathkit 125 watt transmitter. Milliammeters. Good communication receiver. Larry Kleber, Belvidere, Ill.

RECEIVERS: Transmitters, repaired and aligned by competent engineers, using factory standard instruments. Collins, Hallicrafters, Hammarlund, National. Our nineteenth year. Douglas Instrument Laboratory, 176 Norfolk Avenue, Boston 19, Mass.

GOING SSB! Selling Viking II with Johnson LFF, Viking VFO factory built, T-3 mike, Vibroxplus bug, all less than six months old, for \$275.00 Cash. No shipping. W2LPA, 226 Clifton Ave., Staten Island, N. Y.

COMPLETE Station 1-A, TVI-suppressed; S40B, K2DQH, Chris Lane, North St., Harrison, N. Y.

FOR Sale: Globe Champion transmitter, tone/c.w. TVI-suppressed, \$150. B. J. Parisi, Box 1005, Onset, Mass.

SELL: S40B receiver, in excellent condition: \$85.00. W9FTH, Moline, Jr., 3419 W. 112th Pl., Chicago, Ill. Phone: Hilltop 5-1164.

SELL Model 240 Lettine transmitter (improved link or Pi-net output, TVI-suppressed; coils for 20, 40, 80); \$55.00; Lettine VFO (improved single calibrated dial): \$35.00 both: \$85. Guaranteed N. L. Rowe, K2DFW, 85 Huron Rd., Bellrose, L. I., N. Y.

RECEIVER: NC183D, less speaker, like new! \$250.00. F.o.b. New Haven, Conn. Roy Riley, 103 Atwater St., New Haven, Conn.

WANTED to buy or rent: the book "Two Hundred Meters and Down" by Clinton de Soto. Emmons, W9PFD, 1125 Pierce Ave., Marinette, Wis.

COLLINS 32V3, \$595.00; 75A2, \$325.00. Both: \$875.00. Two years old. In perfect condition. Pickup deal only. Write Al Bein, K2BWQ, 26 Lenox Ave., Clifton, N. J.

FOR Sale: Hallicrafters Echophone EC-3 ham receiver, R. F. stage, xtal filter, S meter, noise limiter, monitor, bandspread with original instruction booklet: \$40.00. Dom Garofano, W3VMJ, 4332 Germantown Ave., Phila. Penna. Tel: DA 4-3036.

CANADIANS! Selling out! Large assortment of electronic parts and equipment. Write for free list and prices to W. J. Ford, 36 Deloraine Ave., Toronto 12, Ont., Can.

WYOMING Hamfest July 23-24. Ham vacation in beautiful Big Horn Mountains. Information from W7QFP.

FOR Sale: Heathkit AT-1 transmitter, AR-2 receiver, AC-1 antenna coupler. \$55.00 takes all. Manikowski, W9JGV, 8235 Strong St., Chicago 31, Ill.

FOR Sale: Concord turntable-amplifier with 2 extension speakers; Dynamic D7T clipper microphone with floor stand; Pr. 810s; ICA code course, 5 records; RCA kw modulation transformer, will match E1, 51, 2514; wavemeter. Wanted: GDO, VTYOM; Pr. 4-250A; heavy duty modulation transformer capable of 1.8:1 match; RC 8/U; RG 11/U; preselector, black ripple 5 1/4" enclosed rack. Will sell or buy separately or trade for any of the wanted items. W9PWW, Landfield, 821 Waveland Rd., Lake Forest, Ill.

GONSET Bantam 20 Beam. Can be seen operating. Terrific results: \$42.00. Want: Gonset Commander, used, Earl Burtman, W1VAN, 18 Earle St., Norwood, Mass.

TRADE: PE-101C dynamotor (converted) for BC-453 (any condition); BC-454 or wide-spaced tuning condenser. Byron E. Fortner, W9FYM, RFD #6, Box 370, Indianapolis 27, Ind.

FOR Sale: Brand new condition, Model 2A Marshall 2 meter condenser and 12 element Gonset 2 meter beam. Lewis (Rudy) Simmons, W5CZW, Box 1149, Brownfield, Texas.

RECEIVERS for sale: BC-453, \$9.00; BC-454, converted for 110 VAC, \$11.00; SX-25, \$50.00. RCA ACR-136, \$13.00. W1KW, Birnbaum.

SALE: Motorola Airboy receiver, port., 200 Kc to 400 Kc, \$8.00; Dynamotor Elocor 5.6V, 420 volt, 280 Ma., \$20.00; commercial power supply 110 VAC, 420 volt, 200 Ma., also 6VDC, 6VAC, 13 x 8", \$29.00. AR-B-1 receiver, converted, power supply, 200 Kc to 9 Mc, \$25.00; Ranger surplus recvr 200 Kc., 550 Kc, \$5.00; Bud cabinet CR1742, 14" x 19", \$7.00. Gifford, W5SYB, 1412 No. Manhattan, Amarillo, Texas.

FOR Sale: Super Pro 400 SX, in excellent cond, new set of tubes, clean as new, \$250.00. F.o.b. Albuquerque, N. Mex. R. J. Delorenzo, W5BJQ, 3242B "A" St., Sandia Base, Albuquerque, N. Mex.

BARGAINS: With new guaranteed: R-9-er, \$12.50; S-72, \$59.50; SW-54, \$32.50; S-83C, \$35.00; S-46, \$79.00; Lysox 600S \$129.00; S-27, \$99.00; SX-43, \$129.00; S-70, \$149.00; SX-71, \$169.00; SX-42; \$189.00; HRO-50, \$275.00; Elicidic 1K375 IV \$49.50; Heath AT-1, \$25.00; HT-17, \$42.50; E.S. Shifter, \$49.00; Globe Trotter, \$49.50; Harvey-Wells DeLuxe, \$69.00; Viking I, \$209.50; Viking II, \$259.00; New SS-75, \$189.00; early HT-9, \$139.00; Globe King, 400B, \$359.00; 32V1, \$395.00; 32V2, \$450.00; 32V3, \$550.00. Free trial. Terms financed by Leo, W0PQG. Write for catalog and best deals to World Radio Laboratories, Inc., 3415 West Broadway, Council Bluffs, Iowa.

WANTED: Instruction manual and wiring diagram for National NC-100XA receiver. V. L. Kline, 73 Rhodes Ave., Akron 2, Ohio.

IRE Proceedings: March 1944 to December 1954, one issue missing; QST 220 issues beginning 1932. Take any reasonable offer. W0FXL, 665 Cliff, Pasadena 8, California.

SELL or trade: L W 2 meter transmitter with tubes and crystal, 2-meter converter with tubes. Need wire or tape recorder or 10-meter phone rig. W5BSX, Burlington, Texas.

SELL: PP 813 CW transmitter in 60" enclosed rack, Heath VFO, 3 element 20-meter and 4 element 10-meter beams: \$250.00. Dixie Kiefer, W2ZVS, 266 Midland Ave., Montclair, N. J.

SELL: 75A3, just factory realigned and modified including 6DC6, 1st RF for radically improved signal noise ratio, complete with Collins speaker, 3 and 6 Kc mechanical filters, NBFM adapter, xtal condenser, Pancorder coax connection, \$397.50 value. Sold separately, \$435.00. 32V2 with internally shielded cabinet plus prefabricated 32V3 final internal shield, 35C2 low pass filter, NBFM adapter, complete set spare tubes including two spare 4D32a: \$706.75 value; sold separately, \$485.00. Complete package deal: \$870.00. Used approximately 30 days a year during annual vacations from shipboard (A7J job). Write to W2MZE, Ed Astfalk, 14 Beckman Place, Glen Rock, N. J. Phone Gilbert 4-3727.

FREQUENCY change kit: 6 Johnson pressure condensers type 750-FVSP-250, w/758 max. 226.8 min.; also variable broadcast xmitting hi-voltage capacitors and other parts for kit. All in original cases. Everything for \$400.00. H. J. Abrams, 124 L. St., N.W., Washington, D. C.

SELL: Globe King 400B, push-to-talk, like new. All coils 80 thru 10; BC696, BC457 and BC459; WRL 500 watt aut. tuner. \$450.00 cash takes all. W5UQK, Collins, 5512 Crawford St., Houston, Texas.

FOR Sale or trade: Viking Adventurer; Bandmaster; LM10 frequency meter; Heathkit VFO #1-38 and other gear. Cash or high power transmitter. No reasonable offer refused. K2KKS, Colston, Box 212, Patchogue, N. Y. Tel. Patchogue 3-0186.

HARVEY-WELLS TB550C: \$65.00 and Morrow 5BR converter, \$40.00. In good cond. Wally Ruda, W2MTT, 56 Barbara Pl., Buffalo 25, N. Y.

FOR Sale: Gonset 2-meter converter. In new cond. Used only about five hours: \$30.00. Larry Cohen, K2KGB, 100 Brook Ave., Passaic, N. J.

COLLINS 75A2, late model, in excellent cond: \$285; 6 ft. enclosed relay rack, with dolly: \$30.00. W1QKF, Vigoda, 25 Lafayette Rd., Newton 62, Mass. Tel. B1galow 4-6340.

COLLINS 32V3, L/P filter, spare 4D32, perfect, \$595; also 75A-2, 3 & 6 Kc xtal. lat, latest modifications, speaker, \$425. Both for \$995. Cincinnati, Ohio. Write: Mel Aichholz, W8LTX, 327 Floral Ave., Terrace Park, Ohio.

RECENTLY factory overhauled 75A-2, \$425.00; 32V-3, \$550.00. Right (8) Raycon 3 1/4 ft. horns, \$50. George Sperry, 108 Oak Hill, Portsmouth, Va.

4-125As, removed from commercial equipment, in gud cond, all tested 10 meters, \$10.00 each. Edward Fraser, W1IMD, 17 Ridge Hill Ave., Malden, Mass.

HRO-60, late model, unused and in original carton: \$400; two Eimac 4-250As, new, unused: \$60 pair; 4-65As, \$25 pair; Jennings vacuum variable 40 μ F, \$30; BC-453 Q5'er, converted with power supply dynamotor, \$30; Thoraderson 320, 1000 μ F plate, \$21; 1500/3000 μ F VDC, 650 Ma, \$75; Jennings UCS variable 100-2000 μ F, \$50; 4X150A, new; with Eimac air socket, \$30; open frame plate xtrmr 600 VDC 600 Ma., \$10; Motorola mobile transmitter, unmodified 40 vatts with modulator, \$20; Motorola 6913 receiver, modified for Gonset triband, \$15; 872As \$3 pair. John Huey, W9AMU, 390 Hill, Elmhurst, Ill.

HRO50T, with matching speaker; A, B, C & D coils, Select-O-Ject xtal calibrator, NBFM mod cond., 1000 or best offer; also 10A exciter SSB with a 482 VFO for \$115.00. Would like to contact another ham to share expenses for a house trailer trip around the United States, visiting places of interest. Rogers, W3MER, 1424 Burton St., Whitestone, L. I., N. Y.

SELL: SX-43 with R-42 speaker. In excellent condition: \$140. Converted ARC-4 with power supply: \$35. W9YIP, Edwards, 477 Robinson St., West Lafayette, Ind.

FOR Sale: Sams Photofax, Vols. 1 thru 18, complete and like new: \$180; Stancor battery eliminator, 1.5 amp, 1.5 amp, \$15; three VT17A, \$2 each; 5 each 1625 and 1626 at 45¢; one 100TH, \$9.00; two 5514, \$4.00 each; Babcock mobile power supply, Mod. #PS-4A, like new, \$30.00; new 1K3910 Kc. xtal, \$2.50; new Sola constant voltage transformer, Mod. #7201, \$25.00; quantity of old type receiving tubes, unused and cheap. Calvin J. Evans, LaGrange, Ind., W9LTX.

VIKING Mobile xmitter, like new, and complete: \$85.00 pp. C. Svoboda, W0LQK, Chapman, Kans.

SELL: SX-25, \$85; National NC-120, \$130; National FB-7, \$35. WIAGE, 44 Seaview, Marblehead, Mass.

2 Meter beams: 6-element, horizontal or vertical, all seamless aluminum, \$6.95 prepaid. Wholesale Supply Co. Lunenburg, Mass. 20-15-10 DX bands coming back. The VS baby mobile antenna, beautifully mounted, only 4 1/2 ft. high, is a DX natural. Weatherproof High Q plug-in loading coils, with chrome fittings available 75 thru 10. Trim appearance. Changes bands instantly. Adjustable to exact frequency. Perfect for 50-watt bandswitching transmitters. Effective on all bands. Replaces cowl or fender whip. Simple installation. Antenna with one coil and mounting hardware, \$12.95. Specify band. Additional plug-in coils, \$2.75 each. DX-3 coils, special, \$17.45. WGV5, Bill Davis, 225 Cambridge Ave., Berkeley, Calif.

LIKE new trade-ins: Collins 75A-3, \$450; RME-45, \$95; Collins 75A-4, \$275; BC-221, \$99.50; Collins 30K-1, \$950; "A" Slicer, never used - \$60; Mallory VP-552, \$19.95; Viking II, \$279.95. More! Write for list. Curle Radio Supply, 439 Broad St., Chattanooga, Tenn. 406 Meridian, Huntsville, Ala.

NC-183, extra, \$190; Eldico bug, extras, \$25; excellent home-brew all-band 6146 VFO c.w. transmitter with complete station control system in grey cabinet, \$100. Large 24-hour clock, \$5.00. Will ship anything collect on 50% deposit. Money-back guarantee for 10 days. Inquiries promptly answered. S. Baxter, 635 So. Brainard, La-Grange, Ill.

PRINTED circuits made from your drawings. Etched circuit supplies. Rowe Engravers, 492 East 39th St., Paterson, N. J.

FOR Sale: 130 watt, bandswitching, TVI-suppressed, phone-c/w rig, Parallel 6146 output, 807 modulators. Rig is in 67" Par-Metal Deluxe cabinet. Heathkit VFO included. Best offer takes it. Nick Quackenbush, W3VEJ, 39 Butler St., Kingston, Penna.

WE will be looking for you at the ARRL Central Division Convention at South Bend, Indiana, October 15-16 are the dates. This will be the Big One for 1955! Advance registration \$3.50. Write to Box 551. Make checks payable to Central Division Convention. Do it now!

WANTED: 187V English make rectifier tubes, new. Will pay \$10 each for two to four such tubes. Captain James Faye, C.A.P., Ottona, Virginia.

FOR Sale: Central Electronics 20-A exciter with QT-1 anti-trip unit. Practically new, factory-wired, and also matching 458 VFO. Both for \$250. Two Hi-Life Antenna bases 3-element, 10-meter, \$25.00; 3-element 15-meter, \$30; Radiart TR-2 rotor, complete, \$20. W. S. Thomas, 374 Mancha Place, Monterey Park, Calif. Phone ATlantic 2-7797.

WANTED: Complete mobile set-up in perfect condx. First cash deal, late model equipment. State details in your first letter. Write J. H. Field, Box 112, Brownsville Sta., Brooklyn 12, N. Y.

FOR Sale: HRO-60 with coils for A, B, C, D. New condx; no reasonable cash offer refused. No speaker. R. E. Ridenour, 839 Wildwood Pkwy, Balto. 29, Md.

HALLICRAFTERS S-40A, in gud condx: \$50 or will trade for 35 mm camera. Dick Keast, W3DR, 145 Rambling Way, Springfield, Penna.

FOR Sale: One Premad vertical aluminum antenna; adjustable to 35 ft; Model No. 535, with base insulator. New. Price, \$40.00. Write to Galen Yust, Box 83, Owatonna, Minnesota.

VIKING II goes to best offer over \$225.00. 135-watts not needed for driving new final. K2AHH, Curtis, Jr., 24 North Country Club Drive, Rochester 18, N. Y.

SELL: S-85 Hallicrafters revr, brand new, perfect, \$97. I will ship. Herb Sweet, K2GBH, 2649 Locust Ave., Oceanside, N. Y.

WANTED: NC101X or pre-war HRO in gud condx. State price. W1JFU, Britton, St. Helena, Oregon.

BARGAINS galore! MD-7/ARC-5, \$6.95; split stator 200/200 μ F variable, 6KV, .138" spacing; \$12.75; xirrms, 2AV, 3 amp, \$1.79; ASB-5 revr (500 Mc), Uses lightweight tubes, 60 Mc. IF; FB for amateur TV, new, less tubes, \$7.50; Filter chokes, 12H/250 Ma., \$4.75; 8.5 H/250 Ma., \$4.50; 2.5H/700 Ma., \$4.65. Send money, order or check. Shipping charges c.o.d. Communications, 131 Liberty St., Dept. Q, NYC, N. Y.

BARGAINS! With new guarantee and completely reconditioned: S-8, \$29.00; S40A, \$69.00; S40B, \$85.00; S-76, \$139.00; SX71, \$179.00; SX62, \$199.00; NC98, \$119.00; HQ140X, \$299.00; VHF152A, \$49.00; TESSOD, \$69.00; Meissner EX, \$39.00; Viking Range \$199.00; Viking II, \$229.00; Viking NC18A, \$199.00; Viking Mobile \$89.00; HQ129X, \$240.00; NC25, \$189.00; NC240D, HRO60, AR88, 75A1, 75A2, 75A3, 32V1, 32V2, 32V3, KW1, PMR6A, AR-67, Super 6, Commander, B & W 5100; many others cheap. Shipped on approval. Easy terms. Satisfaction guaranteed. List free. Henry Radio, Butler, Mo.

SELL: Central Electronics signal slicer Model "A", \$45.00; SX25 receiver, \$40.00; RME MC35 converter, \$40.00; on air can demonstrate. Cash deals only. Will ship express collect. \$6.00. Send money, \$35.00, \$22 receiver, \$7.50; MC45 receiver \$7.00; W2WEV, Hunt, 20 Midway Drive, Livingston, N. J.

TELETYPE Mod. 12, less keyboard. Also 21-A. Heathkit VFO with FSK, AT-1 transmitter, AC-1 antenna coupler, 300 ft. Amphenoil KW twin lead. W4ZPZ, Sheffield, Jr., 1805 Madison Ave., Greensboro, N. C.

SELL: Millen grid dip meter, \$40.00; Precision model 85 volt-ohm meter, \$20.00; RME100 speech clipper, \$27.50; Viking Range kit, in factory sealed carton, \$160. Woodfries, W09SD, Box 1264, Sioux City, Iowa.

COLLINS 75A2 factory installed 3 Kc mechanical filter, also latest modification with GDC6 and has crystal 100 Kc. calibrator; used very little, in original carton in new condx: \$350.00 f.o.b. Atlantic City, 2427 Boardwalk, Irv Fishelberg, W2ZLD.

FOR Sale: Elmac A54H and AC power supply; \$130.00. Gonet Tri-Band, \$25.00. All good as new. Dick Shamis, W09FL, Valentine, Nebr.

SELL: 125 watt modulator (AM) with speech amplifier, complete with tubes, less high voltage supply. W0DMA, Smith, Caledonia, Minn.

QSL needed for QSOs with AC2MA, VR2AZ/VR1, VQ1RK, K228E, K228M, C6. Anyone having information please write Lt. Col. Lloyd Colvin, 4th Sig. Gp, APO #403, NYC, N. Y.

FOR Sale: Three oil-filled transformers, primary 115 volt, secondary 14000/1000/0/1000/14000, \$75 each. Original cost over \$300.00. F.o.b. point of shipment. W8NFD.

SELL: Elmac mobile transmitter AF67 and revr, PMR6A. Never used. Best offer. Need VHF152A. Popelarski, W3HDL, 6029 67th Place, Riverdale, Md.

FOR Sale: New and used Gonet mobile equipment. Also two and six-meter Communicators, etc. I buy, sell, exchange mobile gear. Will trade for new and used Polaroid cameras and accessories. R. T. Graham, W1K1T, Box 23, Stoneham, Mass. Tel. ST 6-1966.

SELL: 250W 'phone-c.w. rig, 812s final, custom transformers and chokes, meters, rack, coils, spare tubes, \$125.00; BC-454 revr, new, \$15; BC-456E modulator, new, \$3.00; BC-457 with 80 meter coils, new, \$15.00; BC-459, new, \$15.00; BC-654A 80-meter 'phone-c.w., revr/xmtr, complete, \$30.00; SCR522 xmtr/revr, \$30.00. Information on request. S. C. Reed, WINWV/2, 28 Cheshire Road, Bethpage, L. I., N. Y.

FREE LIST: Amateur components, transformers, capacitors, tubes, 274N equipment. New parts \$3.50.00; transformer, 3600 cented, tapped, 450 Ma., weights 60g, \$25.00. Watt: VHF gear. I. Seidman, W2GNZ, 1535 Longfield, Bronx, N. Y.

VE HAMSI For sale, NC98 with spkr; TA12 transmitter, 500 volt 300 Ma. pwr supply. All for \$250.00. Will sell separately. F.o.b. Weymouth, N. S., VE1ML, A. M. Lawley, P. O. Box 139, Weymouth, N. S., Can.

NATIONAL receivers SW-54, NC-88, NC-98, NC-125, NC-183, HRO-60 in stock. Attractive swaps or trades for used ham receivers and surplus equipment. Dynamotors — 6 VDC/420 VDC 280 Ma., good used, \$12.95; 12 VDC/400 VDC 500 Ma. including filter base, starting capacitor, excellent, \$16.95; surplus RG-8/U cable, 100 ft., \$5.95; 250 ft., \$14.25; 500 ft., \$25.00. Free Bargain Bulletin. Visit store for our unadvertised bargains. Lectronic Research, 719 Arch St., Philadelphia 6, Penna.

SELL: Variac, 45 amp, \$40.00; new BC-457A, \$5.00; new ARC4 RX, TX, \$10.00; HQ-129X with speaker, \$120; Fil. trans. 11 volt 65 amp, \$10.00. W6WYR.

SWAP 3-color OSL printing for small used electric tools, etc. Oscar Craig, Newark, Arkansas.

BC348M, built-in AC supply, \$85; T21-ARC5 transmitter converted to 160 M, no power supply, \$10; Hickok 214 battery operated VTMV, \$20; Gonet noise limiter for auto radio, \$5.00; Supreme 589 tube-tester with roll chart, \$15; Hallicrafters S1G receiver, \$15. Leo Liebl, W9NSY, Medford, Wis.

MUST Sell: Hallicrafters HT-20, TVI suppressed transmitter and Viking 122 VFO, both used less than 10 hours, in perfect condx, all manuals, complete. First \$300 takes both. G. Brady, W2NDP, 910 Smith St., Uniondale, L. I., N. Y. Phone IV 6-0680.

COLLINS 32V-3 and 75A-2A with factory installed mechanical filter, FM adapter and xtal calibrator, including 800 cycle and 3 Kc filters. Matching speaker in original carton. Factory tested and hardly used at all. Submit best offer. Charles W. Jones, Jr., W9CVU, 1550 Kc. 954 ea. Ant. tap switcher, N. E. Cedar Rapids, Iowa.

CRESCENT tape-recorder, \$50.00; Gonet Commander with VFO, \$85; Elmac PMR6A, 2 watt supplies, \$115; BC-946, 110 VAC, \$15; BC-455, 110 VAC, \$20; VFO, 40 & 80 meters, \$20. Looking for an Ecophone EC-4, S-22R, S-38, W4YN.

SELL: Eldico TR75-TV in good condx: \$50.00. Peter Hansen, R.R. #1, Olivet, Mich.

FOR Sale or trade: Crestwood tape recorder, \$100. Williamson type amplifier, two chokes, two chassis, KT-60 tubes, \$75; Shure 55S multi-impedance unidirectional dynamic microphone \$37.50; portable mill, \$35; 10-station intercom Master, \$15; Crosley 5-tube table radio, \$10; Turner BX microphone, \$5. All in excellent condx. Satisfaction guaranteed. Priced F.o.b. Rockford, Ill. V. R. Hein, 418 Gregory St.

SELL: 75A3, in excellent condx, used very little. Highest bidder over \$475. Manuel Castro, K6AMB, 87 El Vanadia Road, Redwood City, Calif.

FD Month Fellows, do you have portable pwr? We have 6VDC Vibrapaks, 400VDC, 100 Ma. output, like new, \$12.50; painted, \$9.00. All are fully guaranteed perfect, 6F, PE101-C dynamotors, \$6.10, brand new, in original boxes, \$5; xtals for 2 meters, \$0.69, \$1.50 Kc. 954 ea. Ant. tap switcher, N. E. Cedar Rapids, Iowa. Gallagher's Service, Boiceville, N. Y.

COLLINS 32V3 transmitter, like new condx, \$525; PE-103 dynamotor, like new, \$25; Hallicrafters TW-1000 receiver, \$65; S-38C receiver, \$25; Don DeShazo, Jr., W9BVC, 529 Blackstone Ave., LaGrange, Ill.

COLLINS 32V2 transmitter, excellent condition, \$475. Will consider lower priced transmitter or receiver as part payment. Meissner EX Signal Shifter, \$50; Revere T-700 deluxe push-button tape recorder, \$145; Solar \$50 capacitor analyzer, \$25; RCA WV-97A Volt-ohm-mtr with H.V. probe, \$50; Eico 1040 D.C. supply, \$17.50. All F.o.b. Baltimore, Md. Robert Wolfe, W3HDT, 2566 East Hoffman, Balto 13, Md.

QUICK sale: Eldico TR-1-TV bandswitched xmtr, pi-net output, with Meissner EX Signal Shifter VFO, 300 watts AM, FM, CW, TVI suppressed. Xmtr used under 100 hours. First \$285 steals it. Pick up; will grate only at your expense. G. E. VRS-1, like new and selector, perfect, \$45. Robert Lewin, W2PFL, 23 Fenimore Drive, Harrison, N. Y. Phone Rye 7-3733.

FOR Sale: SX71 Hallicrafters receiver, like new condx, in original carton, instruction manual; \$165.00. No speaker. Charles K. Brinton, W1QVL, 1180 Narragansett Boulevard, Cranston, R. I. Phone Williams 1-5285.

SELL: Meissner EX Signal Shifter, with pwr supply and FMX modulator. In excellent condx. \$49. W0ZJH, 2444 Dee, Lincoln, Nebr.

WANTED: Viking II, TVI suppressed and VFO. Want to sell BC221AJ frequency meter, 400 cycle modulation, internal VR supply. W2J1J, 3511 Halsey Rd., Fairlawn, N. J.

STOLEN! Hammarlund HQ-140X receiver. Serial No. 3850. Revert for information leading to recovery. Sell: Dumont #241 scope, \$175; Collins 32V-3, \$525 and 75A-3 with two filters and calibrator \$445, both like new. Want: ARC-1, ART-13, ARN-7, TDQ, APR-4 and tuning units. Tom Howard, W1AFN, 46 Mt. Vernon St., Boston 8, Mass. Tel. Richmond 2-0916.

FOR Sale: Single Sideband S575 crystal exciter having upper and lower sideband PA400 linear amplifier to match (450 watt) band-switching mixer operation 40-80 meters. Satisfaction guaranteed. Perfect operating condx. W3ALE, Richard M. Kraus, 1220 Wheat-sheaf Lane, Abington, Penna.

New Hallicrafters SX-96; make offer. S-20R professionally re-aligned, new tubes; \$49.50. New Heathkit VF-1 \$19.50. MS-710 code practice oscillator with speaker, \$5.50. John Bradley, 41 Cedar Ave., Montclair, New Jersey.

FOR Sale: National NC-183D double-conversion receiver, complete with speaker. In new condition, perfect in every way. No modifications. \$100 off amateur net. Will ship. W7TKB, care of Sta. KATL, Miles City, Montana.

GONSET 3-30 \$24.95, 6 meter \$19.95, 10-11 \$24.95, Tri-band \$29.95, Super-six \$39.95, Signal-slicer \$29.95, Commander \$99.95; Hallicrafters SX-18 \$69.95, SX-24 \$74.95, S-38 \$24.95, S-38A/B/C \$39.95, S-40 \$59.50, S-40A \$69.95, S-40B \$74.95, S-40C \$74.95, SX-42, \$179.95, SX-43 \$129.95, SX-62 \$250.00, SX-71 \$159.95, HT-17 \$39.95, HT-18 \$59.95; National HFS \$99.95, HRO \$99.95, NC-125 \$125.00, SW-54 \$34.95; Collins 32V1 \$375.00, 32V2 \$450.00, 32V3 \$550.00; Sonar AMP-50 \$19.95, CFC \$24.95, MB-26 \$34.95, ME-611 \$14.95, SRT-120P \$149.95, 120 \$14.95, VFX-60 \$24.95, XE-RJ \$4.95, SRT-9 \$29.95, SR-9 \$29.95, Meissner S-C \$29.95, EK \$44.95, FMX \$4.95; other used items available. Free list from W1BFT, Evans Radio, Concord, N. H.

FOR Sale: Heathkit DX-100s, wired and tested: \$290.00. We also write and test any kits. Prompt service. Write Zartos, W3GES, Red Lion, Penna.

MOBILEERS! Send for your free copy of Mobile Antenna Design. We cater exclusively to supplying the needs and solving the problems of the mobile ham operator. Skyline Electronics — Ham Division, 5835 W. Chicago, Chicago 51, Ill. Tom Kostl, Pres., W90PU, and W. Vogel, W9BYX.

SELL: Viking II, \$240; Matchbox \$40, in excellent condition. Only six months old. W9DXS, Embach, 7140 Longacre Rd., Milwaukee, Wis.

10, 15 and 20 meter beams. Aluminum tubing, etc. Perforated Aluminum sheet for shielding. "Radcliff's", Fostoria, Ohio.

300 Watt 813 transmitter, \$125; mobile transmitter with dynamotor, \$25; VFO, misc. gear, very reasonable. D. P. Tracy, 2233 Michael Dr., Youngstown 11, Ohio.

FOR Sale: 300-watt, 813 final, with pwr supply, built-in bias supply, grid and plate metered, coils 80 and 40 meters. Very nice rig. \$50 cash and carry. Write or see W0ANK, Nemel Kimberlin, Diagonal, Iowa.

PASS amateur theory exams. Check yourself with sample FCC-type questions and Novice and General Class examinations. All for only 50¢. Ameco Electronics, 1203 Bryant Ave., New York 59, N. Y.

VERTICAL antenna for 20-40-80M. All material and information included. \$59.50. No C.o.d. El Cajon Electronic Engineering, 720 S. Joynson Ave., El Cajon, Calif.

WANTED: 20 meter, 10 meter and 6 meter coils for Millen R9'er. WICUT, de ARRL, 38 LaSalle Rd., West Hartford 7, Conn.

INFO data compiled. W5CA.

S36A Hallicrafters receiver, \$100; NC183D, \$300. All equipment in perfect condition. Clement Gouveia, 3310 63rd St., Sacramento, Calif.

SELL or trade: Collins 32V3. Want 8 mm movie equipment. W9BHV, 857 Burlington Ave., Frankfort, Ind.

PIONEER 6 volt mobile dynamotors, small and efficient, 400 volt at 300 mill int. w/ base containing A, B and R filters, \$19.95. G-E relay control containing sensitive 8000 Ohm 1.5 mill relay and other parts, \$1.24; G-E 10 μ F 1400 volt oil condenser, \$1.44. Send for new Bargain Bulletin. Post Electronics Company, 98 Park Place, New York 7, N. Y.

WANTED: Amateur or govt surplus receivers, transmitters, test equipment, teletype, technical manuals. Cash, or trade for new Johnson Viking, Ranger, Barker Williamson, Hallicrafters, Hammarlund, Harvey Wells, National, Central Electronics, Conset, Elmac, Morrow, RME, Coltex, Fisher Hi-Fi, Pentron, Bell, etc. Need: ARC-1, ART-13, ARN-7, APR-4, TN-19, TN-54, BC-221, BC-610-E, BC-614-E, BC-939, APN-9, APQ-13, TDQ, APA-11, RA-20, BC-312, BC-312, BC-342, LM, DY-12. New & Used equipment at 44 Canal St., Boston; 60 Spring St., Newport, R. I. Write to All-tronics, Box 19, Boston 1, Mass. (Richmond 2-0989).

BOTTLE Sale or swap: In pairs 813s, \$7.50; 803s, \$10.00; 805s, \$5.00; 8005s, \$7.50; Elmac 38T1, \$5.00; Hk-54s, \$8.00; 24Gs, \$2.00; 826s, \$3.00; T220s, \$5.00; 872As, \$6.00; T203Zs, \$7.50, with fil xfrmer and sockets extra. Need KW final and power supply components. Art, W1MNG, 1702 Main St., Agawam, Mass.

TRADE large HO railroad layout, many unopened kits, for ham gear or what have you. Shelton Morgan, Box 274, Brookhaven, Miss.

ATLANTIC City vacation! Commodore Hotel, Kilowatt accommodations at low power prices. Luxury rooms with bath and radio. Budget special rooms with running water. Write for information and reservations. Ben Robin, W2BIC, Manager, Commodore Hotel, 715 Pacific Ave., Atlantic City, N. J.

ROTARY inductors from BC-375B, in excellent condx. Price: \$7.50 prepaid. Also xfrmer 811-As to 813, \$3.00. C.o.d. Phil Garver, W5ZBI, 2136 E. Newton Pl., Tulsa, Okla.

QRT-TR1 and S76 complete, \$210. Separate bids considered. Dr. Guertin, W0UHX, Perry Point, Md.

CASH for your gear. We buy as well as sell. Write for cash offer or trade. We stock Elmac, Conset, Hallicrafters, Hammarlund, Johnson, Lyso, Master Mobile, Morrow, National and other ham gear. H & H Electronic Supply, Inc., 506 Kishwaukee St., Rockford, Ill.

WANTED: Modulation and driver transformer for BC610E; also tuning units for 7 and 19 Mc. range. Ray Snider, 3008 So. 27th, La Crosse, Wis.

NEW Crystals for all commercial services at economical prices; also regrinding or replacement crystals for broadcast, Link, Motorola, G-E and other such types. 20 years of satisfaction and fast service. Send for L-7 catalog. Eidson Electronic Co., Temple, Texas.

BC-221 AE frequency meter for sale. In flawless condx. Complete with original calibration book and built-in selenium pwr supply: \$90.00. Also sell Millen 90800 xmtr with 20 meter coils: \$25.00 prepaid. Sonar XE-10 NFM exciter: \$20.00 prepaid. Trade almost new Ikoflex 11A reflex camera with Tessar f3.5 lens, leather case and \$30.00 cash for HQ-129X with spkr. W9EVI, Reynolds, 1640 Sheridan Rd., Evanston, Ill.

LONG ISLAND Hams! Come to Hams' Heaven. Real bargains in xmitters, recvrs, verticals, mounts, dynamotors, tubes, xfrmers, chokes, condensers and many other parts. Trade-ins taken. Meters repaired and calibrated. Special scales and shunts. Algeradio Electronics Co., 236 N. Franklin St., Hempstead, L. I., N. Y.

TRADE good 5820 Orthon for gud 5527 Icon. Cleaning ho-use. Send for list. Jeppesen, W0QFZ, 2318 Second Ave., Council Bluffs, Iowa.

SELL Heathkit receiver with cab. New \$22.50. James Gaskill, KN6HEW, 125 Estates Street, Livermore, Calif.

LEECHE-NEVILLE 6 volt system, 100 amp. alternator, regulator & rectifier, \$60.00. Leech-Neville 12 volt system, 100 amp. alternator, regulator & rectifier, \$85.00. Good condition. H. A. Zimmermann, 570 Jamaica Ave., Brooklyn 8, N. Y. Ulster 2-3472.

DIAGRAMS: Ham gear, timers, counters, intercoms, organs, etc. \$1.00 each and up. List free. Parks, 104Q SE 57th, Portland 15, Oregon.

WANTED and for sale: Want to buy 10 to 20 2-meter mobile installations, particularly commercial units like those from taxicabs, police, etc. Give complete details and best cash price. For sale: BC-221 frequency meter, Meissner signal shifter, SX-24 receiver, 750 volt 300 Ma. AC power supply. Bruington, W4NJE, Box 246, Lewisburg, Tenn.

Test your QRK*

THIS little quiz is based on articles appearing in *QST* for April. How much do you remember from the issue of two months ago?

1. If W1QRM were operating c.w. aboard a ship on Lake Ontario, how would he sign his call?
2. *QST* technical articles have a "new look" due to _____.
3. The frequency of an AC generator can be checked using what readily available device?
4. A balun for 144 mc. with a 75 ohm input and a 300 ohm output can be made from a piece of coax how long?
5. What new material simplifies the building of high-Q receiver coils?

The questions appearing in the quiz above and those in the three previous issues of *QST* represent a cross-section of the information all active amateurs need. A file of *QST* serves as a complete technical library. Make your file complete; join the League today, and have *QST* delivered each month.

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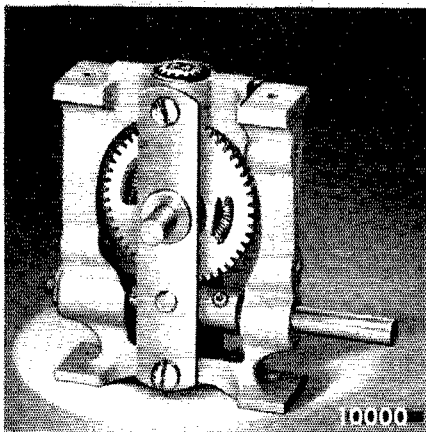
ANSWERS: 1. W1QRM/2 ("It Seems to Us . . .", page 9) 2. New schematic symbols (*Graphical Symbols for Radio Diagrams*, page 16) 3. An electric clock (*Emergency Power Distribution*, page 28) 4. 27" (*Director Beams*, page 23) 5. Ferrromagnetic cores (*Ferroxcube Cores and a High-Selectivity I.F. Amplifier*, page 30)

* QRK — *QST* Reading Knowledge. It is also the International Q-Signal meaning "Your readability is . . .". You'll find *QST* always QRK 5 — Perfectly Readable.

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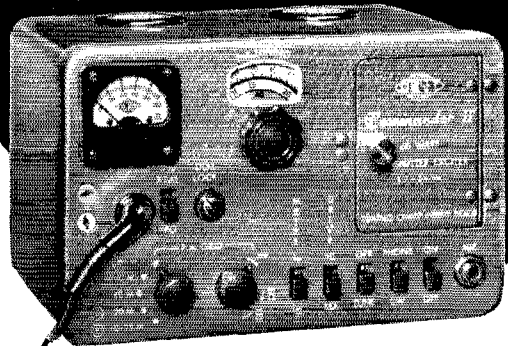
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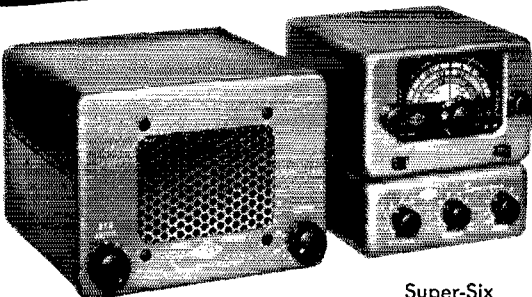
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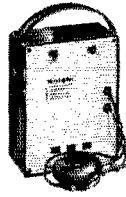
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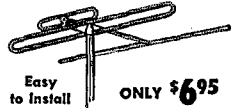
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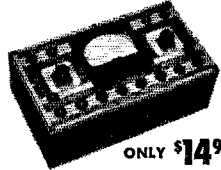
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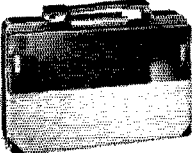
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sands of other amateurs we heard from, too.

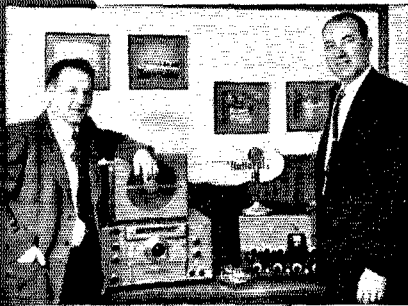
Actually, every ham operator everywhere is a "winner" in National's contest—for its purpose was to enable us to be sure that National products have all the features hams themselves consider to be most desirable.

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[Faded text, likely names of other winners]

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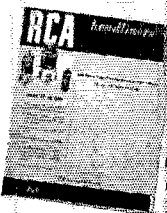
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Close-up view of the Hallicrafters HT-31 Linear Power Amplifier—using two RCA-811A's.



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BOARD MEETING HIGHLIGHTS

The Board of Directors of the American Radio Relay League, Inc., sat in annual meeting at Hartford, Connecticut, on May 13th and 14th. In sessions running well into the second day, the Board carefully examined the progress of the League during the year previous and reached policy decisions charting a course for the future.

An ARRL National Convention was authorized for 1956 to be held in the San Francisco area, subject to completion of plans; the sponsor is expected to be the Central California Radio Council.

So that the views of the Pacific Division could come before the Meeting, the Board invited former director Ray H. Cornell, W6JZ, to participate in the discussions, but necessarily without vote (Mr. Cornell, by recently accepting employment in the radio industry, had rendered himself ineligible to continue as Director but there was insufficient notice to permit the new director, Harry M. Engwicht, W6HC, to reach Hartford for the Meeting).

The Board re-designated Percy C. Noble, W1BVR, ARRL Vice-President, to serve on the Executive Committee, and to that Committee also reappointed Vice-President F. E. Handy, W1BDI, Treasurer David H. Houghton, and Northwestern Division Director R. Rex Roberts, W7CPY, for one-year terms. The Board continued its appropriations for field organization travel for SCMs, SECs and QSL Managers, including provisions for SCM and SEC travel in the territories and possessions. The salary of the ARRL's General Manager was increased to \$18,000 per year.

Regulationwise there is to be a study of the desirability of permitting frequency shifts of less than 850 cycles in F.S.K. emission; if the results are favorable, the Commission will be asked to amend our rules accordingly. Studies are also to be made of the desirability of upgrading the level of the written examination for the Novice Class licenses, and of using WT as the prefix to identify Technician Class licensees. The General Manager was instructed to continue efforts to seek a relaxation of the power limitation on the 420-Mc. amateur band, to the extent it is feasible.

As indicated by a number of commendatory actions, the Board in its examination of our affairs found the League and amateur radio in a most satisfactory status. Bouquets were tossed to the Headquarters for its performance during the year, and additionally to the *QST* staff; to the field Engineering and Monitoring Bureau of the Federal Communications Commission for its continued fine cooperation with the amateur radio Service; and to volunteer League field organization workers (SCMs, SECs, QSL Managers, ECs, etc.) for their outstanding achievements during the year.

By a rising vote of applause, the Board of Directors took note of the attainment by Canadian Director Alex Reid, VE2BE, on January 1st, of 25 years of continuous service on the League's governing body. Congratulations were also expressed to three Headquarters' staff members upon completion, during the past year, of 25 years service: Technical Director George Grammer, W1DF; *QST* Technical Assistant C. Vernon Chambers, W1JEQ; and Communications Department Administrative Aide Lillian M. Salter, W1ZJE. The Board registered its deep regret over the passing of Karl W. Weingarten, W7BG, Northwestern Division Vice-Director and for many years its Director, and Hugh L. Caveness, W4DW, for many years Director of the Roanoke Division.

Minutes of the meeting will appear in July *QST*.