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August, 1952

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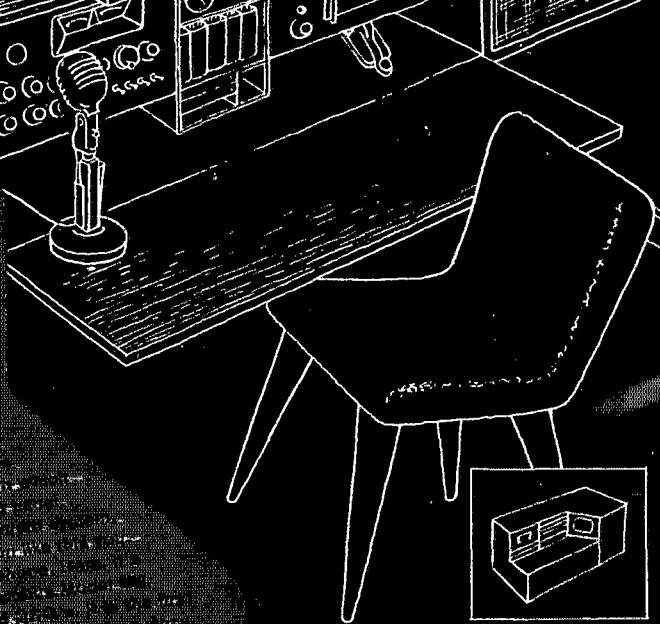
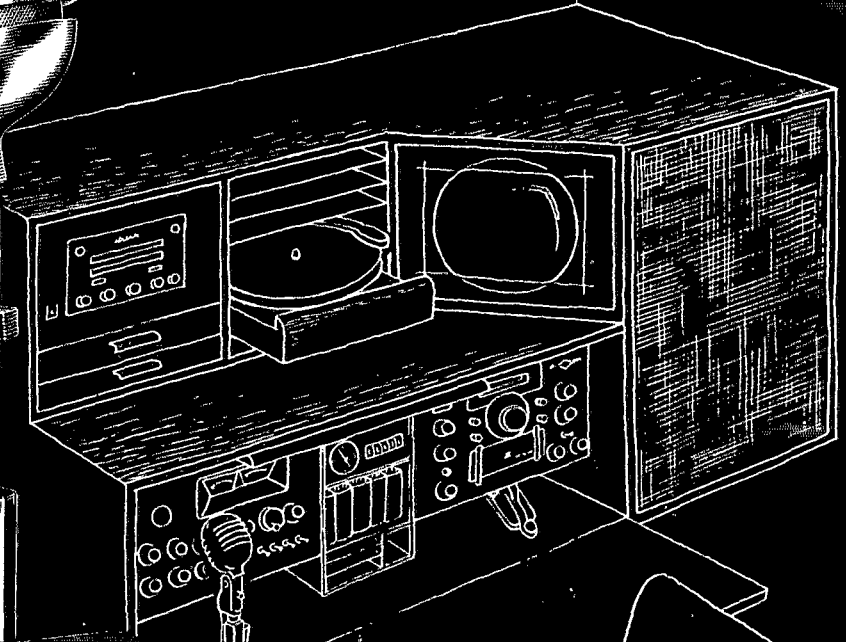
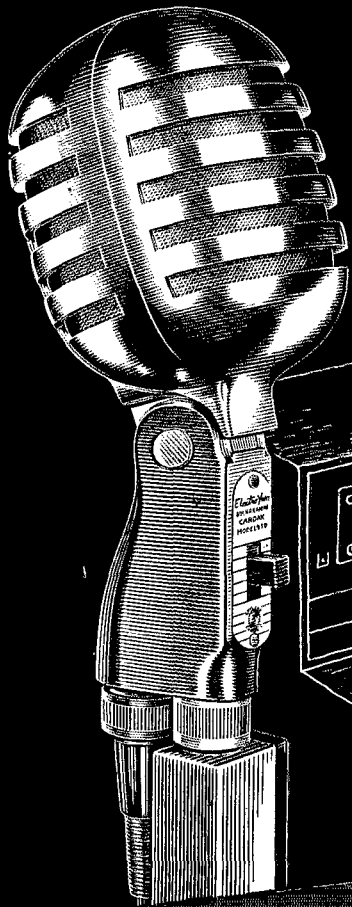
amateur radio



In This Issue: AUTOMATIC TUNING OF THE ANTENNA COUPLER

IDEAS for modern
STATION DESIGN

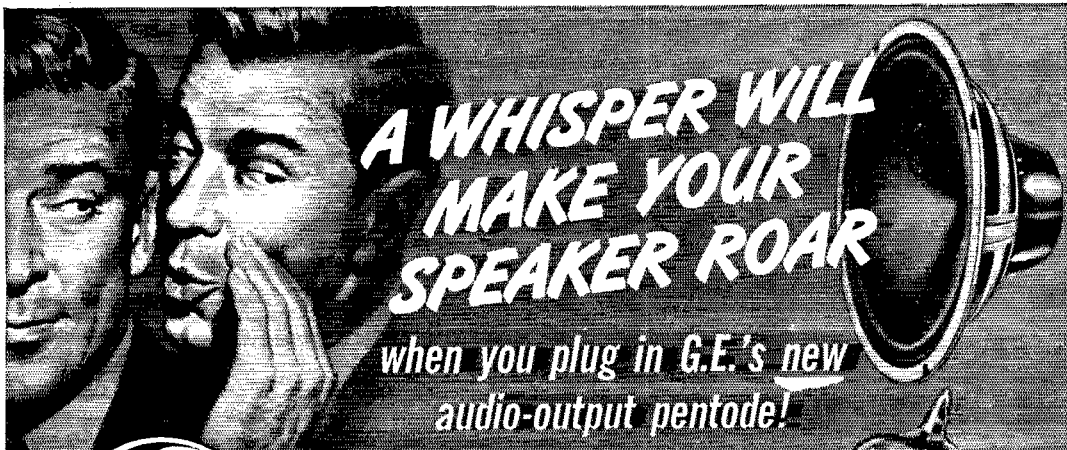
(One of a series)



Electro-Voice

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MICROPHONES • HI-FI-SPEAKERS • PHONO PICKUPS • TV BOOSTERS • TV DISTRIBUTION SYSTEMS



6BK5

9-Pin Miniature Beam Power Amplifier

Heater voltage, a-c or d-c
 Heater current
 Max plate voltage
 Max plate dissipation

6.3 v
 1.2 amp
 250 v
 9 w



GANGWAY FOR HIGH SENSITIVITY plus real audio wallop! With just a few volts' drive, the new 6BK5 will put out enough power for **BIG** speaker response!

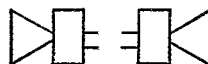
COMPARE the 6BK5's 3.5-w output from 5 v drive, with performance of these well-known audio types:

6AK6	requires 9 v drive to put out 1.1 w
6AS5	requires 8.5 v drive to put out 2.2 w
35L6GT	requires 8 v drive to put out 3 w
6BF5	requires 7.5 v drive to put out 1.9 w
35C5	requires 7.5 v drive to put out 1.5 w

YOU'LL FIND MANY WAYS to apply this new G-E marvel that hears more, and repeats it loudly! A 1-tube phono-amplifier for the junior op.—the power-output stage of your new receiver—an improved circuit for your home-entertainment amplifier—these are among the numerous possibilities.

YOUR G-E TUBE DISTRIBUTOR is ready with price and further facts. See him today! *Tube Department, General Electric Company, Schenectady 5, New York.*

RADIO MILESTONE:



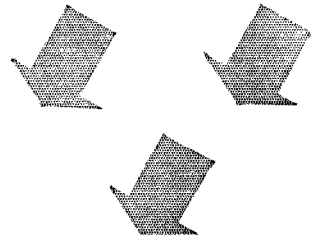
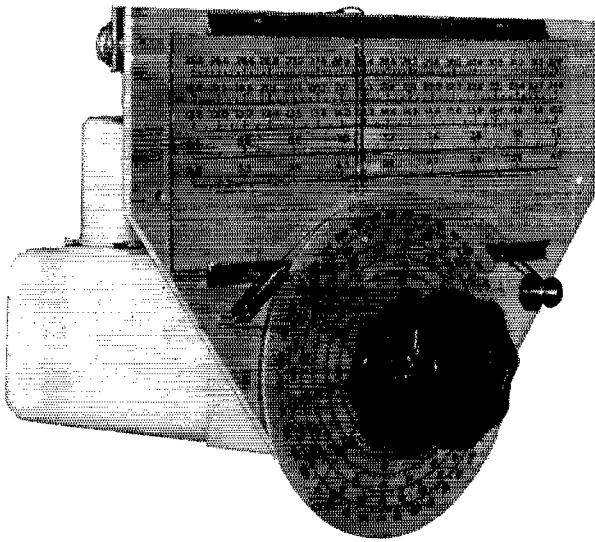
Tubes for Loud-Speaker Reception

● In 1925, General Electric developed the first special radio tubes for loud-speaker reception. This was but one of many pioneering steps by which wireless was freed from earphones, to take its place as today's foremost communications and entertainment medium. The long succession of General Electric radio-tube "firsts" is background for the superior design of advanced types like the 6BK5 which you buy and install in 1952!

ELECTRONIC TUBES OF ALL TYPES FOR THE RADIO AMATEUR

GENERAL  **ELECTRIC**

166-188



... the 70E-8A VFO is back

For those of you who are not acquainted with it, the Collins 70E-8A is an extremely accurate, stable variable frequency oscillator. Off the market since 1949, it is now back again.

The 70E-8A is permeability tuned, and has a linear range of 1600 kc to 2000 kc. Sixteen turns of the vernier dial are required to cover the 400 kc range.

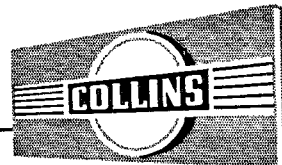
We utilize a secondary standard, continually checked against WWV, in the factory calibration of this oscillator. A special corrector mechanism in the 70E-8A produces the linear calibration curve. The table below shows typical calibration characteristics for the various ham bands.

BAND (meters)	Freq. (mc)	No. of dial divisions	kc/dial division	Oscillator Harmonic	Multiplier Sequence
80	3.5 — 4.0	500	1.0	2	x 2
40	7.0 — 7.3	300	1.0	4	x 2 x 2
20	14.0 — 14.35	175	2.0	8	x 2 x 4
15	21.0 — 21.45	90	5.0	12	x 2 x 3 x 2
11	26.960 — 27.230	54	5.0	16	x 2 x 4 x 2
10	28.0 — 29.7	340	5.0	16	x 2 x 4 x 2
6	50.0 — 54.0	533.3	* 7.5	30	x 2 x 5 x 3
2	144.0 — 148.0	200	*20.0	80	x 2 x 5 x 4 x 2
1 1/4	220.0 — 240.0	500	*30.0	120	x 2 x 5 x 4 x 3
3/4	420.0 — 450.0	666.6	*60.0	240	x 2 x 5 x 4 x 3 x 2

*As read on 7 mc band.

If your Collins dealer hasn't yet received his supply, he will have it soon. The net domestic price of the 70E-8A, complete with dial, is \$97.50.

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PUBLISHED, MONTHLY, AS ITS OFFICIAL ORGAN, BY THE AMERICAN RADIO RELAY LEAGUE, INC., AT WEST HARTFORD, CONN., U. S. A.; OFFICIAL ORGAN OF THE INTERNATIONAL AMATEUR RADIO UNION

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Subscription rate in United States and Possessions, \$4.00 per year, postpaid; \$4.25 in the Dominion of Canada, \$5.00 in all other countries. Single copies, 40 cents. Foreign remittances should be by international postal or express money order or bank draft negotiable in the U. S. and for an equivalent amount in U. S. funds.

Entered as second-class matter May 29, 1919, at the post office at Hartford, Connecticut, under the Act of March 3, 1879. Acceptance for mailing at special rate of postage provided for in section 1102, Act of October 3, 1917, authorized September 9, 1922. Additional entry at Concord, N. H., authorized February 21, 1929, under the Act of February 28, 1925.

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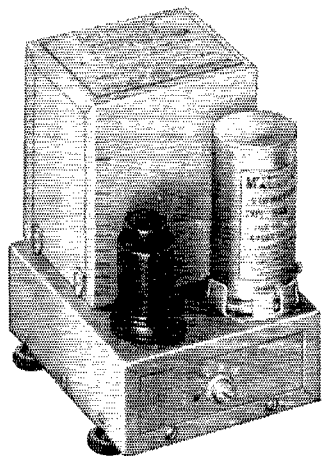
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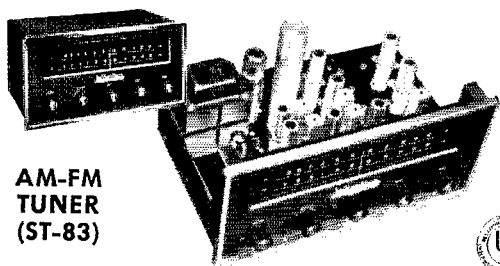
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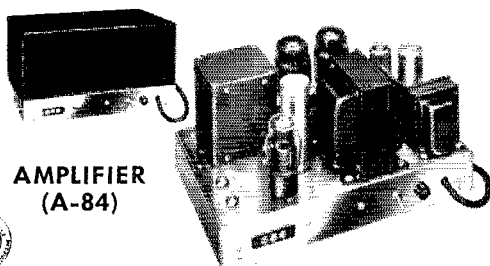
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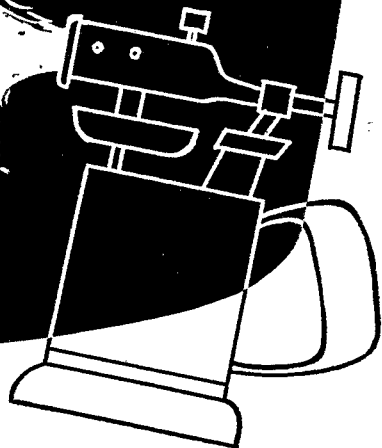
Section Communications Managers of the ARRL Communications Department

Reports Invited. All amateurs, especially League members, are invited to report station activities on the first of each month (for preceding month) direct to the SCM, the administrative ARRL official elected by members in each Section. Radio Club reports are also desired by SCMs for inclusion in *OST*. All ARRL Field Organization appointments are now available to League members. These include ORS, OES, OPS, OO and OBS. Also, where vacancies exist SCMs desire applications for SEC, EC, RM, and PAM. In addition to station and leadership appointments for Members, *all amateurs* in the United States and Canada are invited to join the Amateur Radio Emergency Corps (ask for Form 7).

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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.

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Vice-Director: Ramon S. Walker WØOWP
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104 Myrtle, Cochran, Ga.
Vice-Director: Ernest W. Barr W4GOR
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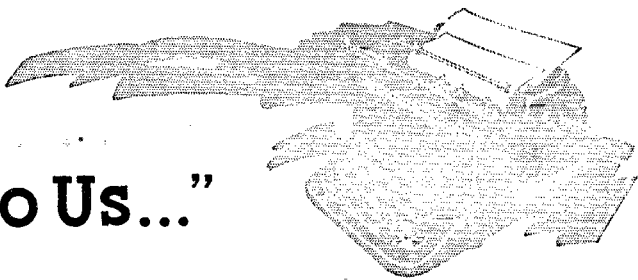
Southwestern Division

JOHN R. GRIGGS W6KW
10412 Don Pico Rd., RFD 2, Spring Valley, Calif.
Vice-Director: Walter R. Joos W6IKM
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A. DAVID MIDDELTON W5CA
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Vice-Director: Frank E. Fisher W5AHT/AST
104 E. 11th, Pawhuska, Okla.

"It Seems to Us..."



RACES

On August 15th there becomes effective a plan which, for the first time in our history, provides *in advance* an opportunity for the radio amateur to be of service to his country in the event of national emergency. The Radio Amateur Civil Emergency Service, the culmination of several years' work by FCC, FCDA, the military and ARRL, is a means of making available the years of practical self-training and experience possessed by the body of amateur radio. It provides frequencies, and it provides the regulatory basis for an operational plan with ample opportunity for drills and tests to bring local organization to a peak of efficiency.

The fact that we now have our emergency regulations and frequency assignments in advance of a national disaster is a tribute to the confidence placed in us by our Government. Let us and our communities justify that confidence by completing our own organization and training. Let us hope that the end situation for which RACES has been created never materializes; let us also take some reassurance from the knowledge that *should* it happen, we can now be prepared.

TVI

While the course of the amateur TVI problem will always be much rougher than the ideal we all like to visualize, there have been a couple of encouragingly-smooth stretches in recent weeks with the scope and nature of the problem more thoroughly penetrating the higher brass in the field and service division of TV manufacturing companies.

For background there were the ARRL letters to the industry, the Dallas project, and the FCC Plan. The fuse which set off a real charge of powder was some front-page publicity in major cities on the opening of our 21-Mc. band and the potential interference to TV receivers on the old 21-Mc. RMA i.f. standard. Everyone doesn't read ARRL letters or *QST* items, but everyone reads the front pages of newspapers, and this story for a while set the industry on its individual and collective ear — we can speculate that there were some hurried engineering and service division conferences within the industry. There are currently sighs

of relief from that quarter that the i.f. interference has not developed to the extent indicated as possible (which in our view is only a matter of time, awaiting the opening of the band to 'phone and the coming of better propagation conditions). But the effect was to create an increasing awareness on the part of the higher-ups to the amateur problem. We do know that the publicity was a large factor in sparking the holding of a service technician TVI educational meeting in Washington, D. C., initiated by hams but sponsored experimentally by RTMA. More frosting on the cake was served up late in June at a meeting of the service committee of RTMA attended largely by national service managers of television (and radio) manufacturing companies. As these are the fellows who administrate the industry's participation in the FCC plan, their cognizance and understanding of the amateur aspect is particularly important. With adequate groundwork previously laid by representatives from the Amateur Section of RTMA, at this meeting Phil Rand, W1DBM, delivered an effective lecture (published in its entirety on pp. 47-49 of this issue) on the over-all aspects of TVI but accenting the amateur phase. A hard-hitting question-and-answer session followed. No earth-shaking events resulted; RTMA is a coordinating, mutual advisory group — not a policy-making body. But we came away with the strong feeling that the amateur story had been absorbed more thoroughly than ever before by the higher brass in the service field, and that it was a very positive step forward in obtaining a common understanding of the practical administration of FCC's plan as well as recognition of the need for educational programs among service technicians on the complexities of TVI.

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.

COMING A.R.R.L. CONVENTIONS

- Sept. 14th — Vermont State, Burlington, Vt.
Sept. 27th — New Hampshire State, Nashua, N. H.
Oct. 3rd-5th — Hudson Division, Albany, N. Y.
Oct. 11th — Roanoke Division, Richmond, Va.
Oct. 11th-12th — Southwestern Division, San Diego, Calif.

HAMFEST CALENDAR

GEORGIA — Sunday, August 3rd, at Dixon's Lodge just outside of Macon — the 1952 Annual Hamfest of the Georgia Cracker Radio Club. Full details may be obtained by contacting C. L. Wilder, W4LXE, 3667 Brookdale Ave., Macon, Ga.

MARYLAND — Sunday, August 10th, at Triton Beach, Mayo, Md. — the Fifth Annual Hamfest-Picnic sponsored by the Baltimore Amateur Radio Club. Tickets are a dollar per person (children half price). Includes bathing, bathhouse, locker, use of picnic tables and pavilion. Beer and soft drinks will be on sale. An interesting program has been planned and there will be awards for the best mobile installations. Bring your picnic basket and remember that the festivities start at 10:00 A.M. W3PSG will be on hand to guide visiting mobiles. From Washington take Route 214 through Capital Heights to Route 2. From Baltimore take Route 2 through Annapolis, then follow the hamfest signs. For further information, write Chairman Ernie Dobos, W3JCL, 2208 North Fulton Ave., Baltimore 17, Md.

OKLAHOMA — Sunday, September 7th, at Craterville Park — the Third Annual Barbecue and Suds Bust, sponsored by the Lawton-Fort Sill Radio Club. Advance registration of \$1.50 per person can be sent to R. L. Hawkins, Box 892, Lawton. Admission at the gate will be \$2.00. There will be exhibits of transmitters, mobile rigs, and old-time gear. And finally, plenty of barbecue.

PENNSYLVANIA — Sunday, August 3rd, at the Totem Pole Lodge in South Park, Pittsburgh — the annual hamfest of the South Hills Brass Founders and Modulators. Plenty of activities scheduled. Lunch and refreshments available on the grounds. Registration, at the gate only, \$2.00. Further information available from C. J. Lauer, W3KVL, 345 South Millvale Ave., Pittsburgh 24, Penna.

WISCONSIN — Sunday, August 24th, at Big Hill Park, just north of Beloit — the SWANI ham round-up sponsored by the Blackhawk Amateur Radio Club. Program starts at 10 A.M., and there will be activities for all the family. Bring your own lunch. Further details are available from Ken Lovelace, W9OOD, Box 166, Beloit, Wis.

FEED-BACK

In the circuit diagram of W6QLV's quadriband mobile rig, on page 25 of the July issue, a blocking condenser is required between the top of RFC_4 and C_{12} . This can be a 0.001- μ f. ceramic or mica unit.

Strays

W0BYR'S first c.w. QSO was first with W0AYD. Two years later, W0AYD's first 'phone CQ brought an answer from W0BYR!

—*—*—

E. H. Noell found this listing in the radio-TV section of a Fort Worth paper: "9:00 — Big Town, Radio's Popular Crime Program on TVL."
"The Mystery of the Plastered Raster"?



August 1927

... Gear for $\frac{3}{4}$ -meter work is featured, including a UV-202 oscillator-transmitter developed by Boyd Phelps, 2EB, and Technical Editor Robert S. Kruse.

... Mr. Kruse discusses several interesting schemes offered by 5VU, 3AB1 and 3ES for the purpose of reducing the effects of static on short-wave reception.

... The 'phone transmitter of Cuban 6XJ furnishes material for an article by Frank H. Jones and Assistant Technical Editor Harold P. Westman.

... Mr. Westman presents constructional information for "A One-Gnatpower Portable" transmitter-receiver which operates from a 90-volt battery plate source.

... L. W. Hatry, 10X, stresses the benefits to be obtained from additional audio stages in "Better Audio Amplification for Short Wave Receivers."

... Data on shielded r.f. amplifiers, designed to have negligible reaction on following detector circuits, are provided by R. B. Bourne, 1ANA.

... Part II of "Short Wave Radio Transmission and its Practical Uses," by Chester W. Rice, analyzes fading, wave paths and angles of antenna radiation.

... Phenomenal miles-per-watt figures highlight the flood of reports being received from twenty-meter enthusiasts who are forsaking the lower frequencies.

... Vigorous amateur activity is reported from Australia, Belgium, China, Estonia, Iceland, France and other countries throughout the world.

... The Canadian Hudson Bay Air Expedition will use the call VDE on several wavelengths and will seek contact with amateur stations.

... Expressions pro and con appear in the Correspondence Section regarding the advantages of 'phone on eighty meters as compared to 150-175 meters.

... Arkansas, Kentucky, Louisiana and Mississippi floods demonstrate once again the value of amateur radio as a reservoir of emergency communications.

A.R.R.L.

DAKOTA DIVISION CONVENTION

Minneapolis, Minn., Sept. 5th-7th

The Mid-American and Dakota Division ARRL Convention, sponsored by the Minneapolis Radio Club with the assistance of the St. Paul Radio Club, will be held at the Nicollet Hotel, Minneapolis, on Sept. 5th, 6th and 7th.

The Convention Committee has arranged for a continuous round of entertainment and activity for the men and ladies for three consecutive days. There will be special v.h.f., mobile and net meetings, plus a sight-seeing trip and shopping tour for the ladies. On Friday night there will be a big "get-acquainted" party. Also on the program are civil defense meetings and the famous Wouff Hong ceremony. Those interested in the latest gear will find numerous display booths of ham equipment. A top-notch banquet and entertainment will be provided to round out the program.

Advance banquet and registrations are \$7.00 — or \$7.50 at the door. For your reservations and further information, write to Joe Tomezyk, W0DBC, 3306 Aldrich Avenue North, Minneapolis 12, Minn.

Automatic Tuning of the Antenna Coupler

A Tuner That Follows Your Frequency Around the Band

BY WALTER A. KNOOP,* W2PXR

A WORTH-WHILE function of the phase detector¹ described by Mezger, W2BLL, is to form the "sensing" element for an automatic antenna-network tuner. In our shack the antenna tuning network is located about 40 feet from the transmitter, near a window through which passes a resonant feeder system tapped symmetrically across an inductance forming part of a parallel-tuned circuit, link coupled to the transmitter with RG-11/U 75-ohm coaxial cable. This quite conventional layout is shown in Fig. 1.

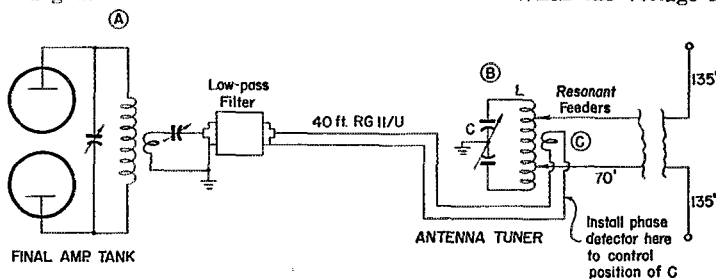


Fig. 1—The original antenna-coupling set-up at W2PXR.

Frankly, it was a nuisance to get up from the operating position and walk over to retune the network each time the frequency was changed and ask the XYL to watch the plate meter for loading as the capacitor was adjusted. It was also a nuisance for her. So the writer reasoned that if the phase detector were placed in the link circuit at the antenna tuner, it could be used to control a reversible motor to turn the tuning capacitor. At resonance the impedance looking into the link, C , should be a pure resistance and consequently the power factor in the RG-11/U line should be a maximum or unity. If there is any reactance present the output voltage of the phase detector may be used to operate a relay to turn a reversible motor in the direction of resonance.

The complete automatic tuning circuit is shown in Fig. 2. The phase detector is different than W2BLL's in only one major respect: the inductance L_1 consists only of a single turn of No. 12 wire as described in greater detail in Fig. 3. Presumably this version of the detector is less sensitive than W2BLL's; however, it functions perfectly well for this application

* Hathaway Lane, Essex Fells, N. J.

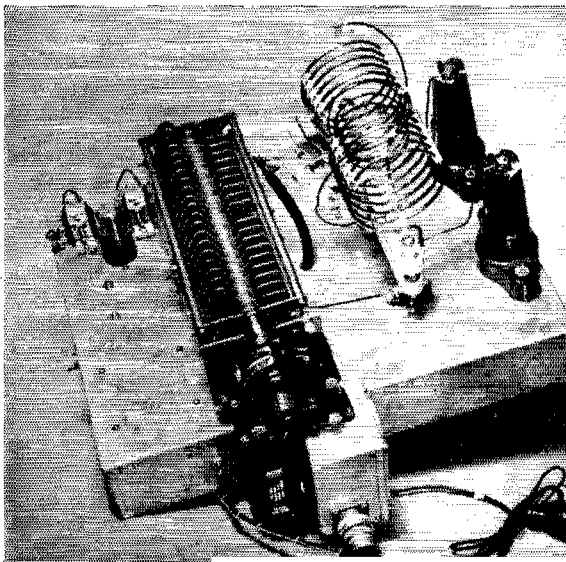
¹ Mezger, "A Phase-Angle Detector for R.F. Transmission Lines," *QST*, July, 1952.

with power between 50 and 600 watts flowing in the link circuit. It was also determined that both W2BLL's and this phase detector exhibit identical null voltages at both 3.9 and 14 Mc.

Control Circuit

There is nothing tricky about the circuitry. This assembly worked perfectly the first time it was turned on—except for the usual reversal of the motor leads. The output from the detector is fed to a two-stage differential d.c. amplifier. When the voltage at point A is negative with

respect to point B, Fig. 2, Ry_1 pulls in and when point B is more negative than point A, Ry_2 pulls in. The relays used here were plate-circuit type relays with 5000-ohm coils, adjusted to pull in on 2.8 ma. and drop out at 2.4 ma. These values should not be too critical because R_3 can be selected, within limits, so that both relays are just below the point of pulling in from static plate-current flow through the 6SN7 sections. Potentiometer R_4 furnishes a bias adjustment for the 6SL7. With the rotor of R_4 at ground, the bias on the 6SL7 will be that developed by cathode current flowing in R_4 . With the rotor at the cathode end, the bias voltage will be zero. The proper setting is determined by swinging the transmitter frequency and noting which setting



This automatic antenna-tuning network is an experimental unit built primarily to try out the circuit, so has not been "dressed up." The control tube and relays are in the upper left corner of the chassis.

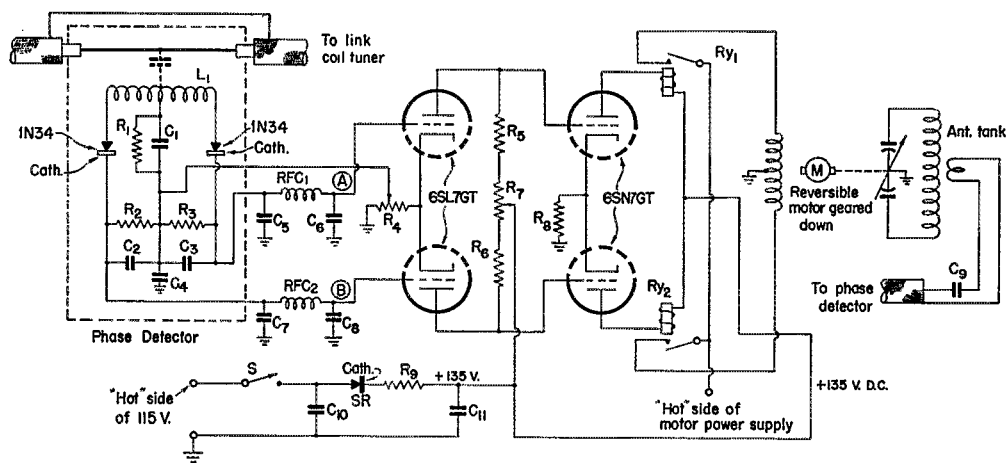


Fig. 2—Complete circuit for the automatic antenna tuner. Various types of motors suitable for the purpose are available from surplus dealers; tuning motors from broadcast or television receivers and "showcase" motors also are excellent possibilities.

- C₁ — 200- μ fd. mica or ceramic.
- C₂, C₃ — 100- μ fd. mica or ceramic.
- C₄ — 0.01- μ fd. ceramic.
- C₅, C₇ — 0.015- μ fd. ceramic feed-through (mounted on shield containing phase discriminator).
- C₆, C₈ — 0.015- μ fd. ceramic.
- C₉ — 100- μ fd. mica.
- C₁₀ — 0.05- μ fd. paper, 600 volts.
- C₁₁ — 40- μ fd. electrolytic, 200 volts.
- R₁ — 30,000 ohms, $\frac{1}{2}$ watt.
- R₂, R₃ — 0.1 megohm, $\frac{1}{2}$ watt.
- R₄ — 50,000-ohm potentiometer.

- R₅, R₆ — 47,000 ohms, $\frac{1}{2}$ watt.
- R₇ — 0.1-megohm potentiometer.
- R₈ — 20,000 ohms, $\frac{1}{2}$ watt.
- R₉ — 50 ohms, $\frac{1}{2}$ watt.
- L₁ — 1-turn coil (see Fig. 3).
- Ry₁, Ry₂ — S.p.s.t. relay, 5000-ohm coil (see text).
- RFC₁, RFC₂ — 2.5-mh. r.f. choke.
- SR — Selenium rectifier.

NOTE: C₉ must handle the r.f. current flowing in the link circuit. Two 50- μ fd. 5000-volt test condensers used in parallel at W2PXR.

causes the tuning unit to be most sensitive to frequency changes, and yet not so sensitive that the capacitor keeps hunting back and forth around the resonance point. The optimum point for this circuit was with the rotor at the cathode end. R₇ is a balance control to establish equal gains for both halves of the 6SL7. With R₈ set up for optimum value, rocking R₇ by only 5 degrees or so is enough to cause Ry₁ or Ry₂ to pull in at the two extremes of the 5-degree rotation. This is mentioned just to give anyone planning to duplicate the design a "feel" for the circuit.

The motor used was a wing-flap actuator which has an output shaft speed of about 2 r.p.m. No form of braking was found necessary. A simple half-wave selenium-rectifier power supply was used for the d.c. amplifier. Two 6.3-volt filament transformers were connected with secondaries in series to furnish 12 volts a.c. The voltage across one of the windings is used for heater supply. The entire unit, including motor, amplifier and antenna tank components, is on a 17 × 13 × 3-inch chassis.

• A useful application of the phase detector described in July *QST* is to control the tuning of a remote circuit, where its ability to sense the proper direction of control is an essential ingredient of a successful "servo." Here it is applied to a remote antenna coupler.

Matching the Line

When the auto tuner was first turned on, the motor would turn in one direction only, indicating that the load seen by the link line never did become resistive. This operation was observed with the taps and link coil identical to those previously used in the manual tuner.

We want to dwell at some length on the subject of tuning up the antenna properly because for nearly a year previously the rig had been operating under what seemed to be optimum tuning conditions. The antenna in use is shown in Fig. 1.

Since the motor turned continually in one direction when r.f. power was applied, it was obvious the impedance looking into the link coil C was not a pure resistance. A single-turn loop was connected to the feeders at the tuner end, and with a grid-dip oscillator it was found that resonances were indicated at 12.9 and 15.4 Mc. These must be points of maximum current or lowest impedance. If this were true, then a frequency halfway between these two readings must be a point of maximum impedance and consequently maximum voltage, and halfway between is 14.1 Mc. OK, the antenna seemed properly cut because this certainly checked with the dimensions.

Then, with the link removed from the antenna tank circuit and the feeders disconnected, the antenna tank circuit was resonated with the dipper to 14.1 Mc. The feeders were then tapped

on the coil about 2 turns either side of center, and the capacitor rotated to bring the tank-antenna combination back to resonance at 14.1 Mc. We noticed here that it took less capacitance for resonance, and when the feeder taps were moved out one more turn the capacitor went through minimum capacitance without ever reaching resonance at 14.1 Mc. So — too much reactance present at the feeders even though the measurements showed we were pretty close.²

Rather than prune the feeder length we chose to connect a coil across the feeder taps so that the unwanted feeder reactance was cancelled, or at least diminished. A 30-turn inductance of No. 12 wire space-wound on a $2\frac{1}{4}$ -inch diameter was found to do the trick, and then regardless of how far out toward the ends of the tank coil the feeders were tapped we could still resonate the combination at 14.1 Mc. with the existing tuning-capacitor range.

Then with the feeders tapped nearly at the ends of the coil, where they should be for a high voltage or impedance point, the whole assembly was fired up, and still the motor kept turning in only one direction, even though I knew from the dipper readings that the combination was passing through resonance. The only element that could be causing the trouble was the link coil *C* itself. Fortunately we own an "Antennascope," so taking a reading of the impedance looking into the link coil *C*, we found our phase detector was right — at resonance in the antenna tank, the "Antennascope" went through a minimum but did not go to zero, indicating substantial reactance present looking into the link coil. One way to fix this was to make the link coil circuit resonant at 14.1 Mc., and since the *Q* of the link could be low this did not seem much of a problem. A 100- μ mf. mica capacitor, *C*₉, in series with the link coil — which is 4 turns on a $2\frac{1}{2}$ -inch diameter — checked with the dipper to be resonant at 14.1 Mc. The resonant link was placed in the tuner and another "Antennascope" reading taken. This time the impedance looking into the link circuit with the tuner at resonance was nearly a pure resistance of about 75 ohms to match the RG-11/U. Spreading the link coil turns a bit and adjusting the coupling finally resulted in a 75-ohm pure resistance looking into the link when the tank and antenna were at resonance.

² Those who do not have grid-dip meters can use the method of checking for feeder reactance described in the transmission-line chapter in the *Handbook* (page 325 in the 1952 edition). The method of adjustment outlined also takes care of the problem of matching to the coax link. Any type of standing-wave bridge, including the "Antennascope," can be used for the purpose. — Ed.

The shield at left center contains the phase detector. Just below it is the pair of r.f. output filters and the d.c. amplifier circuit. The two filament transformers and selenium-rectifier power supply are in the upper section of the chassis.

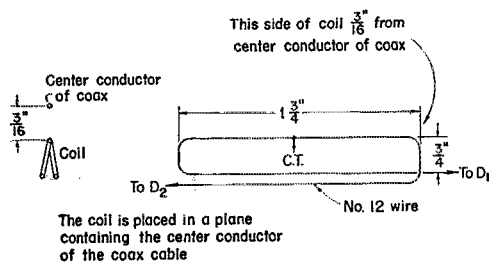


Fig. 3 — Construction of the secondary coil in the phase discriminator.

The automatic tuner was then turned on and with the VFO set at 14.1 the motor didn't budge, but when the VFO was shifted no more than 20 kc., the motor started and the antenna tank capacitor turned to the new resonance point, at which point the motor shut off. All that remained was to adjust the link coil and series capacitor at the transmitter tank to achieve optimum loading on the amplifier.

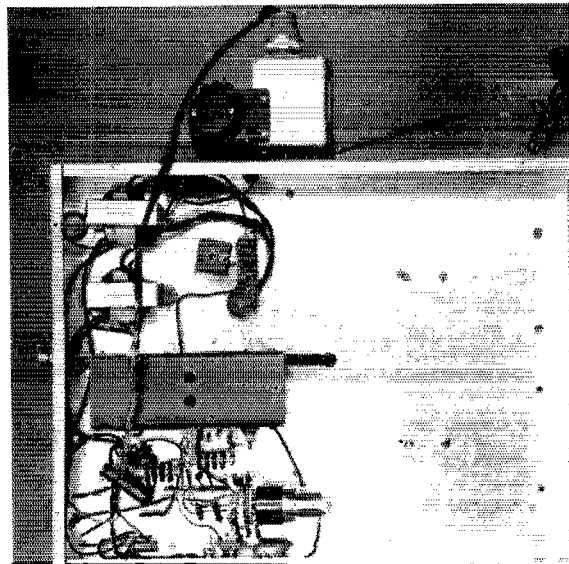
As for results, it can be claimed that getting the auto antenna tuner to work accomplished the following:

- 1) The antenna is now being coupled properly, with loads of r.f. in the feeders and the link running "stone cold." No hot spots or general heating with a full gallon input.
- 2) The low-pass harmonic filter is protected from excessive current or voltage because the line looks like a pure resistance of approximately 75 ohms regardless of the particular frequency used.
- 3) The VFO may be shifted from 14.0 to 14.3 Mc. with constant loading on the transmitter — easy shift from c.w. to 'phone.
- 4) The XYL is also happy. She doesn't have to help read meters.

Conclusion

This type of gear should be a real boon to those with antenna coupling networks in the attic and shacks in the cellar. As a matter of interest the capacitor is tuned to an accuracy of about $\frac{1}{2}$ -degree rotation, which is considerably

(Continued on page 112)



V.H.F. Parasitics in Beam Tetrodes

Preventing Self-Oscillation Without Increasing TV Harmonic Output

BY GEORGE GRAMMER,* W1DF

Most types of beam tetrodes used by amateurs have a tendency to "take off" at some frequency in the v.h.f. region. Two methods of suppressing these v.h.f. parasitics that have proved themselves pretty sure-fire are shown in Fig. 1. The upper one uses a small coil — size usually to be determined by experiment — in series with the control grid, plus a low value of resistance — 50 to 100 ohms — in series with the screen. Usually, neither the coil nor resistor will work alone, but the combination practically always does.

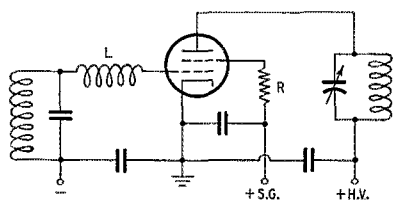
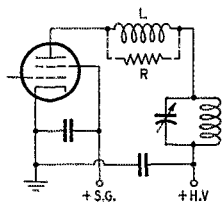


Fig. 1—Two commonly-used methods of suppressing v.h.f. parasitic oscillations in a tetrode amplifier operating below 30 Mc.



We have never been very keen on this method for two reasons. The coil in the grid lead, together with the unavoidable inductance in the path through the grid tank condenser back to cathode, resonates with the grid-cathode capacitance at some frequency in the low group of TV channels and builds up the harmonic output, which is not good for TVI. Second, the resistor in series with the screen puts the screen grid just enough above ground to make it less effective than it should be in shielding the grid from the plate. Self-oscillation at the operating frequency often results unless the amplifier is neutralized.

The lower circuit uses a small coil, either alone or in combination with a low value of noninductive resistance, in the plate lead of the amplifier. It is equally as effective as the upper circuit in suppressing v.h.f. parasitics, once the proper constants have been found experimentally. The explanation usually offered for the operation of the LR combination is that inserting a resistance R of appropriate value in the plate lead introduces so much loss at the parasitic frequency that oscillations cannot get started. The coil L is supposed to be a "choke" of high-enough inductance

to have no effect on the circuit through R at the parasitic frequency, but low enough to act as a good shunt for R at the desired operating frequency so that none of the operating-frequency power is lost. The fact is, however, that the coil by itself will suppress parasitics equally as well as the LR combination. Obviously the coil is not a "losser," and since it is found that there is a minimum value of inductance that must be used at L or the parasitic oscillation persists, it has been assumed that the actual effect has been to resonate the plate circuit (at the parasitic frequency) to a lower frequency than the similar resonance in the grid circuit. As is well known, a tuned-plate tuned-grid type oscillation will not occur when the plate circuit is tuned lower than the grid circuit.

V.H.F. Resonances

While successful in suppressing the parasitic, this method is usually disadvantageous for TV harmonic reduction. For the benefit of those who haven't read their *Handbooks* on v.h.f. resonances in tank circuits, the circuit of interest is shown in Fig. 2. The inductance in this v.h.f. tank, shown heavy, consists of the parasitic suppressor L plus the total lead length from the plate of the tube through the regular tank condenser, C_1 , the blocking condenser, C_2 , and back to the tube cathode. The tank "condenser" for this v.h.f. circuit is the output capacitance of the tube, C_3 . C_1 is usually a good deal larger than C_3 and has a relatively minor effect on the resonant frequency since it is in series with the v.h.f. tank inductance. C_2 is usually so large as to have no effect at all as a condenser, but the leads to it may constitute a considerable part of the tank inductance.

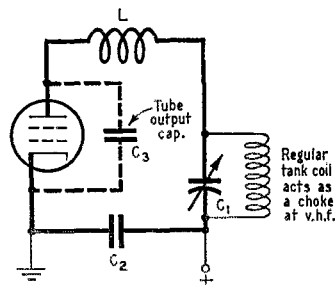


Fig. 2—The tank circuit for the v.h.f. parasitic oscillation.

If the circuit is redrawn to look conventional, assuming that all the inductance distributed throughout the circuit could be lumped into one coil, L_2 , it is easy to see from Fig. 3 that this is a simple tank circuit — and it will act just like one in greatly increasing the harmonic output at the frequency to which it is tuned. Unfortu-

* Technical Editor, QST.

nately, this frequency is usually in the 54-88 Mc. range by the time the parasitic-suppressor coil is made large enough to perform successfully.

A New Approach on Parasitic Suppression

The explanations for the operation of the LR combination in the plate circuit (lower drawing of Fig. 1) or for L alone have never been entirely convincing. An interesting description of feedback contained in the Eimac booklet on beam tetrodes¹ suggests a different way of thinking about parasitic suppression. Briefly, the tube structure is such that at some one frequency the tube becomes self-neutralizing. Below the self-neutralizing frequency the feed-back is principally through the grid-plate capacitance which, although small in a screen-grid tube, is not negligible. If the tube oscillates in this frequency region — i.e., at the operating frequency — it can be stabilized by neutralizing methods similar to those used with triodes. Above the self-neutralizing frequency these conventional methods do not work. The self-neutralizing frequency depends on the tube type but is always in the v.h.f. range, varying from around 40 Mc. or so for the larger tubes to something above 100 Mc. for some of the small v.h.f. tubes.

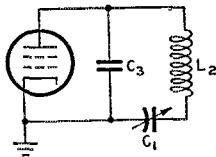


Fig. 3 — Equivalent circuit of Fig. 2, redrawn in conventional fashion.

We can see now why a simple coil in the plate lead will suppress a v.h.f. parasitic. The coil simply tunes the v.h.f. circuit, Fig. 2, near enough to the self-neutralizing frequency to prevent oscillations from starting. But the resonance is then in an undesirable, TVI-wise, frequency region.

With most tetrodes in common use, resonating the plate circuit above 100 Mc., to avoid TV harmonics, puts it so far above the self-neutralizing frequency that a v.h.f. oscillation occurs. Now if we have an oscillator that we want to "kill" (without removing the electrode voltages, of course) the way to do it is to overload it so badly that oscillations cannot start. This we can do by connecting a heavy resistive load across part or all of the tank coil. As applied to the parasitic circuit, this is shown in Fig. 4. If R_1 can be connected across all or most of L_2 , almost any low value of resistance will do the trick. However, if R_1 must be connected across only a small part of L_2 the value tends to become rather critical and adequate loading may not even be attained.

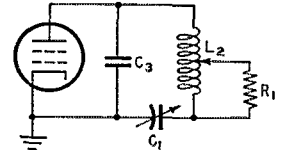
Superficially, this is the same thing as the LR combination in Fig. 1. But if we no longer think of L in that figure as a choke but realize that it is part of an oscillator tank inductance, and further realize that the function of R is to overload that

¹ *The Care and Feeding of Power Tetrodes*, Eitel-Mc-Cullough, Inc., San Bruno, Calif.

tank circuit, we have an approach that brings out the important considerations in this method of parasitic suppression.

For example, there is no theoretical reason why the coil L is needed at all, since the oscillator tank already exists in the loop through the tube, tank condenser and blocking condenser. However, it is not hard to appreciate the practical problem of loading such a "tank inductance" by the method shown schematically in Fig. 4; there is no way to get enough coupling between the resistor and the v.h.f. circuit to load the latter heavily. So we use the coil wholly as a means of getting coupling to the resistor.

Fig. 4 — A resistive load on an oscillator tank can be adjusted to be so heavy that self-oscillation is not possible.



This in turn suggests another point: Since L has to be large enough to permit sufficient coupling to R , and since the resonant frequency of the v.h.f. tank needs to be made as high as possible in order to stay above the low TV channels, the inductance of the connecting leads from the plate of the tube back to its cathode should be kept as low as is physically possible. In general, this means that such leads should be avoided altogether if possible, mounting one component on another if it can be done, and that in any event the leads should be short and heavy — flat strip is best — and that the chassis itself should be used for connections in that part of the circuit in which it is permissible. Also, the inductance of the regular tank condenser should be small, and a tube with low output capacitance should be chosen. When these conditions can be fulfilled it becomes possible to get sufficient coupling to R with a relatively small coil at L , with the result that the resonant frequency can be kept fairly high.

Resistor Ratings

To act as a good load, resistor R should be noninductive. When it has the proper resistance and is adequately coupled to the parasitic tank, it need carry no parasitic current since oscillation is prevented. Hence no great dissipation rating is required on this score. However, some of the fundamental current output of the amplifier will flow through it, and this determines the dissipation rating required.

The worst condition occurs in an amplifier operating on 28 Mc. In practical cases, L_2 and the associated leads will tune the parasitic tank in the neighborhood of 100 to 120 Mc., and since this is only four times the operating frequency the reactance of L_2 at 28 Mc. is not negligible compared with R_1 , which ordinarily will be 50 to 100 ohms. Consequently R_1 may have to carry a fair fraction of the fundamental current. The actual power loss is small, in terms of percentage of the total power output — perhaps 1 or 2 per

cent. However, in an amplifier of 500 watts output this represents 5 to 10 watts that R_1 must handle safely.

If most of the inductance in the parasitic tank can be put into L_2 instead of being in the leads between components, it is possible to improve this situation by tapping R_1 across only part of L_2 , as indicated in Fig. 4. The smaller the portion across which R_1 is tapped, while still suppressing the parasitic, the smaller the proportion of fundamental current it must carry. When this trick can be employed it will reduce the wattage rating required at R_1 as compared with connecting it across the whole coil.

How To Test

In using this method of parasitic suppression, first leave out the resistor, take a trial value of L_2 — four or five turns a quarter inch in inside diameter — and check the resonant frequency with a grid-dip meter. If it is below 100 Mc. the total inductance is too great. If at all possible, it should be reduced by shortening up the amplifier leads in the loop through the tank condenser (or otherwise pruning their inductance) rather than by reducing the size of L_2 . We need as much coil as possible at L_2 to get good coupling to R_1 . Nevertheless, the resonant frequency should not be allowed to go below 100 Mc., even if L_2 has to be cut to a couple of turns. C_1 will have some effect on this frequency, so should be set at the maximum capacitance that will be in use.

After the resonant frequency is in the right region, operate the amplifier at just enough input, without excitation, to let the parasitic oscillation start. The presence of grid current is usually a sufficient indication, but an absorption wavemeter is still more sensitive. Start with a carbon resistor of about 100 ohms and find the minimum number of turns in L_2 across which it can be tapped while killing the oscillation. Keep the plate voltage low, because the resistor will have to handle some parasitic current during this test and may burn up. Once a good tap position is found, try more plate voltage — cautiously, because higher voltage may let the parasitic start again — and inch up to an input equal to the rated plate dissipation of the tube. It is a reasonably safe assumption that if the parasitic is still suppressed at this input it will not occur under normal operating conditions, although there are exceptions.

At this point, apply excitation and with low plate voltage tune up the amplifier in the normal way. Check the power input and after letting the amplifier run for 15 or 30 seconds, shut off the plate voltage and feel the resistor. If it is no hotter than is normal for its rating, run the input up a little at a time until normal dissipation is approached. The total wattage required can then be determined for normal operating conditions. For example, if it is found that a 100-ohm one-watt resistor operates safely with an input of 150 watts while the normal amplifier input is 600 watts, a dissipation rating of at least 4 watts will be needed. In such a case four 1-watt resistors,

each having a resistance of 400 ohms — four times the value of the test resistor — can be connected in parallel. To be on the safe side an extra unit can be included, the values being chosen to give a total resistance equal to that used in the original test. The testing should be done at the highest frequency on which the amplifier is to be operated.

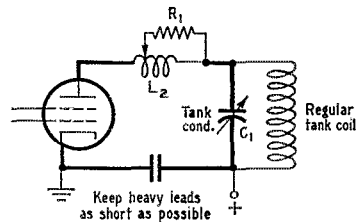


Fig. 5 — "Loaded-tank" parasitic suppressor as applied to a simple tuned plate circuit. The inductance of leads shown heavy should be kept as small as possible.

The writer has used this method of parasitic suppression on two tetrode amplifiers, one using an 807 and the other a 4-250A. In both cases it was possible to use enough coil at L_2 to get good coupling to R_1 , with a resonant frequency in the vicinity of 120 Mc. With the 4-250A the resistor consisted of five 1-watt 680-ohm carbon units in parallel, tapped across three turns of a $5\frac{1}{2}$ -turn coil at L_2 . This resistor has operated safely at inputs up to a kilowatt, although a similar group of resistors burned up from fundamental current at about half the input when connected across the whole coil. That the loaded v.h.f. tank theory is valid was rather forcibly demonstrated when, in the course of finding the proper tap point, the resistor was connected across too few turns on L_2 . The parasitic started up and the resistor literally blew apart before the plate voltage could be shut off. With a high-power amplifier it is well to face the fact that accidents like this are likely to occur, and have a couple of extra resistors handy. It is not too much of a price to pay for getting rid of a parasitic without building up the harmonic output in the TV band.

The complete circuit arrangement, including the normal tank circuit, is shown in Fig. 5.

Quist Quiz

In an effort to eliminate TVI, A plans to use a low-pass filter in the output line of his transmitter. The 20-meter beam he works into is fed with 75-ohm coaxial line, but A has never checked the standing-wave ratio and suspects that it might be high. His friend B says that the low-pass filter is a waste of time unless the s.w.r. is first checked and brought down below a value of 2, since the filter is designed for a 75-ohm line and won't work unless the line is nearly flat. Must A suffer with TVI until he can make the line nearly flat?

(Please turn to page 68 for the answer)

A 30-Watt Transmitter for 50 Mc.

One Chassis Unit with Modulator and Power Supply

BY C. VERNON CHAMBERS,* WIJEQ

ANYONE who is figuring out a method of getting on 50 Mc. usually encounters a sizable project if his plans involve modification of the low-frequency rig. This is not an implication that the new v.h.f. section will be hard to handle; it is merely a case of trying to make something serve a purpose for which it was not originally intended. And even if the revamped job does get to "Six," it is unlikely that the final result will be as efficient as had been anticipated. In other words, effort and efficiency — and probably expense, too — all lead to the advisability of starting anew when the jump to the world above 50 Mc. is made. Of course, this new start will be greatly simplified by going along with low-power design of the type to be described.

The transmitter is complete with audio and power-supply circuits. The r.f. section uses a pair of newly developed television sweep tubes that are not only inexpensive but also exceedingly rugged. Construction, alignment and operation are about as simple as could be expected in a 30-watt rig for any lower band. Meter switching is included and provision is made for using the audio and the power supply circuits with any other r.f. unit, such as a 2-meter r.f. section of similar power requirements.

The Circuit

Type 6BL7GT tubes are used in the r.f. section of the transmitter as shown in Fig. 1. These twin-triodes are well suited for low-level r.f. operation because of their 12-watt-per-envelope plate dissipation rating. One half of the first tube is used in an overtone oscillator which operates at the third overtone of an 8-Mc. crystal. The second section of the tube serves as a conventional 50-Mc. doubler and drives a neutralized

* Technical Assistant, QST.

• If you're one of the fellows who has to "start all over again" in order to get on 50 Mc., here is a simple solution to your problem. And after this little rig has helped you become a confirmed v.h.f. man, it may be used as the exciter for a medium-power final amplifier.

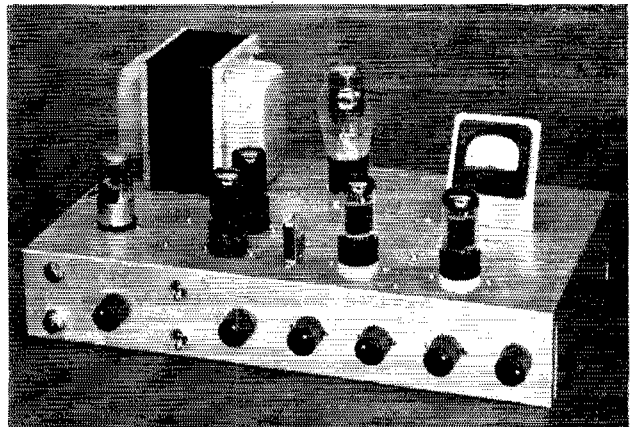
push-pull final amplifier. A variable output link, L_6 , is used to couple amplifier output to a low-impedance feed line or to an antenna tuner. C.w. operation of the transmitter is provided for by the jack, J_1 , connected in the cathode circuits of the doubler and the amplifier tubes.

The audio circuit uses a single-button carbon microphone, a 6J5 speech amplifier and a Class AB_1 modulator that employs Type 6V6GT tubes. Current for the microphone is obtained by connecting the input transformer back to the cathode circuit of the 6V6 modulator tubes. S_2 is a 'phone-c.w. switch that shorts out the secondary of the modulation transformer when on c.w.

The power supply delivers 200 ma. at 300 volts and uses a single-section choke-input filter. S_1 and S_2 are the a.c. input and the stand-by controls, respectively.

Output leads from the audio and the power-supply circuits, and leads to the r.f. stages are brought to the 8-prong socket, J_3 . A plug with jumper connections between Prongs 1 and 5, between 2, 3 and 4, and between 6 and 7 must be inserted into J_3 for normal operation of the transmitter. Removal of the plug disconnects the d.c. and the audio voltages from the r.f. stages and allows these voltages to be used with an external r.f. unit whose corresponding circuits are connected to pins of its power plug.

◆
A 50-Mc. transmitter, complete with modulator and power supply. On the front wall, left to right, are the pilot lamp assembly and microphone jack, audio gain control, stand-by and 'phone-c.w. switches, meter switch, and tuning knobs for the oscillator, doubler, final amplifier and antenna link, respectively. R.f. tubes are at the right end of the chassis and the audio tubes are located to the front of the power transformer.
◆

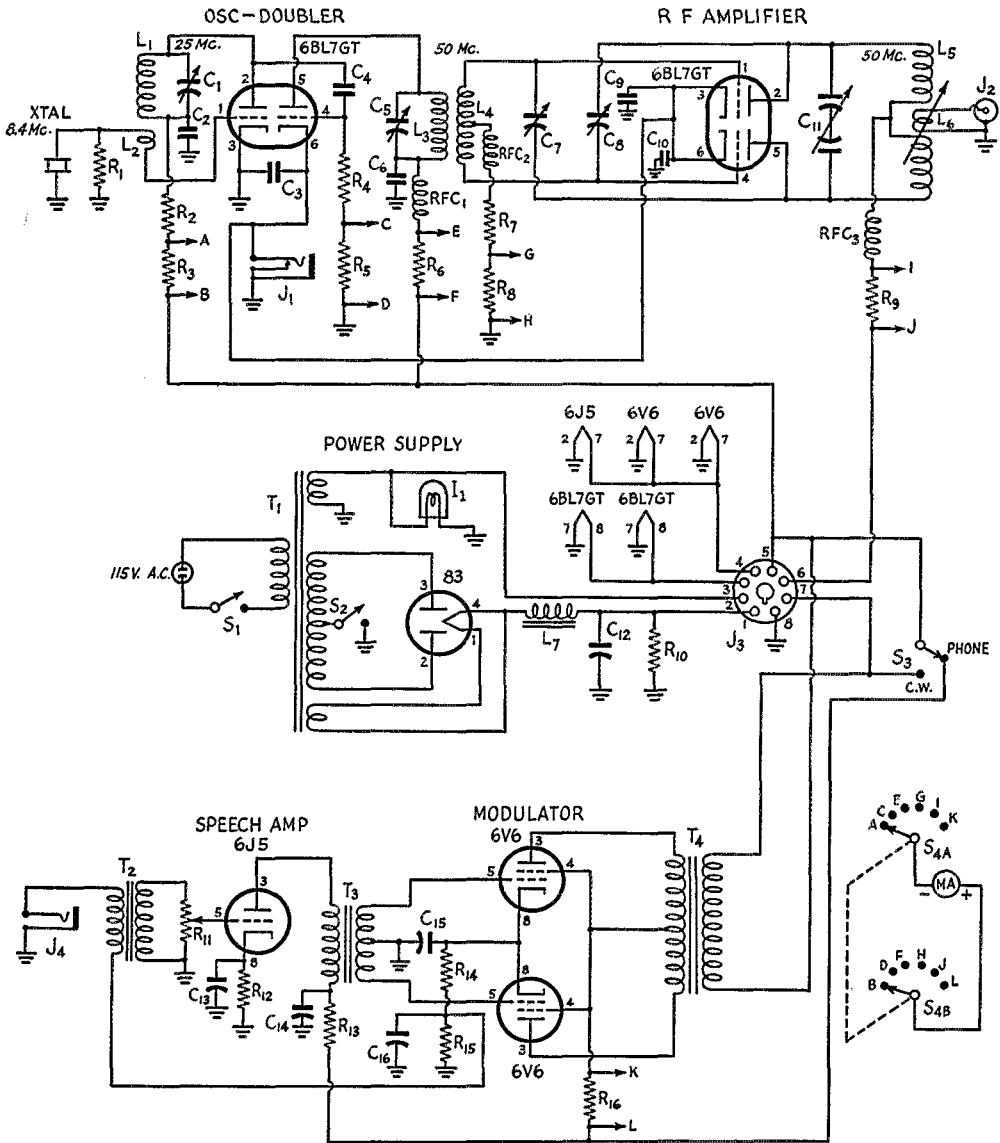


Construction

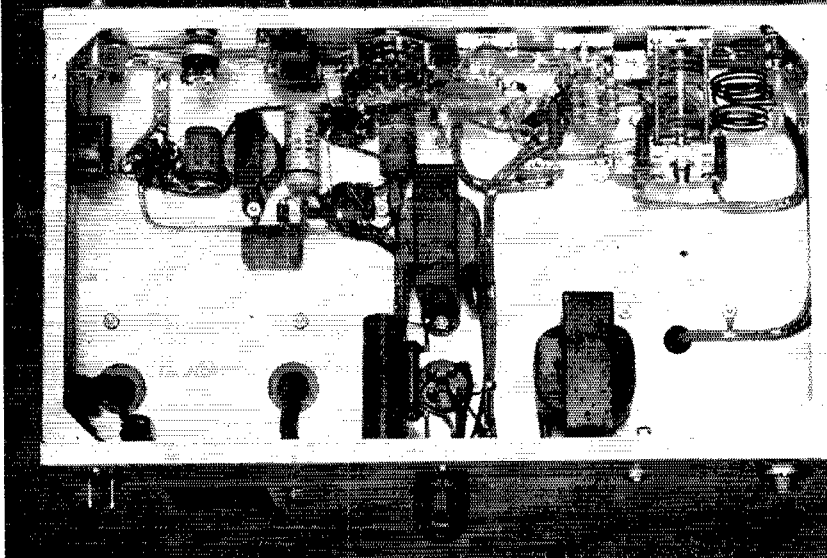
The top view of the transmitter shows how the unit is laid out on an aluminum chassis measuring 3 by 10 by 17 inches. The crystal socket is centered in between the oscillator and the modulator tubes. The 6J5 audio and the 6BL7GT r.f. amplifier tubes are at the left and the right ends of the chassis, respectively, and the Type 83 rectifier is at the rear of the crystal socket. An aluminum bracket supports the d.c. milliammeter at the rear right-hand corner.

As seen in the bottom view, the audio components are in line at the top left-hand side of the chassis with the microphone transformer mounted on the left wall. The modulation transformer is at the center of the base to the right of the 6V6

sockets. In the r.f. section, inductors L_1 and L_2 (made from one piece of Miniductor) are supported by the crystal socket and the stator terminal of C_1 . The doubler plate coil is mounted on the terminals of C_5 and the amplifier grid coil, L_4 , is mounted inside of L_3 . The ends of L_4 are soldered to lugs which are in turn screwed to small stand-off insulators which support the grid ends of the neutralizing capacitors. The amplifier tube socket is wired with prong No. 1 connected to the lug (the one on the stand-off) located to the rear of L_3 and L_4 and prong No. 4 is connected to the lug stand-off assembly at the front of the coils. Leads from the plate prongs of the socket are crossed so that prongs Nos. 2 and 5 connect to the front and the rear stator sections of C_{11} , respectively.



This bottom view of the 50-Mc. transmitter shows the power-supply components grouped at the rear of the chassis. The modulation transformer is at the center of the base and the microphone transformer is mounted on the wall at the left. Jacks J_1 , J_2 and J_3 are located on the rear wall of the chassis along with the connector for 115 volts a.c.



The amplifier plate inductor, L_5 , is soldered directly to the stator-support bars of C_{11} and the output link, L_6 , is mounted on a length of $\frac{1}{4}$ -inch polystyrene rod. Holes that are a force fit for No. 14 wire are drilled through the rod and the ends of the link are fed through the holes and then wrapped around the rod. An insulated shaft coupling is used to couple the swinging link to the shaft of a panel-bearing assembly that is mounted on the front wall of the chassis. RG-59/U cable is connected between the coupling link and the output jack, J_2 . All other wiring, with the exception of leads carrying r.f., is done with shielded wire.

Testing

The power-supply section of the transmitter should be tested first and this is done with the jumper plug removed from J_3 and with a d.c. voltmeter connected across R_{10} . With 115 volts

a.c. applied to input terminals, and with S_1 and S_2 closed, the output voltage should measure approximately 400 volts.

The r.f. section of the transmitter is readied for testing by inserting the jumper plug — minus the connection between pins No. 6 and 7 — by switching S_3 to the c.w. position and by connecting a key to J_1 . With the key closed and with the power turned on, the oscillator is tuned for resonance as indicated by a downward kick in plate current. Some crystals will kick out when the circuit is tuned for absolute minimum plate current and, if that happens, the plate tank should be tuned off slightly to the high side of resonance. The oscillator should draw approximately 10 ma. plate current and develop a doubler grid current of 1 ma. The feed-back requirements for the 6BL7GT appear to be somewhat larger than those of the other tubes that we have used

(Continued on page 118)

Fig. 1 — Wiring diagram of the 50-Mc. transmitter.

- C_1 — 50- μ fd. variable (Millen 20050).
- $C_2, C_3, C_6, C_9, C_{10}$ — 0.001- μ fd. disc ceramic.
- C_4 — 25- μ fd. ceramic.
- C_5 — 15- μ fd. variable (Millen 20015).
- C_7, C_8 — 3-30- μ fd. trimmer (National M-30).
- C_{11} — 12- μ fd. per-section variable (Millen 23912C).
- C_{12} — 8- μ fd. 700-volt-wkg. electrolytic (C-D BRHV-708).
- C_{13}, C_{15}, C_{16} — 50- μ fd. 50-volt-wkg. electrolytic (Malory TC-39).
- C_{14} — 8- μ fd. 450-volt-wkg. electrolytic (Sprague UT-8).
- R_1 — 22,000 ohms, $\frac{1}{2}$ watt.
- R_2 — 2200 ohms, 1 watt.
- $R_3, R_5, R_6, R_8, R_9, R_{15}$ — 100 ohms, $\frac{1}{2}$ watt.
- R_4 — 0.1 megohm, $\frac{1}{2}$ watt.
- R_7 — 4700 ohms, 1 watt.
- R_{10} — 25,000 ohms, 10 watts.
- R_{11} — 1.0-megohm potentiometer.
- R_{12} — 1000 ohms, $\frac{1}{2}$ watt.
- R_{13} — 10,000 ohms, 1 watt.
- R_{14} — 150 ohms, 1 watt.
- R_{15} — 100 ohms, 1 watt.
- L_1 — 9 turns No. 20, $\frac{5}{8}$ -inch diam., $\frac{3}{16}$ inch long.
- L_2 — 7 turns No. 20, $\frac{5}{8}$ -inch diam., $\frac{3}{16}$ inch long. (NOTE: L_1 and L_2 made from one length of B & W 3007.)
- L_3 — 4 turns No. 16, 1-inch diam., 1 inch long (B & W 3013).
- L_4 — 9 turns No. 20, $\frac{1}{2}$ -inch diam., $\frac{9}{16}$ inch long, tapped at center (B & W 3003).
- L_5 — 6 turns No. 12 enam., 1-inch diam., wound in two sections with three turns each side of c.t.; turns spaced wire diam.; a space of $\frac{3}{8}$ inch is left between sections.
- L_6 — 2 turns No. 14 enam., 1-inch diam., turns spaced wire diam.
- L_7 — 4-hy. 250-ma. filter choke (Triad C-15X).
- l_1 — 6.3-volt pilot lamp assembly.
- J_1 — Closed-circuit jack.
- J_2 — Coaxial-cable connector.
- J_3 — 8-prong socket.
- J_4 — Open-circuit jack.
- MA — 200-ma. d.c. milliammeter.
- S_1 — S.p.a.t. switch mounted on volume control.
- S_2 — S.p.s.t. toggle switch.
- S_3 — S.p.d.t. toggle switch.
- S_4 — 2-pole 6-position selector switch (Centralab 1411).
- T_1 — Power transformer: 775 volts c.t., 275 ma.; 5 volts, 6 amp.; 6.3 volts, 8.5 amp.; 6.3 volts, 1.2 amp. (Triad R-36A).
- T_2 — Six le-button microphone transformer (Triad A-1X).
- T_3 — Interstage transformer, single plate to p.p. grids, ratio 1:3 (Triad A-31X).
- T_4 — Modulation transformer: 10,000 ohms c.t. to 3000-, 5000- or 8000-ohm load (Triad M-3X).

Cutting Down VFO Drift

Some Practical Pointers on Reducing Effects of Temperature

BY RICHARD E. LONG,* W3ASW

*Kannscht Du Eensich Seid Baand
Schtimme?
Yah! Wann Se Schtill Hockel!*

DOES this sound familiar to you? Does it look like single-sideband spelling? Many an evening I have sat and listened to a round-table of single-sideband stations and, in a minute or two, one of them would be sure to drift off to where the modulation sounded just like those words up there. Darned annoying, isn't it? If you were ever to hear that particular combination of sounds on the air, it might have a very appropriate meaning, because it is Pennsylvania Dutch for the question, "Can you tune single sideband?" and the attendant answer, "Yes, when they sit still!" Maybe you would like to get a few tips on how to make your single-sideband signal (or any other VFO signal, for that matter) "schtill hockel" without getting in too deep for comfort.

A couple of years ago, the writer went through the throes of trying to sell single sideband to a bunch of mossbacks who would come up with almost any reason as an excuse for not getting into it. One night a W3 said to me, "That stuff may be all right, but with the QRM on 75, if

* 1805 North Third St., Harrisburg, Penna.

• Perhaps a more appropriate title for this article should be, "Killing 'Two Birds with One Stone.'" It happens that the measures taken by W3ASW, aimed primarily at reducing frequency drift, turn out also to provide a very simple means of feeding a remote VFO into a transmitter.

you're tied to crystal, you're licked. You've got to have VFO so you can move around."

I looked at my exciter and it seemed like it ought to work with VFO. So I started out to build one for it. Knowing that a drift of more than 50 cycles would throw the stuff into inverted speech in the other fellow's receiver, I realized that I would have to build something stable. About this time, *QST* came out with a daisy of an oscillator circuit¹ that didn't look too tough to make and which was apparently the solution to many a ham's problems. With a little head-scratching and three rebuildings, it turned out to be the answer to mine, too. Anyone constructing a Clapp VFO should also read the article by W1TS in the December, 1948, issue of *QST*.² There's a lot of good meat there, too.

Mounting Components

The first attempt was the construction of the Clapp oscillator in a 3 × 4 × 5-inch box that would fit into the space allowed for the crystal oscillator it was to replace. Making this one work brought home the first lesson. Solid construction alone is not enough; the components must also be mounted so that there is a minimum of strain on the frequency-determining parts. The coil, tuning condenser and padder were all mounted solidly, but I had fastened the padder in such a manner that it was supported by two *opposite* walls of the shield box, as shown in Fig. 1A. For two weeks I hunted the cause of a burble in the signal. One night I tried the rig with the rear cover of the box removed. The burble disappeared! Put the cover back on, and the frequency would jump continually. The cure was to mount the padder from two *adjacent* walls of the box, as shown at B, thus reducing the compression and stretch on the condenser.

Temperature Effects

Although this solved the business of frequency jumping, I was still bothered by drift with

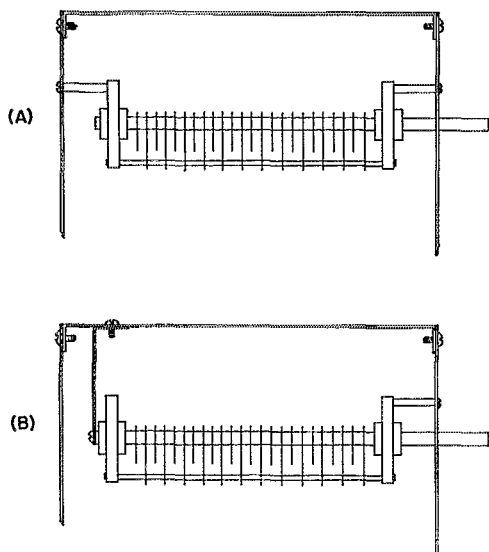


Fig. 1 — Sketches showing (A) original mounting of the variable padder condenser and (B) the alteration in mounting that eliminated frequency jumping in a Clapp oscillator.

¹ Technical Topics, "A High-Stability Oscillator Circuit," *QST*, May, 1948, p. 42.

² Mix, "Building a Series-Tuned VFO Unit," *QST*, December, 1948, p. 11.

temperature. The operating time has always been from 6 to 8 in the evening, and this VFO would drift for just about two hours, after which it settled down. That was just dandy! My signal drifted all evening until I was ready to shut down! A thermometer placed on the VFO box showed that it actually required those two hours for the heat of the chassis to permeate the parts enclosed in the can, and level off.

Why not eliminate the metal-to-metal contact between the chassis and the VFO box? I remounted the box on four ceramic pillars and hoped that it would help in the heating problem. It did! It was now about two hours before the heat would seep through the ceramic to the oscillator parts.

Isolating the Tuned Circuit

That was OK for the evenings. But on week ends, after two hours, I would take off and slide on down the band the same as before. I had only postponed the starting of the drift. Very annoying! This was in the summer of 1949. September *QST* came out with By Goodman's exciter,³ and I saw that he had an arrangement that used switches and short pieces of coax cable connected between the tube and the frequency-determining circuit. Zounds! Heresy! Sabooch! Let's go off the deep end. We'll go Goodman one better. We'll leave the tube on the chassis and put the tuned circuit in a box on the operating table and connect the two with a couple of long pieces of coax.

Yes, it worked! And it worked fine business, too. I put the coil, tuning condenser padder and the two 0.001- μ fd. fixed bridging condensers in a 3 \times 4 \times 5-inch box and ran 4-foot lengths of RG-59/U over to the grid and cathode of the 6AG7 in the rig, as shown in Fig. 2A. The total drift of this VFO was something around 100 cycles from scratch and, furthermore, it settled down in about ten minutes and stayed put. That was more like it. Incidentally, I used a 4- μ fd. negative-temp. compensator (C_3) in parallel with the tuning condenser.

Simplification?

Ah me! Things went quite smoothly for a year or so. Then I moved across the hall and could not get up on the roof for several weeks to change the antenna feed lines and drop them to the new apartment. This gave time for new ideas to brew. The whole rig was more or less experimental, anyway, and this looked like a good opportunity to rebuild. I should have quit while I was even. I had passed along to several of the gang this idea of the remote tuning circuit and they responded, as might be expected, with some elaborations of their own. One, most interesting to me, was an arrangement needing only *one*, instead of two, pieces of coax. One cable looks simple and neater than two. So-o-o-o, I made up a new VFO using the scheme of Fig. 2B with a 6-foot length of coax.

³ Goodman, "A 1950 VFO Exciter," *QST*, Sept., 1949, p. 29.

The first thing that happened was that the darned thing wouldn't oscillate with the same circuit values. I had to remove one third of the turns on the coil and increase the series tuning capacitance before the circuit would oscillate reliably. In this arrangement the cable is in the tuned tank circuit and apparently has a very detrimental effect on the Q . Worse yet, when I put the rig back on the air, the gang began again to ask me to get back on frequency. Brother, I'm going backward here! It doesn't seem probable that losses in 6 feet of coax at 3500 kc. could be sufficient to generate enough heat to account for the drift. My guess is that the increased tank current through the coil, as a result of the lower L/C ratio after the coil was pruned to make the circuit oscillate, was responsible. At any rate, that settled the hash for the single coax line so far as W3ASW was concerned.

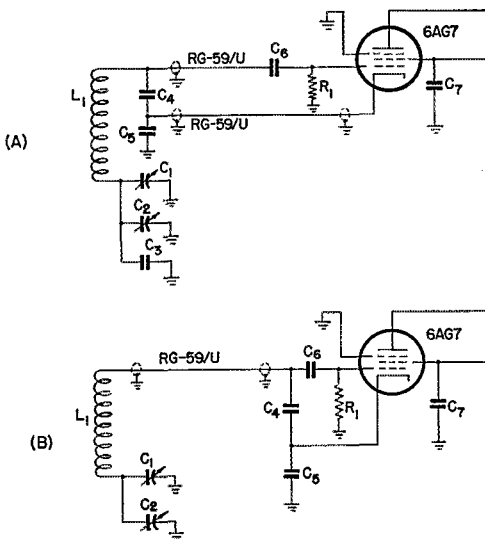
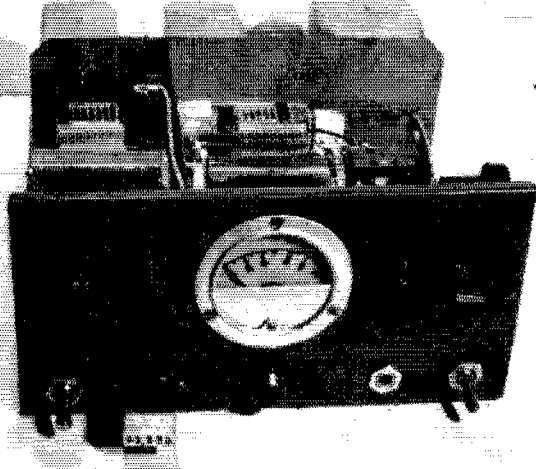


Fig. 2—Two methods of remote tuning for a Clapp VFO. In (A) the bridging condensers, C_4 and C_5 , are mounted with the tuned circuit and coax cables connected to the grid and cathode. In (B) the bridging condensers are mounted with the tube and a single coax line connects the grid to the tuned circuit. The arrangement of (A) is preferred as discussed in the text.

- C_1 — Tuning condenser.
- C_2 — Band-set condenser.
- C_3 — Negative-temp. compensator (see text).
- C_4, C_5 — Bridging condenser.
- C_6 — Grid condenser.
- C_7 — Screen by-pass condenser.
- R_1 — Grid leak.
- L_1 — Oscillator coil.

Improving the Q

This experience led me to consider ways in which I might improve the Q so that the L/C ratio could be made as great as possible, still maintaining oscillation. Remember Mort Moore's article on weak-signal receivers away back before the war in old *Radio?* Mort told about a preselector that wasn't worth the name until he enlarged the shield around the coil to where it measured at least two coil diameters from any
(Continued on page 114)



The "band hopper" features output on 75, 20 and 10 meters.

The Mobile "Band Hopper"

BY DONALD MARX,* W2ANT

THIS little mobile transmitter combines an r.f. section based on a *Handbook* design¹ with a Class B audio system, a combination that results in a highly-effective transmitter for 75-, 20- and 10-meter operation. It is all built into a homemade 8 × 8 × 4-inch cabinet, a convenient size for hiding below the dashboard of the average car.

The r.f. section uses a 6AG7 Tri-tet oscillator to drive a 2E26 amplifier that works straight through on the three bands. The audio section consists of a 6AQ5 driver transformer-coupled to a 1635 Class B modulator stage. As can be seen from the wiring diagram in Fig. 1, the band-switch, S_1 , switches in the proper coils on the various bands and also shorts out the oscillator cathode coil during 75-meter operation. A meter switch, S_2 , provides for metering of the amplifier grid and plate current and the modulator plate current. The microphone voltage is obtained from a fraction of the voltage developed across

the driver cathode-bias resistor. A switch on the transmitter, S_3 , is in parallel with the push-to-talk switch on the microphone, so that the transmitter can be controlled by either. Lamp I_1 shows when the plate power is "on"—another lamp, I_2 , used to illuminate the meter, lights when the heaters are on.

The meter has a 0-1 movement, and the shunts, R_4 , R_5 and R_6 , were adjusted to give a 10-ma. scale for reading grid current and a 100-ma. scale for reading the plate currents. The meter was illuminated by drilling a hole in the back and mounting a pilot lamp there, and a new scale of colored plastic was substituted for the opaque scale furnished with the meter.

The antenna relay is one taken from one of the ARC-5 transmitters and modified for 6-volt operation by rewinding the coil full of No. 32 enameled wire.

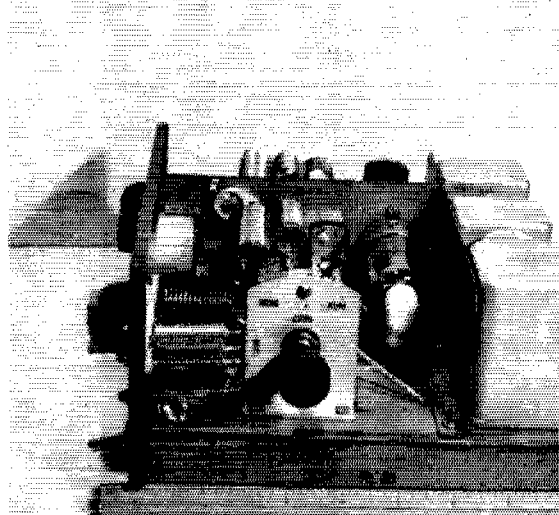
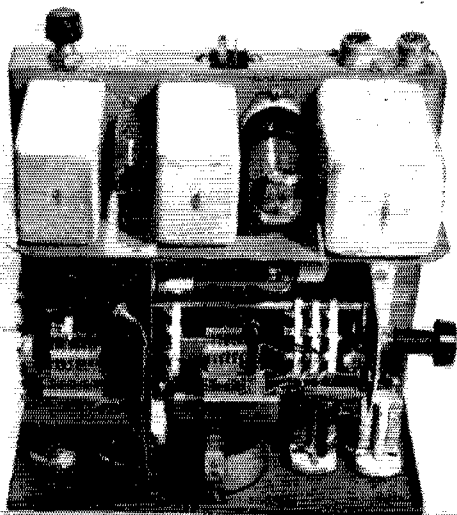
The transmitter is built on a homemade 8 × 8 × 1-inch chassis that fits closely inside the cabinet. As the photographs show, two partitions shield the r.f. stages from each other and the audio section from the r.f. sections. The

☞ The 2E26 output amplifier is mounted horizontally to obtain short leads and compact construction.

* 62-03 62nd Road, Middle Village, L. I., N. Y.

¹ *The Radio Amateur's Handbook*, 1952 edition, page 445

Partitions shield the oscillator and r.f. amplifier sections from each other and from the audio stages.



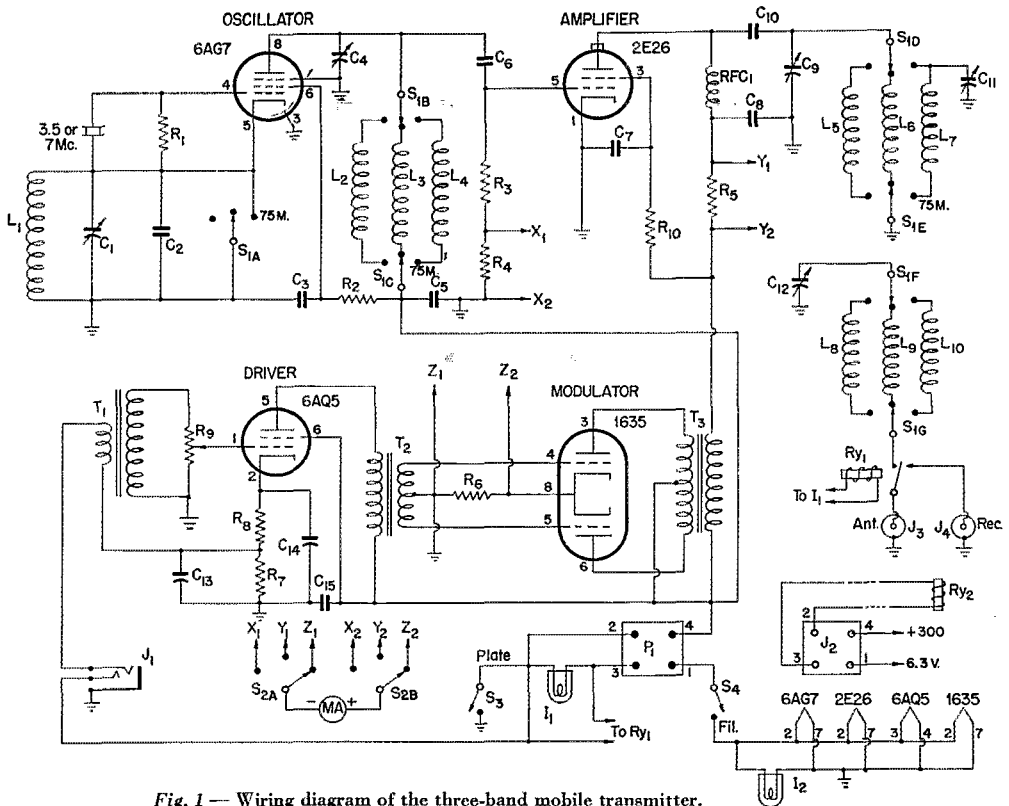


Fig. 1 — Wiring diagram of the three-band mobile transmitter.

- C₁, C₁₁ — 45- μ fd. adjustable ceramic trimmer.
 C₂ — 68- μ fd. ceramic.
 C₃, C₅ — 0.01- μ fd. mica or ceramic.
 C₄, C₁₂ — 140- μ fd. midget variable.
 C₆ — 100- μ fd. mica or ceramic.
 C₇, C₁₅ — 0.002- μ fd. ceramic.
 C₈, C₁₀ — 0.002- μ fd. mica, 1000 volts.
 C₉ — 100- μ fd. midget variable.
 C₁₃, C₁₄ — 25- μ fd. 50-volt electrolytic.
 R₁ — 0.1 megohm, $\frac{1}{2}$ watt.
 R₂ — 22,000 ohms, 1 watt.
 R₃ — 18,000 ohms, 1 watt.
 R₄, R₅, R₆ — Meter shunts (see text).
 R₇ — 470 ohms, $\frac{1}{2}$ watt.
 R₈ — 270 ohms, 1 watt.
 R₉ — 0.5-megohm potentiometer.
 R₁₀ — 15,000 ohms, 2 watts.
 L₁ — 15 turns No. 20 d.c.c. on $\frac{5}{8}$ -inch diam. form.
 L₂ — 0.4 μ h. — 7 turns No. 18, $\frac{5}{8}$ -inch diam., 1 inch long (B & W 3006 Miniductor).
 L₃ — 1.2 μ h. — 18 turns No. 18, $\frac{1}{2}$ -inch diam., 1 inch long (B & W 3003 Miniductor).
 L₄, L₇ — 18 μ h. — 64 turns No. 22, $\frac{5}{8}$ -inch diam., 2 inches long (B & W 3008 Miniductor).

- L₅ — 0.5 μ h. — 8 turns No. 18, $\frac{5}{8}$ -inch diam., 1 inch long (B & W 3006 Miniductor).
 L₆ — 2.4 μ h. — 19 turns No. 22, $\frac{5}{8}$ -inch diam., 1 $\frac{1}{2}$ inches long (B & W 3007 Miniductor).
 L₈ — 3-turn link inside L₅.
 L₉ — 4-turn link inside L₆.
 L₁₀ — 10-turn link inside L₇.
 I₁, I₂ — 6.3 volt pilot lamp, No. 51.
 J₁ — To take PL-68 plug.
 J₂ — 4-terminal cable connector.
 J₃, J₄ — Coaxial connector.
 MA — 0-1 milliammeter.
 P₁ — 4-prong chassis-mounting plug to fit J₂.
 RFC₁ — 2.5-mh. r.f. choke.
 Ry₁ — Antenna relay (see text).
 Ry₂ — Power relay in power supply.
 S₁ — 7-pole 3-position ceramic switch, 6 sections.
 S₂ — 2-pole 3-position rotary switch.
 S₃, S₄ — S.p.s.t. toggle.
 T₁ — Single-button microphone transformer, 200 to 420,000 ohms.
 T₂ — Driver transformer, 2 to 1 ratio.
 T₃ — Class B output transformer, 22,000 to 5500 ohms.
 T₁, T₂ and T₃ taken from SCR-522.

bandswitch is supported at one end by a bracket and at about $\frac{2}{3}$ of its length by the r.f. partition. The knob for the bandswitch projects out the side of the cabinet and is not accessible from the front panel. The volume control, R₉, is mounted on the chassis at the rear because, once set, it need not be adjusted unless a different type of microphone is used.

The power supply for this rig furnishes 300 volts at 200 ma. On 75, fundamental crystals are used, and 7-Mc. crystals are used for 14-

and 28-Mc. operation. The necessary 2.5 ma. grid current is readily obtained on 10 and 20, and on 75, C₄ must be detuned to bring the grid current down to the correct value.

Antenna loading, controlled by the position of the pick-up coils, L₃, L₉ and L₁₀, and the setting of C₁₂, is set so that the 2E26 plate current is around 60 ma. The Class B modulator will idle at about 10 ma. and kick up to peaks of about 70 ma. A T17B microphone, converted with an F1 button, is used.



The completed flea-power transmitter-receiver for 40 meters, mounted on a base-board along with the key for convenience.

A Flea-Power Portable C.W. Station

Building a Handbag-Size Transmitter-Receiver

BY LOUIS D. BREETZ,* W3KDZ, W8QLP

A LONG-LIVED desire to work a flea-power rig was realized not long ago when the author completed the small portable transmitter-receiver shown in the photographs. The set is easily portable and is capable of performing on batteries (dry A batteries or car storage battery, and B batteries) or some rectified a.c. supply, such as the power from the car radio or the home b.c. radio set. When power is taken from the car radio or home b.c. set, the power audio tube is removed (if it's a 6L6, 6F6 or similar tube) and filament and plate power is brought out to the rig by plugging a cable into that socket with the leads connecting to the appropriate tube-socket terminals.

Because the author wanted the set to be capable of using b.c. set power, indirectly-heated-cathode tubes are used. Although these tubes are not so economical when operating the heaters from batteries, there are only two tubes in the set (one for the transmitter and one for the receiver) and therefore the filament drain is not too great. About 10 hours of operation has been obtained from the 6-volt Eveready Hot-Shot A battery and the three 67.5-volt Minimax B batteries and there is still a lot of life left in them. Only c.w. operation was contemplated because of the simple requirements, and since the all-around usefulness of the 7-Mc. band is well known, the set was designed for this band.

The entire assembly — transmitter-receiver, batteries, key, 'phones, antenna wire and miscellaneous items — is carried in a canvas zipper bag. It is hardly recognizable as a complete radio station, and therefore one travels with it very inconspicuously.

Circuits

The rig (see Fig. 1) is built around two tubes. The receiver uses one section of a 6SL7 as a re-

generative detector and the other as an audio amplifier. The transmitter uses one section of a 6SN7 as a Pierce crystal oscillator and the second section as an r.f. amplifier. Since the amplifier is resistance-coupled to the oscillator there is no danger of oscillation in the amplifier stage. An impedance-matching antenna tuner is incorporated in the set to permit using odd lengths of radiator wire. The transmitter is link-coupled to the antenna tuner and the antenna is always connected to the tuner. The receiver input is connected through a toggle switch to the antenna tuner when receiving, or is switched off when transmitting.

Construction

The transmitter-receiver is contained in a cabinet approximately $6\frac{1}{2}$ by $5\frac{1}{2}$ by 4 inches that can be constructed of sheet metal or of bakelite. The entire unit is mounted on a base-board $\frac{3}{4}$ by $3\frac{3}{4}$ by 9 inches which is long enough to accommodate the permanent mounting of the key. On one end of the cabinet is mounted the milliammeter and a switch, S_3 , to shunt the meter after the tuning procedure has been completed.

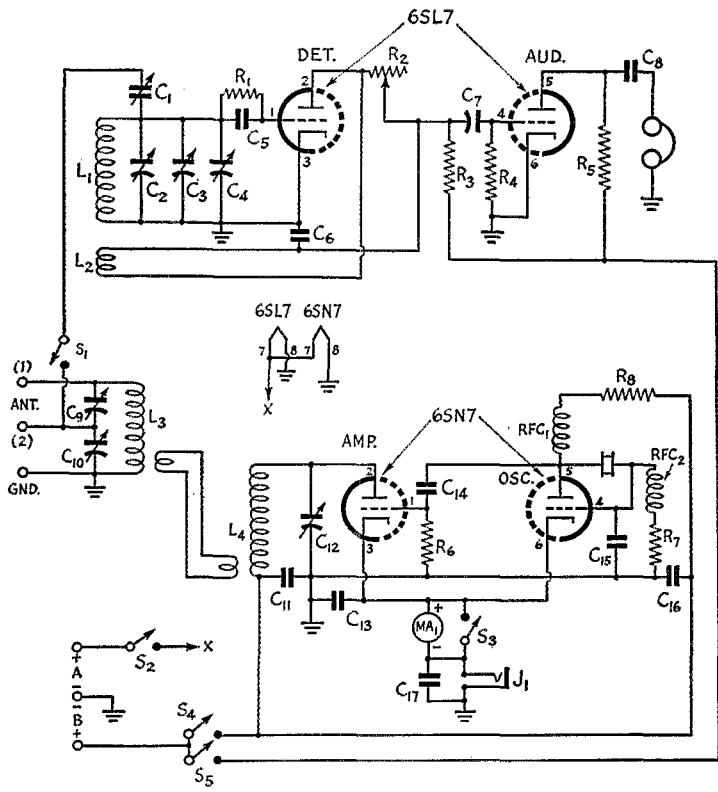
The panel is made of sheet aluminum $\frac{1}{32}$ by $6\frac{1}{2}$ by $5\frac{1}{2}$ inches. The tuning dial for the receiver is of the plain non-vernier type, since plenty of electrical bandspread is available (the 40-meter band covers from 25 to 75 on a 100-division dial). It is located in the upper-left quadrant of the panel. In the upper right are the

• If pushing a kilowatt from the arm-chair gets boring now and then, why not take a breather with this low-power layout you can carry in one hand? W3KDZ and many others will tell you there's nothing like it.

* 133 Joliet St., SW, Apt. 2B, Washington 20, D. C.

Fig. 1—Circuit diagram of the flea-power portable.

- C₁—3-12 μ fd. zero-temp. trimmer (Eric type 557).
- C₂—15- μ fd. variable (Bud CE-2020).
- C₃—75- μ fd. zero-temp. mica or ceramic.
- C₄—8-50- μ fd. zero-temp. trimmer (Eric type 557).
- C₅—220- μ fd. mica.
- C₆, C₁₁—470- μ fd. mica.
- C₇, C₈—0.25- μ fd. 300-volt paper.
- C₉—140- μ fd. variable (Millen 20140).
- C₁₀—100- μ fd. variable (National PSE-100).
- C₁₂—75- μ fd. variable (National PSE-75).
- C₁₃, C₁₆, C₁₇—0.022- μ fd. mica.
- C₁₄—22- μ fd. mica.
- C₁₅—47- μ fd. mica.
- R₁—1 megohm, $\frac{1}{2}$ watt.
- R₂—10,000-ohm potentiometer.
- R₃—33,000 ohms, $\frac{1}{2}$ watt.
- R₄, R₅—0.1 megohm, $\frac{1}{2}$ watt.
- R₆—15,000 ohms, $\frac{1}{2}$ watt.
- R₇—10,000 ohms, $\frac{1}{2}$ watt.
- R₈—8200 ohms, 2 watts.
- L₁—25 turns No. 30, $\frac{1}{16}$ -inch diam.
- L₂—3 turns hook-up wire wound over ground end of L₁.
- L₃—44 turns No. 30, $\frac{1}{2}$ -inch diam.



controls for the antenna tuner. Below the antenna tuning controls is the transmitter plate tank condenser knob. In the center of the panel is the toggle switch S_1 which switches the receiver on or off from the antenna tuner. The bottom row, left to right, includes the regeneration control, R_3 , which also has the rotary switch, S_2 , attached to turn on all filament power. Next is the 'phone jack for the receiver, then the toggle switch S_5 for the receiver on-off control, the jack for the key and the toggle switch S_4 for transmitter on-off control.

The chassis is of the open-end type. It is $1\frac{3}{8}$ inches deep by $4\frac{1}{8}$ inches long by $3\frac{1}{8}$ inches wide. It is made of $\frac{1}{32}$ -inch aluminum. Looking down on top, one sees on the left the receiver tuning condenser (the receiver coil is directly underneath the chassis), and behind is the 6SL7 receiver tube. The middle tube socket serves merely as a terminal board. To the right is the 6SN7 transmitter tube and crystal. To the left of the crystal is the plate tank coil and in front of that lies the antenna-tuner coil. Above these items are the two antenna tuning condensers.

Adjustment

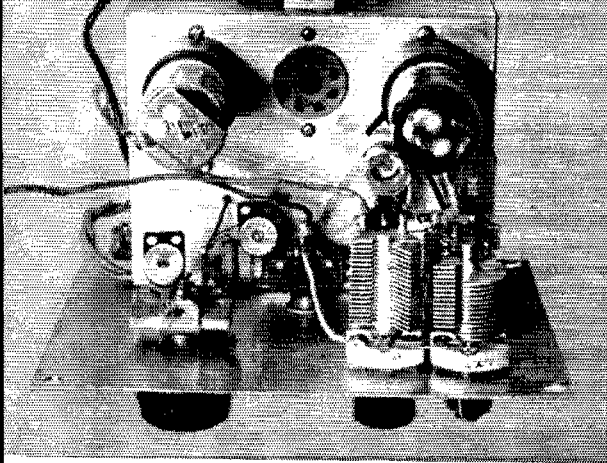
No trouble should be encountered in making the receiver perform satisfactorily once the proper polarity of the tickler coil, L_2 , is found. If both coils are wound in the same direction, the connections should be as shown in Fig. 1, with the plate connected to the outside end of

the tickler winding, and the grid connected to the outside end of L_1 . If the windings are not in the same direction, these connections must be reversed. Regeneration is controlled by R_2 which simply shunts the tickler winding. This control is one that needs little adjusting once it is set properly. Too much feed-back should not be used, since this reduces the sensitivity. C_1 is a variable coupling condenser for the receiver. It should be set to the maximum capacitance that will permit smooth oscillation of the detector over the band.

The transmitter tuning procedure is the conventional one of tuning the plate tank for mini-



W3KDZ's low-power portable station with batteries and all accessories can be carried easily in a canvas zipper bag.



Top view of the miniature 40-meter portable station, showing the placement of the tubes and tuning condensers. The two variables in the antenna coupler are to the right.

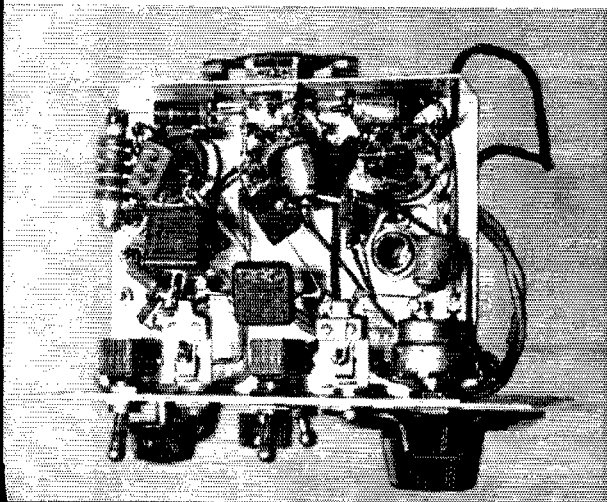
imum plate current and adjusting the antenna tuner to resonance, "redipping" the plate tank and repeating until the proper load is obtained. Since the meter reads oscillator and amplifier currents simultaneously, maximum amplifier power output may not always coincide exactly with the plate-current dip shown on the meter, but they will be close.

If the transmitter is turned off and the receiver is turned on (S_2 closed) and adjusted for a weakly-oscillating condition, and the receiver is tuned across the band, a sharply tunable whistle will be heard in the 'phones as the receiver crosses the frequency of the crystal in the transmitter oscillator. This occurs because the oscillating detector is sending a signal into the antenna tuner which is coupled to the transmitter plate tank and then through the tube interelectrode capacitance and C_{14} to the crystal. This excites the crystal (if the crystal is an active one) and it oscillates weakly. This oscillation can be heard as a sharply tunable pip-like whistle in the receiver and serves very usefully to locate the operating frequency on the receiver dial. Evidence of this crystal oscillation excited by the regenerative detector can be obtained by tuning the station communications receiver to the crystal frequency and then tuning the detector across the frequency very slowly. It is easy to distinguish between the variable note from the regenerative detector and the stable note from the crystal. The strongest pip condition prevails when the antenna tuner itself is lightly loaded

but tuned to resonance along with the plate tank (with an inefficient radiating system, or no antenna at all connected to it, for instance). Since little power can be thus radiated, it leaves a maximum of power from the oscillating detector to excite the crystal.

The antenna impedance is matched by obtaining the proper ratios of C_9 to C_{10} if terminal 2 is used. (Terminal 2 is used for odd lengths of radiator, terminal 1 for antennas half-wave multiples in length). The combination of C_9 , C_{10} and L_3 must always be resonant.

Typical of the thrills experienced working with low power was the contact with W1FAF in Cranston, R. I., from the location of W8QLP in Youngstown, Ohio. The power was taken from an a.c. supply. The final amplifier ran at 240 volts and 13 ma. (about 3 watts input). The antenna was a U-shaped piece of wire about 35 feet long running inside the house from one room to another on the second floor. W1FAF gave a 569 report. (Incidentally, this contact was made at 5 p.m. during a January thunderstorm.) On battery power, with a half-wave end-fed wire stretched inside a second-floor apartment in Washington, W3SKM in Mt. Pleasant, Penna., gave a 559 report. The final amplifier was running at 135 volts, 10 ma. — an input of 1.35 watts. Another QSO at noon from Youngstown with W4JLK and W4PRC in Alexandria, Va., was reported 579 by W4MZN and W3SQP in Roanoke. The total input to the unit, including receiver, was 2 watts.



Looking underneath the flea-power portable. Most of the small components are mounted by their leads without other support. The regeneration control is the potentiometer to the right on the panel.

Antenna Couplers for the Novice

Representative Types: Their Construction and Use

BY RICHARD M. SMITH,* W1FTX

IN any ham station, Novice or otherwise, the antenna coupling system can mean the difference between success and complete failure. The best antenna in the world is no good unless you provide the proper means to get power into it, and the antenna coupler is that means. Getting power into the antenna is an easy task, if you know what type of coupling circuit your particular antenna requires, and know how to adjust that circuit to produce the best results.

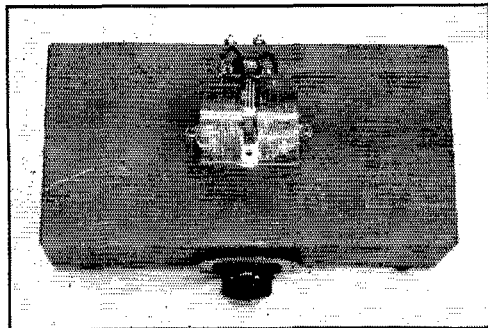
Last month's article¹ paved the way by explaining the distribution of current in an antenna system, and pointing out that the type of coupler to use depends upon whether you need to feed power into the system at a point of maximum or minimum current. A parallel-tuned coupler is required when you feed at a point of minimum current, and a series-tuned coupler does the job when the feeders end at a point of maximum current. We also mentioned the pi-section coupler, useful in putting power into the single-wire antenna that is required when circumstances prevent the use of something more elaborate in the way of skywires. Building any one of these types is a simple job that can be done in a few hours at the most.

Circuits and Construction

The circuits of the various types are shown in Figs. 1, 2, and 3. In each case, input is through a coaxial connector, although a balanced line, such as Twin-Lead, can be used instead of coax, if desired. In such case, the coaxial connector should be replaced by two insulated terminals. Most transmitters nowadays have coaxial output, however, so we've made provisions for its use in

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¹ Smith, "Getting the Most into Your Antenna," *QST*, July, 1952, page 21.



Top view of a parallel-tuned antenna coupler for use in the Novice band. A B&W type 80 JVL plug-in coil is used, and the taps for the feeders are arranged on a Twin-Lead plug that is inserted in a crystal socket. The output terminals are visible just above the coil.

our couplers. The particular connector you use depends on the cable diameter you want to use.

In the parallel-tuned and series-tuned couplers, variable coupling between the transmitter and the coupler is provided by the use of adjustable swinging links on the coils. If your transmitter has an adjustable output link, fixed links may be substituted in the coupler, although it doesn't do any harm to have both ends of the link adjustable. In the pi-section coupler, connection to the transmitter is made direct to the coil, and the degree of loading is adjusted with one of the condensers, as described in later paragraphs.

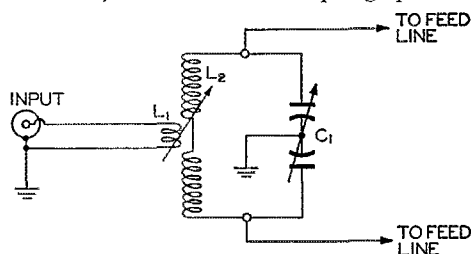


Fig. 1 — Circuit diagram of a parallel-tuned coupler. The feeder connections shown are for use when the feed point is at a current minimum. In other cases, discussed in the text, it is necessary to make the connection a few turns in from the ends of the coil. Provisions for doing this are included in the coupler shown in the photograph.

C₁ — 140- μ fd. per-section dual variable (Millen 23140).

L₁ — Link, 3 turns (part of 80 JVL).

L₂ — 38 turns No. 20 wire, 1 $\frac{3}{4}$ -inch diameter, each half of winding $\frac{1}{8}$ inch long, separated $\frac{3}{8}$ inch for passage of swinging link. (B&W 80 JVL).

The physical size and electrical ratings of the components used depends upon the power the coupler will be called upon to handle. In general, if you make them equal in rating to the coils and condensers used in the output circuit of the transmitter, they will handle the power without danger of breakdown.

Parts arrangement in the couplers shown is not a critical factor in their performance, and the layouts can be rearranged to suit your own requirements. In general, it is best to use a metal chassis, especially when coaxial cable is to be used between the transmitter and the coupler. Each of the couplers shown here is built on a standard 5 \times 10 \times 3-inch steel chassis. This is considerably more space than actually needed, but it allows room for the later addition of such things as r.f. ammeters to measure feeder current, and built-in antenna change-over relays; also, it gives the coil adequate spacing from surrounding objects to avoid circuit unbalance.

An example of the parallel-tuned coupler is

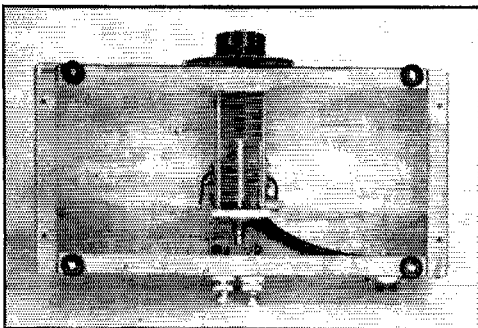
• This article is a "follow-through" on last month's discussion of the antenna fundamentals underlying successful solution of antenna coupling problems. Practical examples of several couplers are described, with tips that will help the Novice toward their successful use.

shown in the photograph. Here a B&W type 80 JVL plug-in coil is used. Two Johnson type 235-860 inductor clips are used for tapping the output connection part way in toward the center of the coil, if needed. The clips are connected to a Millen type 37412 transmission-line plug, which fits into a small ceramic crystal socket (Millen 33102) mounted behind the coil on the chassis. The crystal socket is connected to the ceramic feed-through bushings used as output terminals.

It is difficult to fasten the inductor clips to the fine wire in the 80 JVL coil without shorting turns unless alternate turns are first bent in toward the axis of the coil, to provide a simulated "double spacing" effect. This is best done with a tool such as the Hytron soldering aid or the blade of a small screwdriver.

The pi-section coupler, which is also illustrated, uses a length of pre-wound coil material available commercially. The coil is mounted on $\frac{3}{4}$ -inch ceramic stand-off insulators, and the leads from the coil to the tuning condensers pass through the chassis in $\frac{1}{4}$ -inch ceramic bushings. An inductor clip attached to a short length of flexible wire is used to short out turns of the coil when needed. The condensers themselves are mounted directly on the chassis, which should be grounded to an external point, such as a cold-water pipe, or a copper rod driven in the ground outside the shack.

We haven't shown photographs of the series-tuned coupler, because its construction is very similar to that of the pi-section coupler. The only differences are the addition of a link winding, which can be six or eight turns of insulated wire wrapped around the center of the coil, and slightly different circuit connections, shown in Fig. 2.



Bottom view of the parallel-tuned coupler. The split-stator condenser is mounted on the front of the chassis, close to the five-prong coil socket visible beneath it. The input connection is made through a short piece of RG-59/U coaxial cable, and the output connectors are ceramic bushings projecting through the rear.

It is advisable to space the link winding away from the wire in the main coil by cementing three strips of insulating material about 120 degrees apart around the center of the winding before the link turns are put in place. Note that both tuning condensers in this coupler must be insulated from the chassis.

Adjusting the Coupler

After you've selected and built the type of coupler you need for your particular antenna set-up,¹ adjustment is a simple matter. You should provide yourself with some sort of output indicator, however, so that you can be sure that the power is actually going into the antenna. The best indicator is an r.f. ammeter inserted in series with one feeder to read the actual current in amperes. Such meters are fairly expensive, however, and the job can be done just as well with simple flashlight lamps. Depending upon the amount of power you use, and whether the antenna is to be fed at a point of minimum or maximum current, you should use either 250-ma. lamps (blue bead) or 60-ma. lamps (pink bead). Have a few of each on hand at the start, in case you burn out one or more in the process. The flashlight lamp should be connected so that the feeder current must pass through it. If you are feeding the antenna at a point of maximum current, it is probable that even the 250-ma. lamps

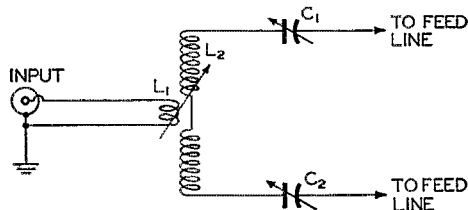


Fig. 2 — Circuit diagram of a series-tuned coupler. The coil specifications are the same as listed below Fig. 1. C_1 and C_2 should be 150 μ fd. each or more, with voltage rating similar to that of the condenser used in the final-amplifier plate circuit.

will be burned out if they are inserted in the line. In this case, connect the bulb to a pair of leads, three or four feet long, and then tap the leads across a portion of one of the feeder wires (in other words, in parallel with a portion of the feeder). In this way, only a portion of the current will pass through the bulb, but it will still serve to give you the relative indication that you are looking for. Determine how much of the feeder must be included by trial. Use the setting that just causes the bulbs to glow appreciably, so that your vision will not be temporarily impaired by the brilliant light. It is easier to distinguish small differences in brightness when the lamps are glowing dimly.

Once you have the indicator (ammeter or flashlight) connected in the feeder, work for the adjustment that produces the greatest indication of current for a given input, because when you are getting the most current into the feeders, you're getting the most power into the antenna.

Adjusting the Parallel-Tuned Coupler

To adjust the parallel-tuned coupler, start with loose coupling between the transmitter and the coupler (swinging link moved out of the coil). With the feeders disconnected, turn on the transmitter and tune the amplifier to resonance, as indicated by a dip in plate current. Now, tune the coupler to resonance. This will be indicated by a slight upward kick in the current read in the plate circuit of the amplifier. Connect the feeders to the coupler, with the inductor clips set on the outside turns of the coils, and recheck for resonance. If the feeders are the right length (resonant), the kink in plate current will be at about the same dial setting as before. They may detune the coupler a bit if they are slightly too long or too short, but this is of no importance so long as you are still able to hit resonance. It may be necessary to increase the coupling between the transmitter and the coupler somewhat to duplicate the reading obtained before the feeders were attached, because they load the coupler, making it more difficult to obtain coupling. If you are unable to get the resonant kink when the feeders are connected, you'll probably find that you erred in one of your measurements, or in choosing the type of coupler required, or in drawing your distribution diagram.¹ If, however, you are sure that the coupler is resonating, increase the coupling to the transmitter by pushing the swinging link into the coil until the final amplifier draws its rated plate current. Recheck the final tank tuning

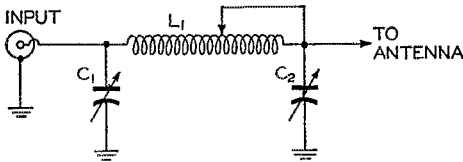
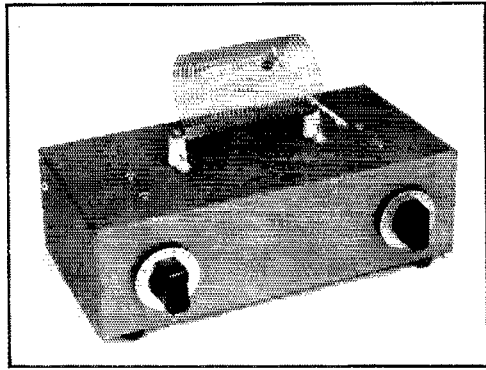


Fig. 3 — Circuit diagram of the pi-section coupler. C_1 , C_2 — 300 μmf . variable (National TMS-300). L_1 — 28 turns No. 14 tinned wire, $2\frac{1}{2}$ -inch diameter, $3\frac{3}{8}$ inches long (cut from B&W Standard Inductor No. 3906).

to make sure that the stage is still resonant, remembering, of course, that the dip will be much less pronounced than before you started to deliver the power to the antenna. Moderate detuning of the amplifier is permissible, but if it is necessary to retune the dial by more than 10 or 15 degrees to restore resonance, go back a step and reduce the coupling between the transmitter and the coupler. If, after you've reached the point where you can swing the coupler through resonance without serious detuning of the amplifier stage, you still can't bring the plate current up to rated maximum, try tapping the feeders in a few turns from each end of the coil. Make sure that you move in the same number of turns from each end, otherwise the symmetry of the circuit will be disturbed. Watch the current indicator when you make this change, because it is possible to get a condition where the coupler loads the transmitter

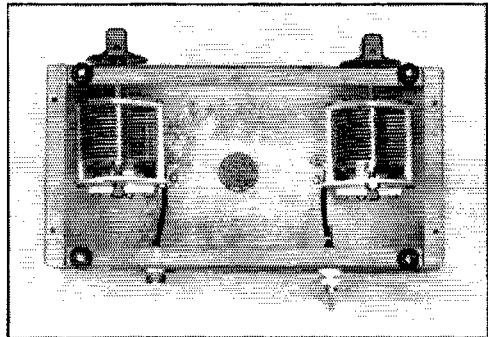


A pi-section antenna coupler. The coil is cut to specifications from B&W "Standard Inductor." A clip attached to a short length of flexible wire is used to short out turns of the coil when necessary. This coupler can be converted to a series-tuned arrangement by adding a link winding around the center of the coil and rewiring to conform to the circuit shown in Fig. 2.

better, but without producing a corresponding increase in output current.

A few trials of this sort will be required before you find the proper place to tap the feeders onto the coil. If you still can't load to the rated maximum, it is possible that you don't have enough turns on the output link coil in the transmitter, or that your power supply just isn't capable of putting out the voltage needed to permit full loading.

One thing to watch out for in using the tapped-coil system is heating of the coil in the coupler. The closer the taps are to the center of the coil, the more current flows in the coil, and if it gets warm, you can be certain that you are encountering losses that should be avoided. In general, you should have to tap near the center of the coil only if the current distribution on your system is such that the end of the feeders approach a maximum current point. If the coil heats appreciably in that case, it will be better to go over to the series-tuned coupler. If your calculations work out correctly so that you are actually feeding the antenna at a current minimum, you should be able to tap the feeders across the whole coil, or certainly most of it. Under these conditions current cannot be excessive unless you have used a coil



The bottom view of the pi-section coupler shows the position of the two tuning condensers and the input and output connections, which pass through the rear of the chassis.

that is made of such fine wire that it just isn't capable of standing up under the work it has to do. At the 75-watt power level, this will not ordinarily be a cause for concern.

Adjusting Series-Tuned Couplers

Adjusting the series-tuned coupler is similar to the process described above. Start with the current indicator in series with one feeder, and with loose coupling between the rig and the coupler. Resonate the amplifier tank circuit, as indicated by minimum plate current, and then adjust the two condensers in the coupler, keeping both at approximately the same capacitance setting. Resonance in the coupler will be indicated by a slight kick upward in the plate milliammeter reading. Increase the coupling gradually until the amplifier is drawing rated current. Recheck the tuning of the amplifier to make sure that it is still tuned to resonance. Watch the lamp bulb all the time. It will tell you when you are on the right track. Always strive for maximum brilliance in the lamp, or maximum current indication in the r.f. ammeter.

Adjusting the Pi-Section Coupler

Adjustment of the pi-section coupler is somewhat more difficult to describe than that of the other types, because the coupler is designed to work over a wider range of conditions. As with the other types, the best adjustment is the one which produces the maximum antenna current for a given input to the transmitter, so if the adjustment procedure you find necessary to load your antenna differs somewhat from the one described here, don't worry. The output is what counts!

In general, whenever a pi-section coupler is used, it is advantageous to connect the ground side of the coupler (chassis) to a good external ground. This can be a cold-water pipe in your house, or a rod driven several feet into the ground just outside the shack.

Start with both condensers in the coupler at minimum capacity. Resonate the amplifier tank circuit, and slowly turn the output condenser, C_2 , in the coupler until plate current rises in the amplifier. Then, tune the other condenser in the coupler to restore the resonant dip in the amplifier stage. Return now to the output condenser again, and turn it in the same direction as before, until plate current rises, again restoring resonance with the input condenser. Continue this back-and-forth adjusting until the amplifier is operating at rated input, all the time watching for the results as indicated by the current indicator in the antenna. Even if you are able to load the amplifier to full input without adjusting the size of the coil in the coupler, you may still not have the correct conditions for maximum output. Move the shorting tap down about one fourth the length of the coil and go through the same procedure described above, each time noting the antenna current. Needless to say, the correct adjustment is the one which produces maximum current in the antenna for a given input to the final amplifier.

Feeder Unbalance

In all of these adjustment instructions, we have said nothing about feeder unbalance because there is usually nothing you can do about it from the coupler end of the feed line. Balance is determined almost exclusively by the length of the flat top in the case of the Zepp. In the centered antenna, unbalance can be caused by having one leg of the flat top longer than the other.

There are other factors which may contribute toward unbalance, but ordinarily they are not important unless the feed line is several wavelengths long. In such cases, if one wire of the feeders happens to run for a considerable length closer to ground or to some metal object than the other, unbalance can result. Transposition blocks (insulators which permit the two feeder wires to crisscross without shorting), should be used in such installations.

To check for unbalance, tune the antenna system and the transmitter in the manner described above, with the current indicator in either wire of the feed line, and then transfer it to a point exactly opposite in the other feeder. The currents indicated should be equal. If you have two meters, or two flashlight lamps of equal rating, you can observe both at the same time, of course. After the checks have been made, remove the indicators from the line. In the case of the bulbs, this saves the amount of power that it takes to light them, and if you use meters, it prevents their being burned out by accident during lightning storms. (The antenna doesn't have to be hit to have enough current flowing in it to burn the meters out during a storm.)

The amount of feeder unbalance that can be tolerated depends on how fussy you want to be, of course. The ideal is to have the currents match exactly, but this is a rare condition not often encountered. As long as they are within 10 or 15 per cent of one another, not too much power will be wasted on the surrounding scenery.

There are other ways to put power into your antenna, but we have space to describe here only the systems most commonly used in the low-frequency Novice assignment. The same principles can be applied, of course, to antennas for the higher-frequency bands. At frequencies higher than 28 Mc., however, different techniques are sometimes called for, because the antennas used are frequently of a different type. In the lower-frequency bands, however, if your transmitter is operating properly, you should be able to get power into the antenna with one or the other of the arrangements shown here. However, there may be circumstances which prevent you from cutting your antenna system to be resonant, so that you find one of the midway points in the current-distribution curve at the shack end of the feeders. The symptoms of this are easy to recognize. The tuned circuit in the coupler will resonate by itself at the operating frequency, but cannot be made to resonate when the feeders are connected, or if it *can* be made to resonate, it

(Continued on page 116)

Cheaper and Better 'Phone Monitoring

A Simple 'Scope Unit for Checking Modulation

BY BASIL C. BARBEE,* W5FPI

SEC. 12.133 of the FCC's *Rules Governing Amateur Radio Service* says in part, "Means shall be employed to insure that the transmitter is not modulated in excess of its modulation capability for proper technical operation." While that word "means" may be subject to widely varying interpretation, it is generally considered that an oscilloscope, connected so as to present one of the common modulation patterns, is adequate for an amplitude-modulated amateur station. Even where a modulation monitor of the sort required in broadcast stations is used, a 'scope is a valuable adjunct, since its spot can move fast enough to follow the most rapid amplitude variations, while the needle of the modulation monitor's meter cannot. Furthermore, a great deal of information about parasitics, distortion, and other phenomena, in addition to percentage of modulation, may be gained from observing the pattern generated on the screen of a 'scope by the output signal of a 'phone transmitter.

While most operators using 'scopes have scrimped, saved, begged, borrowed, or whatever was necessary in order to buy manufactured general-purpose units, the instrument to be described is more suitable because it is designed for the particular purpose of modulation monitoring. Among the advantages it has over the usual store-bought 'scope are:

- 1) Much cheaper because of its simplicity.
- 2) Takes up no desk space and little panel space.
- 3) Neater, built into transmitter, no visible haywire.
- 4) Draws negligible power from final tank circuit.
- 5) Gives three presentations, selected instantly by switch.
- 6) Can be used with mobile rig (with sacrifice of envelope pattern).

* 1608 S. Fredonia St., Nacogdoches, Texas.

The simple modulation 'scope is built on a 3 1/2-inch standard rack panel and is permanently mounted in the transmitter rack. The controls from left to right are for intensity (R_5), focus (R_7), horizontal gain (R_8), pattern-selector switch, secondary tuning (C_4) and primary tuning (C_5).

• Here is a simple oscilloscope designed especially for checking and monitoring a.m. 'phone signals. It is small enough so that it can be mounted in the transmitter rack or cabinet. The unit can be switched instantly to show three different types of patterns, each having its advantage depending on the check being made.

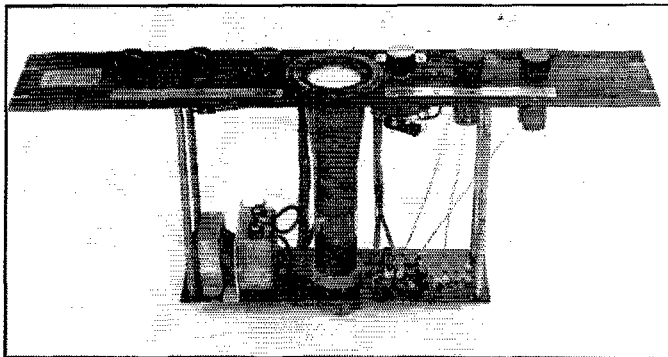
7) Easily connected to receiver for checking modulation of received signals.

Pattern Types

The instrument to be described is designed to display any of three types of pattern as selected by a switch, in order to take advantage of the best features of each. The advantages and disadvantages of each presentation are briefly discussed below:

1) *Envelope Pattern* (see Fig. 1A): Simplest to obtain on store-bought 'scope. Shows parasitics and distortion well, when modulation is sine-wave and synchronized with sweep. On complex modulation, such as speech, about the only information derived is the indication of over-modulation by bright horizontal lines along the X axis. This pattern may be produced with either linear (saw-tooth) or sine-wave sweep voltages on the horizontal plates of the 'scope. While linear sweep is available on ready-made general-purpose 'scopes, a 60-cycle sine-wave sweep greatly simplifies a home-built job by eliminating the relatively complicated saw-tooth oscillator and amplifier required for linear sweep. In addition, sine-wave sweep produces an attractive, symmetrical pattern, expanded in the center, so that the pattern on a 2-inch tube is readable about as far away as is a linear envelope pattern on a 3-inch tube.

2) *Trapezoid Pattern* (see Fig. 1B): This pat-



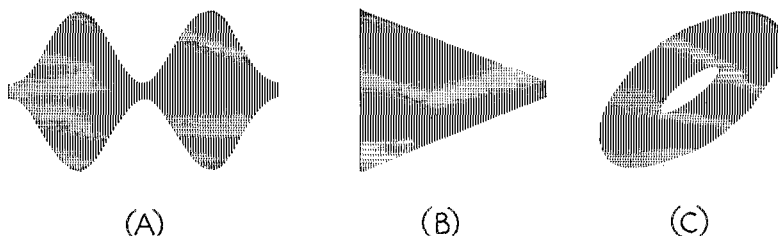


Fig. 1—Any one of three types of patterns, discussed in the text, can be selected by a switch on the panel. A—Envelope pattern. B—Trapezoid pattern. C—Cat's-eye pattern (see text).

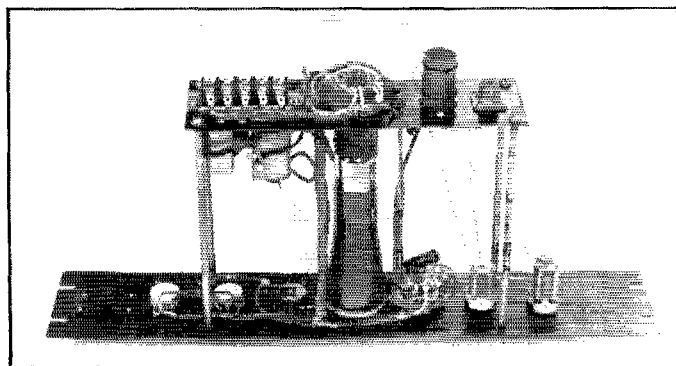
tern is simple to obtain, and while certain parasitics may not be displayed as clearly as with the envelope pattern, non-linearity (distortion) in modulation is readily detectable, overmodulation is instantly apparent by a tail at the apex of the triangle, and actual percentage of modulation may be measured with a ruler; all this with any modulating waveform, no matter how complex. For the horizontal sweep voltage, a connection to the modulator is necessary. To eliminate audio phase shift, it is usually necessary to derive this voltage from the modulator output through a voltage divider and blocking condenser. The trapezoid is no doubt the most suitable single pattern for the monitoring of amplitude modulation.

3) *Cat's-Eye Pattern* (see Fig. 1C): While seldom seen in amateur stations, this presentation has virtue in that it provides an attractive display, with instant and effective warning of overmodulation, and requires neither saw-tooth, 60-cycle sine-wave, nor audio sweep voltage. Both vertical and horizontal plates are supplied with r.f. voltages from the final tank, shifted in phase approximately 90 degrees with respect to each other, thus forming a circle or ellipse on the screen with no modulation. Under modulation, this figure expands to twice its diameter on 100 per cent positive peaks and shrinks to a point on negative peaks. To the eye, this appears as a broadening of the original line to form a solid illuminated disk. Overmodulation is indicated by a bright spot in the center of the disk, which can call the operator's attention to the condition even though he is not looking directly at the screen at the moment. Like the trapezoidal pattern, the cat's-eye works as well on complex modulation as on sine-wave, making it suitable for continuous monitoring of speech modulation.

Perhaps its greatest advantage is the readiness with which it may be connected to the i.f. output of a receiver to gauge the other fellow's modulation. Using it in this fashion, the results are often surprising. (As a word of caution, an overloaded i.f. stage may change the percentage of modulation of a received signal somewhat, as may propagation conditions except on ground-wave, so don't get into a heated argument or bet large sums of money on a received pattern unless you're sure the other station has no 'scope!)

Circuit

The schematic, shown in Fig. 2, is practically self-explanatory. There is no power supply, heater and plate voltages being derived from the transmitter power supply. While the tube manuals recommend a minimum of 500 volts for the Type 2AP1A c.r.t., the particular tube used has been found to work well down to a mere 190 volts, making it feasible to use it with even very low-power rigs. While the spot is less sharp than with higher voltages, the definition is still good enough for modulation indications. With the values of resistance shown, the unit will operate on any voltage up to 1000 although, for voltages above 500, the voltage ratings of the fixed condensers should be accordingly higher, resistors R_4 , R_6 , and R_9 should be made up of smaller resistors in series, and better insulation should be employed than the tie points shown. The filter, R_3C_5 , is included to reduce the ripple usually found in a transmitter power supply to a value more suitable for oscillographic purposes. For instance, a 5 per cent ripple at 500 volts would amount to 25 volts. The deflection factor for Type 2AP1A at a second-anode voltage of 500 is around 100 volts per inch, so 25 volts would produce a line $\frac{1}{4}$ inch long where a spot



Rear view of the simple 'phone-monitoring 'scope, showing the plug-in coil and tuning condensers.

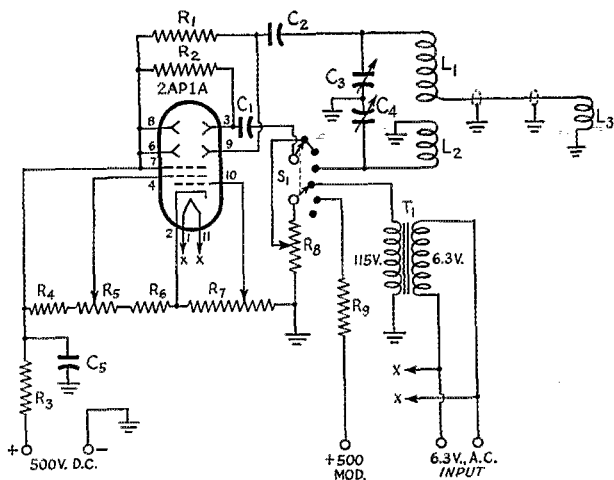


Fig. 2—Circuit of the modulation oscilloscope.

- C₁, C₂—0.005- μ fd. 1600-volt paper.
- C₃, C₄—100- μ fd. variable.
- C₅—2- μ fd. 600-volt paper.
- R₁, R₂—2.2 megohms, $\frac{1}{2}$ watt.
- R₃—47,000 ohms, $\frac{1}{2}$ watt.
- R₄—3.3 megohms, 1 watt.
- R₅—1-megohm volume control.
- R₆—0.47 megohm, 1 watt.
- R₇, R₈—0.5-megohm volume control.
- R₉—1.5 megohms, 1 watt.
- L₁, L₂—1.8 to 4 Mc.—30 turns No. 30 s.c.e., 1 inch diam., scramble-wound, $\frac{1}{4}$ inch long.
- 14 to 28 Mc.—3 $\frac{1}{2}$ turns, 1 inch diameter, $\frac{1}{8}$ inch long.
- L₃—1-turn link, 1 $\frac{1}{2}$ inches diam.
- S₁—Two-circuit three-contact rotary switch.
- T₁—6.3-volt 1-amp. filament transformer.

NOTE: Turns are for each winding. L₁ and L₂ are wound on same form with their centers 1 inch apart.

should be. The resulting pattern would then have all the detail of a picture painted on a small canvas with a house-painting brush! There is no danger of burning a spot in the center of the screen while the transmitter is off, as is the case with store-bought 'scopes because, since the 'scope draws its plate power from the transmitter, it goes off automatically as the transmitter is shut down.

No centering controls are provided, in the interest of simplicity. If there is no leakage in the blocking condensers C₁ and C₂, the undeflected spot will fall not far from center, and may be centered precisely by knocking a chip off an old Alnico speaker magnet and attaching it to the base of the c.r.t. with a drop of household cement, after first finding, by trial and error, the proper location and orientation. If the first chip tried knocks the beam off the screen, break it into still smaller chips until one of the right strength is found.

The pattern-selector switch, S₁, is a three-pole, three-circuit wafer switch, one pole of which is unused except as a tie point. In the "Envelope" position, one pole, S_{1A}, connects the horizontal deflection plate to the arm of the horizontal gain control, R₈, while the other pole, S_{1B}, connects the top end of the control to the reversed 6.3-volt filament transformer, T₁, to provide the necessary 60-cycle sine-wave sweep voltage. In the "Trapezoid" position, the horizontal deflection plate is again connected to the arm of the control, while the control is connected in series with R₉ to form an adjustable voltage divider across the modulator output. In the "Cat's-Eye" position, the horizontal deflection plate is switched to the tuned circuit, L₂C₄, to pick up an r.f. voltage 90 degrees, more or less, out of phase with the r.f. on the vertical deflection plate, derived from L₁C₂. The ideal pattern is obtained when the carrier forms a perfect circle. However, this requires careful adjustment of the two voltages so that they are of equal amplitude and the phase difference is exactly 90 degrees. Results entirely adequate for satisfactory

monitoring can be obtained with a much less accurate adjustment. Either unequal amplitudes or a phase difference other than 90 degrees will result in an elliptical pattern. Unequal amplitudes with a 90-degree phase difference results in an ellipse along either vertical or horizontal axis, depending upon which signal is of greater amplitude. The major axis of this ellipse will fall at some angle between vertical and horizontal if the phase difference is not 90 degrees. Equal amplitudes with a phase difference other than 90 degrees results in an ellipse tilted away from the vertical, but whose horizontal and vertical amplitudes are equal. Fig. 1C indicates a pattern formed by vertical and horizontal signals of approximately equal amplitudes with a phase difference of about 45 degrees and less than 100 per cent modulation.

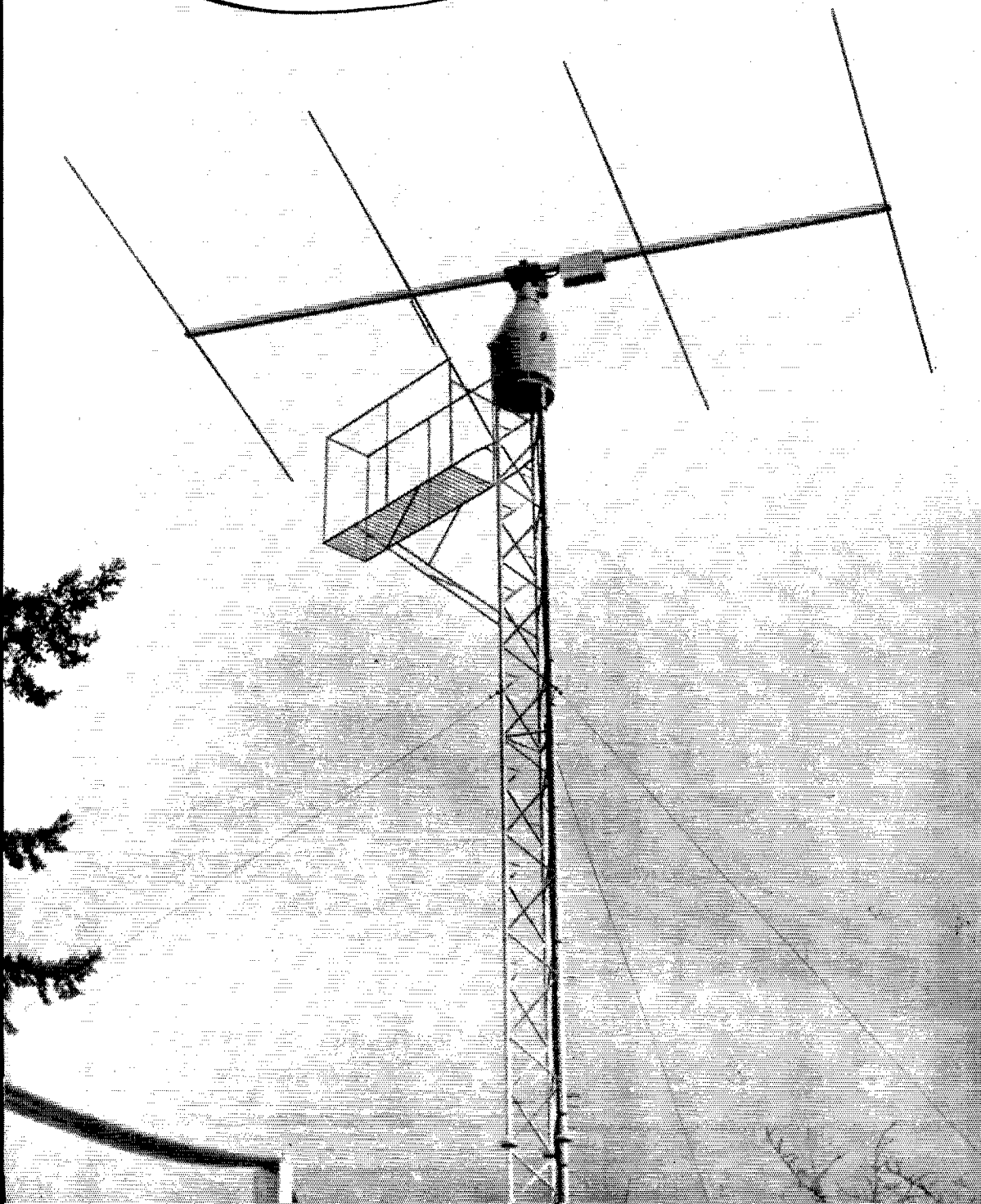
L₁ is series-coupled to the link, L₃, which, in turn, is loosely coupled to the final tank circuit. The two tuning condensers, C₃ and C₄, in conjunction with the loosely-coupled coils, L₁ and L₂, make possible not only the adjustment of phase shift to obtain the cat's-eye pattern, but also, through resonant rise, provide sufficient r.f. voltage for full-screen deflection with a very small amount of power drawn from the final tank circuit. This is a great advantage with low-power rigs, since the usual untuned link wastes considerable power, particularly when a great length (or sometimes a certain length) of coax cable is used between link and 'scope. While the plug-in coil L₁L₂ must be changed for high or low frequencies, there is no reason why a bandswitching arrangement could not be used. Indeed, if only a narrow range of frequencies is to be covered, the tuning condensers on the front panel could be done away with and replaced by compression or ceramic trimmer condensers mounted on the coils.

For monitoring the other fellow's modulation, a midget i.f. transformer with trimmers wide open is mounted on a tube base and plugged into the coil socket. The link line is then fed from a

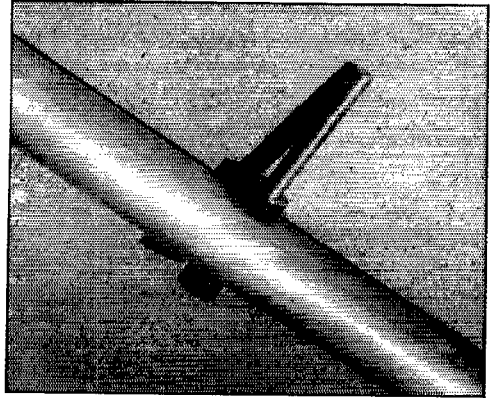
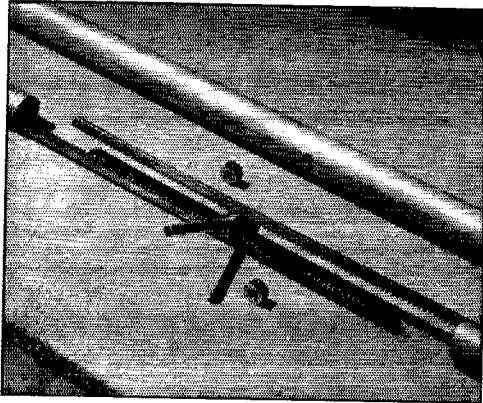
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A TELETUNED 10-METER BEAM

BY WILLIAM GIBSON,* W7BVV

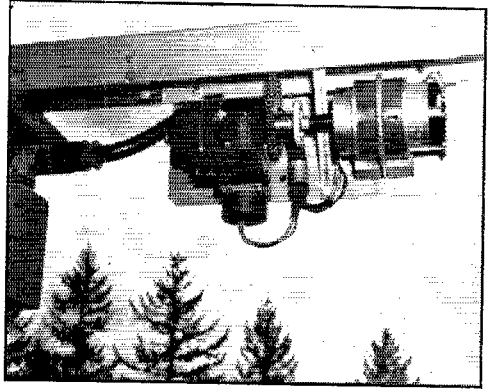
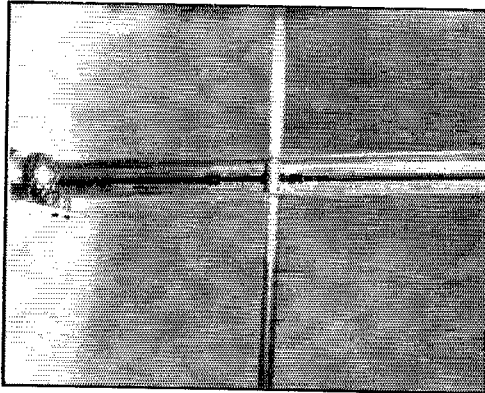


. . . Beam Elements Adjustable from the Shack



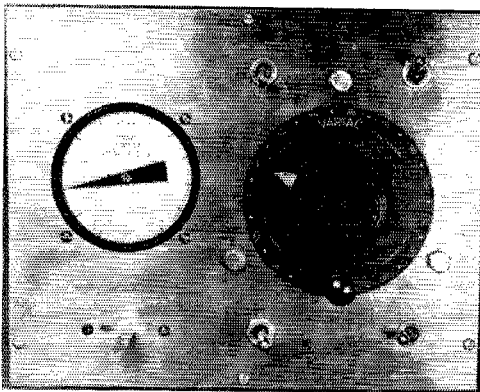
Each of the four 0.2-wavelength-spaced elements has an internal rack-and-pinion drive that controls the length of the element. Collars hold the drive pinion shaft in place after assembly. Good contact between a

fixed midsection and its driven end sections is obtained by first milling eight 1½-inch-long slots in the ends of the midsection and then bending over the tips with long-nosed pliers.



The elements are gang-tuned by a ¼-inch shaft running within the 20-foot boom channel. Element lengths were first adjusted at the center of the band with couplings loose. The tuning drive motor and synchro are

mounted under the boom near the beam rotator. Motor and synchro are protected from the weather only at the top and sides, but in two years of operation have given no trouble.



Beam control panel in the shack includes synchro-driven tuning indicator and Variac for controlling rotation speed. The handsome back-lighted direction map is

home-drawn on sanded Plexiglas. Gamma match and slip rings are used, and the RG-8/U feed line is flat on frequency. Only 100 kc. away, s.w.r. rises to 2:1, increases rapidly after that.

*Box 591, Route 8, Salem, Ore.

Happenings of the Month

ELECTION NOTICE

To All Full Members of the American Radio Relay League Residing in the Central, Hudson, New England, Northwestern, Roanoke, Rocky Mountain, Southwestern and West Gulf Divisions.

An election is about to be held in each of the above-mentioned divisions to choose both a director and a vice-director for the 1953-1954 term. These elections constitute an important part of the machinery of self-government of ARRL. They provide the constitutional opportunity for members to put the direction of their association in the hands of representatives of their own choosing. The election procedures are specified in the By-Laws. A copy of the Charter and By-Laws will be mailed to any member upon request. (The By-Laws will also be found on page 56 of July 1952 QST.)

Nomination is by petition, which must reach the Headquarters by noon of September 20th. Nominating petitions are hereby solicited. Ten or more Full Members of the League residing in any one of the above-named divisions may join in nominating any eligible Full Member residing in that division as a candidate for director therefrom, or as a candidate for vice-director therefrom. No person may simultaneously be a candidate for both offices; if petitions are received naming the same candidate for both offices, his nomination will be deemed for director only and his nomination for vice-director will be void. Inasmuch as all the powers of the director are transferred to the vice-director in the event of the director's resignation or death or inability to perform his duties, it is of as great importance to name a candidate for vice-director as it is for director. The following form for nomination is suggested:

Executive Committee
The American Radio Relay League
West Hartford 7, Conn.

We, the undersigned Full Members of the ARRL residing in the..... Division, hereby nominate..... of..... as a candidate for director; and we also nominate..... of..... as a candidate for vice-director; from this division for the 1953-1954 term.

(Signatures and addresses)

The signers must be Full Members in good standing. The nominee must be a Full Member and the holder of an amateur license, and must have been a member of the League for a continuous term of at least four years immediately preceding receipt by the Secretary of his petition of nomination. No person is eligible who is commercially engaged in the manufacture, sale or rental of radio apparatus capable of being used in radio communication, or is commercially engaged in the publication of radio literature intended in whole or in part for consumption by radio amateurs.

All such petitions must be filed at the headquarters office of the League in West Hartford, Conn., by noon EDST of the 20th day of September, 1952. There is no limit to the number of petitions that may be filed on behalf of a given candidate but no member shall append his signature to more than one petition for the office of director and one petition for the office of vice-director. To be valid, a petition must have the signature of at least ten Full Members in good standing; that is to say, ten or more Full Members must join in executing a single document; a candidate is not nominated by one petition bearing six valid signatures and another bearing four. Petitioners are urged to have an ample number of signatures, since nominators are occasionally found not to be Full Members in good standing. It is not necessary that a petition name candidates both for director and for vice-director but members are urged to interest themselves equally in the two offices.

League members are classified as Full Members and Associate Members. Only those possessing Full Membership may nominate candidates or stand as candidates; members holding Associate Membership are not eligible to either function.

Voting by ballots mailed to each Full Member will take place between October 1st and November 20th, except that if on September 20th only one eligible candidate has been nominated, he will be declared elected.

Present directors and vice-directors for these divisions are as follows: *Central:* Wesley E. Marriener, W9AND, and Charles F. Reberg, W9MVZ. *Hudson:* Joseph M. Johnston, W2SOX, and George V. Cooke, jr., W2OBU. *New England:* Percy C. Noble, WIBVR, and Frank L. Baker, W1ALP. *Northwestern:* R. Rex Roberts, W7CPY, and Karl W. Weingarten, W7BG. *Roanoke:* William H. Jacobs, W4CVQ, and Gus M. Browning, W4BPD. *Southwestern:* John R. Griggs, W6KW, and Walter R. Joos, W6EKM. *West Gulf:* A. David Middleton, W5CA, and Frank E. Fisher, W5AHT.

Full Members are urged to take the initiative and to file nomination petitions immediately.

For the Board of Directors:

A. L. BUDLONG
Secretary

July 1, 1952

GRANDFATHER PROOF FOR EXTRA CLASS EXAM WAIVER

In connection with the granting of the Amateur Extra Class license to old-timers, FCC found that many applicants, through no fault of their own, could not establish their license status before World War I. FCC doesn't even have all the callbooks for that period, and of course no government callbook was issued to show amateurs licensed between July 1, 1916, and the declaration of war in 1917. Accordingly, the Commission has just issued notice that where an amateur is not mentioned in any callbooks available, and does not possess either the old license, copies thereof, official correspondence with the government at that time indicating possession of a license, or evidence in other correspondence or printed articles, he may submit his application on the basis of an affidavit, this to be supported by statement under oath, or affirmation, from "two disinterested persons (of whom one may be a member of the applicant's family)" attesting existence and knowledge of such license prior to April, 1917.

More specifically, FCC has this to suggest as the types of evidence which may be submitted

if neither the applicant nor FCC can find records in old callbooks and lists:

1) License documents or certified copies thereof.

2) An official letter or letters from a Department of United States Government in which reference is made to the applicant's amateur license in sufficient detail to establish that such license was actually issued to the applicant.

3) Copies of personal correspondence or of a publication, written or published prior to January 1, 1919, which refers to the applicant's amateur license and describes it in sufficient detail to establish that it was issued prior to April, 1917. Such correspondence or printed article to be fully identified and explained in a notarized statement by the applicant.

4) A statement by the applicant, under oath, that none of the foregoing data is available and in which he gives the date when his amateur license was issued, place where he resided at the time, and states how long he held such a license. In cases where only an amateur operator license is alleged such statement should describe the amateur station operated and give the name of the licensee, location of the station, and call sign. Such statement of the applicant should be supported by statements, under oath or affirmation, of at least two disinterested persons (of whom one may be a member of the applicant's family), who state that they personally knew the applicant during the time he held an amateur operator or station license issued prior to April, 1917, give details as to the relationship of the affiant to the applicant, dates and circumstances under which he held the license, and, if possible, give the call sign of the amateur station he operated.

Since prior to the enactment of the Radio Act of 1912, amateur stations and operators were not required to be licensed, it must again be emphasized that any evidence submitted in support of an application should indicate the existence of an amateur station or operator license issued by a department of the federal government.

STAFF NOTES

Although perhaps you've already noticed it from the masthead changes, as a result of the unfortunate loss of Ralph Beaudin, W1BAW, two new appointments on the staff have been made as Assistant Circulation Manager. One is Harry Paston, W1DJV, who is now an administrative assistant to Mr. Houghton in circulation matters, with particular emphasis on promotional activities; two years as Assistant Secretary provided DJV with ample background for this work. The second is Harold K. Isham, W1MFA, who continues to supervise our complex shipping operations and who also is taking over many of our purchasing matters. Managing Editor Harold M. McKean, W1CEG, now has charge of our publication production problems, in addition to his editorial responsibilities. John E. Cann, W1RWS, Assistant Communications Manager -- C.W., who for some years has been handling the DXCC post as a specialty, becomes the new Assistant Secretary; a former W3, he has had considerable background in organized amateur activities and has already participated in our field travel.

F.C.C. JOB OPENINGS

The U. S. Civil Service Commission has announced examinations for radio engineer in the FCC, grades GS-5 and GS-7, base pay \$3,410 and \$4,205 per year, respectively. Here's your chance to become an "RL," if interested and qualified. Candidates must have a degree in engineering with emphasis on electronics or communications, or the equivalent professional ex-

perience; ham operating, service technician experience, or factory assembly of communications gear won't count. You have to be able to handle 25 w.p.m., however. Get a copy of announcement No. 328 from your local civil service office, post office, or direct from the United States Civil Service Office in Washington, D. C.

RACES RULES ANNOUNCED

On June 30th FCC released the final version of rules governing the Radio Amateur Civil Emergency Service, to become effective August 15th. In substance this civil defense emergency communications plan is about as proposed last December (see page 33, February *QST*, for highlights), although there are numerous editorial modifications and some minor changes here and there. Hq. is sending copies of the new rules to ARRL administrative and interested field organization personnel, as well as clubs; we shall be glad to furnish additional copies on individual request. As the new regulations become Part B of the regular amateur rules, the text will also appear in future editions of the *License Manual*.

STAFF OPENINGS AT HQ.

Interested in making ham radio your career? Promotions within the ARRL Headquarters Staff have resulted in vacancies, present and prospective, to be filled. Congenial working conditions, free insurance for permanent employees, hospitalization benefits, go with these positions.

One post, immediately available, involves responsibility for the handling of the DXCC and carrying on world-wide correspondence. Another administrative position is concerned with ARRL's 'phone operating program, planning and writing bulletins, and continued development and supervision of the League's Training Aids Program. Applications indicating interest and availability for permanent assignment at W1AW are also welcomed. Positions involve the possibility of field contact travel. Salary in each case is commensurate with ability and experience.

Amateurs with initiative who can work with minimum supervision after becoming familiar with their assignments are wanted. Long experience is not required. Preference will be given to single men interested in making their hobby a career. Write to Box A, ARRL Headquarters, West Hartford 7, Conn., stating your age, type of amateur license held, and giving a brief résumé of your experience in amateur radio. We'll send you a personnel form on which you can submit the necessary additional information about yourself. All inquiries are welcomed and will be held confidential.

A.R.R.L. FILES ON PROPOSALS

For the information of members, we publish herewith the texts of filings by the American Radio Relay League of comment on FCC proposals in Dockets 10021, 10073 and 10173. League comments on Docket 10188 (dealing primarily with 21-Mc. matters) will appear next month.

FEDERAL COMMUNICATIONS COMMISSION

In the Matter of
Amendment of Section 2.104(a)
of Part 2 and Section 12.111 of
Part 12 of the Rules and Regu-
lations of the Federal Commu-
nications Commission } DOCKET 10021

COMMENTS OF THE AMERICAN RADIO RELAY LEAGUE, INC.

Pursuant to Paragraph 4 of the Notice of Proposed Rule Making released April 18, 1952, the American Radio Relay League, Inc., files these comments:

Heretofore, amateurs in the Gulf Coast states have not been permitted to use, during hours from sunset to sunrise, the available portions of the 1,800-2,000 kc. Loran band. This has worked a hardship not only because of the inequality in operating privileges, but also because amateurs in those states were hindered in plans for emergency and civil defense networks. Since the major practical effect of the amended rules proposed is to authorize night-time operation in the Gulf Coast states, the League fully supports the proposed rules changes.

AMERICAN RADIO RELAY LEAGUE, INC.

By:

PAUL M. SEGAL
General Counsel

A. L. BUDLONG
General Manager
June 30, 1952

FEDERAL COMMUNICATIONS COMMISSION

In the Matter of
Amendment of Part 12,
"Rules Governing Amateur
Radio Service" } DOCKET 10073

COMMENTS OF THE AMERICAN RADIO RELAY LEAGUE, INC.

These comments are filed pursuant to Paragraph 4 of the Notice of Proposed Rule Making in Docket 10073, dated April 17, 1952.

The comments are made pursuant to the instructions of the Board of Directors of the American Radio Relay League, Inc. As the Commission is aware, the ARRL Board of Directors is composed of sixteen amateurs nominated and elected by approximately 35,000 licensed amateurs to represent them in the formation of League policy.

As a result of action of the Board of Directors of the League at its meeting in May, 1951, a study of some of the matters covered in the present docket had already been initiated by the Planning Committee of ARRL. At its meeting in May, 1952, the Board gave full consideration to all of the matters covered by the docket. The Board had before it not only the report and recommendations of its Planning Committee, but also a considerable amount of data reflecting amateur opinion obtained prior to the meeting by individual directors in their respective areas. The Board of Directors accordingly formulated the policy of the League toward the proposals as set out below.

I

As concerns the proposal to open the frequency sub-band 7,200-7,300 kilocycles to voice operation (A-3 emission or narrow band frequency or phase modulation):

At the time of the Commission's first action in this matter, on October 31, 1951, the ARRL Planning Committee was already studying the desirability of such a proposal. The study was completed, with affirmative recommendations, which were unanimously adopted by the Board of

Directors of ARRL at its meeting in May. Therefore, the League endorses the Commission's proposal.

II

As concerns the proposal to make additional frequencies available for the operation of Novice Class licensees by authorizing their use of a portion of the 7-megacycle amateur band:

The League not only heartily concurs with the Commission's attempt to remedy an obviously inequitable situation, but goes further and requests consideration of assigning to Novices an even larger sub-band, 7,150-7,200 kilocycles.

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. Some pertinent data are shown in the results of a survey of operating habits and interests of several hundred Novice Class licensees, conducted by the League a few months ago as part of the study of Docket 10073 undertaken by the ARRL Planning Committee. More than three-fourths of these Novices use the only available low-frequency sub-band, 3,700-3,750 kilocycles, *exclusively* for all of their operating activity. Three-fourths of the remainder use the 3,700-3,750 kilocycle sub-band *primarily* for their operating activities. For the entire group, the occupancy ratio for the various bands open for Novice operation is indicated as:

3,700-3,750 kc. c.w.	— 93.8%
26,960-27,230 kc. c.w.	— 1.4%
145-147 Mc. c.w.	— .4%
145-147 Mc. voice	— 4.4%

Somewhat more than half the group indicate band conditions are so crowded they cannot accomplish two-way contacts except in the odd hours of the early morning, or around noon-day when only a few immediately-local contacts are possible. Sixty percent of the group express the view that present Novice privileges are insufficient.

Additional frequencies for Novice operation are indeed required, and should be in one of the lower-frequency bands. Conditions in the 1,800-2,000 kilocycle region are such that it does not appear wise to consider it a possibility. The 14-megacycle and immediately higher-frequency amateur bands not only do not meet the requirements of reliable medium-distance communication, but also are congested with comparatively high-power amateur stations engaged in competitive long-distance work, making those frequencies unsuitable for beginner-training operation. That leaves the 3.5- and 7-megacycle bands. In the former, practical space for c.w. telegraphy in recent years has been cut so severely with the expansion of voice frequencies and the establishment of a Novice band therein that it seems unwise to reduce that space again. For these reasons, the League supports the view of the Commission that additional privileges should be made available to Novice Class licensees, and also that these privileges should be in the 7,000-kilocycle band.

In the League's view, however, a sub-band of 25 kilocycles is inadequate for practical communications purposes in considering the number of amateur newcomers who undoubtedly will be using it. Since the Novice license became available, the Commission's figures show that more than 12,000 such licenses have been issued, and an indicated continuing rate of approximately 13,000 per year. Figures of this degree support the view that occupancy of an additional 50 kilocycle sub-band by Novices will still be sufficiently heavy to present such interference difficulties to Novice Class licensees as to be excellent operating training and also meet the requirement of maintaining incentive for further progress. The League therefore requests that the band 7,150-7,200 kilocycles be made available for Novice operation, A-1 only, under the present equipment restrictions.

III

As concerns the proposal to open for type F-1 emission the non-voice frequencies in the amateur 8.6-, 7- and 14-megacycle bands:

The League believes the privileges proposed are excessive and unnecessary in view of the small number of amateurs

who use — or possibly ever will be able to use — radioteletype printers with this type of emission, and undesirable because (for other than teletypewriter use) F-1 emission is highly uneconomical of spectrum space.

The history of this matter reveals that several years ago there became available for experimentation by amateurs a number of teletypewriter equipments, obsolete for their original purpose. As a result, some amateurs procured these equipments and set them up for operation. Activity centered in the 144-megacycle amateur band, as these equipments were concentrated in the hands of amateurs in metropolitan areas such as New York City, and it was desirable to use a v.h.f. channel. The more-populated lower-frequency bands, of course, are not authorized for F-1 emission. As interest grew and activity spread to additional parts of the country, teletypewriter enthusiasts sought the League's help in making available a small portion of a low-frequency band, that at 7 megacycles being suggested, for radioteletype experimentation and development. After a study by the ARRL Planning Committee and consideration by the ARRL Board of Directors, it was decided it would be desirable to make available for this purpose a nominal segment such as 7,250-7,300 kilocycles. The League a year ago so proposed to the Commission. The League is now obliged to change the specified band limits in its request to read 7,150-7,200 kilocycles, because of the apparent imminence of authorization for voice emission at 7,200-7,300 kilocycles.

The principle of providing a *small* lower frequency sub-band for the development of radioteletype amateur communication still is valid, in the League's view. As in all amateur development, if operation on the small sub-band creates further interest which increases to the point where additional frequencies seem required to provide adequate communications facilities, additional frequencies can then be provided. (Precisely that course is now being followed for the Novice Class licensee, for example.) The League has the feeling there has not been sufficient experience with radioteletype operation on lower frequencies to be able to affirm that such a time will come in the near future. Indeed, the facts in the matter, which indicate that the present number of 300-400 equipments is the maximum expected to be available for amateur work for the time being, would indicate that the Commission's proposals represent an excess of frequencies and that the smaller band for development work is more desirable at this time.

It will be noted that the League's request for radioteletype privileges coincides with frequency privileges requested for the Novice. That is not chance. The effect of the Commission's present proposal coupled with the League's request for additional privileges if adopted, is to cut in half the present space available to c.w. telegraph operation. The 7,000-kilocycle amateur band has long been established as carrying a heavy proportion of amateur activity although it, like higher-frequency bands of amateurs as well as other services, at the moment of writing does not appear so heavily occupied as normally because of temporarily unfavorable propagation conditions. If radioteletype were to be authorized in a separate sub-band, say 7,100-7,150 kilocycles, it would have the effect of cutting still further the frequencies remaining available for normal c.w. telegraph activities. This, in the League's view, would be an undesirable action, since for the greater part of the solar cycle this is an international band at night — the time of greatest amateur activity.

The League wishes to point out that its request is for *radioteletype*, using F-1 emission. It is uneconomical of spectrum space and therefore undesirable to permit the indiscriminate use of F-1 emission. For machine teletypewriter systems there is, of course, considerable advantage in the use of F-1 emission, and it is for the encouragement of amateur radio teletype communication that the League seeks a sub-band allocated for such emission. On the other hand, there is no similar advantage to be obtained from the use of F-1 emission for hand-keying radioteletype systems, and the very great disadvantage of occupying a much larger bandwidth than necessary.

An additional point, perhaps not easily perceivable by the majority of those amateurs interested in teletype communication, but actually of considerable importance to the long-term maintenance of amateur bands, is the confusion which may result between amateur teletype stations, if they are spread indiscriminately throughout lower-frequency bands, and interloping commercial or government teletype stations of other countries operating improperly in our

bands. With the Commission's cooperation, the League has been regularly collecting from its Official Observer system, analyzing, and reporting cases of foreign commercial or government interference to amateur operations, and a considerable amount of such unauthorized operation is with F-1 emission. Observers, few of whom have teletypewriter receiving equipment, would find it difficult to distinguish between legitimate amateur operation and unauthorized infringements by foreign stations; the Commission's proposal for additional identification requirements, concurred in hereinafter, although tending to alleviate the potential problem would not, in our opinion, completely solve it.

For all these reasons, and especially until amateur use of radioteletypewriter operation increases to a point requiring additional channels, the League does not believe it wise to grant broad frequency privileges at this time and proposes instead that the frequencies 7,150-7,200 kilocycles be made available for F-1 emission, radioteletype only.

IV

As concerns the proposal to tighten the requirements for transmission of call signs:

The League perceives that this is primarily an administrative problem of the Commission's, particularly with respect to monitoring of stations using emission other than A-1 or A-3, and therefore makes no specific comment.

V

As concerns the proposal to establish a new section of the amateur rules providing technical standards for teletypewriter operation:

The League in principle opposes the establishment of equipment standards for amateur operation as being inconsistent with a basic reason for which amateur radio exists — experimentation and development. However, inasmuch as it is understood the proposed standards are to a large extent required by the Commission to fulfill its monitoring obligations, and inasmuch as they largely reflect current amateur practice, the League offers no objection.

AMERICAN RADIO RELAY LEAGUE, INC.

By:

PAUL M. SEGAL
General Counsel

A. L. BUDLONG
General Manager
July 1, 1952

FEDERAL COMMUNICATIONS COMMISSION

In the Matter of
Amendment of Part 12 with Respect
to Special Radiotelephone Operating
Privileges Presently Granted
Only to Holders of the Extra Class
and Advanced Class Operator
Licenses } DOCKET 10173

COMMENTS OF THE AMERICAN RADIO RELAY LEAGUE, INC.

Pursuant to Paragraph 5 of the Notice of Proposed Rule Making herein, released April 18, 1952, the American Radio Relay League, Inc., files these comments:

Under present Rules Governing Amateur Service the Advanced Class license will no longer be available to new applicants after December 31, 1952. After that date, amateurs who wish to apply for authorization to use the special radiotelephone operating privileges in the 3.8- and 14.2-megacycle bands will be obliged to qualify for the new Extra Class license as the only means by which to obtain those privileges. The American Radio Relay League brought to the Commission's attention, by petition under date of November 26, 1951, inequities of this situation in view of the announced nature and scope of the Extra Class Examination. Therefore, the League requested continuance of the Advanced Class license as a permanent part of the amateur license structure. The Commission, by order dated April 17, 1952, denied the League's petition. However, the Commission apparently recognizes the inequities described by the League and in its current Notice suggests an alternative method of solution of the problem, which is to eliminate the requirement of holding of an Advanced or Extra Class license as a condition to operation on the restricted radiotelephone bands.

At its meeting in Hartford May 9-10 this year, the Board

of Directors of the League gave its most careful consideration to this alternative proposal. Prior to the meeting, individual directors, representing approximately 35,000 licensed amateur members of the League in every part of the country, had made special effort to ascertain amateur opinion in this matter. It was the unanimous conclusion of the directors that the majority of the active amateurs of the United States, regardless of the class of license now held, desire the continuation of the Advanced Class license as the minimum requirement for operation in the named sub-bands with voice emission and, as an essential to this, continuance of the Advanced Class license as a permanent part of the amateur license structure, and it so requests the Commission.

The Board recognizes that some of the amateur desire for the retention of certain restricted radiotelephone bands, and a special examination in that connection, is based on sentiment and tradition; it has long been a tradition in the amateur service that the radiotelephony suballocations in the 3.8- and 14.2-megacycle bands have been available only to those amateurs who, following a year's apprenticeship in amateur radio, have passed a somewhat higher-level technical examination dealing primarily with radiotelephony subject material. Further, however, and even more important, it can be shown from the Commission's records that the arrangement does actually encourage thousands of amateurs to prepare themselves for the higher grade of examination, while experience indicates that the nature of the Advanced Class examination, while more advanced in scope than the General (or Conditional) Class license, is not so complex as to restrict it to only a small number of amateurs.

The Commission's alternate proposal weakens the stepping-stone principles of the amateur license structure, principles which the Commission earlier endorsed by its establishment of the Novice and Technician Classes of license at one end of the scale and the Amateur Extra Class at the other. Progression of large numbers of amateurs to higher standards of technical knowledge is admittedly desirable; the Commission has indicated its aim of "encouragement and improvement of the amateur radio service through rules which provide for advancing skills in both the communications and technical phases of the art." Adoption of the Commission's current proposal, however, would have the effect of lowering overall amateur standards of technical knowledge. This is because there would no longer exist any practical incentive for an amateur to go beyond the basic General (or Conditional) Class license. The only remaining higher class license would be the Amateur Extra Class, for which no additional operating privileges would be appended. Thus, there would be no practical reason for any amateur to progress beyond the General Class license. It seems obvious that, lacking any such incentive, the majority of the amateur body might stagnate at the basic level, rather than attempt to better itself by trying for higher privileges. This does not appear in consonance with the Commission's aims.

The Commission indicates as one of its aims of its alternate proposal the removing of an existing restriction on the operation of amateur stations licensed to holders of General or Conditional Class licenses. The League's Board has given consideration to this point but feels that related proposals of the Commission in Dockets 10073 and 10188 provide adequate separate solution in the setting up of radiotelephone sub-bands open to licensees other than the highest two grades. In both Dockets the League's Board is indicating its full concurrence with proposals for some radiotelephone suballocations in the 7- and 21-megacycle bands, without the requirement of a higher grade license.

AMERICAN RADIO RELAY LEAGUE, INC.

By:

PAUL M. SEGAL,
General Counsel

A. L. BUDLONG
General Manager
June 30, 1952

EXECUTIVE COMMITTEE MINUTES

The following is an abstract of the minutes of the meetings of the Executive Committee of the League during the past year between Board meetings, published here for your information:

Meeting No. 211, July 23, 1951. Examined, discussed and approved program for 1951 National ARRL Convention at Seattle, Washington. Affiliated 3 societies.

Meeting No. 212, September 10, 1951. Examined FCC Proposal in Docket 10040, and decided to file a League request to FCC for temporary suspension of special call sign privileges rather than deletion. Examined and rejected Proposal No. 74 in IARU Calendar No. 40 requiring IARU representation at international conferences by societies in each of the three world regions. Affiliated 7 societies. Directed Secretary to investigate and report on status of FCC license processing.

Meeting No. 213, September 27, 1951. Examined nominations in regular autumn elections; determined eligibility of candidates; in cases where there was only one eligible candidate, declared him elected without ballot; ordered ballots sent on others. Affiliated 2 societies. Examined the status of license processing and directed a further report be made at the next meeting.

Meeting No. 214, November 20, 1951. Opened and counted ballots in regular elections; certified winning candidates. Directed the filing of a request for an extension of time in Docket 10073 to permit the completion of a study already under way by the ARRL Planning Committee. Examined the status of license processing. Affiliated 12 societies.

Meeting No. 215, January 22, 1952. Examined status of license issuance with the aim of speeding up solicitation of new licensees for League membership. Heard a report from the General Manager concerning progress on relaxation of operating restrictions in the 1800-2000 kc. band, and on the results of the Extraordinary Administrative Radio Conference. Examined municipal ordinance cases in Onawa, Iowa, and Mt. Pleasant, Michigan, and authorized the General Counsel to proceed with court action if necessary. Voted opposed to an IARU proposal that at future world conferences each region must send an amateur delegate. Affiliated 6 societies. Requested Communications Manager to take up with division directors cases of club failures to continue meeting membership affiliation requirements. Decided that Novices and Technicians were not eligible for field organization appointments. Accepted the view of the General Counsel that the Constitution Revision Committee is charged with the responsibility for new Rules and Regulations Governing the Communications Department. Directed the filing of League comment on the FCC proposal for a Radio Amateur Civil Emergency Service favoring the proposed rules with minor exceptions. Voted in favor of IARU proposals that a standard number system for world wide DX contests be adopted by all societies, and that the standard system be that used in the VK-ZL contest.

Meeting No. 216, February 9, 1952. Declined to direct the Editor of *QST* to publish the results of the West Gulf Division poll on 40-meter phone, since conflicting results in other divisions indicated that no one division necessarily reflects the national sentiment on the question. Voted in favor of IARU proposals that national members be added from Ecuador, Germany, Netherlands Antilles and Bermuda. Affiliated 4 societies.

Meeting No. 217, March 24, 1952. Provided additional administrative funds for directors until the Board meeting. Directed the filing of League comment favoring FCC proposals for the deletion of 14,350-14,400 kc. from, and the addition of 21,000-21,450 kc. to, the amateur bands. Established continuing membership requirements for club affiliations until new Rules Governing Affiliated Societies are adopted by the Board. Affiliated 4 societies.

Meeting No. 218, May 8, 1952. Examined and approved financial report of the 1951 ARRL National Convention.

Chester A. Colvin, WØVHR

We regret the duty of reporting the death of former Midwest Division Director C. A. Colvin, WØVHR, of Council Bluffs, Iowa, on June 7th. Elected alternate director in 1944, he took over the directorship in 1946 upon the resignation of Floyd Norwine and served out his term; he was also a member of the Finance Committee. In business life, Chet was vice-president and secretary of the Omaha & Council Bluffs Street Railway. Vale, WØVHR!

YL NEWS and VIEWS

BY ELEANOR WILSON,* W1QON

WE are pleased to announce the results of the YLRL election of officers for the year starting July 1, 1952. Congratulations to all, and may the forthcoming term be an especially constructive and successful one!

President Beatrice Austin, W7HHH, XYL of W7GNI, has been licensed since 1939. An EC and NCS of a YLRL net on 75, Bea has long been interested in YL activities. She currently operates 75, 20, and 10.



Vice-President Dorothy Wickenhiser, W3JSE, is the XYL of W3KWA and the mother of three jr. ops. An active ORS, Dottie works mainly 80, 40, and 20 c.w. and in the past four months has worked 75 countries. She holds ARRL certificates for A-1 Op., RCC, CP-35 w.p.m., and WAS on 80.



Secretary-Treasurer Margaret Wells, W1BCU, ex-W6BCU, is the XYL of W1WUW and the mother of four jr. ops. Active on 75 and 10, Peg has been re-elected to office for a second term. Note Peg's new QTH: Woodland Road, Foxboro, Mass.



Editor Miriam Blackburn, W3UUG, is the XYL of W3MPO and the mother of four jr. ops. On 75, 20, and 10, Miriam is NCS of a YLRL 20-meter net and for the past two years has won the phone section of the YLRL Anniversary Party.



In May, W3LSX, Kay, entertained at a delightful luncheon at her Washington, D. C., apartment. Seated, l. to r.: W3RXJ, WN3TGW, W3CDQ, W3MSU. Standing: W3LXS, W4LKM, W3AKB, WN3TSC. The YLRL photograph album and scrapbook were displayed and the girls discussed various phases of YL interests and activities.

In behalf of YLs everywhere, we extend a note of appreciation to the following outgoing officers: Louis Beringer, W9JTX, president; Katherine Barclay, W3LSX, vice-president; Margaret Wells, W1BCU, secretary-treasurer (relected); Nell Waterman, W1RTB, editor; and the various District Chairmen.

District Chairmen for the coming year:

First — Esther Routhier, W1RYJ; Second — Madeline Greenberg, W2EEO; Third — Clara Burke, W3QFJ; Fourth — Mable Banks, W4LAS; Fifth — Harriett Sanders, W5NES; Sixth — Mildred O'Brien, W6HTS; Seventh — Irma Aufang, W7OVV; Eighth — Wava Harlan, W8FPT; Ninth — Grace Ryden, W9GME; Tenth — Inga Hoffman, W0KOY; VE — Rose Hallifax, VE3BTE.

Publicity Chairman: Eleanor Wilson, W1QON.

Keeping Up with the Girls

W8ZGT, Lillian, topped Michigan traffic handling during February, March and April. Other YLs who help keep amateur traffic moving are W6UHA, Maxine, W7NH, Nell, W7NOB, Gwen, W8ATB, Esther, and W9LRT, Julie. . . . W1TUD, W1QJX and W3RXV are on 160 meters regularly and W8EIR works the band mobile almost daily. . . . At the last meeting of the N.Y.C. YLRL Club, held at the QTH of W2TBU, Kit, the girls had a lively discussion of the FCC proposals. W2MVV, Alma, and W2EUL, Amy, were admitted to club membership. . . . Soon after 15 meters opened for amateur use, W1FTJ worked 4 continents, 7 countries, and 3 states in 11 QSOs. On 20 c.w. Dot added Y1BZL and YU3AT to her DXCC list and also chatted with YLs DJ1AD, Hilde, and DJ1AC, Kaethe, in Lubeck, Germany. . . . W5DRA, Teev, and W6CEE, Vada, work 10, 20, and 75; W6CCC, Jerry, and W8FPT, Wava, work 10 and 75; W6ZYD, Jean, is on 80; and W2WBN, Clara, is on 75. . . . W0BFW, Mary, claims her 85-foot-high beam does very well by her when 10 is open. . . . WN3SVY, Loreli, and WN3TSC, Camille, are new District of Columbia YLs. And new First District YLs are W1VME, Zeld, Worcester, Mass.; W1VWV, Doris, Whitman, Mass.; WN1VOS, Marjorie, Plainville, Conn.; WN1VPF, Gladys, So. Woodstock, Conn.; and 14-year-old WIUBL, Doris, Brattleboro, Vt. . . . W9JUI is net manager of both the Indiana QIN and the CAN. Peggy will be glad to make a sked with anyone who desires to QSO an Indiana YL. . . . WN7QWX raises chickens to get "spending money" for ham gear. Mary is 12 years old and a seventh-grader. But they come younger, too! WN1TAV is nine. Judy thinks that a session with the dentist is harder to take than the Novice
(Continued on page 118)

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

The Wavelength Factor—III

Choice of Frequency Bands for Civil Defense and U.H.F.

BY YARDLEY BEERS,* W2AWH

THE VARIOUS instrumental factors that influence the choice of a wavelength for a particular purpose have been considered in some detail in the two preceding articles.¹ We now come to the conclusions to be drawn from consideration of these factors. There are two principal objectives: The selection of optimum frequencies for civil defense work, and the stimulation of development of the u.h.f. bands.

Selection of a Frequency for Civil Defense

Civil defense utilizes primarily portable stations which probably would use dipole antennas, or certainly antennas of low gain. By reference to the discussion on antennas and with negative inference from most of what followed, one may conclude that large local civil defense nets should be placed on the lowest available frequencies, except perhaps for ionospheric considerations. The choice, then, is between the following three bands:



28 Mc., 50 Mc., and 144 Mc. The wavelength factor of the antenna favors the 28-Mc. band over 50 Mc. by a ratio of 3.2 (5 db.), and over the 144-Mc. band by a ratio of 26 (14 db.), while the 50-Mc. band is favored over 144 Mc. by a ratio of 8.1 (9 db.). Mobile antennas of high efficiency may be built on all three bands. On the other hand, the more favorable antenna factors at the lower frequencies may be compensated by increased atmospheric noise,² especially at 28 Mc. where ionospheric propagation is prevalent. To render a decision on atmospheric noise would require extensive data not now available.

The ionospheric propagation at 28 Mc. is a security risk in that it may aid an enemy to overhear information. Also, it results in QRM which hampers at least the training of nets. However, in an actual emergency it is presumed one net could gain exclusive use of its channel. If two nets in different parts of the country used the

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¹ Beers, "The Wavelength Factor," *QST*, Feb., 1952; "The Wavelength Factor—II," *QST*, May, 1952.

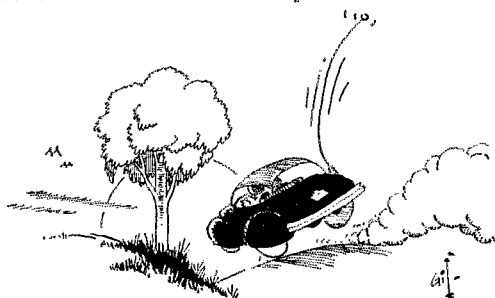
² See, for example, *QST*, page 33, October, 1950.

• In this final article of the series the author draws some interesting conclusions, based on the antenna and equipment considerations outlined earlier, as to the optimum frequencies for civil defense work. Suggestions also are made for a logical way of approaching the problems of u.h.f. development in the amateur field.

same channel it would be very unlikely that disaster would strike both regions at once. Ionospheric and tropospheric propagation at 50 Mc. are sufficiently rare as not to be an important disadvantage on this band for local operation.

A usable crystal-controlled signal derived from fundamental-type crystals may be obtained from two triodes at both 28 and 50 Mc., while at 144 Mc. at least three triodes must be used with fundamental crystals, or else special harmonic crystals—often hard to get—must be used. Reasonably good receiver noise figures can be obtained at 28 and 50 Mc. with conventional circuits, while at 144 Mc. special circuits, usually requiring one more tube, must be used. Band-switching equipment of reasonable efficiency can be made to operate at 50 Mc. and lower, but it is very difficult to design bandswitching circuits that include 144 Mc.

These considerations conspire to give a strong indictment against the 144 Mc. band. The choice between the 28- and 50-Mc. bands is not so clear, but in the opinion of this writer the advantage seems to be in favor of 50 Mc., especially if one also remembers that the total frequency space available there is larger. These conclusions are not likely to be popular, because the 50-Mc. band has not been as widely used for mobile



and civil defense purposes as either of the other two bands. Furthermore, most of the existing operation on 50 Mc. is with horizontally polarized

antennas, while for mobile use vertical polarization is to be preferred. Unpopular as they may be, the conclusions are in the opinion of this writer technically sound. Unfortunately, it may be too late in most cases to change nets that have already been established, but new ones are still in a position to consider these remarks.

Development of the U.H.F. and Microwave Bands

Below 30 Mc. there are seven frequency bands, containing the major portion of all amateur activity. Above 30 Mc. there are eleven bands which, except for 50 and 144 Mc., are largely unused. (For convenience the amateur bands, except for the five lowest ones, are listed in the accompanying table.) It seems desirable to formulate plans for the use of this large assignment of frequency rather than to leave it for haphazard development without benefit of all the knowledge now available concerning these frequencies.

Generally speaking, in the development of the lower frequency bands there was a tendency to proceed, as a band became occupied, to the one next higher in frequency. At that time, techniques were not known and it was necessary to proceed gradually. Also, the nature of ionospheric propagation is such as to cause the properties of adjacent bands to be radically different. However, in the present situation a great deal of information is available concerning techniques, and it is known that there is no such rapid change in the manner of propagation with frequency. Therefore, it would seem desirable to select a few widely separated bands on which to concentrate the efforts of those interested, leaving the intervening bands for later occupancy. Such a selection involves consideration of many aspects and cannot be made by one person. However, it is in order to point out some of the important topics and likely choices.

As stated, the 50-Mc. band seems to be the optimum choice for mobile use. It is also of interest to fixed stations because of occasional ionospheric propagation to large distances, although such stations do not profit from as favorable antenna factors as they might obtain at higher frequencies with antennas of the same size.

Earlier it was indicated that in practice the best antenna factors for general coverage fixed-station operation probably can be obtained in the 420-Mc. band. This alone is an important reason for selecting this band. In addition, the frequency is high enough to have a moderate probability of long distance propagation by "trapping" in a duct. It is the highest frequency band at which (a) tank circuits employing lumped LC circuits or open-wire lines may be used; (b) it is practical to employ high-stability narrow-band modulation techniques; (c) common receiving tubes may be used; and (d) where tubes with directly heated filaments (the 957 and 958 acorns) are rated for operation. On the other hand, anyone with an interest in r.f. "plumbing" and accurate machine work will find it to his advantage to follow his interest. Some war surplus equipment is in use on this band, and other such equipment now in use at 144 Mc. — e.g., the SCR-522 — may be modified for use at 420 Mc. by making the last stage of the transmitter a tripler or by adding a tripler to the present 144-Mc. amplifier. The expected development of the commercial u.h.f. television bands should make improved tubes available at low cost. The 420-Mc. band is wider, on a percentage basis, than any of the lower frequency bands except 1.75 and 3.5 Mc., and it is the lowest at which television is permitted. In spite of a disadvantageous antenna factor of 70 (18 db.) in comparison with the 50-Mc. band, portable operation employing dipole antennas may still be effected. At present there is a legal limit of 50 watts peak antenna power, but that should not be a serious handicap.

On the other hand, the 220-Mc. band has certain advantages over 420-Mc. Under practical conditions, one probably cannot quite obtain the

Amateur Bands Higher Than 25 Mc.
Frequencies in Megacycles per Second

Band	Portion Reserved for Civilian Defense in Case of War	Types of Modulation Permitted
26.96-27.23 28.00-29.70	None 28.55-28.75; 29.45-29.65	A0, A1, A2, A3, A4, f.m. A1; also A3 28.5-29.7; n.f.m. 28.5-29.0; f.m. 29.0-29.7
50-54	50.35-50.75; 53.35-53.75	A1, A2, A3, A4, n.f.m.; also f.m. 52.5-54.0
144-148	145.17-145.71; 146.79-147.33	A0, A1, A2, A3, A4, f.m.
220-225	220-225	A0, A1, A2, A3, A4, f.m.
420-450 ¹	None	A0, A1, A2, A3, A4, A5, f.m.
1215-1300	None	A0, A1, A2, A3, A4, A5, f.m., pulse
2300-2450	None	
3300-3500	None	
5650-5925	None	
10,000-10,500	None	
21,000-22,000	None	
All above 30,000	None	

¹ Peak antenna power in the 420-Mc. band may not exceed 50 watts.

Abbreviations:

A0 Unmodulated carrier	A3 A.m. telephony
A1 C.w. telegraphy	A4 Facsimile
A2 Modulated c.w. telegraphy	A5 Television

optimum antenna factors. Nevertheless, higher transmitter powers can be obtained, partly by greater efficiency and partly by the absence of the 50-watt legal limit, and probably one less multiplier stage is required in a crystal controlled transmitter. At the same time receiver noise figures may be a bit better. Finally, this



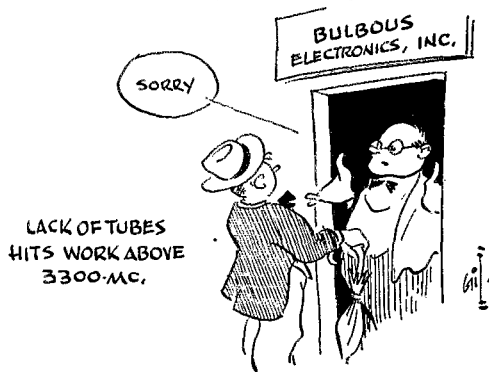
band, in contrast to the 420-Mc. band, has been reserved for civil defense so that any equipment for use on it may be of value in time of emergency.

The 144-Mc. band, which has the greatest occupancy of any of the v.h.f. bands, suffers by being "neither fish nor fowl." The antenna factors are inferior to those at 50 Mc. for portable operation, and to those at 220 and 420 Mc. for fixed stations. Also, ionospheric or atmospheric effects tending to give extended range are more probable at both lower and higher frequencies.

In the 1215-Mc. band and above the antenna factors tend to favor point-to-point operation on a prearranged schedule. In other respects the techniques change. Because of radiation losses it is no longer possible to use open-wire transmission lines as tank circuits. Coaxial lines and, finally, hollow cavities must be used, and as the frequency is raised greater accuracy must be employed in the machining of parts. Yet this situation presents a challenge to enterprising individuals with a mind to mechanical precision. A lathe is almost a necessity. Perhaps some radio clubs having a number of members with interest in u.h.f. might consider owning a lathe, although if one is obtained its use should be closely supervised to prevent damage to it and injury to inexperienced users. On the other hand, if cavities or other r.f. "plumbing" line components are purchased at other than war surplus prices the cost is fantastically high, since these items have never been mass-produced for the retail market. At current prices, for example, a wave-guide crystal mount costs \$125, while the cavity for a 2K28 "McNally" reflex klystron costs \$300 (although the latter is somewhat more elaborate than would be necessary for amateur use).

Above 3750 Mc. all tubes in general use are of the "integral cavity" type: that is, their tuned circuits are largely, and usually completely, contained within the vacuum envelope, and they can cover a frequency range of ten per cent or less. In fact, many of the traveling-wave magnetrons have no tuning adjustment at all, and the only way one may change frequency is to use

another tube. Integral-cavity klystrons and magnetrons have appeared on the surplus market for frequencies up to 30,000 Mc., but practically none of these lies within the assigned amateur bands. However, there are a few integral-cavity types which lie within the 3300-Mc. band. In addition, the 707B or 2K28 "McNally" klystron using an external cavity can be made to operate in this band. Also, it is possible that lighthouse tubes, especially if selected and if used in pulsed operation, may be persuaded to operate here. In the 2300-Mc. band and below, integral-cavity tubes are not generally available. The McNally tube and lighthouse tubes will operate in the 2300-Mc. band, and in the 1215-Mc. band they will be joined by "pencil" triodes and possibly selected 6F4 and 6L4 acorn tubes, whose rated upper limit is 1200 Mc. The machining of a McNally tube cavity for 3300 or 2300 Mc. may be somewhat easier than a cavity for 1215 Mc. because tuning at the higher frequency is accomplished by simple screws penetrating the cavity, while at 1215 Mc. tuned circuits involve coaxial lines which must be tuned by a plunger with sliding contacts. External-cavity klystrons that can be made to operate at frequencies above 3750 Mc. have recently been developed, but prob-



ably these cannot be obtained without a priority and then only at a high price.

From the preceding discussion it may be concluded that widespread use of bands higher than 3300 Mc. appears impractical because of the lack of inexpensive tubes. Of the bands above 420 Mc. left for consideration, the 3300-Mc. one appears to hold more interest partly because it is the highest frequency practical with present components and partly because of the variety of tube types which might be employed. However, it is to be noted that the 1215-Mc. band is the lowest one at which pulsed operation is permitted. For general coverage with this type of modulation, this band might be preferred. Should tubes and other components become readily available for the higher frequency bands, the 10,000-Mc. band might have some appeal since here wave-guide techniques become very convenient.³ The propa-

³ The 1951 and 1952 editions of *The Radio Amateur's Handbook* contain information concerning the modification of war-surplus 723A/B or 2K25 tubes for use in the 10,000-Mc. band.

gation properties differ appreciably from 3300 Mc., and the frequency is low enough not to suffer appreciable absorption by water vapor.

To summarize, if one may forget present usage and select three bands for concentrated development there would be considerable argument in favor of: (1) the 50-Mc. band for portable use and occasional ionospheric and tropospheric propagation; (2) 420 Mc. for fixed-station general coverage, with the possibility of television and wide-band f.m. as well as high-stability narrow-band a.m. and occasional propagation by ducts; (3) 3300 Mc. preferably for pulsed operation and also preferably for point-to-point work on prearranged schedules, with considerable probability of propagation by ducts.

While no one can deny the very great advantages to be obtained by the use of the best available techniques, modulated oscillators and super-regenerative receivers have a certain amount of appeal especially among beginners or those whose interest in the higher frequencies is casual. When there are so many virtually unoccupied bands it would seem a little too bad not to reserve one region where such techniques might be employed. Because of its large width the 420-Mc. band offers an advantage. Perhaps the portion 420 to 432 Mc., which is not in harmonic relation to the

144- and 220-Mc. bands, could be used for this purpose. On the other hand, the needs of civilian defense might well be served by such techniques if nothing else were available, and it might be preferable to reserve the 220-Mc. band for this use.

Appendix on Line-of-Sight Range

With two important and mathematically simple exceptions, no formulas have been used since it is assumed that many readers will not care to follow extensive calculations. However, for those readers who have more mathematical minds, it is desirable to put some of the preceding arguments on a more rigorous basis by repeating here the derivation of the well-known "one-way transmission equation." At the same time it can be shown that the theoretical line-of-sight range obtainable with small amounts of power is much larger than one might otherwise expect. Therefore, for local communication it is practical to employ very low power.

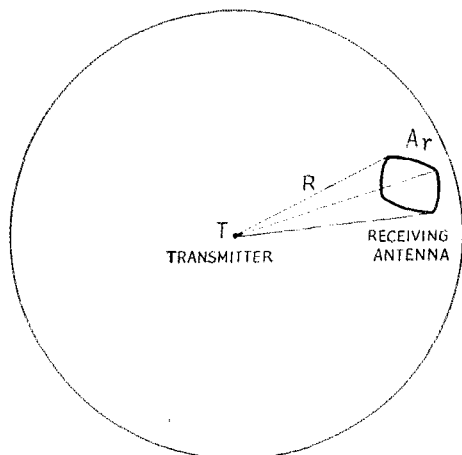


Fig. 1.

With reference to Fig. 1, let us suppose that at T there is a transmitter of power P_t . In the case of pulsed transmitters of low duty cycle, there is a question as to whether P_t should represent the average power, the peak power, or an intermediate value. If the receiver bandwidth is adequate to pass the pulses with little distortion, to a good approximation P_t should represent the peak power. With the types of modulation conventional at lower frequencies P_t would represent the carrier power. Let us suppose atmospheric absorption may be neglected.

For the moment it will also be assumed that the transmitting antenna is "isotropic." Therefore, the fields produced at one instant at the transmitter travel outward and at a later time will be evenly distributed over the surface of a sphere. The receiving antenna is at a distance R . When it is connected to a load equal to its radiation resistance and given optimum orientation, its ability to absorb radiation is characterized by an equivalent area A_r . The received power

AUTHOR'S NOTES:

In the first article of this series, on pages 42 and 43 of the February, 1952, *QST*, it was incorrectly stated that the equivalent area of a bidirectional broadside antenna is approximately equal to the geometrical area, while a correct statement would be that equivalent area of a unidirectional broadside beam (with a reflector) is approximately equal to the geometrical area. Therefore, Table I applies to broadside antennas with reflectors. This error resulted from the author's misinterpretation of source material which was rectified by his reading page 43 of the new book *Antenna Theory and Practice*, by S. A. Schelkunoff and H. T. Friis, John Wiley and Sons, New York, 1952.

One cartoon contained in the second article of this series on page 32 of the May, 1952, *QST*, although not incorrect, did not give the best interpretation of the text. This cartoon indicates a duct with a maximum of water-vapor density at some distance above the surface of the water. Probably such ducts do exist on rare occasions, and when they exist, they can propagate as shown. However, the author had in mind something which is much more likely: a duct with maximum density at the surface of the water and decreasing with height. The author realizes the text was not as definite on this point as it should have been, and therefore the misinterpretation is quite understandable. — Y. B.

P_r will be P_t multiplied by the ratio of A_r to the area of a sphere of radius R or

$$\frac{A_r}{4\pi R^2} P_t.$$

In practice, the transmitting antenna is not isotropic but has a gain G_t when oriented in the optimum manner. Therefore, we may write

$$P_r = \frac{G_t A_r}{4\pi R^2} P_t. \quad (3A)$$

Equation (3A) is given in terms of the gain of the transmitting antenna and the equivalent area of the receiving antenna and therefore corresponds to special case (3) discussed in the first article of this series. In confirmation of the remarks in that article it is observed that the wavelength does not appear in Equation (3A).

By use of Equation (1) of the first article, A_r may be expressed in terms of the gain of the receiving antenna G_r :

$$A_r = \frac{G_r \lambda^2}{4\pi} \quad (1)$$

Then Equation (3A) is transformed into a form corresponding to Case (1):

$$P_r = \frac{G_t G_r \lambda^2}{16\pi^2 R^2} P_t. \quad (3B)$$

It is to be noted that, in accord with the first article, the received power is proportional to the square of the wavelength.

Finally, Equation (3A) may be put in a form corresponding to Case (2) by expressing G_t in terms of the equivalent area A_t :

$$P_r = \frac{A_t A_r}{R^2 \lambda^2} P_t. \quad (3C)$$

The wavelength dependence is again in accord with the first article.

The theoretical limiting range for line-of-sight operation with no atmospheric absorption will occur when P_r is approximately equal to the equivalent noise of the receiver

$$P_r = FkTB, \quad (4)$$

where F = noise figure of receiver expressed as a ratio,

B = noise bandwidth, which may be taken approximately as the half-power bandwidth of the i.f. amplifier in most practical cases,

k = Boltzmann's constant,

T = Absolute "room" temperature.

If B is expressed in kilocycles per second, KT may be taken as 4×10^{-18} watts per kilocycle.

The range may be found by equating the values for P_r in Equations (3B) and (4) and solving for R :

$$R = \frac{\lambda}{4\pi} \sqrt{\frac{G_t G_r P_t}{FkTB}}. \quad (5)$$

This is the so-called one-way transmission

equation.⁴ In this form, R has the same units as λ . The gains of the antennas may be expressed in terms of the equivalent areas by use of Equation (1).

A form of Equation (5) more convenient for numerical computation may be obtained by expressing the wavelength λ in terms of the frequency, changing some of the units and lumping all of the numerical constants into a single factor:

$$R = \frac{7.5 \times 10^6}{f} \sqrt{\frac{G_t G_r P_t}{FB}}, \quad (6)$$

wherein R = range in miles,

f = frequency in Mc. per sec.,

B = noise bandwidth of receiver in kc. per sec.,

P_t = transmitter power in watts,

F = noise figure of receiver expressed as a ratio,

and G_t and G_r are respectively the gains of the transmitting and receiving antennas expressed as ratios with respect to an isotropic antenna.

It is of interest to substitute some conservative values into this equation. For example, if the following values are used:

$P_t = 1$ watt,

$f = 30$ Mc. per sec.,

$B = 10$ kc. per sec.,

$F = 5$ (7 db.),

$G_t = G_r = 1.64$ (corresponding to half-wave dipoles),

the computed value of R has the fantastic value of about 57,000 miles, approximately twice the circumference of the earth! Of course, such line-of-sight ranges have no practical direct meaning. However, it is to be expected that under extremely good ionospheric conditions absorption should be small and the observed range should approach the theoretical line-of-sight range. Therefore, it is no wonder that since the very start of international DX amateurs have frequently reported contacts of several thousands of miles while using powers of the order of only one watt.

At the same time this calculation implies that at line-of-sight ranges obtainable from practical locations the signal-to-noise ratio is very large even with such conservative values of the parameters as are used in the present calculation. For example, at 15 miles the signal-to-noise ratio would be about 60 (18 db.) if the stations were "in sight" of each other, while at 5 miles the signal-to-noise ratio would be 540 (27 db.). Hence, at these closer separations one may infer there is sufficient reserve signal strength to permit one or both stations to be in partially screened locations.

Furthermore, it can be concluded that if one

(Continued on page 118)

⁴This name is to distinguish this equation from an analogous one giving the range of radar sets, called the "two-way transmission" equation.

TVI Report to Manufacturers

An Address Before the Service Committee of the Radio-Television Manufacturers Association

BY PHILIP S. RAND,* WIDBM

• As related on our editorial page, a particularly bright spot in the TVI picture was a lecture, by invitation, delivered by Phil Rand to the Service Committee of the Radio-Television Manufacturers Association at its meeting in Chicago June 24th. It will be of intense interest to amateurs, as part of the concerted effort under way to alleviate the TVI problem.

Gentlemen:

I would like to express my thanks to Mr. Coumont, RTMA Service Coördinator, and to Mr. Yeranko, Chairman of the RTMA Service Committee, for the invitation to speak to you this afternoon on the subject of *Television Interference*, especially that caused or allegedly caused by an amateur radio station. This invitation to me, an amateur radio operator, to speak to you, who represent the leading TV Manufacturers, is certainly a fine example of the coöperation so necessary in solving a case of TVI.

Everything I have to say this afternoon I say as an individual on behalf of radio amateurs all over the world. Most of you probably know that I am employed by Remington Rand Inc. at their Laboratory of Advanced Research in South Norwalk, Connecticut. However, I want you to know that Remington Rand Inc. has no interest in TVI as such in TV broadcasting, does not manufacture TV receivers or any radio gear or parts. In other words they have no axe to grind and do not care what I say or don't say. In fact, they have never asked to see a copy of a speech I've given or a copy of an article I've written.

Remington Rand does realize the seriousness of the over-all radio interference problem. Everyone must realize this who manufactures electrically- or electronically-operated equipment for sale to the armed forces. As a matter of fact, we have a fine interference measurement lab in South Norwalk, complete with shielded rooms and field-strength meters. Remington Rand also recognizes the overwhelming acceptance by the general public of TV broadcasting. For these reasons they have been willing to finance my TVI book and speaking trips as a public service. I wanted to clear up this point as I have been asked many times, "How come Remington Rand puts out a TVI Book?"

Speaking of my TVI book, I presume you all

*% Laboratory of Advanced Research, Remington Rand Inc., South Norwalk, Conn.

have seen it; if not, I have a few copies with me which I shall be glad to hand out. If any of you would like a quantity of them for mailing to your TV servicemen, I will be happy to supply them at no charge.

On June 11th and 12th, in Washington, I gave a general talk on TVI to TV servicemen of the area. I believe each of you has been given a copy of that talk — if not, Mr. Coumont has a supply and will be glad to give you a copy.

Unfortunately, it was not possible to include the slides that were shown; however, I am informed by Mr. Lewis Winner, Editor of *Service*, that this publication will carry the whole story in their July issue. *Service* is published by the Bryan Davis Publishing Co., N.Y.C.

I wish you all could have been there to see the demonstration that was put on. On the stage we had three TV receivers, one an older model of the 630 type, another of current design with a 21.25-Mc. sound i.f., and the last one with a 41-Mc. i.f. with intercarrier sound.

For generating TVI we had the following:

- Doctor's diathermy machine
- Butter conditioner from an ice-box
- Faulty thermostat
- Electric shaver (not a Remington)
- Old-style tungsten light bulb
- 30,000-volt spark and corona discharge
- Amateur radio station free of harmonics
- “ “ “ with harmonics
- Harmonics of oscillator of an f.m. set
- “ “ “ of a TV set
- “ “ i.f. amplifier of TV set
- “ “ 15-kc. oscillator in TV on b.c. band

The purpose of this meeting was to educate the TV servicemen in the area, teaching them how to identify the various types of TVI and what to do about them after they had identified them. I have believed for several years that such an educational program was necessary. That afternoon, to prove my point, I went behind the stage and placed an old-style tungsten light bulb which I had brought with me into a socket. When I returned on stage, I found three factory servicemen studying the strange pattern on the screens of all three receivers. After some five minutes of discussion between themselves they finally noticed me and said, "You're the expert around here — what in . . . is causing that?" A little while later I noticed two others debating the cause of some crosshatching on Channel 5 that changed pattern as the fine tuning was adjusted. It took me about 10 minutes to convince them that this

was the third harmonic of the video i.f. being picked up and received by the TV front end.

It seemed that about the only thing the average TV serviceman present at the meeting could be sure of was spark-plug interference from passing cars. It is therefore no wonder that practically every radio amateur has at one time or another had a TV serviceman tell his neighbors that any disturbance in the picture would be the fault of "that ham down the street."

A standard broadcast radio receiver either receives music or it quits entirely. Servicing is mainly a problem of seeing to it that the serviceman has the proper schematic diagram with a few notes as to probable causes of failure in that particular receiver.

With TV the story is entirely different. The eye is many, many times more critical than the ear. A TV viewer will not be satisfied with a picture that is distorted due to improper service adjustments such as linearity, focus, height, width, etc. Neither will he be satisfied with a picture distorted from interference due to f.m. or TV oscillator radiation, diathermy, etc. It doesn't solve the problem or save service calls to blame the ham down the street when the serviceman just plainly doesn't know what's causing the trouble.

The answer to the problem is a TVI educational program sponsored by the TV Manufacturers and preferably started and distributed by the RTMA to all TV servicemen all over the country. My experience in lecturing on the subject to some fifty groups ranging in size from 25 to 800 hams and TV servicemen all over the eastern half of this country and Canada indicates that the best practical method of approach is a 16-mm. sound motion picture. This film would tell the complete story of TVI, showing the actual TVI patterns on the screen in motion and would explain how to identify them, track them down, and how to cure them. The showing of the film would be followed by giving everyone present a booklet also telling the complete story illustrated with pictures and diagrams, the idea being that you get your point across with the film and the serviceman has the book for future study and reference as he runs into the various types of TVI in the field.

If you simply mail him a book he probably won't read it and if you just lecture to him he will probably forget it the next day. That's human nature. I run into this every day with hams. As you know, I completely covered TVI in my writings back in 1948-49; yet, today many hams tell me at meetings how helpful my TVI talk had been. When I say, "Why, that was just 'ancient history,'" they counter with the statement that they had either mislaid my former articles or had forgotten about them. They all say that an illustrated lecture with a chance to ask questions afterwards allows them to reread my articles in my book and fully understand them.

The best educational program would be a live demonstration like we had in Washington; however, this is not practical due to the length of time required in setting it up and the lack of a suitable

number of TV stations in many parts of the country. I realize, of course, that some of you either include now or plan to include some TVI data in your service notes. I hope in the future that you will all include a larger amount of data in service notes. However, I feel that to really get the point across requires a unified educational program by RTMA. Incidentally, if the printed part of this program were written so that a TV viewer could understand it, it would probably save a lot of needless service calls if such a booklet were delivered along with each new TV set.

A very important part of this TVI educational program, of course, would be explicit instructions on how to tell the difference between amateur TVI and other types. This amateur TVI would be broken down into its two halves: that which was caused by amateur harmonics and the fault of the amateur's transmitting gear, and that which was caused by the legally-radiated fundamental signal and which was due to insufficient selectivity in the TV receiver front end.

In the case of harmonics the TVI can only be cured by installing a low-pass filter on the transmitter. In the case of fundamental overloading the TVI can only be cured by the installation of a high-pass filter on the TV receiver to add the required off-channel selectivity; this is definitely the responsibility of the TV manufacturer. To illustrate: Let us suppose for a moment that you have installed a light on the rear of your home to light your driveway. Your next door neighbor complains that he can't get to sleep at night because your light shines in his bedroom window. A doctor and a lighting authority are called in to investigate the problem. The doctor reports that the patient can't sleep because of too much light and suggests that the power company be petitioned to turn off your power. The lighting authority, however, points out that you have every legal right to have a light if you want one and that the real trouble is the fact that your neighbor bought a house that had neither curtains nor window shades and suggests he have some installed. Your neighbor, however, refuses claiming that it's all your fault and you will have to pay for them. Of course, when the moon or sun shines into the window that's different. He knows he can't do anything about them.

Now I know that none of you would pay the bill to have window shades installed in one or more of your neighbor's houses. However, this is exactly the predicament that thousands of hams are in all over the country. Not only do their neighbors expect them to buy window shades for their TV sets or else get off the air but these same hams must sit and listen to the beat notes and birdies squawking up and down through the ham bands which are being radiated by the 15-ke. harmonics of the horizontal sweep circuits in their neighbors' TV sets — the same harmonic radiation they themselves have had to clear up. It's no wonder hams call a TV set "the one-eyed monster."

It cannot be overemphasized that it is only the ham's responsibility when the TVI is caused by

harmonic radiation from his transmitter. FCC has repeatedly made this point clear.

Several months ago I wrote a letter to the president of each of some 40 TV manufacturers requesting that they install high-pass filters in all their new receivers at the factory. I also enclosed two copies of my TVI book. The only response was for some 1500 additional books — no indication that high-pass filters would be installed! Apparently, it was felt that the question was not whether the set would work better with the filter, but rather would the set work at all without the filter and if so, leave it out. It can't be the few cents it would add to the selling price. If it were a matter of money, I am sure the TV manufacturers would have discovered long ago the tremendous savings they could make by leaving out all the unused channel strips in a tuner. All the TV receivers today come equipped with 12 channels. On the average, across the country, there are probably no more than 2 or 3, at most, available. Why not leave out all the unnecessary strips and use part of this saving for a good window shade that can be left permanently closed?

This of course would only take care of new production. For the millions of sets already sold it will be necessary to install high-pass filters whenever a set is located near an amateur or other radio station and particularly when near one of the new type FCC-approved diathermy machines. These new diathermy machines on 27 Mc. raise cain with the video i.f. on most receivers.

When in Washington, two weeks ago, I had an hour-long conference with FCC officials on amateur TVI and was happy to learn that most of

you had indicated a willingness to go along with the FCC's plan on installing, free of charge, a high-pass filter on your sets when the local TVI committee in the area had found the TVI was due to fundamental overloading.

May I urge that the details of this plan be worked out and the necessary instructions for implementing it be passed down through your service organizations so that your jobbers and distributors will be familiar with it.

The other day a ham friend of mine wrote to one of you, known to have agreed to this plan, requesting a high-pass filter for a neighbor's receiver. He was referred to the distributor who told him to get one of my books and build his own high-pass!

For a high-pass filter to be really effective, it must be installed right up at the tuner. In most cases this means removing the chassis, cutting into the antenna leads, and soldering in the filter under the chassis. If a ham should do this to his neighbor's receiver, he would be blamed for everything that later went wrong with the set. This is definitely a job for the TV serviceman or factory representative.

Gentlemen, I would like to leave you with the following four thoughts:

- 1) There is need for a comprehensive TVI educational program for TV servicemen.
- 2) The spurious radiations from TV receivers should be eliminated.
- 3) High-pass filters should be installed on all new sets at the factory.
- 4) High-pass filters should be installed free of charge when necessary on sets already in the field.

Strays

G-Whiz! . . .

Reducing G5UM in your G8UY oscillator may G3AHY for G2HCO and lots of G5FA. If you're a careful G2DN, you won't G8TU out any G6UN. Otherwise, instead of G2DSW and G5BM you'll find yourself without a single G2DRG! (G5WQ, G6KC?)

— . . . —

Two years ago ARRL Rocky Mountain Division Director Franklin K. Matejka, W0DD, was visiting Arthur L. Greenberg, W2CYK, while en route to West Hartford for the annual ARRL Board Meeting. He was present when an amateur license arrived by mail for W2CYK's XYL (W2EEO). One year later, Sylvia, the daughter of W2CYK and W2EEO, received her ticket (W2GPK) under the very same circumstances. This year Sylvia's brother Martin received his call, K2ACM, with the situation exactly the same — Frank was again visiting while on the way to the Board Meeting! Such unique coincidence won't happen again, however. The Greenbergs have no more ham prospects in their family!



Captain Henrik Kurt Carlsen, W2ZXM, back to sea at the helm of *Flying Enterprise II*, resumes the visits with overseas amateurs he so thoroughly enjoys. Talking things over in the ON4CL shack at Antwerp are (l. to r.) Mr. Claus of ON4TT, Chief Radio Inspector of Belgium's government, J. R. P. Hersleven, ON4CL, and "Captain Stay-put." Watch for the 28-Mc. signals of W2ZXM/MM — the Captain intends to be as active hamwise as ever — emanating from new gear aboard his new command.

Aligning the Crystal-Filter S.S.B. Exciter

A Step-by-Step Tuning Procedure

BY BOYCE S. WEBB,* W4PIX

FOR anyone who has built a crystal-filter s.s.b. exciter of the type described by W1JEO¹ and has had difficulty in aligning it properly, we would like to pass along a different tune-up procedure. The method, devised by W3MBY (aided and abetted by W4PLX), uses an audio oscillator and oscilloscope (or receiver with an S-meter and crystal filter). If a conventional audio oscillator is not available, the BC-221 or equivalent can be used, as described by W8NCO.² When using the BC-221 as an audio oscillator, the variations in output amplitude must be taken into account.

Although this method has only been used so far in aligning the Edmunds exciter, it should be equally applicable to other types of s.s.b. exciters,³ with a few alterations.

Alignment Procedure

The first step is to connect the audio oscillator and 'scope to the s.s.b. exciter, as shown in Fig. 1. A shielded lead should be used between the audio oscillator and the exciter. Fig. 1 indicates capacity

* 714 Oak Ave., Falls Church, Va.

¹ Edmunds, "A Crystal-Filter S.S.B. Exciter," *QST*, Nov., 1950.

² Vogt, "Your BC-221 as an Audio Signal Generator," *QST*, Feb., 1950.

³ As, for example, Weaver & Brown, "Crystal Lattice Filters for Transmitting and Receiving," *QST*, Aug., 1951, or an exciter based on the crystal-filter circuits described by Good, "A Crystal Filter for 'Phone Reception," *QST*, Oct., 1951.

coupling between the output tank coil and one vertical plate of the 'scope, but you can, of course, use link coupling between the s.s.b. exciter tank and a tuned circuit connected between the vertical plates. The exciter should be in complete working condition, with all voltages on and all r.f. circuits aligned. To avoid distortion in the exciter, the audio input should be kept

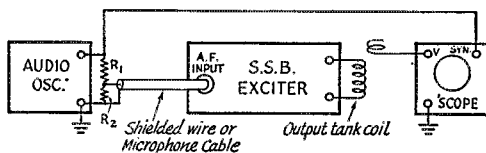


Fig. 1 — Test set-up for aligning a crystal-filter s.s.b. exciter, using an audio oscillator and an oscilloscope. Capacity coupling to the 'scope is shown, but link coupling to a tuned circuit at the vertical plates can be used.

R_1 — 0.2 megohm, approx.

R_2 — 100 ohms.

Value of R_2 determined by output amplitude of audio oscillator. R_1 and R_2 probably not required if BC-221 used as audio source.

low. The coupling to the output tank should be enough to display an adequate 'scope pattern.

If no 'scope is available, a receiver with an S-meter and crystal filter can be substituted. If the receiver has no S-meter, a v.t.v.m. can be connected across the diode load resistor of the second detector of the receiver. The crystal filter

should be switched to the sharpest position, with the b.f.o. off. To insure that the receiver is picking up its signal only from the exciter output tank, a length of shielded wire or coaxial line should run from a 1-turn pick-up loop at the exciter over to the receiver antenna terminals. The antenna terminals should be short-circuited with a short piece of small (No. 22 or so) wire. If the signal is insufficient for a reasonable reading of the S-meter, the shorting wire can be lengthened slightly.

Using the audio oscillator and the 'scope or receiver (or both), the procedure shown in Table I can be followed to align the Edmunds exciter for lower-sideband transmission. Dual filters (as described in the original article) can be aligned by appropriate changes in the procedure.

The circuit of the Edmunds crystal filter is shown in Fig. 2, for

TABLE I
Alignment Procedure for the Edmunds S.S.B. Exciter

Step	Audio Oscillator C.P.S.	Adjust	Using 'Scope, Adjust for . . .	Using Receiver with S-Meter and Sharp Xtal, Adjust for . . .
1	1400	C_{x1} , C_{x2} , C_{x3} , C_{x4} , and resonate succeeding r.f. amplifiers.	maximum height	First locate carrier (audio off), tune 1400 cycles lower (audio on), adjust for maximum reading
2	500	C_{x3}	maximum height	relocate carrier, tune 500 cycles lower, adjust for maximum reading
3	1100	C_{x2}	average flatness of troughs	relocate carrier, tune 1100 cycles higher, adjust for minimum
4	3300	C_{x1}	average flatness of troughs, maintaining height	relocate carrier, tune 3300 cycles higher, adjust for minimum
5	1400	C_{x4} , C_{x1}	average flatness of troughs, maintaining maximum height	relocate carrier, tune 1400 cycles lower, adjust for maximum
6	Repeat all of the above steps except No. 1, to correct for interaction.			

convenience in following the tune-up procedure. The transformer trimmers have been assigned symbols for ready reference in aligning the unit.

After the alignment procedure has been carried out, a check should be run on the response characteristics of the filter. This can be done very easily by varying the audio oscillator from 0 to 4000 cycles and observing the changes in output amplitude of the signal on the 'scope. If a 'scope is not available, a rough check can be obtained by watching the grid meter of the stage being driven by the exciter.

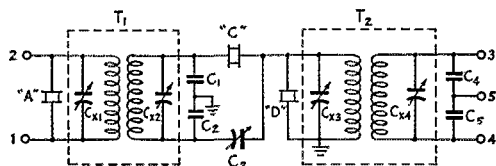


Fig. 2—The crystal filter under discussion is the same as the original "WJEO filter" (see footnote 1). The trimmers are identified for use with the alignment table.

Determining Sideband Suppression

The approximate sideband rejection can be determined by either of the tune-up methods described in Table I, but reasonable care must be taken to insure that the correct frequencies or patterns are obtained. With a receiver connected as described, however, the method is straightforward and the carrier and sideband suppression can be measured in db., provided the S-meter calibration is known. Any S-meter can be checked (and most of them should be) by the method shown in Fig. 3. Using a VFO or other signal source, switching from the top to bottom will give an approximate 6-db. decrease in signal at the receiver input. Thus it is a simple matter to start out at, say, 20 db. over S9 and work back down the scale, checking first the 6-db. interval and then resetting the level with R_1 . This method is, of course, only satisfactory at high signal lev-

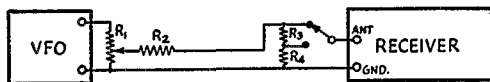


Fig. 3—Any receiver can be calibrated in 6-db. steps by using a signal source (such as a VFO) and suitable resistors.

- R_1 — 1000-ohm potentiometer.
- R_2 — 1000 ohms.
- R_3, R_4 — 50 ohms.

els, and all stray pick-up should be minimized. The calibration should be made with a fixed setting of manual gain control and remains valid if the same setting of manual gain is always used, even when the receiver input is shorted as mentioned earlier. R_3 and R_4 should be mounted as close to the receiver input as possible.

When making measurements on the s.s.b. exciter, the r.f. input to the receiver should be

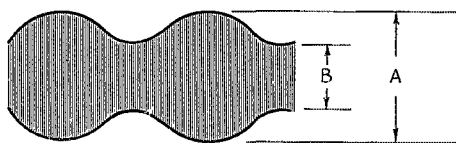
⁴ Provided the receiver selectivity is sufficient to reject any carrier or other-sideband signal that might otherwise affect the reading.

controllable so that the receiver can always be run at the same setting of gain control that was used during calibration. The input can most easily be adjusted by changing the length of shorting wire at the antenna terminals, as mentioned earlier.

Before each measurement, all modulation should be removed from the exciter and the carrier located, with the receiver in "sharp crystal." The test modulation frequency can then be fed to the exciter and the amplitude of the sidebands above and below the carrier noted on the S-meter. The difference between the two readings on the meter is the amount of sideband suppression.⁴ To reduce the possibility of limiting in the exciter, the audio signal should be kept to the lowest level for which an indication of the unwanted sideband can be obtained.



(A)



(B)



(C)

Fig. 4—An oscilloscope can be used to determine the degree of carrier or sideband suppression. A perfect s.s.b. signal (single audio frequency) is shown at (A). With incomplete suppression, some modulation of the envelope will appear, as in (B) and (C). See text for calculation of the suppression.

The unwanted sideband suppression can be approximated by observing the output envelope on an oscilloscope, provided the carrier is suppressed sufficiently and certain other precautions are taken. A perfect s.s.b. exciter would put out a single radio frequency for a single audio input frequency, and the output envelope of such a signal would be the same as for a normal A3 unmodulated carrier, as shown in Fig. 4A. With a single audio frequency applied to an imperfect s.s.b. exciter, however, more than a single radio frequency appears in the output, and the envelope shows "ripples" that are simple or complex, depending upon how many separate frequencies are present and their relative amplitudes.

(Continued on page 122)

Results - Armed Forces Day Activities

Receiving Competition

One hundred and eighty-eight operators have received certificates of merit signed by the Honorable Robert A. Lovett, secretary of defense, in recognition of making perfect copy of his Armed Forces Day message to radio amateurs. This represents 45 per cent of the total participants (416). The message was transmitted at 25 w.p.m. by military stations AIR, NSS and WAR at 2000 EST on May 17, 1952. A paraphrase of this message was transmitted by AIR, NPG and WAR at 2400 EST on the same day.

Certificate winners follow:

W1s ALJ BB BDI BDV BGW BWR DWO FPS JCK
JWT LV MEG MHU MJE NUP PN QWV RCI SPB TA
TOQ UC UPO ZR. W2s ALZ ARO BAI BGO CJI COU
GFG HAZ HX IAS KTF LA LRW LYH MRH MZB
NKD NUI NVB OJX SVC TUK UAP WBT WL WVC
YGV ZMK ZNM ZYO. W3s ADE BHK CLY ECP FFN
GJY GNH HTO JSH NRE NQA QCB QXU RCG RRY
UHN. W4s FR GZU IUY IYR IYT KJ KMG KSW KWA
LYV MFR MPA MXU OXX PHL PL RXE SIO SR URF
VLQ WO. W5s BCF BI EGX JET NII SJY UKK ZB.
K5s NRW. W6s AXV BVY/4 DTY GUJ JF JKD KLY
KTT MQD VMT YXK ZJO. K6s DL DM. W7s CZY FIX
GZG HLU JU NMG PKX WJT. W8s DAE DGI FFK
GLU HS HSW HWZ OIC SCW TSF VWL ZZU. W9s AKP
BA CXY DZW HVP JNG JTX JUJ LEF NRA MTJ
OLU RBS RLB TGB UN WJV. W0s PCB BHA JJK
KXL LHS. KH6s ANV FX. KP4s KD PK. VE7 ALE.

A. C. Bellavit, Urban G. Borneman, Robert L. Boswell, John R. Brittingham, J. H. Canniff, William E. Christian, jr., Bernard I. Cohen, Joseph W. Devenney, Frank A. Dzieciolowski, Edward John Early, Richard G. Edwards, Onree T. Fisher, Philip G. Frazelle, Enrique O. Gutierrez, H. M. Jackson, Paul L. Kervella, Robert P. Laureno, Theodore C. Lindquist, James H. Moren, Ralph Duane

Message from the Secretary of Defense

It gives me pleasure to extend Armed Forces Day greetings to the radio amateurs of America. This is an occasion upon which each of us should review his position and responsibilities in the over-all program for national defense. Radio amateurs have a long and outstanding record of accomplishment and service in the fields of communications and electronics. Many of you are in active military service. Your self-training and experience as radio amateurs are paying dividends to the nation. It is also recognized of course that your record of service is not limited to the military. The potential of amateur radio facilities for civil defense communications places a new and great responsibility upon you. I am confident that you will meet this responsibility with your traditional skill and initiative. The department of defense wishes you success in your endeavors and will continue to support and encourage amateur radio activities.

ROBERT A. LOVETT, Secretary of Defense

Morgan, W. L. Preis, Robert J. Sloan, Harold William Spangenberg, L. E. Tinder, D. G. White, W. White, jr.

Military-to-Amateur Test

Operating on preannounced military frequencies, AIR, NSS and WAR worked amateurs in the 3.5-, 7- and 14-Mc. bands. The three military stations made a total of 933 QSOs with amateur stations. Special QSL cards have been sent to all stations worked by AIR, NSS and WAR.

AIR operated simultaneously on 3497.5 (A1), 7635 (A1), and 14,405 (A3) kc., working amateurs in the 3.5-, 7- and 14-Mc. bands respectively. Operators were W1QYY, Thomas Greenhalgh, A/1c, USAF; W4OAF, Harry Barrett, S/Sgt., USAF; W4RQD, Richard G. Walker, M/Sgt., USAF; W4SDK, Howard D. Riddle, T/Sgt. USAF; W4SLD, Charles C. Mack, Major, USAF, Chief AF MARS; W4TST, Richard S. Fisher, A/1c, USAF; W8BUR, Robert B. Fullman, M/Sgt., USAF; W9CSK, Norman K. Hester, A/1c, USAF; W0BCH, John T. Kennelly, A/1c, USAF; W0QHK, Lawrence Rudolph, A/1c, USAF. AIR made 368 contacts (224 on 3.5 Mc., 79 on 7 Mc., 65 on 14 Mc.).

NSS operated on 4015 (A1) and 7375 (A1) kc., working amateurs in the 3.5- and 7-Mc. bands respectively. Operators were W1NK, Cmdr. R. E. Coleman, USNR; W1RRL, W. J. Krzywda, RMC, USN; W3MCG, Lt. Cmdr. Karl Medrow, USNR; W3MSU, Ethel M. Smith, RMN3, USNR; W3SSL, J. L. Lambert, RM1, USN; W4ABY, Cmdr. D. J. Veazey, USN; W4DDT, Lt. H. E. Thornhill, USN; W4LRI, C. E. Van Pelt, RM1, USNR; W4LW, Capt. R. R. Hay, USN; W4RPI, Lt. Cmdr. F. O. McDonald, USN; and W4UCN, Lt. L. C. Moore, USN. NSS made 323 contacts (183 on 3.5 Mc., 140 on 7 Mc.).

WAR operated simultaneously on 4025 (A3), 6997.5 (A1) and 13,947.5 (A1) kc., working amateurs in the 3.5-, 7-, and 14-Mc. bands respectively. Operators on 4025 kc. were W4EEP, M/Sgt. Paul Allyn, and W9RJF, Gerald Walsh; on 6997.5 kc., W4YCV, Capt. L. A. Peterson and W1SYY, PFC Allen Tellier; on 13,947 kc., W0BYU, Cpl. Raymond McSherry and W3UAH, SFC Henry Camp. All are members of the Army Signal Corps. WAR made 302 contacts (117 on 3.5 Mc., 155 on 7 Mc., 30 on 14 Mc.). The following amateurs worked each of the three military stations on one or more frequencies:

W1s AJK BB BDV BOD CRW DIT FZ JYJ JSM MEG
MX ODW OQP QWV RNW RST SIZ TBS TOQ VW ZR.
K1s NAI WAB WAF. W2s AAO CEF CWK CYK DZK
EEO EQD FPM FXA GFG GND GRH HYN IAS IVS/3
LRW LV MMG MRF PF PYC QDY QXE RQI WCL
WH YBT YGQ ZDR. K3s FAV. W3s ADE AYS CA CLY
HC HIX HTO KNQ MCD PEV PWN QCB QOT ROU
RSL. K3s WAB WAG. W4s ANK CE/3 CWV DLX
IYR/0 MDB OBE OSU/KP4 PHL SBI SR. USA. W5s
CTM LEF NIX. K5s FBP. W6s BXL. K6s DL. W7s DIL
PKX. W8s AJW AXL EMI ET FJR FRD HOX SCW
WKL. K8s NAH. W9s ADM AOV BDZ CVQ CXY FPA
FRP GRW HVP JUJ LEF LIL MOW NJS OLU/4 RWB
SKR YH ZMY. W0s ANW FBH YBV. K0 FAY. VEs RM.

The World Above 50 Mc.

1215-1300 2300-2450 3300-3500 5650-5925 10,000-10,500 21,000-22,000 30,000-2

CONDUCTED BY E. P. TILTON,* WHDQ

WELL, boys, we might as well break down and admit it—it's no longer a man's "world above 50 Mc." We can't make it official, as the reports have not been checked as we go to press, but all indications are that the country's top score in the June V.H.F. Party was turned in by—you guessed it—W8BFQ. And not only the highest score; Margaret Roberts of Everett, Ohio, also made the most contacts and used the greatest number of bands. Working on 50, 144, 220, 420 and 1215, she made 177 contacts with a section multiplier of 22, for 4774 points, some 700 more than the best any male v.h.f. enthusiast could muster!

Of course, there was a man in the case, and great credit is due the OM in this well-known husband-and-wife v.h.f. team, Jerry Roberts, W8WJC, who is the chief engineer of the fine hilltop layout. But Margaret did all the operating, and anyone who has sweated out a v.h.f. contest knows that 177 contacts in one of these week ends is a real accomplishment.

Conditions over most of the country were good, and activity reached higher levels than in any previous spring or fall party. The Pacific Northwest showed some sizable 2-meter scores for the first time, and down in Texas there was a goodly amount of 2-meter contest work. The Great Lakes states enjoyed record participation and excellent 2-meter propagation. The 50-Mc. band was open for a short time at the start of the contest, but not for long enough to give 6-meter operators any edge on the 2-meter contingent, who had a larger following to build up their totals.

The geographical size and distribution of ARRL Sections being what it is, point scores and section multipliers afford little basis for comparison between various sections of the country. This is, of course, the reason why contest awards are

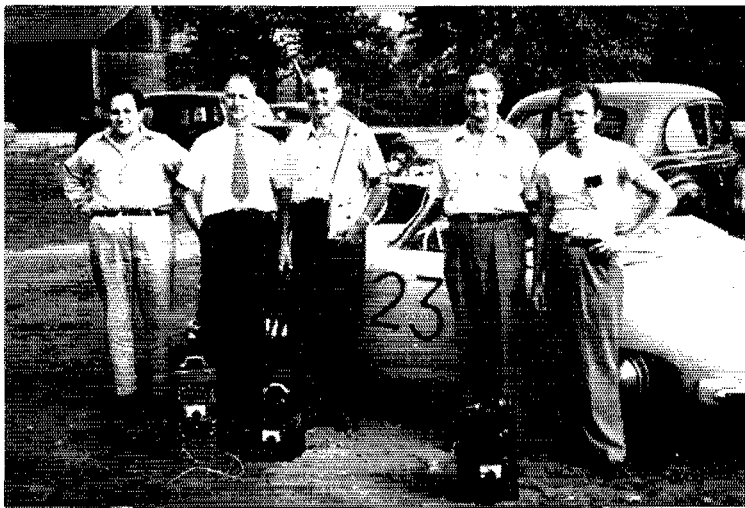
* V.H.F. Editor, QST.

made on the basis of competition within one's own ARRL Section only, rather than on a national basis. Some of the better efforts around the country follow: W1RFU, W. Mass., 140 contacts on 4 bands, 25 sections, 3500 pts. W1GJO, W. Mass., 134 on 6 and 2, 20 sections, 2680. W1MHL/1, N. H., 147 on 6 and 2, in 22, 3234. W2UK, S. N. J., 155 on 2 only, 13 sections, 2015 pts., the top 2-meter score so far. W2FHJ, N. Y. C.-L. I., 124 on 6 and 2, in 17, 2108. W2MLX/2, N. N. J., 104 on 4 bands, in 18, 2376. W2COT, N. N. J., 151 on 6 and 2, in 14, 2114. W3UKI E. Pa., 122 on 6 and 2, in 17, 2074. W4AO, Va., 84 on 2, in 12, 1008. W6GCG/6 S.C.V., 124 on 6 and 2, in 17, 2108, one of the top West Coast scores of all time. W6AJF, E. Bay, 92 on 3 bands, in 15, 1500. VE3BQN, Ont., 126 on 4 bands, in 10, 1540. VE3DIR, Ont., 116 on 2 only, in 7, 812.

The fine June weather brought out mobiles and portables by the hundreds, with many clubs using the contest as a workout for v.h.f. gear to be used in the Field Day two weeks later. Though these multi-operator setups don't figure in the awards under present rules, there were many of them doing a bang-up job. W1MHL/1, Waltham Amateur Radio Association, W3KX/3, Electric City Radio Club, W3KWH, Steel City Radio Club, W5RFF/5, Albuquerque V.H.F. Club, W3RRA/3, E. Pa., W2UPT/2, near Stamford, N. Y., W6GCG/6, Mt. Loma Prieta in the Santa Cruz Mountains, and many others helped to make the week end more interesting for all hands. Coöperative ventures under one operator, such as W1KEX/1, Farmington, N. H., W1CTW/1, Hogback Mountain, Vt., and others had innumerable behind-the-scenes heroes at work.

Scores on 144 Mc. were boosted markedly by the advent of hundreds of Novices. Examination

◆
Six-meter operators and equipment at the Sports Car Club of America Hill Climb, Mt. Equinox, Vt., June 15th. l. to r.: Cross, W100P; Hadlock, W1CTW; Tilton, WHDQ; Bartel, W1PIJ; Thurston, W1MFZ.
◆



of the contest file shows that better than 15 per cent of the stations worked on 2 were WN calls. WN1VNH, WN2ALR, WN2ISI, WN2LXE, KN2AJP, WN5VDA, WN7RAP, WN8HOH and WN9RNE were right up there among the leaders in their respective sections, despite the obvious limitations imposed by the frequency restrictions under which they operate.

There was more use of 220 and 420 than ever before. W2KLZ/1, atop Mt. Greylock, the highest spot in Massachusetts, had a 4X150 final that worked straight through on 144 or tripled to 432 Mc. He put a fine signal down into Connecticut on both bands. W2QED led the 420-Mc. contingent with 9 stations in 3 sections, boosting his total score on all bands to 2086 points. Work across Lake Ontario on 420 built up scores in both Ontario and Western New York, and the W6s were making good use of the 420-Mc. band.

The above comment is based on unofficial claimed scores, in an attempt to give something of the countrywide picture. We hope to have the complete contest results ready for the next issue of *QST*.

Aside from the June V.H.F. Party there was plenty of interest for all hands on the v.h.f. bands during the month of roses. After a slow start, the 50-Mc. band opened quite regularly throughout the month, though conditions never reached the peaks of the past few years. A new section of the country broke the monopoly the Boston area has had on the 220-Mc. record, and some 1000-mile DX showed up on 144 Mc. The summer inversions woke up the 420-Mc. band and the chances for a new record before the summer was over looked very good.

On the morning of June 16th, around 0615 (these fellows get started early!), W5AJG, Dallas, and W5ONS, Victoria, Texas, were swapping S9-plus signals on 144 Mc., so W5AJG put on his 220-Mc. signal and was immediately heard S4 to 6 in Victoria. Two-way contact on 220 was made at 0622. Accurate checks of the distance have not yet been made, but from the maps it appears to be 280 to 285 miles, safely beyond the 275-mile record formerly held by W1CTW and VE1QY. W5ONS uses a 6BQ7 crystal-controlled converter

similar to that described in the 1952 *ARRL Handbook*, and an 829B tripler that is presently running only 8 watts input! W5AJG also uses a crystal-controlled converter of similar design, except that his mixer is a push-push 6J6, and a two-stage lighthouse preamplifier is used ahead of it. His transmitter is an SCR-522 converted so that the 832s triple to 220 and amplify on that frequency. This drives an 829B amplifier with halfwave line tank circuits.

W5AJG also worked W5FSC, Houston, that same morning on 220, and W5ONS has been working W5AXY and W5BDT of Austin and W5FSC. W5AJG uses an all-metal 16-element array 35 feet up temporarily. It will go up on the top of his tower when feed problems have been ironed out.

The big news on 144 Mc. this month is the first 2-meter DX of major proportions to be worked from New Mexico. On the evening of June 18th, W5LFH, Sandia Park, worked W9BPV, Armington, Illinois, a distance of more than 1000 miles, the best 2-meter DX so far reported in 1952. Dean was hearing the W9 for more than two hours before the contact was made later at 8:30 P.M.

Here and There on the V.H.F. Bands

It doesn't take much to work DX on 6 when the band is hot. W1RO, Shrewsbury, Mass., has carried on communication with W9ALU, Metamora, Ill., and W9MPH, Indianapolis, with less than a half watt input to the final stage. Dick was using a self-contained portable like the one described in *QST* for May, 1951, on his regular home-station array. We feel that he was cheating just a bit, however, because both contacts were begun with his "big rig"—a high-powered job with a 5763 in the final, running 8 watts input!

W2IDZ, Denville, N. J., has a little clamp-tube mobile job that runs 6 watts input, with which he has worked W4MS, Pensacola, Fla., and W6JOL, Dana, Iowa.

W3LKG writes of a contact he made from W3KYR, St. Marys, Penna., recently. He was testing a converted 522 on 6, running about 12 watts input and loading the rig with a 50-inch piece of wire suspended from a metal ceiling. The receiver was a 2-tube converter with a random-length piece of hookup wire laying across a workbench. Hearing W4MS coming through he gave him a call and a solid contact resulted. W3LKG thinks 6 is quite a band!

The Arlington, Mass., CD Net stations have been doing OK with their rigs like the one described by W1CTW in *QST* for May, 1952. None of these runs more than 8 watts, and more often it is 3 or 4, but they have been working their share of the DX. W1THO and W1CTW frequently put good signals down to your conductor (100 miles) with their rigs set up at home. W1PEQ worked into the 9th call area on June 14th, while driving through the traffic on Boston's busy Massachusetts Avenue. W1CTW worked W4FNR, Ft. Lauderdale, Fla., with his mobile set-up in Vermont the same day.

These Arlington CD rigs have been doing yeoman service at recent mountain events sponsored by the Sports Car Club of America, New England Region. Their first opportunity came on May 11th, in connection with the Club's hill climb at Mt. Ascutney, Windsor, Vt. Many of the drivers were extremely skeptical because of the dismal failure of 75-meter mobiles at a previous meet, when the jam of signals on 75 had rendered the mobile rigs almost wholly useless. There was no interference on 53.4 Mc., the channel used by the Arlington group, however. With W1CTW/1 at the starting line, W1KNW/1 at the halfway mark, and W1MFZ/1 at the summit, the races were run off without a hitch. Starting times were flashed by radio for the timers, and when each car passed the halfway point another was started up the course. Breakdowns or other trouble along the route could be spotted and following cars flagged down, preventing

W7JRG Makes First Eastern Contacts from Montana on 50 Mc.

When Ken Erickson, W7JRG, moved from Sheridan, Wyoming, to Billings, Montana, last winter, Eastern 50-Mc. men breathed a sigh of relief. Now, surely, they would get a shot at that rarest of rare states, never worked by anyone east of Ohio heretofore. Ken gave them their first chance on June 29th, working W2IDZ, W2AMJ, W1KHL and W1HDQ, in that order, between 9:15 and 10:20 A.M. MST. Heard were W2FHH and W1GJO. All contacts were made on c.w. through a heavy noise level at the eastern end.

that calamity that otherwise hangs over the heads of racing drivers on these tortuous mountain courses, the overtaking of a car in trouble.

The 6-meter gang worked smoothly again for the Sports Car Club's National Hill Climb at Mt. Equinox, Manchester, Vt., on June 15th. This time there were four mobiles, W1CTW, W1MFZ, W1OOP and W1PIJ (see picture), with your conductor and his self-contained battery portable standing by for possible emergency use wherever needed. Though three telephones were available along the 5-mile course, the constant check of the entire length of the run provided by the mobile stations made it possible to run the races off much more rapidly and safely than would have been possible with telephone communication alone. The Arlington boys also provided communication for the Sports Car Club's events at Burke Mountain, in Northern Vermont, July 5th.

A chance for unique 2-meter DX is afforded by the operations of VP9G, Hamilton, Bermuda, on 144.9 Mc. Bill has heard 100-Mc. f.m. DX as far west as St. Louis and Chicago, and he feels confident that he will be able to work Ws on 2. His present schedule calls for transmitting and listening daily between 1630 and 1930 EST with 60 to 80 watts input and a 4-over-4 array. He will also look for American 2-meter operators on 20-meter 'phone, where his frequency is 14,180 kc. Coöperation in the 144-Mc. tests is requested particularly of stations along the Middle Atlantic Seaboard. This will take some beam rotating — not many of us would ordinarily be looking out over the Atlantic Ocean!

This business of aiming in the wrong direction can get us into trouble in other ways, too. W4CVQ, Raleigh, N. C., says that he could hear 2-meter W3s working north during the Contest, and occasional flashes of W2s toward the end of the period. Jake is on nearly every night with high power and a 12-element horizontal array more than 100 feet above ground, so he's a likely North Carolina prospect.

There is increased v.h.f. interest in Cuba this season. CO2CT writes that at least ten stations are now working on 6 or 2, with the following calls recorded: CO2s EV QY CT WL KJ PT FN XA PA WF, CO5MM and CO6WW. Of these, only CO6WW has been heard extensively in this country on 6. He has 50 watts to an 829B, on 50,106 and 50,186 kc. His converter is crystal controlled and the antenna system is a 3-element rotary. His contacts include all U. S. Call Areas and 21 states so far.

W0MVG, Salina, Kansas, says that if more fellows would try the idea of using high-frequency crystals, or overtone oscillators, there would be a lot less 50-Mc. TVI trouble. Jim's nearest TV stations are in Kansas City, a distance of 180 miles, so there is not much signal to work with. He has three receivers within 200 feet, but they don't know he's on the air. It wasn't always so, however. Before he changed to his present 6J6-2E26-p.p. 24G layout he was in hot water constantly. The new rig uses no shielding, no filters; he just stopped using his 6- and 8-Mc. crystals as fundamental oscillators.

50-Mc. observers who have monitored VE9RA will be interested to know that QSLs from that station are available. From VE1QZ we learn that signal reports should be sent to Beacon Station VE9RA, Naval Research Establishment, Defence Research Board, Fleet Mail Office, Halifax, Nova Scotia. Attention O. A. Sandoz. (VE1QZ) Oscar has a fine new home location at Dartmouth, with a much more favorable path down the Atlantic Seaboard than formerly. He is getting set for operation on 50, 144, 220 and 420 Mc. with high power and good antenna systems, and is particularly intent on attempting new records on 220 or 420 Mc.

Why is it that in the areas of the world where v.h.f. propagation is most favorable there is a universal lack of interest? An old friend, OQ5FG (also ON4FG), writes that there are phenomenal inversions in the Belgian Congo. He reports that 116-Mc. airfield communication from Elizabethville is occasionally heard in Leopoldville, a distance of more than 1200 kilometers. Once while flying over the central equatorial forest, he heard tower stations from distances in excess of 1000 miles on this same channel.

The first 2-meter DX of the season for the Minnesota gang came on the night of June 12th. W0JES, Anoka, Minn., says that W0OAC called him about 9:45 p.m. to tell him that the band was open. Phil got on at once and worked W9s LEE, EYN and JBF over in Wisconsin, followed by W8DQR, Toledo, Ohio, and W8VOZ, Van Buren, distances around 600 miles. This was a pre-storm inversion, bringing



W0ZJB.....48	W4IUIJ.....38	W8LBH.....39
W0BJV.....48	W4BEN.....35	W8BFQ.....39
W0CJS.....48		W8LPD.....37
W5AJG.....48	W5VY.....48	
W9ZHL.....48	W5GNQ.....46	W9ZHB.....48
W9OCA.....48	W5MJD.....45	W9QUV.....48
W6OB.....48	W5ONS.....45	W9HGE.....47
W0INI.....48	W5JTI.....44	W9PK.....47
W1HDQ.....48	W5ML.....44	W0VZP.....47
	W5JLY.....43	W9RQM.....47
W1CLS.....46	W5JME.....43	W9ALU.....47
W1CGY.....46	W5VV.....42	W9QKM.....46
W1LL.....45	W5PAL.....41	W9UIA.....45
W1KHL.....45	W5NHD.....41	W9UNS.....45
W1HMS.....44	W5FSC.....41	
W1LSN.....42	W5SFW.....41	W0QIN.....47
W1EIO.....41	W5HLD.....40	W0DZM.....47
	W5HEZ.....38	W0NFM.....47
W2AMJ.....46		W0TKX.....47
W2RLV.....45	W6WNN.....48	W0KYF.....47
W2MEU.....45	W6UXN.....47	W0HVW.....45
W2IDZ.....45	W6TMI.....45	W0MVG.....44
W2FHL.....41	W6IWS.....41	W0JOL.....44
W2GYY.....40	W60VK.....40	W0JHS.....43
W2QVH.....38		W0PKD.....43
W2ZUW.....35	W7HEA.....47	W0IPI.....41
	W7ERA.....47	
	W7BQX.....47	VE3ANY.....42
W30JU.....45	W7FDJ.....46	VE3AET.....35
W3NKM.....41	W7DYD.....45	VE1QZ.....34
W3MQU.....39	W7JRG.....44	VE1QY.....31
W3JVI.....38	W7BOC.....42	CO6WW.....21
W3RUE.....37	W7JPA.....42	XE1GE.....19
	W7TIV.....41	
W4FBH.....46	W7CAM.....40	Calls in bold-
W4EQM.....44	W7ACD.....40	face are holders
W4QN.....44		of special 50-Mc.
W4FWH.....42	W8NSS.....46	WAS certificates
W4CPZ.....42	W8NQD.....45	listed in order of
W4FLW.....42	W8UZ.....43	award numbers.
W4MS.....40	W8YLS.....41	Others are based
W4OXC.....40	W8CMS.....41	on unverified re-
W4FNR.....39	W8RFW.....41	ports.

steady signals and conditions of a sort not experienced along the upper Mississippi Valley in nearly two years.

W5POG, Sherman, Texas, near the Oklahoma border, caught a good one the morning of the 15th, working W5QVQ, Victoria. W5FSC, Houston, W5QIO, Beaumont, W5JBW, Maplewood, La., WN5UJK, Garden City, La., WN5TFK, Thibodaux, La., W5AIE, McComb, Miss., and W5RCI, Marks, Miss. George and his wife, W5SGR, are both enthusiastic 2-meter hams, and between them they manage to be on almost every morning and evening. In addition, George keeps a 12:30 p.m. sked with W5MWW, 130 miles away in New Boston, Texas, the contact being made successfully 9 out of 10 days.

Though there has been some use of the 220-Mc. band around Cleveland for some time, thanks to the efforts of W8s LJG, WJC, UKS, FKC, JWS, ILY, WM and others, the first "DX" on this band came during the June V.H.F. Party, when W8BFQ worked W8WRN in Columbus, 130 miles distant. W8FKC reports that there is activity on 220 almost every evening now. General practice is to call and listen on the hour and half hour, beginning at 9 p.m.

In Baltimore, Md., W3SDT would like to hear from others in the area who may be interested in promoting greater use of the 220-Mc. band. His address is 41 So. East Ave., Baltimore 24, Md.

Jack Drummond, W6YHI, who helped to get 2-meter activity rolling in Germany as DL4CK, is due back in

2-METER STANDINGS

Call			Call				
States Areas Miles			States Areas Miles				
W1HDQ.....	16	6	650	W5ONS.....	7	2	950
W1IZY.....	15	6	750	W5SWV.....	7	2	—
W1MNF.....	14	5	800	W5PBT.....	6	2	500
W1BCN.....	14	5	580	W5IRP.....	6	2	410
W1DJK.....	13	5	520	W5FSC.....	5	2	500
W1CTW.....	12	4	500	W5DFU.....	5	2	275
W1KLC.....	12	4	500	W5JLY.....	4	2	650
				W5POG.....	4	1	450
W2BAV.....	21	7	1175	W6LZ.....	2	2	1400
W2NLY.....	18	6	795	W6WSQ.....	2	2	1390
W2PAU.....	16	6	740	W6PJA.....	2	2	1390
W2AZL.....	16	6	—	W6GGC.....	2	2	210
W2SFK.....	13	6	—	W6EXH.....	2	2	193
W2DFV.....	13	5	350	W6ZEM/6.....	1	1	415
W2CBT.....	13	5	405	W6GGM.....	1	1	300
W2DPB.....	12	5	500	W6YYG.....	1	1	300
W2QBD.....	12	5	365				
W2FBJ.....	12	5	—	W8WJC.....	21	7	775
W2QNZ.....	12	5	—	W8BFQ.....	21	7	775
W2BVU.....	12	4	260	W8WRN.....	19	7	670
W2ORL.....	11	6	620	W8WXV.....	18	8	1200
W2UTH.....	10	6	—	W8UKS.....	18	7	720
				W8EFP.....	17	7	—
W3NKM.....	19	7	660	W8WSE.....	16	7	830
W3RUE.....	18	7	760	W8RWV.....	16	7	500
W3QKI.....	17	7	820	W8BAX.....	15	6	655
W3KWL.....	15	7	560	W8PQK.....	13	7	—
W3LNA.....	14	7	720	W8BLN.....	12	6	680
W3GEP.....	14	6	650	W8CYE.....	12	6	—
W3OWW.....	13	6	600	W8CPA.....	12	—	650
W3KUX.....	12	5	575				
W3PGV.....	12	5	—	W9FVJ.....	20	7	790
W3LMC.....	11	4	400	W9UCH.....	20	7	750
				W9SUV.....	19	7	—
W4MKJ.....	18	7	665	W9EQC.....	18	7	820
W4HHK.....	15	6	660	W9BOV.....	15	6	—
W4OXC.....	13	7	500	W9WOK.....	15	5	690
W4JDN.....	13	6	—	W9MBI.....	14	—	—
W4JFV.....	13	5	530	W9AFT.....	14	—	—
W4IKZ.....	13	5	650	W9UIA.....	12	7	540
W4IFU.....	13	5	720	W9GTA.....	11	5	540
W4CLY.....	12	5	720				
W4JHC.....	12	5	720	W9EMS.....	15	6	1080
W4QLK.....	12	5	720	W9LHD.....	15	6	725
W4FJ.....	12	5	700	W9NFM.....	14	7	660
W4LRR.....	5	2	900	W9ZJB.....	12	7	1097
				W9WGZ.....	11	5	760
W5JTI.....	14	5	670	W9EXY.....	8	3	—
W5QNL.....	10	5	1400	W9JHS.....	7	3	—
W5CVW.....	10	2	1180	VE3AIB.....	12	6	600
W5MWW.....	9	4	570	VE1QY.....	11	4	900
W5AJG.....	9	3	1260	VE3BOW.....	8	5	520
W5ML.....	9	3	760	VE3BQN.....	7	4	540
W5ERD.....	8	3	570	VE3TN.....	7	4	480
W5VX.....	7	4	—	VE3BFB.....	6	4	525
W5VY.....	7	3	1200	VE3AQQ.....	6	4	520
W5FEK.....	7	2	580	VE3DER.....	6	4	450
W5ABN.....	7	2	450	VE3EAH.....	5	4	380

If you're reading this on or before July 27th, you'd better drop everything and take off for Turkey Run State Park, Indiana, for the "national convention" of v.h.f. men, the Annual Turkey Run Picnic.

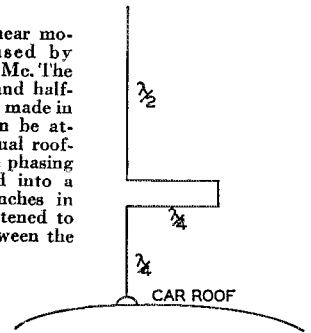
Boom in V.H.F. Mobile

In this day and age most of us spend a great deal of time in our cars, so it is not surprising to see mobile activity on all bands growing by leaps and bounds. Much accent in the mobile field has been on 75 meters recently, but the number of mobiles on 6 and 2 has grown markedly, too. Especially where civil defense communication is planned, the v.h.f. bands are unequaled for mobile operation. Because there is no QRM problem ordinarily, the 6- and 2-meter bands can be worked successfully with very low power, making them attractive to the fellow who does not wish to load up the family car with extra batteries, oversize generators and other paraphernalia needed when the ham rig takes more than a few watts input to the final. The ham antenna problem is solved neatly with v.h.f. installations, too, with no 10-foot center-loaded tree smashers needed.

There are some "super" installations among the v.h.f. fraternity, however. W6MVK writes of what is probably tops in this department, a 16-element 2-meter array that can be used in motion by W6IHK. Bill also has a 24-volt system and can run up to 300 watts. His usual set-up is an ARC-4 transmitter, with a modified BC-733D for receiving. This is tuned by means of an oscillator assembly on the dash. W6MEP has a stacked coaxial array on the top of his car (no low bridges or tree branches in California?) that hops his signals up considerably. W6WKO uses the remote 733D idea, with his oscillator assembly being a Cardwell unit, steering-post mounted. W6YHP has the front end of a 522 mounted up front, with the rest of the unit in the trunk. For receiving many fellows are using superregens with r.f. stages, the general idea being that they will bring anything in that more elaborate set-ups will, under the noisy conditions of mobile operation, and do it with far less battery drain and little, if any, instability trouble. The latter problem has caused many of the boys to give up on 2-meter converters.

WN2ALR, Lockport, N. Y., sends in an antenna hint for 2-meter mobile operators who want something better than the conventional quarter-wave roof-mounted rod. The idea, a brainchild of W2RUL, with WN2ALR's car and rig for the guinea pig, is shown schematically in Fig. 1. The usual

Fig. 1 — Collinear mobile antenna used by WN2ALR on 145 Mc. The phasing section and half-wave radiator are made in one unit that can be attached to the usual roof-top antenna. The phasing section is formed into a circle about 6 inches in diameter and fastened to the insulator between the two radiators.



this country before this appears in print. He will be stationed at Andrews Air Force Base, Maryland, and he hopes to be in business on 144 Mc. as a W3 without too much delay. He leaves Germany with 2-meter interest running high. DL6MH, near Munich, has a superb 48-element array that has made possible successful tests with PE1PL (experimental call) at The Hague. DL6BU has also been working PE1PL. DL3NQ has worked ON4HN, ON4EI, ON4HC, ON4MI, PA9WO, PA9NL, PA9YA, PA9MU, DL9MK, DL9DE, DL1LH, DL3FM, F8YZ and F8UK this year. No G signals had been heard this season up to June 20th.

For the past two summer DX seasons, W5VY, San Antonio, Texas, has been calling "CQ Rhode Island" on 50 Mc. in the hope of landing that last state for his WAS on 6. An answer finally came on June 20th, and W1SGA, Providence, is Pat's pal for life.

quarter-wave rod is made of stiff material so that it will support the phasing section and half-wave radiator above it. The phasing section and radiator are made as a detachable unit that can be screwed onto the top of the rod when the added coverage they provide is needed. The phasing line can be formed into a circle to cut down its over-all dimensions. Tests with VE3DIR, 50 miles away on the other side of Lake Ontario, showed a very worthwhile increase in signal strength, both transmitting and receiving.

Here's another mobile hint that might be worth a try. W2BNF thinks that the big windows on some of our newer cars might be just about the right dimensions to work as slot antennas. How to feed them is anybody's guess, but come to think of it, your conductor has found that his little self-contained 50-Mc. portable works out surprisingly well when it is operated inside the car, with only its small center-loaded whip

(Continued on page 180)



How's DX?

CONDUCTED BY ROD NEWKIRK,* W1VMMW (Ex-W9BRD)

How:

We have reached that time of year which traditionally calls for any rebuilding and modification heretofore put off and avoided. Our own gear and situation is no exception. Even though our rig is but a few years old there is really nothing like being progressive, especially after reviewing data noted by Jeeves during some of our more recent QSOs. Comments on our signals generally went something like this:

"How about turning on the final?" . . . "If you were any weaker you'd be receiving instead of transmitting" . . . "Better add another flashlight cell to your power pack, OM" . . . "How do you feed the bobby pin you must be using for an antenna?" . . . "Your signal is among the best on the band — and completely covered by them, too" . . . "How deep is your dipole?" . . . "Must be something to this mental-telegraphy business" . . . "How are things in Tibet, OM?" . . . "Please QSL my first suppressed-carrier suppressed-sidebands QSO" . . . "If you use a blooper receiver, I think it's radiating" . . . "Heard some QRP Wake Island Novice on your frequency signing WW1VM" . . .

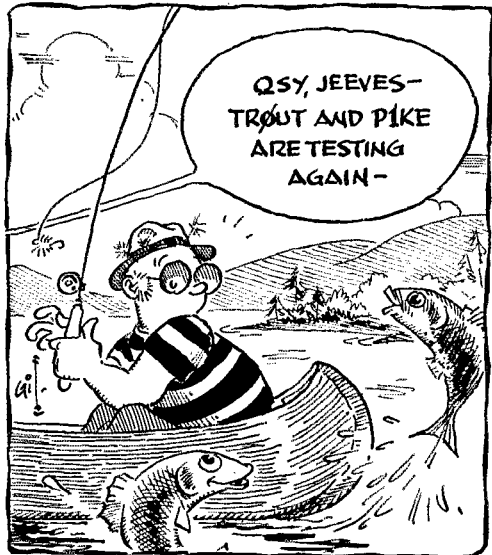
So you see how it goes. We can't put up with much more of that, you'll agree. So get out the hot water, Jeeves — we should have de-based those 210s last year!

What:

On twenty, W3MFW substituted a 4-wavelength long wire for his vertical dipole and came out with KW6BB (040), DU1MB (102), TA3AA (045), VK9s BI (100), XK (015), HE9LAA (012), ZB1KQ (022), FP8AJ (100) and 4XDF (026). Late QSLs from AP4A, ZB1GKU, VS6AE, PZ1AL and VQ5CW bring Russ up to 91 confirmed. . . . W8TKX fell off his 6-meter pedestal long enough to snag VR7AB (011), SUIXZ, KC6DX (100), KC6QY (095), Y13BZL (051), CR4AI, ZC4s XP (015-052), RS, ZBs 1HLW, 2A (035-070), 4X4DK (065) and VQ2QZ/9. After really digging in for the better part of a year of concentrated DXing, one of Bob's conclusions is, "There are lots of interesting people all over the world which one can meet with reasonably low power and a good antenna." . . . W8HEV agitated the ionosphere to the tune of ET3Q (011), HP1AW (050), TI2TG (100), VP1AA (000), CX6AD (070) and VQ4AC (170). . . . WN6NDP dropped the first N in his call and caught up with VESTS, KG6ABW, KM6AX (085), TI2PZ, OA5A, KX6AI (050), YV5s BJ, AE, VP3TY (073) and a VK9. Ken has 100 watts and a doublet. . . . FQ8AF, FF8AG, CPIBK (050), VP2MD, VS7NG (080) and YS1A find the sting of W6ALQ's new beam and big rig. Max is now over the top with 103 in the bag. . . . W4IE clicked with 5A3TA (100) and W1BFK is wondering about one ON1AA recently worked. . . . W6EAY finds the band good on occasion and scored with EA9DC/Ifni, YU3AT (015) and TF3MB (025). Fresh cards for Eric from EL2A, VP7NM, CN8AF, VQ3BNU, VK9GB and CN8MI. One often hears wrangling going on as to just what may be considered "rare DX." W6EAY agrees that any country can be rare if one hasn't confirmed it! . . .

* DX Editor, QST.

W1PWK/KT1WK/CN8EG is still gadding about and notes the following active in the no-man's-land just above 14,100 kc.: VQ5CK, ZD9AA, EA9DC/Ifni, VU2FH, 5A3TA, LZ1RF and VSTGV. . . . YS10 tells W1DF he now has 126 confirmed. Among Oscar's latest are OE13USA (011), FQ8AP and ZC2MAC (030) of the Cocos W2TKG was among the lucky ones to get EA9DC and also ran into CE4AD (039) and OX3BQ (105). . . . W9NN struggles to convert W9RIL, his new-ham brother-in-law, to DXing but still finds time to grab EA9DC, GD3UB (020-040), JY1AJ (46), KR6IG (060), MI3US (084), ZP5AY (078) and a Y13. . . . The EA9 and GD3 were also hooked by W8YGR. Jack then added CT2BO (070) and TG9LC (010). He says that Jean of OX3BQ is no YL. . . . KR6AF, ST2GL, YO3RI, VK1PG, VP2GE, VPSAI, VS6AE, VS7NG, ZS8MK and 3A2AD QSLs brought a 168-confirmed total to W1JLT and his 300-watt-10/20 rotary beam layout. . . . EA9DC, GD3UB, EA8BK (060), OX3MW, OY3IGO (050), YU5 1AG (040), 1BS, 1CX (018), 2CK, 3AC (052), 3BB, ZC4XP (100) and a VK9 were clipped by W2ZQW. . . . W9HUZ got that new beam up in time to try it out on people like VR1B (048), DU5 1FM (078), 6IV (050), MP4BBD (028), EA8BC (055), EK1FM (012), EA9DC and many others already mentioned. Van says 9NDA is erecting a new whirler 80 feet high on one of Alton's highest hills. . . . The twosome EA9DC and GD3UB were worked by W2ESO. Gene added SP6XA (042), TA3AA and FO8AB. . . . W5ASG captured four nice ones in KC6s DX, QL, EA9DC and ZD9AA. . . . W5KUC/UCQ's DX Bulletin has the West Gulf gang chasing (mornings) DU5 1FM (098), 1GT (093), 1WP (055), 6CO (033), 6IV (060), EA9AP (003), FK8s AE (028-050), AI (085), FB8BE (105), FD8s AA (072), AB (022), FN8AD (050-084), HA2CF (070), HZ1AR (058), KJ6FAA (067), KG6FAA (042), KR6s HH (028), IN (088), IT (046), JA (080), KW6AZ (091), KX6AH (075), LJ2F (052), OY2A (045), PJ5RE (005), SPs 2KG (060), 6AS (065), SV1SMX (MM), VK9XD (030), VRs 1A (055-065), 2CK (053), 2CP (065), 4AF (038), VSs 1CZ (061), DU (096), 2CW (080), 2DH (100), 6AE (050-105), 6CG (060), 6CK (040), VQs 3BNU (056), 4HJP (025-050), YS1O (080), ZC6JE (010-108), ZK1BC (030), ZS7F (050); (evenings)



CRs 4AD (080), 6PI (080), CT3AB (010-038), CU3YY (052-146), EAs 6AF (045), 8BE (035-072), 8BI (050), 9BF (060-083), EK1s AO (065), FM (014), JG (020), FR8AF (012), FL8MY (120), FOSAD (036), FQ8s AK (025-075), AP (072), FR7ZA (030), FYY7B (021), HC2KB (030), HI6TC (085), HZ1MY (030), HINU/Trieste (065), IS1CQL (038), JY1OG (058-080), KH6USA/KS6 (058), KJ6AR (095), KM6AZ (071), KR6AI (090), KS6AA (045), I5s WC (078), ZC (045), LBs 6XD (022), 7GD (045), LZ1KAB (070), MI3LK (040-072), MP4s BBD (048), DL (130), KAE (030), OD5AD (076), OQ5RA (020), OY2Z (000), PJ2CC (017 t8), PI1KC (067), SP5AB (022), SV4AL (046), SU1JY (003), TF3AB (090), VPs 3TF (024), 4LZ (035), 7NM (065), VQs 3BM (060), 5CK (105), VS7YL (050), VU2EJ (032), YN1AA (027), YS1NJ (075), YUs 1AG (040), 1BX (015), 1DF (010), 2AK (063), 2CL (060), 3AC (052), ZB1s AQ (020), BJ (007), CQ (017), KO (011), VC (020), ZCs 3BA (025), 4DT (024), 6AG (042), 6JE (010-108), ZDs 1SS (046), 4BC (020), 4BF (077), 9AA (032), ZE4JB (075), ZM6AA (002-100), ZPs 1TH (078), 5AX (060), 9AH (077), ZK1BC (030), ZS3Q (090), ZZ2AA (?), 3A2AJ (022), 4X4s BT (070), BX (019-101), RE (038), 5A2TO (3301) and 9S4AR (025).

Twenty 'phone will get you some new ones if you have a signal with muscles. XE1AC has just that: KB6AO (252), KJ6AW (205), KM6AX (275), KW6BD (235), VRs 1A (190), 2CM (130), ZM6AA (220), EA9DC/Inni (305) and HC8MM (125). Al still works on the Revillagigedo Islands deal. . . . WINVO told us of the raft "Heretique" (similar to "Kon-Tiki") which was to use the call 3A8D, date and frequencies undetermined. Anyone run across this one? . . . A casual 4:05-hour WAC entered W3LXE's log. MI3MK, HZ1TA (155), ZB2A, CE1BH, KH6AHQ and VE6KN were the sextet. . . . EAs 9AD and 9DC/Inni were victims of W9FDX. Doug notes that the embryo Republic of South Moluccas just issued a set of six stamps bearing likenesses of Gen. MacArthur. No recognition for this one, either postal or diplomatic, and no hams active there to our knowledge. . . . W8TKX switched from c.w. to grab AG2AC and Norm Duxbury says the 5A2T gang, OE13HP and VP2SG regularly roll into Providence. . . . The DX Bulletin reports these 'phones active: (A.M.) DU5 1JI (196), 1VVS (195), 6RG (210), 7SV (280), 9VL (195), EA9s AI (300), AR (301), FOSAB (150), FYY7B (020), KB6AO (260), KJ6AW (265-285), W8EY/KJ6 (267), KM6AG (270), W6HQH/KM6 (206), KW6BC (230), KT1WX (141), KX6AH (250-270), OD5AZ (200), SP9KA (340), PJSRE (170), VK9WJ in Papua (148), VQ5DQ (210), VRs 1B (124-140), 3C (132), VSs 1AX (334), 2BD (310), 2DB (180), XZ2SY (310), ZD2HAH (150-210), 5A2TA (133); (P.M.) CR5AC (156-203), CP5EA (188), EAs 8AP (320), 8BC (120), EK1JC (150), FAs 3DS (310), 3FU (310), FL8MY (118), FQ8AI (302),

HZ1MY (135), HH5SS (320), I1YAK/Trieste (175), IT1PA (318), JY1OG (175), MI3BW (317), ST2GL (160), VQ4AC (115), Y13BZL (175), ZB1GKU (160), ZCs 4RX (160), 6UNJ (304), ZDs 2TPE (240), 4BF (140), ZP5CB (190), ZS9A (310), 3A2AQ (192), 3V8AT (325), 5A2TO (320) and 9S4AD (125). [Bet I know why HH5SS prefers 'phone, Boss. — *Jeeves!* (Dot's right, kid.)

Fifteen's mailbag is on the upgrade. A detailed report of W6ZZ's first month on the band is interesting. Miles racked up 9 countries, 3 continents and 21 states with a 32V2-75A1-40-meter zepp combination. Worked: ZLs 1BY 1HY 1MQ 3IA 4GA, VKs 2AWU 2ZC 2GW 3IW 4ZB 5BY 7RK, KH6Ns, KP4C, KZ5AW, CE3DG and PY4IE. Heard: ZLs 2FA 2LJ 4BO 4FO, VKs 3BG 3JE 4XJ 7KB, KG6ABW, KH6YL, KZ5s FJ FL WZ, KP4s JE KD, KY4AA, HP1BR, OA4DI and PY4Zs. W6ZZ heard ON4s UF, VU and CT3AN being called. His ZL1BY QSO made it a five-bander. . . . ZEE3J reports hearing or working MI3s SL, ZX, OD5AB, PY1AQT and ZEE3K. Ivan understands OQ5s and VS7s to be active on the band. . . . VK4EL topped a long list of contacts at W9BPU while W4REZ settled for ZL1HY. . . . W2ESO caught up with EK1CW, ON4HC, OQ5RA, CT3AB and CT18Q. Gene heard 21-Mc. noises from PA9QF and some stations already mentioned. . . . British amateurs got the band on July 1st, adding considerably to the number of different 15-meter countries available (GI, GM, GW, etc.). We expect British colonies and possessions elsewhere to follow suit. . . . W1BDI understands that EIs will soon be on. PY4IE knocked off one of the first WACs on 21 Mc. . . . TF3MB and EA3CK have been testing 15.

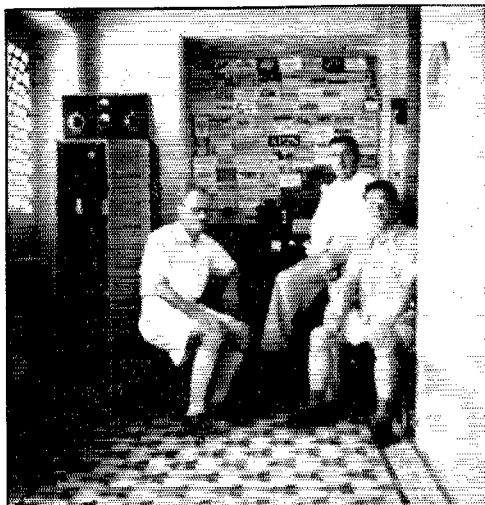
Forty has perked up a bit as much as QRN will allow. VK9GM on Norfolk Island (7008) was a DXceptional catch for W3MFW. . . . VR4s AF and AT (031) created a rumpus and Y810 ran into 2A2EFA on the low edge. . . . HK5DH (020), KW6AW (004) and a QSL from 9S4BF cheered W8HEV. . . . W0NXF is doubtful of one HA5GA with too good a signal and W1RWD likewise re OK1MB (110). . . . W2EEY finds HH2LD on almost every A.M. and W0DMK dug up YL Gloria of CM3GC. . . . The YU and CT gangs, as well as a strong DL contingent, are usually well represented on 40 during European openings.

Ten and one-sixty appear pretty well *kaput* but VE1ZZ delights in challenging the QRN on *eighty*. John's 275 watts tangled with this stuff between 3500 and 3550 kc.: LU1s EP EK, CX1s FB FY, PYs 2AJ 7LN, CEs 3AG 4AD, ON4s EY FQ, HB9s X MQ, PA9s HP LP RZ XYZ, SMs 4APZ 5AQW 7ZF, DJ1AP, DLs 3HI 3TY 4PO 4UG 6BZ 6JB 6TE 7AA 7DT 9DY 9DX 9IS 9SQ, Gs 2CG 2DOW 3CQU 3DDK 3DXJ 3GRF 3HPM 3HYT 3IDQ 3IEW/A 3SY 4BC 5JL 5LH 5VB 6KP 8KP, KG4AU, VP7NT, OZ5CP, LA3FB, CN8FR and SP3PF. Evidently the DX is still there if your ears can take it! . . . W8HEV received a QSL from Virgin Island Novice WV4AZ (3709).

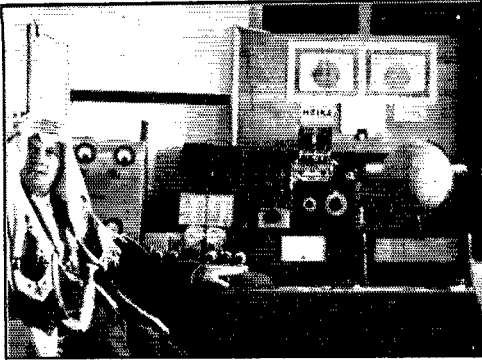
Where:

Cards for VS stations whose calls end in "ELA" may be sent to home station W6ELA. Clyde had intended Sarawak, British Borneo and Brunei activity by mid-July. . . . We have reports of U.S.S.R. SWL caris still coming through but no contact-confirming QSLs for months. Anybody getting better results?

AP2N (QSL via W9FKC)
 CR6BX Box 1311, Luanda, Angola
 DL4OR C. D. Ritchie, AFN, APO 403, c/o Postmaster, New York
 EA9BF Box 38, Tetuan, Spanish Morocco
 ex-FK8AC Felix Franchetti, Villa L'Oustalet, Tamaris-sur-Mer (Var), France
 GD3IBQ K. Holt, Balmoral, South Promenade, Ramsey, I. of M.
 ex-IIIR R. Ognibene, c/o Incos, Papermill, Chandraghona, Chittigong, East Pakistan
 JY1AJ RAF, MAF, RAQ, Jordan MEAF
 KC6QL Truk, Caroline Islands
 KM6BB/W6 ex-KM6AX, 601 O'Farrell St., Apt. 602, San Francisco, Calif.
 KT1WK (QSL to CN8EG)
 KX6AI Navy 824, FPO, San Francisco, Calif.
 ex-KZ5CW (QSL to W4DZR)
 LZ3AA (QSL via 9S4AX)
 MD6BZL (QSL to Y13BZL)
 MI3DW R. Wassum, APO 843, c/o Postmaster, New York



Norman Henry, AP2N (center), entertains visitors G4GB (left) and VU2DY at his Karachi station. (Photo courtesy W9FKC)



Major Ken Ellis, Royal Signals, one of the most famous of hamdom's globe-trotting rare-country DXers, is shown here with his HZ1KE set-up. Ken made DXCCs as MD5KW and HZ1KE, is well on his way toward a third from DL2KE. (Photo courtesy G2MI)

- JZ2CC 22 Piscaderaweg, Willemstad, Curacao, N. W. I
 ex-SU1AD (QSL to W3BHD)
 TA3MP (QSL to W2JQU)
 VX9WL J. Widdup, Torokina, Bongainville, Ter. of N. G.
 ex-VR2CD Chas. H. Freeman, c/o Mrs. C. H. Freeman and Miss
 N. Murray, Swanson St., Auckland, N. Z.
 (QSL to VQ2s QZ or YC)
 VR4AF R. Freeman, c/o Post Office, Nauru Island
 VR7AB (Also ex-VU7JU/LI3JU; QSL to G3JU)
 EA1EM Earl R. Michalka, c/o American Embassy, Managua,
 Nicaragua
 YN1WC W. W. Cooper, W6EWC, P. O. Box 346, Managua,
 Nicaragua
 ZC4DT (QSL via RSGB)
 ex-ZD3B (QSL to G3FHV)
 ZD9AA (QSL via ZS1JD or SARL)
 ZP4AF Box 512, Asuncion, Paraguay
 ZF9AH Dr. Pedro Acosta Moreno, Encarnacion, Paraguay
 ZS2MI (QSL to ZS5AZ)
 3A2AH H. V. Klaveren, 8 rue Comte F. Gastaldi, Monaco
 5A3TA Box 372, Tripoli, Libya

Our helpers-out: W1s GKX NWO RWS, W2s MCM QHH TKG ZQW, W3MFW, W4REZ, W5ASG, W8YGR, W9s ALI FKC KA, W9s IDI TKX, CN8EG, *The DX Bulletin* and Norm Duxbury.

Tidbits:

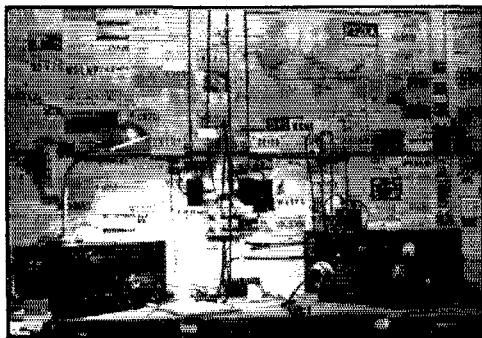
Ex-VK1BS, through W5FNA, offers to handle any QSLs bound for Macquarie Island stations. Send same to: W. J. Storer, 117 Doncaster Ave., Kensington, Sydney, NSW, Australia. . . . 4X4BR, who runs 25 watts to an 807 and uses a Phillips home-brew inverter, is gunning for CT and VS stations to complete his DXCC. . . . A BC-610E, a Super Pro plus a 75A2, and a dipole have put OA4V on 20 with a bang. Johnnie is making plans for a beam with some sock. . . . OD5AF and OD5AS are ex-AR8AK and ex-AR8BC respectively. . . . ZK2AA extends his sincere thanks to all of the gang who helped make his trip to the U. S. A. and Canada such a never-to-be-forgotten experience. Bill may return to ZL at the end of this year and hopes to reciprocate then by welcoming visiting firemen to his own country. . . . W2AOS/KG6 can put dandy signals into Scandinavia but can't ever seem to hear the U. S. east coast. Chas will be on Guam for the next 18 months and all contacts will be QSLd. He quickly knocked off a KG6 WAC with his 75-watter. . . . At the end of one month's operation, HZ1MY counted 103 countries worked after 876 QSOs on 10, 20 and 40. Eighty

MI3ZX got the MI3US gang together for this album snap at Asmara. In the rear (*l. to r.*) are Ralph, MI3EP; Bob, MI3RH; Joe, MI3NJ; Bob, MI3DW; Herb, MI3SL. At front are Bob, MI3NA; Rod, MI3RC; Karl, MI3LK; and Roy, MI3ZX. Dick, MI3RR, drew the short straw and had to take the picture.

August 1952

and fifteen were tuned though not used and all QSLs received will be answered. "It took 23 days to get ZS2MI due to Europeans calling me when I would call him," writes Dick. He plans to add other stops to the 4W1 and FL8 sojourns already completed. . . . DL4OR hit the air recently with 150 watts, a 75A2 and a 171-foot Vcc, operating mostly 20 and 80. He'd like to see more DL4 news in QST. . . . KC6QL tells W5ASG he is after DXCC from the Carolines. Bob will answer all cards received. . . . Those DJIs are perfectly okay. German nationals reached DL9ZZ in their licensing (skipping DL8) and will employ DJ prefixes rather than tackle 3-letter home-station call signs. . . . SU1AD says he is closing down for good and returning to good old W3BHD. Try that home QTH if you have any questions about QSL and the like. . . . "At present I am operating portable on 40 meters but expect to be on all bands . . . as soon as I find a permanent QTH and settle down." This from KM6BB/W6 — bet he causes lots of short-lived excitement on forty with that call! . . . VR4AF was on shipboard until June 5th, says W0TKX. The VR4 is a doctor and will back in VK2 shortly. W0AIH was apparently the first W0 to work the Cocos dish, ZC2MAC. VR7AB tells W0TKX he uses a 50-watt 807 rig and was formerly a GM3. He was on Nauru for five months before he decided to obtain a ham permit. TKX wonders where VR7AA went! . . . Alaskan Novice WL7AOC worked a W5RIZ who gave the name Jim and QTH as Dallas. This doesn't check with the *Call Book* — can anybody give Harold a hand? He doesn't work many W5s on 80. . . . W2QHH has it that the Christmas Island ZC3AX of late 1951 was decidedly n.g. A new ZC3 will fire up shortly with 50 watts and some 40-meter rocks. The station will have an Australian 1st op and an Indian 2nd. Mail goes via Singapore. . . . TA3MP (W2JQU) operates the upper regions of 20 and 40 meters with 750 watts on 'phone and c.w. He deplores the discrepancy in his home-station and DX-station QSL returns — 100 per cent for his TA3 work and but 40 per cent for W2 efforts. . . . OQ5CZ in Ruanda-Urundi, Belgian Congo, operates 20 c.w. with a 50-watter, getting power from an a.c. generator. OQ5RA now has approximately 175 countries confirmed. . . . DX gals W1MCW and W1FTJ have 183 and 113 countries confirmed, respectively. . . . W4KVM, formerly of W1AW, occasionally operates V06H up in Goose Bay. Jim writes that the Goose Bay Amateur Radio Club had planned a gala Field Day outing on the Hamilton River. "Conditions here . . . 20 is best most of the time with 40 running a close second. 80 and 75 open up now and then with surprisingly good signals and low QRN. Even heard a VE1 on 160 the other night . . . not a peep out of 15 or 10 meters." . . . Don't forget that PK (except PK7), FI, EP, EQ, OD5, HS, J and OE stations are still out-of-bounds for Ws. JA and OE13 Allied occupation personnel are excepted — we expect good news on OD5 at any moment. . . . W2ESO calls our attention to the fact that QSLs for VP5BF may go via W4LVV and those for VP5BH via W5GEL. . . . HB9JZ is a Swiss railway engineer. What terrain for railroading! It must call for nerves of steel. . . . The band was filled with Ws on VR2CD's last day of operation in Fiji. So much so that he hated to dismantle the gear! Chas says Fiji calls are not re-allotted so any VR2CDs subsequently worked will be ungod. He was formerly ZL4FH, ZL3AE and ZL1BI and will take care of all incoming QSLs for his VR2 work. . . . VS1AY is returning to Singapore after a most enjoyable stay in the States and would like to thank the W gang for the hospitality so generously extended. Come again, Stan! . . . Connors of VP4LZ passes to us word of the death of Leroy Holtzclaw, one of the VP4LZ operators, who crashed in a Stratocruiser bound from Rio to





Probably the most active of present Macao licensees, J. P. Antas puts that DXotic country on the air with this layout at CR9AF. (Photo courtesy Norm Duxbury)

Trinidad W6AM seems out to visit every ham shack in Europe. He hobnobbed personally with GM3CSM, G2MI, F9BO, EA3 3CY 3HE 3FL, I1s ARK ACL AMU BGF BJC BQS, HB9s J X HF HC JQ and MS. Incidentally, he returned a visit HB9HF paid to W6AM not long ago Excerpts from ZS1FD's letter ament ZD9AA: "Weather conditions on Tristan da Cunha are shocking; gales blow continuously with velocities seldom less than 50 m.p.h. [ZD9AA is] running 500 watts output . . . from 1.5 to 30 Mc." The rig had no speech amplifier to drive its modulator so the audio section of an SX28 was modified for the purpose. The operating frequencies of ZD9AA are 14,035 kc. (c.w.), 14,146 kc. ('phone) and 14,390 kc. ('phone). The harmonics and sub-harmonics of these frequencies are used on 10 and 40 meters. There is a good chance that ZS5LB will operate as ZD9AB in the near future. ZS5LB operates maritime-mobile on the S. S. Tristania which does the ZD9 mail delivering and loads the lobster tails enjoyed subsequently throughout the world. ZS3FD, by the way, is the call ZS1FD plans to use in conjunction with some 6-watt portable work in South West Africa. Henry paid a visit to Europe last year and generally

found ham gear and techniques lagging considerably behind the times The gang at CN8FB is now operating sans the services of W6CNP who just returned to North Hollywood. Gwynn left the boys playing with a 4-element 10-meter beam, a 3-element 20-meter array, a 528-foot-per-leg rhombic and assorted dipoles, all of which serve four transmitters on 10 through 80 meters. The CN8 gang finds the long path more consistent than the short one so far as W6-land is concerned GD3UB tells W8YGR that heavy summer trade at his Isle of Man cafe limits his warm-weather ham activities. Summer brought 24-hour-per-day sunshine to LA3DB W1GKK writes to say that the FP8BX QSL situation is just about cleared up. A few unclaimed QSLs remain. If you are still shy your rightful FP8BX pasteboard, consult W1GKK. George has 199 countries confirmed but could use some help getting ZD1AA, LZ1DX, I5A, VR5GA, ZP6AB, MD4BPC and YJ1AB verifications YN1s EM and WC are newly active. EM uses a 32V1-SX71 combo and WC has a 32V2 and an NC183D. Bands preferred are 10, 20 and 75 'phone From W2PZM: "It sure pays to advertise. Since you mentioned in 'How's DX?' that I was short some QSLs I have received QSLs from EL, VP2 and KR6 which I had been trying to dig up since 1949 — tnx a million!" Hot items from *The DX Bulletin*: MP4s KAB, KAC and KAF are leaving Kuwait; MP4KAD is QRT and MP4KAE intends regular operation . . . 9S4AX received cards bound for one ZA3B who is unknown . . . VQ4RF will visit G-land The Northern California DX Club, 55 members strong, has 47 c.w. DXCCs and eight 'phone jobs. Nine members, W6s AM DZZ MEK MVQ MX PB TI TT and VE have 200 or more confirmed countries. W6EJA puts together the club bulletin, *The DXer*, and yet manages to knock of some DX on his own Watch for FP8AK (W2s BBK and ZBO) early this month on (c.w.) 3505, 7005, 14,005 kc.; ('phone) 3790, 14,190 and 28,490 kc. A 32V2 rig will be used and QSLs should be sent to W2BBK's home address.

We hear that lifting of the TV "freeze" will wipe out some weak-signal zones while producing others. Jeeves still seeks a way to extend his own fringe area.

A.R.R.L. QSL BUREAU

The function of the ARRL QSL Bureau system is to facilitate delivery to amateurs in the United States, its possessions, and Canada of those QSL cards which arrive from amateur stations in other parts of the world. Its operation is made possible by volunteer managers in each W, K and VE call area. All you have to do is send your QSL manager (see list below) a stamped self-addressed envelope about 4¼ by 9¼ inches in size, with your name and address in the usual place on the front of the envelope and your call printed in capital letters in the upper left-hand corner. For a list of overseas bureaus see p. 53, June '52 *QST*.

- W1, K1 — J. R. Baker, jr., W1JOJ, Box 232, Ipswich, Mass.
- W2, K2 — H. W. Yahnel, W2SN, Lake Ave., Helmetta, N. J.
- W3, K3 — Jesse Bieberman, W3KT, Box 34, Philadelphia 5, Penna.
- W4, K4 — Thomas M. Moss, W4HYW, Box 644, Municipal Airport Branch, Atlanta, Ga.
- W5, K5 — L. W. May, jr., W5AJG, 9428 Hobart St., Dallas 18, Texas
- W6, K6 — Horace R. Greer, W6TI, 414 Fairmount St., Oakland, Calif.
- W7, K7 — Mary Ann Tatro, W7FWR, 513 N. Central, Olympia, Wash.
- W8, K8 — Norman W. Aiken, W8LJS, 701 East 240th St., Euclid 23, Ohio.
- W9, K9 — John F. Schneider, W9CFT, 311 W Ross Ave., Wausau, Wis.
- W0, K0 — Alva A. Smith, W0DMA, 238 East Main St., Caledonia, Minn.
- VE1 — L. J. Fader, VE1FQ, 125 Henry St., Halifax, N. S.
- VE2 — Austin A. W. Smith, VE2UW, 6164 Jeanne Mance, Montreal 8, Que.

- VE3 — W. Bert Knowles, VE3QB, Lanark, Ont.
- VE4 — Len Cuff, VE4LC, 286 Rutland St., St. James, Man.
- VE5 — Fred Ward, VE5OP, 899 Connaught Ave., Moose Jaw, Sask.
- VE6 — W. R. Savage, VE6EO, 329 15th St., North Lethbridge, Alta.
- VE7 — H. R. Hough, VE7HR, 1330 Mitchell St., Victoria, B. C.
- VE8 — Roy Walton, VE8CZ, Box 534, Whitehorse, Y. T.
- KP4 — E. W. Mayer, KP4KD, Box 1061, San Juan, P. R.
- KZ5 — P. C. Combs, KZ5PC, Box 407, Balboa, C. Z.
- KH6 — Andy H. Fuchikami, KH6BA, 2543 Namaau Dr., Honolulu, T. H.
- KL7 — Box 73, Douglas, Alaska

Silent Keys

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

- W1MVE, Fred A. Mitchell, West Haven, Conn.
- W1OTA, Edwin S. Butters, Danvers, Mass.
- W4RM, James G. Cobble, Tuscaloosa, Ala.
- W4RTO, Sgt. Selbert L. Hill, USMC, Camden, N. J.
- W6FTR, William Burkley, North Redondo Beach, Calif.
- W7EBK, Norman C. Stansbery, Seattle, Wash.
- W7OY, Eddie Niespo, Florence, Ore.
- W9CJQ, James E. Daily, Indianapolis, Ind.
- W0VHR, Chester A. Colvin, Omaha, Nebr.



Correspondence From Members -

The Publishers of *QST* assume no responsibility for statements made herein by correspondents.

MORE PROPOSALS

314 W. Superior St.
Wayland, Mich.

Editor, *QST*:

I wish to express my support of the proposals as set forth in the ARRL Bulletin 346. I firmly believe that the proposals of the ARRL are much closer to the needs of the amateurs than those set forth by the FCC in Docket 10073.

— Robert G. Hanlon, W8HIZ

5225 44th St., S.E.
Grand Rapids 8, Mich.

Editor, *QST*:

I hereby wish to be put on record as being opposed to the notice of Proposed Rule Making of Dockets 10073, 10173, and 10188 as set forth by the FCC and to urge the acceptance of the proposals made by the American Radio Relay League. . . .

— William F. MacLaine, W8AXP

124 Fulton St., East
Grand Rapids 2, Mich.

Editor, *QST*:

I would like to express my approval of the proposals set forth in the ARRL Bulletin No. 346.

It is my opinion that these proposals would better satisfy the needs of amateur radio than those set forth in FCC Docket 10073.

— David C. Boyce, W8FSW

219 East Fifth Ave.
Roselle, N. J.

Editor, *QST*:

By appropriate unanimous resolution, the membership of this club has voted to extend their sincere commendation to the Directors of the ARRL for the action taken by them with regard to the recent FCC proposals for the Amateur Radio Service.

This action, as reported on page 9 of the June issue of *QST*, follows closely the wishes of the club members. We trust the League may be successful in presenting these recommendations at Washington and in persuading the FCC to modify their proposals accordingly.

Our grateful thanks to the Directors, one and all.

— Union County Amateur Radio Assn., Inc.
W. D. Earnest, Jr., Secretary

330 Baker Drive
Corpus Christi, Texas

Editor, *QST*:

The following resolution was unanimously adopted at the West Gulf Division ARRL Convention, June 28th-29th:

1) Be it resolved that this West Gulf Division ARRL Convention does herewith approve and endorse the 1952 ARRL actions pertaining to regulatory and frequency allocation matters.

2) Be it also resolved that this Convention does hereby respectfully request the Federal Communications Commission to take serious cognizance of these ARRL recommendations regarding the amateur service. . . .

— Henry Binz, W5HQR
Convention Chairman

634 Seventh Street
Grand Rapids, Mich.

Editor, *QST*:

This letter is being written to support the proposals set forth by the ARRL in Bulletin 346. . . . I am in full support of all the requests just as they were proposed by ARRL.

— Norbert Haraburda, W8HJC

QSL BUREAUS

Box 644
Municipal Airport Branch
Atlanta, Georgia

Editor, *QST*:

Here in the Fourth call area, I am holding a five-year backlog of QSL cards for amateurs no longer listed in the Call Book. This non-listing could mean a change from a three-letter call to a two-letter call, a move to another district, an expired call, a Silent Key, etc.

I am sure that other QSL Managers must be holding a similar backlog, unless they have already taken a postwar cleaning. I would like to urge those who formerly held Fourth District calls to contact me, sending an envelope for forwarding cards on hand, and letting me know their present call.

I am sure that other QSL Managers would appreciate this same help from former holders of calls in their district.

— Tom Moss, W4HYW
W4/K4 QSL Manager

TVI CAN BE CURED

1920 Anthony Ave.
Bronx 57, N. Y. C.

Editor, *QST*:

I would like to thank you for the article in the April issue of *QST* concerning TVI and the BC-457A. The steps outlined brought about the elimination of TVI on a Philco model 50-T-1477 located ten feet from my 85-watt transmitter in an adjoining room. I also lost TVI on an RCA set which had its antenna mounted on the same post which held the end of my long wire. I have not used any coax as yet. I found it necessary only to by-pass all leads from the transmitter and to shield it and the power leads. So thanks a lot for a very timely article.

— Eugene Calvert, W2HTK

THANK YOU, SIR

1260 Decarie Blvd.
Ville St. Laurent
Montreal 9, Quebec

Editor, *QST*:

I have recently had the opportunity of studying the Annual Report of the American Radio Relay League for the year ending December 31, 1951.

As an ARRL member, I wish to express my thanks to the officers of the League for a job well done, and the excellent manner in which the League's affairs have been reported in your summary. I feel that every ARRL member, in fact every licensed amateur in the United States and Canada, should read this Annual Report.

— T. C. Cunningham, VE2CK

[EDITOR'S NOTE: Copies of the Annual Report are available for 75¢. The sad fact, however, is that each year fewer than a dozen members ask for copies of this report.]

COUNTERWEIGHTS AWAY

SS Groton Trails
(at sea)

Editor, *QST*:

I wish to take exception to a remark made in an article in March *QST*. The article is entitled "Some Simple Ways of Erecting Temporary and Semi-Permanent Antennas." The objection is to the remark that "a bucket of bricks or sand is a simple counterweight."

I once had a 160-meter dipole between a tall fir tree and a 'phone pole, and resorted to the bucket of bricks method

(Continued on page 116)



Hints and Kinks

For the Experimenters



A METERING KINK FOR COMPACT EQUIPMENT

THE standard closed-circuit 'phone jack, frequently used for metering in equipment where compactness or economy is an important consideration, has a number of shortcomings in this application. The size of the jack itself may be a limiting factor — resulting frequently in inadequate metering provision in a small rig. It is unsatisfactory for plate or screen metering since insulating the shell from the chassis presents a shock hazard. For these reasons it is usually used only in essential tuning position, leaving a number of handy trouble-shooting test points unmetered. Polarity reversal presents a problem unless the jacks are insulated.

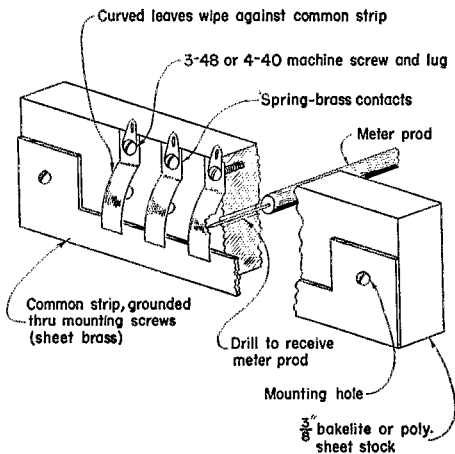


Fig. 1 — A home-built metering system for compact gear. Instead of using the usual closed-circuit jacks, W7MUI uses a strip mounted on the equipment in such position that it can be reached with test prods.

Figs. 1, 2 and 3 illustrate a solution employed at W7MUI to eliminate some of these difficulties. The device in Fig. 1 is extremely simple and compact, while the somewhat more elaborate version in Fig. 2 is handier to use since it holds the test

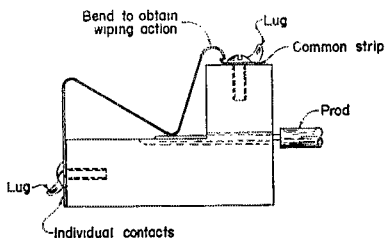


Fig. 2 — A slightly different application of the same idea shown in Fig. 1.

prod, freeing both of the operator's hands. Both of the units shown are intended for grid or cathode metering, one meter prod being clipped to the chassis. To meter above chassis separate con-

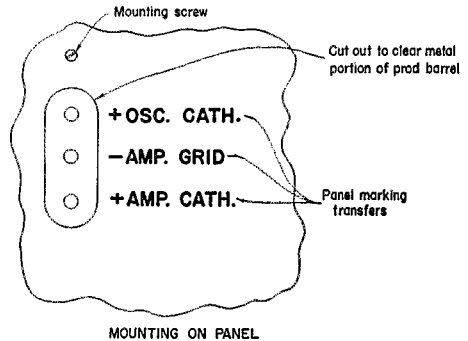


Fig. 3 — To make a professional-looking job, the test points can be labeled with panel-marking transfers.

tacts are used in place of the common strip and additional clips, similar to those in Fig. 2, are provided for the other meter prod. Paint dots or panel-marking transfers are used to indicate polarity. Installation is shown in Fig. 3.

Note that in each type of strip the spring brass contacts are arranged to provide a wiping action as they open and close. This effectively eliminates erratic operation due to tarnishing or corrosion. Better contacts may be had by raiding the junk box for old switch or relay leaves.

In Fig. 1, the plastic should be sufficiently thick to prevent insertion of the prod to the point where it will permanently bend the leaves. If a soft insulating material is used for the base, nuts should be used on the screws holding the leaves, $\frac{1}{4}$ -inch holes being countersunk from the front to take the nuts. Tapped holes may be used on hard plastics.

For safety's sake it is recommended that metering be done at ground returns whenever practicable. A 50-ohm resistor from leaf to ground will prevent high voltage from appearing on the meter terminals while changing ranges.

Using this arrangement, it is possible to meter ten positions in the space normally occupied by 2 or 3 standard jacks. You may not need them all for tuning, but they're mighty handy for front-panel trouble-shooting. — Paul A. Doty, W7MUI

STUB FOR TVI REDUCTION

IF you are experiencing TVI, try cutting a piece of 300-ohm Twin-Lead a quarter-wave long at the TV frequency, shorting one end, grounding this end to the TV receiver chassis, and connect-

ing the other end across the antenna terminals of the TV set. This has been found to be helpful in many cases, and in some it provided a complete cure. When computing the length of the stub, don't forget to multiply the length by the velocity of propagation factor. In the case of 300-ohm Twin-Lead, this is 0.82. — *C. D. Chandler, W4BO*

HOME-BUILT SHIELDED LINK

IT is a simple task to build your own shielded link from the shield braid removed from a short length of coaxial cable, as shown in Fig. 4. First cut a length of braid to correspond to the circumference of the desired link. Remove the inner conductor and the polyethylene dielectric, and then push on the ends of the braid to make it about half as long and twice as large in diameter as it was to begin with. In this form, it is easy to thread the required number of turns of insulated wire through the braid to form the link winding.

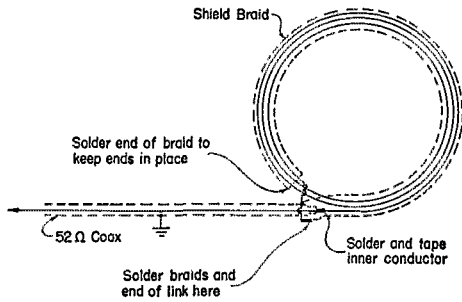


Fig. 4 — W9MUR's method of making shielded links. Note that one end of the shield braid is left "floating," while the other is soldered to the coaxial cable.

One end of the braid can then be opened up for about $\frac{1}{2}$ inch to provide means for joining it to the braid of the coaxial line that runs to the output terminal of the transmitter. One end of the insulated wire is soldered to the inner conductor of the coaxial cable, and the other end to the point where the two shield braids meet. Stretch the braid over the entire link coil, and form it to the desired shape. Cover the entire unit with a winding of cellulose tape, and mount it on a swinging arm assembly.

A six-turn link constructed in this manner has been in use for 75-meter operation at W9MUR for quite some time with excellent results. — *Richard C. Vail, W9MUR*

ELIMINATING GENERATOR WHINE

MOBILE hams plagued by a high-pitched generator whine can usually solve their problem by installing a 500- μ fd. 12-volt electrolytic condenser from the generator output terminal to ground. Correct polarity must be observed, of course, and will depend upon whether the car frame is positive or negative.

Do not connect the condenser to the field terminal of the generator because it will cause the voltage regulator contacts to fail. — *Don Kadish, W1OER, and Walter Cook, W1OED*

ANSWERING LC PROBLEMS WITH THE RECEIVER

IT is often difficult to determine the resonant frequency of an "unknown" LC combination, such as is encountered in surplus i.f. transformers. The following method has been used at W6KEV with success, and requires nothing more elaborate than the ham receiver.

If the unknown is a parallel-tuned circuit, convert it to a series-tuned one, and connect this across the receiver antenna terminals. Tuning across the range in which you expect resonance to occur, signals will be sharply attenuated when exact resonance is found. Provided that the receiver calibration is reasonably accurate, this system is usable with almost any LC combination resonant within the tuning range of the receiver. — *Raymond F. Rinardo, W6KEV*

TIPS ON USING THE 6BQ6-GT

THIS tube, which is being used frequently in ham shacks because of its low cost-vs.-power ratio, has a $\frac{1}{2}$ -amp. heater, the top of which is only about $\frac{1}{4}$ inch below the plate cap. Good ventilation is required, therefore, to avoid loosening of the plate cap. Ceramic plate connectors should be avoided, and instead the solid metal type should be used.

The basing arrangement of the tube leaves Pin 3 blank. This makes it possible to wire transmitters with the plate lead connected to Pin 3 as well as to the plate cap. Thus, in emergencies, other tubes, such as the 6V6, 6F6, and 6L6 may be plugged in and used. — *Nelson Bigelow, jr., W1RVV*

SIMPLIFICATION OF PILOT-LAMP REPLACEMENT

IT is often next to impossible to remove the bulb from a panel-mounted pilot light assembly because the end of the bulb is recessed just far enough to elude the tips of your fingers. At W1AW, where numerous pilot lamps are used, much time is saved by the simple replacement "tool" described below.

The center conductor, dielectric, and shield braid are pulled out of a 3-inch length of $\frac{1}{2}$ -inch diameter coaxial cable, leaving only the black vinyl covering. This fits snugly over the end of the bulb and makes replacement easy. — *Charles Wood, W2VMX/W1AW*

Answer to QUIST QUIZ on page 16

Not at all. If the TVI is caused by harmonic radiation getting out through the coaxial line (and not by direct harmonic radiation from some portion of the transmitter), the low-pass filter will attenuate the harmonics. A may have trouble load ing his transmitter without some changes in the coupling system, and if he is running appreciable power the filter may break down, but the harmonic attenuation is not dependent upon the line match. The transfer of fundamental power, however, becomes more of a problem when the filter doesn't work into a flat line of the correct impedance.



Operating News



F. E. HANDY, WIBDI, Communications Mgr.

J. A. MOSKEY, WJMY, Deputy Comm. Mgr.

GEORGE HART, WINJM, Natl. Emerg. Coördinator

I. G. McCOY, WIICP, Asst. Comm. Mgr., 'Phone

LILLIAN M. SALTER, Administrative Aide

WIAW Summer Traffic Watch. Quite often during the summer months stations get "stuck" with traffic they cannot relay. In view of the fact that WIAW gets around a lot, and has good connections into the National Traffic System, several periods have been set aside in the WIAW operating schedule as "traffic" periods. On Tuesday and Thursday, WIAW reports into the Connecticut Net (3640 kc.) to receive any ARRL incoming traffic. Other staff members handle this duty other nights. WIAW will be free to receive any traffic and will be standing by for that purpose in accordance with the following schedule:

Day	Time (EDST)	Freq.
Tuesday	1930-2000	3875 kc., A-3
Thursday	1930-2000	7100 kc., A-1
Friday	2030-2130	3550 kc., A-1

Note that the above frequencies are the regular National Calling and Emergency frequencies. Give WIAW a call there in accordance with the above schedule. We will answer and designate a side frequency for clearance of any traffic to whatever points addressed. If legal and practical relay of your traffic is possible, we'll be glad to handle.

Transcontinental Corps. Organizational work is now going forward looking toward the establishment of the Transcontinental Corps for operation as a part of the National Traffic System. In the NTS, generally speaking, participation is by consistent reporting into one's Section Net. We want *all* traffic men in NTS; this includes those with unlimited time, those just getting broken in, and those with average as well as outstanding ability. When we say *all* operators, we mean just that. Amateurs with limited time and an occasional message are welcomed too and definitely part of NTS, in proportion to their contributions and participation!

As in any large group, one will find some members whose time permits their shouldering a lot of the load and others who can attend but occasionally. The Corps functioning by selective point-to-point schedules as required to do the job is *not* a return to haphazard individual traffic relaying. It is rather a use of the voluntary individual facilities, organized to use the best band and time to suit daily convenience and propagation factors and *get the traffic through*. The TCC aim is to complete effective and entirely reliable liaisons between each area network. To the degree there's a full completion of the system, we

have filled out our possibilities in the way of reliable traffic exchange between any one of the 72 sections and any other! Single nets and lines do a nice job of the points they cover, but the aim here is to create the best *universal* system, since that can best serve all amateur radio locations! TCC functions can be performed by different stations each night just as has previously been done with net assignees. TCC success or failure at a given time is in proportion to the coverage of the networks and the completeness of the linkages for forwarding traffic. TCC assignments fulfill the requirement of direct liaison between nets in such areas as have not otherwise worked this out. The traffic flow between our lower echelon section nets can increase in proportion to the area-to-area and time-zone-to-time-zone scheduled coverage. As the right men step forward to take the responsibility and accept the honor accorded through TCC and NTS functioning, we have a constantly improving picture of an increasingly useful NTS, one in which all active amateurs can be a part.

Report into your state or section net with traffic for any other part of the nation and you have *all* nets at your disposal through TCC. If time and inclination permit you can use such experience to graduate into posts of section net responsibility or TCC work which make the NTS national in coverage.

For Short Transmissions When Working Mobiles. With the great increase in interest in mobile work, it is time those of us operating from fixed locations had a little more consideration for the chap working mobile. Push-to-talk techniques are the thing in every mobile. Such are of course the order of the day in the best fixed station operation. When traversing the highways at 40 or 50 m.p.h., there isn't normally time to listen to or give a long-winded account from the other fellow on how wonderful it is to hear you on the air, with side observations on the weather, traffic conditions, description of rig and all *in one transmission!* By the time one's turn comes for any mobile to repeat such a routine the mobile fellow is probably parked in his own driveway and the better half pestering the operator asking if he expects to sit in the car all night! Back-and-forth conversation or at the least reasonably short transmissions are most appreciated in the place of two-way long-drawn-out contacts. This goes for other operation too! Some good contacts have been ruined because one fellow kept the air so long the other fellow (mobile) got out of range without being able to

give him a report. *Short Skip* (Manchester, Conn., Radio Club bulletin) hopes that the chair-bound operators at home stations will gradually get the idea so we'll hear less of the long-winded monologues on the 'phone bands.

Try a simple announcement of your call letters and location, even when the band seems dead. This will often bring a surprise by turning up a call from some other mobile or station nearby where the operator was listening.

Club Progress. ARRL now has approximately 700 active affiliated clubs. Annual survey indications show club size up approximately 7.5 per cent with ARRL membership conditions about 12 per cent ahead of last year. The Novice group makes up about 6 per cent of most clubs' memberships. Fifty-seven new clubs were affiliated with ARRL in '51. The average club size is 34.3 members of whom 27.2 are government-licensed. AREC registrations in clubs amount to 16.5 registrations per group. This compares with 14 per group last year and 9 per group the preceding year. Mobiles number 8.65 per club which compares with 7 per club last year. All this is somewhat indicative of our growing ability to contribute to public service work when stand-by emergency communications are needed.

Set Standardization and Instructions. Where amateur groups are building new pack sets and gear for Civil Defense operations, local and area standardization of power plugs, positioning of controls, etc., is highly desirable. In recognition of the fact that a large number of units will always be of individual design or the design of different manufacturers, it is suggested that each amateur draw up a set of simplified *operational instructions* for his equipment. Attach this by tag or label to the equipment. It will serve as a guide should such equipments be placed on 24-hour operation in a national or local public emergency where several operators in turn would have to handle equipment. How to turn on and operate your rig, on station and emergency power? If not used in daily amateur radio work, you may be surprised how useful you yourself may find such operating directions!

A duplicate of the information may also be recorded on one full left-hand page of one's logbook, together with the telephone numbers of the emergency coordinator, of agency served in emergency, of other local communications facilities for liaison tie-in, traffic exchange or routing inquiries as might be required. Another suggestion: It is one thing to have emergency-power to be hooked up for Field Days, special test exer-

cises, etc., but preparedness without any time delay requires that it be possible to put a signal on the air at the throw of a switch! Most car installations have this capability but a lot of our emergency-powered home stations take longer to assemble than desirable. Study of this factor recently set us to modifying older gear to make all rigs and controls plug together by prepared-in-advance connectors. Alternatively, one can build complete units that are instantly operative and useful in the unexpected circumstances.

—F. E. H.

A.R.R.L. ACTIVITIES CALENDAR

Aug. 3rd: CP Qualifying Run — W60WP
 Aug. 18th: CP Qualifying Run — W1AW
 Sept. 5th: CP Qualifying Run — W60WP
 Sept. 10th: Frequency Measuring Test
 Sept. 16th: CP Qualifying Run — W1AW
 Sept. 20th-21st: V.H.F. Contest
 Oct. 4th: CP Qualifying Run — W60WP
 Oct. 11th: Simulated Emergency Test
 Oct. 15th: CP Qualifying Run — W1AW
 Oct. 18th-19th: CD QSO Party (c.w.)
 Oct. 25th-26th: CD QSO Party ('phone)
 Nov. 9th: CP Qualifying Run — W60WP
 Nov. 13th: CP Qualifying Run — W1AW
 Nov. 15th-16th, 22nd-23rd: Sweepstakes
 Dec. 5th: CP Qualifying Run — W60WP
 Dec. 5th-7th, 12th-14th: 10-Meter WAS Party
 Dec. 19th: CP Qualifying Run — W1AW

CODE-PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW will be made on August 18th at 2130 EDST. Identical texts will be sent simultaneously by automatic transmitters. Frequencies of transmission from W1AW will be 1887, 3555, 7130, 14,100, 28,060, 52,000 and 146,000 kc. The next qualifying run from W60WP only will be transmitted on August 3rd at 2100 PST on 3590 and 7248 kc.

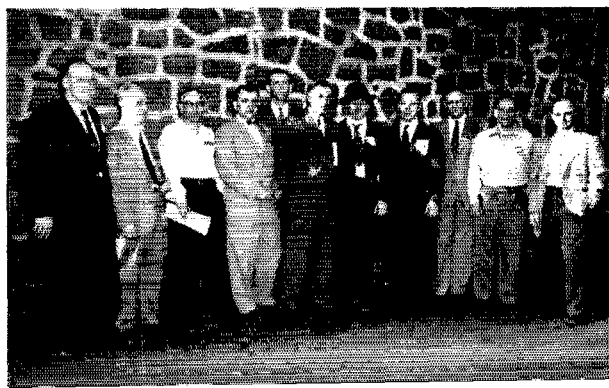
Any person may apply; neither ARRL membership nor an amateur license is required. Send copies of all qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the five speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m., you may try later for endorsement stickers.

Code-practice transmissions are made from W1AW each evening at 2130 EDST. References to texts used on several of the transmissions are given below.

Date	Subject of Practice Text from June QST
Aug. 5th:	<i>A Beat Frequency Exciter . . .</i> , p. 11
Aug. 8th:	<i>A 488-Mc. Converter . . .</i> , p. 14
Aug. 11th:	<i>A Three-Band 40-Watt Mobile . . .</i> , p. 17
Aug. 14th:	<i>The "Black Box" Antenna Mystery Solver</i> , p. 27
Aug. 20th:	<i>An Efficient Sling-Pack Portable . . .</i> , p. 33
Aug. 22nd:	<i>A General-Purpose Frequency Standard and Multiplier</i> , p. 40
Aug. 26th:	<i>An Improved Break-in System</i> , p. 45
Aug. 28th:	<i>The QH (Quick Heading) Beam Antenna</i> , p. 50

The Wisconsin Council of Radio Clubs was organized at the Wausau Hamfest April 26th. Delegates were, l. to r.: W9GJK, Door County Amateur Radio Club; W9JXY, M & M Radio Club; W9ONY, Milwaukee Radio Amateurs' Club; W9ART, Green Bay Mike and Key Radio Club; W9BCC, Point Amateur Radio Club; W9LED, Wisconsin Valley Radio Assn.; W9ILR, Kenosha Radio Communication Club; W9CSU; W9AXS, Dells Region Radio Club; W9LKL, LaCrosse Amateur Radio Club; W9RKT, Mancorad Radio Club.

August 1952





Bill Shakespeare, in one of his plays, said "All that glitters is not gold." We can apply this quotation to the AREC also, by observing that the AREC organization with the best publicity program is not necessarily the best AREC organization. Success is not to be measured in terms only of column inches in the local newspaper or program time on the local broadcast or television station, but also in such things as qualities of leadership, *esprit de corps*, turnout for drills and tests, extent of coverage and of cooperation with local officials, agencies and organizations to be served. We do not mean to say that publicity is of minor importance; far from it. We do mean to say that a good many of the intangible things which are not so apparent, added together can spell success or failure of a local organization with or without extensive publicity.

QST reports are a form of publicity which serve more as a historical record of achievement on the part of the radio amateur than as a brief moment in the limelight such as you generally get in your local paper. These are the chronicles which we can refer to in our own records to show the value and potentialities of amateur radio as a public service. We submit that therefore they are more important than most other forms of publicity, and that local ECs would do well to make sure that QST has accurate and complete details of all participation at the earliest possible moment.

The way we would like to see this worked would be for local ECs each to submit to their SEC a brief résumé of the part played in any particular emergency, especially when such emergency is widespread like the recent Midwestern flood. The SEC can then either consolidate them into a concise report of activities within his section, or transmit the whole bundle along with his monthly report to his SCM and ARRL Headquarters. Our job is then to consolidate that report with any others received into a QST version, either in the front pages or in the "Operating News" section, depending on several factors, such as extent of the emergency and material submitted (pictures, maps, etc.). This is what makes us an organization rather than "a vast army of hobbyists."

This is a report of recent emergency work in New Mexico: On May 6th a small dam on the upper Rio Grande failed, releasing 4000 feet of water in a 6-foot wall. W5s NXE RMU and UVA drove to Espanola to check while W5NJR monitored 3838 kc. at Los Alamos. The river created less than a foot below the levees, so we returned to Los Alamos around 0300.

On May 12th and 13th the Rio Grande levee above Belen became undermined causing a serious threat to the town. EC W5PXA obtained the assistance of W5s PIB and TGC from Albuquerque to set up an SCR-284 at the levee while W5PXA relayed from Belen. The net was in continuous operation for 23 hours and 10 minutes, with W5s JMM LDO NSN PBE and SE participating; 16 formal messages and countless informational transmissions were handled.

On May 19th and 20th the same situation occurred at the

same spot in the levee. The Naval Reserve Station at Albuquerque provided an SCR-299 which worked with W5s PIB-PLK and TGC at the levee. W5PXA and W5NXE provided the relay at Belen. This time the bulk of the Albuquerque traffic was handled by the gang at W5TGC and K5FBF. The net was in operation for approximately 21 hours.

A flash flood hit Albuquerque on June 5th and 6th, undermining roads and collapsing adobe houses. Members of the Albuquerque 10-meter net put eight mobile transmitters at the service of the city and assisted in evacuation and road patrol work.

— W5NXE, SCM New Mexico

The AREC organization in Minnesota, under SEC W0BOL, has worked out a plan whereby amateur radio will be used in disseminating information concerning the condition of some 65 "cow pasture" airports throughout the State. The way this works out, the Airport Manager calls a designated amateur every evening and gives him the airport condition according to a letter code. Such amateurs throughout the State would then meet in net form and exchange this information so that every member of the net receives information on the condition of every other field covered by this system. Each amateur then calls his Airport Manager and gives him the information. In some cases it is possible to cover several out-of-state points, and as a result the airways people in other states have taken up the idea. The South Dakota AREC organization is also organizing toward this purpose. Just another idea for an activity which can be of public service "between emergencies."

Here's a summary of SEC reports received so far this year, showing the number of AREC members represented in each case. Note that April is the highest so far, but we still have a long way to go — a long way:

Month	No. Reports	AREC Members
January	13	2381
February	16	3063
March	17	2949
April	18	3115

If these figures do not agree with those quoted in previous months, it is because several SEC reports show up here over a month late, believe it or not.

MIDWEST FLOODS

It doesn't always take a communications emergency to bring amateurs into action any more. Our facilities are available for special mobile work, and are often put to use for that purpose. In the recent Midwestern floods in the upper Missouri and Mississippi Valleys this fact was very much in evidence. In very few cases was there disruption of normal communications facilities, but amateur radio nevertheless was utilized to a very great extent.

Reports were received from Council Bluffs, where W0GFQ and his crew were of material assistance in an epic struggle against the rising waters; from Museatine, Iowa, and from St. Paul, Minnesota. These are the focal points around which this report is based, with only sporadic and miscellaneous information to supplement it.

Council Bluffs

The situation was fast becoming critical in the Council Bluffs-Omaha area on April 9th, and it was feared that over 5000 families would be flooded out should the dikes break on the Iowa side of the river. The Red Cross requested W0GFQ to set up a communications system be-

With the finesse and efficiency of experienced train dispatchers the hams of Wisconsin, under the leadership of SEC W9OVE, the Milwaukee Radio Amateurs' Club and the Badger Emergency Net provided communication for the movement of about 100 cars during the dedication of Wisconsin's new Memorial (Red Arrow) Highway on May 30th. Shown at control Station W9ART in Green Bay are (l. to r.) W9BKD, W9WLZ, WN9QLE, W9ART and W9OPV.

QST for



tween areas being evacuated and Red Cross Headquarters. The Civil Air Patrol was assigned to patrolling the dikes with hand-carried portables. The equipment originally destined for use by Civil Defense was put into operation immediately. The two amateur frequencies used were 29,640 kc. and 3990 kc. A call to all amateurs was put out by WØGFQ on 75 meters, requesting 10- and 75-meter mobile units and operators to report to the 10-meter net control station.

The call brought magnificent results. Over 150 men and women volunteered their services and equipment. Among the first heard from were WØs FQB, JDJ, UVU and YMU. A 75-meter net control station was set up at Police Headquarters, and as mobile units arrived policemen were assigned to 75-meter mobile units to patrol the city. Ten-meter mobile units were sent to areas being evacuated, each car supplied with a truck dispatcher to handle loading of furniture where required. A mobile unit was also stationed where the trucks were depositing the furniture. In addition, mobile units were stationed where the engineers were loading sand bags and at any weak spots on the dike where a concentration of men were working. Through our communication with the CAP walkie-talkies who were patrolling the dikes, it was possible to dispatch men and supplies to any spots in need of repair within the shortest possible time. Mobile units with an auxiliary policeman or National Guardsman were also dispatched to patrol all evacuated streets. All amateurs connected with the operation were furnished with passes; however, at no time were the ham operators put under the control of any civilian or military authority.

At first mobiles were used in place of certain fixed stations, but later generators were put into use and a.c. was available for fixed-station use, releasing the mobiles for patrol duty. At the height of the emergency, approximately 5000 messages per 24-hour period were completed. At critical times 7500 to 8000 messages were handled. Ten transmitters and 15 receivers were in fixed service, most of them at the 75- and 10-meter net control stations.

Amateurs swarmed to Council Bluffs from all parts of Iowa and Nebraska and several other states. W3RRH came all the way from Arkansas to assist. WØBVX hitch-hiked to Council Bluffs from Onawa, Iowa, after working three days and nights against the flood at his own home. Five YL amateurs were also in there punching: WØs CJY, CSN, FHH, PLL and NXW.

As the river receded and the need for the amateurs' services ceased to exist, all concerned expressed their bottomless thanks to the amateurs who cooperated with and assisted the City of Council Bluffs in this emergency. Special thanks were due to Leo Meyerson, WØGFQ, who practically turned his place of business over to the amateurs, supplying transmitters and receivers in quantity for the fixed stations. We are indebted to WØCJY for most of the above information.

Muscatine

From April 16th to May 6th, members of the Muscatine Amateur Radio Club and the Muscatine AREC organization, under the leadership of EC WØFDL, conducted communication 24 hours per day along a critical stretch of levee extending from Muscatine 20 miles down the river, protecting thousands of acres of farmland. WØFDL was established at the City Hall on April 17th, and four other fixed stations were established along the levee down the river. Although there was no disruption of normal communications facilities, the amateur net dominated the communications along the levee since there are no permanent telephone lines over the area which was threatened. The other four stations were WØGPJ, WØMCI, WØVRD and WØKZW. Equipment was supplied by several local amateurs, Red Cross Chapters and the National Guard. The network of

This was the set-up at the Muscatine (Iowa) City Hall during the flood, the first installation in action in the Muscatine area, using equipment supplied by WØFDL and WØGLJ. Shown operating the rig is WØBMZ. Standing is WØFDL, ARRL EC and Civil Defense Communications Officer.

fixed stations was supplemented by field telephone lines laid by the National Guard, and by runners. Some 3500 messages were handled during the 480-hour operating period.

St. Paul

Situated as it is only 250 miles from the source of the Mississippi River, St. Paul normally has little to fear from floods; however, for the second successive year the city suffered record all-time high-water marks. On April 9th, when the rise began to assume serious proportions, a 10-meter pack set was set up in the Lutheran Church to contact WØDKI, the net control station at Red Cross Headquarters. On the following day, 10-meter pack sets were installed in two National Guard amphibious "ducks" and provided reliable contact with net control throughout the area. After the first few hours of confusion an orderly system evolved whereby incoming calls for assistance were relayed from Red Cross Headquarters to the ducks via the net control station.

On April 12th, Armour Packing plant appealed for an amateur net to aid in directing its fight to keep the dikes intact. Two packs sets and a mobile were dispatched and a net was set up on 28,720 kc. in less than two hours. On April 13th a third rescue vehicle was added to the amateur network when a Coast Guard barge from Duluth was pressed into service. At 1800 Sunday another large area on the west side of the river went under and at 2000 two more ducks arrived, radio gear was installed and out they went.

A council of war was held at WØDKI Sunday evening and as a result Monday morning saw three nets in operation, one on 29,600 kc., one on 29,640 kc., and a third on 144 Mc. using the St. Paul Radio Club's two-meter transceivers. Needless to say, Monday (the 14th) was a very busy day in St. Paul on the above-named frequencies.

On April 15th, as the river level rose eight feet above flood stage, the nets operated from 0800 until dark, and on April 16th, just one week from the beginning of operations, the station was secured after approximately 75 hours of emergency operation. Approximately 34 amateurs participated, most of them members of the St. Paul Amateur Radio Club.

Miscellaneous

In South Dakota, WØCRY, EC for Minnehaha County, and his gang assisted in providing river information and emergency communication.

Sioux City, Iowa, South Sioux City, Nebraska, and Dakota City, Nebraska, were threatened on April 11th. WØENS was active at Sioux City, and South Sioux City was finally abandoned. WØJED and WØYSK moved into Dakota City to set up communication, but by April 18th Dakota City was also abandoned.

Some medium-distance work was also carried on, especially around 3970 kc. The Iowa 75-Meter Net shifted to 3930 with their normal operations. WØGFQ was active several evenings on the Iowa Section Net (TLCN) on 3560 kc. and on the Tenth Regional Net (TEN) on 3545 kc., with some traffic being handled. EC WØSEF was also active in Persia, Iowa.

We want to acknowledge the report on St. Paul from EC WØHKF; from Muscatine through EC WØFDL; and other information taken from the June-July issue of "Midwest Clix" edited by WØKXL.



BRASS POUNDERS LEAGUE

Winners of BPL Certificates for May traffic:

Call	Orig.	Recd.	Rel.	Del.	Total
W3CUL	322	2944	2511	424	6201
K5FKF	625	861	1373	111	2970
W6HQX	62	1437	1422	16	2937
KG6FAA	629	1164	891	195	2879
KZ5AA	31	1263	1225	35	2554
KR6AF	357	894	614	270	2125
W6KYV	261	889	317	569	2038
W8ZGT	16	1018	992	4	2030
W6GYH	11	998	825	173	2007
W9JUJ	17	991	944	14	1966
K4WAR	104	829	779	50	1762
W0COZ	9	847	838	24	1718
W2BTB	38	813	820	21	1692
W7IOQ	35	735	725	29	1524
W6HK	219	638	510	128	1495
W7CZY	9	699	683	9	1405
JA8AB	137	573	499	74	1283
W4FJU	20	605	489	116	1230
K5FBB	316	340	301	49	1006
W6BPT	4	401	392	8	805
W0SCA	4	392	402	3	801
W9QXO	8	395	292	102	797
W9TT	19	383	330	49	781
W1CRW	11	388	369	11	779
W2BO	37	329	353	44	763
K6FAJ	105	303	294	9	711
W0KHQ	3	6	3	636	648
W8ARO	26	307	221	80	634
W8AUJ	11	314	279	29	633
W1SJO	50	297	236	49	632
W0BDR	5	304	263	29	601
W4MGT	13	282	276	5	576
W5MN	27	274	53	220	574
W2BNC	4	281	272	13	570
W7BA	61	230	117	113	521
W8CTZ	11	255	226	25	517
Late Reports					
W6GYH (Mar.)	23	705	620	66	1413
W2CCS (Apr.)	14	358	334	14	720
W9QXO (Apr.)	5	313	264	48	630
W1CRW (Apr.)	17	292	280	8	597
K6FAJ (Apr.)	23	269	259	10	561

The following made the BPL for 100 or more originations-plus-deliveries:

K5FBB/5 217	JA2ES 135	Late Report
W9NZZ 201	W1AW 103	W6EXH (Apr.) 104
W2AEE 151	W8BAM 101	

A message total of 500 or more or 100 or more originations-plus-deliveries will put you in line for a place in the BPL. The Brass Pounders League is open to all operators who qualify for this monthly listing.

TRAFFIC TOPICS

As long as we have amateur traffic handling activities, we will continue to have differences about all of its phases — the form of the message, its routing, individual responsibilities, net procedure and ethics, how to count, etc., etc. These differences are natural and desirable, since they indicate that considerable thought is being given to the subject. Through the years, ARRL has tried to set the standard which meets with the demands, wishes and objectives of the majority. Since on each detail there are at least half a dozen different ways of doing it, whatever standard we set has a less than 50-50 chance of being acceptable to the majority.

Today, with many newcomers from the Novice ranks starting to handle traffic, an increase in the amount of traffic handled on 'phone by operators who have never before done so, and an influx of military training traffic, we are meeting all different kinds of procedure. Naturally, the reaction has been strong, especially on the part of old-timers who have been handling traffic for a good many years. If the truth be known, the appearance on the traffic lanes of these hybrid forms, much as it may irk some of us, is indicative of a new interest in traffic handling on the part of those amateurs — some new, some old — who have not previously engaged in this activity.

What to do when a message comes to you with an incorrect preamble, for example? Refuse it? Correct it? Or relay it in exactly the same form? Well, we ought to observe some basic rules in handling such traffic, rules which were not observed by the originating and/or relaying stations. First of all, as relaying stations we may not change any part of the message, even if we know it is incorrect. We can, however, rearrange the various parts of the message so that they are in proper order, and add parts which are not included, such as a check. We cannot add a place of origin if none is given, nor a station of origin, nor a time or date; but if these are not in the proper order, it is perfectly OK to rearrange them in accordance with ARRL procedure.

In view of the fact that many of these messages come from persons or stations not generally familiar with traffic handling, we should adopt as much tolerance as we can toward them. Refusing to handle them cannot but cause hard feelings. Rather an educational program would seem to be in order.

Much of the traffic which is not in standard form has MARS origin. One of the basic MARS rules for traffic handling is that such traffic be converted to amateur procedure when handled in the amateur bands (see page 16, February, 1952, QST). When this rule is not followed by the station which brings the traffic from MARS to amateur circuits, we feel it perfectly proper for any amateur to make the change back to ARRL form provided he does it properly.

National Traffic System. At this mid-June writing, NTS is just beginning to undergo its customary early summer pains. This year, however, we have more assurance that all regional and area nets will continue in operation. True, some of them will have to cut down their operation in accordance with the reduced personnel availability. The Transcontinental Corps got under way in June with a cadre of operators in each time zone. WINJM has assumed the rôle of "Acting Manager" until initial organization has been accomplished, and in the fall a permanent manager of TCC will probably be appointed, along with three assistants, one for each of the three NTS areas (i.e., Eastern, Central and Pacific). Those of you who have already received invitations to participate in TCC, hang onto them and send them in in the fall if you are unable to participate this summer. Otherwise, your immediate submission of the application form will be gratefully received and promptly acted upon. The ability of operators to keep regular schedules during the summer months is somewhat erratic, and there is need for alternates two or three deep in order to assure that each TCC function will be performed.

May reports:

Net	Ses- sions	Traffic	High	Low	Aver- age	Most Consistent
EAN	22	954	80	9	43.3	2RN, 3RN
CAN	19 ¹	491	68	0	25.7	TEN
1RN	30 ²	306	34	0	10.2	Vt.
2RN	44	372	37	0	8.5	JN
3RN	44	446	28	0	10	MDD
4RN	21	348	60	3	16.6	Fla., N. C.
RN5	12 ³	124	37	0	10	Ala., Ark.
RN6	62	1375	90	2	22	
RN7	46	310	41	0	6	Wash.
SRN	34	167	19	0	7.4	Ohio
9RN	24	530	75	0	22.1	Ky.
TEN	43	1388	169	5	32.2	Ia., Kans., Minn., Ont.
TRN	44	50	9	0	1.1	Ont.
QIN (Ind.)	55	800	60	0	14.5	
QMN	46	294	20	0	6.3	
(Mich.)						
TLCN (Ia.)	22	495	53	4	20.1	

¹ 20 sessions held. ² 44 sessions held. ³ 17 sessions held.

Eastern Area Net (3670 kc., 2030 EST, Monday through Friday): Congratulations are in order to W2COU and his 2RN gang for their excellent attendance record so far this year. Nary a miss for the first five months.

Central Area Net (3670 kc., 2030 CST, Monday through Friday): The new manager, W9JUJ, is bringing renewed interest and enthusiasm into CAN.

Pacific Area Net (7207 kc., 1930 PST, Monday through Friday): W7WJ has been reinstated as PAN manager, and he hopes to reestablish orderly operation.

First Regional Net (3605 kc., 1845 EST, Monday through

Friday): 1RN is running the first session only during the months of June, July and August.

Second Regional Net (3690 kc., 1730 and 1945 EST, Monday thru Friday): More consistent representation is needed from NLI, since much traffic goes that way.

Third Regional Net (3590 kc., 1945 and 2130 EST, Monday through Friday): All three section nets in the Third Region have discontinued regular schedules for the summer and all members have been invited to QNI 3RN.

Fourth Regional Net (3615 kc., 2000 EST, Monday through Friday): More representation is needed from Georgia.

Fifth Regional Net (3645 kc., 2000 CST, Monday, Wednesday and Friday): Manager W5MRK is a proud papa. More representation is needed from Southern Texas.

Sixth Regional Net (3615 kc., 1945 PST, Monday through Friday): Still has difficulty with East and North traffic.

Seventh Regional Net (7225/3575 kc., 2000 CST, Monday through Friday): W7PKX takes over RN7 for June, July and August.

Eighth Regional Net (3530 kc., 1945 and 2130 EST, Monday through Friday): SRN hopes to maintain full operation throughout the summer.

Ninth Regional Net (3565 kc., 1945 CST, Monday through Saturday): 9RN certificates have been issued to W4CDA, W4TAV and W9EHS. W9TT says that "this is the time of year that separates the men from the boys."

Tenth Regional Net (3745 kc., 1945 and 2130 CST, Monday, Wednesday and Friday): W0BDR, W0DQL and W0UBB have received certificates. The TEN operating schedule will be increased if summer traffic demands it.

Thirteenth Regional Net (3675 kc., 1945 EST, Monday, Wednesday and Friday): Poor propagation conditions are making the long hauls required to be covered on TRN difficult, but VE3BUR vows they will keep trying.

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.

Northern New Jersey	Lloyd H. Manamon, W2VQR	July 26, 1952
New Hampshire	Carroll A. Currier, W1GMH	Aug. 15, 1952
Arkansas	Fred Ward, W5LUX	Aug. 16, 1952

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 Sections. 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 memberships, individual signers uncertain or ignorant of their membership status, etc.

The following nomination form is suggested: (Signers will please add city and street address 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
Northern Texas	Aug. 1, 1952	William A. Green	Oct. 15, 1952
San Diego	Aug. 1, 1952	Mrs. Ellen White	Oct. 15, 1952
Maritime *	Aug. 1, 1952	Arthur M. Crowell	Oct. 16, 1952
Nebraska	Aug. 15, 1952	Guy R. Bailey	Resigned
Yukon *	Aug. 15, 1952	W. R. Williamson	Mar. 17, 1949
San Francisco	Aug. 15, 1952	R. F. Czeikowitz	Apr. 14, 1952
West Indies	Aug. 15, 1952	William Werner	Aug. 15, 1952
Kansas	Aug. 15, 1952	Earl N. Johnston	Oct. 29, 1952
Sacramento			
Valley	Aug. 15, 1952	Ronald G. Martin	Nov. 1, 1952
Western Mass.	Sept. 2, 1952	Victor W. Paunoff	Nov. 10, 1952
Saskatchewan*	Oct. 1, 1952	Harold R. Horn	Dec. 15, 1952
Kentucky	Oct. 15, 1952	Ira W. Lyle, jr.	Jan. 2, 1953
Hawaii	Oct. 31, 1952	John R. Sanders	Jan. 14, 1953

* In Canadian Sections nominating petitions for Section Managers must be addressed to Canadian Director Alex Reid, 169 Logan Ave., St. Lambert, Quebec. To be valid such petitions must be filed with him on or before the closing dates named.

DX CENTURY CLUB AWARDS

HONOR ROLL

W1FH 243	W6ENV 238	G6ZO 231
W8HGW 243	W6AM 234	W3JTC 231
W3BES 242	W3GHD 234	W3KT 230
W0YXO 240	W3CPV 234	W4BPD 230
W6VFR 240	W6SN 232	W3EVW 230
G2PL 239	W2BXA 231	

RADIOTELEPHONE

W1FH 218	XE1AC 212	W1JCX 193
PY2CK 215	W8HGW 200	W2BXA 190
VQ4ERR 213	W9RBL 199	W3LTU 187
	W1NWO 195	

From May 15 to June 15, 1952, DXCC certificates and endorsements based on postwar contacts with 100-or-more countries have been issued to the amateurs listed below.

NEW MEMBERS

W5EB 125	LA3Y 103	G2GM 100
PY1HQ 154	W1BTE 103	KG4AF 100
W3A00 120	W5KTD 102	DL300 100
DL7BK 114	VE2WA 102	CT3AV 100
W1MJJ 107	VE1BD 102	W5KCR 100
KV4AQ 106	DLIKV 101	W8FXP 100
W5AWT 105	W40SU 101	W8IQS 100
G3APX 104	G8CD 101	G3CWW 100
DL1PV 104	W5WI 101	W7KEV 100
	W7EJD 101	

RADIOTELEPHONE

PY1AGP 114	W2WZ 107	E14L 100
W5EB 108	IICAR 104	

ENDORSEMENTS

W1ENE 220	W2CNT 172	W0TKX 150
W0DAE 208	KH6VP 170	W6NW 150
KH6JJ 203	PY2OE 170	W6GPB 144
W1ADM 200	W1HA 170	VE5RX 142
W8SYC 200	W3LFF 170	W5BZT 126
F8IH 199	W1LTL 169	W6VDG 123
G8KP 193	W5KUJ 160	W6MEL 121
G2MI 191	W2GFV 160	G8ON 120
W8BKP 191	W6KYG 159	PY1ADA 120
W9LNM 190	PY2NX 154	W1FTY 113
G3DO 190	W8WVU 150	W2PZM 113
W1AXA 190	LA6U 150	W1RAN 110
W5JUF 174	G3COJ 150	

RADIOTELEPHONE

G2PL 180	I1YJ 150	G8KP 130
HC2JR 170	W5JUF 143	PY1AQT 124
G3DO 160	EA2CQ 142	ON4YT 120
W1ADM 154	W0NCG 130	

SCM AEG ORS CP SEG OBS TLE OO
Station Activities
 OBS A10PR EC DXCC CLUBS RM OPS RCC

• 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, John H. DuBois, W3BXE — SEC: ISE. RMs: AXA, BIP, E. Pa. Nets; 2610 kc. The following officers were elected at the May 15th meeting of the Delaware-Lehigh ARC: PYP, pres.; CBN and 2ZVW, vice-pres.; OLO, secy.; QBF, treas. This Club represented amateur radio at the recent Easton Chamber of Commerce Sportsman Show and is active in the Northampton Co. C.D. Net on 29.6/29.64 Mc. The Philadelphia Area Council of Radio Clubs furnished communications during the annual Delaware River motor-boat races on June 1st. The Lebanon Valley and Lancaster Clubs are holding regular 2-meter hunts during the summer. The Phil-Mont Mobile RC conducted a field strength survey for Bucks Co. c.d. organization on May 4th and participated in VFW parade and c.d. demonstration on Apr. 26th. During the recent c.d. drill in the Philadelphia Area, eight Control Centers, four fixed, and eight mobile stations were in operation. Results were highly successful. The York Red Cross set-up now has a well-equipped communications truck and eleven mobiles operating on 29.492 Mc. The Lebanon Valley SRA is installing gear in the County Jail for its AREC/c.d. station. New "AN" (Anthracite) Net is starting up in the coal region for training traffic and emergency work. This net will meet on 3610 kc., 7 p.m. EDT, Mon. through Fri. The E. Pa. Traffic Net is inactive for the summer, but 3RN still is in operation to furnish coverage. WN3SNI is organizing a Novice emergency net on 3735 kc. BES brought his country total to 245. CUL makes BPL again. KEW now has five states on 50 Mc. from new QTH in Broomall. LN is recovering from an operation and will be back in business soon. MAC made it 134 with an EA9. OY is back on 3610 kc. after a two-year lapse. QLZ received his 25-w.p.m. CP sticker. RFI is rebuilding with 813 final. RJE is checking into EPA and 3RN with 35 watts. RJD is on 75-meter 'phone with 85 watts and screen modulation. QMW is on 420 Mc., and looking for skeds. WN3SMB has Novice traffic count of 4 on 2 meters. WN3TEY is operating 146 Mc. with a 522. TKP is active at Franklin Institute. As a reminder, all reports must be received by the 5th of the month, otherwise they will be held for the next issue. Traffic: W3CUL 6201, PYP 208, QLZ 125, AD 96, EID 63, AXA 50, VR 32, ADE 26, RCG 24, RJB 18, PVE 10, DUI 8, QLI 7, QEW 5, BES 3, WN3SMB 4.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA — SCM, James W. John, W3OMN — On May 19th the Baltimore Amateur Radio Club had a talk by HWZ, Maynard Briggs, on "TVI Proofing your Transmitter." On June 2nd MZK, Ron Wood, explained how he cleaned up his 807 transmitter. QLA, A. G. Gilbert of FCC, covered TVI problems. Kits for GDOs were distributed to club members. SGV's talk on Clapp Oscillators was presented to the Chesapeake Amateur Radio Club on May 26th. On May 25th the Rock Creek Amateur Radio Association held a panel discussion on the proposed changes in the Amateur Rules. All Delaware stations are invited to report into the Delaware c.d. net at 3993 kc. on Sundays at 9 a.m. DST. CVE reports TCN now has two sessions — 0615 and 0015 GMT daily. QZC qualified for 30-w.p.m. sticker and has a new rig. Traffic: W3CUE 395, LZM 314, QZC 279, PZW 210, COK 43, HC 43, JE 40, AKB 34, ONB 26, NNX 4.

SOUTHERN NEW JERSEY — SCM, Lloyd L. Gainey, W2UCV — PTM returned from Europe this month after some personal DXing, and reports FB QSO with ZX while visiting G6BY and snagged elusive MP4KAC while at OZ3EA. ASG will be in W7-Land during the month of June. The DVRA has set up a local civil defense council center at 23 W. Hanover St., Trenton, using the club call ZQ. They have ten mobiles operating on 29,500 kc. with drills each Friday at 8 p.m. ZNO now is mobile on 28 Mc. GCU erected a center-fed 40-meter doublet with excellent results to the north and west on 80 and 40 meters. HAD has curtailed his activities while de-TVing. FXT is getting set for maritime mobile operation on 40 meters in August. PAU recently recovered from a siege at Cooper Hospital. He maintained his 2-meter activities using his portable rig

at his bedside. Emergency Coordinators in this section are reminded of their responsibility to make full and regular monthly reports to the SEC. Only a few ECs have been mailing these reports in. BLV and EH have erected twenty-element beams on 420 Mc. with great expectations for the future. QED is the proud papa of a baby girl. 7NJE/2 is giving instructions to a local group on s.s.s.c. Traffic: W2RG 270, K2BG 133, W2ASG 29, ZI 5.

WESTERN NEW YORK — SCM, Edward Graf, W2SJV — SEC: UTH. RMs: RUF, COU. PAM: GSS. NYS, 3615 kc. 7 p.m. 3980 kc. 6:30 p.m. NYSS, 3595 kc. S.P.M. NYS C.D. 3509.5 and 3995 kc. at 9 a.m. Sun. Members of the Binghamton Radio Assn. manned a booth at the Alert America Show using the call UJS/2. K2DG has a new NC-125. QAA located all ham gear in one room. PGT is active on 160 meters. CZQ is on 75 and 80 meters with 5 watts. The Rochester Hamfest was well attended and RARA wishes to thank all for their cooperation. On May 21st the newly-formed 75-meter 'phone net was formally opened with GSS as Net Manager. Forty-seven stations reported and messages of welcome were heard from ILL, SCM of E.N.Y. and SJV, SCM of W.N.Y., as well as from WIAW, ARRL Headquarters station, and 1BDI, ARRL Communications Manager. 1NJM, National Emergency Coordinator, and 3GEG, our Director, were unable to be on hand so sent messages to be read. Ken Thomas, Red Cross Disaster Communications Chairman, Onondaga Co. Chapter, addressed the net. Nineteen from W.N.Y. attended the v.h.f. meeting in Oakville, Ont. Erie Co. AREC conducted a test for local c.d. officials. ZOL and BTB attended the graduation of their jr. operator at Staunton and visited hams along the trip. FMH has returned after a winter in Florida. RXM and IJR are MM from the Yacht *Dutchess*. 3QMP is in the USAF and operating K2FAV. All Emergency Coordinators are requested to contact their local Red Cross Disaster Communications Chairman to advise him of the availability of the AREC for emergency communications of any nature and to have a representative of the local AREC nets call in to the NYS c.w. and 'phone nets to effect tie-ins for long-haul traffic. PYC skeds GLX each week on 80 meters. BVZ has HRO-50-1 and runs 125 watts on 75 and 40 meters, and is active in NYS and ICFN. COU and WZQ report an FB time at the Rochester Hamfest. The Rochester v.h.f. meeting was held at the QTH of UXP. UTH and YUE spoke on 2-meter mobile and OWF gave the gang all the dope on the ARRL V.H.F. Contest. JEY is back on the air again after a siege of fever. HNN is mobile 75 meters. HSI is on 80 and 40 meters. QHH worked VP4LZ on 160 meters with a single 616 for his 10th country on 160. JUV is a new station on 2 meters and station at the Syracuse State Fair, assisted by CYD, Onondaga Co. EC. Traffic: W2BTB 1592, ZOL 417, RUF 411, COU 284, NAI 153, VIQ 143, BVZ 99, DJF 93, GSS 74, TPN 52, OE 44, SJV 42, WZQ 25, PYC 22, RJJ 12, K2DG 10, W2UYG 9, RCG 7, KEL 7, ZHU 5, JEY 4.

WESTERN PENNSYLVANIA — SCM, Ernest J. Hlinsky, W3KWL — One of the biggest acts of public interest occurred in Mercer County when the Mercer County Radio Assn. put on a full week of demonstration at a Local Home Show. Equipment for 144 Mc. was set up and traffic accepted for overseas and state-side. The demonstration created quite a showing since it was the first public appearance of a local amateur radio group. With indoor antenna several outside stations as far as 20-odd miles were worked, messages relayed into Regional nets on c.w. Among those active in this set-up were KQA, SOAJ, GEG, MWV, LNA, KWL, KQM, NCD, CJF, WN3SXF, QNC, and SCW. Highlight was the splendid operating technique of WN3SYZ who, although handicapped by blindness, showed a remarkable ability to carry on and make friends. The MCRA also played hosts to 30 Boy Scouts who were given opportunities to hear interesting talks on ham radio and see actual operation of ham gear. Up Emporium way, *The Bucktail Hamster* reports that club activity feels the spring fever among its members. The Steel City Amateur Radio Club still puts out its fine club paper with NKM, MPO, RXT, RIK, NRQ, and Jack Engel doing a wonderful job as editorial staff. The WPEN hamfest was a huge success with prizes being well distributed among LOR, MTP, NKM, NRQ, OUA, SWL, MPO, and UUG. Can someone tell OMY how to find 420 Mc.? New ORS is 21VS/3, who is attending college at Meadville. WN3SLY has received her General Class ticket, and the OM, KXS, received his Extra Class ticket. Western Pennsylvania's outstanding XYL operator, JSH, received her WAS certificate for 80 meters and is sweating out her Class A ticket. CA reports he traded his Collins 32V-2 for a 32V-3. UVD, in Jeannette, is working on his grid-dipper. Our Atlantic Division Director, GEG, a mem-

(Continued on page 74)



A NEW MODEL of the famous HRO series of communications receivers is now available. The new addition to the series has double conversion on all frequencies where the use of such a system offers an advantage, has a new crystal filter, and incorporates current regulation of both the first oscillator and mixer heaters. All of the proven features of the HRO series have been retained including the exceptionally selective IF amplifier.

This new HRO provides exceptionally high rejection of undesired signals. The two R.F. stages with three high Q tuned circuits ahead of the first mixer guarantee virtual freedom from spurious signal interference. Preliminary models were "on the air" tested during the 1951 ARRL Field Day and during the recent SS contest. In the hands of even the most inexperienced operator, the new HRO is a superb performer.

After the design of the HRO-Sixty was completed, the writer compared it with his own elaborate experimental receiving installation. This installation includes an adaptor of selectable single sideband reception of conventional signals. A choice of three bandwidths was also available: 100 cycles, 1200 cycles, and 3000 cycles. In addition, either locally generated or filtered and reconditioned carrier voltage was available for detection. Tests made in crowded amateur bands indicate that in almost all cases the use of the crystal filter in the HRO backed up with the highly selective IF amplifier ran circles around the SSB unit. The only time the elaborate system offered any improvement was when CW was received in the 100 cycle position. This was a little discouraging to me since I had devoted considerable time, money and effort to the design and construction of fussy torroidal carrier and sideband filters. Incidentally, the market value of the adapter alone would exceed that of the HRO!

Working with sharp filters requires stable oscillators and precision tuning mechanisms. The stability of the receiver with change in line voltage has been considerably improved by the addition of a current regulator. Every PW condenser and drive used in the HRO is carefully checked in a special jig before installation. Bearing tension is carefully adjusted to a standard and the rotors are electrically centered. Mechanical centering is not relied upon for correct rotor alignment.

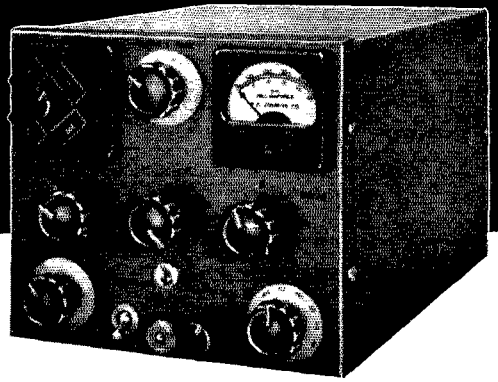
As in the past, a wide variety of extra coil sets and dial scales is available for special coverage. The AA range, for example, provides a 90 db. signal to image ratio. It is interesting to note the wide frequency coverage of the HRO — 50 kc. to 35,000 kc., complete except for the small gap at the IF frequency, plus 50 to 54 Mc. The coil system and the availability of easily installed dial scales are a guarantee against receiver obsolescence.

Writing about an HRO is easy — the thrill of personal use makes it so.

ED HARRINGTON, W1JEL



Announcing the NEW **JOHNSON** VIKING MOBILE KIT



AMPLIFIER INPUT: 30 to 60 watts
BANDSWITCHING: 75, 20 and 10 meters
DASH MOUNTING, GANG TUNING
**CRYSTAL SWITCHING, VFO PRO-
VISION**

Antenna loading problems solved in advance, the result of extensive development work. Efficiency assured, "cut and try" eliminated with specific antenna data!

240-141 kit complete, less tubes, microphone, power supply and antenna.

\$99.50
Amateur Net

Unlike any mobile "ham rig" you've ever seen before! Plenty of power, audio gain, 100% AM modulation combined with the utmost in operating convenience. Designed for economy of power and maximum utilization of power conversion equipment.

RF SECTION

Three ganged RF stages with an 807 output amplifier. All inductors for 75, 20 and 10 meters contained in transmitter. Bandswitch provides for one additional band. Adjustable links for each band, tailored for 52 ohm coax. Four crystal positions; Viking VFO will drive the Viking Mobile to full output.

These Cooperating JOHNSON Dealers

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Ack Radio Supply Co
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Hagerly Radio Supply
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LONG BEACH
Larry Lynde Electronics
1526 East 4th Street

LOS ANGELES
Henry Radio Stores
11240 West Olympic Boulevard

WEST LOS ANGELES
California Electronics Supply, Inc.
11801-03 West Pico Boulevard

OAKLAND
W. D. Brill Co.
198 10th Street

PASADENA
Empire Electronic Distributors, Inc.
37 East Union Street

SAN DIEGO
Western Radio & Television
Supply Co.
1415 India Street

SAN FRANCISCO
Offenbach & Reimus Co.
1564 Market Street
San Francisco Radio & Supply Co.
1284 Market Street
Zack Radio Supply Co.
1424 Market Street

SAN JOSE
Frank Quement, Inc.
161 West San Fernando Street

DISTRICT OF COLUMBIA

WASHINGTON
Capitol Radio Wholesalers, Inc.
2120-22 14th Street N.W.

FLORIDA

MIAMI
Herman Radio Supply Co.
1365 N.W. 23rd Street

TAMPA
Kinkade Radio Supply Inc.
402-04 West Fortune Street

GEORGIA

ATLANTA
Specialty Distributing Co., Inc.
425 Peachtree Street N.E.

ILLINOIS

CHICAGO
Allied Radio Corp.
833 West Jackson Boulevard
Newark Electric Co.
223 West Madison Street

INDIANA

INDIANAPOLIS
Graham Electronics Supply, Inc.
102 South Pennsylvania Street

IOWA

COUNCIL BLUFFS
World Radio Laboratories
744 West Broadway

DES MOINES
Radio Trade Supply Co.
1224 Grand Ave.

KANSAS

WICHITA
Amateur Radio Equipment Co.
1203 East Douglas

KENTUCKY

LOUISVILLE
Universal Radio Supply
533 South 7th Street

LOUISIANA

NEW ORLEANS
Radio Parts, Inc.
807 Howard Avenue

MARYLAND

BALTIMORE
Kann-Ellert Electronics Inc.
9 South Howard Street

MASSACHUSETTS

BOSTON
Hairy & Young
811 Boylston Street
Radio Shack Corp.
167 Washington Street
Radio Wire Television Inc.
110 Federal St.

MICHIGAN

ANN ARBOR
Purchase Radio Supply
605 Church Street

BATTLE CREEK
Electronic Supply Corp.
94 Hamblin Avenue

DETROIT
M. N. Duffy & Co.
2040 Grand River

MINNESOTA

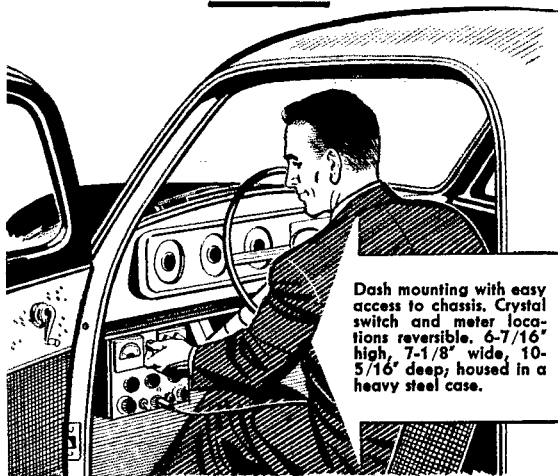
DULUTH
Northwest Radio
123 East First Street

MINNEAPOLIS
Lew Bonn Co.
67 South 12th Street
Northwest Radio & Electronic
Supply Co.
52 South 12th Street

ST. PAUL

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Northwest Radio & Electronic
Supply Co.
194 West 4th Street

INSTANT BANDSWITCHING WITH VIKING MOBILE



Dash mounting with easy access to chassis. Crystal switch and meter locations reversible. 6-7/16" high, 7-1/8" wide, 10-5/16" deep; housed in a heavy steel case.

This ad tells only a part of the story of the VIKING MOBILE. Send for data sheet 711-E8 for full information.



E. F. JOHNSON CO., WASECA, MINN.

JOHNSON

MODULATOR

Three audio stages with pp ABL 807 modulators. Ample gain for either crystal or carbon microphones. 100% AM plate and screen modulation gives the Viking Mobile plenty of punch.

POWER

A full 30 watts input at 300 volts, 60 watts at 600 volts. An RF type fixed bias supply provides protection for amplifier, conserves plate voltage and improves efficiency by keeping modulator idling current low. Speech amplifier and exciter may be powered separately from modulator and PA for maximum flexibility.

OPERATING FEATURES

Equipped with PA drive control and front panel gain control. All RF stages and modulator are metered. "Tuning" position of function switch for "non-swish" VFO. Optional "push to talk" operation.

- Capacitors
- Inductors
- Sockets
- Plugs & Jacks
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- Pilot Lights

The VIKING MOBILE is another kit with the unique JOHNSON touch. Complete in every detail, supplied with step-by-step instructions, photos and drawings, any amateur can assemble and obtain superb performance from the VIKING MOBILE.

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Evans Radio
10 Hills Avenue

NEW JERSEY

NEWARK
Radio Wire Television Inc.
24 Central Avenue

NEW YORK

ALBANY
Fort Orange Radio Dist. Co., Inc.
904 Broadway

JAMAICA, L. I.
Harrison Radio Co.
Hillside Avenue at 172 Street

NEW YORK
Arrow Electronics Inc.
82 Corlandt Street
Concord Radio Corp.
55 Vesey Street
Harrison Radio Co.
225 Greenwich Street
Hudson Radio & Television
48 West 48th Street
Radio Wire Television Inc.
100 Sixth Avenue
Terminal Radio Corp.
85 Corlandt Street

NORTH CAROLINA

RALEIGH
Radio Amateur Center
411 Hillsboro Street

NORTH DAKOTA

FARGO
Fargo Radio Service Co.
515 Third Avenue North

OHIO

CINCINNATI
The Mytronic Co.
121 West Central Parkway

CLEVELAND
The Progress Radio Supply Co.
413-15 Huron Road

COLUMBUS
Thompson Radio Supply Co.
182 East Long Street

DAYTON
Srepco, Inc.
135 East Second Street

TOLEDO
Soletronic Supplies, Inc.
1013 Jefferson Avenue

OKLAHOMA

OKLAHOMA CITY
Radio Supply, Inc.
724 North Hudson

OREGON

EUGENE
United Radio Supply Inc.
179 West 8th Avenue

PORTLAND
Pacific Stationery
414 S.W. 2nd Avenue
United Radio Supply, Inc.
22 N.W. 9th Avenue

PENNSYLVANIA

PHILADELPHIA
Radio Electric Service Co.
7th & Arch Streets

PITTSBURGH
Cameradio Co.
963 Liberty Avenue

SOUTH DAKOTA

ABERDEEN
Burghardt Radio Supply
P. O. Box 342

WATERTOWN
Burghardt Radio Supply
P. O. Box 41

TENNESSEE

MEMPHIS
Bluff City Distributing Co.
905-907 Union Avenue

TEXAS

DALLAS
Wilkinson Bros.
2406-08 Ross Avenue

FORT WORTH
The Electronic Equipment Co.
917-19 Florence Street

HOUSTON
R. C. and L. F. Hall
1301 Palk Street

SAN ANTONIO
Amateur Headquarters & Supply
P. O. Box 5086, Beacon Hill Sta.

VIRGINIA

NORFOLK
Radio Equipment Co.
821 West 21st Street

RICHMOND
Radio Supply Co., Inc.
3302 West Broad Street

WASHINGTON

SEATTLE
Western Electronic Supply Co.
717 Dexter Avenue

TACOMA
C & G Radio Supply Co.
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(Continued from page 70)

ber of the Western Pennsylvania section, was partially responsible for ARRL proposals as mentioned in the last issue of QST. Upon his return from the Board meeting he made long distance phone calls to his Vice-Director and Assistant Directors, giving them the highlights of the Board meeting at ARRL, and met with your SCM and discussed the full procedure of that meeting. I sincerely and honestly can say that GEG has taken upon himself to serve each and every amateur in the division to the best of his ability. His keen interest and sincerity in his appointment as Director can more than be appreciated by all of those who know him. Your suggestions, comments, and personal opinions will be welcomed by him, and fullest consideration given to everyone who asks for his cooperation. Incidentally, how does a Division Convention held in Western Pennsylvania sound to you? Traffic: (May) W2IVS/3 152, W3UHN 62, KWL 25, JSH 14, CA 4, (Apr.) W3JSH 46, W2IVS/3 5, MIZ 3, (Mar.) W2IVS/3 10.

CENTRAL DIVISION

ILLINOIS — SCM, H. F. Lund, W9KQL — Section Nets: ILLN, 3515 kc., IEN, 3940 kc., SEC: QLZ, Asst. SEC: HPG, RM: BUK, PAM: UQT. The Chicagoland Mobile Club will operate for the coming year under the able guidance of VIZ, pres.; GET, vice-pres.; EPI, treas.; and JYG, secy. FKJ was transferred to Texas but still is QNI on ILLN under the call 5VKF. New OBS and quite active on the traffic nets is LLN's YL operator, LGR. The trading game netted BPU a new Collins 32V-3. The Danville Club (the boys with the five-band emergency station set-up in a bus) elected GMU, pres.; ILE, vice-pres.; UJ, treas.; and TME, secy. MUN won his Advanced Class license, while JNQ, WIO, and your SCM were favored with Extra Class tickets via the exam route. HPJ is a new OBS and puts out Official Bulletins on 147.5 and 29.64 Mc. for the benefit of the mobile group around Chicago. Mobiles are becoming more numerous, with 2DZW, 8IHC, 9KQO, QDI, QJY, BAE, and MDB land-cruising in St. Clair County. PTZ returned from Ripon College for the summer. KPS has a twelve-element beam 80 feet high for 144-Mc. work. JLL now is OO and OBS down Mt. Vernon way. Because of a close vacation schedule this column will not appear next month. Traffic: (May) W9CSW 243, EBX 205, YIX 180, SXL 82, CEE 55, LGR 51, SYZ 35, STZ 14, KRH 10, BGN 6, DOR 6, NN 5, LIN 4, BPU 2, YTV 2, KA 1, (Apr.) W9EHS 35, SYZ 17, DUA 5, MUN 5.

INDIANA — SCM, Clifford C. McGuyer, W9DGA — DHJ has licked his TVI. DLL works 2 meters. IZC is back on the air. Anderson has seven new Novices. FLO is building a new final for two meters. TT worked ZK2AB on 7 Mc. YVS now uses 866 rectifiers. BKJ reports IFN traffic as 178. BKJ/9 operated from Boy Scout Jamborie, assisted by EOG. FYM received commercial c.w. license. JVE is attending Ohio State University. The XYL of FSA has dropped the N out of WN9PEX. KAS worked YI3BZL on 14-Mc. phone. The OM of JJJ is WN9TKO. New appointees are MVZ, RE, and KLR as OPS; LQE as OBS. ECs are HIW, Knox County; FON, Gibson County; JWB, Monroe County; OAC, Jay County; and HQF, Warrick County. KTX has 25-w.p.m. CP award. JBQ reports RFN traffic as 74. DEB heads the Ft. Wayne mobile group. ABP, BKJ, KFS, LDL, TDW, ZDS, and BRW provided communications for the Ft. Wayne Memorial Day Parade. OVF has new 28-Mc. mobile. DPL works the c.w. bands with seven watts. The Indianapolis Radio Club is starting to build its own club house under the direction of JJC, FRX, and FFF. JWB is building new mobile rig. TG has new 80-meter antenna. DKR is building new mobile converter. LQE has complete break-in with an input of 1 kw. KAS has new antenna tuner. SJE works 7 Mc. NUI moved to New York. UUN is station trustee of FWRG. IDZ has new 10-acre plot. FMJ has new converter. DUU has new 75-meter mobile running 15 watts. JFJ is building TVI-proof rig for c.w. TARS had a transmitter hunt. RGD has a "J" antenna for working 28-Mc. mobiles. TT, NZZ, and JJJ again make BPL. New officers for the Martinsville Club are KDV, pres.; VFY, vice-pres.; NTA, secy-treas. The Lake County Club new officers are JRY, vice-pres.; and INU, treas. JUJ reports April QIN traffic as 1356 and May traffic as 800. INU has new mobile installation. EJM is new in Evansville and works 80 meters. DGA has a new mobile antenna. QLW still is rebuilding. If your county does not have an EC, contact LZJ, the SEC. Traffic: (May) W9JUU 1968, TT 781, JBQ 361, NZZ 302, LZJ 148, BKJ 116, KDY 104, PMT 96, DHJ 78, KTX 75, DGA 65, PZW 51, FYM 38, WBA 37, JZB 30, KAS 26, DOK 25, DKR 24, IZC 24, IFR 22, VNV 20, FSA 18, QLW 12, BDP 10, MUR 5, NH 1, (Apr.) W9PMT 60, VNV 39, FSA 20, KAS 19, BDP 17.

WISCONSIN — SCM, Reno W. Goetsch, W9RQM — SEC: OVO, PAM: ESJ, RMs: IQW, WBE. 'Phone Net (BEN) 3950 kc., 6 p.m. daily. C.W. Net (CIN) 7 p.m., 3625 kc. State-wide mobile emergency and c.d. frequency: 29,620 kc. UIM has a Johnson Viking I. NKZ has a Collins 32V-2. SGG is enjoying WIN net operation. LaCrosse operated on Field Day as SFL/9. GFL is building new super mobile using 6146 final. GJK souped up modulation on his

(Continued on page 76)

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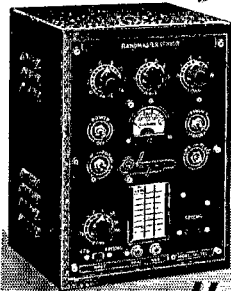
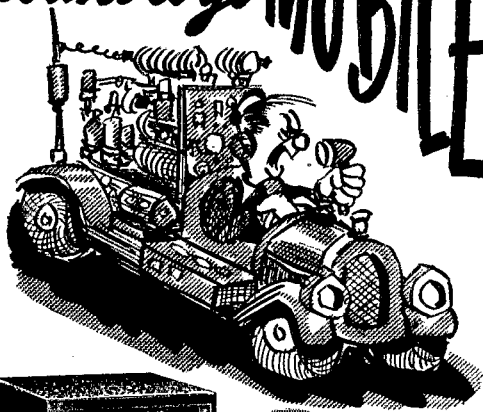
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mobile. With ART/9 as NCS, 3950-ke. operation was supplemented with 28-Mc. units during the Highway 32 Autocade and ceremonies on Memorial Day. FDX picked up some nice DX in FL8MY and HZ1MY. Receiving equipment for HIA includes an HRO-50 at home, and a Morrow converter for mobile. RIL is new at Wisconsin Rapids with 300 watts on 80, 40, and 20 meters. New calls at Superior are WN9RQN, WN9PAH, and WN9PAI, while at Spooner we have WN9QEX. The ARA puts out a nice bulletin, *The Discharge*. RUF attended a meeting May 16th of the Tri-State Communications Coordinating Committee in connection with c.d. frequency planning for the amateur service. The M. & M. picnic is slated for Aug. 10th at Henes Park, Menominee, Mich. MRAC elected as new officers: IZO, pres.; WK and MOT, vice-pres.; LSK, secy.; MDG, treas.; ONY, chairman of the Board; and VQD, RH, DR, IRZ, ANA, and GPI as directors. Thirty watts to a 2E26, Gonet tri-band converter and center-loaded whip make up MYG's new mobile. On 144 Mc., EYN worked LUQ and LEE/M. ALG has new converter ready to try. FAN has a new p.p. 826 final. VHA, Wausau EC, reports a highly successful Emergency Corps operation in providing communications for the State Championship Motorcycle Endurance Run over a 225-mile course, with spot frequency operation on 29,620 kc. for control station NJW and mobiles at 18 different check points. Merrill has 2 new mobiles, 1BF and QJX. PHP has a TBS-50 and three-element beam. When not busy fishing, MSD keeps an eye on the 28-Mc. band. WN9PBA and WN9PBB operated portable at the Boy Scout Camporee using emergency power. Traffic: W9ADM 236, MQV 153, SFL 101, IQW 70, BVG 55, CXY 42, ERW 35, SDK 35, FDX 10, SGG 14, ZGL 13, OVO 12, RQM 12, HDV 11, LSK 2, NLE 2.

DAKOTA DIVISION

NORTH DAKOTA — SCM, Everett E. Hill, W0VKP — The North Dakota State Ham Picnic at Mayville was a huge success with 146 registrations, including twelve Canadian hams. The Sioux Amateur Club of Grand Forks arrived in a convoy of 17 vehicles. They presented ARRL President Dosland, TSN, with a gift in recognition of his recent election as president. Jamestown is to have the event in '53 and Grand Forks in '54. The Fargo Club wishes to extend its thanks for the fine turnout. Fargo hams have received an appreciation letter from the Red Cross for flood communications. Radio station WDAY has extended its appreciation for the excellent job done by the local mobiles in directing one of Fargo's largest parades. RRW, our SEC, was in charge of both operations. GSR and BZJ are working in Minneapolis. We are looking for applicants for all operating appointments. Our section is sadly lacking in a decent emergency set-up and net set-up. It is requested that all hams in the State please participate as much as possible. Contact your SCM for a way in which you can participate. Traffic: W0UBB 40.

SOUTH DAKOTA — SCM, J. W. Sikorski, W0RRN — SEC: GCP, RM; OLB. South Dakota amateurs are going after call-letter license plates and will make their presentation to the next legislature. Take every opportunity to publicize this activity. GCP signed up four new ECs this month, but there are wide stretches of the State without an EC. Write to Bill and offer your services. JHO is a new Novice at Trent. KSW now is in Huron working for ILL. ILL has converted a Motorola for 75-meter mobile. ZFE has a new Viking, and LJB, with a new HFS, plans 2-meter operation. MARS net, 4080 kc., with EHO as NCS, operates Fri. 2100C, Sun. 1800C, and Tue. 2000C. FSD has been transferred to Minneapolis. The Pierre ARC had a ham display at the hobby show in charge of FKE, activities director, with UVL operating and GLK, QVY, BCO, and BTK assisting in the demonstration. BTK is building a 160-meter mobile rig. Traffic: (May) W0EHO 43, PHR 23. (Apr.) W0AEN 5.

MINNESOTA — SCM, Charles M. Bove, W0MXC — Asst. SCM, Jean Walter, 0KYE. SEC: BOL, RM; RPT. The Mid-American Dakota Division ARRL Convention soon will be held so be sure to get your tickets in advance. The convention committee is selling tickets on a time payment plan if you so desire. Just write Joe Tomczyk, W0DBC, 3306 Aldrich Ave., No. Minneapolis, Minn. New hams in this section are WN0IPW, EPQ, HGW, and IRD. HTX now is W0HTX and HFS is W0HFS. YLZ was awarded a nice large gold trophy by the Minneapolis Radio Club for his outstanding contribution to the advancement of amateur radio. The following 75-meter mobiles are checking into the MSN: OTU, BGL, LSC, HEO, and RHT. LYW now has a 50-watt mobile rig on the air. Art Monsees, formerly W0DSF, now is a major in the Army and is stationed in Western Germany. Art's new call is DL4HM. EFK was back in the Cities recuperating from an operation. 3NL visited the mobile gang in the Twin Cities. WQM, of Hillman, has a new Viking on all bands. DQL is building a new final. KNR is revamping his shack. BRA has a rig at the lake and is checking into the nets from there. DZZ has moved to Triumph, Minn., and is engineer for the local light company there. If you want a weather report for that picnic, just call ATD. Walt now is an authority on weather. MPW now is ORS. Join the Emergency Corps now! For

(Continued on page 78)

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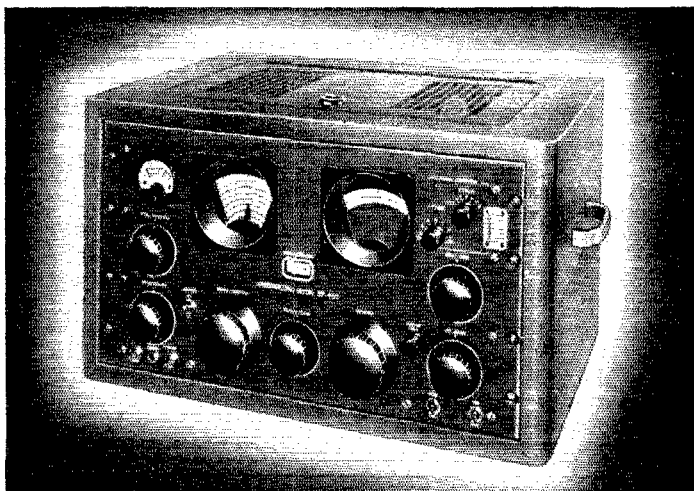
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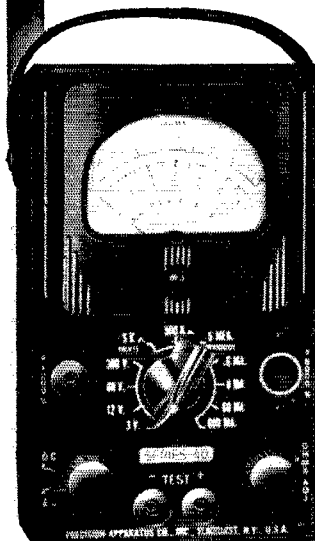


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DELTA DIVISION

ARKANSAS — SCM, Dr. John L. Stockton, W5DRW — A welcome to a new ham in Harrison, VUD. PZC has new rig running 400 watts input. CPV has a new Collins KW-1. THX has been active on the OZK Net. JXO, formerly of Harrison, visited DRW, BAB, NIR, LUX, and other Arkansas hams while on vacation. This is my last report as SCM. It has been a pleasure to have been your SCM and I know that Fred, LUX, will make the best SCM we have ever had. Let's all get in there and help him all we can by sending in monthly reports with news items and by taking appointments such as EC, ORS, OBS, etc., so that Arkansas can have a strong organization through our ARRL. EA has been busy with emergency plans and conferring with State Police, Red Cross, etc. All amateurs who are not members of the Emergency Corps should contact EA or LUX. Traffic: W5RWJ 117, LUX 37, EA 25, DRW 16.

LOUISIANA — SCM, Robert E. Barr, W5GHF — KTD is a recent winner of DXCC certificate. KAA, IOP, and KTD are all telephone men in Shreveport. NG holds weekly class for several youngsters preparing for future Novice and/or General Class licenses. Barksdale AFB has an FB amateur club, with K5FBI handling quite a bit of GI traffic in and out of the base. CNQ operates 28-Mc. mobile, and 100-watt fixed c.w., chiefly on 80 meters, and is building new VFO and a final using an 813. MWE now is meeting seven different net assignments on 80- and 40-meter c.w., and on 75-meter phone. HEJ was selected by the Ouachita Valley Club to serve as EC for the West Monroe section, with MWE to serve in the same capacity in Monroe. This Emergency Corps is growing into one of the leading set-ups in the State, as well as the newly-formed Webster Parish Corps under the guidance of FYZ. HEJ and LDH report the rapid strides toward future recognition of ham operators by the State Police Department in martial law areas following disasters. NMS is back in the State and active on 75-meter phone. UZA purchased a 750-watt rig. HEJ has new 183D. OXF is a mainstay for MARS for the Shreveport Area. ZS is QRL building new TV transmitter in Shreveport. DHE worked portable c.w. and mobile while on vacation in the Smokies. All hams wishing to line up with the Emergency Corps will please send applications directly to the SEC, IUG, in Baton Rouge. USN suggests that separate recognition be given to Field Day activities of Novice operators, because of their limited frequencies and power. Traffic: W5NG 351, MWE 76, GHF 52, CNQ 4.

MISSISSIPPI — SCM, Norman B. Feehan, W5JHS — More news from the boys in Korea, thanks to RMC. RUT and RMC looked up JFE when they got back to Tokyo and had a very FB reunion. JFE was wounded and was convalescent but is in good shape again. RMC has a new camera and should bring back some very interesting pictures. SEC, RWN, SGJ, JHS, SKB, LWF, NYV, OAE, 4UZF/5 and Mac Ruel and Bill from K5FBB were at the Mobile hamfest. The Central Gulf Coast Hurricane Net also made a good showing by having 22 of its members there. A new novice in the State that we are proud of is Helen Martin, WN5WCG, 9 years old. 9OS0/5, ORS/OBS, is doing a fine job on Official Bulletins and now is working 40, 75, and 80 meters using a Globe King transmitter. If you guys want this column to continue you will have to send me the dope to go in it. Traffic: K5FBB 1006, K5FBB/5 217, W5RIM 72, JHS 46, KYC 38, W9SO/5 32.

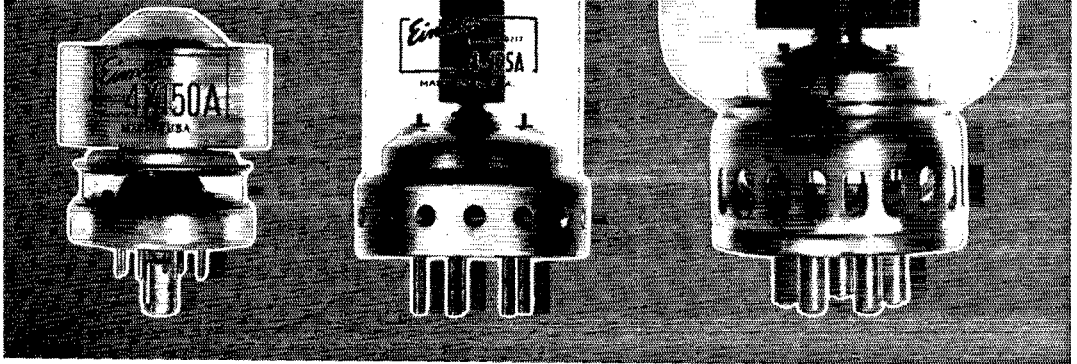
TENNESSEE — SCM, Mark M. Bowelle, W4CXY — Thanks to the gang for greeting the new SCM with a nice batch of reports, even though the traffic totals are way down, as can be expected for the hot weather months. PAM KMH reports that the Tennessee 'phone net will continue to operate for the summer on 3980 kc, at 1900C, Tue, and Thurs. and at 0800C Sun. RM AGC has moved the 3635-kc. c.w. net to 0500C daily except Sun. for the hot months. PFP takes over the traffic lead this month — his TPN sked must be paying off. IIB is gleaming some nice traffic from MARS, and OGG, still trying to get a transfer to Memphis, reports from Pope Field. PMR graduated from high school with honors but won't talk as to his future educational plans. NDE conducted a hidden transmitter hunt for the Oak Ridge gang and ran a poor second to EYW, who walked off with the prizes without the aid of directional equipment. The annual Crossville hamnick was a big success, with PAL the lucky man on the prize drawing as usual, and RLF in his wheel chair the most popular man at the meet. Let's hear from some of the clubs next month. Traffic: (May) W4PFP 313, AGC 204, OGG 126, CXY 54, IIB 54, RHO 26, KH 24, FEB 14, JWO 12, AEE 10, PMR 8, FLW 3, (Apr.) W4APC 411, PFP 394, AGC 221, AEE 77, KH 30, RMJ 10.

GREAT LAKES DIVISION

KENTUCKY — SCM, I. W. Lyle, jr., W4KEG — K NBY, RRU, RPI, and many other fine operators keep KYB running in good style. NEP has PA system interference. HI. Paducah is booming with new hams and TAV
(Continued on page 80)

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WEST HARTFORD 7, CONN.

booms in with a nice signal and good traffic total. BAZ is more than slightly QRL with the business of selling flying machines. MGT again makes BPL. OOS is operating portable in Evansville. KTA has a full sked; working at night and building new home in the day. RYL has added a high-power transmitter to the family—a baby girl! VRK is a new ham near Fort Campbell. Thanks for your report, John, and keep 'em coming. We are always glad to hear from new hams. 5QDT/4, of Fort Campbell, is a welcome addition to KYN and a good operator. JUI says the 2-meter bug is biting! CDA works all bands with 40-meter Zepp! FBU is MARS station at U. of L. and officers of the club are MEY, pres.; NWQ, vice-pres.; and OXT, secy. SHF now is in the Air Force and moving around the country. MWX keeps KYN open during the summer for traffic from servicemen. It is quite heavy and also with our outlets on 4RN and TLJ/9RN we can give good service. MWX is our RM, as you know, and requests some of you guys help the regular net stations by reporting in on 3600 kc. often. Traffic: W4MGT 576, TAV 296, MWX 184, W5QDT/4 145, W4NBY 64, CDA 58, BAZ 31, KKG 28, RFI 12, RRU 11, KTA 8, JUI 1.

MICHIGAN — SCM, Norman C. MacPhail, W8DLZ — Asst. SCMs: R. B. Cooper, 8AQ4; J. R. Beljan, 8SCW; M. C. Wills, 8CPB. SEC: G.J.H. RMs: YKC, ELW, UKV. PAM: UTH. New appointments: OBS to DED in Holland. Asst. SCM (Upper Peninsula) to CPB. QMN announces its summer sked: 3663 kc. at 1830 EST Mon. through Fri. until Oct. 1st. The Grand Rapids mobile gang, 8 strong, assisted the Red Cross and police department in patrolling critical traffic areas during the Memorial Day week end. The mobiles were ZCH, FCP, GHY, QAM, YDJ, FJJ, DUV, and PSW. We understand FBV is about to pull up stakes and head for W6-Land, where he will attend U.S.C. or U.C.L.A. HKT reports six low-powered rigs now on 160 meters in the St. Joe Area. JAX and ITZ now hold General Class tickets in Flint, according to WXO. FX worked hard on DARA gear for Field Day. MGQ is about to put the finishing touches on his big rig. CTC is home from Florida after a 2-week "second honeymoon." We understand PUV expects to leave for New Mexico shortly on 20 meters, set an all-time Michigan high traffic total this month—2030. Lil is doing a truly great job on overseas messages. THG is experimenting with vertical antenna on 28 Mc. BEF now is mobile on 75 meters with a pair of 6BQ6s running 75 watts. EGI reports INY, formerly of Battle Creek, now living in Lansing. IBB is busy working on a mobile rig. MQU's neighbors think he is off the air, but he has that 813 so completely TVI-proofed they just don't hear him. We'd still like to hear from the many club secretaries. These guys must be allergic to pen and ink — or postage stamp glue! Traffic: (May) W8ZGT 2030, NZZ 296, SCW 294, RJC 169, ZLK 152, QBO 99, DLZ 88, DAP 79, WXO 77, IV 70, ILP 50, COW 36, THG 29, RTN 28, JYJ 26, SPF 24, FX 22, IBB 22, FBV 20, TQP 20, QIX 19, AXP 15, LR 15, WVL 15, AQA 14, LLD 13, SJF 10, GJB 6, EGI 5, WN8JPY 4, W8EEF 3, MGQ 2. (Apr.) W8YKC 91, YIN 50, FBV 46, DOI 19, SYQ 16, ENX 10, IBB 10.

OHIO — SCM, John E. Siringer, W8AJW — Asst. SCMs: C. D. Hall, 8PUN, and J. Erickson, 8DAE. SEC: UPB. PAM: PUN. RMs: DAE and PMJ. New appointments are: DCX, MEI, and VCJ as ECs; HNY and JUJ as ORS. ARO again heads the BPL list with 634 points. A newcomer to the BPL ranks is CTZ with 517 points. Warren copies his messages on a pocket Braille typewriter, transfers them to Braille sheet form and, lastly, records them on a normal typewriter. JBI is the 11th West Park Radiop to make DXCC. The official nets in this section are the Buckeye Net on c.w. and the Doghouse Net on 'phone. All members are eligible for a net certificate. CPA and ZCQ are proud papas with a new daughter apiece. ZAU will be in Denver for several months. LBH has new antennas on 10 and 20 meters. CBI has worked ZL with 20 watts on 21 Mc. The deadly DX duo of BRA and HGW added a couple of new countries each this past month. YGR is up to 89 countries. A dependable Columbus outlet is needed by BN. EIV spent two weeks on tour with the Air Corps. ET is the new publicity chairman of the CACARC and will coordinate the All-Band Contest scheduled for September. AQ used his 75-meter mobile with good results during his recent trip to Toronto. UPB is trying to get a Columbus man to take over the State Radio Communications Officer post for c.d. Carty has been doing a great job but is somewhat overloaded. The *BN Spring Bulletin* states that ARO leads in total QNI with 174 out of 182 sessions. FYO has 172, QIE has 154, AL has 133, and DSX/SG has 127. Most active in SRN are YCP, FYO, SG, UPB, UZJ, DAE, ARO, AEB, and IB. JWM is a new call in Holland. The Canton gang operated at the Reservoir during Field Day. New officers of the Case Tech Radio Club are DAD, pres.; YBF, vice-pres.; KCJ, secy.-treas.; and ZHP, chief engineer. JZT is the newest member of the Club. From Dayton's *RF Carrier* we learn the following: Plaques will be awarded to winners within the Club of the SS and DX Contests; WPDM, the old police transmitter, will be used for c.d. work on the 2- to 6-Mc. band of frequencies; six of the Dayton Club members supplied the porto-mobile communications for the Radiological Group during the Armed Forces Day Exercises

(Continued on page 82)

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540 kc to 54 Mc in six turret-selected bands.

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Dual conversion, 455 kc and 6 Mc crystal controlled.

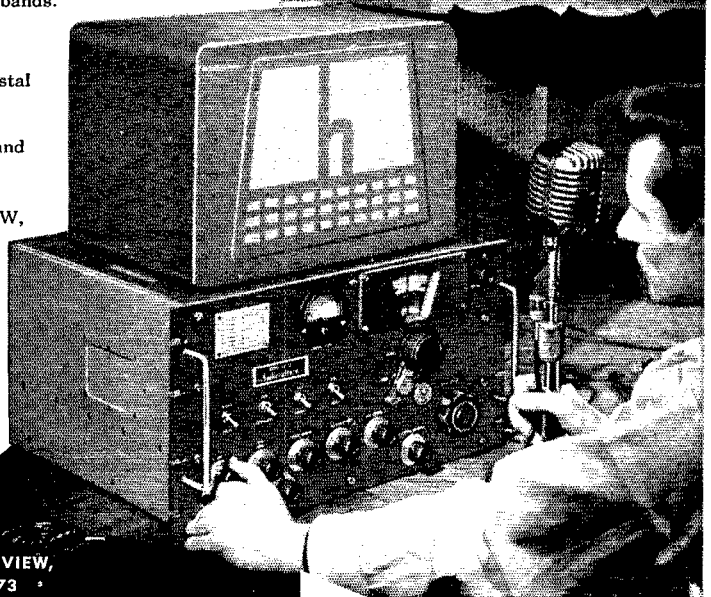
Receiver type: Single superheterodyne in tuning ranges of 540 kc to 7.0 Mc and dual conversion on tuning ranges from 7.0 to 54.0 Mc.

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at Patterson Field; and on May 25th the Club held a successful hidden transmitter hunt. According to Toledo's *Shack Gossip*, the May 4th picnic at Fort Meigs Shelter House was an outstanding success; CZJ grabbed off an XYL on May 31st; QUO has a new daughter; and YAZ and BN both received their Advanced Class tickets. Oh yes, the gals included a new nut bread recipe! The next OCARC meeting will be held on Oct. 25th, and clubs are encouraged to send their delegates to this meeting regardless of whether or not they are presently affiliated with the council. Congratulations, fellows, on the fine degree of reporting. Let's keep it up during the warmer months. Traffic: (May) W8ARO 634, CTZ 517, FYO 296, YCP 212, UPB 96, DAE 75, AL 53, EQN 35, EIV 30, YGR 28, AJW 22, QIE 22, RN 16, WE 16, HOX 13, BFH 10, PUN 7, GZ 5, AQ 4, DAD 4, ET 4, DZO 3, CBI 2, BUM 1. (Apr.) W8GZ 11.

HUDSON DIVISION

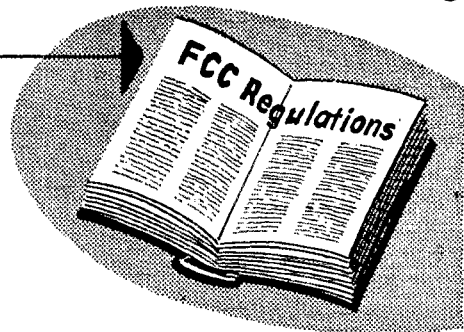
EASTERN NEW YORK — SCM, Stephen J. Neason. E W2LI — RMs: TYC, KBT. PAMS: IJG, JQI, K2CA. It is with regret that I report the passing of JGM. The official opening of the New York State Traffic and Emergency Phone Net occurred on May 21st. More than 47 members from three sections, including the SCMs of Eastern and Western New York, were present. GSS, the Net Manager, was master of ceremonies. Highlights of the party included a message from INJM via IAW, also comments from IBDI. Mr. Ken Thomas, Disaster Chairman of the Syracuse Chapter American Red Cross, addressed the Net through the facilities of GSS. This Net operates Mon. through Sat. at 1830; Sun. at 0830 on 3980 kc. The cooperation of all ECs is requested; all counties in E.N.Y. should be represented in this Net. HF, while getting settled at the new QTH, is working mobile. HEI is brushing up for the Advanced Class license and is getting FB reports with a new 6-watt rig on 3.5 Mc. Congrats to PPU on the birth of a new son. UKA is Manager of the Section Novice Net. For information and a copy of the Novice Directory, write UKA or the SCM. PHO still is QRL with no let-up in sight. HUB, ZPL, DHR, CYW, and Novice KYF supplied the mobile communications at the recent hill climb held at Keene by the Motor Sports Club of America. AVF and the Albany County AREC gang did an excellent job in the recent A-Bomb test. DKA is preparing for Advanced Class exam. VCB is active on 3.8 Mc. BNC makes BPL again. NYM me ts on 3615 kc. at 7 P.M.; NYSS on 3595 kc. at 8 P.M. daily. To avoid loss of your appointment, check eaddressment date now. Appointments: DIF as EC, Endorsements: KBT as RM; KBT and TYC as ORS. Traffic: (May) W2BNC 570, TYC 166. LRW 187, EFU 38, ILI 33, BLU 25, APH 12, PHO 12, HEI 6. (Apr.) W2HEU 22.

NEW YORK CITY AND LONG ISLAND — SCM, George V. Cooke, Jr., W2OBU — Asst. SCM, Harry Daniels, 2TUK, SEC: KTF, RM: TUK, PAM: YBT, AREC/c.d. activity continues on an even basis, with membership maintained and increased in parts of the section. BW, Brooklyn EC, conducts 5 drills per week with one addition in c.d. and has increased members by four. JSV, Queens EC, reports 12 tests per month with no change in membership. VKE, Staten Island EC, states 4 drills per month are held with 1 c.d. drill with local officials. RT, Nassau EC, now is in new QTH in Wantagh and reports the North Nassau 10-meter AREC group is holding drills with ZNX and JHF as NCSs under EC ZAI and NFU with 2 new mobiles added. CLG has been appointed EC for the Freeport Area and KFV has been appointed to cover Baldwin and Malverne. At a recent installation and dinner, the Nassau Club placed in office the following officers: VL, pres.; K2AC, vice-pres.; KEB, secy.; and WN2BZZ, treas. A Certificate of Merit was presented to FI for outstanding work in c.d. in Nassau County. Copies of the Affiliated Club Bulletin containing reprints of DIC's article on "The Proper Approach to the TV Listener" are available from ARRL. This will help the gang to start work on their own complaints. Contact DIC for further details. KN2AFX now makes it four in the family of DXV, ex-BAM, with brothers CPG and FBH, all active on 40- and 80-meter c.w. Can any other family top this? GNI received appointment as EC for Smithtown, replacing JFU, TUK, RM for the NLI Net, reports the net is on summer schedule on 3630 kc. at 1930 Mon., Wed., and Fri. and will resume fall and winter schedule Sept. 8th. Harry participated in AF Day and QSOed AIR and NSS. For participation in Queens AREC nets the following received Section Net certificates: AFA, YSM, BTX, GIO, KTH, WN2MAR, ZOS, DGF, and LGK. MWB asks that all 420-Mc. experimenters contact him for skeds to coordinate contact possibilities and exchange of ideas. PAA is looking forward to V.H.F. QSO Parties for contacts on 420 Mc. Please send the SCM all data on your 420-Mc. gear, frequencies, and schedule times and dates. The North Nassau Amateur Radio Club has been newly formed and has the following officers: NFU, acting pres.; CNN, treas.; WN2OJG, secy.; with an enrollment of 12 charter members. The New York Radio Club has as new officers: CYK, pres.; IXE, vice-pres.; ATT, secy.; and NSH, treas. The Club has a membership of 153 and added BEN, EHR, EPT, ISO, NZT, ONX, WN2IGA, and K2ACM (fourth member of the family to join) as new members.

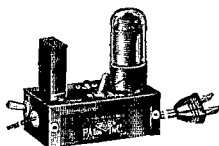
(Continued on page 84)

It's the Law

F.C.C. Regulation 12.135 states "the licensee of an amateur station shall provide for the measurement of the emitted carrier frequency or frequencies and shall establish procedures for making such measurements regularly . . . measurement shall be made by means independent of the means used to control the frequency generated by the transmitting apparatus and shall be of sufficient accuracy to assure operation within the amateur frequency band used."



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No extra wiring is required to install this unit. Plug the FCC-90 into a 110 volt receptacle, connect the pick-up lead to the antenna binding post of the receiver and the unit is ready for operation. An ON-OFF switch and a STANDBY switch are provided.

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A pair of ear-phones plugged into the 'phone jack will convert the unit into a monitor. It can be used as a field strength meter when link-coupled to a small pickup antenna. When placed in the field of an amplifier the GIMIX will indicate complete neutralization. If a milliammeter is plugged into the meter jack, the unit becomes a carrier shift indicator.

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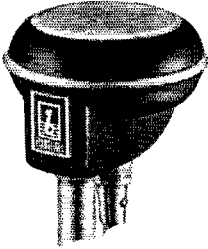
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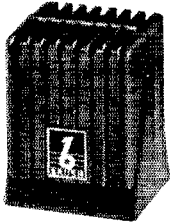
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These highest quality crystal headphones are also available in single headphone and Iorgnette models.



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QHI changed QTH to Morris Plains, N. J. The Sunrise Club operated Field Day at Sag Harbor, the Lake Success Club in Amityville, the Nassau Club at Garden City, and the Tu-Boro Club at Mastic. EC now is completely emergency powered with 2-kw. gas generator installed in the garage. BO and WFL have received Extra Class tickets. YDR, DGF, GIO, and WVA have been appointed OES. DFL, an RTTY enthusiast, earned his OES certificate. GXK has received ORS appointment for efforts in the NLI Traffic Net. WL and OGX have been appointed Official Observers. LGK received OBS appointment. Traffic: (May) W2BO 763, AEE 337, EC 123, OBU 117, DZK 76, OJX 63, DIC 46, VNJ 46, BGO 37, PF 33, YBT 25, JBQ/2 24, CLG 19, BQM 16, WDP 14, LGK 12, LRI 3, EBY 2. (Apr.) W2JBQ/2 89, OJX 77.

NORTHERN NEW JERSEY — SCM, Thomas J. Ryan, jr., W2NKD — N.N.J. 'Phone Net meets 9 a.m. Sun., 3900 kc. CCS, the PAM of N.N.J., is NCS. This is an open net. Anyone may report in. Jersey Net (c.w.) meets nightly, except Sun., on 3695 kc. WCL, of Rockaway, is the new manager of JN. After many years of faithful and prolific traffic handling, CGG has turned over the reins of JN to WCL. JN also is an open net. WCL will be pleased if you report into the net. The N. J. Civil Defense C.W. Net meets at 7:45 p.m. Tues. Net Manager is RG of Merchantville, N. J. C.D. 'Phone Net meets Sun. at 9:30 a.m. on 3995 kc. Yours truly wants to say farewell after two very pleasant years as your SCM. Your cooperation made possible whatever the section was able to accomplish. Your new SCM is your former SEC, VQR, of Asbury Park. You can be of tremendous aid to him if you will send him a report of your activities each month. If you hold an appointment such as EC, ORS, OPS, etc., send him your certificate on time for annual endorsement. For the second time in less than a year CCS has made BPL on 'phone, this time with a total of 720 messages handled. The newest Official Observers are TPJ, of Long Branch, and IHF, of Wanaque. Month after month fellows like GVZ, NIY, and OUS, and new TPJ and IHF, send courteous post cards to hams who violate our regulations and give them a chance to clear up the violation before they receive a "Grand Island QSL." TPJ has completed a converter for 21 Mc. ESW has the Hawthorne c.d. station, LUL, on the air every Sun. at 10 a.m. on 29,250 kc. The Fairlawn c.d. station is on at 9:45 a.m. on 29,510 kc. NIY tells us VYB now is assigned to duty on the U.S.S. *Cowell*. JKH spent some time on the Novice band and had a whale of a time with the gang prepping themselves for General Class licenses. CJX has a new QTH — 1 1/2 blocks from the old one! BAS continues his great job in JN and the Second Regional Net. EXG says he reports into TCPN (Transcontinental 'Phone Net) every night and enjoys handling traffic on 'phone. CUI, one of our most consistent reporters, bemoaned the fact that ESN was discontinued for the summer and he had a total of only 184. EKU, the *Newark News* scribe, says CWK has succumbed to the mike and is devoting much time to 144 Mc. By the way, EKU now is using a twin Yagi on 144 Mc. VPL has his study of sunspots paying dividends on 144 Mc. with accurate predictions of band openings. ZMF is the latest to enroll in the AREC. NQA took a 40-mile canoe trip down the Delaware's White Water region. He went from Skinner's Falls to Port Jersey. JOE is chief engineer of WCTC. LTI temporarily is sidelined by illness. BAI, the EC of Middlesex County, went mobile on 144 Mc. PIX was a recent speaker at the Raritan Valley RC. The Club is looking forward to a visit by a delegation from the Passaic Valley RC, to reciprocate the Raritan Valley's visit to them. Traffic: (May) W2CCS 308, CUI 184, LMB 126, ANG 115, EAS 85, CGG 70, EXG 42, OUS 5, CJX 4, JKH 4, CFB 3, NIY 2. (Apr.) W2CCS 720.

MIDWEST DIVISION

IOWA — SCM, William G. Davis, W0PP — TLGN had its 5th Annual Party on May 24th at AUL's home in Des Moines with 23 in attendance, including the SCM and SEC. A guest was 0ITQ, Manager of TEN. YTA received his Extra Class license, as did QVA. These are not granddaddies! NYX had a fine trip to New Mexico. W0RR/MM, the U. S. Survey boat on the Missouri River, recently QNI TLGN. The following stations received their Section Net certificates: BBZ, CQL, DDV, DET, DEY, DFD, FDL, JMX, UJC, and VRA. SCA has rig in his car on 29.6 Mc. He says it is lots of fun and urges others to do likewise. Hmmm — another bug in danger. BBZ has returned to Council Bluffs. WLY got out new 75-meter 'phone net roster and revised the rules. NWX reports working 4 continents on 21 Mc. EYL, Emmetsburg, no longer is lonely. He has been joined by WNDs KWB, KCD, KJ, KCO, and KCU. KWB is KCU's XYL. This speaks well for the Spenser Club. It becomes my duty to regretfully report three of our fellows in Silent Keys this month. Traffic: W0SCA 801, BDR 601, QVA 156, NYX 53, YBV 53, BBZ 14.

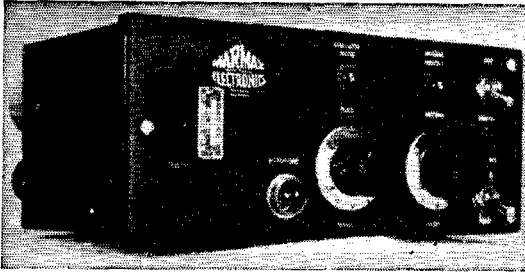
KANSAS — SCM, Earl N. Johnston, W0ICV — SEC: PAH, PAM; HEC, RM; FDJ. We amateurs are indebted to the sponsors of the ham picnics held during the last month. Attendance at Christy's picnic totaled 237, with about sixty mobiles on the grounds. Bingo, prizes, and lots of food were enjoyed by all, and to Mr. and Mrs. Christy and
(Continued on page 88)

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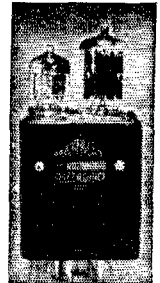
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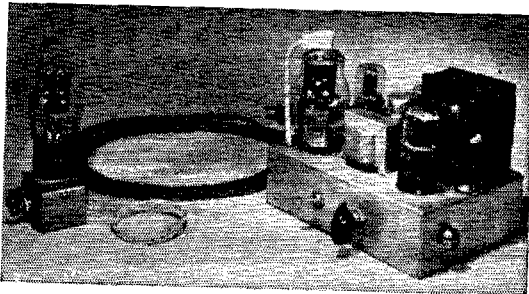
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assistants, thanks for a wonderful time. The CKRC picnic at Salina the following week was equally attended and enjoyed. More than 168 were registered. There was no count on mobiles, and several walkie-talkie sets were on the grounds. MVG/Ø's balloon-supported vertical on 75 meters sure did a nice job working the mobiles. VBQ, of Lawrence, has just completed restricted range speech amplifier. OTN, of Paola, is trying to get along with his new Collins 32V-3. One has to see BLI's QTH to appreciate it. There is plenty of space for antennas, a view overlooking Junction City and the valley, and a shack full of commercial-looking equipment is the nearest I've ever seen for a ham paradise. UPU and FMR are new mobiles in Topeka, both on all bands. OOU, of Emporia, is back from the service. Traffic: WØNY 304, BLI 189, BET 61, FDJ 42, VBQ 6, LIX 4.

MISSOURI — SCM, Clarence L. Arundel, WØGBJ — SEC: VRF. HARC held its picnic at Lexington on May 18th. The Band Hoppers Radio Club recently became affiliated with ARRL. The Rolla Amateur Radio Assn. held its Field Day activities at the Fair Grounds. HUI and BPD recently attended a meeting of the Hannibal Radio Club. RCE, with the aid of PMU and BOT, supplied communications for the Armed Forces Day parade in St. Louis. Activity on the new 15-meter band has been reported by the following: UXQ, EBE, HUI, and FNN. FNN reports having worked 21 states and 7 countries on 15 meters. GAR now has three transmitters available for use. CFI is home from the two-week Naval training cruise. FIR has finished the power supply for his kw rig. LNK has moved to the country and named his place "Antenna Acres." PLJ found 2 meters open early in May and contacted several stations. CPI has completed modification of his 75-A and has the 10- and 20-meter beams back up on the pole again. QMF has added triple conversion to his 75-A. RR/mm is operating on the Missouri River with TBS 50-D for transmitter and S-77 receiver. CCK passed the Advanced Class examination recently and the OM, BPE, is on 75-meter phone now. CIA's XYL got her ticket and is HOD. QXO again makes BPL and reports he had a fine vacation in Florida and also met some of the H. & B. Net fellows. Golf keeps ARH off the air. New stations reporting: CPI, ECA, and RR. New AREC members: WØGFE, ETW, and WNØHGR. Renewals: QMF as EC and GAR as ORS. Don't let the hot weather and vacations cause you to forget your monthly reports and news items. Thanks for being so prompt this month. Traffic: (May) WØQXO 797, KØFAY 279, WØCPI 150, GBJ 123, KØWBD 72, WØUD 40, BVL 36, EBE 35, ECA 34, WAP 26, KIK 25, HUI 16, GAR 12, JEF 11, CKQ 10, CXE 10, QMF 8, RR/mm 2, WIS 1. (Apr.) WØQXO 630, IQY 82, QMF 8, WIS 6.

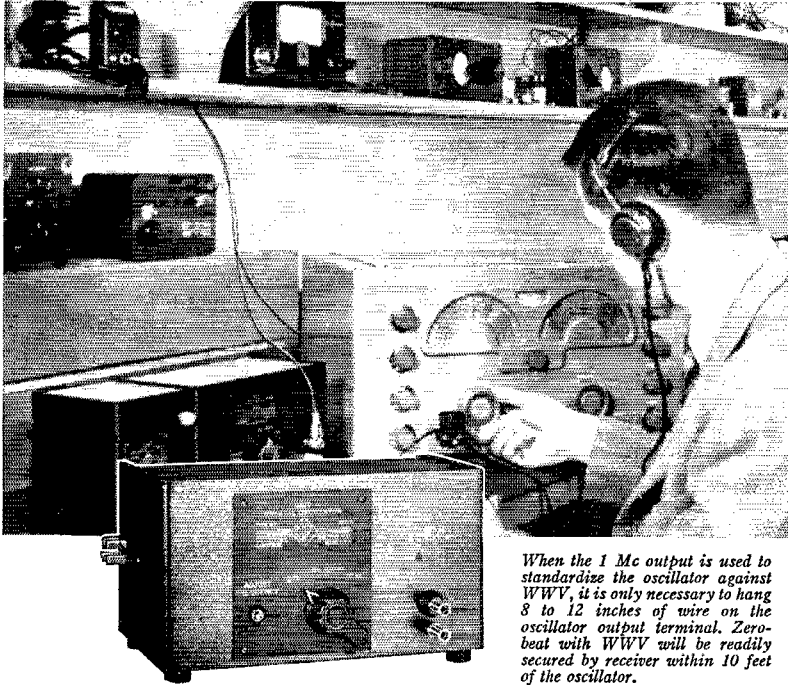
NEBRASKA — SCM, Guy R. Bailey, WØKJP — Now that the summer QRN has set in and the c.w. nets have folded up, the SCM can thank the 75-meter net for most of the dope to fill this column. JHG and CCK have been holding out in Omaha with the traffic end, as the SCM hasn't been on too much. Thanks, Ray and Larry. EUT also is back on the net after his three-month sojourn in California. Sure glad to have you back, Bob. Forgot to mention that YMU also is one of our Omaha reliable. JDJ and FQB are the main stand-bys for summer traffic with the national nets, which still are functioning at this time. JDJ reports that 3CVE, while in Lincoln, was able to contact his wife nightly through JDJ and SCA to K4USA. AUH is happy to report his student ham now has his ticket. The call is JEQ and he is Leland Winfrey, Rt. 1, Greeley. The Omaha gang used the workshop of PHW as an assembly plant to get the rigs ready for Field Day. Your SCM will appreciate all the reports he can get through the slow summer season, so please send them in, gang. Traffic: WØDJ 61, QHG 41, AUH 10, HQQ 8, CCK 6, KJP 6, VPR 3, YMU 3, VBJ 2.

NEW ENGLAND DIVISION

CONNECTICUT — SCM, Roger C. Amundsen, W1HYF — SEC: LKF. PAM: STU. RM: KYQ. CN-3640, CPN-3880, CEN-29,680 kc. RWS, CUH, VVB, and APA all rate endorsements as ORS. FOB renewed both OPS and EC appointments. Over 60 more are due and must be asked for or they will be discontinued. Look at your dates. AW made BPL on originations and deliveries. SJO does it the hard way with 632. The following received net certificates: ABZ, AYC, BDI, BGT, CUH, EMF, FOB, HYF, KV, KYQ, LIG, LV, NBP, NEK, ODW, PFE, RFJ, RMZ, RRE, SJO, and STU. CN high three are KYQ-25, HYF-16, KV-14. CN now meets at 9 A.M. Sundays for rag chews. The preceding CN score is for April. May: KYQ-22, HYF-14, RFJ-11. CUH is busy getting a green thumb. FYG has a new final. APA is adding still more antennas. EMF is stronger than ever with antenna now in the air. He makes recordings for mobiles daily at 1245 on 75 meters. 2VMX/1 is our busiest OO. AOS still is going strong. NBP again is combining ham radio and gas-pumping with 45 watts. RRE is busy with MARS and State Guard. ODW now has 97 cards and should have DXCC soon. DAV is back on the mend. MHT got hitched. That is about it for this month. Reports are just a bit better but we can stand a lot more. Traffic: (May) W1SJO 632, EMF 334, AW 156, ODW 156, KYQ 150, HYF 52, LIG 51, NJM 45, BDI 39, NBP 34, RFJ 23, NEK 22, CUH 11, RRE 10, TWX 7

(Continued on page 88)

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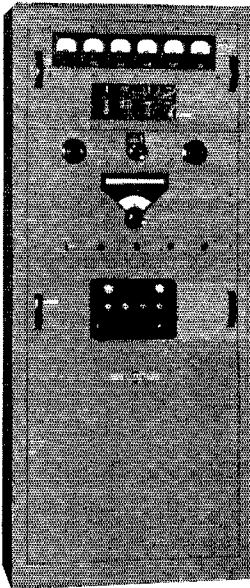
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MAINE — SCM, Orestes R. Brackett, W1PTL — SEC: BYK. RM: LKP. The Pine Tree Net still operates on 3596 kc. Mon. through Fri. at 1900 EDST. TO is holder of Extra Class ticket. Sid Tibbits, of Caribou, has his Advanced Class ticket. New ticket-holders are VSL, Eugene McLaughlin, of Limestone; N1VVT, Marie MacIntosh, of Presque Isle. TLR, of Randolph, and RJE, of Orono, have Advanced Class licenses and both are doing a very fine job on 75 meters. TSU, S/Sgt. George Harmon, from Bridgeport, Conn., now is at Mars Hill. We finally found out what the voice of BX sounds like after listening to his PB fist for several months. He has been awarded that super-duper Extra Class ticket and is doing very well on 75 meters, his first time on voice since 1929. N1VVQ, Charles Preston of Wilton, and Edna Heim, N1VWV, are new Novices. Edna is the owner of Sun Set Lodge where the Kezer Lake Hamfest will be held. The boys and girls of Auburn and Lewiston sure did themselves proud with the grand program which they put on May 31st. The mobile hunt lasted about two hours and was first found by PDN, with KKZ being second. BYK, LIZ, and OLT were the operators of the hidden transmitter. About fifteen took part with all kinds of gadgets such as field strength meters, direction finders, loops, etc. However, PDN didn't have any of these. Total altitude was about 225. 2HX, from Trenton, N. J., came the longest distance. Traffic: (May) W1LKP 89, OHT, 46, EFR 28, PTL 25, SEJ 23. (Apr.) W1NXX 33, GKG 3.

EASTERN MASSACHUSETTS — SCM, Frank L. Baker, jr. W1ALP — New appointments this month: MB as EC for Scituate, THT as EC for Revere, MOJ as EC for Millis, and JCK, EC for Eastern Mass. Traffic Nets, who will handle the c.w. end of the c.d. work on 3506.5 kc. BY is new ORS. Appointments endorsed: SUR Mansfield, SZO Methuen, DW Westwood as ECs; WU as ORS; BGW as OO; CTW as OES. VVW is SCA's XYL. AYN and JLK are on 3.9-Mc. 'phone. 3NEQ is operating at K1NAR at Squantum Naval Base. ALP and MPP attended a c.d. meeting of Winthrop hams at BB's QTH. BL and ALP attended the meeting of the Merrimac Valley Amateur Radio Club and both spoke on various subjects, c.d. work and ARRL activities. 2DGV is ex-11QH in Fredonia, N. Y. VTT is a new ham in Quincy. PYK and UGC are on 3.5-Mc. c.w. TNK has Class A. ORE, Reading, and HXY, Everett, are on 144 Mc. NYU is on 28 Mc. UTH, Roslindale, has a TBS-50C and SX-71 and is on 3.5 and 7 Mc. UPK has General Class and UPL Technician Class licenses. MOJ now is living in Millis. QWP has Class A and has mobile. KUA is building mobile rig. Gypsy Radio Club is holding an outing. ALP attended ARRL Board of Director's Meeting with BVR, and 2KH passed his 73 to all the gang in this section. The Braintree Amateur Radio Club installed new officers and held an auction. MXG/MM writes he has a rig on 28 Mc. on his boat, so look for him, gang. The T-9 Radio Club held a meeting at BGA's QTH. New officers are: KON, pres.; FTB, vice-pres.; IPE, secy.; CVM, treas. UXL has HT-17 and S98-B and now is a member of BCG. MCR is operating at MOS in Boston C.D. Net on 144 Mc. IVI went on a trip to Oregon. 9ANA was in Boston for two weeks and visited ALP. The Needham Amateur Radio Assn. now is affiliated with ARRL; N1N is secy-treas. The Quannapowitt Radio Assn. held its final meeting with a supper at Mrs. Abbott's in Wakefield; QWT is secy. The Wellesley Amateur Radio Society held its final meeting with an election of officers. W1UUTX and RPM got married in Orono, Maine, and will live in Gardner, Mass. ODQ bought a new rig for 144 Mc. for Mansfield. MTT has a mobile rig on 144 Mc. SUR has low-power rig at home on 28 Mc. SUR and ODQ are on 50 Mc. IQU, Amesbury EC, has appointed QUY as his assistant. QW, Newburyport EC, reports that they put on a drill for the c.d. officials in his town. Those helping out were RYJ as NC of TWQ's rig at G.D. Headquarters. DOX, JOT, HQO, HRI, QUY, UBB, QW, and RZZ, TWQ, W1UOU, and VVE acted as drivers and operators in the CAP section including 3 planes and 4 mobiles. The Eastern Mass. Club held a party at its meeting with the YLs and XYLs taking over. NUP reports conditions poor on 7 Mc. June and Wally Coffin, of Framingham, have a new baby YL. BB has his sailboat 73 in the water. EMG says that they need more Western liaison stations. AVY worked AHB on 144 Mc. 9HHM/M visited BGW. TVZ is working up in Hillsboro, N. H., for the summer. VCH, operating at K1FAH at Otis AFB, Falmouth, took a message and had it delivered in Germany in 9 minutes via K1FAJ to a DL4 in Weisbaden. The South Shore Club held its annual banquet, with the installation of new officers, prizes, and QVP doing his stuff again. A Sector 5 c.d. meeting was held in Quincy with these hams present: FWS, DW, QON, ONV, MD, SH, KCT, EKG, QKY, ADM, and ALP. It was decided to hold drills on Tues. nights on 28 Mc. through the summer. The monthly meeting of the Region 5 committee was held at M.I.T. with these hams present: PXY, ALP, DFS, KTG, RM, N1N, TQP, HKG, HOH, and WB. Traffic: (May) W1EMG 396, VCH 345, MME 171, JCK 157, SS 142, TY 85, NUP 54, WU 20, BY 19, AVY 13, CTR 13, QON 8, RDV 8, BB 7, PU 6, LM 4, TVZ 2. (Apr.) W1RSE 71, BGW 6.

WESTERN MASSACHUSETTS — SCM, Victor W. Paounoff, W1EOB — SEC: JYH. PAM: RDR. RM: BVR. West Mass. Net (WMN) meets at 7 P.M. on Mon.,

(Continued on page 90)

How's your amateur I.Q.*?

*Interest Quotient

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- Free individual technical information service
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- Traffic handling
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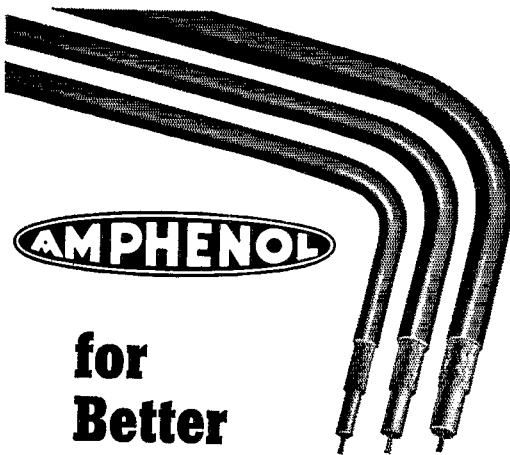
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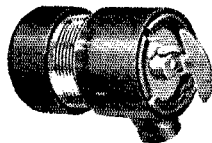
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NEW HAMPSHIRE — SCM, Norman A. Chapman, W1JNC — RM: CRW. The NHN meets on 3685 kc. at 1900, Monday through Friday. Appointments as ORS have been renewed for TBS and QJX. The Nashua Mike and Key Club will sponsor the Fifteenth Annual N. H. State Convention and ARRL Hamfest on Saturday, Sept. 27th. If it's a good time you are looking for, be sure to reserve this date. Complete details will appear in a later issue. QGU reports that he now is Extra Class via the "grandfather" clause. CRW has finished rebuilding his kw. rig, with complete bandswitching 10 to 80 meters, on 'phone or c.w. Cliff reports FB on his new 75A-2 receiver. The Nashua Mike and Key Club elected the following officers for 1952: MKD, pres.; NMB, vice-pres.; TJU, secy.; KYY, treas.; TA, act. mgr. To all the gang, "May every hour of your summer vacation be filled with wholesome pleasure." Traffic: (May) W1CRW 779, JNC 56, HS 30, QGU 18, QJX 12, (Apr.) W1CRW 597.

VERMONT — SCM, Raymond N. Flood, W1FPS — This report is quite limited this month because of having just sent out my SCM Bulletin with all the latest information. But I have a little news here. C. D. Jennison and John Frazer spoke on civil defense at the June meeting of the Tri-County Amateur Radio Club and showed a very interesting film. AVP likes his new Viking VFO. KJG is working out field strength patterns on 10 and 2 meters. TEW is active on 28 Mc. again. TXY has a 5-watter on 2 meters. RWP made WAC on 7 Mc. Stan got to ragchewing with BNV and discovered they both had been members of the same radio club in 1928 down in Jersey. FPS is going to rebuild this summer to get away from TVI, he hopes! Traffic: W1OAK 146, S1O 75, AVP 53, FPS 30, IT 24, TXY 14, SVT 5, RWP 1.

NORTHWESTERN DIVISION

ALASKA — SCM, Glen Jefferson, KL7NT — Your SCM is on the job and hoping for the cooperation of all hands. Territorial c.d. officials have commended Alaskan amateurs for full cooperation in c.d. activities. The Fairbanks Club is really going to town with plans for the hamfest at Copper Center. Active mobile rigs are steadily increasing in number and 3892 kc. should carry some heavy traffic into hamfest. QTH. WL7AOC, at College, turned in an impressive list of contacts on 8725 and 8730 kc. with W1, WN, YB, KL, and WL contacts aplenty. KL7KX, on St. George Island in the Pribaloffs, looks like a solid and ready contact for the WLS. Dan is a long-time amateur and is giving many new WLS a thrill with an off-the-Mainland contact. The normal rush of summertime work in Alaska has made inroads on ham activity but, for the less hectic days of fall and winter to follow, many plans for building new rigs are in the making. How about some news from you fellows?

IDAHO — SCM, Alan K. Ross, W7IWU — Emmett: OTL has applied for membership in the AREC. He meets with the FARM Net. Not much news from the gang is on hand this month. Random notes: The FARM Net is on Mon., Wed., and Fri. at 7:30 p.m. MST for the summer. The GEM Net meets the same days at 9:00 p.m. CUG, formerly of Stibnite, was worked mobile in Boise. He plans to live in Boise now. ACD, of Shelley, is on 50 Mc. with 500 watts. The Big Springs Hamfest will be held Aug. 2-3-4. 6EBK, mobile, was worked and visited while en route to North Idaho. Lots of Idaho mobiles now are on, with MXM laying down the best signal. The FARM Net on 3935 kc. is a popular spot for mobiles during the day and for evening traffic check-ins. Traffic: W7PCS 82, MKS 42, ACD 16, FIS 7, IWU 5.

MONTANA — SCM, Edward G. Brown, W7KGJ — Montana SEC, Walter R. Martin, KUH, is making a trip around the State visiting as many of the Emergency Co-ordinators as time will allow. Walt has his new 75-meter mobile rig finished and will be working many of the boys along the way. CT will be batching for quite a spell, as he has shipped his XYL to Alaska for a vacation of several weeks. 8BTV/7 is active on the traffic nets and should have his new W7 call soon. JRG is set up on 6 meters at his new QTH and has been doing FB despite few band openings. Ken is constructing a cascode crystal converter for 2 meters. KGF is putting the finishing touches on his 75-meter mobile rig in time for his trip to Minnesota. BNU is proud possessor of a new Class A ticket. Harry Darby, Billings employee of the Montana Power Co., is anxiously awaiting his Novice call. How about a Montana hamfest? Let's have some letters on this. Maybe we can stir something up. Thanks for the nice batch of traffic reports. Traffic:

(Continued on page 92)

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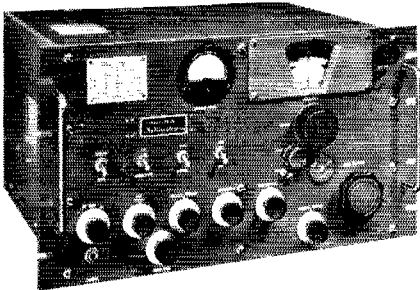


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W8BT/7 109, W7MPV 58, CT 28, EZI 14, KGJ 13, OGY 12, FTV 6, LER 4, ODK 4.

OREGON — SCM, J. E. Roden, W7MQ — GDV is a new ORS and is very active on RN7, and has completely shielded his rig against TVI. WN7RWM has just received his Novice Class license and hails from Merrill, Ore. OFS is new EC for Medford Area. OFS also is OO, Class IV. LVN reports that the Valley Radio Club of Eugene is working on a project in which the Club will possess a communications trailer for c.d. with amateur and City Police gear included. JRU reports all is progressing satisfactorily along amateur participation in c.d. communications at Klamath Falls, and that the gang there is training a number of amateur newcomers. ESJ and AJN are very active in recruiting new members for MARS and invite inquiries. New officers for Oregonian Amateur Radio Society of Portland are GCT, pres.; Bob Hansen, vice-pres.; William Stubbs, secy.; I.E. treas.; MSS, act. mgr. GNJ is new Net Manager for OEN 'phone net, replacing BDN, who has resigned. The Baker Amateur Radio Club put on a very successful hamfest at Baker, and has drawn more than a hundred amateurs from Eastern Oregon, Western Idaho, and Eastern Washington. This is an annual affair and seems to be growing more each year. Traffic: W7APF 315, OJG 296, MLJ 251, II 244, MQ 71, GNJ 65, GDV 51, HDN 41, NOB 38, AHZ 37, EUG 15, DZT 12, F'Y 12, KTG 12, KLE 10, EDU 8.

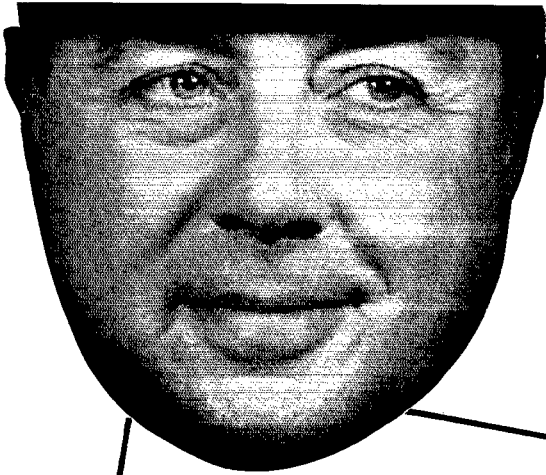
WASHINGTON — SCM, Laurence M. Sebring, W7CZY — SEC: BTV, RM: FIX, PAM: NRB. The VARC made a good showing in the state-wide c.d. drill, with two mobiles and six fixed stations. HNQ now is mobile. LEC works 40 meters after midnight to avoid TVI. PFZ and WN7RED work at Boeings. QGB is active on 20-meter c.w. The VARC ladies' auxiliary furnished food for Field Day. GWK had the mumps, but being on c.w. it did not curtail his activities. JVE works at KTAC as an announcer. JJK is an instructor at San Luis Obispo. KCU and some of the XYs are working on a MARS Net. EQN was in the hospital for a major operation, with KCU as his special nurse. LEV spent his vacation mobilizing to Wisconsin making 52 contacts. IG was the host at the Tacoma Club picnic. Twenty-three hams and families were present. FIX did not take a rig along on his vacation. Fifty hams turned out for the Walla Walla Valley Club picnic. Eight mobiles, 2 portables, and 3 fixed stations took part in the May c.d. alert. PRZ was elected president of the Roosevelt High School Radio Club and is trustee of the club station, ROQ. OE sent his transmitter to the factory for modification. AIB is NCS on WSNet twice a week. OEX received a nice write-up in Japan for his 'phone-patch work with the JA gang. The Seattle mobile gang started their hidden transmitter hunts with half a dozen mobiles and have built it up to 25. JNC has an all-band mobile VFO. KZP was Field Day director for the North Seattle Club. BA has a new Workshop beam pointed toward Hilo, where his son now is located. QZF has a new aluminum tower. DND visited 9EH in Illinois. OZG is using a vertical on 20 meters. VI converted his ART-13 to operate on 10 meters. ETK does a nice job of NCS on OEN. Traffic: W7IQQ 1524, CZY 1405, BA 521, EVI 364, ETK 140, FIX 80, KCU 80, AQN 72, FRU 69, EHH 65, LEV 62, MSI 54, CZX 33, OHV 36, PGY 33, OEB 29, FWD 20, NRB 13, LVB 12, NTU 10, EKT 9, MBY 9, EVW 7, ZU 3, BG 2, GAT 1, NWP 1.

PACIFIC DIVISION

HAWAII — SCM, John R. Sanders, KH6RU — HARC held a trial Field Day set-up at Bellows Field prior to the June event. The YLRL Club of Honolulu now has 10 licensed members. Among the girls: TI has departed to spend several months in Maine and North Carolina. AOO now has made General Class. APG, new Novice, is XYL of AO. ALH gave a talk on Rothman Modulation at the HARC meeting and was assisted by Rothman himself via a tape-recorded QSO. WU has a Rothman mobile rig. KA has resigned as Assistant Director. GF again is active after several years' absence from the Islands. AN has moved back to Honolulu. *For Pacific Area:* KB6AO has returned to Honolulu from Canton permanently. JA2ES runs 700 watts to a rhombic and is setting up for 21 Mc. JA4AI now is W5QDT. KG6FAA continues to make BPL and reports that he has been a one-operator station since February. Traffic: KG6FAA 2879, KR6AF 2125, JA8AB 1283, JA2ES 241.

NEVADA — SCM, Ray T. Warner, W7JU — Nevada State frequencies are 3660, 7225, and 29,360 kc. New appointments: HJ, SEC for Nevada. LGS, EC for Boulder City. New calls: Doc Hemington, of Las Vegas, blossoms out with RSY; Frank Parrish, of Henderson, with RSO. The Southern Nevada Amateur Radio Club (SNARC) members again were guests of the K7FAR MARS gang at Nellis AFB with a turnout of 70. This was followed a week later with a club picnic on the shore of Lake Mead. With sorrow we report the sudden passing of Lt. Col. Cook, O.K. SXD is happy with his new HQ-129X. JO is sporting a new 450T in his final. OXX has a Collins 75-A and 32-V installed in his station wagon and a 1500-watt motor-generator set in his trailer for mobile and emergency uses. Appointments are open for those who wish to take an active part in League affairs. Traffic: W7JU 24.

(Continued on page 94)



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Bob Henry
WØARA

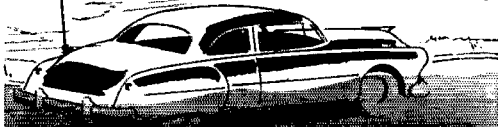
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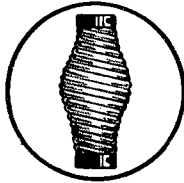
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SANTA CLARA VALLEY — SCM, Roy I. Couzin, W6LZL — SCCARA'S annual barbecue will be held at Weiland's Brewery in San Jose, Aug. 9th. The NPEC has a new monthly bulletin. SMCARC still is doing an FB job on c.d. MMG has a 10-watt rig on 160 meters. YHC rebuilt new rig in a new Bud cabinet. GFN is planning on a new 829-B final. GXF has the NPEC club transmitter just about finished. AMH moved to South San Francisco. HRZ now is radio operator on a maritime ship. YHM now is using a 6146 in his bandswitching exciter and is just about ready to use the SCCARA TVI test set. MMY is burning the midnight oil putting up a new 160-meter antenna and cleaning up TVI. Ring, of the NACA Laboratory at Moffitt Field, now is with Varian Associates. PDX finished building his new onboard cruiser and launched the beautiful ship at Palo Alto. LZL finished new 75-meter mobile rig. SCCARA invited the public to inspect the installations on Mt. Hamilton over the Field Day week end. At the last meeting of SDDARA Bob Mason, head of County Communications, told of equipment available for c.d. work when the State forms the main blueprint of the disaster network. We are all sorry to learn that our SCM, LZL, was taken to the hospital suddenly for a kidney operation. We are all wishing you the best of luck and hoping for a speedy recovery. Roy. Traffic: W6BPT 805, HC 175, YHM 90, MMG 36.

EAST BAY — SCM, Ray H. Cornell, W6JZ — Asst. SCMs: Guy Black, 6RLB, and Julio Amaro, 6WGM. SEC: RVC. RM: IPW. PAM: KZF. Your reporter had the never-to-be-forgotten experience of visiting Headquarters and WIAW during "Open House" on May 8th. 2BO, 3CDQ, 4EYX, and K4USA also were visited. We amateurs have an asset of inestimable value in that we can travel the length and breadth of the globe anywhere and always find a friend. Just look for the nearest "Antenna Farm." Summer has set in and ham activity is playing second fiddle to gardening and vacationing. Clubs are reporting the usual slump in attendance but nevertheless our section nets, c.d. activity, and TVI committee are all working nicely. A large majority (over 90 per cent) of TVI cases handled to date have been fundamental overloading of the receivers. The NBARA held its annual picnic at Boyes Springs on June 8th. YDI is Communication Coordinator for the first district Contra Costa County. EJA is heard daily on 14-Mc. "phone. JOH, QXN, and IPW are heavily supporting BAN. RVC had a minor operation, which took him out of circulation for about a month. CTL carried on the W6JZ code practice schedules during the latter's absence. In the meantime he has constructed some fancy high-fidelity audio gear. Would like to hear from the DX boys oftener. We can only print the news we receive. The NBARA is offering a monthly prize to the Novice with the best DX. Southern Alameda County c.d. boys report the May 20th drill as the "best ever." 10-meter stations active were ANK/M, BSC/M, GGS/M, KKB/M, QZZ/M, UPD/M, KNJ, KSF, TM, BSY, BUR, and 2VYI. 6.75-meter stations were GLB/M, TUN/M, AAQ/M, IYS/M, and TQJ/M. Traffic: W6JOH 187, QXN 90, IPW 80, YDI 5, EJA 3.

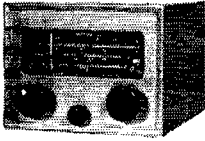
SAN FRANCISCO — SCM, R. F. Czeikowitz, W6ATO — Phone JU 7-5561. SEC: NL, Phone PL 5-3457. Emergency Coordinators: BYS, KNZ, ZLB, LOU, SILK. Emergency Corps and c.d. work are continuing on the upswing, with financial assistance gradually being made available for amateur c.d. equipment. The Television Interference Elimination Committees, now active in San Francisco, Marin, and Sonoma Counties, are doing excellent work and are to be especially commended for their practical and workmanlike approach to a difficult job. The FCC here is especially pleased with the results. **SPECIAL NOTE:** The San Francisco Radio Club, temporarily until the end of the year only, will meet on the **THIRD** Friday of each month, but expects to return to the **FOURTH** Friday in 1953. The meeting place, effective July, will be changed to the auditorium of the new Lakeview business district on the south side of Ocean Ave., opposite 34th Ave. If visitors do not find the club at the new meeting place they should try the old one at 1641 Taraval St. The High Frequency Amateur Mobile Society meets the 2nd Friday at 1825 Van Ness Ave., San Francisco. The Tamalpais Amateur Radio Club meets the third Friday in the home of OZC, in Tiburon. The Marin Radio Club meets the second Friday at the American Legion Hall, Larkspur, Calif. The Sonoma County Radio Amateurs meets at the taproom of the Grace Bros. Brewery, Second St. west of the Freeway, Santa Rosa, on the first Wednesday. The Humboldt Amateur Radio Club meets the second and fourth Fridays in the YMCA rooms, rear of Municipal Auditorium, entrance on "E" St., Eureka. RBQ reports in with traffic after several years lapse. Welcome. Traffic: W6RBQ 80, JCG 5, ATO 4.

SACRAMENTO VALLEY — Acting SCM, Willie van de Kamp, W6CKV — AYU now holds Advanced Class license. MON moved to East Bay. ETD has 10-meter portable in suitcase. The Dunsmuir gang provided communications for annual Railroad Days. KPK is operating from Gold Crown Mine. PTX is a new blind licensee. WYX has joined the mobile gang. Traffic: W6JDN 64, PIV 23.

SAN JOAQUIN VALLEY — SCM, E. Howard Hale, W6FYM — Sorry there was no report last month, gang. (Continued on page 96)

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The latest in Mobile Converters... Easy to operate... Sturdy construction for long, trouble-free service.

Model 2BR for 10-75 meters, net \$54.95
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The LN series converters are identical to the standard 2BR and 3BR converters, less the noise limiters.

HARVEY-WELLS XMTRS

...have everything from 2 to 80 meters, for fixed or mobile operation. H-W is the transmitter you will use for years. Best for Hams, Business Organizations, Government Departments, Emergency Services and Civilian Defense.

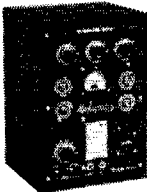
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Continuous tuning 1.7 to 54 mc, with 35 watts on phone and 50 watts, CW. Requires 300 volts DC at 200-225 ma and 6.3 volts AC or DC at 3.15 amps. Suitable for under-dash mounting.

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PRECISION SERIES 85 AC-DC Circuit Tester



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VOLTAGE: to 6000 volts (20,000 ohms per volt DC — 1000 ohms per volt AC).

RESISTANCE to 60 megohms.

CURRENT to 12 amperes DC

DECIBELS from -26 to +70 db.

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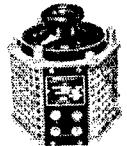
aid in the elimination of TVI. Uses 6L6 oscillator — 807 amplifier combination PI-network output. Husky power supply delivers 600 volts to the 807. Complete . . . including a punched chassis and shielded cabinet. Unbelievably low priced at . . . \$59.95

MD-40 modulator kit for above...\$34.95

MD-40P as above but with power supply.....\$44.95

SUPERIOR POWERSTATS

Smooth, efficient voltage control, 0-135 volts output from 115 volt AC line. Models also for 230 volt input. Write for free literature. Models for table and panel mounting.



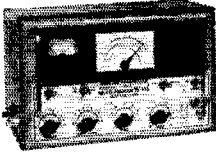
Type 20, 3 amp.....\$12.50
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The MODEL 10 is a new, compact unit measuring only 3" in diameter and 2 1/16" deep. It is rated at 1.25 amps. (150 watts/165VA), and is continuously variable to deliver 0-132 volts with 120 volt 60 cycle input.....\$8.50
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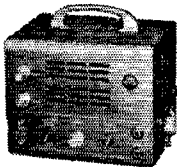
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Measures: 7 1/4" x 7 1/2" x 12"
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For Carbon Mike Input.....Net \$139.00
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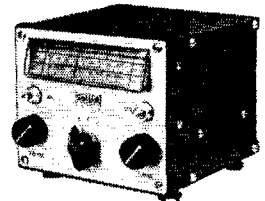
Complete Kit of Parts (less tubes)...\$47.50
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SONAR MOBILE Rcvr. Model MR-3

Complete coverage for 10-11-20-75 meters. 8 tubes, 4.5 watts audio output. Uses: 12AT7 RF stage and B.F.O.

6U8 oscillator mixer
 (2) 6CB6 I.F. stages
 6AL5 2nd detector and noise limiter
 6AT6 1st audio
 6AQ5 audio output
 OB2 voltage regulator

1 Microvolt signal produces 0.5 Watt audio output. A.N.L. and B.F.O. are push-button operated.



Requires 250 Volts at 60 to 80 mils. Size: 4-9/16" x 5-3/16" x 5-11/16". Complete with tubes . . . less power supply and speaker.....\$89.95

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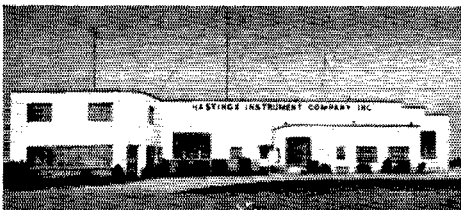
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HAMPTON 23, VIRGINIA

but look at the end of this report for April and May traffic totals. FKL reports that the Fresno Club used mobiles in its paper drive and collected between 4 and 5 tons of paper and over \$70.00 for the club treasury — an idea for some of you clubs low on finances. LDI, at Castle AFB, has new Johnson Viking and checks in on MTN. BNP is active on California C.D. Net on 3501 kc. and SJVN on 3525 kc. His XYL, P'KY, is working for her Advanced Class ticket. New calls in Stockton are WN6OVR, WN6OY, WN6POD, and WN6PYY. PIQ, at Edwards AFB, is active on SJVN, MTN, c.w., RN6, and SSN. CQI, at Sonora, is a mainstay on the Orphan's Net on 3885 kc. K6FAJ made BPL in both April and May. The Bakersfield Club station, LIE, is on at new location. GCS, EC for Tulare County, reports 25 full AREC members drilling once a month. Turlock ARC won Sweepstakes prize in the adult division of a local hobby show for "most useful hobby." ERE has new 2-meter mobile installed. EXH, RM, reports SJVN on 3525 kc. had 172 check-ins and handled 132 messages during May. Traffic: (May) K6FAJ 711, W6IAZ 128, EXH 120, PIQ 65, GIW 54, BNP 27, LDI 7, NDP 6, FYM 5, CQI 4. (Apr.) K6FAJ 561, W6EXH 302, JQB 59, FEA 37, GIW 28, WJF 26, PGP 24, FYM 13, LRQ 12, W4-LDM/6 10, W6CQI 8, EHN 2.

ROANOKE DIVISION

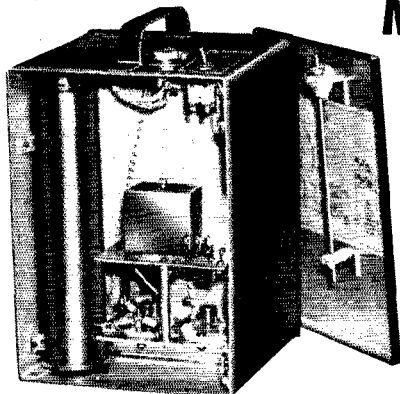
NORTH CAROLINA — SCM, J. C. Geaslen, W4DLX — Asheville Radio Club has new officers; AFM, pres.; MZS, vice-pres.; Ray Echerd, secy.; and VG, treas. VG heads new TVI committee. EJ is active on 75 meters with new Viking. KTD, of Canton, and OXZ, of Candler, have joined the Asheville Club. DHN works in Georgia and mobiles on 28 Mc. back and forth. DPF is trustee for club station MOE. AKC, of Gastonia, reports the NCN closed for the season and hopes all members will be back in September. Let me add my congrats to the NCN boys for a job well done. New ORS in the NCN are HER, Burlington; PXE, Warsaw; PIC, Greensboro; ILJ, Newport. W4ULX, in Greensboro, is working 2 meters and looking for v.h.f. stations. REZ, at Hickory, reports the Catawba Valley Club has the call VTF and is on with a BC-610. DSL now is at WNNC in Newton and working 75-meter mobile. EQJ, in Maiden, has a new shack and Advanced Class ticket. SMN, in Lenior, is working 28-Mc. 'phone. AKC, the RM for North Carolina, would be interested in hearing from any Novice who would be interested in handling traffic with NCN next season. The SCM is going to stick his neck out with some explanations for the Tar Heel Net, in answer to some recent complaints. Basically, the THN was organized for and still is an EMERGENCY NET, not a TRAF-FIC NET. The THN is ready and willing to take any traffic it can DELIVER through its members. THN will take any North Carolina G.I. OVERSEAS traffic from out-of-State stations. Traffic: W4AKC 328, RRH 261, BDU 88, ILJ 65, HAW 20, DLX 18, OKD 16, CGL 10, CVQ 7, LWU 6, AGO 2, LDD 2, W8AUB/4 2.

SOUTH CAROLINA — SCM, T. Hunter Wood, W4ANK — GFP reports good results from tests with the Rothman modulation system. EDQ has new Collins 75-A receiver. ULH has 10-meter mobile and is on 160 meters from the home station. CXO has "Black Box" antenna that gets out and is deceptive to TV lookers. Thirty South Carolina hams met in Columbia May 11th to discuss license plates, emergency preparation, and net operation. Twenty South Carolina hams attended the Charlotte hamfest on May 25th. The Florence Club is planning a state-wide hamfest in early September. The Florence Club now is an ARRL affiliated club. FM has new antenna for his emergency rig. The Charleston Shipyard Club meets the 1st and 3rd Tuesdays of each month. W4DX is the Section Emergency Coordinator, and all who have emergency or mobile transmitters are urged to register equipment and frequencies with the SEC. Ben is preparing a state-wide civil defense and emergency plan and his efforts deserve your support, so please keep him informed regarding your emergency gear. Traffic: W4ANK 137, FFH 70, CHD 41, FM 2.

VIRGINIA — SCM, H. Edgar Lindauer, W4FF — The Third Annual QSO Party brought out 102 participants. Most activity was crowded into the latter four hours of the party. C.w. was practically impossible on 40 meters. The 'phone band cleared and sparked the final part of the fracas. Mobile rigs were in abundance. Prize winners in their order of standing were ODA, FV, LTZ, SHJ, KMS, and W4UHG. The Annual VFN Picnic, attended by 135 hams and their families, was successful as usual. Highlight of the event, held at the Palmyra farm of NV, was the quantity of good usable radio gear auctioned off for little or nothing. Under the "nothing category" goes a complete 813 transmitter panel-mounted given to TEL by Bill Hudgins, NUU. Bill is leaving the section for a new assignment under the auspices of the Department of the Navy. Great Lakes Area is the lucky spot. JAQ received the tough assignment as NCS for the VFN gang for the coming season. Summer operation of VFN and partial operation of VN and SSN carries on. Much credit goes to Prof. Ed Johnson, FV, for a good job of NCS and his organizational work on the 'phone net the past season.

(Continued on page 98)

NEW USE FOR 'GOLD-PLATED SPECIAL' MAKES HOT XTAL-CONTROLLED 4-TUBE 432 MC CONVERTER!

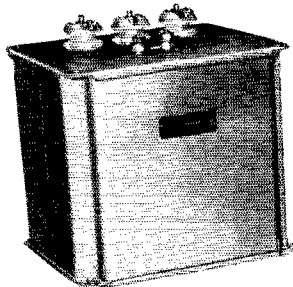


Thanks to a detailed write-up in the June 1952 issue of QST (p. 14), you can now convert the famous TS-1/ARR-1 Test Oscillator into a tunable oscillator for the VHF and UHF bands! Other popular uses include: 1-Meter-Plus xmtr-rcvr. Citizens' Band Freq. Meter, TV-FM Wobulator; UHF high stability converter oscillator. Contains gold-plated resonator, two 955 acorn tubes, antenna, etc. all mounted in a rugged metal cabinet 9½ x 6 3/6 x 6½". When converted according to the QST article it

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consists of a push-pull grounded-grid r.f. stage, a crystal mixer with a coaxial tank circuit, an over-tone oscillator and frequency multiplier chain, and an i.f. amplifier stage on 50 mc. **LIMITED SUPPLY, P.S.** — as far as we know, Radio Shack is the **ONLY** company with a supply of these units . . . **AND** at a give-away price! Weight 10 lbs.
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5300 VCT @ 550 MA (ICAS)



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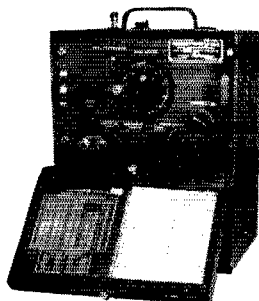
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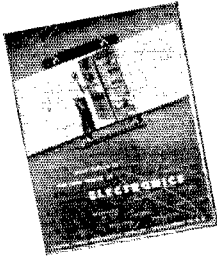
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WEST VIRGINIA — SCM, John T. Steele, W8MCR — W. V. N. and the West Virginia 'Phone Net have ceased operations for the summer. Regular schedules will be resumed in September. Outlets for W. Va. traffic can be found on 3890 kc. any evening at 7 p.m. EST. #CQL and XYL #DDU, of Iowa, visited hams in Weston. #CQL is the son of SAKQ, an old-timer, of Jane Lew. New hams in Weston are W8NIZO and SWNG. GIN now has Advanced Class license. AHF of Huntington, now is operating on 75 meters at new Marshall College station, with the call EMQ. W8SJDY now is 8JDY. GIO worked WAS on 10-meter 'phone. DPF has new Elmac all-band mobile transmitter. BWI asks the gang not to forget him; he is temporarily off because of TVI. W8SIES now is 8IES. WUH is president of the Huntington Radio Club, which now has a club station going with the call KEG. VPO had to go to North Carolina to get his mobile rig put on 75-meter 'phone. Traffic: W8AUJ 633, BWD 30, YPR 23, GEP 15, FUS 12.

ROCKY MOUNTAIN DIVISION

COLORADO — SCM, M. W. Mitchell, W0IQZ — Since no news was sent in for April because yours truly was on a vacation, this will cover both months, April and May. COZ and KHQ made BPL in April. FYV is a new call at Grand Junction. #DC, GMB, UVY, FRE, PXZ, and FKY, at Grand Junction, are on 10-meter mobile. The father of IQV and FRE's mother passed away. IQZ visited the Colorado Springs Club and stayed over night with TV. Because of a series of serious operations to be performed on my daughter, it will be necessary for me to give up the job as SCM at the end of the term, Sept. 15th. You have been a swell bunch to work with and I would like to continue working with you but find it will be impossible until some future date, at least three or four years. My thanks to Orval, KHQ, who has worked so tirelessly at the SEC job, and to all the ECs who have helped to line up their respective communities. I will write up four more reports, then the August one will be the final one. So long, gang, see you on the air. Traffic: (May) W0KKH 263. (Apr.) W0COZ 1718, KHQ 648, APK 28, OWP 5, WUR 4.

UTAH — SCM, Floyd L. Hinshaw, W7UTM — This month's activities find several amateurs changing work locations. ZDX has moved from Salt Lake City to Philadelphia for work with Philco. KKW has moved from Price, Utah, to Salt Lake City to work in United Air Lines Communications. #OUZ moved from Denver to Salt Lake City for a new job with United Air Lines Communications. SP is rebuilding to lick TVI again. LMH built and is using the new Twin Loop antenna on 14 Mc. 1952 Field Day will be history by the time this is in print. UARC (Salt Lake City) activities in Field Day were under the direction of OSV. Ogden Club Field Day activities were all mobile. TVL is in new QTH. Traffic: W7UTM 57, LMH 7.

SOUTHEASTERN DIVISION

ALABAMA — SCM, Dr. Arthur W. Woods, W4GJW — A SEC: ISD. The Mobile Hamfest was a big success. PHR won the grand prize, which was a completely-wired Johnson Viking. KNW won the high-speed code-sending contest, and XYL TXM won the left-foot sending contest. Many fine prizes were given away. YL VSF is on 10-meter 'phone with 40 watts. Jane, XYL of ERW, and Adrene, XYL of EBD, are both awaiting their Novice tickets. VYD will be going overseas shortly but his XYL, WN4WAP, will be on 80 meters working toward her General Class ticket. The ladies in Alabama are rapidly joining the ham ranks. CJZ kept in constant contact with Birmingham while on a trip to the West Coast. He operated 20-meter mobile. GJW enjoyed 75-meter mobile while on his vacation in Florida. MKF graduated from the U. of A. Medical School, and will intern in Texas. The Birmingham Club had an FB steak fry with 18 coming from Tuscaloosa, 7 from Montgomery, 2 from Mobile, and 2 from Anniston and Oneonta. FGT still is doing a wonderful job as PAM of AENP. The new policy of rotating Net Control Stations is working out nicely. Traffic: W4KIX 98, EJZ 66, HFP 42, EBD 12, RTI 11, DXB 9.

EASTERN FLORIDA — SCM, John W. Hollister, jr., W4FWZ — The 'cane planes started in business again in May and that is a reminder to us all that we should start looking over our emergency gear. Do you have a tie-in with the local b.c. station, as has the AREC at Ft. Lauderdale? Have you checked with the Red Cross and others?

(Continued on page 100)



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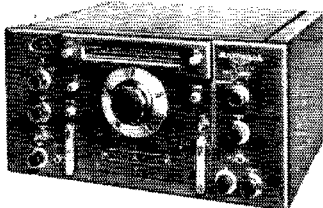
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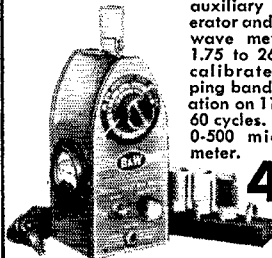


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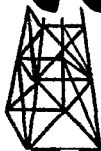
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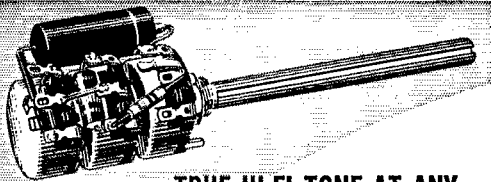
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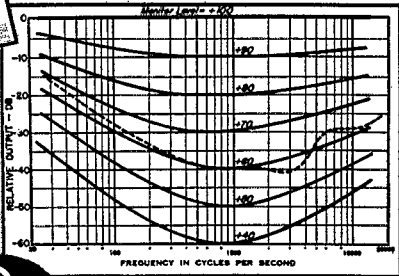
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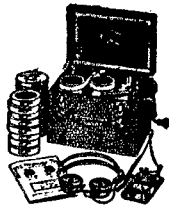
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Clewiston: PJU made BPL with a total of 1230 for May and remarks "All bands are in a deplorable state of affairs (Hi)." Deland: RVU made his WAS. Dunedin: NRT has moved to Oviedo. Ft. Lauderdale: IM reports an excellent AREC plan using fixed and 13 mobiles. The AREC also made headlines for work-drill with CAP that ended up with a plane down in the glades bog. The AREC mobiles directed a boat to the stranded. Jacksonville: The Florida military district reports that they will have Army personnel manning the District's stations at Miami, St. Petersburg, Tallahassee, Orlando, Tampa, Bartow, West Palm Beach, and Gainesville to round out a new network. Melbourne: Officers of the Brevard County Club are PLZ, UKK, AVG, RBR, CRJ, and CAM. Miami: WNs UNW and TYI operated W4JOX for Tech High Field Day. Okcechobee: PZT works 4RN and into EAN Nets. Orlando: AKT reports OZC and XYL PIK back in Orlando. AREC has a net on 29,520 kc. The Club station is at Red Cross. St. Petersburg: Nice to have FPC on 3675-kc. net. Tampa: Drop the "N" from TYE's call. Bob is headed for 7 Mc. The doctor says DES can go back to work. Umatilla: Lightning hit the rig at TKD. West Palm Beach: CKB ran second in the QM/YL Contest. Traffic: W4PJU 1230, FPC 234, DRD 202, PZT 110, FJO 73, WS 71, KJ 50, HWA 40, LMT 37, RWM 23, FWZ 22, UKH 21, ALP 19, TRA 16, CKB 13, NRT 13, TKD 13, DES 5, IYT 4, TYE 4, ART 3.

WESTERN FLORIDA—SCM, Edward J. Collins, W4MS/RE—SEC: PQW, EC: PLE, TL, ACB, and MS are building s.s.b. transmitters. OCL has an FB radio-equipped trailer. OYR has Advanced Class ticket. NOY runs EC-610 on 75 meters. SYS has 32V and HRO-50T and is an XYL. OMN works 7 and 4 Mc. ACB has NC-183. SWF presented the EARS group with an FB VFO for the club station. RKH has a TBS-50 as a mobile rig. MFY overhauled the HQ-129X. NJH runs a kw. on 20 meters. PLE has VFO all over the shack. SMM is eyeing the new car with mobile ideas. UNE has the Viking ready to go. RKH has new 32V-3. The EARS gang has an FB club house. PQW is building auto-call. 9CGO/4 is active on 6 and 10 meters. LUF is back on. NJB is burning up 75 meters. RZV is burning up the other half. MUX keeps 7 Mc. hot. UUF enjoys 10 meters at ART. FHQ has been on 6 meters. RDC made the Mobile hamfest. UTB-VCB have their 32V-3 going FB. WN4UYS is building a better rig. JPD gets on 10 meters. HJA is having transformer trouble with the HT-9. QK is back on 10 meters and doing c.d. work. UCY now is a DX man. PTK keeps 75 meters going while his XYL, TTM, looks after 10 meters. BFD works the wee sma' hours on 20 meters. SZH has increased power. ISW keeps 20 meters going. NOX meets 75-meter nets. NYZ works 20 meters with an FB signal. MS is keeping an eye on 6 meters and working lots of the gang. BKN won a 4-250A at the Mobile hamfest.

GEORGIA—SCM, James P. Born, jr., W4ZD—The Atlanta Radio Club's hamfest, which was held June 8th, was attended by approximately 600 hams, XYLS, and jr. operators. One of the highlights of the hamfest was the talk given by Dick Baldwin, IIKE, Asst. Secy. ARRL. The HRO-60T National receiver was won by MA, and the TBS-50 was won by Audrey, XYL of OKL. We are all saddened to learn of the death of RM. He was very active in ham activities in Alabama and Georgia. KWC has returned to Atlanta; the tanker he was on collided with an oil barge on the Delaware River. CRH has returned to the air after an absence of fourteen years and is working all bands, 'phone and c.w. WN4VJH is a new ham in Millen. EFS has a new harmonic—it's a girl. K4WAR made BPL again this month with a grand total of 1762. Congratulations to the Carrollton Radio Club, now affiliated with the League. New officers of the Club are GDW, pres.; G. L. Smith, 1st vice-pres.; PJ, 2nd vice-pres.; RJY, secy-treas. The Georgia Cracker Radio Club's hamfest will be held Aug. 3rd at Dixon's Lodge on U. S. Highway 80 at Lizella, Ga., 12 miles from Macon. An HQ-129X Hammarlund receiver will be given to some lucky attendant. KZ5WA visited MZO and OPS. TTT is rebuilding. NS has a new all-band 125-watt transmitter. If your community or county does not have an EC, make recommendations to our SEC, EJC, 202 North Semmes Street, East Point, Ga. Traffic: K4WAR 1762, W4OSE 177, ACH 79, EJC 60, ZD 58, POI 39, FBH 35, MZO 29, MTS 22.

WEST INDIES—SCM, William Werner, KP4DJ—SEC: KP4ES, KV4AA, new EC for St. Thomas, V. I., reports 210 OSOs with 15 counties on 21 Mc. KP4AK has been appointed ORS and OO. DV renewed ORS and OPS appointments and is new OBS. HZ was reappointed EC for San Juan District. AK, CY, LK, OA, OW, PR, PZ, and QR are new AREC members. ORS KV4AU transferred to Knoxville. UW now has 500 watts. RD replaced Viking with a kw. LV transferred to Ariac, Miami. The PRARC picnic was a great success. JC's new station is on 75 meters with BC-610 and mobile installation. DJ cut back 80-meter antennas from 3559 to 3925 kc. and put up new 32-foot poles. OS's new station is on 3925-kc. Net. BR reports to 3559-kc. Net on Mondays. KG4AF reports to 3925-kc. Net from Cuba. NO is another new station on 3925-kc. with a kw. OA has new multiband antennas. 3559-kc. Net attendance averaged 16 stations each session in May. NY

(Continued on page 102)

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CANAL ZONE — SCM, Everett R. Kimmel, KZ5AW — In a full-scale Isthmian-wide military practice alert called "Operation Jackpot" AREC and MARS net members had their nets formed a few minutes after the all clear signal, and received a commendation from the Chief, ANAF Communications. Participating either as KZ5s or with MARS calls were AA, AB, AF, AW, CN, EE, FQ, GG, JQ, KA, IM, ML, PC, and WA. FJ is NCS for Central Area while WA is on leave. On a non-interfering basis, the 20,994 MARS frequency is free for 'phone or c.w. each Monday 1800 to 2000R. The Crossroads Radio Club sponsored and sparked this year's Field Day. GD is boning up for the Extra Class amateur exam. GT now is signing KL7AOS. July 1st was the closing date for SCM nominations. Watch for your ballot from Headquarters and mail it back promptly, preferably by Air Mail. Thanks, gang, for building up a live, active section. Keep up the good work under your next SCM. Traffic: KZ5AA 2554.

SOUTHWESTERN DIVISION

LOS ANGELES — SCM, Samuel A. Greenlee, W6ESR — SEC: KSX, PAM: PIB, RMs: FYW, GJP. Section Traffic Nets: L. A. Section Net (LSN) Mon. through Fri. . . . c.w., 3600 kc. at 2130. El Capitan Net (ECN), 3655 kc. at 1930. BPL this month was made by KYV, GYH, and HK. Upon this, the first anniversary of your SCM's term in office, I wish to thank each and every one of you for the grand support and consistent cooperation which has resulted in putting the section in its present dominant position in all forms of activity. You are invited to inquire about qualifying for ARRL OFFICIAL APPOINTMENT wherever your interest may lie, be it traffic (ORS, OPS), experimental (OES), or in helping the rest of us to keep informed (OBS) or out of the FCC dog-house (OO). All appointees in the section are ACTIVE, all are doing a wonderful job. Wouldn't YOU enjoy being one of that highly qualified group? They're top! Section Net certificates have been awarded to BHG, CMN, DDE/FAE, FCT, JQB, QIW, WPF, GJP, and FMG; Net Manager, in recognition of outstanding ability and participation in LSN. NCP runs many 'phone patches for KL7s and has daily skeds with AKIBD at North Pole. KYV is setting up teletype (1 kw.) for skeds with Pacific when OKed on 20 meters. Your SCM and SEC attended two FB picnics, one at Santa Barbara where the gang extended a royal welcome, and the Council picnic, sponsored by the S. F. Valley gang, a success from every angle. PIB (PAM) reports that a station was set up at Burbank Armory to operate during Armed Forces Day week end with the National Guard. The station used the call HOV/6 and plenty of traffic was handled by HOV, HVC, CMN, HFA, PRB, ZRZ, WFG, JGW, and PIB. Everything is new with GJP — house, granddaughter, rig, traffic. GEB copped another scholarship (for math); two of his pupils got licenses, WN's PFX and PJY, and two more are ready. BHG still works the world on 21 Mc. BLY reports that his son, WGL, is back from the wars; MHX is moving to W4-Land; GTL has a hot new mobile on 2 meters; CEA's XYL, FAN, now is Class A; and LVQ and DWL were bossmen of FD for the Whittier Net. PMS is back in traffic with a bang. New reporter OZ says his antenna is "almost" underground . . . because of neighbors, mebbe! JQB is building new portable and tells of a new club, the Eastern Sierra RC, up thataway. CMN is rebuilding house and rig. KSX, SEC, now is on 2 meters. Another new one: FWZ, ex-4LDM. DDE/FAE NCSes several nets. CFL has a new beam for his mobile (on 2400 Mc. yet!) EBK will be mobile from W7-Land this summer. Grim-of-the-month department (per (GTE): At a recent Fresno hamfest the prize, a set of code records, was won by DQZ, a long-time commercial operator and holder of commercial telegraph (4th) YLRC notor per CEE: New officers NLM, pres.; KER, secy; and PJU, treas., were installed at the June meeting, and NLM won Activity Award for the year. IDU says that the "Mobilers" are going great guns in c.d. work; IGH and ZEN are 28-Mc. mobile, and ERU again is active after an illness. AREC notes per KSX, SEC: Nets out for FD were West Valley (ZPS, EC); Crescent Bay (FPD, EC). Long Beach (NSX, EC) is very active with c.d. and had mobiles in the Armed Forces Day parade; the RC station's new license is PMO. Also reporting: COF, COZ, EBK, EPL, KQS, LZS, MU, WOO, WN6NJU. Traffic: (May) W6KYV 2036, GYH 2007, HK 1495, NCP 485, DDE/FAE 386, HOV 242, GJP 160, BHG 113, FMG 113, PMS 113, OZ 93, BLY 92, JQB 92, HLZ 88, KOY 47, GEB 27, CK 24, CMN 23, FYW 18, OHX 15, WOO 13, KSX 6, PWZ 5, YSK 2. (Mar.) W6GYH 1413.

ARIZONA — SCM, Albert Steinbrecher, W7LVR — There is an "Early Bird" Net at 6:30 each morning on 3800 kc. MAE and MLL are on 3500 kc. at the same time. RNB got a GREEN card from FCC for key clicks. PZ worked EA-Land for 109 countries and MIN got his DXCC. New Novices: RTC, RVB, RVH, RWC, and RWI. New Gen'l. (Continued on page 104)

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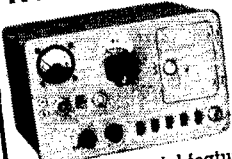
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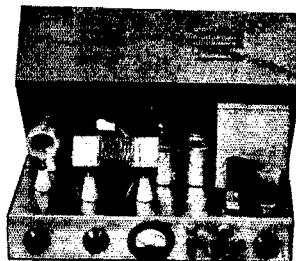
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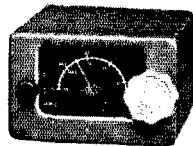
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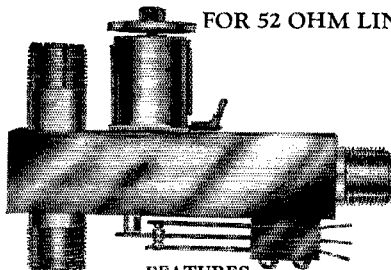
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Class: LZL, QHE, QHT, RTD, and RTK. EMA and LVR are on 15 meters. Anyone else? NRF and SPK are back on the air. LOJ and NYT are mobile on 10 meters. ØDBO now is 7DRQ. OEN is in J-Land. OAO is shielding his Viking as per QST article. 6APW/7 now is 20BR in Haddonfield, N. J. He works 10-, 20-, and 75-meter mobile and wants to talk to the gang. PEF is sending out questionnaires to start an Arizona YL Net. Please give her your cooperation. New officers of OPRC are: 5RDB/7 pres.; PLM, vice-pres.; LAD, secy.-treas. Your SCM will appreciate receiving news and traffic reports from everyone, and especially from appointees. Write a postal or send a radiogram, but get it in by the end of each month. Appointees should check their certificates for endorsement. Your SCM now is ready to make appointments to any ARRL member interested. Write for application. Traffic: KTFAG 44, W7MAE 35, PZ 5, LVR 4.

SAN DIEGO — SCM, Mrs. Ellen White, W6YYM — Asst. SCMs: Shelley E. Trotter, 6BAM; Richard E. Huddleston, 6DLN; Thomas H. Wells, 6EWU. RM: IZG. ECs: IOK and DEY. The 10- and 2-meter sections of the Orange County Emergency Net Control Stations now are both located at the O.C. Communications Centers. DEY reports that QZQ has a baymobile antenna on his 75-meter mobile set-up which seems to work O.K., as QZQ is working the DX with it. ZE has a new vertical for 75 meters. Activity in Orange is booming on 2 meters. TET cooperated with 7MLL in June and handled daily traffic for two weeks between a man in Tucson and his sick wife in Scripps Clinic in San Diego. HQX may change from that call to IAB shortly. The boys in Pendleton reported a whopping traffic total of 2938 for May traffic. IZG broke away from the traffic business long enough to work his first 80-meter DX in May: Chile, Argentina, and Alaska! GTC, San Diego lad with the beautiful fist, received his 25-w.p.m. sticker. Congratulations, Bob. TZB is taking K6CN's job as electronics officer of AirFMPac, El Toro. FCT's daughter is an RN now and planning to take Pre-Med in the fall. Mary Parker has exchanged the call WN6UDM/6 for W6QMG. Congratulations! WN6MWU is the new president of the San Diego YLRL. HDN is letting his South African DX take a rest while he works the New Zealanders! Don't forget the Southwestern Division Convention in San Diego the week end of October 11-12. A bang-up time will be had by all. Traffic: (May) W6HQX 2937, BAM 464, BLQ 407, TET 223, IZG 205, GTC 48, FCT 8, DEY 2. (Apr.) W6TET 106.

WEST GULF DIVISION

NORTHERN TEXAS — SCM, William A. Green, N 55BKH — Asst. SCM, Joe G. Buch, 5CDU. SEC: JQD. RM: QHI. PAM: IWQ. Appointments were made to LIU as OES, TSV as OBS, ONQ and UXY as ORS. Congratulations to NUX, recently appointed Communication Officer for this region of the FCDA. He will have the support of Northern Texas amateurs in promoting the RACES program. AREC and MARS are working very closely in emergency matters. All emergency nets have been on a semi-alert during the tornado season. Traffic in general is dropping off but NTO Net on 3960 kc. still carries the bulk of the area business with a high percentage of deliveries. The Lamesa ARC held a successful simulated emergency test on 10 meters. Abilene ARC is expanding its 10-meter organization in view of RACES. Pampa ARC held open house in honor of 7IGM, who was visiting. Known to be working 2 meters are MWV, MHM, and 7NSH/5. New equipment department: LIU, an 829 rig on 50 Mc. working into a Rhombic pointed at Lubbock; PZU, a pair of 24Gs on 50 Mc. OHY, 750 watts of s.s.s.c. using a pair of 4-125As, having worked 23 states in three weeks on 3998 kc.; SRQ, a new WAC, and 40 watts of a.m. on 75, 20, and 10 meters. AWT has a new QTH, Fort Worth. ONQ has a new rig in process. New calls noted are VVA, WBL, WBW, WBY, and WVN. Traffic: (May) W5QHI 172, PAK 153, BKH 128, VRX 116, LEZ 102, ARK 83, IWQ 54, ASA 42, CWE 40, UXY 12, SGR 11, KPB 8, SRQ 8, WN5UFP 8, W5OHY 7, LIU 3, PYQ 2, RHP 2. (Apr.) W5UY 5.

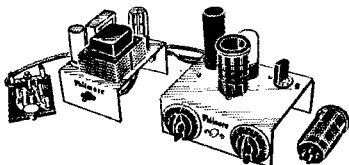
OKLAHOMA — SCM, Jesse M. Langford, W5GVV — SEC: AGM. RM: OQD. PAMs: GZK and ATJ. QBX now is working at Tinker Air Force Base and expects to be on this fall with about 300 watts. RST is a new granddad. MRK has a new jr. operator. ESB has a new Novice, WN5WAH. JVX has moved to Hobbs, N. M. JCW is rebuilding and de-TVing. SLS and QJE are working on mobile antennas. CKQ is too busy to get his modulator back on the air. LXH is building a new house. WN5TLT now is W5TLT. OZE has been working lots of short skip on 20 meters. WN5PKE now is W5PKE and will be on with a pair of 24Gs. LWG has worked 20 states on 21 Mc. besides lots of DX. QXL and FKL left on another assignment the middle of June. PA will represent Oklahoma at the West Gulf Convention. RIT has been very active on MARS this month. TKC is on a scout trip. EHC and SWM have been to San Antonio for MARS equipment. UEK is getting his c.w. rig ready for 3.5 Mc. Attendance on OPEN is very good despite the hot weather and wheat harvest. HZZ has been active on NTO lately. MJU and JHA will move to Pampa in the near future. AHT/9, in Chicago,

(Continued on page 106)

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SUPER SPECIALS

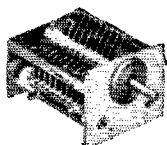
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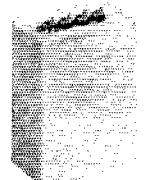
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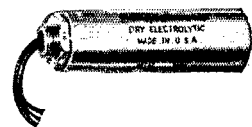


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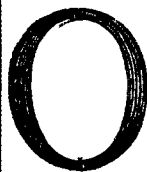


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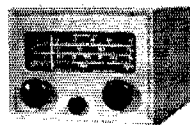
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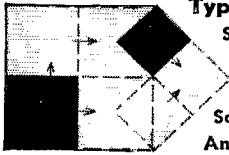


Steinbergs

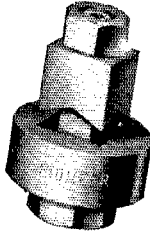
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— See Page 119 —

reports into the MARS Net as often as possible. QT reports into OPEN regularly. Traffic: W5GZK 458, ROZ 244, MRK 228, MFX 118, OQD 88, JHA 87, FOM 58, FKL 39, FOG 39, SWJ 27, CKJ 19, KY 19, ESB 13, GVV 12, OFG 11, HFN 9, EHC 6, RIT 1.

SOUTHERN TEXAS — SCM, Dr. Charles Fermaglich, W5FJF — 9NFK moved to Houston June 1st. PSC is putting a converted 522 on 220 Mc. RPH was seen at STEN Convention with new XYL, Betty. QKF was STEN Convention general chairman. IBT and his XYL are sporting new Buick and PB mobile rig. PTR is working Novices. LLT is displaying a gold pin for 10 years' service with FCC. ON, on 432.15 Mc., already has worked AYU, HPC, FON, UW, and IGL. E. J. Shuttis, Texas Highway Patrol officer, who is awaiting his ham ticket, recently stopped FJF, your SCM, for exceeding the speed limit. GLD and WN5TSA stopped and we all had a ham meeting on the side of the road. At the recent STEN Convention in Kerrville the following officers were elected: FAH, NCS; PNP, Alt. NCS, FJF, secy-treas.; GXP, net chaplain; EV, net P.R.O. Zone 1: Zone Control ORG; Alt. Zone Control, OOU; P.R.O., RWX. Zone 2: Zone Control, BHO; Alt. Zone Control, APP; P.R.O., 12B. Zone 3: Zone Control, FNH; Alt. Zone Control, RAL; P.R.O. LHX. Zone 4: Zone Control, OOG; Alt. Zone Control, PBU; P.R.O., NZH. Zone 5: Zone Control, Bob Cranford; Alt. Zone Control, KBU; P.R.O., REM. The C.W. Net: Zone Control, FIW, Alt. Zone Controls, CUQ and ABQ; P.R.O., PY. FXN received Extra Class ticket. TUN, recently appointed OBS, is a member of the Longhorn RC. TOM, 14 years old, is a member of the R.C.C. and the Novice emergency net. RN5 is doing FB on 3645 kc. Mon., Wed., and Fri. at 2000 CST. MRK is NCS. RIH is organizing a c.w. net called "Tin Ear and Glass Arm Net" on 3780 kc. at 2000 CST Wed. for the purpose of improving c.w. speed for all General Class licenses. NPX reports NPX, EIR, and WN5TYI are all on 144 Mc. WN5VQM is a new ham. TYI is active in TSGRC and has mobile on 2726 kc. ABQ plans to retire his 23-year-old 204A soon and use something with a screen with 1 kw. JQ is back on 7 Mc. after 12 years inactivity with 100 watts to 829B, 1/4-wave vertical antenna. PZJ will be operating in W1 until late August. MN has sked with 0TQD, 3CUL, 0QXO, 5NG, and 5NKG. NLY is trying phone with n.f.m. TFY is back on 10 meters with 12 watts n.f.m. and worked 13 states, 5 KZ5s, and KH6AFR in May. 4RZU/5 is active on TXN, A.T.L. c.w. net, SAEN and has daily sked with K5NRX on 7200 kc. at 1315 CST. NLY is active in STEN and ORS. The Regional and National Convention will be held in Houston in 1953. K5FKF made BPL with credits due all ops on duty, 7PPX "Hank," 4TLE "Ray," 5MEU, "John" and the licensee "Harry." Traffic: K5FKF 297U, W5MMN 514, QEA 160, W4RZU/5 80, W5RIH 58, BHO 41, RNF 27, ABC 7, PZJ 6, NLY 4.

NEW MEXICO — SCM, Robert W. Frawmen, W5NXXE — SEC, PLK, RM; NKG, PAM; BLW, PAM v.h.f. FAG. The picnic at Capillo Peak was attended by more than 135 in spite of rainy weather. W5UTS is a new member of the AREC in Artesia. ZU, RFL, and RMU all have Elmaco mobiles. RFJ and K have a 35-foot mobile antenna. PIB and JMM are new members of the 75-meter net. NSN has been named honorary NCS of Dragnet by acclamation. The Rio Grande acted up three times during May, breaking a dam upstream and threatening levee failures above Belen twice. The first episode saw UVA, RMU, and NXE packing to the Espanola region. The first week at Belen saw PIB and TGC in the field, with PXA coordinating from Belen. PBE, SE, JA2ZZ/W5, LDO, JMM, and NSM aided in relaying and clearing the channel. The second week saw PIB, TGC, K5NRX, and PLK in the field; PXA and NXE in Belen; with K5FBF and the gang at TGC providing liaison. A flash flood hit Albuquerque. Ten-meter net members turned out in force to aid evacuation and road patrol work. Nets: (1) 6:00 P.M. MST, Tues, and Thurs.; 7:00 A.M., Sun., 3838 kc. (2) C.w. net at 6:00 P.M., Mon., Wed., Fri., 3838 kc. Traffic: W5NKG 198, PXA 152, NXE 62, JZT 38, PLK 26, ZU 17, PSV 6, RMH 6.

CANADA

MARITIME DIVISION

MARITIME — SCM, A. M. Crowell, VE1DQ — SEC: FQ, EC; EK, RM; OM. The Glace Bay Club now is operating with the call NU. The HARC boys had three gas-driven plants in the Field Day activity. We hear that DL1XM, who was a recent visitor here, has located a new position in Montreal; also that VE3CC will be at FP8AJ this summer. Congrats to LZ on the arrival of new YL jr. operator. WD soon will join the 3.8-Mc. mobile gang with Command set. SI has been trying to knock off some 14-Mc. DX in addition to his mobile work on 3.8 Mc. AW and XR have been holding daily skeds. The latter at his summer QTH finds 3.8 Mc. very nice for contacts with the city. BC and AW have both taken up TV. Notes from FRAC: AAY is building a new home. ZK and YW, students at U.N.B., have left for summer vacation jobs. GL has been monitoring the 21-Mc. band. BM has the new B&W coils and shielded link in operation. UD has settled on 7 Mc. GU has new NC-183D on order. AAY changed QTH. PF and ABT are

(Continued on page 108)

Lafayette



Scotty Says

There are a lot of new items listed here that will interest all YL's, WN's, and OT's. Needless to say, should you require any additional info on any of these items, drop me a line and we'll send it to you promptly. 73
DUNCAN SCOTT W2LAL



J.F.D. Zoom-up Mast

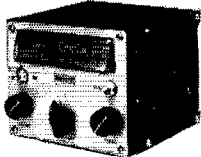
Zinc-plated seamless, 16 gauge steel, telescoping antenna masts. Supplied with guy rings, clamps and insulation hardware (less guy wire).

- ZU12-20 20 ft. mast \$ 7.35
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- ZU1234-40 40 ft. mast 20.41
- ZU12345-50 50 ft. mast 33.38

Sonar MR-3

3-band receiver, model MR-3.

\$89.95

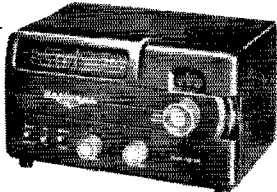


Eldico Novice Course

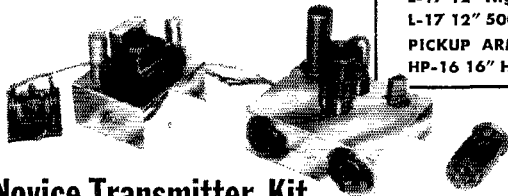
- Complete course \$25.00
- Records only 17.00
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SW 54



National —SW-54..... \$49.95



Novice Transmitter Kit

New! Philmore, one of the pioneers in designing radio kits, has just introduced this new novice transmitter kit. It is a complete kit, including power supply and key. Transmitter uses Pierce type crystal oscillator, PI type tuning amplifier. 6V6 tube is used in the oscillator and a 6L6 in the amplifier. The power supply uses a type 5Y3 rectifier and supplies 370 volts DC at 100 milliamperes. All parts needed are supplied except hook-up wire, solder, crystals and antenna. Instruction manual supplied to simplify work of constructing the kit. Priced right for that novice budget.

Philmore novice transmitter kit **\$29.40**

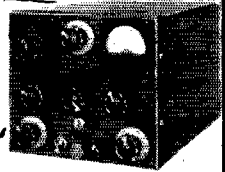
Ham Specials!

- CONDENSERS**
- .05 mfd 7500 VDC \$.75 ea.
 - .05 mfd 2500 VDC .75 ea.
 - .5 mfd 600 VDC .25 ea.
 - 2.0 mfd 600 VDC .75 ea.
 - .006 mfd 2500 VDC .10 ea.
- RESISTORS**
- 10,000 ohm 120 W \$.75 ea.
- SWITCHES**
- Toggle SPDT and DPST \$.29 ea.
- COAX**
- RG59U per 100 ft. \$4.50
- HEINEMANN CIRCUIT BREAKERS**
- Type 2163M4 2 pole 1.25 amp. 117 VAC \$2.95
 - Type 0322M 2 pole 15 amp. 125 VAC \$3.95
 - Type 0711 single pole 5 amp. 115 VAC \$2.95

Special Sale!

- DUAL SPEED PROFESSIONAL TURNTABLE**
- 33 1/3 & 78 RPM
 - 16" HQ16 ~~\$84.00~~ \$34.50
 - 12" HQ12 ~~58.50~~ 24.50
- PICKUP ARMS: AUDAX**
- L-18 16" High Imp. \$7.95
 - L-18 16" 500 ohm 7.95
 - L-17 12" High Imp. 6.95
 - L-17 12" 500 ohm 6.95
- PICKUP ARMS: ASTATIC**
- HP-16 16" High Imp. 5.95

it's new!



Viking Mobile Transmitter Kit

\$99.50
(less tubes)



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P-7253 spring base rear — mount antenna **\$23.13**

New Gon-set Tri-Band Spread Converter... **\$47.60**

MOTOROLA P-69-13 or 18-ARS receiver with special noise limiter for use with any converter having 1440-3000 KC..... **\$60.00**

3-30 famous Gon-set converter complete to connect to the P-69-13 or 18-ARS receiver. **\$44.75**

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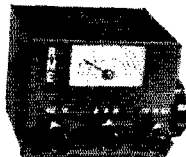
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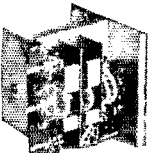
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GOOD NEWS!



**RME ANNOUNCES A
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(For 2, 6, 10-11 Meters)
**BUILT TO VHF 152A
STANDARDS OF EXCELLENCE**



For the finest in mobile gear, you'll want the new RME MC-53. Look at the chassis and under it — compare it with any converter — then decide. It's stable, won't hop frequency, has bandspread galore, a built-in automatic noise clipper circuit, a lead for optional "battery" if even greater stability is required, using auxiliary 6-volt dry battery. Tube complement, 6AL5 clipper, 6AK5 RF amp., 12AT7 detector and oscillator, OA2 vol. reg. Tuning knob on side. Produced by RME — the nation's outstanding converter manufacturer! See it at your jobber or write for spec. sheet. **Amateur Net...\$66.60**

detector and oscillator, OA2 vol. reg. Tuning knob on side. Produced by RME — the nation's outstanding converter manufacturer! See it at your jobber or write for spec. sheet. **Amateur Net...\$66.60**

HF 10-20

**FOR 15 METERS —
THE BAND IS OPEN**
(For 10-15 and 20 Meters)



"21 Megacycles — On the way at last" says Mar. '52 QST editorial. Be prepared — the popular HF 10-20 is the only converter that supplies 7.8 linear inches of bandspread on each band. Images non-existent. Average gain 25 DB, voltage regulated. Write for specs. **Amateur Net...\$92.00**

RME
TIME WILL TELL

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Peoria 6, Illinois, U.S.A.

back on 14 Mc. after some DXing on 7 Mc. LX is believed to be building a new rig. NN, a new call in the Halifax Area, is on 14-Mc. c.w. Sorry to hear that NO is on the sick list. Traffic: VE1FQ 126, HC 83, MK 81, LZ 48, AAK 29, BK 27, SI 18, ABJ 17, BC 17, XH 16, AB 14, ZO 14, AAL 8, ZM 8, PT 7, DB 6, ABA 5, LY 2.

ONTARIO DIVISION

ONTARIO — SCM, G. Eric Farquhar, VE3IA — Holidays, gardening, and band conditions in general have cut deeply into ham radio activities. Traffic totals keep up a nice amount. The Kitchener-Waterloo Radio Club had a fine turnout at its May meeting, with AQZ providing an excellent talk on super modulation. Short periods of code instruction have become a regular thing at this club's meetings. It's a good idea and worthy of repeating at other clubs. AJI has moved to Hamilton. The Ontario Section Net found the following reporting in during May: DU, WY, ATR, EAU, BMG, EAM, BME, BL, BOZ, OD, BUR, BBM, DEA, BXX, ADX, AJR, and AXQ. AVS, up Kapuskasing way, enjoys LO-NITES and CD Parties. OJ was a welcome visitor in Hamilton and was able to take part in S.E.T. with XZ mobile. JU vacationed in the Soo. DGZ goes for trout fishing in a big way. News was very scarce this month. Let's hear about your summer doings. Hope your vacations are pleasant. Traffic: (May) VE3ATR 138, BUR 108, IA 72, WY 53, BMG 46, AHA 36, EAM 32, BJV 30, DU 30, EAU 14, PH 9, DFE 6, VJ 6. (Apr.) VE3TX 93, GI 50, VJ 3. (Mar.) VE3TX 70.

QUEBEC DIVISION

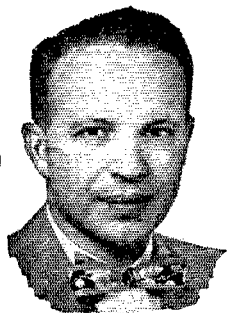
QUEBEC — SCM, Gordon A. Lynn, VE2GL — EC reports for the St. Maurice Valley gang, which maintains a continuous watch on 144 Mc. on the lookout for DX. He also skeds AEM and APE, AFM, ANP, and ANH are new on 75-meter 'phone from that district. BK has his mobile rig operating on 10, 20, and 75 meters with good success. AQT is at VE3RCS for the summer. AGG still is working on the 813 rig but keeps AFARS skeds with his 30 watts. JN had AGG as a visitor during the month. LO reports traffic almost at a standstill since spring, and that he entertained the second operator on G8DMO. Together they visited TD, where the G had an opportunity to note the "W" QRM from which we suffer. CA reports northern traffic picking up this month, with somewhat better conditions to the north. AO manages to do quite a bit of traffic-handling despite his many out-of-town trips. KN has an antenna coupler and is using a long wire on 20 meters. ABX is ex-VE1ST and is located on the south shore. Traffic: VE2CA 48, EC 19, AGG 4, LO 3, BK 2.

VANALTA DIVISION

ALBERTA — SCM, Sydney T. Jones, VE6MJ — GJ needs only two states for WAS. WO is brushing up on c.w. for his Class A ticket and plans mobile on 3.8 Mc. EE is constructing Select-O-Ject and reports some nice DX on 7 Mc. EH still is working on the super de luxe hamshack complete with hi-fi set-up. AH is QRL with new studio construction. DZ has worked some choice DX on 14-Mc. 'phone. VK, FB, HI, and GW have been heard on mobile operation with good signals. Don't forget to cast your vote at the hamfest for your candidate in the "Queen Contest." JJ is recovering from an illness. EL is a frequent visitor to the big city and works the local gang on mobile. AO made a quick trip to Edmonton in connection with RCAF duties. EO is vacationing in U.S.A., combining business with pleasure. Haven't heard much from EA lately. EP has erected a new antenna and will be on the air shortly. BU and HE were Edmonton visitors recently. HC visited MJ recently during a business trip to the city. HB still is working single sideband. Traffic: VE6HM 98 OD 26, GJ 17, MJ 4.

BRITISH COLUMBIA — SCM, Wilf Moorhouse, VE7US — There are about 15 mobile rigs for Vancouver, with AIA new EC for 10-meter mobiles, also fixed stations, and AG-AEC for 40 meters. The VARG had its mobile transmitter hunt on June 1st with 10 units participating, followed by a gathering and judging of mobiles. First prize went to YZ, second prize to AOB. QC sounds very FB with his 813. UT and LG have been heard at last from Estavan Point. AQB has graduated from the fraternity of expectant fathers, and has another jr. operator. PN also has graduated from the same fraternity. GP is about fed up trying to rid the local h.c. station of standing waves. BK made a flying trip to Nanaimo and was scared of the heavy traffic, so cleared out again. JI is another welcome station on 75-meter c.w. AIV is just out of hibernation. Welcome back, Walt. ACC still is DXing. DH still is our good old stand-by on 3755 kc. JB is the new EC for district No. 6. QY has located in Nanaimo, but must have gone into hiding. US/ASA/JB mobile, while running into Merritt, were clearly read in Nanaimo. Traffic: VE7QC 79, AC 15, DH 13, YI 11, AMJ 2.

(Continued on page 110)



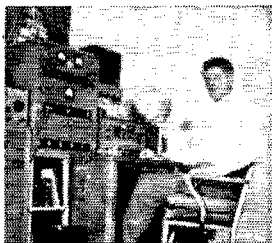
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modulation. I worked the Globe King in all climates on shipboard and on 10-20-40-75 and 80 meter bands, Crystal and VFO, and I am completely sold on it."

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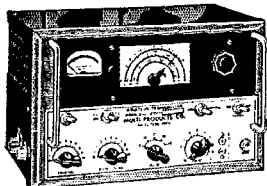
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Power Supply, 110 Volt AC..... **\$ 39.50**

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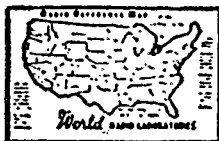
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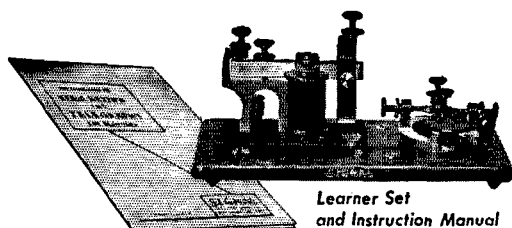
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PRAIRIE DIVISION

MANITOBA — SCM, A. W. Morley, VE4AM — Sorry there have been no reports the last couple of months, fellows, but as most of you know I have been in the hospital a couple of times and in bed the rest of the time. To all who visited me, sent cards, cigarettes, fruit, and so on, thanks a million. To all the new amateurs recently heard on, RN, RT, PJ, DB, LB, LE, KG, and EN, welcome to the game. 50 Mc. is showing interest, with WS, at Rosser; EX, ER, and FU, at Winnipeg; and YW, at Brandon, all active. ER reports working a W4 in the V.H.F. Contest. Belated congrats to CE on his appointment as PC on Eastern Manitoba AFARS Net. HC, at Selkirk, has new VFO driving p.p. 809. WARC is incorporating and going after call-letter license plates. The AVARC hamfest on May 24th was a great success, with 68 licensed hams in attendance, along with their XYLs, YLs, and jr. operators. The christening of PA as "Pretty Ankles" was one of the highlights. ID and AX made a fine job of the hidden transmitter hunt. Ex-DL3UH and ex-PA6YJ were visitors to the WARC meeting, together with BU and his XYL from Pointe du Bois. The next big event will be the Dauphin Hamfest on August 31st.

SASKATOON — SCM, Harold R. Horn, VE5HR — Activities and reports were very weak this month and as a result this column, which is made up of information sent in by you, will be small. Perhaps the good spring weather and band conditions have a lot to do with it. Ex-5SE now signs VE7SJ, and Stan is doing FB with DOT and likes his new work. EH and RO have moved to Saskatoon. The Saskatoon Club is sorry to lose MC, who is taking up residence and a VE4 call at Flin Flon. Good luck, Len, in your new vocation. LG has taken up farming at Fort Qu'Appelle. CO had a good week end on 50 Mc. working the W gang, a W5 being the best. JF sends in a good report on v.h.f. activities. FY and DR rebuilt their mobiles and put out an FB signal. EA also does well on mobile. FG has been appointed EC for the Weyburn Area. OC is doing well on 21 Mc. and reports skip conditions different from other bands but has worked all he has heard so far. PJ has new VFO working fine. Traffic: VE5HR 66, TE 15, PJ 13, FY 3, YF 2.

VOICE OF AMERICA AMATEUR PROGRAM SCHEDULE

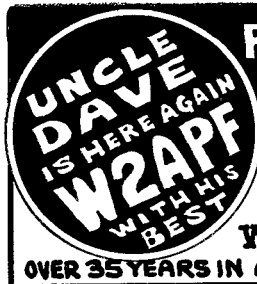
The following is the world-wide transmission schedule for the Voice of America's Radio Amateur Program. The locations given are transmitter points. Times and frequencies are subject to change with changing propagation conditions:

Far Eastern and Pacific Service — (0545 EST Sunday)
U.S.A. on 6075, 9515 and 11,730 kc.; Manila on 15,245 kc.; Honolulu on 11,790 kc. (0945 EST Sunday) U.S.A. on 6185, 9600 and 11,870 kc.; Manila on 920, 6125 and 11,890 kc.; Honolulu on 9650 and 11,790 kc.

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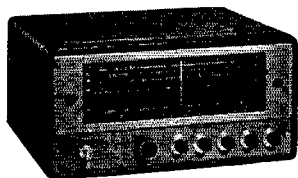
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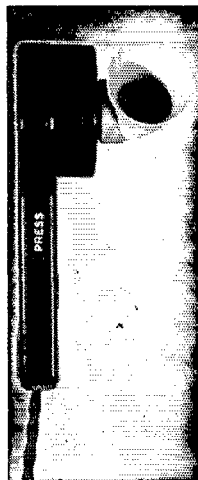
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Automatic Tuning

(Continued from page 18)

closer than I have ever been able to do manually. A 20-ke. shift in transmitter frequency on either the 75-meter 'phone band or the 20-meter band is enough to cause the network to return to the resonance point.

W2BLL is at work on an impedance detector which will make this a truly universal antenna coupler. W2PXR will soon be at work to make his final-amplifier tank circuit tune automatically as has been done before,³ so that everything will be automatic, relieving the operator for operating.

The author wishes to thank A. W. Janes, who unfortunately has no interest in ham radio, for his valuable suggestions in the design of the d.c. differential amplifier, and Bob Mezger, W2BLL, who spent many hours listening to tales of woe regarding antenna theory and assisting in the design of the phase detector.

³ Vogel, "Automatically Tuned All-Band Kilowatt," *CQ*, February, 1948.

50-Mc. Transmitter

(Continued from page 19)

in overtone circuits, accounting for the large feed-back winding, L_2 , employed in this rig. It is quite possible that the number of turns specified for L_2 will have to be changed to suit the characteristics of a particular tube and its associated circuit layout. The winding should be made larger if the circuit refuses to oscillate or behaves sluggishly or the inductance should be reduced if the oscillator "takes off" at a frequency not determined by the crystal. Incidentally, the oscillator adjustment must be made quickly, as the doubler plate current remains at a high value until the doubler circuit has been resonated. When this latter stage has been properly tuned, it should draw approximately 35 ma. If extensive testing of the oscillator is required, the plate voltage should be removed from the doubler temporarily.

Neutralizing of the amplifier is the next step and this is accomplished by adjusting capacitors C_7 and C_8 so as to eliminate amplifier grid current fluctuation when the plate circuit is tuned through resonance with no plate voltage on the final stage (no connection between pins No. 6 and 7 of the jumper plug). Grid current for the final should stay at approximately 13 ma. with the circuit thoroughly neutralized.

A connection may now be made between pins No. 6 and 7 of the jumper plug and a 15-watt lamp bulb should be coupled to J_2 . With the plate power turned on, and with the final tuned for resonance, the amplifier should load to 75 ma. when the output link, L_6 , is tightly coupled to L_5 . When an antenna is substituted for the dummy load, the coupling between L_5 and L_6 may be adjusted for a full-load current of 100 ma.

When testing the audio circuits, it is recom-

(Continued on page 114)



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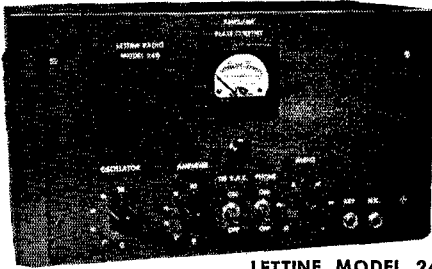
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mended that the r.f. amplifier be loaded with the lamp bulb. Set S_3 at the 'phone position and insert a carbon microphone in J_4 . Current to the 6V6s should be approximately 75 ma., increasing to 85 or 90 ma. on speech peaks. An increase in the brilliance of the load lamp and the upward kick of the modulator plate current may be taken as a fairly certain indication that the audio circuits are behaving properly. Of course, distortion in the speech equipment, if present, will not show up without a more comprehensive test. The last quick-and-easy check of the audio circuits may be made with a voltmeter. The meter should show speech-amplifier and modulator cathode voltages of approximately 8 and 19 volts, respectively. Plate voltage for the 6J5 should measure 235 volts and the microphone potential should be 4 or 5 volts when the microphone button is depressed.

It will be noticed that except for the use of shielded wire within the chassis, the transmitter includes none of the customary de-TVing practices. Shielded wire was installed because that was the one precaution that could not be conveniently added at a later date. So far as shielding and filters were concerned, we felt that these could be added readily if on-the-air operation indicated that they were necessary. Now, we're very happy that we were a little lazy at the time of construction because numerous contacts have indicated a complete freedom from TVI — at least in this area where Channel Six has the only TV signal to be contended with.

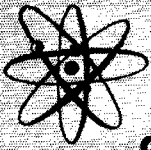
The author wishes to express his appreciation for the assistance rendered by Robert Resconsin, W1TRF. Bob was good enough to give the rig its on-the-air shakedown and intends to keep it fired up until the W1JEQ antenna is erected.

VFO Drift

(Continued from page 21)

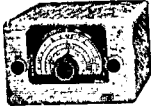
side of the shield to the coil. I had noticed at one time during my experiments that the oscillator behaved a lot differently when one side of the box was removed. The same components gave a much lower frequency and the circuit would oscillate with a lower value of C . Well, let's throw out the little box and try a larger one. Charley Atwater, W2JN, sent me a $4 \times 5 \times 6$ -inch box and I mounted the coil as near to the center of it as I could and then fitted the other components around the coil, as far away from it as possible. Then, mounting the two 0.001- μ fd. bridging condensers back in the box with the tuned circuit, as it was in the first model, I replaced the two coax lines between the box and the tube in the rig. Now the coil is larger than the one I started out with and the series tuning capacitance is almost down to half what it was then. This ought to cut the mustard. Fire up the rig. Now, this is more like it. I can tune all the way from 3500 to 4500 kc. without having the oscillator quit. This means I can switch side-

(Continued on page 118)



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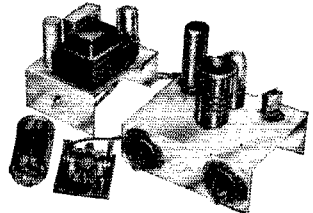
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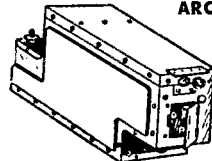
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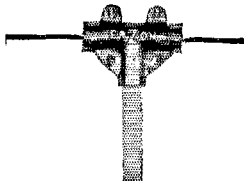
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bands merely by tuning the VFO. Now let's set up the old modified BC-221 that has brought some fair results in the ARRL Frequency-Measuring Tests. Let it run all day to make sure that it has warmed up thoroughly. Snap on the transmitter filament switches and apply plate power after 30 seconds or so. As soon as you can find the VFO beat, measure the frequency. Let the rig run for the total two-hour evening session, or longer, and check the frequency at short intervals. You come up with something like two-tenths of a dial division drift on the BC-221 which represents about 35 cycles. With heat in the house all day, there is a more even room temperature and the drift characteristics may be different as the seasons change. So far I have never seen the drift reach 50 cycles which is better than twice as good as the first model and this one uses no temperature compensator. Here again, it looks like the drift is mostly a matter of how much tank current you put through the coil to heat it up. This VFO is "schtil hocke." How about yours?

Novice Antenna Couplers

(Continued from page 30)

does so at a widely different condenser setting. While there are means for getting around this situation,² the beginner is well advised to adjust the length of his feed line to make the entire system resonant. Then, he should never have to worry about loading, because one of the tuners shown here should do the job.

As in everything else, learning the right way first may seem like the hard way, but it makes the going a lot easier in the long run. Putting up the right antenna and building the right coupler at the start may take a bit more planning and a bit more work than just running out a length of wire to the most convenient support, but it will go a long way toward eliminating coupling problems before they occur. There's no need to trust to luck in getting the most into your antenna. With a moderate understanding of what you're doing, you can be sure. And when you get the most into your antenna, you'll get the most out of ham radio.

² See page 124 of *The A.R.R.L. Antenna Book*.

Correspondence

(Continued from page 61)

to keep it up for longer than a few days at a time. It worked beautifully until one day when a rainstorm did me in.

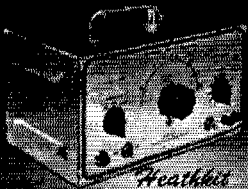
Our neighborhood was graced by a battle-axe of large dimensions, who had had her say on dipoles among other things. She was bound down the alley on her way home from the store when the rope broke. The bucket came down the tree, missing nary a limb, and pelting her with bricks and ice water at every leap. When she arrived on my back porch, she was saying something about hams and eggs that I never did get straight, but I do remember that she appeared to have been doing the polka in butter.

The moral is this — if you use a bucket for a counterweight, knock a couple of holes in the bottom. Water is heavy stuff. Using this approach to the counterweight problem eliminates having to restring your antenna when the lady's husband isn't home.

— Keith Olson, W7FS

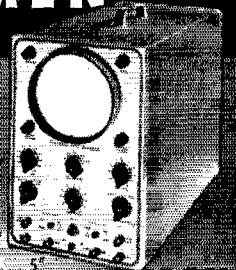
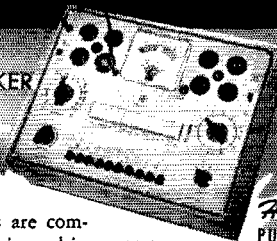
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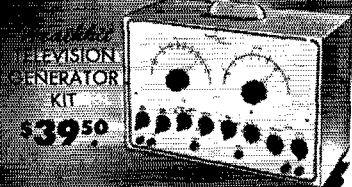


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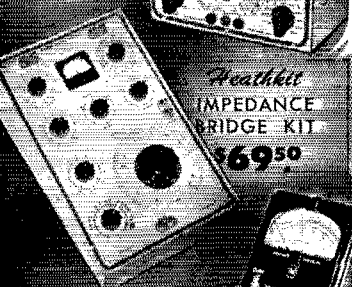
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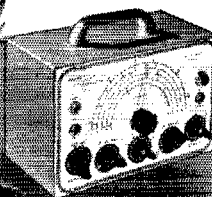
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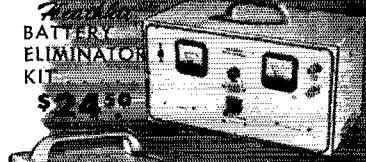
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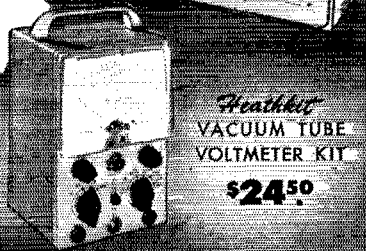
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DS-400
power supply
\$79.95 net

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THE United States Government has openings for radio operator technicians who are interested in careers in radio communications and general electronics involving extensive overseas assignments.

Applicants should have the following technical qualifications: (A) Two years active radio experience in the design, construction, and maintenance of transmitting and receiving equipment and the ability to copy International code at fifteen words per minute, preferably on a typewriter. (B) Knowledge of radio wave propagation and practical design and construction of antennae.

The required personal qualifications are as follows: (A) Age, over 21 and must be able to pass a thorough physical examination. (B) Indicate a willingness to serve overseas extensively and in any location required.

Current starting salaries for non-supervisory radio operator-technicians range from \$3410 to \$4205 per annum. Salaries, leave, promotions, employee benefits, transportation and baggage allowances, cost of living differential allowances, etc., are in accordance with current government regulations.

Interested personnel are requested to write a brief application letter to Box 1136, Main Postoffice, Washington, D. C. Considerable duplication of effort will be avoided if the following outline is adhered to:

1. Experience and training.
 - a. Number of months radio training and type (college, service schools, technical and/or trade schools).
 - b. Number of years radio experience and type (military, merchant marine, commercial, government).
 - c. Amount of this experience in telegraphy and amount in construction or maintenance.
 - d. Present radiotelegraph code speed.
 - e. Present or past radio licenses, including amateur.
2. Marital status.

If your initial application appears promising, you will be sent full application forms upon which detailed information can be entered.

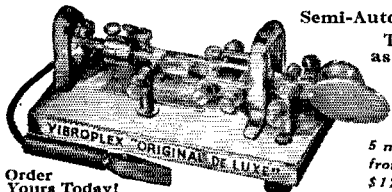
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833 Broadway New York 3, N. Y.



'Phone Monitor

(Continued from page 88)

cathode-follower stage tucked into the receiver with its grid capacitively coupled to the plate of the last i.f. tube.

The 'scope is built on a 3½-inch standard rack panel with space to spare. All controls are accessible on the front panel. All other components are mounted on a 3 × 10-inch sub-panel of ¼6-inch steel, supported 7¼ inches behind the front panel by ¼-inch brass rods.

Most or all of the controls, except the pattern-selector switch, could be eliminated from the front panel and made by screwdriver adjustment. In fact, the c.r.t. and tuned circuits could be mounted in a box remote from the rest of the instrument for mobile use. For this purpose, it would, of course, be impractical to use the transformer T_1 to obtain sine-wave sweep, since the heater supply would be d.c.

YL News and Views

(Continued from page 41)

Class exam. And four-foot-tall 9-year-old Helen Martin of Gulfport, Miss., amazed FCC personnel by breezing through the Novice exam and emerging WN6WCG. . . . YLs noted at the ARRL New England Convention at Springfield were W1s BCU FOF FTJ GQT MCW MJE MUW OME QON RYJ TRE UBL UBM UET UKR VHN VMF; WN1s UPZ UTX; W2BTB; and W8ZGT. The girls enjoyed a YL meeting and YL-XYL luncheon. . . . YLs W7s FCC FKS FXE GLE GPO HER HHH ITZ JFM NJS NTT and WN7s QWX QXH RAX RGJ RIC attended the 20th annual Oregon A.R.A. Convention. A special YL program included a breakfast, flower show, and tour through the University of Oregon. . . . W9GME wishes to thank all of the YLs who helped make the W9 YL Chicago get-together the success that it was.

Club News

New officers of the L. A. YL Club are W6NLM, Beulah, Pres.; W6KER, Gilda, Secy.; WN6PJU, Mildred, Treas. W6NLM, also chairman of the Club's Field Day operations, was awarded the Activity Contest prize for her consistent operation, net activity, and club attendance during the past year. On Field Day the L. A. Club goes on the air with their new call, W6MWO, the re-issued call of and a memorial to the late Helen Cook.

Wavelength Factor

(Continued from page 46)

is primarily interested in local communication, as is the case in most civilian defense work, practical results may be achieved by the use of very low power. The present need appears to be for a large quantity of low-powered equipment rather than a small amount of high-powered equipment. Also, it is to be remembered that in an emergency gasoline for battery charging may be scarce or not available, and high-powered transmitters may be nearly useless. Under these conditions there is much to be said in favor of midget transmitters employing available receiving tubes with powers of a watt or two. Such equipment may be simplified and be made more economical by having the transmitter "borrow" its power from an automobile broadcast receiver.

(Continued on page 120)

THE RADIO AMATEUR'S HANDBOOK

Internationally recognized as the standard manual of amateur radio communication, *The Radio Amateur's Handbook*, over a span of a quarter of a century, has grown from modest beginnings to the world's most valuable and widely-used radio book. Just as amateur techniques and developments have often been fore-runners of professional engineering practices, and the amateur body itself become a training ground in providing executives, engineers, and technicians for the radio industry, so has this text become the all-purpose volume of radio.

Retaining the material on theoretical fundamentals, principles, and design which has long made the *Handbook* so valuable a work, the 1952 edition has been further revised and integrated with constructional data. The practicing radioman and the student as well may find herein practical examples and applications of the theory he is learning. In its capacity as a text alone, the *Handbook* is probably more widely used in radio

schools and colleges than any other single volume.

Emphasizing practical utility with a wealth of illustrated constructional material, the *Handbook* treats communications problems in factual how-to-do-it terms rather than by purely academic abstract discussions and abstruse mathematical formulas. Copies of this all-purpose reference source are invariably found in the possession of radio manufacturers, schools, engineering firms, experimental laboratories, and military communications units.

In the annual modification and revision of the *Handbook* there has always been the paramount objective of presenting the proved and soundest aspects of current engineering practice rather than the merely new and novel.

Text, data book, constructional manual, operating reference book — no publication in the fast-moving and progressive science of radio equals the *Handbook* in universal application and appeal.

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Self Supporting

STEEL TOWERS

For Rotary Beams, FM, TV



ATTRACTIVE—NO GUY WIRES!

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Another great Arrow Special. Order both whip and base above, together and save still more!

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- THE EMBLEM CUT: A mounted printing electrolyte, 3/4" high, for use by members on amateur printed matter, letterheads, cards, etc. \$1.00 Each. Postpaid
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PORT ARTHUR COLLEGE PORT ARTHUR TEXAS
Approved for G. I. training

During the last three years this writer has used mobile equipment of this type, at first using a 6AK5 final on 28 Mc. with 1.5 watts, and later a bandswitching affair employing a 6AQ5 doubler with 4 watts, contained in a 4 x 5 x 6-inch box along with a 6J6 converter. Most of the time the antenna was the standard Ford 54-inch b.c. whip. Ranges of 5 or 10 miles have been quite consistent on 28 Mc., and on rare occasions contacts up to 70 miles have taken place. This equipment has been used in local AREC drills and has usually effected communication from typical city locations of a few miles. While there is no doubt that the higher-powered stations have put through louder signals, only rarely has this low-powered equipment been unable to get through. The operators of stations worked have frequently expressed surprise at the strength of the signal, and a few have questioned the writer's sanity. This writer makes no general claim on the latter point, but it happens that theory has given a valid justification for the use of such low power, and all of the writer's results are in complete accord with what the theory predicts.

World Above 50 Mc.

(Continued from page 56)

(also completely inside the car) for an antenna. Maybe our Chevy has a resonant window!

The World Above 420 Mc.

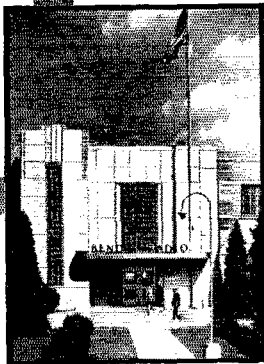
As receivers improve and antennas get bigger and better, the margin between 420-Mc. signals and those on lower bands gets smaller and smaller. When there is a good inversion the signals on 420 even overtake and surpass those on 144 Mc., as W2QED and your conductor found on our 210-mile hop last summer. Last year, however, W2QED was still using a very broad i.f., and often could not hear W1HDQ when the W2QED signal was audible up in Connecticut. That has been remedied now, and the first two-way contact of 1952 on 420 over this path was made on the morning of June 14th. Signals on 144 Mc. were running S6 on 144 Mc., and S3 to 4 on 435 Mc. The higher frequency tends to fade out first, as the early-morning inversion dissipates. When the 2-meter signals hit really high peaks, however, the 435-Mc. signal has been found to run up to 15 db. *stronger* than the 144-Mc. one.

Use of the 420-Mc. band has reached the point where it is no longer necessary to "make an appointment" on some other band to get a contact. W2QED makes a 3-minute transmission to the northeast each Tuesday, Thursday and Saturday evening at 10 p.m. At 10:15 he repeats with his array northwest. At 10:50 he aims southwest, and at 11:15 he works W3BSV, Salisbury, Md., with his beam south. This schedule is maintained regardless of conditions, and is repeated on other nights if conditions appear favorable. The high TV channels provide a good check on the possibility of 420-Mc. DX. Ken would like particularly to make checks with Boston area stations, in the hope of setting a new record.

W5ONS, W5AJG and other Texas stations are working on 420-Mc. equipment, and if their results on 144 and 220 are any indication they are likely candidates for a new 420-Mc. record.

W0HAQ, Davenport, Iowa, has a 4X150 amplifier and a crystal-controlled converter, and is checking regularly with W9ZHB and W9MBI, both of whom also have first-class 420-Mc. installations.

W3RKQ, Wilmington, Del., now has a 9903 amplifier following his tripler, and W2HEK, Woodstown, N. J., has a similar tube working as a tripler. W3GGR reports about six stations on 420 around Elkton, Md., all of whom are using low-powered oscillator rigs. They are interested in the band, however, and better gear is expected to be in use in that area soon.



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SEND and RECEIVE CODE this EASY — FASTER WAY! The CANDLER SYSTEM has developed expert Amateur and Commercial Operators, and Code Speed Champions. In a few weeks you can pass the code examination for license. You can send and receive with amazing skill and speed, without tension. Long hours of practice unnecessary to acquire proficiency. The WAY YOU LEARN is ALL IMPORTANT! By simple progressive lessons Candler teaches you at home to send and receive as easily as you talk or read — FAST, ACCURATELY. SEND Now For FREE BOOK — explains how fine amateurs and radio-telegraph experts learned code and developed skill and speed.

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QH (QUICK HEADING)

Sensational 5 Element NON-ROTATING BEAM

by ARRANGEMENT WITH DESIGNER WIPKW

(See June QST)

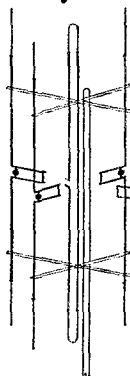
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- 4 Guardian Relays in Weatherproof Housings
- Easily Installed and Adjusted
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10 METER — \$62.50

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Wood Spreaders, easily obtainable
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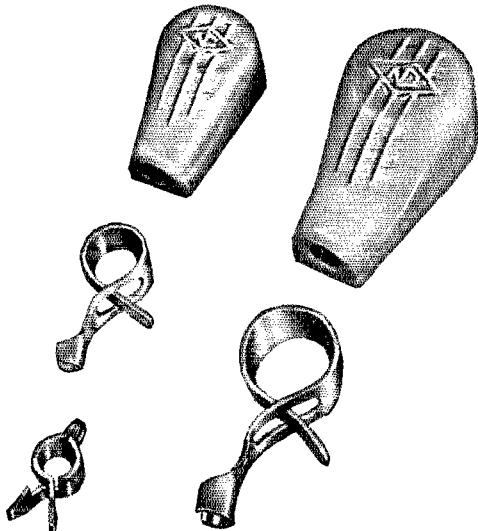
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High-quality grid and plate connectors of both the insulated ceramic (meeting JAN-1-10 specifications) and the non-insulated spring clip types for use on tubes having contacts of $\frac{1}{4}$ ", $\frac{3}{8}$ " and $\frac{1}{16}$ " diameters. All lugs are designed to provide strong mechanical connection. Write for drawings.

National



NATIONAL COMPANY, INC.
MALDEN, MASSACHUSETTS

S.S.B. Exciter Alignment

(Continued from page 51)

The "two-tone" pattern⁵ is a simple and familiar example of this that, as the name implies, contains only two frequencies, of equal amplitudes. In using the 'scope to determine sideband suppression, the carrier amplitude must be small enough to be negligible or its presence will complicate the patterns. The carrier amplitude can be checked by removing any audio signal and then turning the exciter off. A decrease in the thickness of the 'scope trace will indicate the presence of carrier.

If, for example, a 1000-cycle audio signal produces a pattern as shown in Fig. 4B, and the envelope variation is caused only by the presence of the unwanted sideband, then the ratio of desired sideband to undesired sideband is given in decibels by

$$S = 20 \log \frac{A + B}{A - B}$$

If either the audio signal or the audio amplifier has distortion, the contour of the envelope will not be sinusoidal because more than one audio input signal is being applied. The effect will be practically the same if carrier is present. A good approximation can only be made if the signal input is kept low, to avoid distortion and flattening.

Fig. 4C shows a complex envelope, obtained with a single audio frequency, and is an example of how the peak instantaneous sum of all unwanted frequencies can be approximated using this method. In the case shown, where the ratio of maximum to minimum is

$$\frac{7 + 5}{7 - 5}, S = 20 \log \frac{12}{2} = 20 \log 6 = 15.6 \text{ db.}$$

An attempt should be made to keep these undesired emissions as small as possible, and 25 to 30 db. down for the unwanted sideband and 50 db. down for the carrier represent reasonable values for amateur s.s.b. equipment.

⁵ Long, "Sugar-Coated Linear-Amplifier Theory," *QST*, Oct., 1951.

Strays

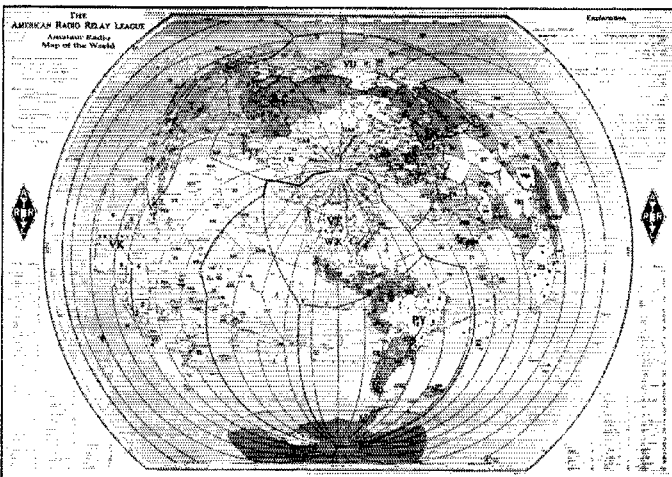
Dr. Gustave Hoehn, Seventh-Day Adventist doctor-missionary stricken by polio in Africa and speedily removed to Boston through the efforts of several amateurs (July *QST*, p. 27), is to undergo subsequent treatment in California. Lack of sufficient space last month prevented proper acknowledgment of the outstanding performance of Milton A. Chambers, W4NTZ, who served as "NCS" and liaison throughout most of the episode. At one time W4NTZ facilitated a conference hook-up between five key figures, four of them doctors, at widely scattered points. His efforts to maintain schedules and generally expedite the entire proceedings earned him many well-deserved plaudits in the press throughout the world.

Sorry...

**No Mermaids
nor Sea Monsters!**

● Old maps are quaint but ARRL does not compete with Herr Blaeu... we leave that market to the antique shops. Our World Map is strictly 1951, not the 16th century.

No active ham can afford to be without one of these popular and useful adjuncts to good operating. Here is why the ARRL World Map is such a favorite because:



As soon as you hear a DX station you can see exactly where he is—the country prefixes are not just listed in the marginal index; they're printed on the countries, themselves. You can tell his direction from you, and his distance. There's no question about which continent he's in—boundaries of the six continents are plainly marked.

The time zones are plainly marked, too. Call areas of thirteen countries are shown. Principal cities are designated. There's a scale of miles, another of kilometers. Printed on heavy map paper measuring 40" wide x 30" high, in 8 colors that really stand out, this new ARRL World Map is easily read from your operating position.

267 Countries are clearly outlined

40" x 30" 8-Color Map, \$2.00, postpaid anywhere in the world

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38 LA SALLE ROAD . WEST HARTFORD 7, CONN.

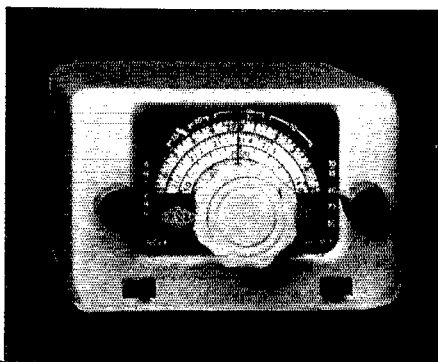
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- "HI-LO" impedance switch for 75 meter antenna input
- Plus the many other features which have sold several times as many "Tri-Bands" as all other makes of amateur converter combined.
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(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others.

(3) The Ham-Ad rate is 30¢ per word, except as noted in paragraph (6) below.

(4) Remittance in full must accompany copy. No cash or contract discount or agency commission will be allowed.

(5) Closing date for Ham-Ads is the 25th of the second month preceding publication date.

(6) A special rate of 7¢ per word will apply to advertising which, in our judgment, is obviously non-commercial in nature and is placed and signed by a member of the American Radio Relay League. Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, if by a member of the American Radio Relay League take the 7¢ rate. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising by him takes the 30¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply.

(7) Because error is more easily avoided, it is requested signature and address be printed plainly.

(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

Having made no investigation of the advertisers in the classified columns, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

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MOTOROLA used communication equipment bought and sold, W5BCO, Ralph Hicks, 204 E. Fairview, Tulsa, Okla.

SUBSCRIPTIONS. Radio publications a specialty. Latest Call Books, \$2.50. Earl Mead, Huntley, Montana. W7LCM.

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ANNOUNCING Chicago Hamfesters Radio Club Eighteenth Annual picnic at Frankfort Grove, Ill., Aug. 10th, 1952. Donations \$1.50.

5-Element 2-meter beams. Riverside Tool Co., Box 87, Riverside, Ill.

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QSLs Taylor, (W5VME) Little Rock, Miss.

QSLs, SWLs, America's Finest! Samples, 10¢. C. Fritz, 1213 Briar-gate, Joliet, Ill.

WANTED: Your attendance at the Mid-American and Dakota Division ARRL Convention, September 5, 6 and 7, 1952. Nicollet Hotel, Minneapolis, Minn.

QSLs: Fluorescent QSLs radiant and glowing with quality-control. QSLs Kromekote three colors and up. Rainbow maps, DX QSLs. Samples rushed, 10¢. Uncle Fred, Box 86, Lynn, Pa.

QSL and SWL cards. Samples. WISQF, Minner, Candia, N. H.

PHONE patch schematics, practical discussion, \$1.00. Nichols, WIMRK.

WANTED: Top prices paid Navy selsyns 1F, 1G, 1CT, 5F, 5G, 5CT and BC-348; BC-221, AN ART-13, AN/ARC-1, AN/ARC-3, RTA-1B. Electronic Research, 719 Arch St., Philadelphia.

TRANSFORMERS 1000 Va., 4400-2200-1100-1100-2200-4400, G-E \$15. 2MF condensers, 4000 VDC, continuously. \$9. G-E, both guaranteed. Dawson, 5740 Woodrow, Detroit, Mich.

QSLs. Brownie, W3CJL, 433 Chestnut, Emmaus, Penna.

10 and 20 meter beams. \$23.25 up. Aluminum tubing, etc. Willard Kadcliff, Fostoria, Ohio.

WANTED: Early DeForest and Marconi Wireless apparatus. Also early tubes and early magazine, call books, text books and other literature. Franklin F. Wingard, Rock Island, Ill.

WANTED: Navy Selsyns, types 1F, 1G, 1CT, 5F, 5G, 6G, 7G, etc. Autosyns: AV1, AV5, AY101D, AY201, etc. Tubes, Test equipment, Signal Corps equipment. Send lists. Top prices. Electro, 110 Pearl St., Boston, Mass.

WANTED: Cash or trade, fixed frequency receivers 28-42 Mc. W9Y1Y, Troy, Ill.

DON'T FAIL! Check yourself with a time-tested "Surecheck Test", similar to the FCC tests. Notice, \$1.50. General, \$1.75. Advanced, \$2.00. Amateur Radio Supply, 1013 Seventh Ave., Worthington, Minnesota.

QSLs, SWLs. High quality. Reasonable prices. Samples. Write to Bob Teachout, W1FSV, 40 Elm Street, Rutland, Vermont.

IMMEDIATE delivery: power supplies for Bandmaster transmitters. \$39.50. F.o.b. Alco Electronics, 102 Marston, Lawrence, Mass.

SELL: BC654-A transceiver in A-1 condition. Complete less PE103. \$50.00. F.o.b. Harrisonburg. Jay Suter, W4QDC, Park View, Box 49, Harrisonburg, Va.

QSLs? SWLs? America's finest and largest variety super-gloss QSLs! Samples 25¢. Sakkera, W8DED, Holland, Michigan.

FOR Sale: New Premax 33 ft. steel vertical antenna with mounting insulator. Catalog price \$58.00. Will sell for \$40.00. Dr. C. H. Scheffley, Mayo Clinic, Rochester, Minn.

COLLINS 32V2, new in condition and appearance, in original carton, with instruction manual. \$550.00 cash or best offer. W0MVO, Laurel A. Dirks, Route 1, Pawnee Rock, Kansas.

SELL: Panoramic adaptor, No. 841 'scope, TS-69A. Want: ART-13, DV-12, TCS equipment, RA-62, RA-34, BC-639, RA-42, SCR-694, PE-237, GN-58, test equipment with I or IS prefixes, technical manuals, radar and tubes. T. Clark Howard, W1AFN, 46 Mt. Vernon St., Boston 8, Mass.

BARGAINS: New and reconditioned Collins, Hallicrafters, National, Hammarlund, Johnson, Eimac, Harvey-Wells, Gonset, Morrow, RME, Millen, Lyco, Meissner, others. Reconditioned S38, \$29.00; S53A, \$49.00; S40A, \$69.00; S40B, \$79.00; SX43, \$119.00; SX71, \$149.00; SX42, \$199.00; SX62, \$199.00; NC173, \$139.00; HR05TA1, \$159.00; NC183, \$199.00; HR05OT, \$249.00; HR05OT1, \$299.00; HQ129X, \$139.00; SP400X, \$259.00; Meissner BX \$59.00; Lyco 600A, \$99.00; Meck T60, \$59.00; TB550, \$79.00; TB550D, \$99.00; DB22A, \$49.00; VHF152A, \$59.00; Collins 32V1, \$425.00; Collins 32V2, \$495.00; Collins 75A1, \$279.00; HT19, \$159.00; many others. Shipped on trial. Easy terms. List free. Henry Radio Stores, Butler, Mo.

MAP pins, round head, colors: red, blue, green, yellow, orange, brown. One buck brings fifty. Robest Products, R. Davy, 701 Dewey St., Harvard, Ill.

ATLANTIC City area: swap: 3-element 10-meter Workshop beam for commercially made 0-meter beam equal value. W2VXM.

TRADE for xmitter 2 1/4 x 3 1/4 folding camera, Zeiss Tessar, 3.5 lens, film pack adapter, cut film holders, filters, synchronized flash unit and other accessories, Burke & James enlarger complete dark room equipment. Worth over \$340.00. Will consider any reasonable offer. Eric Viking or similar values in trade. All inquiries answered, Cy B. Woods, 2048 North Cleveland Ave., St. Paul 8, Minn. WN0FFU.

SELL: Model TS-2 Heathkit Sweep-Generator, wired, new, \$45.00; Heathkit Model 0-3 oscilloscope, good, \$25.00. Will swap on good NC-57B. W8EUJ, Box 127, Mill Creek, West Va.

WANTED: T-17 mikes very badly. WN1UFZ, 49 Fletcher Place, Burlington, Vt.

LOOKING for QSTs 1915-1920. ARRL List of Member Stations, Blue Book List of Calls; any early call books or listings of stations, Year Book of Wireless Telegraphy, Marconigraph magazine, Electrical Experimenters, Amateur Wireless School catalogs, Radio Service Bulletin, National Amateur Wireless Association bulletins, early ARRL map, Wireless Age, Collins Wireless bulletin, early wireless catalogs, Modern Electrics, any early wireless gear, receivers such as Marconi, etc., parts. Bob Willis, W1PN, Box 26, Hyannis, Mass.

ACCURATE component tester; new measuring bridge design booklet; complete "build it yourself" plans, (precision measurements: resistors, inductances, capacitances). Guaranteed, only \$1.00. Technological Developments, 475 F Fifth, N. Y., 19, N. Y.

200-watt bandswitching transmitter, AM, FM, CW. 813 final. Excellent performer. 5" oscilloscope. Both: \$150.00. T. E. Powers, 2014 13th Avenue, Oakland 6, Calif.

FOR Sale: BC-794, Super-Pro, no cabinets, excellent condition, \$175.00; Millen, Vari-Arm, V.F.O., little used, \$25.00; Bug, gold-plated, jeweled, with case, \$25.00. Bergie M. Anderson, W5PMP, 1 Carby Loop, Apt. 8, MacDill AFB, Florida.

QSLs, 100 standard two-tone. Postage included \$2.30. Stamp for samples. Wahi, W3GFF, 1805 Kenilworth N.E., Washington, D. C.

QSLs Radio News May '45-April '49, \$8.00; Shortwave Craft, Aug. '33-Sept. '41, \$11.00. Albert Price, Plainfield, Ill.

FOR Sale: Army push-to-talk carbon mike, \$1.75; new Shure 710 mike, \$6.50; antenna relay 110 volt DTD, \$4.50; 300 V/150 Ma., 24 volt Dynamotor, \$5.00. W9LQI, F. Boyd, Ashton, Illinois.

FOR Sale: BC-221-AE with built-in selenium power supply (less heat developed) \$105.00; HQ-129-X with matching speaker, \$129.00. These units are electrically perfect and their cabinets are exceptionally clean and without scratches. Also for sale: Millen 90800 exciter, \$28.00; Sonar XE10, \$12.00; I offer a check for \$55.00 for a Collins PTO unit, No 70E-8A in absolutely perfect electrical and mechanical condition. Will express coast anywhere in USA. W. M. Keynolds, W9EVI, Box 485, Lake Forest, Ill.

SELL or swap: DCSW3 11 sets coils, \$30; RAK-5 used, \$50.00; Metalena 3-el 10-meter beam, \$20; tubes, new original cartons, Eimac 304TLs, @ 4.95; RCA 810s, \$3.00; GE VGS-3 xtal signal generator new, \$150.00; approved A-460 TVFS-3 meter, \$55.00; FT-24 mounted BT crystals, 7307, 7373, 7407 Kc., @ 1.00; UTC, S-38, \$10; Kaar 11X mobile receiver 1600 Kc. input, \$25.00; write to WIJR, Mockingbird Hill, Gardner, Mass.

PASS FCC Amateur Radio Exams. Leads to profitable career. Simple, quick recorded, home study course for theory and code. Lowest cost. Details free. American Electronics, Dept. QS, 1451 Wilkins Ave., New York City 59, N. Y.

QSLs! Interesting samples, 10¢. Tooker, P. O. Box 71, Lakehurst, New Jersey.

FOR Sale: 1 kilowatt transmitter Variac controlled using PR 4-250A's in final Mod's. PR 805's, high level speech clipping VFO controlled, \$400.00. Picture sent on request. Samuel Strauss (W2RCN), 3335 203rd St., Bayside, L. I., N. Y.

WANT G. E., YRS-1. W2GSF, V. R. Cassman, 36 West 10th, New York, N. Y.

WANTED: Marconi, DeForest, Electro Importing, Wireless Specialty Apparatus, "Ultimate" bug key, Marconigraphs, Wireless Age, Electrical Experimenters, QST's before 1920. Proceedings of I.R.E. before 1920, Modern Electrics, early crystal detectors, early hand keys, unusual bug keys before 1920. Please describe items fully and give asking price. Louis Rizoli, WIAAT, 100 Bay View Avenue, Salem, Mass.

SELL or trade: ARC/4 VHF transmitter with tubes, \$30.00; APQ/2 transmitter with tubes 210-500 Mcs, \$20.00; Simpson TV field strength meter model 488, \$50.00; Eico model 325 oscilloscope, \$30.00; Eldico antennascope AT-1, \$20.00. Need: UHF and microwave equipment for 1215 Mc. band and up. W3RKQ, Swearer, Box 1123, Wilmington 99, Del.

FOR Sale: Harvey-Wells transmitter, Model TBS-50A with A.C. power supply, \$85.00; Collins 75A1 receiver, \$215.00; both in excellent condition. Invader 1000 transmitter with Collins 310B exciter and separate speech amplifier for desk control. Transmitter has 750 watts of audio and two Eimac 4-250 new tubes in final amplifier. Grids of final are bandwitching 80 to 10 meters and plate coils are B&W, changeable. This transmitter is a wonderful buy for \$1000.00. Reason for selling: moving to Florida. Also numerous other pieces of equipment. A visit in person to WIDLEH would be well worth while.

S-40A like new \$63.00; new S-38B, \$39.00. Want: NC173. E. Tischler, 56 Carey Avenue, Wilkes-Barre, Penna.

COLLINS 70E-8A PTO is being made available once again. Your cost including the complete dial assembly: \$97.50. Production may be limited, so get your order in immediately. We also can supply the 32V3 transmitter and 75A2 receiver. We trade and offer terms. Write to Carl, WIBFT, Evans Radio, Concord, N. H.

FOR Sale: Hallicrafters SX-42 and R-42 speaker; Eldico TR-75, BC-696 (used); any reasonable offer accepted. W3QZX, 111 Second St., Coaldale, Penna.

TRIBAND Gonset, \$30.00; Sonar VEX680, \$35.00; NC173, \$125.00, all in excellent condx. W2CR, 412 Humboldt St., Rochester, N. Y.

HAMMARLUND 4/20 Transmitter and 4/11 modulator, both for \$50.00; Millen 90700 VFO \$20.00; BC459 never been altered, \$10.00. All in excellent condition. First check gets any one or all. Express paid. H. A. Simpkins, W8CRA, 1638 Cone St., Toledo 6, Ohio.

BC453, dynamotor, \$11.00. H. D. chokes, \$11.00. two Par-Metal cabinets, ER225, roller trucks, \$45.00 each; Amertran 6200 VCT, 700 Ma., \$45.00; KW final, speech amplifier, modulator delivering 600 watt audio, power supplies. For details and list of tubes, Variacs, parts: W4K1TZ, 4412 Brighton, Louisville, Kentucky.

SELL: Sonar SRT75 xmitter, 75w. fone/cw, 10 thru 80, with all coils and 2 spare final 2E22's, \$125.00; 80 meter ARC-5, 40 meter ARC-5 with common power supply, \$35.00. W2ZBY.

TELETYPE midget printers, trace transmitters, write for information. Wanted: ART-13, TCS, SCR-694, BC-1306, PE-237, GN-58, BC-639; test equipment, APR, BC-348, BC-312, BC-342. Arrow Appliance, Harrison Court, Lynn, Mass.

WANTED: Low frequency surplus crystals, channels 321, 350, 351, 353, 355, 357, 358, 359. State price. W9LQE, Dubois, Indiana.

HEATH V-5A VTVM, 18 ranges, brand new, accurately calibrated, \$39.50. W5AXV.

NEW crystals for all commercial services at economical prices; also regrinding or replacement crystals for broadcast, Link, Motorola, G.E. and other commercial types; no amateur. Over 16 years of satisfaction and fast service! Edson Electronic Company, P.O. Box 31, Phone 3-3901, Temple, Texas.

COLLINS 75A2 and speaker, perfect, used only few hours. Original cartons, \$365.00. BC-453 and miscellaneous parts. Send for list. QST from 1938 to 1951. Make offer. W7SD, 6425 N. E. Mallory Avenue, Portland 11, Oregon.

WANTED: Army walkie-talkies. State price, conditions and model number. Andy Andros, 249 North 48th, Lincoln, Nebraska.

RECTIFIER Signal Corps RA-34-H. Power input with line voltage match 105-125 or 210-250 volts 50-60 cycles AC. Power output filament 12 volts DC center tap 14.25 amperes. Control and microphone 12 volts DC 2.4 amperes. Plate supply 1000 volts DC, 350 milliamperes. Complete with chest, line cords and technical manual. Best swap or cash offer takes. Joe Farmer, W4MIZ, Hunting Towers, Alexandria, Va.

BIRTH announcements, ham styled, 25 for \$1.00. Narvestad, Granite Falls, Minnesota.

BARGAINS: Extra special! Motorola P-69-13 mobile receivers, \$29.50; Globe King, \$315.00; HT-9, \$199.00; HRO-50, \$275.00; Lyco 600, \$109.00; HRO-7, \$199.00; Collins 75A1, \$275.00; HRO-5T, \$175.00; SX-71, \$159.00; SX-42, \$199.50; HRO Sr., \$119.50; RME 2-11, \$99.50; RME-23, \$99.00; Meissner EX Shifter \$59.00; S-40A, or SX-16, \$69.50; VHF-152, \$59.00; HF-10-20, \$59.00; SX-24, \$69.00; Globe Trotter, \$79.50; Meissner signal calibrators, \$24.95; MB611 mobile transmitters, \$29.00; 90800 exciter \$29.50; RCA chanalyser, \$69.50; XE-10, \$14.95; Gonset 10-11 converter, \$9.95; and many others. Large stock of trade-ins. Free trial. Terms financed by Leo, W9CFO. Write for catalog and best deal to World Radio Laboratories, 740-44 West Broadway, Council Bluffs, Iowa.

NATIONAL 240D with speaker, \$125.00; Hallicrafters S-76, \$140.00, speaker \$15.00; RME-HF 10-20 converter, \$70.00; VT83 mike, \$10.00; Millen 90711 VFO \$85.00; 30 watt 10-20 meter TVI-power transmitter \$100.00; 250FT, \$12.00 10th, \$6.50. From the shack of the late W2YU. John A. Sutter, 2465 Knapp St., Brooklyn 35, N. Y.

SELL: Meissner signal shifter, Triplett metered and shielded for break-in; \$70.00. 150 watt transmitter, p-p 807 with 3 National multiband tanks, see ckt QST June 1949; includes power supply; \$125.00. NC-57 receiver with Select-O-ject; \$85.00. Robert B. Steward, 1127 N. 25th Street, Richmond 23, Va.

WANTED: 331/3 rpm microgroove broadcast transcriptions, aluminum base for private collection, 1500 volt plate xformer. William F. Baer, W0DZU, 1223 Highland Terrace, St. Louis 17, Mo.

COLLINS 32V2 for sale, in excellent condition. \$550.00. W8FTQ, Medina, Ohio.

PITTSBURGH Area: PE103, \$20; BC221, 115 VAC, \$55.00 or swap for V.H.F. 152A, W3AEV.

SALE: HT-17 xmitter with 40-20 coils, \$30.00. Trade: new Nikkor f3.5 35MM wide-angle lens in case, and \$50.00 for HQ-129X in good condx. Nace P. Abell, W3PWA, Route 6, Paragould, Arkansas.

FOR Sale: Model 9 1040 Meissner analyst, used about one year. Excellent condition. Would consider trade for Stancor ST-203A mobile xmitter or Gonset converter, H. E. Metcalf, W5AT, 1534 Woodard Street, Abilene, Texas.

WANTED: BC-221. Must have original calibration book and crystal. State P.o.b. price and condition in detail. Dale J. Fisher, W4VQK, 198 N. Purdue Ave., Oak Ridge, Tenn.

WANTED: BC-221, any model, provided the units are complete with original calibration book and crystal. Write for our high offers. Weston Laboratories, Weston 93, Massachusetts.

NATIONAL HFS receiver wanted. Must be in top condition. Local deal is preferred. Please send details and price in first letter. David Smith, 54 Butler Road, Scarsdale, N. Y.

COLLINS 32V2, National NC-173, Hy-Lite 10-Meter 3-element beam, Shure 70H microphone, Vibroxel, Simpson vacuum tube voltmeter, Jones 52 ohm Micro-Match, Eldico high and low pass filters, Eldico line filter and grid dip meter. Assorted parts including universal antenna matching unit. Equipment given little use. All in perfect shape. A \$1500 value. All for \$600. Make an offer if you don't want it all. Kent H. Landsberg, 426 South Camden Drive, Beverly Hills, California.

SELL: HQ129X modified per CQ April '52; Hammarlund 4-20 xmitter, Motorola FMT 30DMS, complete with mike, cables, etc.; Gonset Triband, 2-meter converters, Vibrampt VP555H, 300V, 200 Mills, small parts. Take best offer. W4VMT, 624 Mokena Drive, Miami Springs, Fla.

WANTED: Xmitter 200 to 500 watts, fone c.w. Must be good "20" cw rig. Phil Gendreau, W7PFZ, 1804 7th St., S.E., Puyallup, Wash.

SELENIUM rectifier and transformer kit 28VDC/12 amp, price, \$31.98; 1N34 diodes prepaid USA, 7 for \$4.65. Sell your surplus tubes and equipment. Free Tabogram. "TAB," 109 Liberty St. New York City 6, N. Y.

SELL S-20R receiver. In very good condx. \$45.00; 829B tubes, \$4.50 each. Richard W. Rice, W9LOC, 816 West Maple St., Champaign, Ill.

LICENSE now required to operate radar. Send 50¢ for complete questions and answers, study guide on FCC element 8. L. Dillin, W6UHC, 2445 N. Orchard Drive, Burbank, Calif.

WANTED: Super Pro cabinet. State price and condition. W4QT.

SELL HRO-7, 1.7-30 Mc. power supply and speaker, 100 Kc. marker xtal built-in, \$189.50. W4BSO, Grafton, Va.

MAKING a list of Baptist preachers who are hams. Free copy to each one listed. Write Rev. Wes Miller, W5QNK, First Baptist Church, Canton, Oklahoma.

SELL: Conservatively rated 275 watt transmitter. Millen exciter, PB12 final, 811 modulators, 600 watt UTC modulation transformer, 5 power supplies. Completely enclosed in 66" Deluxe Par-Metal cabinet, casters, etc. Best cash offer. W4KKC, 865 Cardova Drive, N.E., Atlanta, Georgia.

A Motorola transmitter for sale. A T19-32H, 250TH final, 100TH mod. Varic fil, control, complete, in perfect shape for \$350 F.o.b. W9KBT. Now on 10 m. Easy to convert to all bands. 450 watts inp. C. E. Gates W9KBT, 812 N. Washington, Janesville, Wis.

AN/APR-4 COMPONENTS WANTED

In any condition. Also top prices for ARC-1, ARC-3, APR-1, APR-5A, etc.; TS-34 and other "TS-" and standard Lab Test equipment, especially for the MICROWAVE REGION; ART-13, BC-348, BC-221, LAF, LAF, LAG, and other quality Surplus equipment; also quantity Spares, tubes, plugs and cable.

ENGINEERING ASSOCIATES

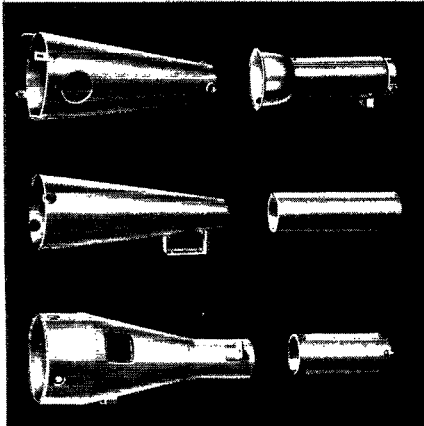
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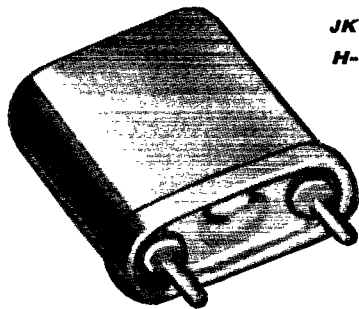


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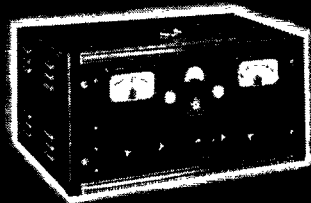


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H-17 CRYSTAL**

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The small, compact H-17 is designated as a military type crystal for its use in mobile units common to the military. Frequency range: 200 kc to 100 mc. Hermetically sealed holders; wire-mounted, silver-plated crystals.

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FREQUENCY AND MONITOR MODULATION

Monitors any four frequencies anywhere between 25 mc and 175 mc, checking both frequency deviation and amount of modulation. Keeps the "beam" on allocation; guarantees more solid coverage, too!

"High Gear" Response to High Power Maintenance!

Dawn or dusk, it doesn't matter. These heroes of the high wires arrive to stop power trouble before it starts. Their "nose for disaster" is in the service truck, in the mobile radio unit which often relies on JK crystals and monitors to keep their assigned radio frequency on the beam!

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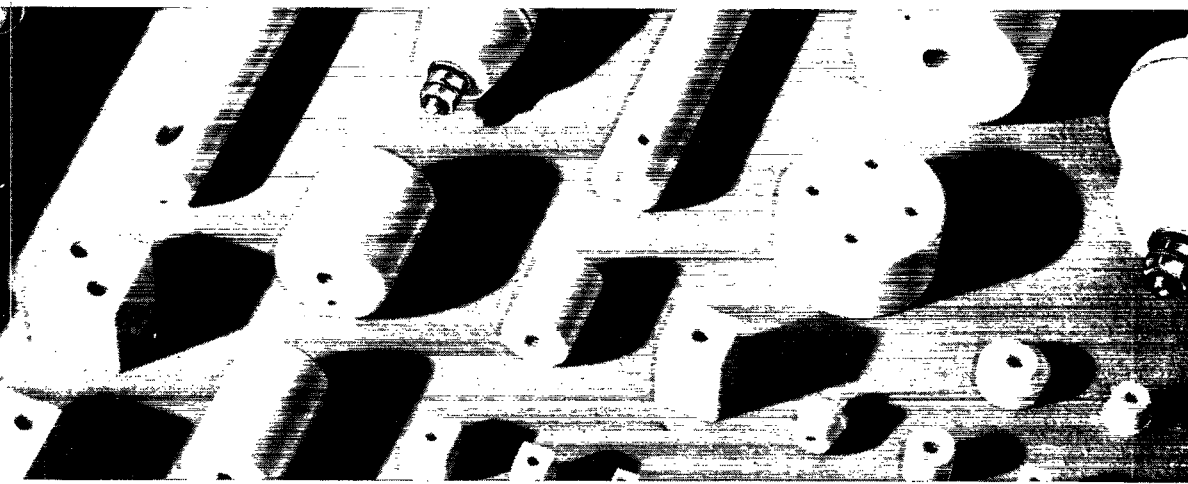
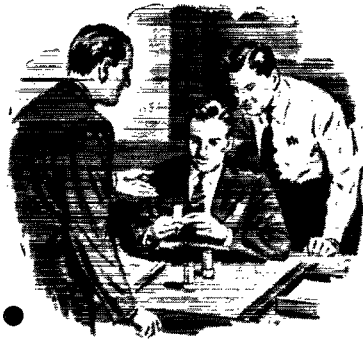
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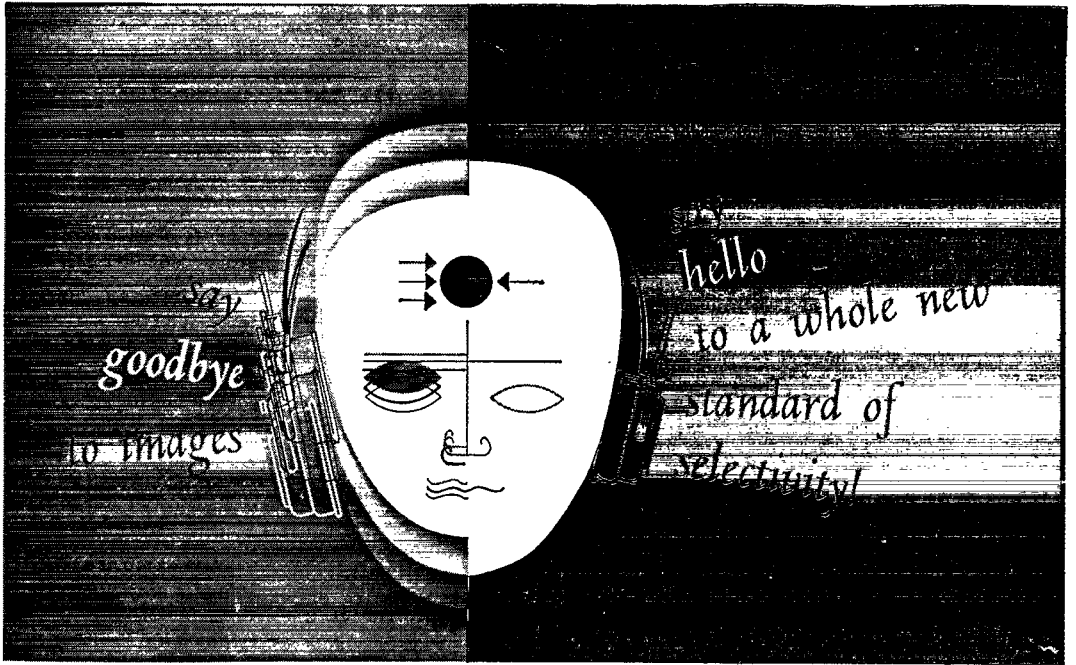
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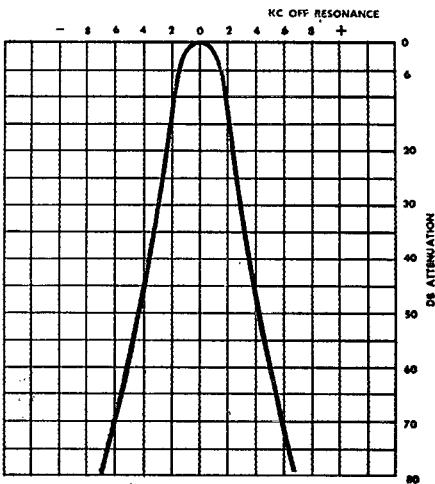
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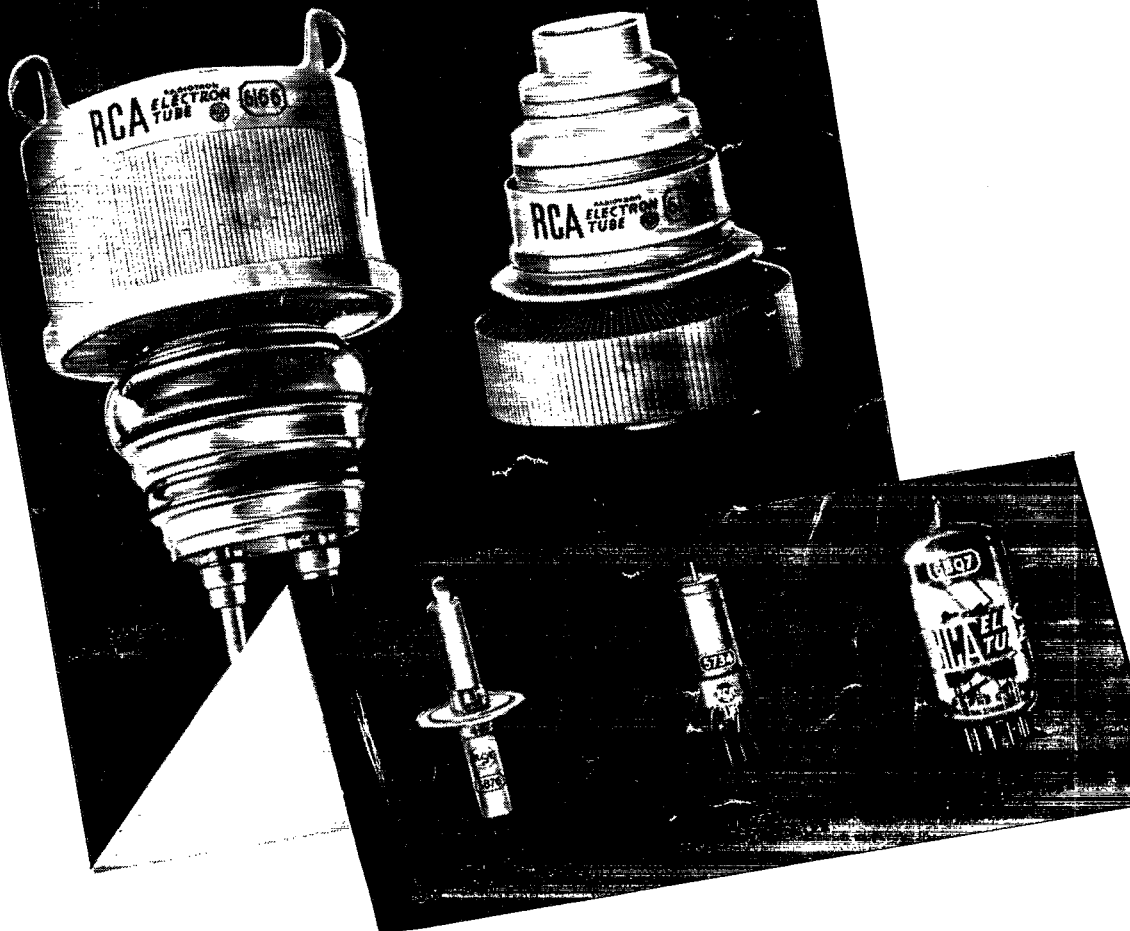


Dual Conversion! 12 Tuned I. F. Circuits!

Here now — the HRO Sixty — latest and greatest of a great series! Now, in addition to all the wonderful features of the HRO-50T1, you get *dual conversion* on all frequencies above 7 mcs. *plus* 12 permeability-tuned circuits in the 3 456-kcs. I. F. stages! Other new features include current-regulated heaters in the high-frequency oscillator and the 6BE6 mixer. High-frequency oscillator and S-meter amplifier are voltage regulated.

Be sure to see and hear the ultimate — **the HRO Sixty!**





Revolutionary tubes ...by professionals with "Ham Tickets"

While these revolutionary tubes are not normally used in Amateur activities, they typify the advanced engineering that goes into the tubes you do use. What we especially wanted you to know is that these tubes were designed by professional engineers at the RCA Tube Department who are also Radio Amateurs.

Each tube represents a practical solution to an extremely tough design problem . . . as well as a tribute to the ingenuity of Radio Amateurs and their continuing contributions to the radio industry.

Here are some interesting facts about these tubes:

The **RCA-6166** is a forced-air-cooled tetrode that can deliver a synchronizing-level power output of about 12 Kw in VHF-TV Service (54 to 216 Mc).

The **RCA-6181**, using ceramic-metal seals, is a forced-air-cooled tetrode capable of delivering a useful synchronizing-level power output of about

1200 watts at 900 megacycles in UHF-TV Service.

The **RCA-5876** is a "Pencil" type high-mu triode for use in receivers at frequencies up to about 1000 Mc. As an rf power amplifier the 5876 is capable of delivering a useful power output of about 5 watts at 500 Mc . . . and gives a good account of itself as an oscillator up to 1700 Mc.

The **RCA-5734** Mechano-Electronic Transducer is used for the measurement of small mechanical vibrations up to 12,000 cycles per second.

And the **RCA-6BQ7** is a new low-noise twin triode, especially developed for VHF-TV tuners. Incidentally, it's a fine rf tube for 2-meter receivers.

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