October, 1949
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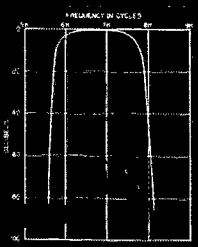
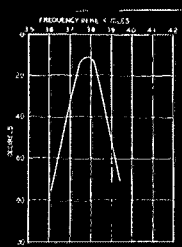
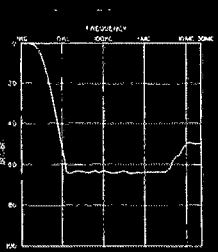
PRODU R A DECAD

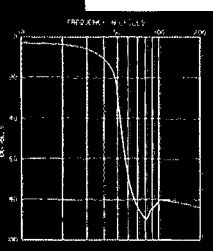
FOR FILTERS







ATTENUATES
10KC TO 30
MEGACYCLES



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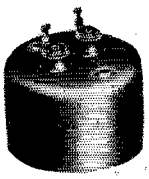
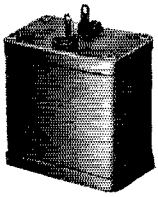
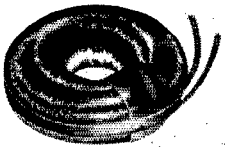
Filters employing SUB-OUNCER toroids and special condensers represent the optimum in miniaturized filter performance. The band pass filter shown weighs 6 ounces.



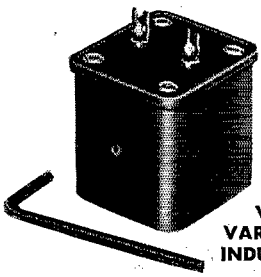
HQA, C, D TOROID COILS
$1\frac{13}{16}$" Dia. x $1\frac{3}{16}$" High.



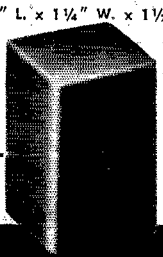
HQB TOROID COIL
$2\frac{5}{8}$" L. x $1\frac{5}{8}$" W. x $2\frac{1}{2}$" H.



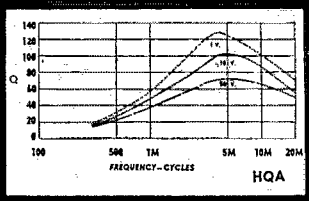
UNCASED TOROIDS

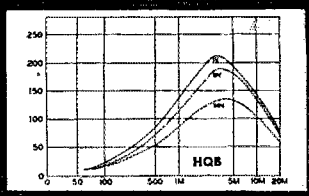


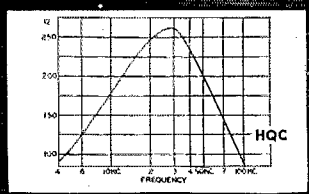
VIC VARIABLE INDUCTOR
$1\frac{3}{8}$" L. x $1\frac{1}{4}$" W. x $1\frac{1}{2}$" H.

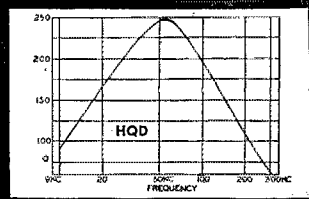


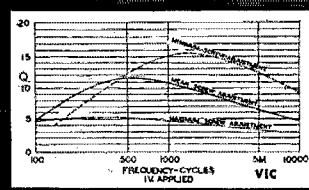
FOR HIGH Q COILS











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Ken-Rad and General Electric engineers designed the 6AB4 for television circuits, as a grounded-grid amplifier, frequency converter, or oscillator. The tube is doing a bang-up job commercially, meaning you can install it in your rig with confidence.

Being a true miniature, the 6AB4 is plenty compact. That makes it one of your team of small tubes for v-h-f transmission, where compactness is a practical necessity. And the high transconductance—well over 6,000 micromhos—points to an operating efficiency that sets the tube apart performance-wise.

The 6AB4 is precision-built to Ken-Rad high standards, so has the quality that comes when skilled manufacture takes up where expert design leaves off. See the tube at your Ken-Rad distributor or dealer. Its low price, you'll find, underscores the 6AB4's value. This is the v-h-f amplifier triode for that newest of rigs you're planning!

K KEN-RAD

6AB4

7-pin Miniature R-f-amplifier Triode

Heater voltage (a-c or d-c)	6.3 v
Heater current	150 ma
Max plate voltage	300 v
Max plate dissipation	2.5 w

182-HA29

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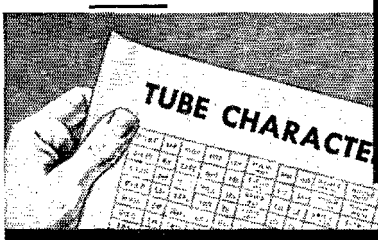

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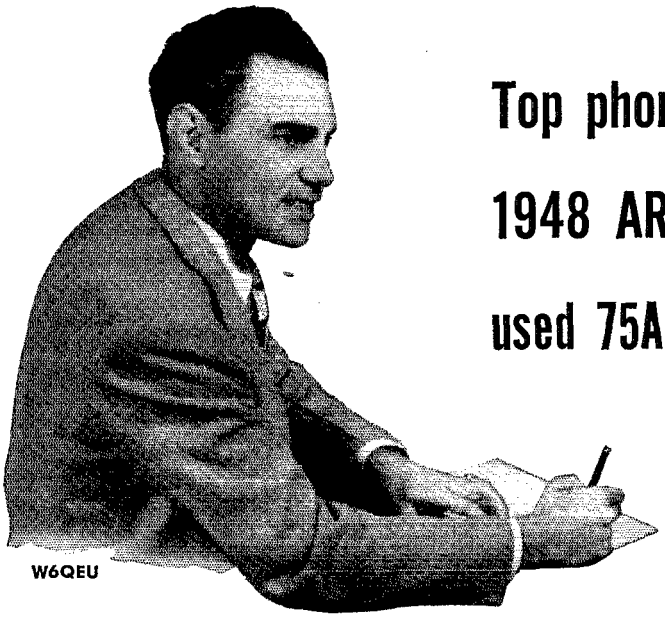
Top phone men in the 1948 ARRL Sweepstakes used 75A-1 receivers



W6QEU

Both W6QEU, top phone scorer with 85,896 points, and W6OGZ, who scored 78,936 to take second place, used Collins 75A-1 receivers.

Here are comments from W6QEU, Peter K. Onnigian, about receiver performance:

"Having come out of the 1948 SS Contest as top phone contestant, it may be interesting to state here what part the Collins 75A-1 played at W6QEU. For example, the accurate dial frequency calibration was a tremendous aid in staying inside the crowded band edges. To put it mildly, the 75A-1 is a frequency monitor at this station, its indicated accuracy being checked against WWV on 30mc. Its r-f stage threshold sensitivity is far superior to any other receiver used here, and needless to add, with the double heterodyne system used, its image rejection is tremendous, even on 10 meters.

"However, even with all the above, the writer believes the most wonderful feature of the 75A-1 receiver is its SELECTIVITY! It's terrific! During the peak periods of operation in the SS Contest, where on the 20 meter phone band an estimated 300 stations were trying to exchange contest data, in a 100 kilocycle band, selectivity with a capital S was mandatory for successful operation. W6QEU made 140 two-way contacts in 11½ hours of operation on this band, averaging 12.4 contacts per hour. On 10 meters time per contact was less, where 17.9 contacts per hour were made, while on 75 meters, 16.1 contacts per hour were chalked up. To accomplish this feat, the receiver selectivity requirements were severe. The Collins 75A-1 has the selectivity to make contacts at a record breaking pace, with the tremendous QRM conditions prevailing.

"In these days of high prices, the amateur like others must make his dollar go far. The Collins 75A-1 is ahead of others, in selectivity, sensitivity, dial frequency accuracy, image rejection and other features which are not found in other receivers, regardless of the price. The amateur dollar goes farther when invested in a Collins 75A-1 receiver!"

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OCTOBER 1949

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OFFICES

38 La Salle Road
West Hartford 7, Connecticut

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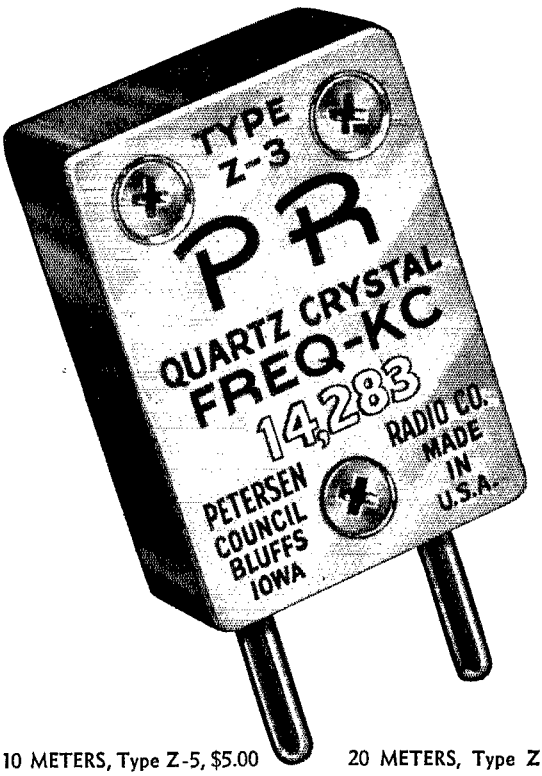

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Reports Invited. All amateurs, especially League members, are invited to report station activities on the first of each month (for preceding month) direct to the SCM, the administrative ARRL official elected by members in each Section. Radio Club reports are also desired by SCMs for inclusion in *QST*. **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* are invited to join the ARRL Emergency Corps (ask for Form 7).

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

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

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

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

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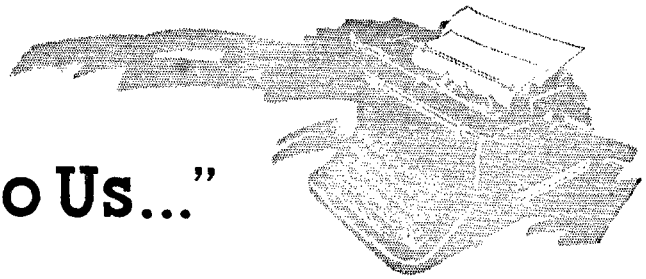
1834 Whittier Blvd., Whittier, Calif.

West Gulf Division

WAYLAND M. GROVES W5NW
P. O. Box 586, Odessa, Texas
(W5NW at Humble Pipe Line Camp, Odessa)
Alternate: David H. Calk W5BHO
7730 Joplin St., Houston 17, Texas



"It Seems to Us..."

A.R.R.L.'S NEW TVI FILM

A goodly proportion of *QST* space during the past few years has been given over to TVI reduction. Yet there are many amateurs who have never seen what their transmitters can do to television reception — many, probably, who have never even seen a television picture. So at this stage, there is a lot of natural curiosity: just what happens when ham transmissions show up on a receiver screen?

You'll soon have a chance to see. With the enthusiastic help of Phil Rand, W1DBM, League Hq. has produced a TVI movie short that will be on its way around the country by the time this issue of *QST* reaches you. In a half hour or so of running time it shows you typical kinds of interference, fundamental and harmonic, modulated and unmodulated. Equally important, it demonstrates the measures that have been found to be successful in combating such interference. The things that noncommunication QRM-makers — diathermy, for instance — do to a TV picture are shown, too, so you'll have some background on TVI in general.

Because TVI is of such vital interest to all of us, ARRL is making two copies of the film available. One, we expect, will be in constant circulation among the affiliated clubs, and arrangements for presentation at your club should be made through the Communications Department, as announced in "Operating News" in this issue. The other will be held for special events, such as divisional conventions. The latter film is scheduled for its "world première" at the New Hampshire State Convention in mid-September and subsequently will be featured at the Hudson Division Convention. Then Secretary Budlong expects to take it with him to the West Coast starting about the middle of October.

A strictly amateur job, the film is a "silent," but plenty of explanatory titles are interspersed to make the story clear. Get a look at it as soon as you can; we're sure it will help show the way to clear up your TVI troubles, present or future.

COÖPERATIVE ENFORCEMENT

Down in Little Rock a few months ago a newcomer to ham radio decided to enjoy the privileges of 75-meter 'phone operation without benefit of a Class A license. When the matter became known to local hams who were thoroughly schooled in the amateur tradition of policing our own ranks, they reported it to FCC. But these matters require time in careful handling and investigation by the Commission and its field offices, and the weeks dragged on. Meanwhile, Little Rock's postwar crop of newcomers, aware that the Class A regulations were being flagrantly violated while FCC was "doing nothing about it" (so it seemed to them), got to wondering why they shouldn't have some fun on 75, too. It became quite a problem for the older and more experienced heads, who were fully aware of the responsibility every amateur has toward the high standards of his hobby. The answer came in early August when the Commission, its investigations bearing fruit, issued an order suspending for six months the operator license of the offender. Our guess is that the younger element doesn't need the moral spelled out in capital letters.

The principle of self-policing is a very big factor in the coöperative attitude the amateurs have always had from the Commission. FCC, while it must of necessity move slowly and carefully in many such cases, remains constantly prepared to lay down the law to any amateur who doesn't play the game according to the rules. FCC has confidence in our ability to keep ourselves and our fellow-hams in line in most respects, but when someone flagrantly kicks over the traces the Big Stick is ready for application.

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.

Strays

For the benefit of 160-meter DXers, G2PL will operate on 1800 kc. from 0300 to 0400 GCT during Sundays in October.

—•••—

OUR COVER

Kitchen chores completed for the evening, Eleanor Lyder, W1RNT, of *QST's* advertising department, busily puts the finishing touches on the oscillator stage of her new traffic rig. Why this sudden switch from chasing WAS to message handling? Well, the secret's out and congratulations are in order. Back from vacation, Eleanor is wearing the diamond of Tom McMullen, W1QVF, senior operator and traffic handler at W1AW. Best o' luck, "Runt" and Tom!

On August 25th Dr. José Arce (left), Argentine ambassador, on behalf of President Osvaldo Risso Peuser, Radio Club Argentino, presented the "Trophy of the Radio Club Argentino, Donated by Jorge Delcasse, LU5CZ" to IARU President Bailey (center), who in turn delivered it into the custody of Mr. Benjamin Cohen (right), assistant secretary-general of United Nations. The trophy, which symbolizes the friendly spirit which exists in communications between amateur operators of the world, will be displayed at K2UN, UN amateur station, for ten years, after which it will be awarded to the society of the Union that is adjudged to have contributed most to the advance of the amateur communications art and to international understanding among amateurs. The sculptor is Louis Narbondo.

CONSTITUTION & BY-LAWS AND OFFICERS' REPORTS AVAILABLE TO MEMBERS

In April of each year the officers of the League make comprehensive written reports to the directors. The Board has made these reports available to interested members. The cost price is 75 cents per copy, postpaid. A copy of the Constitution & By-Laws will be sent to any member free upon request. Address the Secretary at West Hartford.

FEED-BACK

In Fig. 3 of W1DX's "A 1950 VFO Exciter," September *QST*, the voltage terminal labeled "−105 reg." should have read "−240." Also, the values of C_3 and C_4 were interchanged — C_3 is the 100-$\mu\mu$fd. unit. And just in case the CTC labels of L_3, L_4 and L_5 are unfamiliar to you, they stand for Cambridge Thermionic Corp., 445 Concord Ave., Cambridge 38, Mass.

16th ARRL Sweepstakes — Nov. 19th–20th and 26th–27th

How many ARRL sections and how many stations in those sections can you work in two week ends? If you are located anywhere in the League's field-organization territory (see page 6), you are cordially invited to take part in this popular annual operating activity. Any amateur bands, 'phone or c.w., may be used. The total operating time allowed each contestant is 40 hours. The Sweepstakes comprises seventy-one c.w. and seventy-one 'phone contests! 'Phone entries are compared only with other 'phone entries — c.w. scores only with other c.w. scores — in your particular section, in the competition for awards. The week-end periods starting Saturday afternoon (3 P.M. PST or 6 P.M. EST) on the 19th and 26th of November mark the "open season" for SS contacts. "CQ SS" or "Calling any Sweepstakes station" will be the calls indicating your wish to pile up a score!

A complete announcement of the contest, including the rules governing participation, will appear in November *QST*. The rules will be the same as those of the 1948 SS. Amateurs in remote ARRL sections who do not receive the November issue before the Sweepstakes may refer to October, 1948, *QST* for contest details.

Contest reporting forms will be sent to all amateurs who request them by mail or radiogram. It is not necessary to make advance entry or to use these forms, if the report form prescribed in October 1948 or, in the next issue of *QST*, is followed.

CU in the '49 SS!

A Cascode Converter for 144 Mc.

Improved 2-Meter Performance in an Easy-to-Build Layout

BY HENRY H. CROSS,* W1OOP

To anyone who has tried to get along on 144 Mc. with surplus gear or "simple" home-made equipment, it is no news that most 2-meter receivers could stand a lot of improvement. Most commercially-available gear is not too much better, and a more satisfactory answer to the receiver problem has heretofore seemed too costly or complex for most of us. The converter to be described, while not the ultimate in performance, is no more than two or three decibels below the best that is possible by today's most advanced techniques, yet it should be within the financial reach of anyone who can afford a transmitter. Though it requires a few more tubes than the basic minimum, it is straightforward in design and easy to adjust. With a little care in the mechanical work involved, the constructor should have no trouble in turning out a converter that will surpass anything currently available in manufactured form.

The principal reason for the improved performance is the r.f. stage, or stages, employed. The cascode [1] circuit, developed originally for use in radar i.f. amplifiers, is now being used very successfully in amateur [2] and television r.f. work. A triode-connected 6AK5, with inductive neutralization, is used in the first stage. The second stage uses one half of a 12AT7 dual triode as a grounded-grid amplifier, the other half of the tube serving as the oscillator. The mixer is another 6AK5, which may be either triode- or pentode-connected. A 6BA6 i.f. amplifier and a built-in power supply complete the unit.

* % Pickard & Burns, Inc., 240 Highland Ave., Needham, Mass.

[1] "A Low-Noise Amplifier," Wallman, Macnee and Gadsen, *Proc. IRE*, June, 1948.

[2] "Using the Cascode on 50 Mc." *QST*, March, 1949, page 29.

Though there is no better or cheaper tube than the 6AK5 for the first stage, the 6J4, 6J6, or 2C51 may be used for the second, in place of the 12AT7 specified. However, the other elements of the 6J6 would have to be grounded and the 6J4 is much more expensive. The 2C51 could be used in the same manner as the 12AT7, but it, too, is a somewhat rare and expensive type.

Constructional and Circuit Details

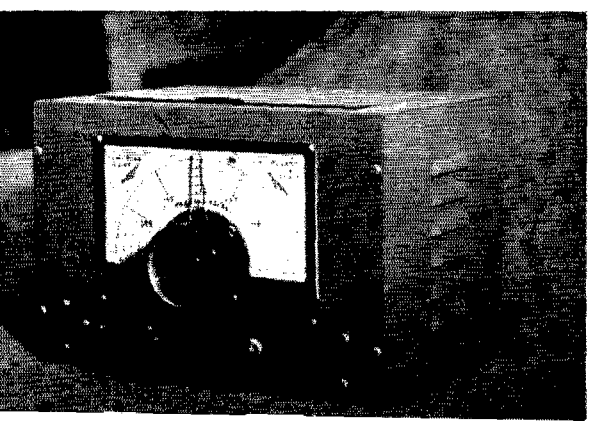
Assembling is begun by laying out the sockets for the most convenient wiring. With the tubes specified, it will be found easy to mount the oscillator tube at the right of the tuning condenser, with the mixer nearer the panel, and the antenna terminals at the rear, as seen in the photographs. Then in a top view the sequence will be as in the schematic diagram, and all leads can be short and direct.

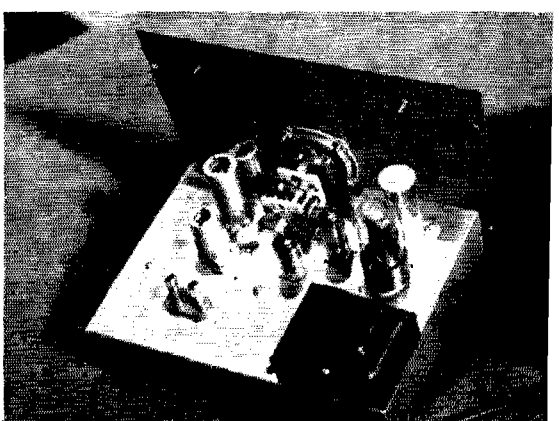
The grid leak and condenser in the input circuit are arranged to protect the r.f. tube from transmitter leakage, a chronic problem in ham shacks. The 330-$\mu\mu$fd. by-pass condensers specified are the small button micas with stud mounting, purchased on the surplus market. If these are not obtainable, the new Centralab "Hycaps," either 250 or 500 $\mu\mu$fd., may be substituted.

The neutralizing coil, L_3, and the plate coil, L_4, are not critical; they may be wound to the specifications and need not be a source of worry, provided the layout is similar to that used here. The second r.f. plate coil is slug-tuned, in order to permit tuning it to midband. Its loading resistor, R_6, provides reasonably flat response across the entire band. Antenna coupling should be as tight as possible for best signal-to-noise ratio and broad response.

The oscillator coil is self-supporting, and is mounted directly on the tuning condenser. With

The 2-meter cascode converter described by W1OOP. *Left*, in its cabinet, and *right* showing the topside layout.





care it is possible to solder the coil *on* without soldering the condenser plates *off*. By squeezing the coil and adjusting the trimmer the degree of bandspread may be varied widely. Leads from the variable condenser to the tube and the ceramic padders mounted near the socket go through ¼-inch holes in the chassis.

Note the small amount of temperature com-

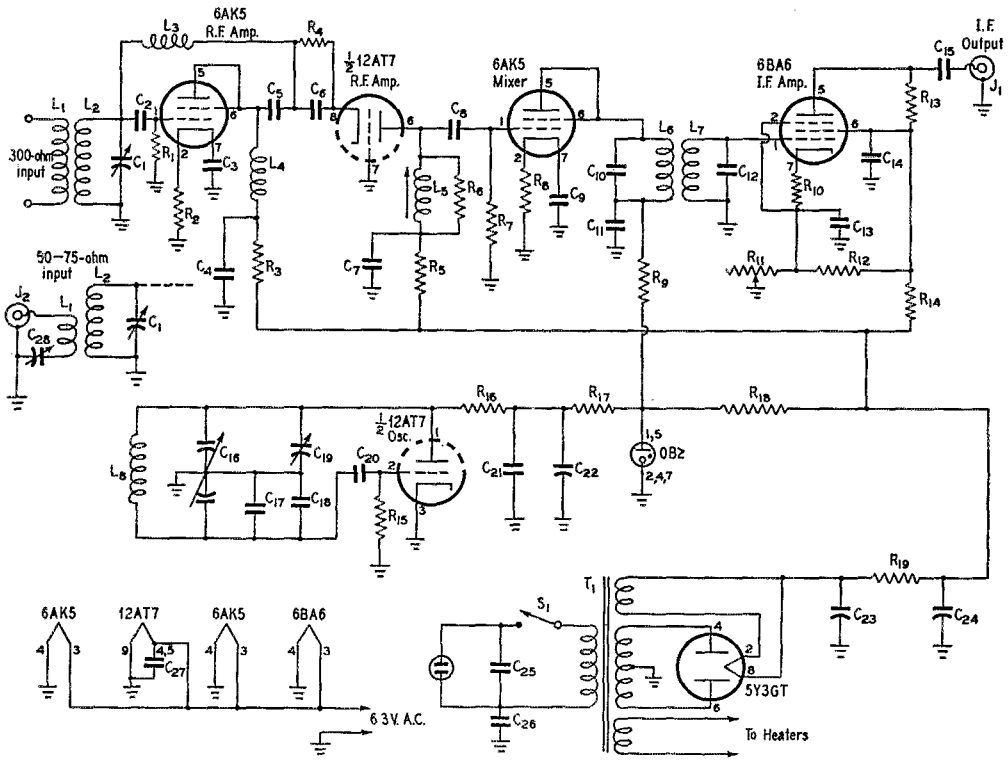
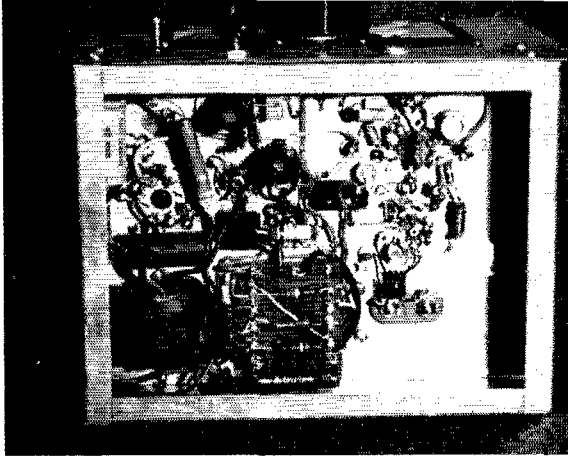


Fig. 1 — Schematic diagram of the cascode converter described by W1OOP.

C_1 — 5-μμfd. miniature variable (Johnson 160-102).
C_2 — 100-μμfd. mica or ceramic.
C_3, C_4, C_7 — 330-μμfd. button mica (Centralab 250- or 500-μμfd. Hycaps may be substituted).
C_5, C_{21} — 250-μμfd. ceramic (Centralab Hycap).
C_6, C_{15}, C_{27} — 470-μμfd. ceramic or mica.
C_8 — 47-μμfd. ceramic or mica.
C_9 — 1000-μμfd. ceramic or mica.
C_{10}, C_{12} — 120-μμfd. ceramic or mica.
C_{11}, C_{13}, C_{14} — 0.01-μfd. ceramic (Centralab Hycap).
C_{16} — 6-μμfd.-per-section split stator (surplus, or Millen 21906D).
C_{17} — 20-μμfd. ceramic, zero temperature coefficient (Erie 20NP0K).
C_{18} — 5-μμfd. ceramic, negative temperature coefficient (Erie 5N100K).
C_{19} — 5-25 μμfd. ceramic trimmer, zero temperature coefficient (Centralab 822-AZ).
C_{20} — 25-μμfd. ceramic or mica.
C_{22} — 30-μfd. 150-volt electrolytic.
C_{23} — 4-μfd. 450-volt electrolytic.
C_{24} — 30-μfd. 450-volt electrolytic.
C_{25} — 0.005-μfd. mica.
C_{26} — 0.001-μfd. mica.
C_{28} — 3-30 μμfd. trimmer.
R_1 — 0.47 megohm.
R_2 — 120 ohms.
R_3 — 6800 ohms, 1 watt.
R_4 — 150 ohms.
R_5 — 470 ohms.
R_6 — 4700 ohms.
R_7 — 0.22 megohm.
R_8, R_{13} — 2200 ohms.
R_9, R_{15} — 22,000 ohms.
R_{10} — 68 ohms.
R_{11} — 25,000-ohm potentiometer.
R_{12} — 47,000 ohms, 1 watt.
R_{14} — 4700 ohms, 1 watt.
R_{16} — 10,000 ohms.
R_{17} — 1000 ohms.
R_{18} — 5000 ohms, 10 watts.
R_{19} — 3500 ohms, 10 watts.
All resistors ½ watt unless otherwise specified.
L_1 — 4 turns No. 20 enamel, ⅝-inch diameter. Insert between turns of L_2.
L_2 — 4 turns No. 20 enamel, ⅝-inch diameter. Adjust turn spacing as required to resonate with C_1.
L_3 — 12 to 14 turns No. 22 Formvar on 1-watt resistor.
L_4 — 3 turns No. 22 Formvar, ¼-inch diameter.
L_5 — 3 turns No. 22 Formvar on Millen 69041 form.
L_6, L_7 — 5-Mc. i.f. transformer; see text.
L_8 — 3 turns No. 14, ⅜-inch diameter.
J_1, J_2 — Coaxial fitting.
S_1 — S.p.s.t. switch.
T_1 — Small power transformer, with 5- and 6.3-volt windings.



Under-chassis view of the W1OOP converter. The r.f. components are at the right.

pensation in the oscillator; it's all that is needed, but care should be taken to use a *zero*-coefficient condenser for C_{19}. The 12AT7 socket should be of good quality, preferably ceramic, and the tube shield should be crimped so that it cannot wobble, once on. Drift, after the initial warm-up period, should be negligible.

Almost any intermediate frequency may be used, though it may be necessary to add oscillator injection coupling externally, in addition to that provided by the interelement capacitance of the 12AT7, if the i.f. is much over 5 Mc. The i.f. transformer used in this case was made from two coils removed when converting a 522 receiver. The bias-controlled i.f. stage provides some gain when short lengths of coaxial line are used to the receiver. If a long line is required, or if more i.f. gain is needed, the more conventional form of i.f. output coupling may be employed.

Aligning the converter requires only a wavemeter, by which the oscillator may be set to the proper frequency, which should be 139 to 143 Mc., if a 5-Mc. i.f. is used. If the oscillator is on the high side of the signal it will give you the various mobile services as images. The rest of the job can be done on noise, peaking C_1, L_5, and the i.f. coils, L_6 and L_7, for maximum noise. There may be some pulling of the oscillator frequency as these adjustments are made, so it is better to use a noise source (ignition, an electric razor, or a noise generator [3]) rather than a 2-meter signal for these adjustments.

The neutralizing winding, L_3, is not critical, but it may be adjusted to the best value by using the old dead-tube trick employed in servicing broadcast receivers with triode r.f. stages. A burned-out 6AK5, or one which has had one of its heater pins cut off, should be inserted in the first socket. Then with a strong signal near 146 Mc. adjust the turns spacing of L_3 (or use a slug-tuned coil) for minimum signal. If appreciable change is made in L_3 it will be necessary to retune the input circuit.

[3] "Noise-Generator Technique for the V.H.F. Man," Tilton, *QST*, August, 1949.

Performance

Once the converter or r.f. preamplifier is installed don't expect that ignition noise and other external interference will vanish. The cascode is a low-noise r.f. system, but it won't reduce any outside noise. Don't expect that the fellow who used to be S5 will now be S9 — if he is your S-meter needs adjusting. But — it should now be possible to read the modulation on that weak carrier you couldn't identify with the old noise box, or maybe find other weak ones you never knew were there. Three decibels is enough to do that, if it's a 3-db. improvement in signal-to-noise ratio, and not just more gain. This converter should be at least that much better than the best you can buy at your favorite radio store — and it will cost you a lot less money.

Other Applications

By omitting the i.f. stage and the built-in power supply, the converter may be incorporated as part of a complete receiver. The cascode preamplifier alone may be used ahead of the mixer-oscillator combination in the 2-meter portion of a commercial converter. If this is done it is advisable to remove any other r.f. stages, as the gain of the cascode pair is more than enough to feed even a noisy mixer. If the converter has a gang-tuned r.f. stage, an easy dodge is to remove the tube and replace it with a small capacitance (1 $\mu\mu$fd. will do) between the grid and plate pins. In this way the converter's image ratio will not be sacrificed, yet there will not be an excess of gain over that required to override the mixer noise. With too much gain strong local signals may cause cross modulation.

HAMFEST CALENDAR

VERMONT — Saturday, October 15th, at the Hotel Bardwell, Rutland. Sponsored by the Green Mountain Amateur Radio Club. Featuring traffic and emergency net meetings in the afternoon, display of amateur equipment, swap session, code contest, banquet, entertainment, special program for XYLs. Registration begins at 11 A.M. Advance registration, including banquet, $3.75 (tickets purchased at the door $4.00). Plan to bring the YL or XYL. Make reservations through John Dinsmore, W1MUK, 251 Lincoln Ave., Rutland, Vt.

Two-Band Antenna-Matching Networks

How They Work and How To Design Them

BY JOHN G. MARSHALL,* WØARL

• Continuing correspondence about the two-band matching network described in *QST* a few years ago has prompted WØARL to delve into the subject in greater detail. This article is the result. It covers all practical cases of antennas working on two harmonically-related amateur bands, with straightforward design formulas requiring none of the cut-and-try that was necessary in the original system.

THERE has been much interest in the two-band antenna-matching network which was described in *QST* about four years ago.[1] One striking example is the description of a rotary beam which operates as a four-element on 14 Mc. and as an eight-element system on 28 Mc.[2] Such operation is accomplished through the use of one of those two-band antenna networks in conjunction with another type of network in the center of the parasitic elements, the detailed description of which also was given previously in *QST*.[3]

The network described in the early article[1] is suitable when the transmission line's characteristic impedance, Z_0, lies between the two values of driving-point impedance (d.p.i.) and the larger d.p.i. is at the higher operating frequency. It is the purpose of this article to describe two-band antenna networks that will match any combination of Z_0 and d.p.i.s likely to be found in present-day antennas, and also to include more information and more convenient formulas for the previously described case of $Z_1 < Z_0 < Z_2$ (Z_1 being the d.p.i. at the lower operating frequency, f_1, and Z_2 being the d.p.i. at the higher operating frequency, f_2). These networks are not restricted to a second harmonic relationship, but may be used on any two frequencies where the d.p.i. is purely resistive. This permits the use of the same antenna, simultaneously matched to the transmission line, on its fundamental and *any* of its harmonic frequencies, or on any two of its harmonic frequencies where f_2 is an integral multiple of f_1. This includes the 21-Mc. band in connection with either the 3.5- or the 7-Mc. band.

Before entering into the design and operation of such networks, it might be well to review briefly the characteristics of series and parallel reactive circuits that are important to these two-band networks.

Purely Reactive Circuits

Fig. 1A shows a theoretically perfect series circuit of inductive and capacitive reactance. It is generally known that the net reactance, $X = X_L - X_C$; and, when $X_L = X_C$, the circuit is series resonant, and X equals zero.

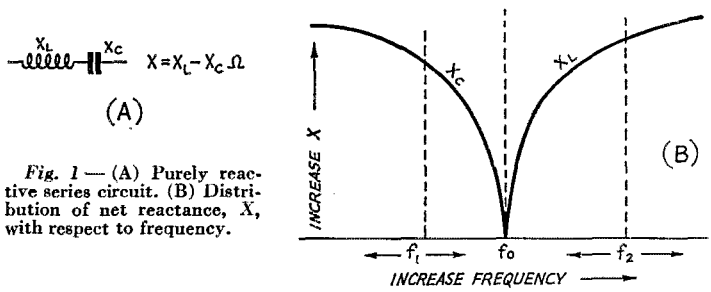


Fig. 1 — (A) Purely reactive series circuit. (B) Distribution of net reactance, X, with respect to frequency.

Fig. 1B shows the distribution of X at frequencies below and above the resonant frequency, f_0. At frequencies below f_0, X is capacitive; at frequencies above f_0, X is inductive. The greater the ohmic values of X_L and X_C, and the greater the deviation from f_0, the greater is the magnitude of X.

When this simple series circuit is viewed from two different frequencies, f_1 and f_2, certain interesting relations exist between the net reactance at f_1 (X_{f1}) and the net reactance at f_2 (X_{f2}). Those which are important to these two-band networks are:

1) When f_0 is greater than f_1 and f_2, both X_{f1} and X_{f2} are capacitive, but X_{f1} is always greater than KX_{f2}, where K is the frequency ratio, f_2/f_1.

2) When f_0 is less than f_1 and f_2, both X_{f1} and X_{f2} are inductive, but X_{f2} is always greater than KX_{f1}.

* Box 6023, Kansas City 4, Mo.

[1] Marshall, "Matching the Antenna for Two-Band Operation, *QST*, Sept., 1945.

[2] Pichitino, "A New Principle in Two-Band Rotary-Beam Design," *QST*, Oct., 1948.

[3] Espy, "Resonant Circuits in Antenna Systems," *QST*, Sept., 1943.

3) When f_0 is between f_1 and f_2, X_{f1} is capacitive, and X_{f2} is inductive.

4) When $f_0 = f_1$, X_{f1} is zero, and X_{f2} is inductive.

5) When $f_0 = f_2$, X_{f2} is zero, and X_{f1} is capacitive.

Formulas for determining the amounts of X_L and X_C required for obtaining desired values of X_{f1} and X_{f2} are easily derived as follows:

At f_1, the net reactance is

$$X_{f1} = X_L - X_C \text{ ohms.}$$

where X_L and X_C are the reactance values at f_1. Since X_L varies directly with frequency and X_C varies inversely with frequency, the net reactance at f_2 is

$$X_{f2} = KX_L - \frac{X_C}{K} \text{ ohms.}$$

Simultaneous solution of these two equations gives the reactance of X_L and X_C at the f_1 frequency as

$$X_L = \frac{KX_{f2} - X_{f1}}{K^2 - 1} \text{ ohms} \qquad (1)$$

and

$$X_C = \frac{K(X_{f2} - KX_{f1})}{K^2 - 1} \text{ ohms.} \qquad (2)$$

The appropriate signs for X_{f1} and X_{f2} should be entered in these expressions. However, since it has been taken into account that X_L is positive and X_C is negative in deriving formulas (1) and (2), a resulting negative answer for either X_L or X_C indicates that an unworkable combination X_{f1} and X_{f2} exists. If one of the above five conditions is satisfied, the answers to formulas (1) and (2) will be positive.

Fig. 2A shows a theoretically perfect parallel circuit of inductive and capacitive reactance. A generally known formula for the net reactance of this circuit is

$$X = \frac{X_C X_L}{X_C - X_L} \text{ ohms.}$$

When $X_L = X_C$, the circuit is parallel resonant, and X equals infinity (theoretically).

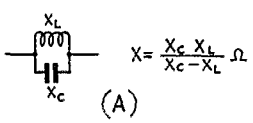
Fig. 2B shows the distribution of X at frequencies below and above f_0. At frequencies below f_0, X is inductive, and at frequencies above f_0, X is capacitive. The greater the ohmic values of X_L and X_C, and the less of deviation from f_0, the greater is the magnitude of X.

When this parallel circuit is viewed from two different frequencies, f_1 and f_2, the relations existing between X_{f1} and X_{f2} which are important to these two-band networks are:

1) When f_0 is greater than f_1 and f_2, both X_{f1} and X_{f2} are inductive, but X_{f2} is always greater than KX_{f1}.

2) When f_0 is less than f_1 and f_2, both X_{f1} and X_{f2} are capacitive, but X_{f1} is always greater than KX_{f2}.

3) When f_0 is between f_1 and f_2, X_{f1} is inductive, and X_{f2} is capacitive.



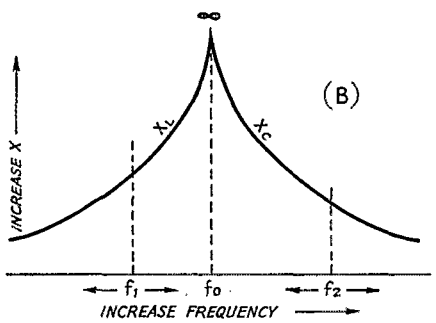


Fig. 2 — (A) Purely reactive parallel circuit. (B) Distribution of net reactance, X, with respect to frequency.

4) When $f_0 = f_1$, X_{f1} is ∞, and X_{f2} is capacitive.

5) When $f_0 = f_2$, X_{f2} is ∞, and X_{f1} is inductive.

Formulas for determining amounts of X_L and X_C required for obtaining desired values of X_{f1} and X_{f2}, consistent with the above five conditions, are easily derived as follows:

At f_1 the net reactance is

$$X_{f1} = \frac{X_C X_L}{X_C - X_L} \text{ ohms.}$$

Since X_L varies directly with frequency and X_C varies inversely with frequency, the net reactance at f_2 is

Terminology

f_0 — Resonant frequency.
f_1 — Lower operating frequency.
f_2 — Higher operating frequency.
K — Frequency ratio = f_2/f_1.
Z_0 — Characteristic impedance of transmission line.
d.p.i. — Driving-point impedance (general).
Z_1 — d.p.i. at f_1.
Z_2 — d.p.i. at f_2.
L_P — Parallel inductor.
X_{LP} — Reactance of L_P at f_1.
C_P — Parallel capacitor.
X_{CP} — Reactance of C_P at f_1.
L_S — Series inductor.
X_{LS} — Reactance of L_S at f_1.
C_S — Series capacitor.
X_{CS} — Reactance of C_S at f_1.
X_{P1} — Net parallel reactance at f_1.
X_{P2} — Net parallel reactance at f_2.
X_{B1} — Net balancing reactance at f_1.
X_{B2} — Net balancing reactance at f_2.

$$X_{f2} = \frac{\left(\frac{X_C}{K}\right)(KX_L)}{\frac{X_C}{K} - KX_L} \text{ ohms.}$$

Simultaneous solution of these two equations gives the reactance of X_L and X_C at the f_1 frequency as

$$X_L = \frac{X_{f1}(K^2 - 1)}{K\left(K - \frac{X_{f1}}{X_{f2}}\right)} \text{ ohms} \qquad (3)$$

and

$$X_C = \frac{X_{f2}(K^2 - 1)}{\frac{X_{f2}}{X_{f1}} - K} \text{ ohms.} \qquad (4)$$

In the special case of where the desired X_{f1} is ∞ (when $f_0 = f_1$, as in Condition 4), formulas (3) and (4) become equal, and reduce to

$$X_L = X_C = \frac{X_{f2}(1 - K^2)}{K} \text{ ohms.} \qquad (5)$$

In the special case of where the desired X_{f2} is ∞ (when $f_0 = f_2$, as in Condition 5) formulas (3) and (4) reduce to

$$X_L = \frac{X_{f1}(K^2 - 1)}{K^2} \text{ ohms} \qquad (6)$$

and

$$X_C = X_{f1}(K^2 - 1) \text{ ohms,} \qquad (7)$$

respectively.

As in the series circuit of Fig. 1, if the answer to either X_L or X_C turns out negative, it indicates that an unworkable combination of X_{f1} and X_{f2} exists.

Reactive Circuits Containing Resistance

Fig. 3A shows equivalent series and parallel circuits of resistance and inductive reactance, while Fig. 3B shows equivalent series and parallel circuits of resistance and capacitive reactance.

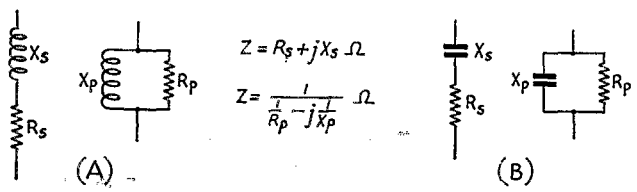


Fig. 3 — Series and parallel equivalents. (A) Resistance and inductive reactance; (B) resistance and capacitive reactance.

Many texts express the impedance of the series circuits as $Z = R + jX_S$ ohms, and that of the parallel circuits as $Z = \frac{1}{\frac{1}{R_P} - j\frac{1}{X_P}}$ ohms.

For each combination of R_S and X_S, there is a combination of R_P and X_P having the same resulting impedance and phase angle. Then when a series circuit and a parallel circuit are electrically equivalent,

$$R_S + jX_S = \frac{1}{\frac{1}{R_P} - j\frac{1}{X_P}}.$$

From this basic expression, it can be shown that the components of the equivalent parallel circuit of a given series circuit are

$$R_P = R_S\left[1 + \left(\frac{X_S}{R_S}\right)^2\right] \text{ ohms} \qquad (8)$$

and

$$X_P = X_S\left[1 + \left(\frac{R_S}{X_S}\right)^2\right] \text{ ohms.} \qquad (9)$$

From that same expression, it can be shown that the components of the equivalent series circuit of a given parallel circuit are

$$R_S = \frac{R_P}{1 + \left(\frac{R_P}{X_P}\right)^2} \text{ ohms} \qquad (10)$$

and

$$X_S = \frac{X_P}{1 + \left(\frac{X_P}{R_P}\right)^2} \text{ ohms.} \qquad (11)$$

Through the use of formulas (8) to (11), inclusive, it is a simple matter to convert a given series circuit to its equivalent parallel circuit, or vice versa.

R.F. Transformer

A careful study of formulas (8) through (11), or a graphical solution of them, will reveal several interesting relations between the four circuit elements in Fig. 3. Those important here are:

1) With a fixed value of R_P, a gradual increase in X_P from zero to infinity, causes a gradual increase in R_S from zero to a maximum, equal to R_P.

2) With a fixed value of R_S, a gradual increase in X_S from zero to infinity, causes a gradual increase in R_P from a minimum, equal to R_S, to a maximum of infinity.

From these two statements, we learn that R_P is always greater than R_S and that the ratio, R_P/R_S, is determined by X_P or X_S.

If R_S and R_P represent values of power-source and load impedance, both of which are purely resistive, the ratio, R_P/R_S, is, in effect, a trans-

former (impedance) ratio, and when conjugate circuits are used, the impedance of the load is matched to that of the power source. A step-by-step demonstration of this is as follows:

1) The 4-ohm power source in Fig. 4A is shunted by a parallel reactor of such value that the equivalent series circuit contains a resistance component equal to the 2-ohm load. A rearrangement of formula (10), solving for X_P,

$$X_P = R_P\sqrt{\frac{R_S}{R_P - R_S}} \text{ ohms} \qquad (12)$$

gives a value of 4 ohms for the parallel reactor, as shown in Fig. 4B. (Inductive reactance was chosen, arbitrarily.)

2) The equivalent series circuit of the 4-ohm inductive reactance across the 4-ohm resistance is found from formulas (10) and (11), or from formula (11) and a rearrangement of formula (8), solving for X_S,

$$X_S = R_S\sqrt{\frac{R_P}{R_S} - 1} \text{ ohms} \qquad (13)$$

shows the equivalent circuit to be 2 ohms resistance in series with 2 ohms inductive reactance. (Of course, from Step 1 we already knew that the resistance would be 2 ohms.)

3) This equivalent series circuit is substituted for the parallel circuit as in Fig. 4C.

4) A 2-ohm capacitive reactance is placed in series to balance out the 2-ohm inductive reactance as in Fig. 4D.

5) The 2-ohm resistance and 2-ohm inductive reactance in series is replaced by its original parallel equivalent as in Fig. 4E, making a transformer of 2 to 1 impedance ratio, the elements of which are shown in Fig. 4F.

The above results are duplicated, of course, by employing a capacitive shunt reactor and an inductive series reactor. There are other approaches that might be used to demonstrate this transformer ratio, but the one used here fits into the two-band networks nicely.

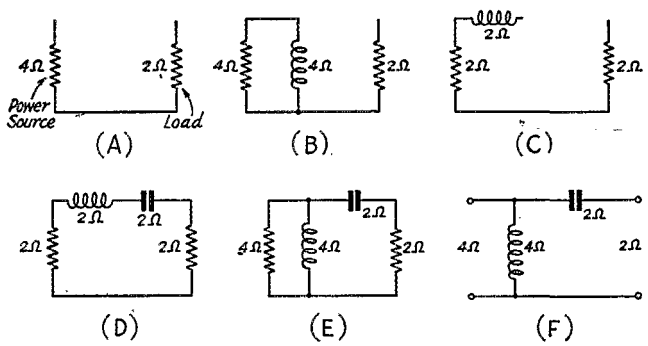


Fig. 4 — Development of an r.f. transformer using shunt and series reactances. See text for discussion.

The type of transformer of Fig. 4F may be used step-up or step-down, the larger impedance always being placed across the parallel reactor, but it must be used only on the frequency at which the reactors are figured; this is strictly a single-frequency transformer. Formulas (12) and (13) give the values of the parallel and series reactors, respectively, for any pair of terminations. Similar formulas were given previously in articles describing certain single-band antenna-matching transformers.[4]

As far as the networks to follow are concerned, it is convenient to view all transformer ratios from the direction that makes them step-down. When doing this, the function of the parallel reactor is to establish the transformer ratio, i.e., the ratio between the resistance connected to the high-impedance side of the transformer and the resistance component of the equivalent series circuit (of the reactor across the resistance connected to the high side); and the function of the series reactor is to balance out the resulting reactance component of that same equivalent series circuit.

Using the above reasoning in the example of Fig. 4, the 4-ohm parallel reactor establishes the transformer ratio, and the 2-ohm series reactor balances out the reactance component of the equivalent series circuit of the 4-ohm inductive reactance in parallel with the 4-ohm power source.

The above analogy serves to separate the functions of the two reactive elements that make up the basic transformer. To understand the "mechanix" of the two-band networks to follow, a substantial knowledge of these transformer effects will be helpful.

Two-Band Networks

The theory of the fundamental circuits of Figs. 1, 2 and 3 combines with the transformer characteristics disclosed in Fig. 4 to make up these two band networks. All of their formulas were derived from basic formulas (1) through (13) of those basic circuits.

There are several possible circuits for two-band antenna networks. However, only three of them are required to cover the combinations of Z_0, Z_1, and Z_2 existing in present-day antennas. Each of these likely combinations will fall into one of the following general cases:

(1) $Z_0 < Z_1$ and Z_2 (2) $Z_1 < Z_0 < Z_2$
(3) Z_1 and $Z_2 < Z_0$

A network capable of handling each of these

[4] Andrew, "An R.F. Matching Network for General Use," *QST*, Oct., 1939; Gadwa, "An Impedance-Matching Transformer," *QST*, Feb., 1943.

three general cases will be described, separately, in turn.

For the sake of example, a few common radiating systems will be classified into the three general cases. Reference to a long-wire system includes the "V" and the unterminated rhombic as well as the simple long wire, which will be considered as a wire one wave-length or more long at f_1. Factors such as proximity to ground and other objects affect the value of d.p.i., and under extreme conditions a certain radiating system might not fall into the general case under which it is grouped. This will be disclosed, however, when determining the values of d.p.i., which will be discussed later.

Case of $Z_0 < Z_1$ and Z_2

This general case covers such systems as:

1) A current-fed half-wave doublet at f_1, also operating on any harmonic, f_2, of f_1, using 53-ohm line. When $K = 2$, this system is two half waves in phase at f_2, voltage fed.

2) A center-fed two half-waves-in-phase (collinear) system at f_1, also operating on any harmonic, f_2, of f_1, using any type of line. This antenna is voltage fed at both f_1 and f_2.

3) A long-wire system, current fed at f_1, also operating on any harmonic, f_2, of f_1, using 53- or 75-ohm line.

4) A long-wire system, voltage fed at f_1, also operating on any harmonic, f_2, of f_1, using any type of line. This antenna is voltage fed at f_2, also.

Fig. 5 shows a suitable network for this general case of $Z_0 < Z_1$ and Z_2.

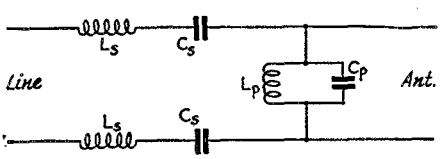


Fig. 5 — Two-band network suitable when the line impedance is less than the driving-point impedances.

The reactance of L_P and C_P in Fig. 5 is proportioned so that:

1) At f_1, the net reactance, X_{P1}, is inductive and of such magnitude that the resistance component of the equivalent series circuit of X_{P1} in parallel with Z_1 equals Z_0; and

2) At f_2, the net reactance, X_{P2}, is capacitive and of such magnitude that likewise establishes the correct transformer ratio between Z_2 and Z_0.

Since X_{P1} is inductive and X_{P2} is capacitive, condition (3) of the basic parallel circuit of Fig. 2 is satisfied.

From basic formula (12), the required net reactance of L_P and C_P at f_1 is

$$X_{P1} = Z_1 \sqrt{\frac{Z_0}{Z_1 - Z_0}} \text{ ohms;}$$

and at f_2 it is

$$X_{P2} = -Z_2 \sqrt{\frac{Z_0}{Z_2 - Z_0}} \text{ ohms.}$$

Then, from basic formulas (3) and (4), the reactance of L_P and C_P at the f_1 frequency is

$$X_{LP} = \frac{X_{P1}(K^2 - 1)}{K\left(K - \frac{X_{P1}}{X_{P2}}\right)} \text{ ohms} \qquad (14)$$

and

$$X_{CP} = \frac{X_{P2}(K^2 - 1)}{\frac{X_{P2}}{X_{P1}} - K} \text{ ohms,} \qquad (15)$$

respectively.

The reactances of both sets of L_S and C_S are simultaneously proportioned so that:

1) At f_1, the total net reactance, X_{B1}, is equal in magnitude but opposite in sign to the reactance component of the equivalent series circuit of X_{P1} in parallel with Z_1; and

2) At f_2, the total net reactance, X_{B2}, likewise balances out the reactance component of the equivalent series circuit of X_{P2} in parallel with Z_2.

Then, X_{B1} must be capacitive, and X_{B2} inductive. This satisfies condition (3) of the basic series circuit of Fig. 1. From basic formula (13) the required total net reactance of L_S and C_S at f_1 is

$$X_{B1} = -Z_0 \sqrt{\frac{Z_1}{Z_0} - 1} \text{ ohms,}$$

and at f_2 it is

$$X_{B2} = Z_0 \sqrt{\frac{Z_2}{Z_0} - 1} \text{ ohms.}$$

Then, from basic formulas (1) and (2), the reactance of each L_S and each C_S at the f_1 frequency is

$$X_{LS} = \frac{KX_{B2} - X_{B1}}{2(K^2 - 1)} \text{ ohms} \qquad (16)$$

and

$$X_{CS} = \frac{K(X_{B2} - KX_{B1})}{2(K^2 - 1)} \text{ ohms,} \qquad (17)$$

respectively.

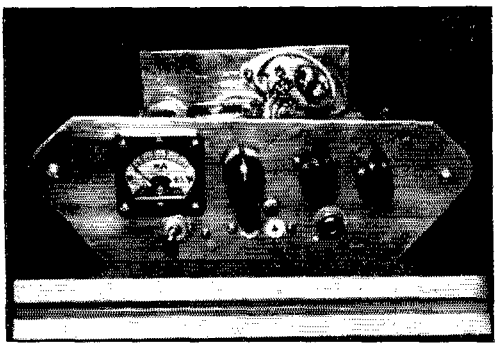
[*EDITOR'S NOTE — The second part of this article, to appear in a subsequent issue, will cover the two remaining cases, Z_1 and $Z_2 < Z_0$, and $Z_1 < Z_0 < Z_2$, and will discuss practical adjustment problems.*]

A "Built-In" 10-Meter Mobile

BY HOWARD J. HANSON,* W7MRX

IMMEDIATELY upon taking delivery of a new car the writer, like any good ham, began to think of means for mobile operation. Since the car represented a major portion of my life's savings, I couldn't see the usual system of hanging an ugly black box where it would mar the rather attractive interior. I wanted my mobile installation to look as if it had come with the car.

The first thought was to build a compact job for the glove compartment, but that storage space is quite handy for its intended purposes, and the compartment is a long reach from the driver's seat. The front seat in the new Hudson is a couple of inches wider than I am tall. Then there is the luggage compartment at the rear, but I didn't want to run around and unlock the rear deck every time it was necessary to QSY, or check or adjust the rig; this should be done from the driver's seat. The solution was to put the controlling portion of the rig in a small neatly-built bundle in a position convenient to the driver's seat, and the bigger parts (modulator, final amplifier, power supply) in places where they would be out of sight.



Close-up view of the 10-meter mobile exciter. The meter switch is in the center, with the oscillator and doubler plate tuning controls at the right. Across the bottom are the toggle switch, crystal socket, and microphone jack.

Basically the transmitter is a 9003 Tri-tet oscillator, using 7-Mc. crystals, doubling to 14 Mc. A 6AQ5 doubler to 28 Mc. is link coupled through coaxial cable to an 815 power amplifier. This amplifier, and its modulator, a pair of 6V6s driven by a T-17 carbon microphone, are mounted in the luggage compartment at the rear. Provision is made in the control unit for monitoring the oscillator plate current and the amplifier plate and grid currents. A 300-volt supply is used on all stages. Output is approximately 20 watts.

*Lt., SC, 250th Signal Co., Fort Lewis, Wash.

Exciter Details

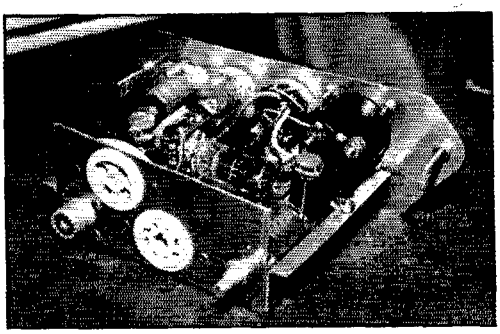
The original exciter circuit used a 6J6 doubler, and this arrangement is shown in the photographs. A 6AQ5 was later substituted, as shown in the schematic diagram, without affecting the mechanical set-up. The oscillator cathode circuit works, without readjustment, over a wide range of frequencies, so the cathode condenser is placed with its shaft projecting from the rear of the unit. The cathode coil may be seen in the rear-view photograph, between the condenser and the meter. Like other coils, it is wound on half-inch clear plastic rod.

It is necessary to adjust the oscillator and doubler plate condensers when shifting frequency appreciably, so they are mounted on the front panel. They are the two small knobs at the right side of the panel in the front view. The oscillator plate coil is mounted horizontally, below the meter switch, and the doubler coil is at the right side of the unit. The coupling winding on this coil is connected to a coaxial output fitting on the rear wall of the chassis.

The form factor of the exciter will be different for different-shaped compartments; this one was made to fit neatly into the compartment provided for a broadcast receiver in the 1948 Hudson. The meter is one I picked up in Japan, but similar small types are now available in this country.

The Amplifier and Modulator

The rest of the transmitter is contained in a small steel cabinet, which may be mounted in



Rear view of the exciter portion. The cathode tuning condenser, power and control cable sockets, and coaxial output fitting are mounted on the back wall of the chassis.

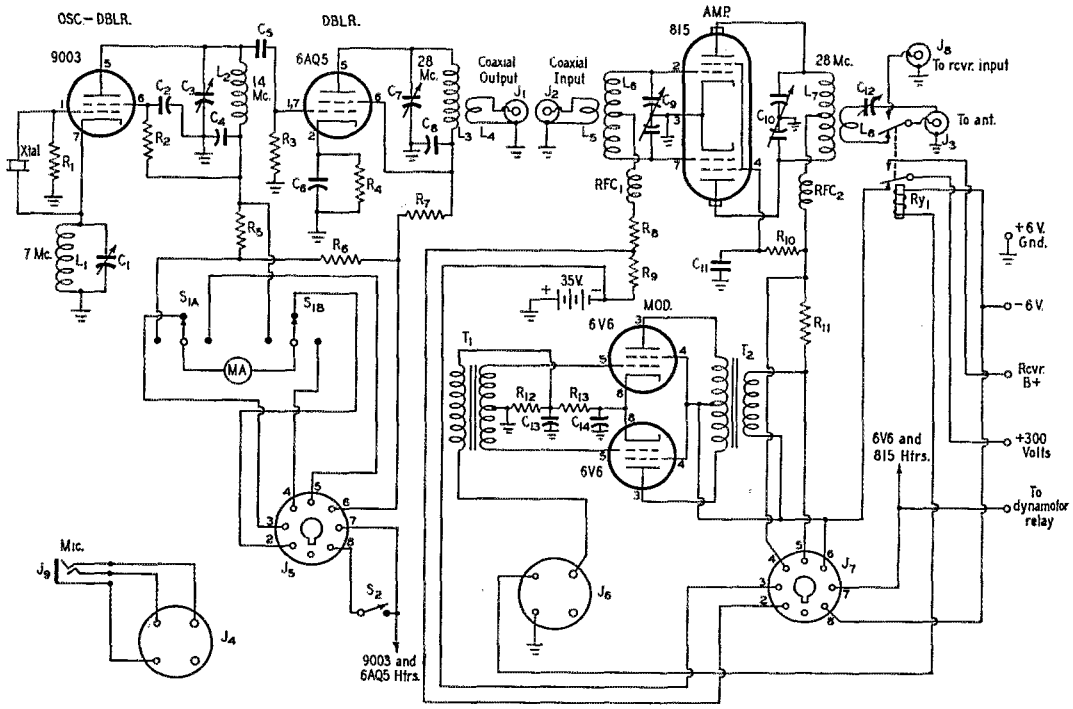
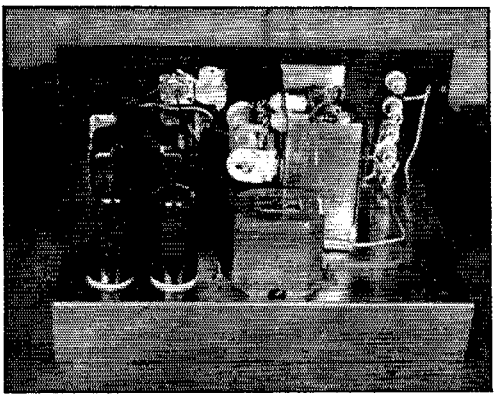


Fig. 1 — Schematic diagram of the 10-meter mobile installation. The coaxial fittings, J_1 and J_2, the microphone sockets, J_4 and J_6, and the power sockets, J_5 and J_7, provide for interconnection of the two units.

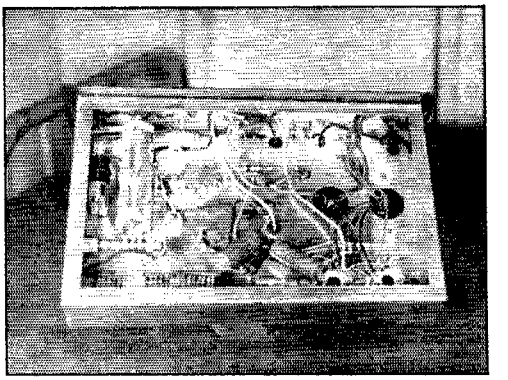
C_1, C_3, C_7 — 160-$\mu\mu$fd. midget variable.
C_2, C_4, C_6, C_8 — 0.01-μfd. 600-volt tubular.
C_5 — 100-$\mu\mu$fd. mica.
C_9, C_{10} — 15-$\mu\mu$fd.-per-section split-stator variable.
C_{11} — 0.001-μfd. mica.
C_{12} — 60-$\mu\mu$fd. variable.
C_{13}, C_{14} — 10-μfd. 25-volt electrolytic.
R_1, R_3 — 0.1 megohm.
R_2, — 47,000 ohms.
R_4 — 750 ohms, 1 watt.
R_5 — 18 ohms.
R_6 — 4700 ohms, 1 watt.
R_7 — 6500 ohms, 1 watt.
R_8 — 1200 ohms.
R_9 — 100 ohms.
R_{10} — 15,000 ohms, 10 watts.
R_{11} — Meter shunt — 10 turns fine wire on ½-watt resistor, or as required for meter used.
R_{12} — 100 ohms, 1 watt.
R_{13} — 150 ohms, 1 watt.
L_1 — 27 turns No. 20 enamel, close-wound on ½-inch diam. form.
L_2 — 13 turns No. 20 enam., ½-inch diam., 1¼ inches long.
L_3 — 5 turns No. 18 enam., ½-inch diam., ½ inch long.
L_4 — 3 turns stranded vinyl-insulated wire, around center of L_3.
L_5 — 3 turns stranded vinyl-insulated wire, around center of L_6.
L_6, L_7 — 18 turns No. 18, c.t., close-wound on 1-inch form.
L_8 — 3 turns No. 18 vinyl-insulated wire, around center of L_7.
J_1, J_2, J_3, J_8 — Coaxial fitting.
J_4, J_6 — 4-prong socket.
J_5, J_7 — Octal socket.
J_9 — Microphone jack, closed-circuit type.
RFC_1 — 2.5-mh. r.f. choke.
RFC_2 — 75 t. No. 30 wire on 2-watt carbon resistor.
S_{1A}, S_{1B} — 3-position 2-circuit rotary switch.
S_2 — S.p.s.t. toggle switch.
T_1 — Microphone-to-p.p.-grid transformer (UTC S-7).
T_2 — Modulation transformer (Merit A-3109).

any available space about the car. The photographs tell most of the story. The grid circuit of the amplifier is placed below the chassis, along with the bias battery and a few other components. The amplifier plate circuit is mounted on a "U"-shaped aluminum shield. Output is taken off through a 3-turn link, and run through one side of the antenna relay, the other half of which is used to switch the power supply from the transmitter to the receiver. The 815 is neutralized by means of wires near the tube plates, though it showed little tendency toward self-oscillation without this precaution.

The control unit and amplifier-modulator are connected by two cords. One is the coaxial cable carrying the r.f. power from the exciter to the amplifier grid circuit. The other is a cable about as big as my finger, carrying twenty rubber-insulated wires. This is Signal Corps telephone line, known as ten-pair cable. It carries the control, metering, and microphone circuits, with about four pairs left over.



Rear view of the amplifier-modulator portion of the W7MRX mobile station.



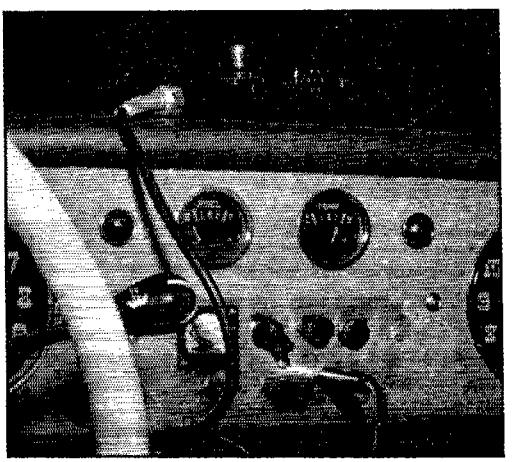
The grid circuit of the final stage, the protective bias battery, and miscellaneous audio components appear in the bottom view.

Tuning Up

Tuning the transmitter is simple. Put in a 7-Mc. crystal and close the switch, starting the dynamotor and energizing the heaters. When the tubes are warmed up, set the cathode tuning condenser at minimum and press the push-to-talk button on the microphone, which closes the antenna and B-plus relay. With the meter switch in the No. 1 position turn the cathode condenser toward maximum, watching the meter. The reading will drop steadily and then jump back, as the crystal kicks out. Set the control slightly below the point of minimum reading for the highest frequency to be used, and leave it in this position.

Next tune the oscillator plate circuit for the minimum reading, the dip in this case being very slight. Switch the meter to the No. 2 position and adjust the doubler plate and final grid circuits for maximum grid current. Then with the meter switch in the last position adjust the final plate circuit for minimum plate current. These adjustments can be made with the rig on the workbench, if desired.

When the installation is completed the antenna loading adjustment may be made. The setting of the controls in the amplifier portion should be broad enough to hold over a fair range of frequencies without resetting.



The control unit of the W7MRX 10-meter mobile rig fits neatly into the instrument panel of the author's Hudson.

A.R.R.L. PACIFIC DIVISION CONVENTION

Reno, Nevada, October 29th–30th

If you're within trekking distance of Reno, get set for a rip-roarin' time the last week end of October when the Nevada Amateur Radio Association will sponsor the ARRL Pacific Division Convention to be held in the State Building on October 29th–30th.

Plan now to show up early Saturday morning to take in the interesting displays of the latest in amateur equipment and supplies. An open forum will be conducted Saturday afternoon, providing an opportunity to hear what the other fellow has to say and to discuss any ideas you may have on the subject of amateur radio. The Wouff-Hong initiation ceremonies and the convention banquet — complete from soup to after-dinner speakers — will round out the activities of the day.

There will be group breakfasts Sunday morning, giving you a chance to have your eggs and coffee with congenial fellow hams whose specialized interest in ham radio is the same as your own. For the amateurs who look upon anything below 50 Mc. as practically direct current, the v.h.f. group will swap conversation on the topics of the amateur world from 50 Mc. up. The boys and gals who look under ten layers of stuff for the elusive DX will find kindred spirits at another breakfast gathering, while the traffic-handlers and rag-chewers will munch toast with groups devoted to talk on those subjects. Bring your gear on two, six and ten, so that you can participate in the hidden-transmitter hunt which will be featured as the convention finale. Whatever you do, don't leave the YLs and XYLs at home — there'll be lots of things they will enjoy, including a conducted tour of historic Virginia City in the Comstock.

The OMs will be taxed $5.00 a head for the event, while the ladies will be registered for $3.50 apiece. Send in your cash and requests for advance registrations now to John A. Lang, President, Nevada Amateur Radio Association, P.O. Box 1003, Reno, Nevada. Let's go to Reno!

Painless Prediction of Two-Meter Band Openings

Interpreting Weather Maps in Terms of V.H.F. Propagation Conditions

BY W. F. HOISINGTON,* W2BAV

BEING something of a fanatic as regards v.h.f. DX, the writer has for years been going up on mountain tops with field gear for 2½ and 2 meters, in the hope of snagging the elusive W3s and W4s. Since the war this mountain-climbing effort has centered on one spot as I was fortunate enough to locate and obtain the use of a tower location in Bedford, N. Y. The elevation at the tower railing is 870 feet above sea level. Fortunately, its owner, an amateur astronomer, had a nodding acquaintance with amateur radio. From there on, all I needed to do was install my own a.c. line (about a half mile), set up the two-meter gear, and get down to DX chasing in earnest.

For a long time it seemed to be mostly a matter of luck. When you're doing your operating 14 miles from home you can't be on the air all the time, and in the summer of 1948 I missed out on some fine openings to W4, and the first W2–W8 opening in 2-meter history. I was lucky, however, in being on hand when VE1QY came through — for no meteorological reason that was readily apparent. Obviously, I needed some system by which I could tell, in advance, whether conditions were going to be worth a trip up to the tower.

In the spring of 1949 the tower installation for W2BAV/2 was improved to include a 700-watt transmitter, a 48-element horizontal array in addition to the 32-element vertical, and a 3-stage grounded-grid r.f. amplifier using lighthouse tubes in trough-line circuits. The urge to work into the horizontal territory of the Middle West accentuated the need for some reliable method of anticipating good band conditions in various directions. Luckily this installation proved to be part of the means by which we learned to predict openings, as it extended our range to the point where just a glimmer of approaching openings is noticeable. Now we hear signals at 200, 300, or 400 miles out directly, or we hear fellows part way out working the DX farther west. At such times, stations in Middle or Western Pennsylvania or New York coöperate in exchanging information on band conditions, and thus a good idea of what is going on over most of the northeastern part of the country is obtained.

A hint was given by Harold Miles, W2PCQ, who insisted that 2-meter DX could be worked along lines of equal barometric pressure, and thus we started on our weather-map studies. After cutting out daily weather maps from the New York papers (*Herald Tribune* for the map of the previous evening, *Sun* for morning conditions) for two months and making notes of stations heard and worked on each visit to the tower, there appeared 2-meter DX direction signs as plain as those that mark our highways.

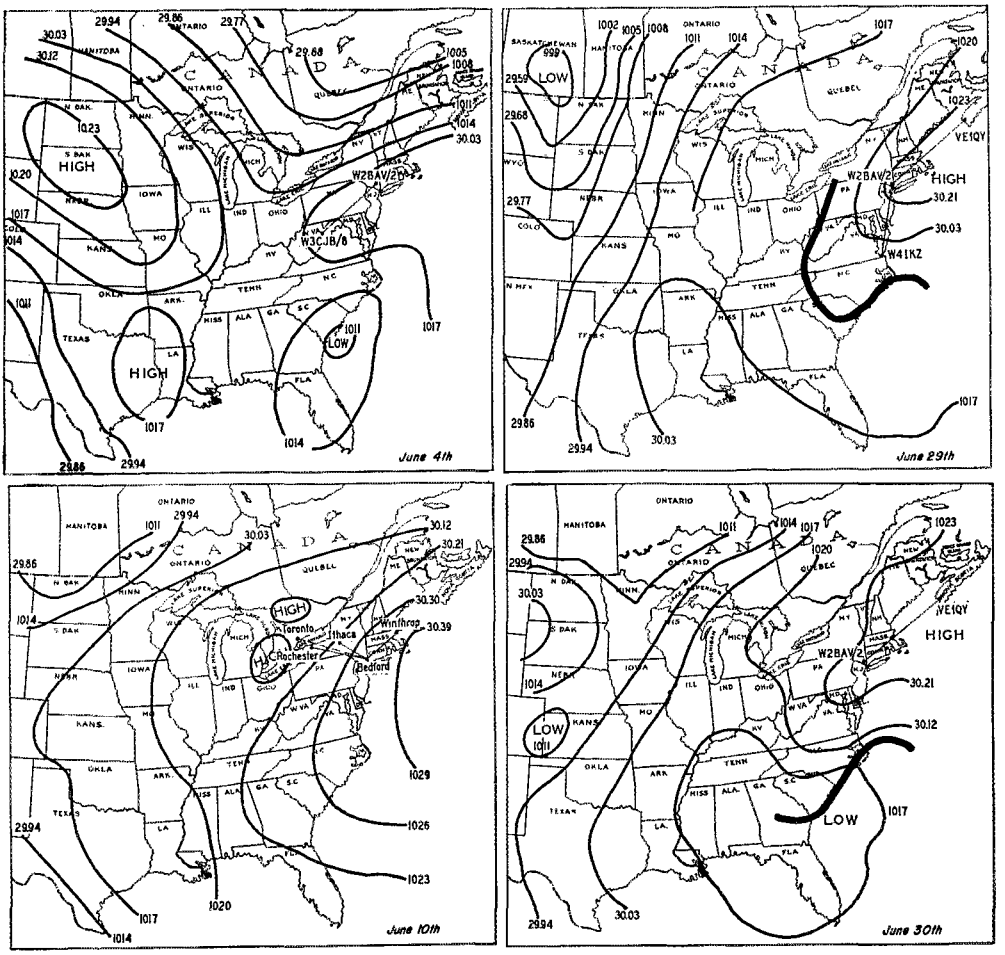
Watch Those Highs!

Pronounced high-pressure areas (30.1 or over) *always* bring improved conditions on 144 Mc., and who knows how many higher bands. The trailing edges of such high-pressure areas are most important, and paths across elongated areas or islands of highs are especially favorable. Pressure centers move across the country from west to east at about 500 miles per day; sometimes faster, bringing a "quickie" opening, and sometimes slower — what the Weather Bureau calls a "persistent high." One of these may be associated with a 2-meter band opening of three or four days continuous day-and-night DX. Pronounced low-pressure areas are invariably accompanied by dead band conditions. By "open" we mean that stations beyond the normal day-to-day range are heard. Examples are Virginia W4s, at 300 miles or more, W3s in Central or Western Pennsylvania, and W2s in the horizontal-polarization areas of Central and Western New York. A "closed" band is said to prevail when stations at 100 miles or more (normally workable) are weak and fading occasionally to nearly zero.

Let's have a look at maps for some particularly interesting days. The morning map for June 4th shows the North Atlantic Seaboard states under the influence of a pronounced high, the trailing edge of which extends from Maine to West Virginia. Remember the week end of the June V.H.F. Party, when we were fortunate in enjoying a period of more than 24 hours of fine tropospheric bending? That night we managed the first West Virginia contact (W3CJB/8) from W2BAV/2, and signals throughout W1, 2, and 3 were strong and steady.

Turning to the map of June 10th, note the two islands of high pressure over the Eastern Great Lakes, and the large high-pressure area centered just off the Atlantic Coast. This evening we had

* % U.H.F. Resonator Co., Rye, N. Y.



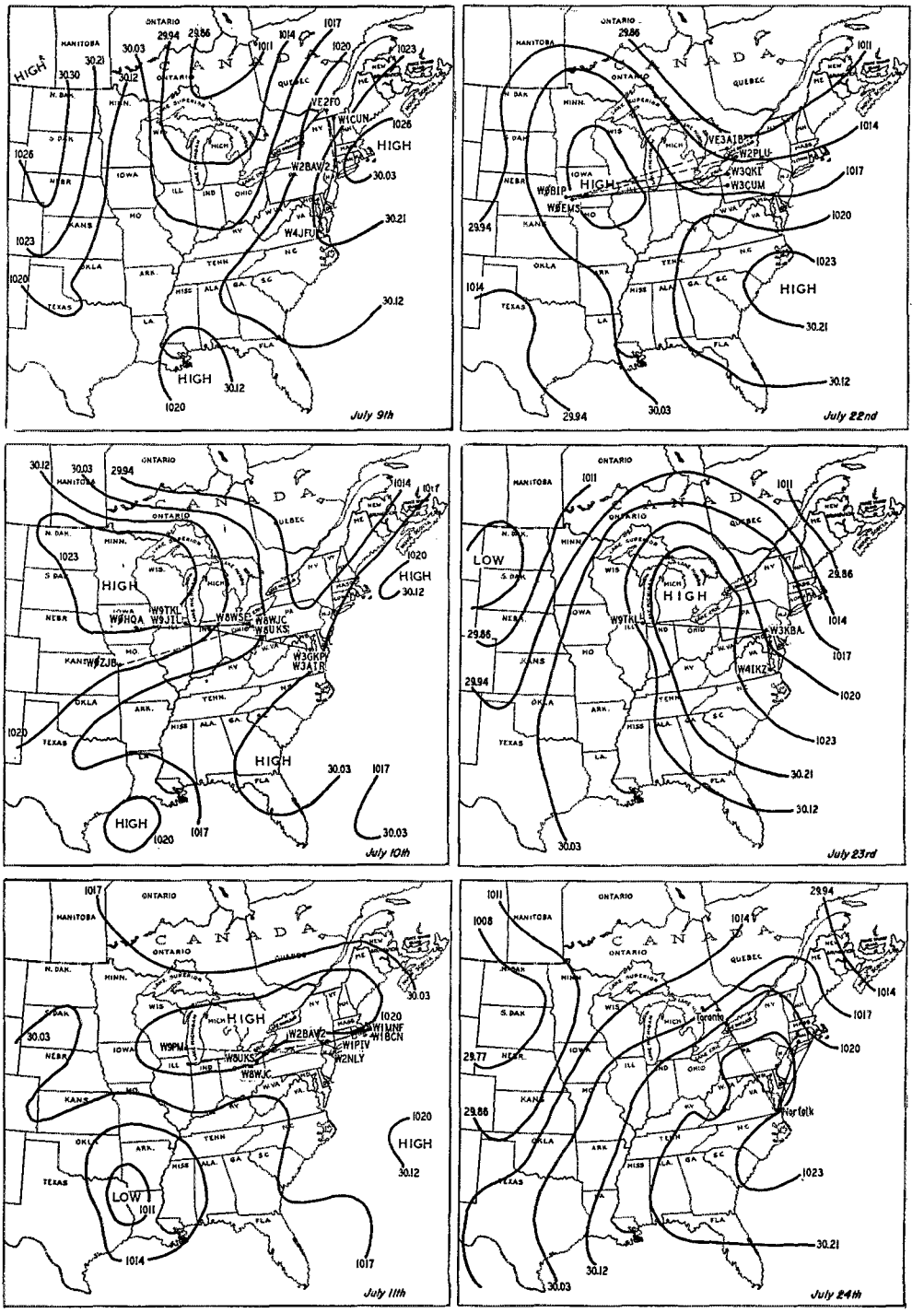
Favorable conditions for v.h.f. propagation invariably accompany the trailing edges of high-pressure areas as they move from west to east. The June 4th map, upper left, shows why good conditions prevailed during the June V.H.F. Party. The two maps at the right show the stationary condition of June 29th and 30th, permitting contacts between the New York area and Nova Scotia on consecutive days. Solid lines show contacts; dashed lines are heard reports.

our first contacts with the Rochester area, and heard reports were received from several VE3s around Toronto. Upstate New York and New England stations were extremely loud.

June 29th and 30th show a characteristic stationary front indicated by the heavy lines. Note that there is no significant change in the pressure distribution over the eastern half of the country on these two maps, a condition also prevailing as to propagation. There was nothing coming through from the West, but from Virginia to Nova Scotia conditions were good. VE1QY was worked with S9 signals, and W4s came through well late in the evening. VE1QY was still coming through on the night of the 30th, as he continued to do until the morning of July 1st. This is a 430-mile path.

The July 9th map [p. 24] shows a somewhat similar set-up, with the trailing edge of a high giving us openings to the northeast and southwest. W4JFU, Parksley, Va., and W1CUN, Richford, Vt., were the limits of our two-way work that night, and W2BAV/2 was heard by VE2FO in Montreal, over more than 300 miles of mountainous country to the north. This map, incidentally, carried a tip-off on interesting doings to come. Note that big high coming down from Canada, and covering nearly all of our northern plains area.

By the night of the 10th the Middle West was having a wild time of it, the area from Kansas to Ohio being liberally sprinkled with DX contacts over phenomenal distances. This DX splurge even included W3GKP and W3AIR, near Washington, D. C., who worked W9TKL and W9JIL, in Northern Illinois, probably the first contacts on 144 Mc. over this path. Note the elongated east-



These two three-day periods, July 9th–11th at the left and July 22nd–24th at the right, show the west-east movement of two of the summer's best 2-meter openings.

west high on the night of the 11th. The bottom of the 30.12 high on this map defines almost exactly the path of 2-meter signals on that eventful evening. At W2BAV/2 we worked three Ohio stations, and received a heard report from the Chicago area. Stations in Connecticut and Massachusetts experienced their first W8 opening of the year, the second such on record. It takes no great amount of hindsight to see that regular study of the weather maps would have kept that opening from being any surprise to 2-meter regulars!

The July 22nd–23rd–24th series clearly shows the movement of the biggest 2-meter opening of the summer. The large high on the map of the 22nd lies over the middle of some record-breaking paths. No one needs to be reminded that W3CUM, Butler, Pa., worked WØBIP, Elliott, Iowa, moving the 2-meter record out to 800 miles at the culmination of that evening's activities. The center had moved over by the following evening, as is evidenced by W3KBA, Dover, Pa., working W9TKL and W4JFU. Having watched this situation developing, Easterners were expecting some excitement, but summer conditions never were poorer than those observed in W1 and W2 on these two evenings.

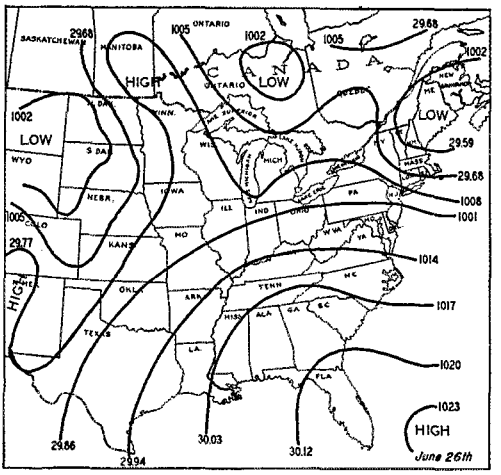
Their time came on the 24th, when the high-pressure center moved over the Alleghenies. This being Sunday, the gang was on hand throughout the day. W4IKZ, and others in the region around Norfolk, Va., began working VE3s in the Toronto area around 9 A.M., and the band was open wherever there was 2-meter activity on the Atlantic Seaboard through most of the day and evening.

We remarked earlier that pronounced lows are bad news for the 2-meter DX man. An example is the map of June 26th, showing a low over New England, its center registering below 29.6. Operators in this region were agreed that this was a completely flat night. Out of 63 days of observation up to early August, the band was open 22 days and closed 41 days, according to the definition of these terms given earlier. All the openings were during periods of appreciable highs, and all the really dead periods were those when we were in pronounced lows.

Conclusions

We leave to the meteorological and propagation physicists the job of explaining why openings occur in high-pressure regions.[1] We now know *when* — at least for our part of the country. We suggest that others will find considerable of interest if they will file the daily U. S. Weather Bureau maps with a record of stations heard and worked for each date. Different localities and other seasons may show other interesting trends.

A request is hereby made for all operators interested in 2-meter DX to use the highest power, the best receiver, the biggest beam, and the best locations possible. Watch for favorable



The map of June 26th shows a typical example of poor propagation along the North Atlantic Coast. Note that generally low pressure prevails over the northeastern part of the country. The only appreciable high is centered well off the Florida Coast.

weather conditions, and when they are present or anticipated, get on the air. Make some noise, plenty of it — don't be bashful about calling CQ! Use whatever antenna polarization is in use at the end of the path you hope to work. A personal preference for one polarization or the other won't help you much if the DX is on the other side of the fence.

There is little doubt that many opportunities for extreme 144-Mc. DX have been missed because stations were not active in the right places at the right times. Perusal of the maps in our album makes this abundantly clear. Look at the June 10th map — why didn't somebody in Quebec work someone in Iowa? How about the Nova Scotia-to-North Carolina path? The July 22nd–23rd–24th series shows other possible lost opportunities. Surely there were a number of paths open during that eventful period in addition to the ones over which DX contacts have been reported. South Carolina to Michigan seems almost a "must" in view of that 30.21 high over the entire area.

The distances covered on 144 Mc. in the past two years, sometimes with low power and inferior receivers and antennas, indicate that we have hardly scratched the surface. The occasional "heard" reports over distances up to 1500 miles bear this out. The writer is even willing to go out on a limb to the extent of predicting an eventual WAS on 144 Mc., when we develop our activity, our gear, and our awareness of opportunities on the way to the proper point. The fortunate fellow will undoubtedly be a W9 or WØ, but that doesn't need to keep a W2 from trying!

[1] A nontechnical discussion of weather forms and their relation to v.h.f. propagation may be found in *QST* for July, 1944, page 42. — *Editor.*

Earthquake in Ecuador

BY JOHN MARK REED,* HC2JR

• Here's a stirring account of how a small group of Ecuadorian amateurs rallied to their nation's aid during one of the major catastrophes of the South American continent. They have performed admirably under the most trying circumstances, and deserve the congratulations of amateurs everywhere.

IT was 5:15 P.M. EST on Friday, August 5th, and we were in QSO with FA9KJ, discussing ways and means of working 4X4AA for our 116th country. Suddenly the telephone rang, bringing us an ominous message that was to end all DX activity at HC2JR for over two weeks. The tragic situation revealed by this call and by subsequent reports was as follows: A terrible earthquake, which was felt over all of Ecuador and which had as its epicenter the Andean plateau in the vicinity of the city of Ambato, had destroyed a large part of that area. One town, Pelileo, was 100% destroyed; only one-third of its 3500 inhabitants survived. Telegraph communications were wiped out. Railway traffic with Guayaquil was cut off completely. Vital roads leading from Ambato to towns in the interior were, in many cases, completely obliterated.

One of the Guayaquil Radio Club emergency installations in the stricken city of Ambato. HC2KJ is at the microphone, with HC2OH seated to his left.

Damaged equipment and power failure prevented operation by the two amateurs and the two broadcasting stations in Ambato. Only one station, a commercial, was able to get on the air in the stricken city. In an effort to establish communication between Guayaquil and Ambato, we called this station for seven hours on Friday night. Although we got an occasional acknowledgment, we were unable to establish two-way communication because the commercial was obliged to concentrate all of its activities on traffic with the official government station in Quito.

On Saturday morning the Guayaquil Radio Club decided to get into Ambato with emergency equipment, and members made ready a 32V-1 transmitter, an NC-173 receiver, and a 1500-watt generator. HC2KC took charge of the gear and booked passage on the first plane scheduled for Ambato that afternoon. Unfortunately, this particular plane was unable to take off that day so it was Sunday morning before our equipment was set up. Using the call HC2GRC/6, the station was located in the center of the devastated city without protection against the elements, continuing tremors, and shambled buildings. In short order contact was established on 7100-kc. 'phone with HC2GRC and HC2JR back home in Guayaquil.

Strange to say, the first hours of operation were devoted almost exclusively to "agony traffic." It seemed that almost everybody in Guayaquil had a friend or relative in Ambato about whose fate he was concerned. A group of well-informed citizens in Ambato gathered about the microphone of HC2GRC/6 and over 60% of all inquiries were answered on the spot. Another 30% were cleared within 24 hours.

By Monday morning official and Red Cross traffic as well as press service messages assumed such proportions that we were unable to relay the personal inquiries from Guayaquil to Ambato promptly. On the other hand, we continued to transmit without delay all personal messages from Ambato to Guayaquil in which definite information was given about the fate of individuals or families. The typical text read "All well. House destroyed" but of course there were many tragic ones in which deaths were reported. Whenever messages had addresses — and most of them did — delivery was made, and where this in-

* President, Guayaquil Radio Club, Guayaquil, Ecuador.

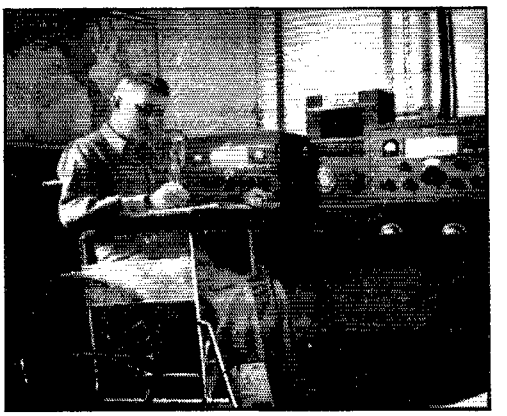
formation was lacking, a list was made and posted in the Guayaquil Radio Club premises reporting dead, injured and saved. Between complete messages and personal inquiries, we handled a total of 3125 communications one way or the other between Ambato and Guayaquil.

It soon became evident that Ambato desperately needed communication with other parts of the Republic as well as with Guayaquil, so on Tuesday the GRC decided to send another equipment, that of HC2OH, who went along with it. We had no sooner installed this service when officials decided that our first installation was required in the town of Baños, which was completely isolated. Notwithstanding the fact that communications between Ambato and Quito were never completely disrupted, we soon found demands for the use of our facilities in order to maintain contact between these two cities. HC1KX and HC1KP had been handling traffic with Ws and KZ5s [See accompanying box. — *Ed.*], the latter with the purpose of bringing American facilities and supplies for the relief of Ambato. Since these stations operated on ten and twenty meters, they hooked up with us on forty through HC1KE. Considerable traffic was handled in this manner. HC1FG came into the picture by handling foreign traffic (a message to Europe was sent via Australia), and HC1OR took over in the last week, handling official and Red Cross traffic into Quito from Ambato. HC2OL, located 40 miles out of Guayaquil, away from local QRM, did a fine job for us by handling traffic for both North and South America and by keeping in contact with HC2JR on 80 meters. On one occasion, when Quito was not in contact with Ambato by amateur radio, a message from HC1KX was sent to a KZ5 on ten who relayed it to HC2OL on twenty, who passed it on to HC2JR on eighty after which it went to Ambato on forty. In Guayaquil, HC2KM and HC2AF were among those handling traffic with foreign countries.

And here is a note to make you DX operators green with envy: HC8ME, a newcomer, and the first licensed Ecuadorian amateur station in the Galapagos Islands, who had very recently made his first QSO with HC2JR, carried on a daily schedule with the latter station for several days on forty meters, the only band on which he is operating so far.

After five days of operation we realized that our operators in the Ambato area were expendable. Added to the rustic living conditions were the lack of food and the strain under which they worked, with practically no opportunity to relax. HC2OH, who relieved HC2KC, was soon relieved by HC2KJ (Ernie) who was eventually succeeded by HC2OS. In Guayaquil, HC2KB did the lion's share of the work at the Radio Club's station, occasionally relieved by HC2KJ. At this point we should mention that since only half a dozen amateurs in Ecuador were prepared to work on forty meters, it was impossible to make use of many of the stations who would have been willing to help but which were limited to occasional traffic on twenty and ten.

Once our amateur network was organized we realized that an enormous amount of traffic between Ambato and other cities of Ecuador was accumulating. With no amateurs on forty meters to handle it, the solution was found by bringing into the picture the network of stations operated by the firm of Reed & Reed, namely, HC1DJ in Quito, HC2DJ in Guayaquil, HC5DJ in Cuenca, and HC6DJ in Ambato. The latter station had been damaged by the earthquake but was put into



The author, HC2JR, at his station in Guayaquil.

KZ5 AMATEURS COMMENDED

Canal Zone amateurs assisting during the Ecuadorian emergency included KZ5s AA, AB, AW, CG, CS, DB, FL, NM, PA, PC, RM, WG, WJ and WZ, according to reports just received. The outstanding work of these amateurs has resulted in the following messages of commendation being received by SCM Everett R. Kimmel of the Canal Zone Section:

"I wish to express my profound gratitude for the invaluable service being rendered by the amateur radio operators in this crisis."

Galo Plaza, President of the Republic of Ecuador

"I wish to express to the radio amateurs of the Canal Zone my sincere appreciation for their excellent service and coöperation during the recent disaster in Ecuador. The communication facilities made available to this Headquarters by these amateurs, working in coöperation with the amateurs in Ecuador, made it possible to secure timely information upon which decisions to fly necessary personnel and relief supplies to Ecuador were based.

"Please express my gratitude to all the amateurs who contributed their efforts to produce such satisfactory communications."

Lieut. General M. B. Ridgway, USA, Commander-in-Chief

operation and was soon handling heavy traffic, not only with the other DJ stations but also with HCB6, the government station in Baños, HCOP6 in Pujili, and the commercial broadcasting stations in Riobamba and Ibarra. In all cases, traffic bearing directly on relief for Ambato was handled in addition to a heavy volume of personal inquiries. The operators of the "DJ" network were in many cases amateurs, notably HCs 1JP, 2JR, 5MM and 6RA.

Perhaps the most notable difference between the emergency in Ecuador and similar operations in W-land was its duration. The Guayaquil Radio Club network operated two weeks, mostly on a 16-hour schedule, and the "DJ" network has agreed to handle the Red Cross traffic for an additional two weeks' period. We have served long after regular communications were established merely because our services were preferred and we were requested to continue them.

We have just remembered that we made a schedule with FA9KJ for Monday, August 8th, at 5 P.M., and we are wondering if Monday, August 22nd, will do. In any event, we are going on ten and twenty just as soon as we get this article into the mail.

October, 1924

. . . Secretary of Commerce Hoover has called a "Third National Radio Conference for the Better Voluntary Regulation of Radio." Broadcasting and the short waves are the main items on the agenda.

. . . Canadian amateurs have been assigned short-wave bands matching those authorized by the Department of Commerce in this country.

. . . A Hartley transmitter for the new 5-meter band is described by Technical Editor Kruse. A C-302 tube, with base removed, is used.

. . . The MacMillan Arctic Expedition *Bowdoin*, with ARRL operator Don Mix aboard, is expected to return shortly from its 15 months' cruise in northern waters.

. . . John L. Reinartz's station, 1XAM, has been copied by New Zealand 1AO and Australian 3BQ on 108 meters.

. . . Trendall Rowe, 7AGI, tells how he built and erected his impressive 100-foot wooden tower.

. . . Traffic Manager Schnell has completed arrangements for a new Pan-American Test this fall in an attempt at two-way communication between the American continents.

. . . Announced for November, 1924, *QST* — Construction notes and circuit values for J. L. McLaughlin's renowned "One-Control Superheterodyne."

. . . The "Experimenters Section" reports disappointing response to the project of studying moonlight effects on radio transmissions.

. . . Fire has destroyed the Silver Lane, Conn., house containing the combined stations of Messrs. Kruse, Beekley, Budlong and Mason of the Hq. staff.

. . . For the benefit of West Coast amateurs, 6XBM, at Leland Stanford University, has joined WWV in transmitting standard waves.

. . . Featured amateur stations of the month are Ray Carr's 3BMN, Petersburg, Va., Edward M. Glaser's 2BRB, Brooklyn, and F. H. Lester's 9VK, Oak Park, Ill.

Military Amateur Radio System

Another MARS "First"

Pvt. Eddie Virginia Williams, Women's Army Corps, helped the MARS chalk up another "first" when she became the first woman in the regular Army to receive her ham ticket from the FCC. "Ginny" is an operator at the MARS-Army Headquarters station, K4USA. Eighteen, brown-eyed, and a native of Birmingham, Ala., she'll be looking for you-all on the ham bands.

MARS Overseas Link

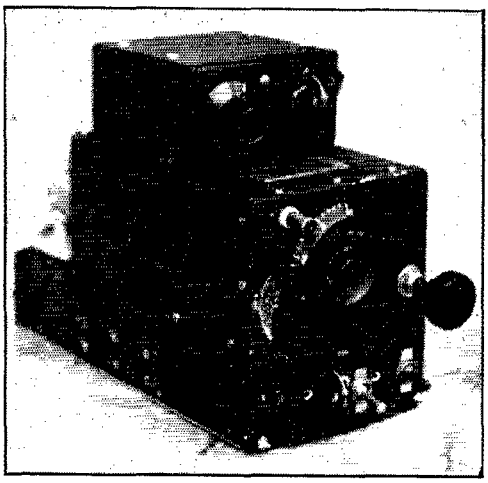
Col. Lloyd C. Parsons, Sixth Army signal officer, and M/Sgt. William F. Robinson, A6QIU, who made the first contact on the newly-organized MARS Pacific overseas relay link between A6USA, Sixth Army Headquarters, San Francisco, and AB6USA, Fort Shafter, Territory of Hawaii. The two are in the "Pride of the Presidio"-A6USA shack.

A Crystal-Controlled Plug-In Converter for the Q5-er

An Inexpensive Receiver for the 40- and 80-Meter Bands

BY JOHN L. STEWART,* W6UJD

THE converter to be described was designed for working into the Type BC-453 aircraft receiver, commonly known as the "Q5-er." The combination of converter and receiver gives a high-stability, high-performance, accurately-calibrated c.w. or 'phone receiving system of extremely small dimensions. As shown, it will tune over the 80- and 40-meter bands, and methods for extending the range to the higher frequencies will be suggested.



An effective but inexpensive 40- and 80-meter receiver can be made by mounting a crystal-controlled converter on the top of a BC-453 ("Q5-er") surplus receiver.

The BC-453 tunes from 0.19 to 0.55 Mc. It has high-order selectivity, obtained in a two-stage 85-kc. i.f. amplifier. Its gain is sufficient to give adequate volume from the one-tube converter to be described.

The converter is crystal-controlled, and all tuning is done with the BC-453. If the oscillator portion of the converter is set at 6.75 or 7.55 Mc., tuning the Q5-er from 0.25 to 0.55 Mc. will cover the 40-meter band. Since the 80-meter band is 500 kc. wide, it is necessary to furnish two oscillator frequencies for this band. To cover 3.5 to 3.85 Mc., the oscillator frequency is 4.05 Mc., and to cover 3.65 to 4.0 Mc. requires an oscillator frequency of 4.55 Mc. This permits covering either the 'phone portion or the mainly-used c.w. portion of the 80-meter band with one oscillator frequency, while maintaining a relatively high i.f. to minimize image response. No r.f. stage is used in the converter because images are not troublesome and atmospheric noise is large compared with mixer noise.

*68 Cornell Road, Menlo Park, Calif.

The circuit diagram of the converter is shown in Fig. 1. An ordinary 2.5-mh. r.f. choke is used as a plate load for the converter, so the output section needs no tuning. However, a variable condenser is used in the input circuit so that various antennas can be compensated for and stations can be peaked at various parts of the band. This tuning minimizes image response, but this control need be touched only during wide tuning excursions.

Construction

The entire unit is built around a 4 × 4 × 2-inch metal box. A six-prong plug is fastened to

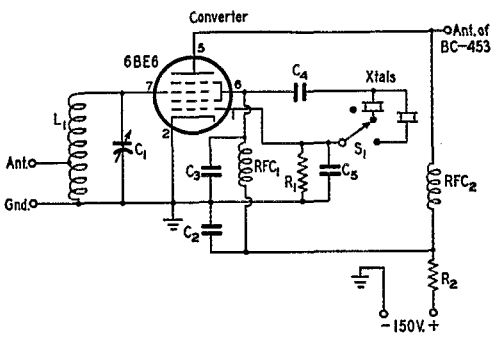
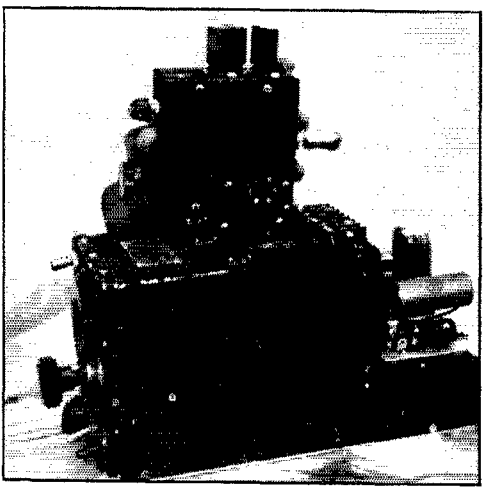


Fig. 1 — Circuit of the crystal-controlled converter.
C_1 — 140-$\mu\mu$fd. midget variable (Hammarlund HF-140).
C_2 — 5-μfd. 150-volt electrolytic.
C_3, C_5 — 47-$\mu\mu$fd. mica.
C_4 — 0.001-μfd. 400-volt paper or mica.
R_1 — 22,000 ohms, ½ watt.
R_2 — 2500 ohms, 1 watt.
L_1 — 42 turns No. 24 enamel close-wound on National type XR-50 slug-tuned form. 12 turns are wound between the ground lug and first lug from the bottom end where the antenna tap is made. The remaining 30 turns are wound in the normal manner in the space provided.
RFC_1, RFC_2 — 2.5-mh. r.f. choke.
S_1 — Single-pole multitap rotary switch.
Xtals — 40 meters: 6.75 or 7.55 Mc.
— 80 meters: 4.05 and 4.55 Mc.



The converter plugs into the top of the BC-453, and can be removed if the receiver is to be used for other purposes. The power supply is mounted on the rear platform of the receiver.

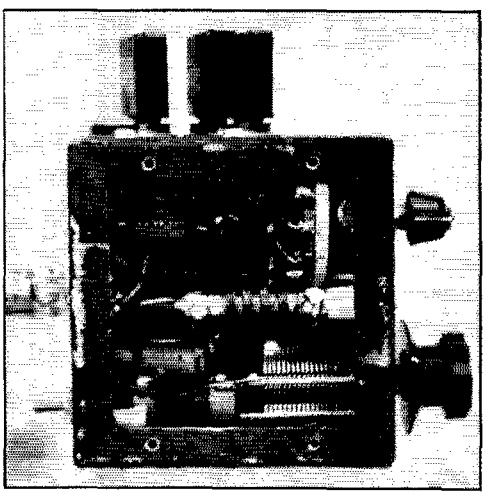
the cover plate of the box and a socket mounted in the removable top plate of the Q5-er. This allows the BC-453 to be used either in the normal Q5-er sense or with other plug-in converters. A switch is provided so that the proper crystal frequency (either 40- or 80-meter coverage) can be chosen. The input circuit, L_1C_1, will tune both bands. A terminal strip is mounted on the rear edge of the removable cover plate of the Q5-er, where all external connections are made (see text later). The shields around the tuning condensers of the aircraft receiver must be removed to bring a lead from the antenna terminal to the tube compartment. With this lead within the case of the receiver, no stray pick-up troubles will be encountered. The wiring and parts placement in the converter are not critical at all, except that the input circuit should be separated from the r.f. chokes as much as possible.

The crystal-controlled converter gives the ultimate in stability. The author tried fixed-tuned self-controlled oscillators but decided that the extra trouble involved in obtaining crystals was well worth the effort. Crystals may be obtained at nominal cost by writing to the manufacturer or they may be ground by hand. (The author obtained a 6.75-Mc. crystal from the stock of a radio parts dealer.) If any crystal will not oscillate in the converter, the values of C_3 and C_5 can be varied to change the feed-back. The oscillator portion of the 6BE6 does not have a great deal of gain, and these condensers are needed to obtain sufficient feed-back for reliable operation. In addition, C_3 insures that plate and screen loads are not tuned to the same frequency.

Calibration accuracy is potentially great with this system, because the aircraft receiver is accurate over its frequency range. The dial divisions represent 10-kc. intervals, and it should be easy to log stations to within the nearest kilocycle. The BC-453 receiver can be realigned slightly to compensate for any one crystal being off a few kilocycles, but in the long run it probably would be more satisfactory to use the correct crystals throughout.

Modifying the BC-453

Although conversions and changes in the Q5-er have been explained before, it is felt that the particular ones the author made are useful. The power supply is a half-wave affair using a 40-μfd. input condenser and a 35Z3 rectifier. The filament of this tube and the other six tubes of the receiver (not the converter) are wired in series, bringing the total filament voltage drop to 117 volts. The filter condenser immediately in back of the lower right front panel of the aircraft receiver can be removed and placed elsewhere, allowing a d.p.d.t. switch to be mounted on the front panel. This switch can be used to operate 6-volt a.c. send-receive relays and the plate voltage for the receiver. A small filament transformer (1-ampere rating) is mounted with the a.c.-d.c. supply. This is used to furnish filament voltage for the converter and external relays.



The converter parts mount in and on a 4 × 4 × 2-inch box.

The 150 volts d.c. from the transmit position of the d.p.d.t. switch, constant 6 volts a.c., relay voltage, and antenna terminals are brought to the terminal strip on the cover plate of the Q5-er where they may be used to power associated equipment such as a VFO, small exciter, or flea-power transmitter. With the plug-in converter described here, the antenna trimmer condenser on the front panel of the BC-453 is

set at minimum capacity. Thus, this condenser is not necessary in the input circuit and can be reconnected in the b.f.o. circuit for front-panel c.w. pitch control.

Other Possibilities

Plug-in converters for 15 and 20 meters can be of similar form but should have at least one r.f. stage because of both image and noise considerations. Crystal control can be used here, too, but two crystals would be needed to cover each band.

There is another use for the plug-in converter. Ordinary amateur-band crystals can be used to get a variety of input frequencies. This allows an outboard converter to be used on the higher frequency bands. A crystal-controlled external unit can be used and small ranges tuned with the aircraft receiver. Also, a self-excited plug-in unit could be built, with the tuning done in the converter, thus using the BC-453 as an i.f. system only.

With the Q5-er, it is better to use an external converter for 28 Mc. and above, as images are troublesome even with one or two r.f. stages. Further, with crystal control, the narrow tuning range of the Q5-er will not allow coverage of a band without a prohibitive number of crystals. An alternative to this would be to extend the crystal-control concepts to one of the other aircraft receivers that tune over higher frequency ranges. Here, crystal-controlled plug-in converters, with an r.f. stage to improve the signal-to-noise ratio, could be built to permit the tuning to be done with the aircraft receiver. The unit tuning from 6 to 9 Mc. (BC-455) would be best for this purpose. Although these other units are not as selective as the BC-453, extreme selectivity is not necessary above 28 Mc. This type of equipment would be very convenient for mobile- or portable-receiver usage.

Silent Keys

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

W1ATF, Harry Page, Hinesburg, Vt.
W1BQU, Ralph S. Gross, W. Warwick, R. I.
W1NXR, ex-W3FYF-W2KIC, Glenn H. Musselman, Bergenfield, N. J.
W4VA, Commodore John V. Murphy, USN (ret.), Arlington, Va.
W5NJG, Richard E. Babcock, San Antonio, Texas
W6CZN, H. A. Harrold, Napa, Calif.
WØUGK, W. Williams, Chadron, Nebr.
G3BXK, L. E. W. Johnson, Colchester, Essex

COMING CONVENTIONS

October 7th–9th — Hudson Division, New York City
October 8th–9th — Midwest Division, Omaha, Nebr.
October 29th–30th — Pacific Division, Reno, Nevada

WWV Schedule

STANDARD-FREQUENCY transmissions are made continuously, day and night, as a public service by the National Bureau of Standards over its standard-frequency station, WWV, on the following frequencies:

Mc.	*Power (kw.)*	*Audio Freq. (cycles)*
2.5	0.7	1 and 440
5.0	8.0	1 and 440
10.0	9.0	1, 440 and 4000
15.0	9.0	1, 440 and 4000
20.0	8.5	1, 440 and 4000
25.0	0.1	1, 440 and 4000
30.0	0.1	1 and 440
35.0	0.1	1

A 0.005-second pulse may be heard as a faint tick every second, except the 59th second of each minute. These pulses may be used for accurate time signals, and their one-second spacing provides an accurate time interval for physical measurements.

The audio frequencies are interrupted at precisely one minute *before* each hour and each five minutes thereafter (59th minute; 4 minutes past hour, 9 minutes past hour, etc.), resuming after an interval of precisely one minute. This one-minute interval is provided to give Eastern Standard Time in telegraphic code and to afford an interval for the checking of radio-frequency measurements free from the presence of the audio frequencies. Ionospheric-disturbance warnings applicable to the North Atlantic path are given at 19 and 49 minutes past each hour. If a disturbance is in progress or is anticipated within 12 hours, the time announcement is followed by 6 Ws; if conditions are quiet or normal, the time announcement is followed by 8 Ns. The announcements of the station's services and call are given by voice at the hour and half hour.

The accuracy of all the frequencies, radio and audio, as transmitted, is now better than a part in 50,000,000. Transmission effects in the medium may result in slight fluctuations in the audio frequencies as received at a particular place; the average frequency received, however, is as accurate as that transmitted. The time interval marked by the pulse every second is accurate to 0.000001 second. The beginnings of the periods when the audio frequencies are resumed are synchronized with the basic time service of the U. S. Naval Observatory.

15th ARRL DX Contest

Part II: Final Results — 'Phone Section

IN accordance with a new policy of reporting DX Contest results in two parts, the final scores of the c.w. section of the 1949 ARRL International DX Competition were published in September *QST*. This month we complete the story with the 'phone results and some photographs of leading participants in both sections of the contest.

The pattern of new score records set in the c.w. fracas is also evident in the final tabulation of 'phone entries. The general level of scores in the upper brackets was far above that of any earlier 'phone DX contest. This year 19 W/VE and 7 foreign contestants scored over 100,000 points, compared with totals of 6 and 5, respectively, in 1948. Contact and multiplier records were similarly precedent-shattering.

A total of 592 reports was received, 406 from W/VE and 186 from foreign points. Engraved medallion awards are being made to 62 U. S. and Canadian participants and to 71 contestants outside the W/VE area. Heartiest congratulations to each winner.

Highlights

The performance of W2SAI sets up J. Dawson Ransome as a 'phone DX contest king for W/VE who probably won't be dethroned in a hurry! Dawson racked up the highest score, 313,200, a contact total of 600 and multiplier of 174, to outclass all participants in this or any previous competition. Two basic requirements are necessary to amass a score of such magnitude: a walloping signal and superior operating ability. Dawson's log shows convincingly that his station has the former and the score itself that he possesses the latter!

Second among the record-smashing 'phone scores was the 223,040-point total (468 contacts, 160 multiplier) of "Chad" Knowlton, W1ATE. In twelfth place last year, Chad this year made terrific strides toward the top position; his '49 score was almost three times greater than his '48 total. C.w. contest master W3BES showed that in addition to his skill as a DX brasspounder he has what it takes to keep up with the best of the 'phone contingent. Jerry taxed his tonsils through

Ivar Westerlund, SM5WJ, 'phone winner for Sweden, third-highest scorer in continental Europe, used an SM version of the "Table-Top Kilowatt," described in the *Handbook* and *QST*.

80 hours of the fray to the tune of an even 500 contacts, 147 multiplier, and a grand total of 219,765 points. Next on the list of high-scoring contestants: W8HUD 214,830, W7ESK 196,506, W8REU 174,450, W4DQH 137,093, W3DHM 130,634, W9BCV 129,870, W6ITA 123,343, W9EWC 120,384, W6TT 116,523, W8HRV 113,400, W1AFZ 110,550, W2BXA 106,835, VE7EL 106,736, W6RM 105,621, W4KWY 102,960, W1OND 100,855, W4OM 97,342, W5BGP 88,200, W4FUM 85,347, W2VQM 83,868, VE7ZM 83,694, W5KZN 81,534, W3GHS 79,860, W2PQJ 76,230.

♦

Here's the top operator among the W/VE contestants in the c.w. section, Rolf Lindenhayn, jr., W8BHW. Lindy scored 390,450 points, stepped out way ahead of the field. W8BHW ran 900 watts to p.p. 250THs. Six antennas were in use: for 3.5 and 7 Mc., three separate double-extended Zepps; a three-element rotary on 14 Mc.; six-element rotary on 14 Mc.; six-element rotary for 27 and 28 Mc. A fifteen-year-old HRO took care of the receiving end.

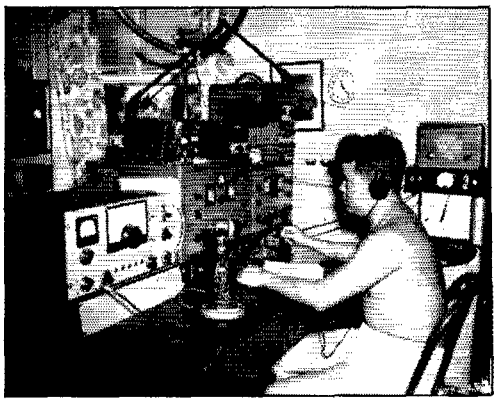
Honors for the top W/VE contact total go to W2SAI for his 600 QSOs. Other leaders in number of contacts: W3BES 500, W1ATE 468, W8HUD 437, W7ESK 405, W8REU 389, W4DQH 381, W6ITA 337, W1AFZ 334, W6RM 323, W9BCV 322, W6TT 321, VE7EL 319, W2BXA 311, W3DHM 309, W9EWC 306, W1OND 295, W4OM 273, W8HRV 270, W4KWY 264, W4FUM 261, W5KZN 254, VE7ZM 253.

Largest multipliers in the W/VE area were made by W2SAI 174, W8HUD 165, W7ESK 162, W1ATE 160, W8REU 150, W3BES 147, W3DHM 142, W8HRV 140, W9BCV 135, W9EWC 132, W4KWY 130, W6ITA 122, W3GHS W4DQH W6TT 121, W5BGP 120, W4OM 119, W8NXF 117, W2VQM 116, W1OND W2BXA 115, VE7EL 112, VE7ZN 111, W1AFZ W2PQJ 110, W4FUM W6RM 109, W1BFB 108, W5KZN 107, W4LXE 101.

Outside the W/VE area, Pedro J. Piza, KP4ES, was the outstanding contest operator.

Producer of the second-highest W/VE c.w. score was Larry LeKashman, W2IOP. Note that object in Larry's right hand. Could W2IOP be warming up to give the 'phone boys a run for their money next year?

Pedro made 1212 contacts and a multiplier of 59 for a score of 214,524 points. KP4ES was in operation for only 33 hours during the contest, which figures to the excellent average of 37 contacts per hour. The second-highest foreign score was entered by Vernon F. Scott, HC1KP. His score of 190,400 was obtained through 755 contacts and a multiplier of 85. Vern's log gives the power output of the transmitter at HC1KP as a mere 25 watts! VP6CDI placed next with 168,445 points, 959 QSOs and 59 multiplier. Other high scores outside W/VE: PY2CK 146,608, TG9AN 143,664, VP6SD 109,296, HC2OL 105,662, ZS6DW 101,898, G2PU 97,990, XE2W 95,088, KH6IJ 93,280, JA3AA 71,148, G8QW 62,806, XE1PZ 62,307, VK7AJ 61,758, OA1E 61,294, PAØAD 57,450, G2XV 55,012, CT1QF 54,900, HK3CU 54,230, SM5WJ 52,928, DL4VN 51,381, ZC6XY 51,207, F3WV 50,976.



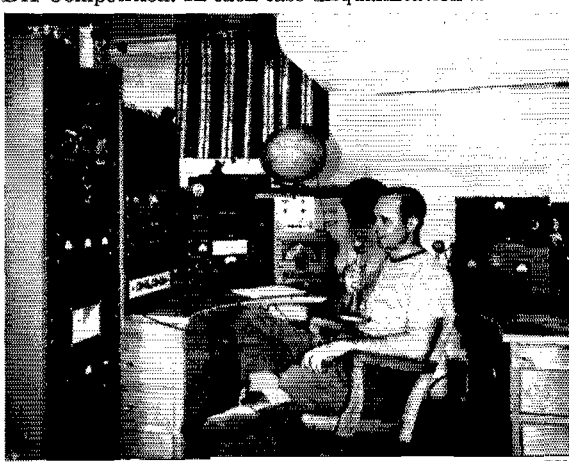
Katashi Nose, KH6IJ, veteran participant and winner of many awards in ARRL contests, made the fifth-highest c.w. score outside the U. S. and Canada, 338,935.

Leaders in number of contacts with W/VE: KP4ES 1212, PY2CK 1002, TG9AN 1000, ZS6DW 999, VP6CDI 959, G2PU 793, VP6SD 769, HC2OL 768, HC1KP 755, G8QW 681, XE2W 668, PAØAD 639, CT1QF 619, KH6IJ 590, SM5WJ 561, G2XV 543, OA1E 542, HK3CU 539, F3WV 531, DL4VN 521, LU3DH 512.

High multipliers: HC1KP 85, KP4ES VP6CDI 59, KH6IJ 53, JA3AA PY2CK 49, VP6SD TG9AN XE2W 48, VK7AJ 47, HC2OL 46, XE1PZ 43, G2PU 41, CM9AB 40.

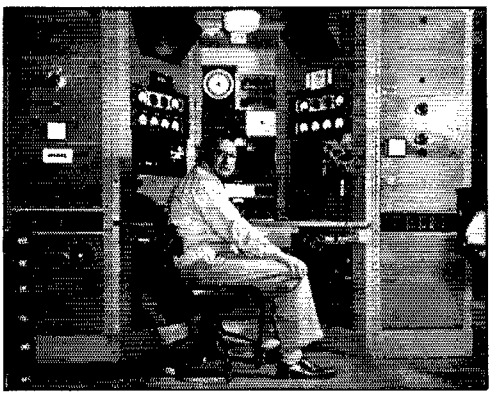
Disqualifications

The following entrants are ineligible for 'phone score listings or awards in the 15th ARRL DX Competition. In each case disqualification is



♦

A score of 313,200 points gave J. Dawson Ransome, W2SAI, a healthy lead on all other W/VE 'phone contestants. A 400-foot doublet, 80 feet in the air, put out an outstanding signal on 75. Dawson's antenna for 10, 11 and 20 meters is a DX ham's dream! It's a switchable phased array, four elements on 20 and eight on 10 and 11. W2SAI's transmitter runs 750–850 watts to p.p. 4-250As, modulated by 250As, and the receiver is a 75-A1. All TVI has been eliminated by traps contained in the shielded box atop the transmitter rack.



From this neat layout Doc Stuart, W6GRL, pounded out a signal to the far places, tallied 278,640 points, the top West Coast c.w. score and tenth-high among the W/VE entrants.

for off-frequency operation as confirmed by a single FCC citation or advisory notice or two accredited Official Observer measurements: W1CJH, W1HX, W1KKT, W3EQK, W4BPD, W6AM, W9BDV, WØGWH.

Club Scores

The standings of clubs competing for the special award offered to the amateur radio club submitting the highest aggregate score of members are shown in the accompanying tabulation. The winning group is once more the Frankford Radio Club of Philadelphia. FRC bettered its prize score of 1948 by more than 1.5 million! Winners of the individual club certificate awards, made only in cases where three c.w. and/or three 'phone entries were received from members, are also listed in the club tabulation.

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It isn't too early to start getting ready for the Sixteenth ARRL International DX Competition, the dates of which will be announced in November *QST*. Arrange your station for maximum flexibility and ease of operation, make any contemplated changes in your antenna set-up while the weather remains favorable. Such advance preparations will pay off when the clock strikes the opening hour and DX starts pouring through in the 1950 Contest!

'PHONE SCORES

Operator of the station first-listed in each section and country is winner for that area, unless otherwise indicated. . . . Asterisks denote stations not entered in contest, reporting to assure credit for stations worked. . . . The multiplier used by each station in determining score is given with the score — in the case of W/VE entrants this is the total of the countries worked on each frequency band used; in the case of non-W/VE participants it is the total of the W/VE districts worked on each frequency band. . . . The number of contacts established is next listed. . . . The letters A, B, and C approximate the input to the final stage at each station; A indicates power up to and including 100 watts; B indicates over 100 watts, up to and including 500 watts; C indicates over 500 watts. . . . The total operating time to the nearest hour is given for each station and is the last figure following the score. . . . Example of listings: W3BES 219,765-147-500-C-80, or final score 219,765; multiplier 147; 500 contacts; power over 500 watts; total operating time 80 hours. . . . Stations manned by more than one operator are grouped in order of score following single-operator station listings in each section or country tabulation; calls of participants at multioperator stations are listed in parentheses.

ATLANTIC DIVISION

E. Pennsylvania

W3BES.....219,765-147-500-C-80
W3DHM.....130,634-142-309--- -
W3GHS..... 79,860-121-222-B-46
W3NZZ..... 40,950- 75-182-B-60
W3FGB..... 36,792- 73-168-B-38
W3BET..... 21,504- 64-112-C-30
W3EQA..... 17,328- 57-102-B-34
W3LNN..... 8778- 38- 77-B - -
W3MQU..... 8184- 44- 62-C-14
W3IMV..... 4092- 31- 44-B-20
W3CPV..... 2700- 25- 36-B-14
W3JLJ..... 1539- 19- 27--- -
W3NYT..... 1125- 15- 25-B-16
W3QGK..... 648- 12- 18-B- 3
W3FDH*..... 588- 14- 14-B- 8
W3GHD..... 270- 9- 10-B- -
W3QLW..... 147- 7- 7-B- 9
W3HFD (W3s CBT GYV W2HEH)
131,138-122-360-C-80

Md.-Del.-D.C.

W3IYE..... 40,170- 78-173-C-45
W3NSM..... 25,604- 74-118-B-51
W3IZL..... 23,556- 52-151-B-46
W3AM..... 14,076- 46-102-C-26
W3NNX..... 11,289- 53- 71-B-28
W3OZG..... 270- 9- 10-B- 7
W3KDP..... 240- 8- 10-B- 1
W3NGF*..... 168- 7- 8-C- -

So. New Jersey

W2SAI.....313,200-174-600--- -
W2PQJ..... 76,230-110-231-B- -
W2PWP..... 48,327- 89-181-C-28
W2QKE..... 48,222- 94-171-C- -
W2OKJ..... 41,657- 77-181-B-48
W2GME*..... 36- 4- 4-A- -

W. New York

W2VQM..... 83,868-116-241-C-65
W2PUT..... 52,110- 90-193-B-53
W2FBA..... 36,636- 86-142-B-33
W2QWS..... 26,722- 62-145-B-50
W2MA..... 19,405- 62-105-C-65
W2TVR..... 18,468- 54-114-B-42
W2VRZ..... 13,671- 63- 73--- -
W2UTH..... 12,936- 49- 88-B-30
W2CKY..... 11,088- 48- 79-B- -
W2PYW..... 8601- 47- 61-B-30
W2TTQ..... 6474- 39- 56--- -
W2ROM..... 5984- 34- 59-B-35
W2WSZ..... 4992- 32- 52-B-17
W2ICE..... 3090- 30- 35-C-10
W2TXB..... 2208- 23- 32--- 16
W2YFZ*..... 832- 13- 22--- -
W2WME..... 240- 8- 10-B- 8
W2SYV..... 148- 7- 8--- -
W2ZJ*..... 132- 6- 7--- -
W2SAW..... 108- 6- 6--- -
W2QEW..... 27- 3- 3--- -
W2AKX*..... 3- 1- 1--- -

W. Pennsylvania

W3KQU..... 26,130- 65-134-B-36
W3LOE..... 14,868- 59- 84-C-22
W3AER..... 6720- 40- 56-B-27
W3OJW..... 3570- 30- 42-B-17
W3LOR..... 798- 14- 19-B- 6
W3CJF..... 3- 1- 1-A- 1

CENTRAL DIVISION

Illinois

W9BU..... 42,389- 97-146-C-53
W9NH..... 32,058- 78-137-B-54
W9IOD..... 25,920- 72-120-B-35
W9ABA..... 13,050- 50- 87-C-63
W9ZUL..... 9447- 47- 67-B-27
W9WXT..... 9360- 39- 80-B-29
W9SD..... 8118- 41- 66-B-18
W9VIN..... 7740- 43- 60--- -
W9ZYL..... 5328- 37- 48-C-33
W9FAB..... 3094- 26- 41-C-22
W9IT..... 3038- 23- 44-C- 9
W9JUQ..... 2574- 22- 39-B- -
W9DWQ..... 2184- 26- 28-B- 7
W9BWM..... 1458- 18- 27-A-22
W9CZC..... 969- 17- 19-C- 6
W9EXY..... 765- 15- 17-B-13
W9QM..... 360- 8- 15-C- -
W9KHZ*..... 304- 8- 12-B-26
W9BPU..... 75- 5- 5-B- 1
W9EJZ..... 36- 3- 4-B- -
W9ONK*..... 12- 2- 2--- -
W9MIR (W9UYX). 53,934- 89-202-C-

This compact operating position is that of CE4AD, c.w. winner for Chile. Op Adalberto Brito scored 100,286 points with a rig running 150 watts to an 805; the antenna was a simple Zepp.

Indiana

W9UUN..... 64,602- 97-222-B-58
W9LO..... 18,862- 59-106-B-56
W9JYU..... 18,810- 55-114-B-35
W9UEM..... 11,792- 44- 90-B-29
W9EMK..... 6831- 33- 69-B-34
W9WCE..... 5346- 33- 54-B-19
W9CWO..... 4488- 34- 44-B- 8
W9EGQ..... 1224- 17- 24-B- -
W9UIA..... 330- 10- 11--- -
W9IAG..... 324- 9- 45-C- 5
W9FYY..... 192- 8- 8-C- -

Wisconsin

W9BCV..... 129,870-135-322-C-71
W9EWC..... 120,384-132-306-C-85
W9DUB..... 23,625- 63-125-B-35
W9RNX..... 14,900- 50-100-B-41
W9RQM..... 6440- 35- 62-B-11
W9VHA..... 1638- 18- 31-B-10
W9GMY..... 507- 13- 13-B-10
W9CYN..... 56- 4- 5-B- 2
W9EJD*..... 3- 1- 1--- -

DAKOTA DIVISION

No. Dakota

WØVSK..... 22,302- 63-118-B- -

So. Dakota

WØPRZ..... 65 728- 79-218-C-56

WØACT..... 7650- 34- 76-B-50
WØZRA..... 1224- 17- 24--- -

Minnesota

WØVIP..... 2990- 26- 39-A- 9

DELTA DIVISION

Arkansas

W5FPD..... 2376- 24- 33--- -
W5NTT*..... 3- 1- 1--- -
W5HNU(W5OXL) 264- 8- 11-B-13

Louisiana

W5KC..... 29,749- 71-141-B-25

Mississippi

W5BDQ..... 2440- 20- 38-B-28
W5BK..... 1840- 20- 31-B-15
W5LPL*..... 108- 6- 6--- -

Tennessee

W4DQH.....137,093-121-381-C-65
W4AOR..... 33,327- 69-161-C-42
W4NBV..... 20,930- 46-153-C-62
W4LMJ..... 6960- 40- 58-B-42
W4MKB..... 495- 11- 15--- -
W4GQL..... 248- 8- 11-B-11

Tara Singh, XZ2KN, made many W 'phones happy by providing the somewhat rare opportunity to work Burma during the contest. Winner of the Burma 'phone award, XZ2KN ran 40 watts to an 807.

Dick Spenceley, KV4AA, Virgin Islands winner, had 2085 contacts and a score of 491,222, placed third among c.w. entrants outside W/VE.

GREAT LAKES DIVISION

Michigan

W8HUD.....214,830-165-437-C-80
W8REU.....174,450-150-389-B-72
W8NML..... 46,092- 92-167-C-43
W8YPU..... 28,145- 65-145-B-64
W8ZAZ..... 17,640- 56-105-A-43
W8PYY..... 10,209- 41- 83-A-40
W8NCB..... 9810- 45- 74-A-20
W8CYL*..... 588- 14- 14--- -
W8BET..... 510- 10- 17--- -
W8UIX*..... 420- 10- 14--- -

Ohio

W8HRV.....113,400-140-270-C-64
W8NXF..... 65,754-117-188-B-63
W8NSS..... 52,416- 91-192-B-46
W8ZOK..... 45,969- 77-199-B-51
W8ZMC..... 31,916- 79-136-B-41
W8RM..... 25,623- 73-117-B-51
W8VOZ..... 22,842- 54-141-C-40
W8QAD..... 20,010- 58-115-B-35
W8BNA..... 18,865- 55-115-B-40
W8BFH..... 16,320- 48-116-A- -
W8CDY..... 14,324- 44-107--- -
W8BNJ..... 13,230- 49- 90-B-50
W8BPM..... 10,206- 42- 81--- -
W8TJM..... 8364- 41- 68-C- -
W8LJ..... 7800- 40- 65-C-13
W8PNJ..... 6936- 34- 68-B- -
W8CVH..... 6804- 28- 81-B-14
W8LFE..... 6384- 38- 56-C- -
W8ATK..... 5124- 36- 53-B-20
W8OBS..... 5586- 38- 49-B-30
W8MQG..... 5208- 28- 62-B-18
W8PM..... 4662- 37- 42-B-20
W8OG..... 4104- 36- 38-B-11
W8PBX..... 4002- 29- 46-B-18
W8KC..... 3000- 25- 40-B-20
W8JFC..... 2673- 27- 33--- 19
W8AUP..... 2277- 23- 33-B- 7
W8BSR..... 1740- 20- 29--- -
W8ODJ..... 1716- 22- 26--- -
W8VQI..... 1302- 14- 31-A- 7
W8LAX..... 1152- 16- 24-B-13
W8YPE..... 624- 13- 16-A- -
W8YNN..... 570- 10- 57-A- 3
W8AOP..... 363- 11- 11-A-11
W8BIQ*..... 351- 9- 13--- -
W8ZCL*..... 189- 7- 9--- -
W8VHO*..... 75- 5- 5-A- -
W8EYE..... 48- 4- 4-B- 1
W8SYY..... 48- 4- 4--- -
W8DFD..... 27- 3- 3-B- 8
W8BAB*..... 12- 2- 2---
W8PCS*..... 12- 2- 2---

HUDSON DIVISION

E. New York

W2RYT..... 39,920- 80-167-B-69
W2DSU..... 3159- 27- 39-B-20
W2PFU..... 2541- 21- 41-B-21

N. Y. C.-L.I.

W2BRV..... 33,480- 60-188-B-40
W2OTC..... 29,273- 73-137-C-45
W2IRV..... 27,936- 72-131-B-42
W2GSN..... 8280- 30- 92-B-18
W2NQR..... 6200- 40- 53-B-24
W2EGG..... 4108- 26- 54--- 14
W2UQB..... 2160- 20- 36-B- -
W2BIT*..... 1104- 16- 23--- -
W2IFM..... 702- 13- 16-A- 3
W2BT..... 696- 12- 20-B- 8
W2NNB..... 495- 11- 15-A-11
W2VNG..... 304- 8- 13-B- 6
W2DBI..... 60- 4- 5-A- 3
W2NHH*..... 12- 2- 2--- -
W2VSQ*..... 3- 1- 1---

CLUB SCORES

Club	*Score*	*C.W. Winner*	*'Phone Winner*
Frankford Radio Club	3,612,566	W3BES	W2SAI
Southern California DX Club	2,029,557	W6GRL	
Northern California DX Club	1,613,669	W6RM	W6TT
Potomac Valley Radio Club	1,592,841	W4KFC	W4LM
Ohio Valley Radio Assn.	990,913	W8JIN	
Rochester DX Assn.	807,276	W2FBA	W2VQM
Greater Cincinnati Amateur Radio Assn.	555,152	W8BHW	W8ZMC
Columbus Amateur Radio Assn.	386,132	W8FJN	W8NXF
North Suburban Radio Club	352,769	W9BSR	
Hampden County Radio Club	253,686	W1JYH	W1CJK
Ridgewood Radio Club	192,515	W2ATE	W2JQJ
Springfield Amateur Radio Club	158,562	W8CDT	
The DX Club	134,211		W3GHS
Conn. Wireless Assn.	132,835	W1FTX	
South Lyme Beer, Chowder & Propagation Society	88,908	W1DF	W1LVQ
Dayton Amateur Radio Assn.	81,823	W8OBS	W8NSS
The Denver Radio Club	66,843	WØART	
Calgary Amateur Radio Assn.	58,076	VE6AO	
Northwest Amateur Radio Club	44,541		W9NII
Buckeye Shortwave Radio Assn.	41,437	W8QYI	W8BFH

No. New Jersey

W2BXA.....106,835-115-311-C-52
W2JQJ..... 16,200- 50-108-A-36
W2IUV..... 10,206- 54- 63-B-19
W2DMJ..... 8769- 37- 79-C-18
W2JFQ..... 7200- 40- 60-B-11
W2PMQ..... 5100- 34- 50-B-35
W2YTI..... 3744- 24- 54-A-16
W4NLA/2..... 1200- 16- 25-B-43
W2BF..... 768- 16- 16-C-22
W2GNQ..... 270- 9- 10-C- -
W2AEB..... 36- 3- 4-B- 2

MIDWEST DIVISION

Iowa

WØSQO..... 45,720- 90-170-C-40
WØBFY..... 29,025- 75-129-B-54
WØDIB..... 1050- 14- 15-B- 7
WØFGW..... 72- 4- 6-B- 3

Kansas

W CQC..... 22,110- 66-112-C-33
WØBNU..... 8651- 41- 71-B-25
WØQQT..... 765- 15- 17-C- 8
WØIWS*..... 3- 1- 1--- -
WØUQV (WØAIW) 167,882-143-391-C-78

Missouri

WØANF[1]..... 52,962- 97-182-C- -
WØGUV..... 24,180- 52-155-C-61
WØEYR..... 23,544- 72-109-C-49
WØOMG..... 10,062- 43- 78-C-30
WØAJU..... 4080- 30- 46-B-19
WØBTD..... 1904- 17- 38-B- 9
WØGEK..... 1785- 17- 35-B-23
WØBOS..... 240- 8- 10-A- 5

Nebraska

WØHHB*..... 189- 7- 9--- -
WØGDB*..... 27- 3- 3-B- -

NEW ENGLAND DIVISION

Connecticut

W1ATE.....223,040-160-468-C-86
W1OND.....100,855-115-295-C-55
W1OMW..... 6440- 28- 79-A-41
W1MRJ..... 4960- 31- 54-B-20
W1PRA..... 1560- 20- 26-A-25
W1FTX..... 1020- 17- 20-B- 6
W1LVQ..... 126- 6- 7--- -
W1KE*..... 48- 4- 4-C- 1
W1PEK*..... 12- 2- 2--- -

Maine

W1GKJ..... 12,546- 51- 82-C-53

E. Massachusetts

W1AFZ.....110,550-110-334-C-70
W1ONK..... 52,374- 86-203-B-54
W1FJN..... 42,630- 87-164-C-46
W1QPN*..... 9417- 43- 77-B-31
W1BPH..... 5643- 33- 57-C-16
W1PPZ*..... 1368- 19- 24-B- -
W1PWK..... 798- 14- 19-A- 5
W1ONP..... 528- 11- 16-B- 6
W1DYV*..... 330- 11- 11--- -
W1IQO*..... 75- 5- 5-B- -
W1LID*..... 48- 4- 4-B- -
W1LQQ..... 27- 3- 3-A- 2

W. Massachusetts

W1CJK..... 38,232- 81-158-C-50
W1IJT..... 11,868- 46- 86-B-42
W1JYH..... 6018- 34- 59-B-15
W1QFB..... 5940- 33- 60-B-19
W1QDE (W8DIW W9JCD) 9165- 39- 79-C-51

New Hampshire

W1CRW..... 2232- 24- 31-C- 5

Rhode Island

W1BFB..... 74,844-108-231-B-62
W1NCX..... 10,800- 50- 72-B-33

Vermont

W1QNM..... 4239- 27- 53-B-35

NORTHWESTERN DIVISION

Idaho

W7KK..... 3198- 26- 41--- -

Montana

W7IXL..... 162- 6- 9-B- 3
W7KUX*..... 65- 5- 5-B- -

Oregon

W7MLJ..... 8132- 38- 72-B-39
W7DAA..... 1449- 21- 23-B-20
W7EJS..... 198- 6- 11-A- 4

Washington

W7ESK.....196,506-162-405-C-80
W7GUI..... 37,179- 81-153-C-25
W7BLX..... 1940- 20- 33-B-12
W7EYD..... 1786- 19- 32-B- -
W7KWC..... 1596- 19- 28-C- -
W7AXS..... 1122- 17- 22-B- -
W7FLD..... 459- 9- 17-C- -
W7DCV..... 328- 8- 15-B- -
W7FWR*..... 75- 5- 5--- -

PACIFIC DIVISION

Nevada

W7JUO..... 4205- 29- 49-C-16
W7JLV..... 1764- 21- 28-C-16
W7GC*..... 756- 12- 21--- -

Santa Clara Valley

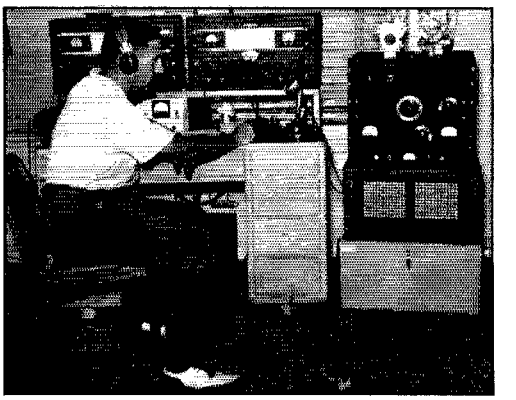
W6ZZ..... 672- 12- 19-B-12
W6EFR*..... 561- 11- 17-C- -
W6NHK..... 378- 9- 14-C-10
W6MDY..... 6- 1- 2-B- -

East Bay

W6TT.....116,523-121-321-C-82
W6RM.....105,621-109-323-C-75
W6UZX..... 41,184- 78-176-C-51
W6IKQ..... 36,180- 67-180-C- -
W6YI..... 18,648- 56-111-C-20
W6YDI*..... 3- 1- 1--- -

[1] Operated by WØWCV.

Morris Guzick, W5BGP, Northern Texas 'phone winner, top W5 scorer. His rig runs 400 watts to p.p. 100THs; receivers are a Super Pro and HRO.



From a hotel location on Chicago's West Side, John H. Dodman, W9GA, scored 200,718 points to win the Illinois c.w. award against competition from contestants with much more favorable locations.

Sacramento Valley

W6GVM..... 1860- 20- 31-C- 8
W6WTL..... 1425- 19- 25-B-11
W6BTT..... 810- 15- 18-B-22
W6WLI..... 450- 10- 15-B- 9
W6JDN..... 12- 2- 2--- -

San Joaquin

W6NIG..... 47,740- 70-228-C-55
W6VPV..... 3379- 31- 37-B- 8
W6ILH*..... 64- 4- 6--- -

ROANOKE DIVISION

North Carolina

W4ONI..... 5088- 32- 53--- -
W4ASO..... 4320- 32- 45-C-13
W4AEH..... 2664- 24- 37-A-18
W4MKT..... 387- 9- 15--- -
W4OEL..... 351- 9- 13-A- 1

Virginia

W4KWY.....102,960-130-264-C-78
W4OM..... 97,342-119-273-C- -
W4FPS..... 47,642- 82-194-C-65
W4LM..... 41,712- 88-158-B- -
W4KFC..... 38,193- 87-147-B- -
W4IWO..... 30,459- 71-143-B- -
W4JLW*..... 8299- 30- 65--- -
W4FV..... 1392- 16- 29-C- -
W4KMS..... 1026- 18- 19-B- -
W4GKY..... 378- 9- 14-A-12

West Virginia

W8VAN..... 58,968- 91-217-B-60
W8AVW..... 4248- 24- 59-B-11
W8CKW..... 1200- 16- 25--- -
W8JM..... 240- 8- 10--- -
W8QHG(W8s CLX UEB) 1701- 21- 27-B-17

ROCKY MOUNTAIN DIVISION

Colorado

WØJYW..... 17,040- 48-119-B-37
WØFUH..... 9636- 44- 73-B-70
WØNWW..... 7134- 41- 58-B-27
WØWO*..... 75- 5- 5-A- 1
WØKIN*..... 12- 2- 2--- -

SOUTHEASTERN DIVISION

Alabama

W4KCQ..... 51,336- 93-184-B-35
W4HA..... 40,271- 77-175-C-48
W4PZV..... 12,815- 55- 79--- -
W4HLG..... 1512- 21- 24-C-15
W4CXT..... 610- 10- 21-A-18
W4GLR..... 12- 2- 2--- -

E. Florida

W4FUM..... 85,347-109-261-C-69
W4BMR..... 16,632- 63- 88-C- -
W4LZM..... 7910- 35- 76-A-17
W4EEO..... 600- 12- 18-B- -
W4CY*..... 243- 9- 9--- -
W4CJ..... 54- 6- 6--- -

W. Florida

W4AGB..... 24,072- 68-118-B-44

Georgia

W4LXE..... 68,478-101-226-C-39
W4BOC..... 36,556- 74-166-B-46
W4INO..... 6954- 38- 61-B-16
W4GIO..... 2496- 24- 36--- -
W4TO..... 2436- 28- 29-C- 5
W4GDQ..... 1800- 20- 30-B- 8

SOUTHWESTERN DIVISION

Los Angeles

W6ITA.....123,343-122-337-C-77
W6BJU..... 29,580- 68-145-C-56
W6UQQ..... 6405- 35- 61-B-29
W6BJZ..... 1680- 16- 35-B-11

Arizona

W7ENA..... 3276- 28- 39-A-40
W7MOW..... 1296- 18- 24-B-11
W7RFE..... 24- 2- 4--- -

San Diego

W6CHV..... 45,900- 85-180-B-63
W6MI..... 17,415- 45-129-A-30

WEST GULF DIVISION

Northern Texas

W5BGP..... 88,200-120-247-B-58
W5KZN..... 81,534-107-254-C-79
W5ERD..... 38,212- 82-158-B-53
W5FKQ..... 25,200- 80-105-C-36
W5HDU..... 2574- 26- 33-B-13
W5OUS..... 3- 1- 1-A- 3

Oklahoma

W5JME..... 27,918- 66-141-A-50
W5GZK..... 20,510- 70- 99-B- -
W5OJH..... 4290- 33- 44-B-44
W5LJI..... 2262- 26- 29-A-23

Southern Texas

W5LWV..... 52,154- 89-196-C-59
W5JWM..... 3225- 25- 43-C-23

New Mexico

W5LGS..... 765- 15- 17-B- 4
W5NXF..... 280- 10- 10-B- 9

CANADA

Maritime

VE1ET..... 25,050- 50-167-B-16
VE1ID..... 6156- 38- 54-B-24
VE1FQ*..... 1800- 20- 30--- -
VE1PQ..... 810- 15- 18--- -
VE1CU..... 36- 3- 4-B- 2

Ontario

VE3AGW..... 43,134- 78-187-B-64
VE3BBN..... 29,000- 58-168-B-46
VE3BNQ..... 24,300- 50-163-A-49
VE3AQB..... 12,510- 45- 93-B-30
VE3BDB..... 12,084- 53- 76-B-27
VE3AMK..... 10,080- 40- 84--- -
VE3JJ..... 5952- 32- 62-B-33
VE3TF..... 3360- 28- 40-A-10
VE3MZ..... 1288- 14- 32-A-15
VE3KE*..... 1254- 19- 22--- -
VE3PE..... 858- 13- 22-B- 5
VE3BLY..... 780- 15- 18-B- 9

VE3BYW..... 715- 13- 19--- -
VE3KG*..... 360- 8- 15--- -
VE3AJQ*..... 12- 2- 2-A- -
VE3YR*..... 12- 2- 2--- -
VE3JU (VE3BHS). 6916- 38- 62--- -

Quebec

VE2CA..... 18,819- 51-123-B-54
VE2GE..... 3432- 26- 44-A- -
VE2HM*..... 108- 6- 6--- -
VE2AJ*..... 27- 3- 3--- -
VE2ABS*..... 12- 2- 2--- -

Alberta

VE6TM..... 25,437- 61-139--- -
VE6FK..... 24,495- 71-117-B-36
VE6NW*..... 1701- 21- 27-A- 2

British Columbia

VE7EL.....106,736-112-319-B-76
VE7ZM..... 83,694-111-253-B-48
VE7VO..... 50,997- 89-181-B-86
VE7ZZ..... 12,210- 37-110--- -
VE7VT..... 1620- 18- 30-A-11

Manitoba

VE4RO..... 26,065- 65-135- --53
VE4KF..... 15,345- 55- 93-B-28
VE4RP..... 14,006- 47-100-B-57
VE4GE..... 12,474- 42- 99-B-20
VE4LC..... 7602- 42- 63-A-32

Saskatchewan

VE5CD..... 17,157- 43-133-B-25
VE5BF..... 5133- 29- 59-B-41
VE5JV..... 576- 12- 16-B- -
VE5OC*..... 105- 5- 7-B- -

AFRICA

Algeria

FA3JY..... 4238- 13-110--- -

Belgian Congo

OQ5LL..... 29,880- 24-418-A- -
OQ5CF..... 2100- 10- 72-B- -
OQ5AB*..... 1404- 12- 39--- -

Eritrea

MI3SC..... 23,382- 27-290-A-25

French Equa. Africa

FQ8SN..... 16,968- 24-238--- -

French Morocco

CN8BA..... 49,173- 37-459-A-18

Kenya

VQ4RF..... 4980- 10-170-A-19

Libya

MT2E..... 3710- 10-125-A- -

Nigeria

ZD2S..... 92- 4- 8-A- 3

So. Rhodesia

ZE1JO..... 5964- 14-142-A- 7

Sudan

ST2AM..... 7500- 15-167--- -

Union of South Africa

ZS6DW.....101,898- 34-999--- -
ZS6Z..... 39,732- 33-404-A-33
ZS6JS..... 21,360- 15-477-A-61
ZS6OV..... 5838- 14-139-A- 8
ZS2DY..... 4635- 15-104--- 22
ZS1BF..... 290- 10- 10--- -

ASIA

Burma

XZ2KN..... 987- 7- 47-A- 4

Hong Kong

VS6BA..... 81- 3- 9-B- 1

Iwo Jima

W3CHH/IWO.... 31,920- 38-282-C- -

Japan

JA3AA..... 71,148- 49-485-C-35
JA2KG..... 4800- 20- 80-C-11

Palestine

ZC6XY..... 51,207- 39-439-B- -

Shanghai

C1JH..... 10,582- 22-161-B-21
C1MK..... 1512- 7- 72-A-14

Transjordan

ZC1AZ..... 235- 5- 16-A-35

EUROPE

Austria

MB9BN ..... 546- 7- 26--- -

Belgium

ON4CC..... 32,177- 23-466-A-28

Czechoslovakia

OK3ID..... 13,088- 16-276-B-24
OK1FF..... 2057- 11- 63--- -
OK1AW..... 580- 10- 20-A- -
OK1RW..... 228- 6- 13-A- 3

Fifth-high W/VE 'phone scorer and Washington 'phone winner was Rush Drake, jr., W7ESK. The conveniently-placed steering wheel rotates a four-element 20-meter beam and a three-element 10-meter job.

Denmark

OZ7TS..... 39,970- 35-387-A-49
OZ7G..... 32,010- 30-359-A-74
OZ4P..... 21,546- 27-269-A- -
OZ9Q..... 6600- 22-101--- -
OZ7EU..... 4080- 16- 86--- -
OZ2FR..... 2844- 12- 79--- -
OZ7SM..... 2205- 15- 49--- -
OZ1W..... 115- 5- 8-A- -

Eire

EI7M..... 26,950- 35-261-B-35

England

G2PU..... 97,990- 41-793-B-47
G8QW..... 62,806- 31-681-B- -
G2XV..... 55,012- 34-543-B-80
G5HB..... 37,555- 35-360-A-50
G5CP..... 27,768- 26-359-B-32
G2DYV..... 16,464- 28-196-A-35
G3XC..... 12,992- 32-136-B-14
G2EC..... 10,948- 34-110-B-15
G6CL..... 10,890- 18-205-B- -
G6CB..... 8864- 16-163-B-25
G3AIM..... 2420- 10- 82--- -
G5OJ*..... 928- 8- 39-A- -
G3AJP*..... 27- 4- 6-A- -
G3DFC (G3s BUX CKX G8WI) 8626- 19-153-A-26

Finland

OH6NB..... 378- 7- 18-A- 5

France

F3WV..... 50,976- 32-531-A- -
F8SK..... 33,750- 30-377--- -
F9BO..... 17,528- 28-209-A- -
F8SI..... 11,732- 28-141--- 20
F9LR..... 8880- 16-188-A-19
F3OX..... 8694- 23-131-A-33
F9KF..... 3471- 13- 89-A- -
F3DI..... 3066- 14- 73--- -
F9CO..... 2290- 10- 77--- -
F8XP..... 2016- 14- 48-A- -
F9MX..... 1104- 12- 31-A- -
F9FM..... 976- 8- 41--- -
F9EZ..... 510- 10- 17-A- -
F8SC..... 174- 6- 11--- -
F8DW..... 10- 2- 2-A- 2

Germany

DL4VN..... 51,381- 33-521-B-55
DL4ZY..... 31,320- 30-348-B-80
DL4LN..... 6075- 25- 81-B-14
DL4VV*..... 27- 3- 3--- -

Luxembourg

LX1JW..... 65,805- 41-543--- -

Hungary

HA5B..... 6534- 18-121--- -
HA1KK..... 1860- 12- 52-A-18

Italy

I1BU..... 16,156- 28-193-A-26
I1AMU..... 2292- 16- 63-A-12
I1ZV*..... 2502- 9- 98-A-10
I1ADX..... 1150- 10- 41-A- 7
I1AXV..... 448- 7- 22-A- 6
I1PM*..... 3- 1- 1--- -

Netherlands

PAØAD..... 57,450- 30-639-A- -
PAØALO..... 42,455- 35-408-A- -
PAØRU..... 37,260- 30-414-A- -
PAØMZ..... 22,320- 30-248--- -
PAØPAS..... 9724- 17-208-A-25
PAØOO..... 8826- 15-196--- -
PAØBE..... 6363- 21-102--- -
PAØIF..... 4920- 10-166-A-12
PAØPN..... 4446- 13-114-A-10
PAØUV..... 4335- 15- 97-A-17
PAØZJ..... 3120- 8-132-A-23
PAØCB*..... 754- 13- 20-A- -

Norway

LA2UA..... 6420- 12-181-A-16
LA5N..... 981- 17-101-A-15
LA8RB..... 594- 9- 22-A- 6
LA9T..... 480- 8- 20-A- 7
LA7WA.. ..... 3- 1- 1-A- 1

Portugal

CT1QF..... 54,900- 30-619-A-50
CT1NT..... 9657- 29-111-A-21
CT1FM..... 5616- 16-117-A-17
CT1SQ..... 2100- 15- 47-A- 7

Sardinia

IS1AYN..... 34,684- 29-414-A-65
IS1AHK..... 203- 7- 10-A- 1
IS1AFM..... 27- 3- 3-A- -

Scotland

GM2UU..... 18,304- 32-192-B-18

The top VE 'phone score, 106,736 points, was chalked up by A. L. "Bert" Porter, VE7EL. The entire station consists of completely home-constructed gear.

(*Continued on page 98*)

Your Beam—Will It Stay Up?

BY RAYMOND W. WOODWARD,* W1VW

QUITE often we hear of a beam that withstands several severe windstorms and then tumbles down in a comparatively light breeze. This generally baffles the builder, but a close examination will disclose that some of the fundamental rules in the use of metals have been violated.

Nearly everyone is familiar with the fact that iron and steel will rust readily on exposure to the weather, so proper steps usually are taken to prevent rusting, either by painting or applying a protective coating of some other metal. Few, however, realize that under certain conditions other metals — for instance, aluminum — may become badly corroded.

In the case of our broken-down beam, we find that the tubular aluminum elements have been bolted together with brass screws and nuts. At each of these joints, the aluminum has been badly corroded and finally weakened to such an extent that the light breeze caused failure. A great many of the otherwise excellent beams that have been described in *QST* have called for the use of brass bolts or clamps with aluminum tubing. Nor are the hams alone in this undesirable practice. Some of the commercial television antennas, including the newly-marketed rotators, fall into the same error and may be expected to give trouble after installation.

Why is this condition bad and what can be done to overcome it? Let's go back to our high school chemistry, or maybe the days when we used wet batteries to operate a telegraph line with the fellow up the street. Remember those wet batteries used two dissimilar metals, usually zinc and copper, immersed in a conducting solution or electrolyte such as one containing copper sulphate. The combination gave an electromotive force of something over one volt, and as we used the battery the zinc was gradually used up or corroded while the copper was unattacked. The zinc was the negative terminal and the copper positive.

In like manner, any two dissimilar metals in contact with each other in the presence of an electrolyte will form a small galvanic cell and the more negative metal will be attacked or corroded. All metals can be arranged in a series according to the individual potential attributed to each. The e.m.f. developed by any particular couple or combination is the sum of the potentials of the two metals. The greater this e.m.f. the greater the tendency toward corrosion. Table I shows the electrochemical series for the more common metals and the potential of each.

In outdoor exposure, the required electrolyte is supplied by atmospheric humidity or rain. Industrial and urban atmospheres contain small amounts of sulphur dioxide from fuel combustion which will slightly acidify the moisture. Marine atmospheres contain salts which will provide the necessary conducting electrolyte.

TABLE I

Magnesium	1.55 volts	Tin	0.14 volts
Aluminum	1.33 volts	Lead	0.12 volts
Zinc	0.76 volts	Copper	0.34 volts
Chromium	0.56 volts	Silver	0.80 volts
Iron	0.44 volts	Platinum	0.86 volts
Cadmium	0.40 volts	Gold	1.36 volts
Nickel	0.23 volts		

Reference to Table I shows that aluminum and copper (brass is an alloy of copper) are far apart, and considerable galvanic corrosion can take place in moist atmospheres when these metals are in contact with each other. The aluminum is the most negative of the combination and will be attacked with resulting loss of strength. The table will suggest other poor combinations but aluminum-copper is one of the worst offenders.

What can be done to guard against this condition? If you live along the southern seacoast of the United States or in similar hot marine atmospheres, all possible protective measures should be used. For a dry inland climate, the danger is not as great and less stringent measures will be satisfactory.

For some of the beam elements, anodized tubing can be used if procurable. This is aluminum treated by a process that can hardly be undertaken by the amateur but provides a thin nonconducting skin of aluminum oxide on the surface of the metal. A joint across such a layer is insulated and galvanic currents cannot flow. Unless mechanically broken down or scratched, the skin will have an insulation breakdown of the order of 500 to 1000 volts. Where electrical conducting joints are required such tubing should not be used unless proper steps are taken to break through the insulation.

The screws, bolts, and nuts can be made of steel with a more protective coating such as a zinc plate, or galvanized coating. Cadmium or nickel plate can also be used. All of these plated steel parts are much better than brass, but still not entirely preventive.

*41 Middlefield Drive, W. Hartford, Conn.

As a final precaution, the joint should be painted to keep out moisture and the electrolyte required for corrosion. Here again the degree of protection required dictates the materials used. For highest protection, a first coat of zinc chromate primer should be used followed by one or more coats of good outside paint. The zinc chromate, besides serving as a prime coat, also provides a "passivating" action to aid further in corrosion protection. For less severe climates, the outside paint alone may be used.

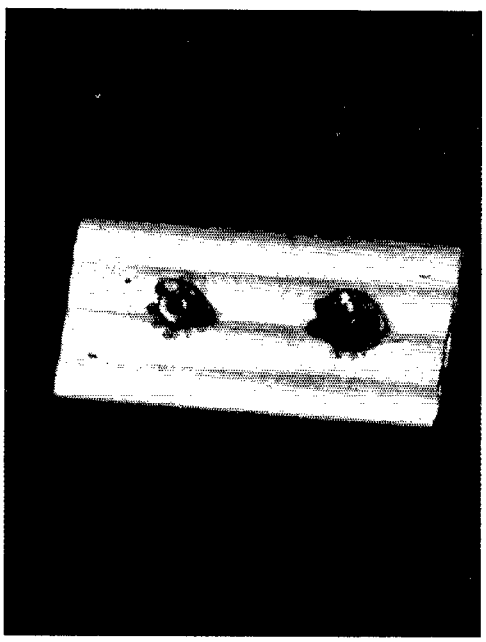
Similar precautions should be taken on indoor construction if one lives in a part of the world subject to destructive atmospheres or if equipment is used in basements where relative humidity is high. Nickel-plated brass or steel hardware is nearly always satisfactory on steel chassis. On aluminum, the same treatment as for beams should be followed.

Many small steel parts are plated with either cadmium or zinc for protection. Cadmium is generally to be preferred but at present is little used because of cost. Zinc, either in the form of coatings or die castings, is subject to another form of attack known as "white powder corrosion." This is not an electrolytic effect but a direct chemical attack by certain atmospheres, principally marine. As the name implies, a white powder is formed on the surface and is quite pronounced under the most adverse conditions. It can be prevented or delayed by treatment with certain passivating solutions but this is beyond the scope of home operations. However, if the parts you buy have an iridescent appearance they have been so treated. Cadmium is not subject to the same form of corrosion except under rather unusual conditions.

As might be expected from Table I, magnesium is a worse offender than aluminum as regards electrolytic corrosion. Since it is also of lower strength than aluminum and its alloys, and larger sections must be used for equal rigidity, it is not generally advisable to use it for amateur construction of antennas. Magnesium is also readily attacked in almost all atmospheres and should not be used without adequate pretreatment, prime coats and final painting.

Another fact not generally recognized is that stainless steel is not corrosion-resistant unless it has a good polished surface. If dirt or scale is present, electrolytes can go to work and readily start destructive corrosion.

It is hoped that these few simple rules of the materials engineer may help to keep more antennas in the air and more hams on the ground.



A sample of flattened aluminum tubing with two steel screws and brass nuts attached. After 3 days in a salt fog at 95° F corrosion has progressed in the aluminum at the points of contact with the brass. The steel has, of course, also rusted.

Strays

To assure ARRL Hudson Division Convention-goers of enjoying the renowned hospitality of New York City, the Honorable William O'Dwyer, mayor, has proclaimed October 8th as "Amateur Radio Day." Mayor O'Dwyer's proclamation pays tribute to radio amateurs in the following language:

WHEREAS the men and women of the Amateur Radio Service have offered their equipment, time and ability in many emergencies to maintain the lines of public communication in peace and war, and

WHEREAS the Amateur Radio Service has greatly contributed to the high development of radio, and

WHEREAS the Amateur Radio Operators of the City of New York are sponsoring the American Radio Relay League Hudson Division Convention and the Greater New York Amateur Radio Show, which will further the interest of the younger generation in radio, electronics and in amateur radio communications, and

WHEREAS the said Convention and Show are to be held at the Ninth Regiment Armory in the City of New York on the 7th, 8th and 9th days of October, 1949,

NOW, THEREFORE, I, William O'Dwyer, Mayor of the City of New York, do hereby declare Saturday, October 8th, 1949, as AMATEUR RADIO DAY in the City of New York, and call upon our citizens to honor the men and women of the Amateur Radio Service for their unselfish devotion to a duty which they have voluntarily assumed, and for the invaluable aid which they have rendered our country and its communities.

IN WITNESS WHEREOF I have hereunto set my hand and caused the seal of the City of New York to be affixed this 9th day of August, 1949.

[signed] WILLIAM O'DWYER
Mayor

By: [signed] WILLIAM J. DONOGHUE
Executive Secretary to the Mayor

The "Hum Bug"

Effortless Perfection in Manual Keying

BY A. F. SCOTTEN,* W6ZMZ

"THEN after Richard had arrived he and Clarence each kissed beautiful Annabelle and she ceased all resistance because in actual fact she liked it better than ever."

Never mind what happened next. Just try that sentence on your bug and listen critically. Mediocre? Then take comfort in the thought that, since the sentence contains no characters having consecutive dashes, it is your own fault. You would not sound a bit better using any of the "fully-automatic" keys or keyers, mechanical or electronic, hitherto devised. No, you would sound worse, because of fumbling.

Those keyers exert a powerful and mysterious fascination. They illustrate perfectly the tyranny of the machine, in that they force man to come to time, to toe a scratch ready or not, and taunt him with their throbbing "nyah — nyah — nyah" when his obedience is tardy by a microsecond. Automatic dots we gratefully embrace, for no hand can comfortably execute dots at convenient speeds. But why automatic dashes?

It can only be answered that something in our nature bars us from true contentment unless we have the Devil behind us with a sharp stick. One operator in this area has been brought by an electronic keyer to a state of blissful incoherence; he spends his evenings twitching his hands and counting monotonously. Another, audible nightly on 80 meters, performs the astounding feat of compressing every transmission into a single compound character, incredibly intricate. His acquaintances call him a holophrast and pretend to despise his sending, though secretly they envy it and wish they could read him. Still others, men of stable mind and quick reaction time, dance nimbly to the tune their keyers play, yet already sigh for new trials of their agility. To them encouragement can now be offered.

Do not be downcast, dear friends. What you need is the "Hum Bug," logical successor to the obsolescent keyers of the present day.

* 1045 So. Orange Grove Ave., Pasadena 2, Calif.

Spacing & Rhythm

The Hum Bug is based on a well-established principle that has not received the recognition it deserves. Our code consists of fifty-odd sound patterns, or rhythms. By combining these we can say just about anything, and frequently do. In perception of a rhythm by the human ear the actual duration of the sounds is, within fairly wide limits, unimportant; it is the spacing between them (or, more accurately, the front-to-front spacing) that is significant.

Let us draw for analogy upon the other field in which rhythm is a paramount consideration. When the trumpeter reaches the breathe-or-burst point with no relief in sight, he shortens a half-note to a quarter and comes up for air in the time thus gained; no one notices. When the pianist absently holds a chord a fraction of a second too long, only a compressed nostril here and there in the audience lowers the tone of the proceedings. But the very first time the violinist reads a quarter-rest as an eighth and comes in a half beat too soon, he is instantly invited, in the words of the old song, to hang up the fiddle and the bow, stick to the shovel and the hoe. He is through; he turns in his card. His timing is off.

Is *your* timing off? Try the Hum Bug.

Curiously, our judgment of the length of brief sounds is poor, perhaps because of a "persistence of audition" loosely akin to the persistence of vision on which the cinema depends; yet we judge the relative length of brief time *intervals* rather well. It is for this reason, they say, that landline telegraphers stick to the sounder. It is also for this reason that hard keying is easier to read than soft. And so keyers that tailor emitted sounds to rigid reassurement are a waste of time. If longs are substantially longer than shorts, the ear will be satisfied. The desideratum is perfect spacing, and this only the Hum Bug gives.

Referring to Fig. 1A (theoretically perfect code), you will observe that it is built of three

Fig. 1 — (A) Theoretically perfect code; (B) Hum Bug sending; (C) ordinary electronic keying.

different elements; namely, spaces of one, three, and seven time units respectively. These, and only these, make the code intelligible. The long and short fragments of mark merely serve the secondary purpose of correctly placing the spaces in relation to one another and preventing them from running together. No keyer which does not supply the three kinds of spaces can legitimately be called fully-automatic.

Note now in Fig. 1B, Hum Bug sending, how exactly the essential elements match the ideal pattern. And the marks match also, showing that if you take care of the spaces the marks will take care of themselves. The unmodulated marks before and after the transmission are attributable to inattention of the operator.

Figure 1C shows, for convenient comparison, the same text sent with a conventional electronic keyer.

If you have difficulty understanding Fig. 1, consult Fig. 2.

The Hum Bug Circuit

Design of the Hum Bug is shown by block diagram in Fig. 3. The circuit to be keyed is completed through four normally-closed relays in series. Each relay is actuated by its own timing circuit, selected at will through S_1, the manual control. A wide choice of schematic diagrams and constructional details for appropriate timing circuits has been published. No speed adjustment is provided, the circuits being preset to approximately 45 w.p.m.

Moving the manual control to the four positions causes the corresponding relays to open the keyed circuit, giving measured spaces as follows:

Position 1: 1-unit spaces marked 1 unit apart ("dots")

Position 2: 1-unit spaces marked 3 units apart ("dashes")

Position 3: 3-unit space, terminated (between letters)

Position 4: 7-unit space, terminated (between words).

(A) **HUM BUG**

(B) **(eek) HUM BUG (eek)**

(C) **HUMBUO?**

Fig. 2 — Translation of Fig. 1, for nonlicensed readers and inquisitive 'phone men.

The Hum Bug requires no tedious hours of practice with an oscillator. Either you can send with it or you can't. However, should you find yourself becoming confused, pick out a commercial press station using frequency-shift keying and read the back-wave for a few minutes each day. Operating is child's play, because the manual control preserves the familiar "feel" of an automobile gear-shift lever. Simply grasp the handle of *S*, set it in neutral, and turn on your rig. As soon as the filaments warm up, it will emit a continuous mark. Now think fast! Unless you want a citation for AØ operation, you must start talking whether you have anything to say or not. When your opponent breaks you, keep right on talking, for otherwise you cannot hear him. Eventually he will go away.

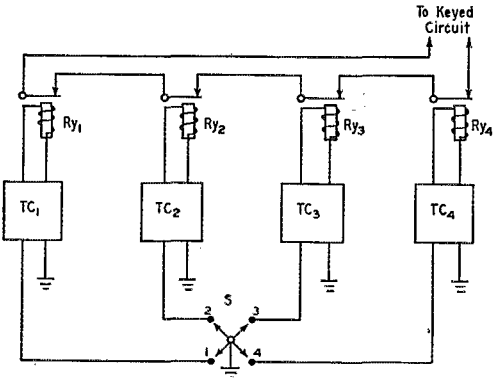


Fig. 3 — Wiring diagram of the basic Hum Bug design.
Ry_1, Ry_2, Ry_3, Ry_4 — S.p.s.t. relay, normally closed, sensitive type.
TC_1, TC_2, TC_3, TC_4 — Timing circuit. See text, by all means.
S — Single-pole quadruple-throw momentary toggle switch, with extension handle and special knob.

If after full and fair trial you do not care for the Hum Bug, there is still hope. Scrap it, and try again the test sentence about Annabelle on your old key. But this time put in the spaces precisely as you would on a mill. That is, take your fingers off the key between letters, and touch the space bar between words. If your bug is not equipped with a space bar, you may install one by strapping a tongue-depressor, or other thin strip of wood, across the base under the knob and paddle with a rubber band. It need not be connected to anything. You will be delighted by the improvement.

Strays

The Alaska Communication System, Signal Corps, will observe its Fiftieth Anniversary in 1950. In connection with the many events scheduled, there will be a special issue of the *ACS News Bulletin*. At least one page will be devoted to items about former ACS men, both military and civilian. It is requested that all ex-ACS-ers drop a friendly line to their former headquarters: Alaska Communication System, 550 Federal Office Building, Seattle 4, Wash., Attn. Public Information Officer.

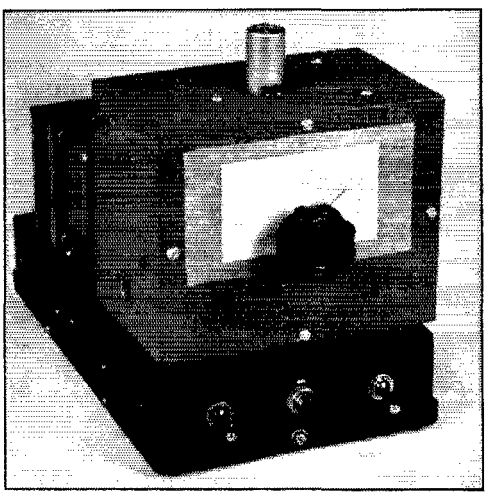
Tailoring the Series-Tuned VFO to Your Needs

A Stable Unit of Rugged Mechanical Construction

BY G. L. COUNTRYMAN,* W1RBK, W3HH

ONE of the most publicized developments for amateur use in recent months is the so-called Clapp circuit for variable-frequency oscillators. Most of the published material has stressed the desirable features of this series-tuned oscillator, including its excellent stability, ease of keying, etc., but little has been printed about its shortcomings. As a result, many amateurs have constructed a VFO using this circuit and have been greatly disappointed in the results.

Mechanical stability of a series-tuned oscillator circuit is of the utmost importance. All components must be rigidly mounted — all leads, including the filament lead to the tube, must be installed so that there cannot be the slightest movement of them with respect to other leads or components. This means heavy bus wire between components instead of hook-up wire, and cabled leads to the power supply and key terminal. It is rather important that all grounds from the VFO itself be brought to one tie point. The tuning condenser used must have no axial displacement under pressure of the tuning knob or dial. This requires double-bearing condensers or ruggedly-constructed single-bearing midgets with heavy double-spaced plates. Lack of knowledge of the mechanical requirements of the Clapp oscillator has been responsible for most of the difficulties encountered.



The completed VFO. The bandset condenser may be adjusted through the hole in the side of the oscillator compartment.

The unit to be described has proved to be satisfactory in every respect. As will be noted from the photographs and the wiring diagram of Fig. 1, the unit consists of a 6C4 series-tuned Clapp oscillator mounted in a 4 × 5 × 6-inch utility box and followed by two untuned 6F6 isolation stages. For most applications one isolation stage will suffice, but an attempt has been made to construct a VFO as mechanically and electrically perfect as possible and one that will be foolproof under all conditions of operation.

Before proceeding with the description of the VFO it may be stated that the output at the fundamental (which is in the 3500-kc. range) is sufficient to drive any crystal or multiplier stage in the transmitter with input requirements similar to an 807. A coaxial line makes the connection easy. At W1RBK this VFO drives another unit consisting of a broadband 6AG7 followed by an 807 which, in turn, drives the final amplifier at something under 400 watts input to push-pull triodes.

Construction

An aluminum chassis measuring 6 by 10 by 2 inches is used for the base. The corners are welded and an aluminum tray one-half inch deep completes the shielding underneath the unit. The filter choke, L_2, and resistor, R_7, are mounted underneath the chassis. Along the front of the base chassis are, left to right, the a.c. line switch, S_1, the pilot light and a d.p.s.t. switch, S_2. This switch is used to set the VFO quickly on a signal picked up by the receiver without putting the transmitter on the air. By using this switch, the VFO note picked up in the receiver is of sufficient volume for quick identification, yet does not blast your eardrums nor interfere with the reception of the station whose CQ you want to answer on frequency. In case a send-receive relay or a separate send-receive switch is not used, this switch may also be used to turn on the VFO when it is desired to transmit, provided a stage following the

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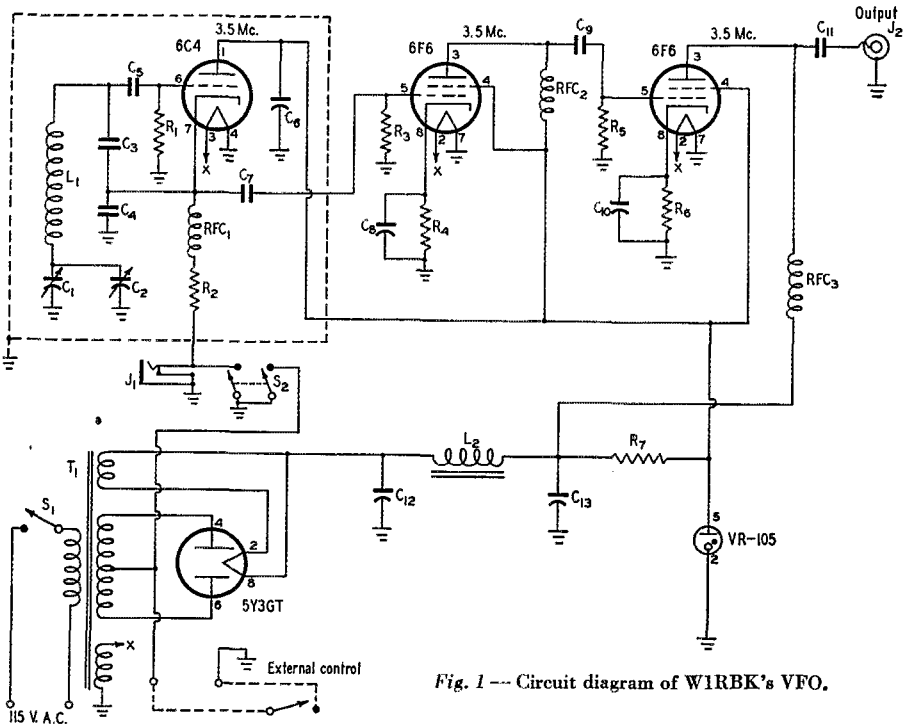


Fig. 1 — Circuit diagram of W1RBK's VFO.

C_1 — 10-plate midget (see text).
C_2 — 37-plate midget (see text).
C_3 — 0.001-μfd. silver mica.
C_4 — 600-μμfd. silver mica.
C_5 — 100-μμfd. silver mica.
C_6, C_8, C_{10} — 0.01-μfd. paper.
C_7 — 180-μμfd. neg. temp. coef. mica (Erie).
C_9, C_{11} — 100-μμfd. mica.
C_{12}, C_{13} — 20-μfd. 350-volt electrolytic.
R_1, R_5 — 0.1 megohm, ½ watt.
R_2 — 820 ohms, ½ watt.
R_3 — 47,000 ohms, ½ watt.
R_4, R_6 — 220 ohms, ½ watt.
R_7 — 10,000 ohms, 5 watts, adjustable.
L_1 — 27 turns No. 18, spaced diameter of wire on 1⅜-inch diam. ribbed ceramic form (1⅝ inches long).
L_2 — 16-hy. 50-ma. filter choke (Stancor C1003).
J_1 — Closed-circuit jack.
J_2 — Coaxial jack.
RFC_1, RFC_3 — 2.5-mh. r.f. choke.
RFC_2 — 25-mh. r.f. choke.
S_1 — S.p.s.t. toggle switch.
S_2 — D.p.s.t. toggle switch.
T_1 — 275-0-275 volts, 50 ma.; 5 volts, 2 amp.; 6.3 volts, 2.5 amp. (Thordarson T22R30).

VFO is keyed. It will be noted from the wiring diagram that the switch turns on the high voltage to the oscillator and the two untuned stages, and also completes the cathode circuit of the oscillator. After the VFO has been set to frequency, it may be turned on and off along with the rest of the transmitter by means of a common switch connected to the "External control" terminals.

On the right side of the base chassis is a closed-circuit jack for the lead from the key. If the VFO is keyed, the key plug is inserted in this jack. If a following stage is keyed, the key plug is inserted in the following stage and the closed-circuit jack completes the VFO circuit as soon as the high voltage is turned on either by S_2 or by a separate relay or external switch. Behind this jack is a coaxial jack for the r.f. output to the following stage.

The chassis rear contains a Millen four-terminal strip, two terminals for the a.c. line, and two for the send-receive relay or external switch if used.

On top of the chassis, behind the VFO box are, left to right, the two 6F6 isolation tubes and the dual electrolytic plug-in filter condenser, an inexpensive surplus item. The small power transformer is mounted at the left rear, with the 5Y3GT rectifier tube and the VR-105 regulator tube to the right.

Wiring of the power supply and isolation stages is easy following the circuit diagram and should present no difficulties. Cathode-resistor bias is used on both 6F6 tubes to hold down the current under key-up conditions when keying the oscillator. No key-thump filter of any kind has been found necessary, even the 0.01-μfd. condenser usually shown across the key in most Clapp-circuit diagrams being unnecessary. No clicks can be heard in a small a.c.-d.c. broadcast receiver in the same room and reports on the keying indi-

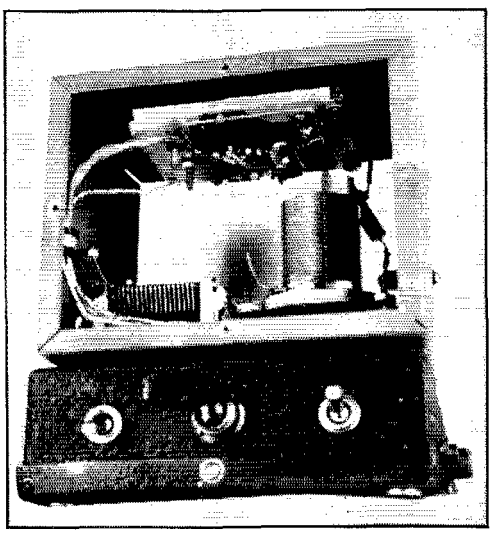
cate that it is excellent, with a soft break and just solid enough on the make to be easily copied at a distance. The oscillator cathode resistor contributes to the excellent keying characteristics.

Oscillator Unit

The VFO itself is mounted within the utility box which, in turn, is mounted with the 4 × 6-inch side down on the base chassis on rubber grommets to absorb mechanical vibration. (Felt or rubber feet should also be placed on the bottom tray of the base chassis as additional insurance against vibration and to avoid scratching the desk or table top.)

Careful placement of the parts within the box is necessary. To maintain the high Q of the coil, the coil is mounted vertically at the right-hand side of the box so that there is a clear space of more than half the diameter of the coil between any part of the coil and the shield. Rigid mounting of this coil is of the utmost importance. Various types of manufactured plastic-strip air-wound coils were tried. In every case they were unsatisfactory. The only acceptable coil of the ten or twelve tested was one wound on a ribbed ceramic form which prevents even the slightest movement or vibration of any part of the coil itself.

To the left of the coil, at the bottom of the box, is mounted the bandset condenser, C_2, with a small opening drilled at the side of the box for screwdriver adjustment. The particular condenser used was picked up at surplus and is an exceptionally rigid double-bearing midget with 37 heavy plates. The maximum capacitance is about 175 $\mu\mu$fd. When mounting the coil and this bandset condenser be sure to allow enough room



Interior view of the oscillator box, showing the placement of the bandset condenser, the oscillator coil and the terminal board holding the oscillator-tube socket.

for the tuning condenser, C_1, which is mounted directly on the front panel. The front panel is the normal top of the utility box. Both top and bottom of the box should be removed for ease of mounting the components within.

In an effort to obtain the maximum mechanical rigidity all VFO components, except the coil and the two variable condensers, are mounted on a ¼-inch polystyrene sheet 3¼ by 3 inches and used in terminal-board fashion. Small copper

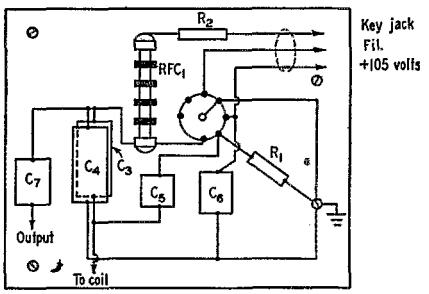


Fig. 2 — Sketch showing layout of components on polystyrene terminal board inside VFO box.

escutcheon brads are inserted in the sheet at each end of the fixed condensers, resistors and the r.f. choke to secure these components, and the wiring connections are soldered to these brads. The miniature socket for the 6C4 tube is mounted in the center of the sheet and a hole is drilled in the top of the VFO box to permit the 6C4 tube and its shield to project above. Your 1¼-inch socket punch will do the job nicely. With the tube outside the box and the hole in the top for ventilation, all VFO components in the interior of the box will remain close to room temperature even during prolonged periods of operation.

Fig. 2 shows the approximate placement of the oscillator parts on the polystyrene sheet. The output lead and the cabled key, filament and high-voltage leads all extend through the bottom of the box and are connected underneath the base chassis. All leads running to the base chassis must be secured with small cable clamps at enough points to eliminate any possible movement either with respect to each other or to any components, and these cable clamps should also be used underneath the base chassis up to the point where the leads connect to the power supply, the first isolation tube or the key jack.

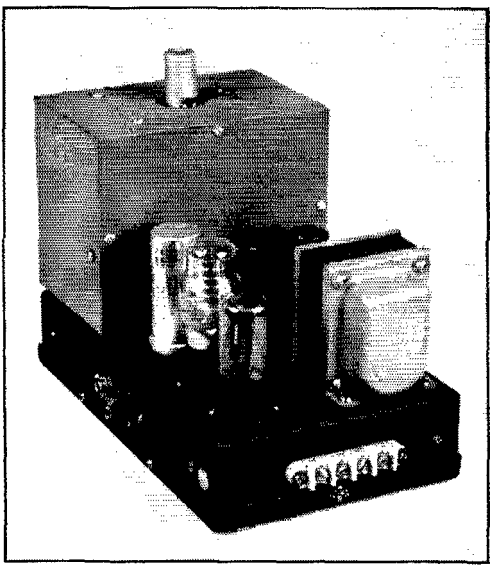
Condensers C_3 and C_4 are mounted one on top of the other to conserve space and make wiring short. All grounds are brought to one machine-screw terminal, as will be noted from Fig. 2. When all components are mounted on the sheet, it is then secured underneath the top of the VFO box so that the 6C4 tube will protrude through the opening in the box. Pillar spacers ½ inch long are utilized to space the sheet below the top of the box. It should be unnecessary to add that

every machine screw used anywhere in the assembly should be lock-washered.

Necessary connections between the coil and C_2 should be made, and then a heavy bus wire is run from the C_3 tie point on the polystyrene sheet to the coil.

Frequency Range

Now for C_1, the tuning condenser, and tailoring the VFO to your own specific requirements. The selection of a condenser for C_1 should be made — considering the way the builder plans to use the VFO. Here at W1RBK practically all operation is between 7000 and 7140 kc., with a rare excursion into the 20-meter c.w. band. Within these limits



Rear view of W1RBK's VFO, showing the two buffer-amplifier tubes and the power-supply components. Other amplifier and power-supply units are located under the base chassis.

no tuning adjustments of the buffer, doubler, final amplifier or antenna tuning are necessary and it is easy to QSY. Accordingly, a condenser with just enough capacitance to cover a fundamental range from 3500 to 3570 kc. was selected. If occasional operation elsewhere in a band is desired, the capacitance of the bandset condenser C_2 can be changed by screwdriver adjustment and the advantages of wide bandspread tuning retained. The tuning condenser is a husky double-spaced midget with a maximum capacitance of about 15 $\mu\mu$fd. A 50-$\mu\mu$fd. Hammarlund double-bearing midget condenser with the two outside rotor plates removed will cover from 7000 to 7360 kc. (fundamental 3500 to 3680 kc.) while a similar 80-$\mu\mu$fd. midget will cover the 80-meter band with enough overlap to take care of 11-meter operation. It cannot be overemphasized that this condenser must be rugged. The usual trimmer is unsatisfactory but there are many heavy-duty double-bearing midgets on the surplus market of acceptably-rigid construction. The condenser should be mounted directly on the panel by a shaft mounting nut pulled up tight.

Before the panel is put in place, a heavy bus wire, bent approximately to connect the coil to the condenser, should be soldered to the stator-plate terminal. It is recommended that the metal screws supplied with the utility box be discarded and that the front panel be mounted with machine screws and, of course, with lock washers. Now, working with the back cover off, solder the bus wire from the tuning condenser to the coil. This particular lead (and the one to the bandset condenser) is "hot" and care must be exercised to get a good hot-soldered connection.

The box is now mounted on the base chassis with the four leads, output, filament, key, and positive high voltage going through a rubber grommet and the proper connections made underneath.

Before replacing the rear cover on the VFO box put a knob with a pointer on the condenser shaft, adjusted so that the pointer is horizontal to the left with the tuning condenser at minimum capacitance (plates all the way out). Tighten the knob on the shaft securely. If available, use a knob equipped with two setscrews. Reference to the photograph will show that no commercial dial is used — a saving of $3.00 to $6.00 which will appeal to the average ham. The dial scale is made by drawing two semicircles in pencil on a piece of cardboard (the back of a QSL card will do nicely). Care should be taken to orient this scale properly on the panel. It is then secured at the top, bottom and both sides with ordinary masking tape.

Adjustment

Assuming that the rig has been fired up and tests OK, the next step is calibration. Determine first of all what minimum frequency you want and using a heterodyne frequency meter, or your receiver if it is accurately calibrated, set the knob pointer to the right, turn on the meter or receiver and by using a screwdriver carefully adjust C_2 through the hole at the left of the VFO box for zero beat on that frequency. Here at W1RBK there is a marked aversion to the little pink billet-doux from the FCC, so 7001 is established as the minimum frequency. Even if the tuning knob is rotated past that point the frequency will start to increase, and under no possible conditions of temperature, humidity, voltage change or what-have-you could the frequency get outside the low-frequency end of the band.

Using the same meter or receiver, calibrations should now be made until the knob pointer is horizontal to the right. It is best, when calibrat-

(Continued on page 100)

• Technical Topics —

Stop-and-Go Circuits

THE double-resonance effect observed in tuning the plate traps used to suppress harmonics for TVI reduction [1] deserves some thought because it has useful applications. Actually, we have been applying it in communication day after day for many years, in one specialized case, but specific attention is seldom called to it.

The general properties of these "stop-and-go" circuits are illustrated by Fig. 1. If a coil and condenser are inserted between a receiving device and a source of variable-frequency energy as in Fig. 1A, the relative amplitude of the output voltage will follow a curve similar to that given at the right. (The shape and height of the curve will depend on various factors that can be neglected here, in the interests of confining the discussion to the main issue.) This is the familiar series-resonance curve. The output voltage will be largest at the frequency at which L and C form a resonant combination — that is, the frequency at which their reactances are equal.

If the same coil and condenser are connected in parallel, as in B, they are still resonant at the same frequency, but that frequency now is the one at which the output voltage is minimum. The circuit is now parallel-resonant — or "antiresonant," to introduce a term frequently used in this connection — and the output voltage variation is just the opposite of the series-resonance case. The parallel-resonant circuit used as shown is a "wavetrap."

Combining both circuits, as in C, leads to an interesting type of output curve. Let us say that L and C_1 together are resonant at a particular frequency which we will call the resonant frequency of the circuit. If we now connect a second condenser, C_2, across LC_1 a parallel circuit is formed. This will have an antiresonant frequency determined by L, C_1 and C_2 in series. Since C_1 and C_2 in series have less capacitance than either by itself, the antiresonant frequency is obviously higher than the resonant frequency, which is determined by L and C_1 alone. This type of circuit will have a "go" frequency determined by LC_1 and a "stop" frequency determined by LC_1C_2.

The output curve, shown at the right, is essentially the series-resonance curve with a notch at the antiresonant frequency. The position of the notch can be changed by varying C_2, within practical limits determined by the circuit constants. It can be made to appear below, rather than above, the resonant frequency by substituting an inductance for C_2, since an inductance at this point will tune the circuit as a whole to a lower antiresonant frequency.

[1] "Re Harmonic Suppression in Class C Amplifiers," *QST*, April, 1949, p. 34.

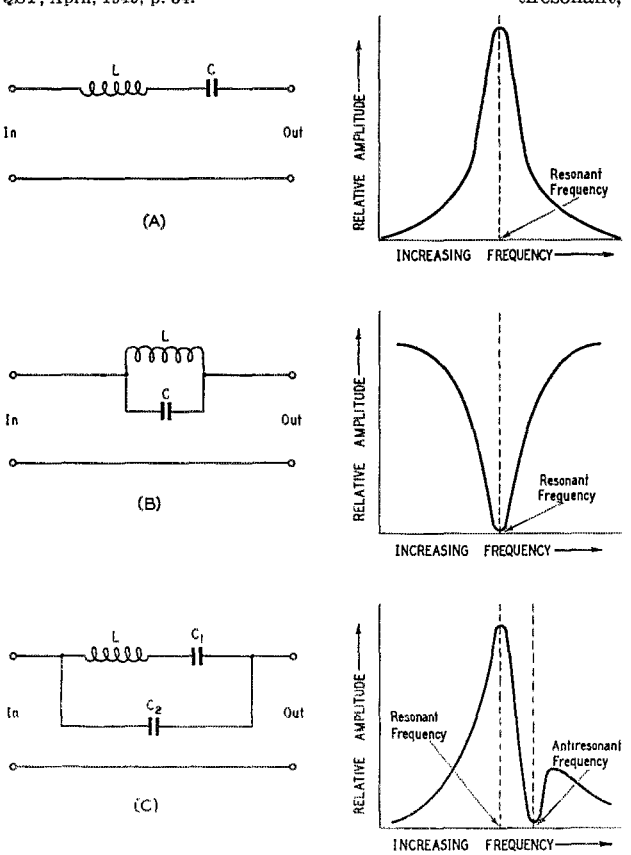


Fig. 1 — Behavior of series- and parallel-resonant circuits inserted in a line, and a combination of the two.

Probably at this point many readers will have recognized the circuit of Fig. 1C as being a very much simplified equivalent of the familiar crystal filter. LC_1 represents (without the equivalent resistance) the electrical constants of the crystal itself, while C_2 represents the holder capacitance. In the practical filter the effect of C_2 is wholly or partially balanced out and even made "negative" — that is, inductive — by the phasing condenser. Varying the phasing condenser varies the *antiresonant* frequency of the circuit, and thus moves the rejection notch around, without affecting the resonant frequency.

In the crystal-filter case the resonant and antiresonant frequencies can be quite close together (high-Q circuits are a requisite for this to be so), a situation that is quite advantageous in the application for which the crystal filter is designed. However, there is no fundamental reason why the circuits cannot be as far apart as we like. A 2-to-1 ratio was used by Pichitino in the novel two-band beam antenna described in *QST* some time ago.[2]

Another form of the stop-and-go circuit makes use of two parallel resonances. This circuit, shown in Fig. 2, is the actual equivalent of a harmonic

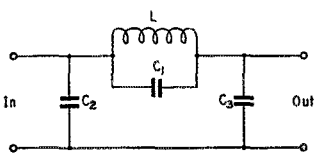


Fig. 2 — A circuit with two parallel-resonant points, one to pass a desired frequency and one to stop an undesired frequency.

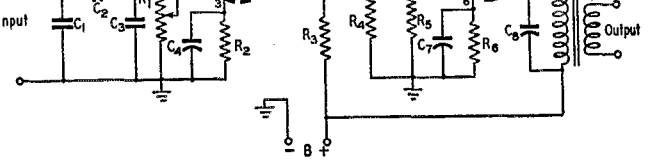
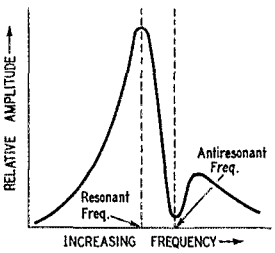


Fig. 3 — Practical circuit of a selective audio amplifier. The antiresonant frequency can be adjusted by changing the value of C_1. The resonant frequency depends on the total capacitance of C_1, C_2 and C_3 connected as shown. With the constants given below the antiresonant frequency is 1250 cycles and the resonant frequency is 900 cycles.

C_1 — 0.003 μfd.
C_2 — 0.00267 μfd. (2200 and 470 in parallel).
C_3 — 0.002 μfd.
C_4, C_7 — 25-μfd. electrolytic, 25 volts.
C_5, C_6 — 0.001 μfd.
C_8 — 0.03 μfd.
R_1 — 3-megohm volume control.
R_2 — 2000 ohms, ½ watt.
R_3 — 47,000 ohms, 1 watt.
R_4, R_5 — 0.82 megohm, ½ watt.
R_6 — 1000 ohms, ½ watt.
L_1 — Thordarson T12C27 or equivalent. Effective inductance, as measured by determining capacitance required for antiresonance, is approximately 6 henrys.
S_1 — S.p.s.t.
T_1 — Small 'speaker output transformer.

NOTE: T_1 is the ordinary type for working into 6- to 12-ohm load. With a 250-volt plate supply the undistorted output of the 6SN7 section is about 100 milliwatts, ample for moderate volume from a small 'speaker. Low-impedance 'phones connected across the transformer secondary will have more than adequate volume. For high-impedance 'phones an appropriate transformer should be used, or the 'phones may be connected directly in the plate circuit.

trap installed in an amplifier plate circuit. LC_1 is a combination resonant to some particular frequency — the antiresonant frequency — in the same way as the simple parallel circuit of Fig. 1B. It will try to prevent that frequency from reaching the output terminals. On the other hand, C_1 is shunted by an additional capacitance formed by C_2 and C_3 in series. This total combination resonates at some lower frequency which we will call the resonant frequency. At the resonant frequency a rather large current circulates through C_2 and C_3, and if the circuit constants are chosen properly a relatively large voltage will develop across C_3. The over-all curve, at the right in Fig. 2, resembles the curve of Fig. 1C but represents the effect of a parallel-resonant circuit connected across the line (which has the same sort of curve as a series-resonant circuit in series with the line, Fig. 1A), with a notch caused by the antiresonant circuit LC_1. (Those familiar with filters will recognize the resemblance to an m-derived pi-section low-pass filter; the operation is in many respects similar, but no special effort is made here to design for a definite impedance.)



The circuit of Fig. 2 can be used to make a very desirable type of audio filter for c.w. reception. It seems to be common experience, perhaps a result of the frequency-response characteristics of ordinary headsets, that the frequency region just above the tone we like for regular copying gives more QRM trouble than the region immediately below. To combat this an audio filter should have a rather sharp cut-off just above the desired tone. A more sloping curve can be tolerated below. Not only tolerated, as a matter of fact; some remnant of low-frequency response adds "body" to the sound of the receiver and an operator can listen for long periods without feeling that holes are being drilled in his

(*Continued on page 100*)

[2] Pichitino, "A New Principle in Two-Band Rotary-Beam Design," *QST*, October, 1948.

The purpose of this column is to report schedules and operating times of active single-sideband stations, describe operating experiences and sometimes the gear in use, and possibly discuss some of the practical operating problems and suggested solutions. Contributions from active single-sideband stations will be welcomed.

WHILE we don't advance it as a *raison d'être* for the stuff, it should be noted that **W4OLL** cleared up his TVI when he switched to single sideband. "Shy" lives in a 500-apartment housing development where the regulations say "no outdoor antennas," but he is on the air by virtue of over 100 feet of buried coax line and a near-by patch of woods. All of the 50 or 75 TV sets in the area use indoor antennas, and 300 watts on 3.9-Mc. 'phone was making no TV owner happy. But W4OLL runs 500 watts peak power to the 100TH on single sideband and, with no other tricks, there is no TVI and Shy operates when he wants to. There wasn't even any need to filter leads or doctor any of the TV sets, and the TVI complaints have now switched from W4OLL to the local police f.m. rig! Naturally it is no special characteristic of single sideband that removed the interference, but the fact that Shy switched over to linear operation of his output amplifier, with a consequent reduction of harmonics. Single sideband is the real way to get the most out of a linear amplifier.

In another QRM test, **W3ASW** and **W4OLL** on the high end of 75 were duplexing with **W2VVC** and **W2KUJ**, respectively, who were near the low end. ASW and OLL were within 100 cycles of each other, and VVC and KUJ were 500 cycles apart, but they all managed. It was easy at 500-cycle separation but a little tough with the 100-cycle spacing. Try that on your old-fashioned a.m. set, Mister!

The boys "down under" are pushing single sideband in a big way. F. M. Nolan, **VK4FN**, built a phasing job using four screen-modulated 807s that run about 80 watts peak input. Since 4FN is the station manager at **VK4WI**, the WIA Queensland Division station, he uses the rig on the Sunday morning broadcasts of WIA news, on 7 Mc. This gives the VK listeners a chance to compare the stuff with the simultaneous a.m. broadcasts and an opportunity to learn the receiving techniques. No attempts at DX have been made so far, but the rig will be on 14 Mc. soon from VK4FN.

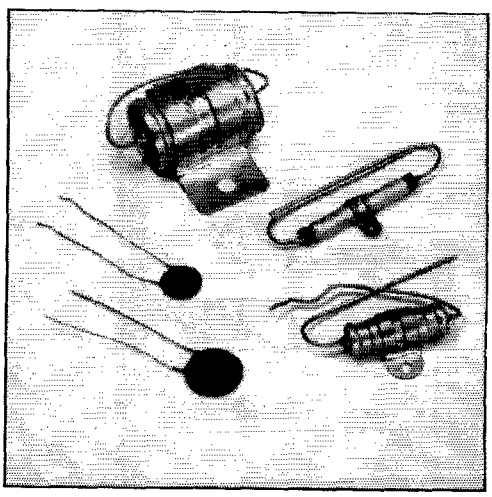
(Continued on page 102)

New Apparatus

New By-Passes for TVI Reduction

Readers who have been following the TVI-reduction articles in *QST* will remember W2VLQ's favorable comments in the February issue on the effectiveness of Sprague Hypass condensers as v.h.f. by-passes. At that time no high-voltage units of this type were available, but subsequent conferences between the manufacturer and ARRL Hq. have led to the development of a new line of high-voltage Hypass condensers. They are being marketed by the Sprague Products Company, North Adams, Mass.

The complete line as announced includes two capacitances, 0.005 and 0.01 μfd., at each of three working voltages, 600, 1000, and 2500 d.c. A



0.002-μfd. unit is also available with a 5000-volt rating. All high-voltage types have wire leads. For filament and power-line by-passing the recommended size is 0.1 μfd., available in 250-volt a.c. rating with screw terminals. The latter type will carry 20 amperes.

Three typical units are shown in the accompanying photograph. The construction of these condensers is such that they simulate a lossy transmission line and thereby introduce considerably more attenuation of v.h.f. currents than a simple by-pass across a circuit. The tubular metal case connects to ground or chassis and the lead being by-passed goes in one of the two end terminals and out the other. The largest unit shown has a capacitance of 0.01 μfd. and is rated at 2500 w.v.d.c. The unit of intermediate size is 0.005 μfd. at 1000, and the smallest is 0.005 at 600.

The small disc condensers (Sprague "disc ceramics") also shown are not exactly new, but have so far had little amateur use. They are particu-

(Continued on page 104)

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

How:

We haven't blown our horn much of late pertinent to the DX Hog situation. The type of pigishness whereby W/VEs beat each other over the head by fair means or foul in efforts to raise respective country totals has been, it is true, somewhat on the downgrade.

But another phase of the subject is rapidly becoming intolerable and is antagonizing dozens of really rare DX station operators. In fact, mail is arriving almost daily from such widespread points as FK8, EA8, ZD2, VR, VQ, MP4, et al, some complete with blacklists and all written in the same tenor:

"Why do so many Ws, merely because they hear us on the air, consider it their exclusive prerogative to force us into QSO regardless of the fact that we may be very QRL?"

One isolated ZD2 has now closed his log to Ws and for reasons not unjustifiable. On his attempted schedules with England certain hollow-headed Ws have repeatedly ruined his contacts by intermittently calling him for an hour or more. We're not sure what causes such individuals to bang away stupidly at the key like that, but we've all probably heard similar goings on. Could be that the characters have gotten into such a country-hungry rut that new prefixes in their 'phones strike them as just so many delightful squeaks produced by some being at the other end without a mind or objectives of his own.

Contrary to some beliefs, all DX stations are not on the air for the sole purpose of gratifying DXCC appetites. They *do* have a right to extraneous pursuits despite the fact that we would all like to have them in our logs but quickly.

Okay, Jeeves, toss a glass of water on this mill and feed us the pitch. . . .

What:

PY7WS was finally caught up with by W4BRB for Gene's No. 62 on *eighty*. Other items in the W4BRB log are 'phone contacts with **TG9RB** (3825) and voice-c.w. crossbanders with G3AAM and VP5BD . . . . W4JQ has been working **ZL3LE** (3940) on 'phone around 6 A.M. local time . . . . **LU7AZ** (3525) and **PY7WS** (3520) were secured by W2AIS and we hear the VE1 gang knocking off Europeans on occasions. We expect a large increase in 3.5-Mc. reports from this time on as Northern Latitude atmospherics are slacking off.

The same goes for *forty* but some of the boys consider this band good enough as it is. W2AIS worked over 30 countries in the past month or so which include **PJ5ZZ** (7060) who QSLs with dispatch, incidentally, **VP5BD** (7295) still in the Caymans, UB5BU, OX3MG, CT3AB, EK4AO, HA4SA and VP6SJ. Pat passed out oodles of Asian contacts on this band from ZC8PM but is having tough luck locating same for himself . . . . W7MGO hooked **KV4AA** (7295) and TF3MB while W7MQY picked up **PK2AB** (7037) and **ZS5YF** (7045) with the latter on the long path at 6 A.M. . . . . The band has been less noisy down under and here are a few items obtained by VK4RA during the Australian winter months: FK8s AB and AC, JA2s BQ and CK, KH6TY/KJ6, KM6AK, KW6s AK and AL, KX6BE, VK9NR, VR2s AS and BD, UAs 9BC, 9FJ and ØFK. Reg's rig runs 30 watts, VFO, and he uses a 2-tube blooper inhaler . . . . W9NN folded up on 40 during the hot months in favor of working 28-Mc. South Americans with his mobile 'phone paraphernalia. By now he should be rarin' to go on his favorite band once more . . . . When not busy pushing traffic in BPL proportions and skedding W2OXE/MM, W1QMJ collects contacts like **HZ1KE** (7020), **VP4TAQ** (7005) and **ZD3D** (7065 t5) for a 7-Mc. total of 70 countries. Joe also worked G2HKU on the Isle of Sheppey but, unfortunately, that's just another part of Kent. VK9GW, VP1AA and EA6AF (Balearics) were heard . . . . W2ETT parted the static for a bunch of DLs and SMs and W6YZP's snooping paid off with **JA2AE** (7050), **UAØFK** (7042), **PY2AQ** (7040) and **VK9GW** (7030). Jack is still stalking **KH6TY/KJ6** (7041), **KP6AE** (7053), **VP4TE** (7040) and **FO8AD** (7030) . . . . The grapevine is vibrating with late news of one **FG8AD** on 7060 kc.

Twenty festivities received a stimulant as the Africans began to knock off W/VE ears on both the long and short paths at the end of the heat season. W6JWL got the busted beam patched up for **XZ2FK** (14,092), **GD3UB** (14,090), **VK1VU** (14,065), **VS7AD** (14,035), **SVØWH** (14,090), **ZD4AM** (14,085), **FE8AB** (14,030), and **VP1AA** (14,120) . . . . W6ZZ is relaxing after receipt of his DXCC souvenir but managed **DU1FIT** (14,043), **VK9NR** (14,013), **JA2AB** (14,035) and **OX3MG** (14,033) . . . . W6EAY trifled with **VQ8AY** (14,050 t8c), **ZD4AU** (14,080) and **EA8BC** (14,130 t7). After working 138 countries, Eric finally worked Nevada for WAS! . . . . At WØPVS we find **UC2CB** (14,080), **UF6AC** (14,095), **EK4AO** (14,004),

* DX Editor, *QST*. Please mail reports of DX activity to W9BRD's home QTH: 1517 Fargo Ave., Chicago 26, Ill.

I1NU/Trieste (14,055), **FO8AC** (14,070), **DU1WP** (14,085), **KR6AZ** (14,020), **CT3AB** (14,090), **OQ5RA** (14,110), **PK4DA** (14,018) and **VS1DA** (14,040) while WØGHN adds **TA3GVU** (14,098), **FA9UO** (14,043) and **TF3AR** (14,012) . . . . An 8JK beam is much liked by WØVDC because of **YS1RA** (14,060), **DU1NL** (14,030), **PK4KS** (14,065) and several JA2s . . . . W2WZ's 3-element beam does almost as well minus half an element: **VR5PL** (14,088), **VS1BQ** (14,078), **VS2CE** (14,082), **VS7RA** (14,064), **VS9AL** (14,068), **VK1RA** (14,026), **MD4GC** (14,016), **MS4UU** (14,088), **ST2RF** (14,032), **DU1HR** (14,082), **W6CRE/KC6** (14,011), **PZ1QM** (14,020), **IS1AFM** (14,035), **YR5KAA** (14,074), **UF6PA** (14,012), **HS1SS** (14,062), **CT3AA** (14,122), **FK8AB** (14,004), a mess of JA2s and a long-path contact with **ZC1AR** (14,056) . . . . W2QHH tracked down **LX1QF** (14,079–053), **LX1RB** (14,102) and **GD3FOC** (14,018). Howy finds that the **EA8AO** on around 14,005 kc. operates in Madrid after recently leaving the Canaries . . . . "Late to bed and early to rise makes the country total of reasonable size." There's truth to the parody if W3OCU's list is any indication: **FK8AC** (14,005), **KB6AJ** (14,095), **KG6GC/KC6** in the Palaus (14,025), **KM6AK** (14,090), **KP6AH** (14,000), **MD2GO** (14,045), **VK1FE** (14,065), **VS7CL** (14,067), **VS7RF** (14,069), **SVØAK** (14,013), **HZ1AU** (14,071), **HZ1TD** (14,060), **VR4AA** (14,085), **ZK2AA** (14,125), **DU1AP** (14,045), **DU1AW** (14,053), **TA3FAS** (14,085), **UO5KAA** (14,060) and **EA6EG** (14,145) whose QSLs, by the way, are reported to be coming through with promptitude . . . . W5LVD sprung the trap on **CR4AD** (14,015) among others and his experiences with the grapevine would make it seem that neither CR1Øs AA, FU or VR3AB are located according to prefix . . . . ZS5BS mentions the activities of **ZD6AH** (14,080) who is ex-VQ2DH as well as the appearance of a new ZS7 and ZS9 . . . . At W2UNR's behest, 4X4CJ (ex-ZC6AA) writes of his successful use of only 6 watts input to a 6V6. In a few short months he's worked some 50 countries while receiving with a one-tube (6C8G) blooper. The skywire is a 33-foot single-wire-fed job . . . . Active for the first time since the war, W6ALQ scared up VSs 1CW, 6AC and 6BH, VR2AS, VK9WL, ZK1AA, PK6NQ and UAØFB all close to 14,010 kc., and W4MR tried 4X4CL, OQ5GD, HZ1LD, UF6AC and numerous others while slithering down into the third or fourth layer in pursuit of unwary UM8s . . . . Consolidating the many reports anent the TWA (Tibet Workers of America) activities, the following stations were among the fortunates to QSO either AC4NC, AC4RF or AC4YN: W2SAI (A3), W2s IOP, ITD, PEO; W3s BES (A3), CPV, GHD, GYV, IXN, JLJ, KT; W6s EAY, JWL; WØSQO; ZS2CR. W3EVW also made the snatch, **AC4YN** (14,150). 4YN has been using 'phone on this same frequency and **AC4RF** works his voice in the U. S. 'phone band on 14,255 kc. **AC4NC's** c.w. is usually found near 14,120 kc.

Phil Caldera, W6IKQ, left, was the guest of ARI amateurs operating portable in San Marino during the first week of July. He's shown in the congenial company of Marino Maceli, I1SN (center), and Lugi Franceschi, I1ALU, who, with I1LT, worked over 300 stations, 98 per cent being Ws. I1SN is planning a return stand in M1-land later this year, for the benefit of those who couldn't break through the pile-up.

Another good 'phone catch is ZS6PE on Marion Island (14,350), raised by ZS2CR . . . . W5JUF swapped audio with KB6AJ, KX6AF, W6ATB/KC6 in the Palaus, VRs 2BJ, 2BM and 4AC, PKs 4KS, 6CS and 6NQ, 4X4s AA and BC, TA3FAS, IS1AYN, F9QU/FM8, PJ5KO, CR9AG, ZE2s JG and KI over the long path and ZP2AC. As an afterthought, John also adds **VQ2PL** (14,355) and a YL, **CR7AI** (14,195) . . . . OQ5CF, ZS3F, ZM6AF, FQ8SN, KM6AK, VP7s, NL and NU, HL1s AE and BJ, EA8CO, FA8s CF and WH, SVØWF, ZC6UN, EK1MD, VK9KT in Papua, MD2AC, MF2s AA and AC, CP1AM, VR3C, FM8AA, ZP8FA, VP3HAG, DU1s AK, FIT and HR and VR2BG were welcomed at W4BA. Ed now has accumulated over 100 'phone confirmations, too.

The m.u.f. has still been giving *ten* the go-by; in general, that is. An 8-element rotary presented W2ZVS with a lengthy list of 'phone contacts: EK1WX, EL6A, OQ5s DZ, KL and VJ, VP6s JC and KM, VP3s CW and HL, VP4TAY, ZLs 1KG, 2BN and 2WS and all sorts of South and Central Americans . . . . W3OCU found the band worth while for VP2GG, VP3HL, VQ4RF, PJ5KO, ZP5BL, YN1HB, HH1FB, HP2RO, EL2A, OQ5LL, YS2AG and CT1SX, all orally . . . . LU8BF managed **ZE2JL** (28,230), **CT1CW** (28,420), **EK1AR** (28,485) and **HB9IE** (28,020) via the mike and W5HBM ran across **KG6SD** (28,550) and **ZK1BA** (28,542) . . . . As attested by OA4B and OA4DT, OA4DI celebrated his 100th contact on 28-Mc. 'phone with KZ5FL. These contacts occurred over a period of less than a year and demonstrate the consistency of the higher frequencies in the midlatitudes.

Where:

All of the catches in the listing below are not necessarily of breathtaking rarity. But what may be common stuff for one is often juice for the next fellow. So we try to present previously unpublished QTHs of any stations outside of W/VE in the hope that many a shack wall will benefit.

CR4AD	Box 16, Praia, Cape Verde Islands
CX3AF	Libertad 2484, Montevideo, Uruguay
EA6EG	Box 324, Palma, Majorca, Balearic Islands
EA8FF	(via URE)
EA8RM	Box 8, Laguna Tenerife, Canary Islands
EK1FM	34 Goya St., Tangiers
EK1WX	(via TARC)
EK4AO	34 Goya St., Tangiers
EP5B	Box 121, Teheran, Iran
HK1AQ	415a Lope de Vega, Barranquilla, Colombia
HK3BK	(via HK3DL)
HK3GA	(via LCRA)
HK4ARP	(to HK4AR)
HK4JB	Box 650, Medellín, Colombia
HP1CF	B. J. Cieshefski, Apartado 1098, Panama City, Panama
HP1FJ	Box 826, Panama City, Panama
HP1RR	Box 1672, Balboa, Panama Canal Zone
HP1WM	Box 2041, Panama City, Panama
HZ1KE	(via RSGB)
HZ1TD	J. L. Koenreich, Trans-Arabian Pipeline Co., Beirut, Lebanon
HZ1VP	(to G2AVP)
ex-KG6ES	(to W5QIC)
KG6SD	(via KG6DI)
KP6AH	% CAA, Palmyra Island, Pacific
KZ5AC	(via CZARA)
KZ5LS	Box 223, Cocoli, Canal Zone
LU6CY	Wm. Lastra, Holmberg 2585, Capital Federal, Argentina

MD2GO	(via RSGB)
MS4UU	(via RSGB)
PY7QT	Box 2353, Rio de Janeiro, Brazil
ST2TC	Box 25, Malakal, Sudan
SVØAK	% British Naval Mission, British Troops in Athens, Greece
SVØUN	% UN Station, Med Hotel, Salonika, Greece
TA1AT	QSL via 822 N. Lexington Ave., Hastings, Nebr.
TI2TG	H. M. Gabbert, Apartado 1649, San José, Costa Rica
VP4CE	APO 869, % PM, Miami, Fla.
VP4CF	VP84 Navy Fleet P. O., % PM, New York City
VP4TBB	APO 867, % PM, Miami, Fla.
VP7NL	Edward Carey, Nassau, Bahamas
VQ2RF	(via RSGB)
VQ4AJ	Box 2474, Nairobi, Kenya
W6KZJ/KW6	(to home QTH)
W6OCQ/KW6	(to home QTH)
W6YKE/KW6	(to home QTH)
W7MEM/KL7	R. Paulsen, Fish & Wildlife Svc., APO 942N, 54th Airways, % PM, Seattle
W7NFT/KL7	U. S. Navy Communications Station, Adak, Alaska
ZA1B	Box 7, Tirana, Albania
ZK1BA	% Govt. Radio Station, Raratonga, Cook Islands
ZP8FA	(via RCP)

You are much obliged to W1s FWH, JGY, ODW, QIS; W2s ADP, CJX, HAZ, ZVS; W3OCU; W4s BPD, GXB, IYT; W5s DF, HBM; W6YZP; W9CFT; WØPVS; LU8BF; VO6EP.

Tidbits:

Another new prefix block to become effective is the French 3VA-3VZ allotment. Tunisian stations are now using 3V8 and FT4AB has drawn 3V8AB. We know it sounds weird but we'll just have to get used to it! W2QHH scored first with this info . _ . . _ . W2QHH, by the way, went to the trouble of securing 300 cards for YU7RO according to agreement but hasn't received logs from the fellow as yet. Anybody spot an old YU7RO log lying around loose perchance? . _ . _ . _ YK1AC feels badly about the lack of WØs in his QSO total. We'll bet the Zeroes aren't too happy about it, either. As stated upon the back of a W2BXA-received card, active Syrians now include YK1s AA, AB, AC, AD, AE and AH . _ . _ . _ W7GUV has been receiving some interesting pasteboards bound for one AC4AR but doesn't know beans about the guy and neither do we. The Wailing Wall line for expectants forms on the right . _ . _ . _ A few lines from W9AEH and W8SYC boil down to the fact that it cost FU8AA about one hundred smackers to catch up on the QSL situation. Cards had been on order from France for years and he finally had to have them printed in Sydney . . . . Furthermore, G3CKV would like contacts with other blind amateurs on 14-Mc. c.w. . . . . VP7NU told W8SYC that he intends to dig into the QSL difficulties being experienced with other VP7 stations to see if he can't get the ball rolling . _ . _ . _ We heard W6RBQ in there the other night calling EA6EG. Nice to hear you back on, Bill — stick to it! . _ . _ . _ . Some of the cards sent out to confirm I1LT/M1 QSOs bear the signature of the Captain-Regent of the Republic of San Marino. That's equivalent to President there so you may have two collector's items in one. Judging from a much-signed souvenir card we received from this ARI outing there were at least 40 active Italian amateurs present . _ . _ . _ W1IKE corrects a previous misimpression to state that only postwar contacts will be considered for the WAP (Worked All Pacific) certificate award. If this is a new one to you the deal will be reoutlined in a future "IARU News" section . _ . _ . _ . Two long letters from MD7s QRP and WE pretty well put the kibosh on possible legitimacy of ZC4AC or any other ZC4 of the period. The prefix is for civilian use and such a license has never been issued by the authorities there. Currently licensed MD7s include BL and TJ on 'phone and DA, RCS and WE who like c.w. Stations signing DC, GR and SP are to be expected on the air shortly. Some of the pirate calls the boys know nothing about: ZC4s AC, AF, AH and MD7s AF and RF . _ . _ . _ . There are quite a few VE8s on the air but W9AND will bet that there aren't many who are native to the locality. Wes discovered that Wally Koockerak of VE8SI makes himself quite at home at Coral Bay, Southampton Island, and literally, because he's an Eskimo . _ . _ . _ . W5MAD (ex-HL1BG) writes to say that an extensive loyalty check is required before one may operate an amateur station in Japan. After these formalities he expects to make extensive use of his future JA call . _ _ . _ W4JVJ hasn't been on 20 meters yet but he's on the verge of completing his

(Continued on page 104)

VK/ZL DX Contest, 1949

C.W. Periods:
1401 GCT Sept. 30th to 1359 Oct. 2nd
1401 GCT Oct. 14th to 1359 Oct. 16th

'Phone Periods:
1401 GCT Oct. 7th to 1359 GCT Oct. 9th
1401 GCT Oct. 21st to 1359 GCT Oct. 23rd

No Time Limits: One QSO per band per station per week end. Single-operator stations only. Entries may be either open (all-band) or single-band.

Serial Numbers: Each contestant assigns himself a 3-digit number, which must remain unaltered throughout the contest, for 'phone and c.w. The first part of the 6-digit exchange consists of the above serial. The second part of the exchange consists of 000 for the first QSO and for subsequent contacts will be the *first* three numbers of the station of the previous QSO.

Scoring: 3 points per complete exchange; otherwise no points. Band multiplier is number of VK/ZL districts worked. Add band multipliers for total multiplier. Total points times total multiplier gives final score.

Logs: Date, GCT, band, call, sent NR, received NR, points claimed, and the new VK/ZL district must be shown in that order in log. Separate log for each band. Submit a summary sheet, with usual information and statement that all rules have been observed.

In addition to handling the IARC QSL Bureau, Sam Monastirsky (ex-ZC6SM) finds time to keep 4X4BX consistently on the air. With a maximum of 50 watts input to 1625s, an SX-28, and a dipole, over 100 countries have been worked.

The World Above 50 Mc.

CONDUCTED BY E. P. TILTON,* W1HDQ

By the time this issue of *QST* is mailed we will just be recovering from the September V.H.F. Party. If this contest runs true to form we will have witnessed a degree of activity on our v.h.f. bands that is seldom observed at any other time. A great many fellows, knowing that they can count on finding others there, will have made a definite effort to get on too, and work as many stations as possible. Whether conditions are good or bad, we will have seen that it is possible to have a lot of fun on the v.h.f. bands at any season.

Thus, there is no better time than now to make plans to maintain v.h.f. activity right through the year. This is the season when DX rolls in again on 10, static fades out of the low-frequency picture, and fair-weather v.h.f. enthusiasts tend to give up for another six months. Sporadic-*E* skip has ceased to be a nightly phenomenon on 50 Mc., and we can't expect too many 500-mile openings on 144 Mc. before another spring, but does that mean that we should desert the v.h.f. bands until next April? What is the alternative?

Probably the best way to assure sustained v.h.f. occupancy is to conduct v.h.f. activity on some sort of regular schedule. You may not want to be on 6 or 2 every night, so make a point of operating regularly at certain times. Arrange this program to fit in with that of others of the v.h.f. fraternity who are within your *reliable* range. Pick out one fellow who has a good set-up, so that he can hear and work all the gang, and make him the control station for network operation, involving as many of the group as possible. Be sure that this net convenes *every* week at a specified time, and let everyone know about it. Talk it up at your local club, and over the air. Drop us a line, and we'll run your schedule in *QST*.

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

Part of the handie-talkie gang at the recent Midwest V.H.F. Club Picnic. *Left to right* — W9s ZYF, BYG, PEN, GLB, CT and UMD. This affair drew 350 v.h.f. enthusiasts from seven states. (*Photo by W9KLQ*)

Make some individual schedules, preferably in several different directions. Nightly skeds are best, but if you don't have time for them make it two or three nights a week. Pick out some fellows who are near the limit of your working range under normal conditions, or even a bit beyond it. It will surprise you to see how often the signals get across supposedly difficult paths, when two fellows make a definite effort at a predetermined time. Think you can't work a 100-mile radius on 50 or 144 Mc.? Two or three good skeds may prove that you can do it, and quite a bit more. Even if you don't always have a solid QSO it will be a lot of fun trying, and you'll find that consistent observation of signal variations over long paths is a mighty interesting proposition.

Be sure to continue random operation. This doesn't mean turning on the receiver and spinning the dial. Get on the air and make some calls. And if you hear someone else doing it give him a call, even if he is in the next town. The fellow 10 miles away is just as good a ham as one 110 miles away, or one on the other side of the world, for that matter. Never forget that, in v.h.f. work, activity comes first; DX later. The best opening in the world is no good if there's nobody using the band at the time.

Last but not least, summer has no monopoly on interesting v.h.f. conditions. We're just heading into the fall aurora season, for instance. Fix up the rig so that it can be keyed for c.w., and turn the antenna north when visible or aural signs of magnetic disturbances are detected or predicted. Sporadic-*E* skip on 50 Mc., while not as frequent as in spring, can happen any time, and tropospheric openings come along with weather cycles as regularly in fall and winter as in summer. Yes, the v.h.f. bands have plenty to offer the year 'round. Let's stay with them!

August Activities

Because so many v.h.f. shacks are in attics, activity falls off considerably during excessively hot periods. Most of August was in that category, but even so plenty of good stuff was worked. The 6-meter band was open several times during the early part of the month, and aurora contacts

were made on both 6 and 2 on August 3rd. Though nothing of record-breaking proportions has been reported for 144 Mc., tropospheric openings were frequent, and many contacts were made over distances that would have been considered phenomenal a few years ago.

The month started off right for W5JTI, Jackson, Miss. Tim found the 144-Mc. band open to the north on August 1st, and worked W9s FVJ, Toledo, SUV, Arcola, CBU, Lerna, HNL, Centralia, and K9FAE, Scott Field (all Illinois), JMS, Cory, and EWO, Lebanon, Ind., W4OXC, Louisville, Ky., W8CYE, Miamisburg, Ohio, 620 miles, W4BYN, Memphis, Tenn., and W9LLA, location not recorded. W8WJC, Everett, Ohio, about 775 miles, was heard calling on two occasions, but fade-outs prevented two-way communication. Quite a bit of territory to be covered in one evening's work on 144 Mc.! Tim has the set-up to do it. He uses a crystal-controlled converter with three r.f. stages, and a 700-watt transmitter is on the air by now, though it was not in service when these contacts were made.

Another Southerner who is making hay on 144 Mc. is W4HHK, Collierville, Tenn. With 300 watts to a pair of 4-65As, Paul has been working WØZJB, Gashland, Mo., WØMNQ, Kansas City, W9UED, Carbondale, W9NVY, West Frankfort, Ill., W4FBJ/4, Glasgow, Ky., frequently. W9ZHB, Zearing, Ill., 450 miles, was worked on the 23rd. Regular schedules are maintained with W5JTI, and with W5NYH, Lexington, Miss. In three months ending Aug. 17th 111 contacts had been made with W5NYH, 145 miles, and 75 with W5JTI, 190 miles. These QSOs have taken place at all hours of the day and night, in all kinds of weather, and the consistent nature of the communication is selling more of the gang in that part of the country on 2-meter work. W4BYN and W4BOR are doing well in the Memphis area, and the Mississippi boys have a new convert in W5JZK at Yazoo City. More stations are expected soon in both localities. A lot of credit is due W5JTI, W4HHK, and W4FBJ, particularly, for their enthusiastic spreading of the gospel and development of interest in the v.h.f. bands.

The night of August 22nd and the following morning were the occasion of a fine opening along the Atlantic Seaboard. VE1QY had everyone from Maine to Virginia calling him and his best DX, W3RE, Washington, D. C., about 650 miles, is a new Atlantic Coast DX record. He was heard by W4AO, Falls Church, Va., and W3KBA, Dover, Penna., among others. He also worked W1IO, W1CTW, and heard W1FZ on 220 Mc. that night. VE1QZ, Halifax, 130 miles northwest of Yarmouth, also caught this opening, but with less success. Oscar was hearing weak signals for two hours beginning at 10:50 EST, but his only contact was with W1PIV, East Freetown, Mass. VE1QY, W1KIM, W2KTU, and W2BV and countless weaker 'phones were heard. Dozens of these would have been R5 on c.w. How about it, boys — let's get out those keys when the band is open!

Conditions were also good out through the northern part of the Middle West on the 22nd. What was probably the first Wisconsin–South Dakota QSO on 144 Mc. took place at 7:50 P.M. when W9FPE, Willard, Wis., worked WØTI, Millband, S. D., a distance of about 300 miles.

A mild ionospheric disturbance on August 3rd netted a few interesting c.w. contacts. Tropospheric conditions were generally poor at the time, however, so relatively few stations were active. W9FVJ, Toledo, Ill., reports working W3RUE on 2-meter c.w., beams north. W3KWL was heard in contact with W9JMS. And then the same sad story — "Lots of other stations were heard attempting to use voice, but I was not able to identify any of them!" And yet fellows ask "Why c.w. on the v.h.f. bands?" Your conductor had a c.w. contact with W2LUB, Amsterdam, N. Y., by aurora reflection that night also. This is only a matter of 100 miles or so, but W2LUB is right at the foot of a 1500-foot mountain, and his signal has never been heard via tropospheric bending.

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

Pensacola, Fla. — Years of experience on all active amateur bands have convinced W4MS that 50 Mc. is the most reliable band we have for work over distances of 50 to 100 miles. It thus looks like the best possible bet for a Gulf Coast hurricane network. Even with low power it should be possible to cover the distances generally encountered in such work with 100 per cent reliability. W4MS would be glad to hear from others along the Gulf Coast who would be interested in organizing such a net.

Victoria, Texas — Though the sporadic-*E* openings on 50 Mc. tapered off during August, W5ONS has been having some nice contacts on ground wave. W5BDT, Austin, 120 miles, and W5PKX, Brownsville, about 200 miles, have been worked regularly.

Chuquicamata, Chile — Who's afraid of sunspot cycles? Not CE1AH! Though 50-Mc. DX has been missing for several months Larry and Ida are ready for the fall equinox, a period that has not failed to produce some international DX in several years. The first 50-Mc. opening for LU, OA and YV came on the 20th. A 4-over-4 stacked array is fixed on the States, and a Quad is beamed on South Africa. The 4-element rotary that has caught all the DX heretofore is still in service. Ida sends along word from our old friend Ken Ellis, of MD5KW fame, that he will be working on 50 Mc. as HZ1KE this fall, in a location 30 miles from Mecca.

Devon, Conn. — No mountain tops or high power for W1RMZ. Early in August Dick completed his first year on the air. Going through his log he finds 288 different stations worked on 144 Mc., including 30 W3s (nearest W3 is more than 100 miles away) and 5 W4s. All this from a location 12 feet above sea level, on noisy U. S. Route 1. Power? The rig is a 522. A good many of the contacts were made with a

2-Meter Standings

	Call States	Areas	Miles		Call States	Areas	Miles
W8UKS	18	7	720	W2PIX	9	4	
W8WJC	17	7	700	W2PJA	9	4	
WØNFM	14	7	660	W1BDF/1	9	3	
W8BFQ	14	6		W1JMU	9	3	
W2BAV	14	5		W1OOP	9	3	
W3RUE	13	6	550	W1QXE	9	3	
W3KBA	13	6		VE1QY	9	3	650
W3GKP	13	5	610	W8BAX	9		
W1BCN	13	5	600	W5JTI	8	5	660
W1PIV	13	5	575	VE3AIB	8	5	520
W2 LY	13	5	515	W3KWH	8	5	
W4IKZ	13	5	500	W4AJA	8	4	
W1HDQ	13	5	480	W3KWU	8	4	
W2NGA	13	5		W4NRB	8	4	
W2DFV	13	5	350	W9OBW	8	4	
W8CYE	12	6		WØHAQ	8	4	
W8WSE	12	6	620	W1MBS	8	2	275
W9JMS	12	5	600	W8CPA	8	–	
W3KUX	12	5	575	W3VVS	7	4	430
W4CLY	12	5	500	W8RDZ	7	4	340
W3OWW	12	5	425	WØLZE	7	4	320
W2CET	12	5	405	W9NFK	7	4	450
W4FJ	12	5	450	W2FHJ	7	3	
W8WRN	12	5		W8DIV	6	4	
W1CTW	12	4	500	WØZJB	6	3	
W2WLS	12	4		W4FQI	6	–	
W2DPB	12	5	500	WØGOK	6	–	
W4FBJ	11	5		W2RPO	5	4	
W2QNZ	11	5		W2UTH	5	4	
W3PGV	11	5		W1AW	5	2	
W2NPJ	11	5	500	W4KKG	5	–	
W3BLF	10	6		WØHXY	5	2	
W9PK	10	5		W2UXP	4	4	
W4MKJ	10	5	475	WØDEN	4	3	520
W1REZ	10	4		W9UIA	4	3	205
WØWGZ	10	4	660	W6JHS	4	2	
W1JSM	10	3		W4LNG	4	2	
WØIFB	9	6		W5ML	2	1	425
W3GV	9	5	660	W5AJG	2	1	400
W4HHK	9	5		W5FSC	2	1	250
W3HB	9	5		W5JLY	1	1	1000 *

* Crossband.

W9ZHB	**48**	W5AJG	47		
WØZJB	**48**	W5VY	47		
W9QUV	**48**	W5JTI	44	W8QYD	44
WØBJV	**48**	W5ML	42	W8YLS	38
WØCJS	**48**	W5VV	42	W8LBH	36
		W5JLY	41	W8NQD	31
W1CLS	45	W5ONS	41	W8RDZ	27
W1CGY	44	W5FSC	41	W8RFW	25
W1LLL	43	W5HLD	40		
W1HDQ	42	W5FRD	38	W9HGE	47
W1KHL	41	W5DXB	35	W9ZHL	47
W1LSN	40	W5ZZF	34	W9PK	47
W1HMS	38	W5GNQ	32	W9ALU	46
W1RO	36	W5JBW	32	W9JMS	45
W1JLK	35	W5NHD	32	W9QKM	45
W1ELP	35	W5IOP	30	W9RQM	44
W1EIO	35	W5LWG	26	W9UIA	43
W1DJ	31			W9UNS	42
W1HIL	31	W6UXN	47		
W1CGX	28	W6OVK	40	WØUSI	47
		W6ANN	38	WØQIN	47
W2RLV	45	W6IWS	37	WØDZM	47
W2BYM	42	W6BPT	35	WØNFM	47
W2IDZ	40	W6AMD	35	WØINI	47
W2AMJ	38	W6NAW	35	WØKYF	44
W2QVH	37	W6FPV	34	WØJHS	44
W2FHJ	29	W6BWG	20	WØYKX	43
		K6BF	14	WØTKX	43
W3OJU	44			WØSV	42
W3OR	35	W7HEA	47	WØHXY	41
W3RUE	34	W7BQX	45	WØIPI	39
W3MKL	33	W7DYD	45	WØPKD	36
		W7ERA	43		
W4EQM	44	W7JRG	40	VE3ANY	33
W4FBH	44	W7BOC	40	VE1QZ	31
W4QN	43	W7JPA	40	VE1QY	28
W4LNG	42	W7FIV	40	VE4GQ	20
W4GIY	40	W7CAM	40	XE1GE	19
W4EID	40	W7KFM	40	VE3AET	16
W4EQR	40	W7FDJ	36	HC2OT	16
W4EQR	40	W7FFE	35	XE2C	14
W4DRZ	38	W7KAD	35	VE2GT	14
W4MS	38	W7ACD	32	XE1QE	10
W4FQI	34	W7QAP	32		
W4GMP	34	W3CIR/7	30		
W4WMI	33				
W4FNR	33				

ground-plane antenna, but a 32-element job now in use has accounted for most of the DX.

Reliance, Va. — The family-affair schedule of W4BCT and W8WJC/BFQ has now passed the 100-contact mark. Reliable operation over this 250-mile mountainous path is a classic example of what *can* be done on 144 Mc.

Nashville, Tenn. — The change to horizontal polarization and the beginning of extended coverage on 144 Mc. were simultaneous for W4FWH. After two years on vertical, with a DX record of 55 miles, the great change came when W4FBJ convinced him that horizontal was the thing. His two-year-old 16-element array didn't survive the alteration, but a 6-element job was put up and contacts were made immediately with W4FBJ/7, Glasgow, Ky., 77 miles, and W4HHK, 192 miles. Several others at distances up to 300 miles were heard frequently. Like many another operator whose conversion to horizontal came at a propitious moment, W4FWH is convinced that there is nothing like it. He reports that he often hears signals from Illinois, Indiana and Ohio, but finds it hard to make contacts at times. Turn the antennas toward Nashville, boys, and give Walt a break.

Los Angeles, Calif. — Random v.h.f. news, as reported by W6MVK, PAM for the L.A. Section: There was considerable 6-meter interest in this area during the summer, some of it developing among the 2-meter enthusiasts. Several of these tried their 16-element 2-meter jobs and found that they work out on 6 quite nicely. [This is confirmed by experience some years ago at W1HDQ. Why they load up is anyone's guess, but they do. — *E.P.T.*] W6ZUX has a 16-element job for 50 Mc., which is *quite* an antenna! The highest antenna may not always be the best for 2-meter work, according to tests conducted by W6DSO with three 16-element arrays at different heights. Tests with Bakersfield, more than 100 miles of rough terrain, show that best results may be obtained with any of these, depending on conditions prevailing at the moment. The "Two Meters and Down Club" continues to provide interesting programs. Their picnic on August 4th, a family affair, drew an attendance of 200. At a recent meeting the feature was a teletype demonstration by W6MEL and W6PSW. Visitors came from as far as Bakersfield.

Brooklyn, N. Y. — If a ham's 2-meter station is situated behind a hill that makes his horizon higher than the normal radiation angle of his antenna wouldn't he get over the hill better by aiming his antenna upward slightly, so as to graze the top of the hill, rather than hitting it partway down? Do you know the answer? If so, W2KUZ would like to hear from you.

Wausau, Wis. — Regular schedules are maintained on 144 Mc. with the Twin Cities area by W9JBF and W9FPE. Though signals are spotty a contact can usually be made over this 200-mile path. W9FPE has also been keeping schedules with W9TKL, Waukegan, Ill., regularly. Other W9s up to 300 miles or more to the south are worked when conditions are right, and W8s have been heard a few times.

Dallas, Texas — Piling up an impressive states-worked total on 144 Mc. is not easy when one lives well inside the Texas borders. W5AJG is up to 2 now, and is running schedules with W5NLZ in Oklahoma City in hopes of adding a third. He has heard the Oklahoma station several times.

Clacton, Essex, England — For some time schedules between G6DH and PAØPN, Walcheren Island, Netherlands, 110 miles, and ON4FG, Bornem, Belgium, 155 miles, have been kept on 144 Mc. at 1845 GCT. On June 2nd, and at other times since, both PAØPN and ON4FG reported a considerable increase in background noise as their antennas were swung around toward G6DH. Record has been kept of the times and dates when the high noise level has been observed, and an interesting correlation with sporadic-*E* observance on lower frequencies has shown up. Since June 2nd, ON4FG has made twice-daily checks of noise levels in various directions, at 0700 and 1830, reporting to G6DH on the 1845 sked. When E_s reflections have been observed at 28 Mc. or higher at G6DH, the noise level increase has been noted by ON4FG, coming from the same general direction as the E_s reflections. When the frequencies above 25 Mc. are dead there is little or no change in noise level as the 12-element array at ON4FG is rotated. At times when sporadic-*E* skip is widespread the angle over which the increase in 144-Mc. noise is received is correspondingly broad. Detailed observations of a similar nature would be welcomed by G6DH, and by your conductor.

Yakima, Wash. — 2-meter contacts with Seattle and Portland are the aim of the gang in the Yakima Valley. So far only W7JRZ in Portland has been heard, and no two-way work has yet been done. This is rough terrain, and a distance of around 125 miles in each case, but it doesn't appear impossible. Do we hear a chorus of W8s and 9s shouting, "Why don't they try horizontal polarization?"

Piney Point, Md. — The tendency to use the low end of the 2-meter band may be all right for the DX hounds, but when everybody does it things get rather jammed up. With this in mind W3s SPT, ONT, NQI, OMU, VVS and AVL operate on 146.8 Mc. for their local contacts. Look for them when the band is open.

A similar plea for the gang above 145 Mc. is made by W2ZHB, secretary of the Rochester V.H.F. Group. The

(*Continued on page 106*)

TVI Tips

SUBSIDIARY TANK RESONANCE AT V.H.F.

One aspect of harmonic suppression touched upon by W2VLQ in his article in February *QST*[1] deserves reëmphasis, because it may be responsible for unnecessarily high harmonic output in the TV range from otherwise well-designed transmitters. We had it forcibly brought to our attention not long ago in trying to "de-TVI" a low-power (35 watts) 40-meter transmitter that was kicking up far more fuss in Channel 6 than another rig running many times the power. The higher-power set, as a matter of fact, caused no interference at all, while the little job washed out the picture in great shape.

The trouble turned out to be a v.h.f. resonance in the tank circuit. The circuit, as ordinarily drawn, is shown at Fig. 1A. At around 85 Mc. the coil, L_1, was practically out of the picture, but the inductances of the various leads to the tuning condenser and by-pass condensers were by no means negligible, even though the total length was not unusual. The lead inductance was tuned by the output capacitance of the tube (Fig. 1B) in series with C_1; C_2 and C_3 were large enough to play no significant part in the tuning. The equivalent circuit was therefore as shown in Fig. 1C, which will be recognized as a tank circuit with series tuning. As it happened, this subsidiary circuit resonated at the 12th harmonic of the fundamental frequency at almost exactly the same setting of C_1 that gave resonance at the fundamental. Tuning through fundamental resonance while watching the TV receiver screen showed that a small amount of detuning — just enough to have an observable effect on the plate current and fundamental power output — was enough to reduce the TVI to the level of invisibility, although the picture was completely obliterated at the normal condenser setting.

The transmitter was a small modified surplus set in which the original amplifier plate-circuit wiring had not been touched. The leads were not long, in terms of the frequency for which the set had been designed, but at the same time they were not as short as they could be. A rearrangement of the circuit to shorten them moved the resonance point up above 100 Mc. and the TVI was gone. Subsequent checking on a number of higher-power amplifiers showed that, even when the construction is what is ordinarily considered good from the standpoint of lead length, the resonance is prone to occur somewhere below 100 Mc., depending on the kind of tubes, leads, and the setting of the plate tank condenser.

V.h.f. resonances can easily be detected by a grid-dip meter covering the 50-100 Mc. range. They are almost independent of the tank coil because, with the exception of 10 meters, the tank-coil inductance is so large that it acts simply as an r.f. choke. Since the circuit of Fig. 1C is partially tuned by the tank condenser, the resonance point can be shifted over a fair range by changing the tank capacitance — as much as 30 to 40 Mc. in some cases.

It is impossible to avoid such resonances so long as components cannot be made vanishingly small. The best that can be done is to move them to some part of the spectrum where they will do

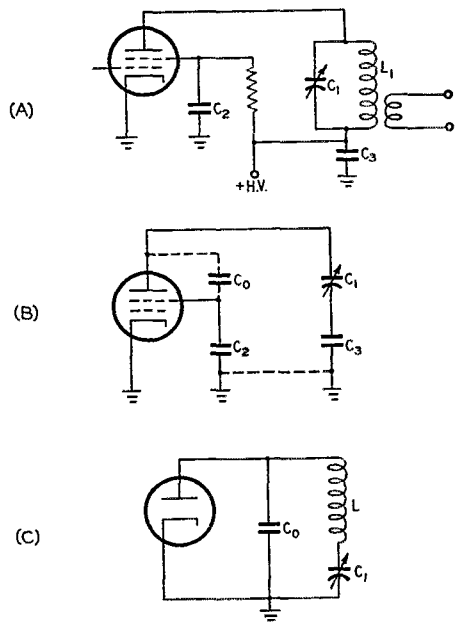


Fig. 1 — A conventional tank circuit and its equivalent as a series-tuned v.h.f. circuit. C_0 is the output capacitance of the tube.

the least harm. The best plan is to make the loop length from the tube plate through the tank condenser and back to the tube cathode just as short as is physically possible. With large tubes, especially those like the 813 that have high output capacitance, this practically calls for the elimination of leads. The return from the frame of the tank condenser to the cathode should be made through the chassis rather than through a separate wire lead direct to cathode, because the

(Continued on page 108)

[1] Gemmill, "Harmonic Suppression in Class C Amplifiers," *QST*, February, 1949.

Hints and Kinks For the Experimenter

MODULATING THE TEST OSCILLATOR

A SIMPLE way to add modulation to the r.f. test oscillator is shown in Fig. 1. In this circuit the primary of a small interstage audio transformer, *T*, serves as a Heising modulation choke and a feed-back winding for a simple audio oscillator. Dual triodes such as the 6SN7 are ideal for the purpose, and any type of oscillator could be used instead of the series feed-back type shown. If a Clapp or an ECO is used as the r.f. oscillator, tubes with separate cathodes must be used.

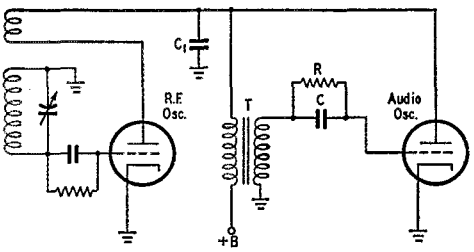


Fig. 1 — A simple method of applying tone modulation to the r.f. test oscillator. An old interstage audio transformer is used as combined Heising modulation choke and feed-back winding.

The tone may be changed by adjustment of the grid leak, *R*, and the condenser, *C*, in the audio-oscillator section of the tube. Suitable values in most instances will be 1 megohm for the resistor, and 220 $\mu\mu$fd. for the condenser. C_1 should be 0.001 μfd. or less to avoid by-passing the audio frequencies. — *Clifford Bader, W8NNL*

HAND-DRIVEN GENERATOR HINTS

FOR emergency use, I recently purchased a BC-1306 rig, complete with hand generator GN-58. Anyone who has ever cranked one of these units will attest to the fact that it is next to impossible to crank with one hand and send with the other, and talking isn't much use either, if you're short-winded! However, by anchoring the tripod that holds the generator, and sitting on a chair, it is possible to pedal the thing like a bike, leaving both hands free. Provided you keep your transmissions short, it's not too tiring.

For the real lazy man, however, it is possible to run the generator from a 6-volt storage battery. Attach the battery leads directly to the brush connections on the low-voltage commutator. The generator will run as a d.c. motor and will generate at the same time, delivering only slightly less voltage than when cranked by hand. — *Russ Robinson, W4JGS*

FILTER AND CONTROL CIRCUIT FOR THE PE-103

NUMEROUS PE-103 dynamotor units have been sold on the surplus market minus the mounting base, which contains various control circuits, overload relays, etc. The circuit shown in Fig. 2 has served as a very satisfactory substitute for the original set-up, and is in several ways easier to handle than the modifications which are necessary if the complete unit is to be used with anything but the original transmitter.

The main switch S_1 controls input to the dynamotor and to the filaments of both transmitter and receiver. The filaments of both units operate full time when this switch is closed, and by means of a double-pole double-throw relay, 6-volt input is applied to the 12-volt input winding of the dynamotor. This results in 250-volt 80 ma. output from the unit, suitable for operation of the receiver. When the microphone switch is closed,

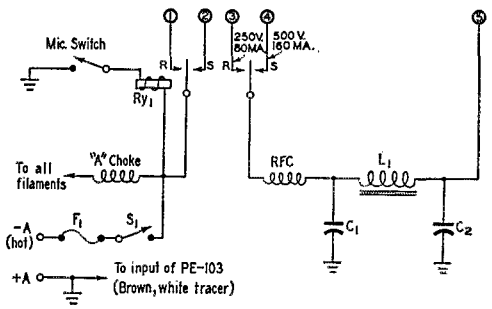


Fig. 2 — Filter and control circuits for the "baseless" PE-103 dynamotors now available in surplus. The terminals designated at the top of the diagram should be connected as follows:

(1) To 12-volt input lead of PE-103 (white with brown tracer).
(2) To 6-volt input lead of PE-103 (white with black tracer).
(3) +B to receiver.
(4) +B to transmitter.
(5) To +B from PE-103 (red wire).
C_1, C_2 — 8-μfd. 600-volt filter condenser.
L_1 — 4- to 10-hy. filter choke, 175 ma.
F_1 — 60-amp. fuse.
RFC — Ohmite Z-28.
Ry_1 — Double-pole double-throw relay. (Potter-Brumfield PR-110, 6 v. d.c.)
S_1 — S.p.s.t. toggle switch, 35-amp. rating.

the relay changes the dynamotor input over to the 6-volt winding, resulting in 500-volt 160-ma. output, and at the same time switches the output from the receiver to the transmitter.

All parts are mounted in a 5 × 10 × 3-inch chassis, with a bottom plate used as a cover. The end of the chassis has two sockets mounted in it, one a 4-prong unit for transfer of power to the transmitter, the other a 5-prong unit for the receiver and the relay control.

In my own installation, the dynamotor is mounted on the engine side of the fire wall, with the control box directly in back of it, inside the driver's side of the partition. This permits short leads and eliminates the need for shielding. In cars where the battery is mounted under the hood, short primary leads are also made possible. All "A" leads, and the ground lead, are made with No. 10 or larger wire. — *George Hart, W1LIH*

MINIATURE 10-METER EXCITER

THE problem of obtaining sufficient grid drive to the final amplifier of a 10-meter mobile rig while using a minimum of precious plate current, filament current, and space was tackled recently with very pleasing results. After trying several circuits and variations thereof, none of which produced the desired results, a 6J6 dual triode was tried with one half of the tube operating as an oscillator-doubler from 7-Mc. crystals, and the other half as a doubler from 14 Mc. to 28 Mc.

With this circuit, and with a plate supply of 250 volts, the exciter delivered 7 ma. grid drive to a loaded 807 at an expenditure of only 21 ma. total plate current to the two sections of the 6J6. Plate voltage was reduced to 175 volts, which produced 3.2 ma. grid current to the 807 with a total expenditure of only 14 ma. in the exciter.

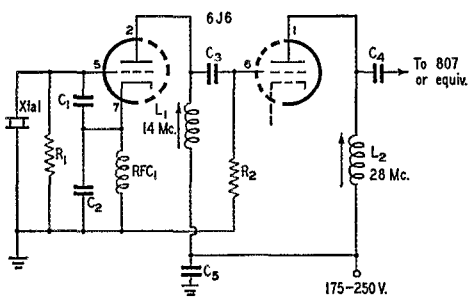


Fig. 3 — Circuit diagram of a pint-size exciter capable of driving an 807 at 28 Mc. with a minimum of input to the exciter stages.

C_1 — 25-$\mu\mu$fd. ceramic.
C_2, C_4 — 50-$\mu\mu$fd. ceramic.
C_3 — 20-$\mu\mu$fd. ceramic.
C_5 — 0.0022-μfd. mica.
R_1 — 47,000 ohms, ½ watt.
R_2 — 33,000 ohms, ½ watt.
L_1 — Slug-tuned coil for 14 Mc.
L_2 — Slug-tuned coil for 28 Mc.
RFC_1 — 2.5-mh. r.f. choke.
XTAL — 7 Mc.

The exact value of the parts specified does not seem to be critical, but good ceramic insulation should be used for both the coils and the tube socket. Changing to a bakelite socket and coil forms resulted in about 50 per cent less efficiency!

The coils were wound on small ceramic slug-tuned forms found in some surplus radio gear, but similar units are available commercially. The ones used measure ⅜-inch diameter and are 1¼ inches long.

A test model of the exciter was built on a small metal box measuring only 3 by 3½ by 1½ inches, and there was still plenty of space available for an 807 amplifier. This little 3-stage transmitter was loaded to 60 watts input without any trouble. It may not be the ultimate in compactness, but it shows what can be done with a few parts, very little space, and very little plate and filament current. — *Theodore W. Rast, VP3TR (W6SMU)*

SIMPLE INVERSE FEED-BACK CIRCUIT

HERE'S a simple way to add inverse feed-back to a resistance-coupled amplifier. The grid resistor of V_3 in Fig. 4 is removed, and replaced by a potentiometer, R_2, of equal value. The grid

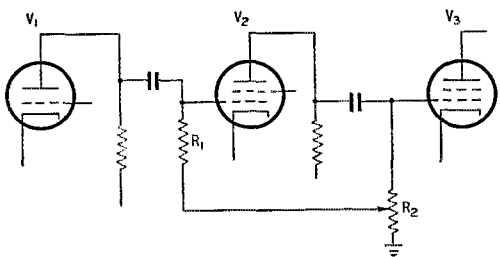


Fig. 4 — Adding inverse feed-back to a resistance-coupled amplifier the easy way. In this circuit, only one tube, V_2, is included in the feed-back loop. Variations are discussed in the text.

resistor of V_2 is then returned to the arm of R_2. Thus a portion of the audio voltage at the plate of V_2 is fed back to the grid of V_2 which, naturally, is out-of-phase. The amount of feed-back may be controlled by the setting of R_2.

Although the diagram shows only one tube (V_2) in the feed-back loop, it is possible to have more, so long as there is an odd number of tubes in the loop. An even number of tubes would result in positive feed-back and oscillation. If there are transformers in the loop, make sure that the phase shifts are such that the two ends of the loop are out of phase at all frequencies, otherwise oscillation at one or more frequencies may result.

If there is any reserve gain in your speech amplifier, installation of the simple system described can result in improved speech quality at very small cost. — *Charles Erwin Cohn*

(Continued on page 112)

Correspondence From Members-

"PLANNING" AND "DIRECTION"

609 Norvell St., El Cerrito, Calif.

Editor, *QST:*

I have just read your "Written Statement of Comment" [p. 9, September *QST*] directed to the FCC and wish to extend my sincere congratulations for what I consider the most outstanding defense of amateur radio to date. Every ham should be afforded the opportunity to read it. I think it would do more to create unity within our ranks than anything which has been done for many years.

— *W. G. Hurd, W6CTL*

Box 13, Hico, Texas

Editor, *QST:*

About the proposed new FCC rules: I agree with ARRL in opposing the FCC's intention to "provide scope and direction for amateurs." I believe this would jeopardize the future of all amateurs. . . .

— *James R. Bobo, W5ODD*

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12 Hanford Place, Caldwell, New Jersey

Editor, *QST:*

I cannot wait to tell you how much I approve of your very fine stand as expressed in "It Seems To Us." . . .

— *Howard L. Stanley*

[EDITOR'S NOTE: Special thanks to OM Stanley, ex-2FS, a member of ARRL's first Board of Directors, 1917.]

4506 Chestnut St., Bethesda, Maryland

Editor, *QST:*

Come now, fellows, the ARRL isn't God. At least I hadn't thought so until I read the report of the recent directors' meeting and the editorial in the August *QST*. So we let someone else beat us out with the proposals, and now we are griping like a bunch of kids! The guys who worked out the proposed regulations were hams themselves, probably ARRL members, and just as interested as anyone in the continued development and prosperity of amateur radio. . . .

— *Harvey W. Lance, W8KWF*

4024 N. Pioneer Ave., Chicago, Ill.

Editor, *QST:*

For some time now I've been paying dues to what I considered a splendid idea for amateurs. Judging from your August editorial (which another friend ham labeled as "trying to justify something"), I now find that I'm merely paying for a magazine subscription. What happened to the progressive ideas of ARRL? . . .

— *Ero Erickson, W9HPJ*

Hartford, Connecticut

Editor, *QST:*

After reading your recent editorial in the August issue of *QST* it is my feeling that the substance contained therein should be read by every amateur who believes in freedom of amateur radio. . . .

— *C. R. Knowlton, W1ATE*

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971 Federal Avenue, Zanesville, Ohio

Editor, *QST:*

We have received and read your editorial for September *QST* with a great deal of interest. It is a very fine piece of work and the League's legal staff are to be congratulated. . . .

— *R. E. Swope, President*
Muskingum Amateur Radio Assn.

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5 Lockwood St., Bradford, Mass.

Editor, *QST:*

I have just read your editorial in August *QST*. I would like to express my unqualified support of the principles you outlined.

— *Richard C. Arnold, W1KBQ*

1105 S. Grant Ave., Crawfordsville, Ind.

Editor, *QST:*

. . . Government has a rôle to fulfill. This rôle is one of dealing with others in international communication agreements and the orderly control of domestic communications services. Ham radio is not a business for governmental control, except in setting standards for participation. It is a hobby, and one that can guide its own path of development. What will it be: ham radio under increased governmental supervision and eventual extinction, or guided by our more able amateurs to greater fields of development and personal enjoyment? . . .

— *Marsh H. Jones jr., W9FZV*

R.F.D. 6, Knoxville, Tennessee

Editor, *QST:*

. . . I am convinced that a bureau-controlled amateur radio will die out . . . a hobby just won't survive a bureau-controlled hobbyhorse and a rider bedeviled with directives. . . .

— *H. J. Merwin*

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218 Sherman Ave., Ashland, Ohio

Editor, *QST:*

. . . We would like to congratulate you on your stand in regard to these issues. Although our tickets are new, our interest in ham radio dates back to the middle thirties. The fact that ham radio has expanded as it has certainly isn't due to Government direction. . . .

This country has been built on personal and individual initiative. Our progress as a nation in general and the continued development of amateur radio in particular depend on that fact. If it is at all possible, let's keep ham radio as it is today. . . .

— *C. W. Grimm, W8ECU; M. E. Truex, W8DWQ*

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901 Second St., Liverpool, New York

Editor, *QST:*

. . . As a representative, mature radio amateur with a 28-year service record I am behind the League 100% in its efforts to continue a free amateur body. Possibly I can say this with more conviction and understanding than hundreds if not thousands of my fellow hams can, because I was actually involved in government and Army red tape, regulation and frustration for four years while stationed in Washington during the war. Since that time I have also had a few additional contacts with regulations, and believe me, if the guys think they are being regulated and controlled now, they have seen absolutely nothing! . . .

— *Roy Jordan, W2KUD*

Woodland Hills, Calif.

Editor, *QST:*

. . . The proposed changes, as I understand them, would seem to remove much of the joy and opportunities for originality and investigation — the true amateur spirit — in this interesting field. There would be less incentive for us to continue our licenses and interest prospective licensees.

— *Charles W. Clifford, W6KFE*

(Continued on page 112)

Operating News

F. E. HANDY, W1BDI, Communications Mgr.
GEORGE HART, W1NJM, Asst. Comm. Mgr., C.W.
....., ..., Natl. Emerg. Coördinator

J. A. MOSKEY, W1JMY, Deputy Comm. Mgr.
....., ..., Asst. Comm. Mgr., 'Phone
LILLIAN M. SALTER, Administrative Aide

On Operating and Public Relations. ". . . Listening in the band is not just the privilege of the hams but of the general public as well, and the impression gained from one 'lid' destroys to an immense extent the relations we try to improve between the general public and ourselves. This week, on 10 meters, we heard a chap using phonetics for his call that varied from transmission to transmission. First he was 'Dan Cupid Lover,' next he was 'Dirty Crummy Louse,' *ad infinitum*. We have a very fine set of words accepted generally as proper to use in the attempt to get through QRM. They are not hard to learn and it is the mark of a good operator to practice and become perfect in their use. . . .

"Some practices on the air oft approach the utterly ridiculous, leaving a poor impression of the ham as an individual and of our group as a whole. How many of us are responsible for acts that brand us as 'lids'? . . . In this category is the chap who uses language over the air that leaves nothing to imagination but which may be suggestive as to meaning. . . . Then we have the chap who does not see eye to eye with organizational policies. He 'calls names' via the airways and often succeeds in swinging people of his convictions to the other side, failing in any event to gain respect for himself or the institution of Amateur Radio. . . ."

Are you improving your operating procedure and practices, so that your technique and ability are automatically good spokesmen for the institution of amateur radio? As the Springfield Amateur Radio Club states in the above quoted paragraphs by W8JRG from the May issue of *Q-5*, "We all admire A-1 operators. Are we in that category or on the way to qualify!" Persons listening to amateur work form opinions entirely on *what* we say and *how we say it*. Let's aim always to permit no impressions but the *best* as we operate.

LOKO/MM Citations. According to reports reaching ARRL, about thirty amateurs not currently familiar with FCC's Section 12.101 of our regulations may have received FCC citations for making unauthorized communications, noncompliance with Section 12.101. It seems that a nonamateur station, LOKO/MM, has been operating in the 20-meter band. Copies of the citation have been sent to ARRL so we may warn amateurs against the practice of working such stations. The Commission asks the coöperation of all amateurs in observing the regulatory requirements. For information, here is the applicable text of this section, full version of which will be found in the *License Manual:*

> An amateur station may be used to communicate only with other amateur stations, except in emergencies or for test purposes it may be used temporarily for communication with other classes of stations licensed by the Commission, and with U. S. Government stations. Amateur stations may also be used to communicate with any radio station other than amateur which is authorized by the Commission to communicate with amateur stations. . . .

The Annual Emergency Test. This year's Simulated Emergency Test (Oct. 15th–16th) should prove the opener for interesting operating activities in the AEC over all the coming months. Nearly a thousand coördinators in as many communities invite your participation and stand ready to make you and other licensed amateurs members of their local AEC groups if you will but *register your facilities* — the equipment and bands you use — on the forms that they or ARRL Hq. will provide on request.

The ARRL coördinates this activity, is sponsor of the AEC, which is open to every amateur, whether a League member or not. Hams working in every band are needed; to subscribe to the principles of emergency work set down in the booklet *Emergency Communications* (your EC will give you one when you register and get your membership card) will enable you to be a Supporting Member of the Corps; if you are actively on the air, and can report on a test, you can be a Full Member. On the same principle that the Red Cross has an annual roll call, the Emergency Corps registrations (new and active-endorsed) will be reported with Simulated Test results on a special form that has been distributed for the purpose, in connection with this October Simulated Emergency Test. Whether making a new or renewal report of your readiness for emergencies, be sure you do report to add to the sum total of public service interest shown the Red Cross and other Government agencies on behalf of the amateur service.

The community tests in mid-October will be based on several types of simulated contingencies, any one of which might threaten your city's welfare and require supplementary or special radio communications. ARRL ECs aim to have

definite plans for disposition of all fixed, mobile and portable amateur facilities as might be required in any such occurrence. It will be a surprise test with the details varying from hour to hour. Call your EC today to get lined up, so that you will be sure to be called on and enjoy some fun and communications work in the test. All amateurs and clubs are asked to recommend EC candidates to SCMs and SECs where communities do not have active leaders and current plans for use of amateur facilities in the event of communications need.

— *F. E. H.*

JULY CD QSO PARTY

Scores in the July CD QSO Party were surprisingly high, considering that the affair was held at a time when amateur operating activity normally hits a low point in the year. W3EOP, second in the April shindig, outclassed all other participants with a fancy 428-QSO total and a claimed score of 787,350 points. Contest expert W4KFC stepped up from a previous third place to take the runner-up position in the midsummer party. Still in there giving the gang a run for their money, West Coaster W6WNI snagged third place easily.

The next CD Party will be held October 22nd–23rd. Any amateur who holds an ARRL appointment or office will be eligible to take part. The pleasure to be derived from these quarterly get-togethers can be fully appreciated only by participation. If you do not already hold a League appointment, and are interested in organized operating activities, look over the list of such appointments in the booklet *Operating an Amateur Radio Station* (sent gratis to any League member upon request) and decide which suits your particular interest and capabilities. Then write to your SCM or ARRL Headquarters for information on how to qualify for the appointment of your choosing. Get lined up for the busy 1949–50 operating season now!

Claimed Scores (C.W.)

Station	*Score*	*Contacts*	*Different Stations*	*Sections*
W3EOP	787,350	428	301	61
W4KFC	645,840	407	256	56
W6WNI	565,250	260	179	59
W7KWC	437,580	221	163	57
W1JYH	401,075	301	208	55
W1EOB	333,785	270	186	55
W2GFG	328,440	269	186	52
W3HRD	325,745	282	178	49
W3ADE	294,745	246	174	59
WØIC	282,975	238	176	55
W1RWS	282,375	244	175	50
W1QMJ	275,625	238	172	53
W1IIN	257,465	226	175	46
W4NNJ	244,200	213	176	46
W1CRW	234,330	214	163	56
W6VAQ	228,360	151	118	47
W2TYU	224,715	213	159	52
W5NGN	220,455	207	162	51
W9WEN	219,420	206	157	50
W2CWK	214,830	211	149	49
VE3WY	210,940	192	160	52
W2ZVW	196,650	200	142	48
W6KEK	192,384	128	119	48
W1AW	189,405	200	133	50
W1CEG	185,220	190	143	46
W1LHE	178,525	187	142	43
W8DAE	163,800	175	132	48
W4NJV	162,870	172	140	43
W1JTD	161,190	155	147	52
W8HOX	160,200	175	136	42
W5DRW	155,220	151	151	48
W8YDR	151,470	162	136	51
W9UKT	151,035	139	138	45

Others with scores over 100,000: W1FTX 144,640, W8LII 136,290, W3BWL 131,880, W2OBU 120,000, W9QLW 116,900, VE1BK 116,220 W2URX 114,915, W2YGW 114,750, W2EWZ 114,240, W3CUL 112,495, W4AYV 110,600, W2RSL 110,080, W8NOH 108,230, W4FF 105,750, W9RQM 104,280, W4AUT 101,060.

Here are a few of the fellows who handled the big job in Petersburg, W. Va., over the Field Day week end, as chronicled in last month's *QST*. *L. to r.*, W8HSC, W8GSN and W3EYV, the latter fondly caressing the battery-powered unit which kept W8EYV/8 on the air during the most difficult hours of the emergency.

A.R.R.L. ACTIVITIES CALENDAR

Sept. 24th–25th: V.H.F. Contest
Oct. 7th: CP Qualifying Run — W6OWP
Oct. 14th: CP Qualifying Run — W1AW, WØTQD
Oct. 15th–16th: Simulated-Emergency Test
Oct. 22nd–23rd: CD QSO Party
Nov. 2nd: CP Qualifying Run — W6OWP
Nov. 16th: CP Qualifying Run — W1AW, WØTQD
Nov. 19th–20th, 26th–27th: Sweepstakes Contest
Dec. 4th: CP Qualifying Run — W6OWP
Dec. 13th: CP Qualifying Run — W1AW, WØTQD
Jan. 7th: CP Qualifying Run — W6OWP
Jan. 19th: CP Qualifying Run — W1AW, WØTQD
Jan. 21st–22nd: V.H.F. Sweepstakes

TRAINING AIDS

We are pleased to announce a new addition to the ARRL Film Library, a 16-mm. silent motion picture film prepared by the ARRL Technical Department through the collaboration of Phil Rand, W1DBM. The film is entitled "TVI." One copy of this film is being placed in the ARRL Film Library for distribution among affiliated clubs in the normal manner; another copy will also be available for hamfests, conventions and other special occasions. TVI being the important subject it is to most of us, we expect initial booking of this film to be heavy, so affiliated clubs should get their requests for booking in early. Details on the film and its contents will be found elsewhere in this issue.

This is the 26th motion picture film in the ARRL Film Library and will bear the reference number F26.

♦

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for July traffic:

Call	*Orig.*	*Del.*	*Rel.*	*Extra Del. Credit*	*Total*
W7CZY	105	124	1228	67	1524
W6CE	20	46	1212	26	1304
W4PL	6	45	823	32	906
W7CKT	1	4	802	4	811
W1QMJ	20	50	646	46	762
W7LHI	361	188	1	181	731
W5GZU	15	74	488	69	646
W9EBX	7	13	558	13	591
W2OXE/MM	421	68	2	52	543
KL7BE	7	501	17	0	525
WØZJO	29	7	440	36	512
K5NRJ	321	68	89	24	502

The following made the BPL for deliveries:

W1IIN 283	W6YLZ 134	W8NOH 104
W6FDR 255	W9ESJ 130	W8RJC 102
W6DDE 147	VE1BK 118	W7FIX 101
	W7KCU 115	

A message total of 500 or more or 100 "deliveries plus extra delivery credits" 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.

BPL HONOR ROLL

Points for BPL Honor Roll are accumulated at the rate of four points for every BPL appearance plus one point for every 100 points in your *BPL* traffic total. The Honor Roll listing below gives the point totals and shows only the *high ten* traffic-handlers for 1949 and postwar:

1949		*Postwar*	
W4PL	131	W4PL	306
W7CZY	124	W7CKT	269
W6CE	120	W6REB	243
W7CKT	89	W7CZY	171
W9EBX	81	WØHMM	165
W5GZU	65	W6FDR	151
W6DDE	56	W6CE	136
W6REB	54	W2TYU	128
W6FDR	53	W7FST	127
W9QIL	50	W5GZU	110

TRAFFIC TOPICS

In connection with the BPL Honor Roll, it will interest traffickers to know that BPL points (not to be confused with traffic points) are credited and recorded *every time an operator makes BPL from his own station*, and they will be accumulated from month to month and year to year. If an operator moves his location and/or changes his station call, he takes his BPL points with him; he does not have to start all over again. However, we do not always have this information, and some of the credits are probably held separately for the same operator, when they should be combined. If you have made BPL postwar under a different call from the one you are now using, drop us a line with the dope so we can give you proper credit for your postwar BPL traffic performance. We hope to be able to present a summary at the end of the year, so don't think you fail to get cumulative credit for making BPL just because you are not in the high ten.

♦

As has been previously mentioned, the section traffic organization is the foundation on which our National Traffic System rests. Without participation in regional and area nets by representatives from section nets, we aren't going anywhere. It therefore behooves *every* section in the ARRL Field Organization to get a section traffic net rolling so that the full benefits of participation in the National Traffic System will be yours. We'll be glad to help in any way we can, but the section net is *your* baby and the initial organizational gestures are up to you. To get full benefit from the National Traffic System, arrange your section net meetings at 1900 and/or 2200 your local standard time.

— • • • —

Are you, and your station, ready for the October Simulated Emergency Test?

— • • • —

W1HDQ reports what seems to be a revival of interest in v.h.f. traffic relaying. A message from W5JTI, Jackson, Miss., was relayed to W1HDQ *all the way* on 144 Mc. This is something that isn't done every day, but it *could* be. Why not? Further reports on v.h.f. traffic relaying will be welcomed.

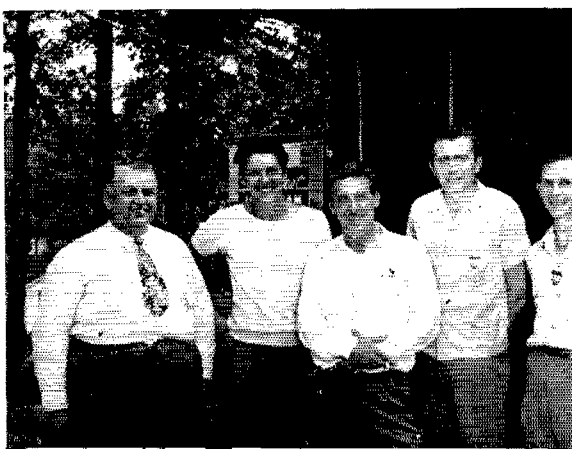
CODE-PROFICIENCY AWARDS

Have you received an ARRL Code Proficiency Certificate yet? Twice each month special transmissions are made to enable you to qualify for the award. The next qualifying run from W1AW/WØTQD will be made on October 14th at 2130 EST. Identical texts will be sent simultaneously by automatic transmitters. Frequencies of transmission from W1AW will be 1887, 3555, 7215, 14,100, 28,060, 52,000 and 146,000 kc. WØTQD will transmit on 3534 kc. The next qualifying run *from W6OWP* only will be transmitted on October 7th at 2100 PST on 3590 and 7248 kc. These W6OWP-only runs will have different text from the runs sent by W1AW and WØTQD. For additional qualifying run dates, see the ARRL Activities Calendar elsewhere in these pages.

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, 15 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, Monday through Friday, at 2130 EST. References to texts used on several of the transmissions are given below. These make it possible to check your copy.

Date	Subject of Practice Text from August *QST*
Oct. 3rd:	*A 28-Mc. Installation for the Car*, p. 11
Oct. 5th:	*Noise-Generator Technique*, p. 20
Oct. 7th:	Qualifying Run, 2100 PST, from W6OWP only
Oct. 11th:	*The Coffee-Can VFO*, p. 22
Oct. 13th:	*TVI Reduction — Western Style*, p. 24
Oct. 14th:	Qualifying Run, 2130 EST, W1AW/WØTQD
Oct. 17th:	*A Power-Distribution Panel*, p. 30
Oct. 19th:	*Technical Topics*, p. 32
Oct. 25th:	*Simplicity on 6*, p. 40
Oct. 27th:	*TVI Tips*, p. 45



This little group of League officials was snapped at the Missouri Emergency Net first annual picnic. From left to right: WØNIP, Missouri PAM; WØICP, NCS of Missouri Emergency Net and assistant SCM; WØDEA, ARRL Midwest Division director; WØVRF, Missouri SEC; and WØICD, Missouri SCM.

DX CENTURY CLUB AWARDS

HONOR ROLL

W1FH.....223
W6VFR...218
G2PL.....211
W3BES....209
W8HGW..208
W2BXA...206
W3GAU...203
W6EBG...200
G6ZO.....199
W2AQW...199
W4BPD...199
W6SAI....199

RADIOTELEPHONE

W1FH.....181
W6DI.....163
XE1AC....159
W4CYU...156
VQ4ERR..153
W8HGW..153
W2BXA...151
W1JCX....150
G2PL.....149
W2AFQ....149

From July 15 to August 15, 1949, DXCC certificates and endorsements based on postwar contacts with 100 or more countries have been issued to the amateurs listed below.

NEW MEMBERS

VE4RO....154
W9AND...140
KH6MI....136
W1BAV...135
VK2NS....133
W8DEN...131
W2LPE....126
WØPNQ...126
G5VU.....124
VE7VO....124
W9IOD....124
WØDU.....122
VO6EP....121
W3GHS...121
W4IWO...121
G2IO.....120
OK1RW...120
W7ENW...120
W6PH.....118
W9MXX..118
W6SR.....117
G8VB.....116
KH6QH...115
W1MUN ..115
W6ID.....115
W1IKE....114
W4IYT....114
LA6U.....113
ZS5BS....113
VP6CDI...112
G2CDI....112
W2MA....112
W2WZ....112
VK5KO ...111
W4LVV...111
W6RLQ...111
G5FA.....110
W1LZE....110
W5LGS....110
W6AAO...110
W6EYR...110
HK3CK...109
I1ZZ.....109
ON4FL....109
OK2DD...108
VE4XO....108
W1EZ.....108
W6LN.....108
G8IP.....107
PAØCB....107
PAØIF.....107
W1KLY...107
W1ZD.....107
W9BQE...107
G2ZF.....106
GM3AVA..106
SM5WI....106
VO1B.....106
W2DSB...106
W2GTP...106
W5CGC...106
G5CW.....105
GM6MS...105
OK3AL....105
VE3KE....105
W6DOT...105
W6VE.....105
W9LI.....105
WØMKF...105
GC4LI....104
OK1OP....104
VE3ACS...104
W1QF.....104
W2PBG...104
W4TP.....104
W6LVN...104
W7KEM ..104
W7PEY...104
W9GA.....104
W9UXO...104
WØDSO....104
G3DAH...103
GM3CSM .103
I1AFM....103
KV4AA....103
W2CSO....103
W2WC.....103
W5MMD..103
W6MHB...103
ZS6A.....103
EI4Q.....102
G6VQ.....102
G8PL.....102
GM2FHH .102
I1AIV.....102
OK2EL....102
PAØRU....102
PAØSU....102
VE6FK....102
W2GFW...102
W2LSX....102
W3NOH...102
W4HVQ...102
W4KKX...102
W6CYI....102
W8LAV....102
W9CYT...102
W9LVR...102
W9MXP...102
ZL4GA....102
G2DM.....101
KH6LF....101
OQ5RA....101
W1DEP...101
W2QCF....101
W3AYS....101
W3RNQ...101
W5IGJ....101
W6BIL....101
W6CEO...101
W6EAY...101
W6KEK...101
W6WJX...101
W7GPP. ..101
ZS6GI.....101
CR9AG....100
EA5BE....100
EI5F.....100
G2AO.....100
G2BXP....100
G3AAG....100
G8JR.....100
I1PL.....100
KH6LG...100
OA4AK....100
OK1WF...100
OZ4PA....100
VE1PQ....100
W2GTL...100
W2JJI.....100
W2TJK ...100
W4GXB...100
W5BK.....100
W6CGP...100
W6JK.....100
W6ZZ.....100
W7KTN...100
W7ONG...100
W9TQL....100
WØRIA....100
ZS1M.....100

RADIOTELEPHONE

W4IYM...120
W1FFO....114
W3GHS...112
W4HRR...112
W5KC.....112
W4GMA...111
W6WNH..111
W1BAV...108
G4MS.....107
HB9DS....106
W4JCK ...105
CN8RA....104
W4AHF...104
W4MRA...104
CE3AB....103
W3NA.....103
W5ALA ...103
W6KQY...103
WØNCG...103
KP4ES....102
OZ7TS....102
W2PBI....102
W3BES....102
W4BA.....102
W4CWV...102
W7MBX..102
W8IWI....102
I1ZV.....101
W2WME..101
W5ZS.....101
W8AUP...101
WØAIW...101
W4OM....100
W9LQ.....100
WØGSW...100
ZS6FU....100

ENDORSEMENTS

WØNVC...192
WØYXO...192
W3CPV ...191
W7AMX ..188
ZS2X.....181
W3JTC....180
ZL1HY....180
W1ENE...173
VE3QD....172
W7GUI....172
W6OMC...171
F8BS.....170
W1BIH....170
W3GRF...165
W9RBI....161
WØUOX...161
CE3AG....160
W2ALU...160
W2LJR....160
W5ENE...160
W8LEC ...160
W2HMJ...155
WØAIW...154
G3DO.....152
KH6IJ....151
W3OCU...151
W5GEL...151
ZL2QM....151
G8KP.....150
I1KN.....150
W2PUD...150
W4OM....150
W6KUT...150
W6SYG ...150
ON4QF....149
C2FSR....143
VE3QD....141
W7GUV...141
I1IR.....140
PAØGN....140
W2GUR...140
W2IMU...140
W2ZA.....140
W6PZ.....140
W8SYC ...140
W9LNM...140
W4LZF....139
ZL1BY....134
W9CYU...133
VE3IJ.....132
W2CNT...131
W6MHH..131
W8KPL...131
W9YNB...131
G5YV.....130
OK1CX ...130
W1DQH...130
W6BVM...130
W9UIG....130
W1NW....128
I1OJ.....126
OK1HI....125
W2AGO...124
HB9EU ...123
G8FW.....122
W2ADP...122
W2GVZ...121
W4ML....121
W5ACL...121
W8TJM...121
ZS2AG....121
W4CYC...120
W6DUB...120
W6LDD...120
G2MI.....119
W4IUO....119
W1BGW...114
W2ICO....112
W4RBQ...112
ZL3AB....112
VE3AGC..110
W9FKH...110
W9LNH...110

RADIOTELEPHONE

W9RBI....136
G3DO.....131
W1ENE...131
ZL1HY....126
W1EKU...120
W9BZB ...120
W6TT.....115
I1SM.....114
W6CHV...112
WØVSK...110

"SOLID OM"

Is the expression "Solid OM" becoming automatic and therefore meaningless? How many times have you sent a long and detailed account of your rig, the weather, general conditions, etc., and found that the reply received indicated that only part had been received? But the first words *you* receive are "Solid OM."

Of course, there are times when you yourself have been so long-winded that the other fellow has forgotten just what you said and what you wanted to know! That is often the case, and "Solid OM" is quite a legitimate reply there, even if the other fellow *does* forget to answer your queries!

Personally, I have derived a great deal of amusement out of these two words, and if I were to list the number of lads who come back to me with a nice crisp "Solid OM" after I have carefully explained my sex and name, there would be quite a number of Ws who ought to blush!

— *Margaret Mills, G3ACC,*
District Chairman YLRL, England

WITH THE A.E.C.

The Missouri Emergency Net, one of the more active of those groups of amateurs who have dedicated their stations to the cause of service in the public interest, has recently introduced the requirement of AEC membership on all net members to ensure their coöperation with their local ECs as well as their participation in the section-wide net drills.

— • • • —

During a period of communications emergency accompanying a local disorder in Bolivia in early June, Canal Zone amateurs effectively served the authorities on the Isthmus by establishing communications with the South American republic. News filtering out of Bolivia was meager and incomplete, and effective communications were required to determine what need, if any, might be necessary for U. S. citizens in the affected area. KZ5CM maintained contact with CP5FA on an *around-the-clock basis*, and was assisted by KZ5AA, MARS officer for the C.Z. region. CP5FA, CP5FB and CP1AM, as well as ZP5BL and many others, assisted the C.Z. gang.

To Acting SEC KZ5FL, to EC KZ5NM, to the Canal Zone AEC, and to all the KZ5 hams who participated, including the CAA and MARS gangs, much credit is due for the manner in which they carried out one of the most difficult of assignments — that of listening and monitoring for long hours at a stretch while KZ5CM worked to get the traffic through.

— • • • —

The Los Angeles gang now has a station set up in the L.A. Red Cross Headquarters. Since the new station will act as message center for the entire Los Angeles metropolitan area during time of communications emergency, we looked at a map. Wow!! W6RIT is directly in charge of the station, according to SEC W6ESR.

— • • • —

The Quebec Emergency Net, under the leadership of EC VE2GM, held a very successful simulated-emergency test over the week end of May 14th and 15th. Operating in both A1 and A3 nets, the gang reported the progress of a hypothetical air raid. Sixteen stations handled a total of 260 messages during the period of the "emergency."

— • • • —

Did someone say that the 3.5-Mc. band is useless for emergency work during the summer months? KP4DJ and W1IIN have been keeping a weekly schedule on 3710 kc. for the past several months with nary a "miss." The rigs? Thirty-five watts input at each end, with simple half-wave antennas. The time? 2100 EST.

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The San Joaquin Valley Emergency Net, comprising some twelve stations actively operating the 144-Mc. band, now holds weekly drills. The post of NCS is passed around from week to week to allow all net members to attain proficiency in net directing. Because of the great distances over which communications might be needed in that part of California, tie-ins with the 3.5- and 7-Mc. traffic groups are given particular emphasis.

— • • • —

W8EYV and cohorts, who worked long and hard to keep communications flowing into and out of Petersburg, W. Va. during the Field Day week end emergency, as described in September *QST*, sum up the lessons they learned in the following words:

1) Be ready — flea power is okay if you can keep the QRM level down.

2) Be battery-operated. Petersburg had no power available, not even a portable a.c. generator.

3) Be independent of your automobile. Our car had to be left miles from the stricken area.

4) Be flexible — use either a VFO or *plenty* of crystals.

5) Be ready to QSP on another frequency or to make the switch from 'phone to c.w. or vice versa.

6) When you are not directly involved in an emergency, whether or not you think you can help, *stay off the emergency frequencies until you hear a specific request for assistance which you are equipped to render.*

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:

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*
Western New York	Oct. 3, 1949	Harding A. Clark	Nov. 21, 1949
Eastern Pennsylvania	Oct. 3, 1949	Jerry Mathis	Nov. 24, 1949
Indiana	Oct. 14, 1949	Charles H. Conway	Resigned
Yukon*	Oct. 14, 1949	W. R. Williamson	Mar. 17, 1949
North Dakota	Oct. 14, 1949	Paul M. Bossoletti	July 31, 1949
West Indies	Nov. 1, 1949	Everett Mayer	Dec. 15, 1949
Los Angeles	Dec. 1, 1949	Vincent J. Haggerty	Jan. 15, 1950
South Dakota	Dec. 1, 1949	J. S. Foasberg	Jan. 15 1950

*In Canadian Sections nominating petitions for Section Managers must be addressed to Canadian General Manager 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.

ELECTION RESULTS

Valid petitions nominating a single candidate as Section Manager were filed in a number of Sections, as provided in our Constitution and By-Laws, electing the following officials, the term of office starting on the date given.

New York City & Long Island	George V. Cooke, W2OBU	July 31, 1949
Eastern Florida	John W. Hollister, jr., W4FWZ	July 31, 1949
East Bay	Horace R. Greer, W6TT	Aug. 16, 1949

In the Western Florida Section of the Southeastern Division, Mr. S. M. Douglas, jr., W4ACB, and Mr. Harvey Campbell, W4EQR, were nominated. Mr. Douglas received 21 votes and Mr. Campbell received 16 votes. Mr. Douglas's term of office began July 29, 1949.

Section Emergency Coördinators of the ARRL Emergency Corps

The Section Emergency Coördinator is appointed by the SCM to take charge of the promotion of the ARRL Emergency Corps organization throughout the Section. He acts as the SCM's executive in the furthering of provisions for emergency amateur radio communications in every community likely to suffer in case of a communications emergency. One of the duties of the SEC is to recommend the appointment of Emergency Coördinators for the various communities in his Section. Does *your* town have an EC? If not, recommend the name of a likely prospect to the SEC. The SEC invites your questions concerning the status of the AEC in your Section.

ATLANTIC DIVISION				
Eastern Pennsylvania	W3BXE	Jack Du Bois	4105 E. Elbridge St.	Philadelphia 44
Maryland-Delaware-D.C.	W3EIS	Donald McClenon		Beltsville, Md.
Southern New Jersey	W2ORS	Charles B. Roop	201 Pavilion Ave.	Riverside
Western New York	W2SJV	Edward G. Graf	81 King St.	Tonawanda
Western Pennsylvania	W3MPO	Robert A. Blackburn	Box 2	Ingomar
CENTRAL DIVISION				
Illinois	W9QLZ	George E. Keith	RFD 2, Box 22A	Utica
Indiana	W9WNM	H. E. McClellan	R.R. 12, Pigeon Creek Blvd.	Evansville
Wisconsin				
DAKOTA DIVISION				
North Dakota	WØSSW/NRQ	John Glass	601 17th	Bismarck
South Dakota	WØHDO	Coy DeLapp	c/o Montgomery Ward Store	Mitchell
	WØGLA	Frank Mayer	511 St. Joe St.	Rapid City
Minnesota	WØBOL	Robert A. Prehm	108 West College	St. Paul
DELTA DIVISION				
Arkansas	W5EA	Leo V. Brians		Carlisle
Louisiana	W5KTE	James M. Coleman	6900 Louisville St.	New Orleans
Mississippi	W5JHS	Norman B. Feehan	Box 491	Gulfport
Tennessee	W4FDF	John A. Oliver	121 Mead Lane	Oak Ridge
GREAT LAKES DIVISION				
Kentucky	W4BEW	E. G. Leachman	1314 Maryland Court	Ashland
Michigan	W8GJH	Francis E. Gary	620 Thayer St.	Flint
Ohio	W8UPB	D. E. Cartwright	2979 Observatory	Cincinnati 8
HUDSON DIVISION				
Eastern New York	W2CLL	George W. Sleeper	76 Fuller Road	Albany 3
N. Y. C. & Long Island	W2OHE	P. C. Yeomans	1156 E. 40 St.	Brooklyn
Northern New Jersey	W2IIN	John J. Vitale	57 Sayre St.	Elizabeth 3
MIDWEST DIVISION				
Iowa	WØFP	T. J. Innis	R.R. 1, Lincoln Rd.	Bettendorf
Kansas	WØPAH	W. G. Schrenk	1528 Pierre St.	Manhattan
Missouri	WØVRF	O. H. Huggins	3605 East 72nd St.	Kansas City
Nebraska				
NEW ENGLAND DIVISION				
Connecticut	W1LKF	Peter R. deBruyn	163 South Marshall St.	Hartford
Maine	W1QUA	Percy R. Parker	125 Newton St.	Portland
Eastern Massachusetts	W1BL	Raymond E. Boardman	53 Thurston Road	Newton Upper Falls 64
Western Massachusetts	W1UD	Isaiah Creaser	76 Cortland St.	Springfield 9
New Hampshire	W1APK	Basil F. Cutting		Pembroke
Rhode Island	W1MLJ	Carl M. Getter	96 Oakland Ave.	Providence 8
Vermont	W1NLO	Burtis W. Dean	P.O. Box 81	Burlington
NORTHWESTERN DIVISION				
Alaska				
Idaho	W7IWU	Alan K. Ross	2105 Irene St.	Boise
Montana	W7CT	Leslie E. Crouter	608 Yellowstone Ave.	Billings
Oregon	W7HLF	Dwight J. Albright	Box 508	Medford
Washington	W7KAA	H. D. Weeden	Route 4, Box 174	Port Orchard
PACIFIC DIVISION				
Hawaii	KH6AS	John Keawe, jr.	714 Ocean View Drive	Honolulu
Nevada	W7JU	Ray Warner	539 Birch St.	Boulder City
Santa Clara Valley				
East Bay	W6OBJ	Omar Day	1441 81st Ave.	Oakland
San Francisco	W6DOT	Gene J. Pera	27 Gaviota Way	San Francisco
Sacramento Valley	W6KME	E. J. Schoenbackler	1622 Que St.	Sacramento
San Joaquin Valley	W6JPS	J. A. Ross	1910 West McKinley	Fresno
ROANOKE DIVISION				
North Carolina	W4KJS	C. E. Beard	2824 Bon Air	Winston Salem
South Carolina	W4ANK	T. Hunter Wood	Rt. 6, Box 690	Naval Base
Virginia	W4KDV	Fred S. Howell	15 Mitchell Rd., Cavalier Court	Hampton
West Virginia	W8FMU	Raymond L. Wardle	501 Pythian St.	Morgantown
ROCKY MOUNTAIN DIVISION				
Colorado	WØKHQ	O. E. Cunningham	Massachusetts St.	Eads
Utah-Wyoming	W7UTM	Floyd Hinshaw	165 East 4th North St.	Bountiful
SOUTHEASTERN DIVISION				
Alabama	W4MAB	Edgar R. Christopher	813 12th St.	Tuscaloosa
Eastern Florida	W4DQW	Robert E. Lowery, jr.	Box 879	Cortez
Western Florida	W4ACB	S. Monte Douglass, jr.	P.O Box 3	Tallahassee
Georgia	W4BIW	Byron Lindsey	2909 N. Fulton Drive, N.E.	Atlanta
West Indies (Cuba-P.R.-V.I.)	KP4ES	Pedro J. Piza	Box 2001	Ponce, P. R.
Canal Zone	KZ5GD	George C. Dunlap	Box 28	Balboa Hts.
SOUTHWESTERN DIVISION				
Los Angeles	W6ESR	Samuel A. Greenlee	1701 Sepulveda Blvd.	Manhattan Beach
Arizona	W7JPV	Howard Chambers	Route 4, Box 99	Tucson
San Diego	W6DUP	Raymond Wieveg	4081 Jewel Drive	Pacific Beach
WEST GULF DIVISION				
Northern Texas	W5AAO	James A. Lee	620 Cedar	Abilene
Oklahoma				
Southern Texas	W5GLS	George N. Sharp	3541 Federal	Pasadena
New Mexico	W5ZM/ZU	G. M. Sayre	New Mexico Military Institute	Roswell
MARITIME DIVISION				
Maritime (Nfld. & Labr. att.)	VE1FQ	L. J. Fader	125 Henry St.	Halifax, N. S.
ONTARIO DIVISION				
Ontario	VE3KM	T. W. Clemence	King St.	East Bartonville, Ont.
QUEBEC DIVISION				
Quebec	VE2SA	Gordon S. Waugh	802 Godin Ave.	Verdun, Montreal, P.Q.
VANALTA DIVISION				
Alberta	VE6MJ	Sydney T. Jones	Box 373	Edmonton, Alta.
British Columbia	VE7ID	R. O. Norman	8090 Main St.	Vancouver, B. C.
Yukon				
PRAIRIE DIVISION				
Manitoba				
Saskatchewan				

• 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, Jerry Mathis, W3BES — The Northeast Radio Club participated in its first Field Day. With the call 3PKV/3, located in Frankford near the city line, they ran two rigs at 30 watts. All W/VE sections except VE8 were worked. The best DX was G5WI. The operators were DYL, EER, KIW, MYL, NKU, NLL, and NOH. OYJ, of West Chester, has a BC-406 and a BC-645 on 420 Mc. Can any of the v.h.f. experts tell him if he could possibly work into Philadelphia? The Car-Le Radio Club, under the call 3TCC/3, made 135 contacts on Field Day with the aid of TCC, SNZ, HA, AIW, OWP, JPR, OP, and AVM. ASW is on s.s.s.c. at 3999.5 kc. and is doing his OO job from there. He reports that many of the 3.85-Mc. 'phones have sidebands over the edge. PST is a new ham in Germantown; he is rock bound on 7206 kc. EU is trying eight bay-stacked cones on v.h.f. CPV and KLZ made the Class A ranks. The Eastern Pennsylvania Net resumed Sept. 6th on 3785 kc. at 6:30 P.M. NHI's fine traffic total was made with 4 watts to a Hallicrafters HT-18. OCU now has 600 watts and enjoyed his first CD Party. He has 177 countries worked and 153 confirmed. NNV transmits ARRL Bulletins, c.w. and 'phone, on 28,904 kc. at 2 A.M. week days for those who work nights. EAN has his TBS-50 on 14 Mc. and worked an IS for a new country. AQN's York Emergency Net drills the 2nd and 4th Mondays of the month on 144,138 kc. It will be all over by the time you read this, but BXE has been assigned the temporary call of FQ8AB and will operate a week in what is generally known as FP8. He will QSL all contacts 100 per cent. The line forms to the right. Traffic: W3CUL 159, NHI 79, OCU 26, AQN 14, EAN 6, QEW 6, BXE 2.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA — SCM, Eppa W. Darne, W3BWT — The Mars Amateur Radio Society of Baltimore County celebrated its first anniversary in June. Organized by employees of the Martin Co., its membership is limited to employees of that firm. The Club owns several medium-powered transmitters, and has the call PGA. Ten licensed members are in the group, as well as 62 "ham-to-be" members, who are working hard for their "tickets." The licensed members made an excellent showing on Field Day, using the club call and equipment set up at Whitemarsh, Md. The Chesapeake Amateur Radio Club, at its July 5th meeting, featured Dr. Keats Pullen, who gave an illustrated lecture on "A New Method of Calculating Amplifier Gain and Distortion." At the second July meeting LXK and DXV discussed "Directional Antennas including Loops" with a 28-Mc. loop operation demonstration. The Club recently received its affiliation charter from ARRL. The Delaware Amateur Radio Club held a social meeting on July 7th with eats and door prize. The Club held a picnic July 10th at Riverview Beach Park with prizes, games, and gifts. The affair was thoroughly enjoyed by all present. The Rock Creek Amateur Radio Association's present officers are OBR, pres.; NXN, sr. vice-pres.; JQN, jr. vice-pres.; LQK, secy.; LYV, treas. The Club contemplates ARRL affiliation. The Washington Radio Club's July 23rd meeting was a rag-chew, get-together. EOV vacationed at Virginia Beach, made a lot of nice contacts with his mobile rig, and visited 4OM. BWT/AKB vacationed at Ocean City, N. J., along with DK and his XYL. GKP has made a number of contacts in the Midwest on 144 Mc. and also handled traffic on that band. LFG has been busy with Washington Radio Club code classes and picnic arrangements. EYX gets out well with his 28-Mc. mobile rig. His Collins rig is being rebuilt at the factory. EQK was visited by I1TZ, who contacted several Italian stations via Art's rig. LSX has her Class A "ticket." Traffic: W3EQK 23, BWT 13, NB 8, GKP 3, AKB 2, AKR 2, LVJ 2.

WESTERN NEW YORK — SCM, Harding A. Clark, W2PGT — SEC: SJV. RM: FCG. RUK and YRF are new OO appointees. TJK has made DXCC, retired the BC-610 from service, and is using a BC-474 with 15 watts. ZOL operates 28-Mc. 'phone while his XYL, BTB, who just received her ticket, operates on 7 Mc. Swing Shift and Eastern Shuttle Traffic Nets still are going strong with AOR, RUF, WNO, WZQ, and YGW taking active parts. QHH has worked his 111th KP4, and added two new countries with VR2BH and I1ALU/M1 with low power. WZQ's mobile rig works fine in the house but not so good in the car, but he still is plugging at it. AOR is getting out better with new 3.5-Mc. Zepp antenna 50 ft. high. 3SNJ is newcomer to Kenmore. ZHH is having splendid success running 30 watts on 3.85 Mc. with super modulation. RIZ, ex-8CSE, has three transmitters running on 420–450 Mc. and would like to hear from anyone interested in this band. QQ is back on 14-Mc. c.w. after a long period of inactivity. RUK would like to hear from anyone who is active on 220 Mc. WOE is building 3.85-Mc. mobile rig. BBO is a new ham at Syracuse University Trailer Camp. QEE, RUC, SJV, TBD, UHI, and ZRC furnished communications on 144 Mc. at New York State Motorboat Races held in the Niagara River. PGT has new YL operator — the second harmonic. The Cayuga County emergency gang held two tests with portable equipment on 3.5, 7, and 220 Mc. Which reminds me that the annual Simulated Emergency Test on a nation-wide basis will be held shortly after you read this. Are you prepared? RXM and his XYL spent vacation cruising aboard the yacht *Dutchess* on Lake Ontario and St. Lawrence River working maritime mobile and visiting several hams on the trip. QNA and NZH spend their time on 50 Mc. UTH's schedule with VE3ANT clicked 100 per cent during the month of July over a distance of 97 miles. UTH, UXP, FBA, ZHB, UAO, and NES enjoyed working in the 144-Mc. openings to the Midwest and all added several states to their totals. UXP had a 575-mile contact. Traffic: W2QHH 90, YGW 78, AOR 27, WZQ 15.

WESTERN PENNSYLVANIA — SCM, Ernest J. Hlinsky, W3KWL — During July CUM, of Butler, broke the old 144-Mc. DX record by working ØBIP in Elliot, Iowa, for a distance of 800 miles. We learn with sorrow of the passing of a real ham and friend, SJX. It is with deepest regret we report the passing of the wife of NUG, our Chief Route Manager. QN makes a splendid report on the gang up Erie way. The Conneaut (Ohio) Radio Club held a successful hamfest and picnic with over 300 in attendance. The youngest ham in Erie is 14-year-old PSE. WG will put on a radio-controlled model airplane demonstration. Through *Hamateur News* we learn of a new station, PRO, in Altoona. TXQ is enlivening 14 Mc. RYN heard RUE on 144 Mc. POZ has 9 states worked. QJM is t.v. operator at WJAC. Since becoming an ORS, BWL is heard pounding traffic on 14 Mc. LJS is looking for a car. RFM will be heard on 160 meters soon. LIV had a nice life history write-up in club paper, The Steel City Amateur Radio Club paper, *Kilo Watt Harmonics*, tells us NKM worked New Jersey on 144 Mc. VZA and PAP are installing 144-Mc. antennas. OMA, DNO, and UAK are planning 28-Mc. mobile. FCO is reported doing OK in a rest home. UHM is kidded quite often on his being a racing enthusiast. PAU won a four-year scholarship at the Univ. of Chicago. LKM is active on 7-Mc. c.w. TVG is working DX like mad with only a piece of wire out of the window. NDH was heard on 144 Mc. UVD makes his FB report. NGB has a single 4–125A with 300 watts. On 14 Mc. he worked KV4, SM, OZ, PAØ, and TA with this new rig. GJY reports Beaver Valley Club Field Day score as 5,706 points. BWL reports 7-Mc. DX FB with EA, G, DL, F8, CT, and SM all on 7028 kc. LSS says he had lots of fun in CD Contest. GEG has been appointed as Route Manager, replacing TOJ. New ORS appointments are BWL and NCD, brother of GEG. Heard on the recent openings on 144 Mc. were NKM, RUE, PGV, QCN, KQA, and QKI. Your SCM finally managed to work his first W9 on 144 Mc. with Wisconsin, Illinois, Indiana, Maryland, and Virginia for a total of 10 states for his 144-Mc. DX total. QCN worked his first W9, also KQA worked his W9 in Illinois and Indiana. Traffic: W3BWL 117, KWL 4, LSS 3, NCJ 2.

CENTRAL DIVISION

ILLINOIS — SCM, Lloyd E. Hopkins, W9EVJ — EBX reports TXN Net on 7150 kc. going good and operates Monday through Friday at 8 P.M. CDT. FRP has new Lib-

erty 33-ft. trailer coach. TAL is ready to devote more time as OO. EEK is active on TXN. We welcome to our section ØJNC, who will be heard from Franklin Park shortly. KJ returns to the air and got the call he had 25 years ago. YIX assisted KJ in getting skywire in place. NN says hot weather got the best of him this month. New hams in Joliet are HFO, GYZ, REA, CNP, KPC, and MFW. ODT has p.p. 813 on 28-Mc. n.f.m. DO has been heard on 28-Mc. 'phone. TLT is interested in OO work. WEA is moving to new QTH after the landlord cut down all his antennas. In the meantime Clyde went mobile. (You can't stop these guys!) SYZ reminds us that ILN is scheduled to start again on Sept. 6th. BON says he is winning prizes and having fun with mobile rig. BRX was on duty at WMAQ when 490-ft. tower collapsed and he thought sudden thunder shower had come up. Em says they shifted to emergency antenna in 1½ minutes. JMG is now settled on deep south side of Chicago. HKA is operating portable from Mackinaw City, Mich., for the summer with 45 watts to 807 on 3.85-Mc. 'phone. BPU reports AML/9 had a dandy Field Day. OOH has new 32V-1. CFV is sporting new Stancor job. MRIF's XYL is in the hospital for an operation. AMP, MMH, and MRT are now mobile. IUF has set up private practice of medicine in Skokie and returned to the air recently. Good luck in both undertakings. Ralph. OLU is kept busy as business manager of All-American Girls Baseball League. LIG, KDP, UFF, UTG, and IFA are new ECs. IQC had lightning get into his receiver. YBY is burning up the 144-Mc. band. PBY and ACJ visited ZHB who knows how to do things on 50 and 144 Mc. HKI is active on 28 and 56 Mc. JVC is chasing DX on 14-Mc. c.w. HCP is hunting them down on 7 Mc. Last time YNE was heard from he was heading northwest for a two-week vacation. TLC has become quite a photographer. 8TBP visited the SRRC gang recently. The Society of Radio Operators and the Midwest VHF Club held very successful picnics the last two Sundays of the month. Traffic: (July) W9EBX 591, EEK 82, HKA 13, FRP 4, SYZ 4. (June) W9DUA 16, EEK 14, SYZ 9, BPU 4. (May) W9SYZ 22.

INDIANA — Acting SCM, Wilber E. Monigan, W9RE — The Michiana Amateur Radio Club at South Bend is now located at the local Red Cross Headquarters. A 28-Mc. transmitter is installed for local control. An elaborate emergency set-up is being organized. Code classes are going strong. DPS is MARS NCS for Indiana and Michigan. It is suggested that all eligible stations contact him. EQN has moved his transmitter upstairs. He needs Alabama, Florida, Idaho, and Nevada for WAS. Send your activity reports in, fellows, and we'll try to run an interesting report for you. Traffic: W9BKJ 77, EQN 30, RE 21, PAP 14, GQM 10.

WISCONSIN — SCM, Reno W. Goetsch, W9RQM — The 'phone net (BEN) meets daily at 6 P.M. on 3950 kc. The c.w. net (WIN) meets Mon. through Fri. at 6:30 P.M. on 3775 kc. With the fall operating season at hand, plan now to participate and devote some time to organized operating activities. CWZ renewed EC appointment. A new addition at FCF's is an HT-18 VFO. New calls at La Crosse include HRL and HPJ. OGT is playing with t.v. A theory class for beginners is being conducted by LKL at La Crosse. SFL reports things are pretty quiet. In addition to WIN activity, PM also works 144 Mc. regularly. YCV put his rig into two 28-inch cabinets, with a mobile rig as the next project. HDZ has VFO on 3.5 and 7 Mc. and also works 160-meter 'phone. EIZ is off to a good start with his first listing as OO. M. & M. Radio Club held its 2nd annual picnic at Henes Park July 24th. NYS has a new jr. operator. CFT can be heard on 28 Mc. with 32V-1 and new beam. ERZ needs Iowa for WAS on 28 Mc. QJW stayed up until 4:30 A.M. to work VK2 and 7. HIR is a new call at the Rapids. CWK has been using 50-Mc. gear to control model aircraft. After a wait of two years, WEN received his card from YR5J to make 70 confirmed. CIH says the OO business was poor this month and it looks like the boys are becoming frequency conscious. KXK plans a new 14-Mc. beam. ERW has 16 watts on 7-Mc. c.w. ESJ has been working over the modulator in his mobile rig, which operates on 4- and 28-Mc. 'phone. JBF leads in WVRA's 2-meter contest with 4 states worked on 144 Mc. and numerous contacts over 200 miles. LZU, our SEC, is moving to New Jersey and probably will be heard as 9LZU/2 by the time you read this. CTD's DX now totals 95 countries, with only 20 watts power. At HEE's we find a new HRO. A VHF-152 converter has been added at CGO's. Traffic: W9ESJ 263, HDZ 21, YCV 21, PM 17, EIZ 11, FCF 10, CBE 9, CWZ 8, LVR 8, IQW 6, IWT 6, MUM 4, DND 3, SFL 2.

DAKOTA DIVISION

SOUTH DAKOTA — SCM, J. S. Fossberg, WØNGM — SECs: HDO and GLA. RM: GCP. Rebuilding time finds JFS rehashing his final and also a vertical antenna 66 feet high. YJO, VT, and NGM are heard on 14-Mc. 'phone quite consistently. It seems that the news of the State is practically nil and it makes the reporting extremely difficult. ZIQ is passing cigars out to celebrate the addition of the second jr. operator in his family. RWE purchased AKX's beam. GKU is gathering parts for a 150 final driven by a Meissner; RRN is doing the same, plus building a converter. GWH has headed north to the border to assume his duties as a custom officer. He does this every year. CRY is back in Sioux Falls after finishing service with the USNR and now has his WAC on 'phone. BJH is a new bridegroom. The XYL says that he can have a corner of their apartment for the rig. Is the little Jim Dandy B.C.I. Eliminator Corp. still in Sioux Falls?

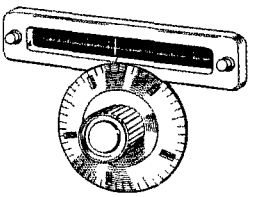
MINNESOTA — SCM, John B. Morgan, WØRA — Asst. SCM, Jean E. Walter, ØKYE. SEC: Robert Prehm, BOL. 108 College Ave., St. Paul 2. Please send Bob your AEC membership applications promptly, so we can get squared away for the winter as soon as possible. ZWW gave an excellent talk before the last meeting of the St. Paul Radio Club on the subject of "Pulse Techniques in Modern Electronics." The St. Paul Club turned in a spectacular performance in keeping the Press tent up-to-date during the playing of the Western Open Golf Championship. Four 144-Mc. transmitters, and four walkie-talkies lent by the Army, were in use from various points of vantage. During the last day's play the relays to the Press were on a stroke-by-stroke basis, and were the reason why the Press Associations were able to keep their releases so close behind the actual playing. The St. Cloud Radio Club picnic on July 17th turned into a three-state convention. Held at Sauk Rapids, near St. Cloud, the program included baseball (St. Paul trimmed Minneapolis Club), games for the kiddies a hidden transmitter hunt, lots of ham chit-chat and some swell sunburns. CWB visited the Duluth gang and amazed everybody by displaying a "Paul Bunyan" facial. Every man in Walt's town had to grow one or pay a penalty. HZQ has moved to St. Paul. NRV broke radio silence by unlimbering his Meissner on 28 Mc. BWE got his release from the sanatorium. Congratulations from us all. OM. EPZ is visiting California. The Arrowhead Radio Assn. has a hidden transmitter using 1G6s in the final. It is so small even the operator has trouble finding it. The Rochester gang is planning to give the rest of us a run for our money in the Simulated Emergency, using master control which is permanently set up in the Red Cross Headquarters, and three mobiles. FID and NOD are both sporting "W6OWP" electronic keyers and are pleased with their operation. BGY has been keeping the State nets rolling during the summer. Nearly every net schedule sees several mobiles checking in. Traffic: WØUCV 51, AA 24, RA 6, EHO 4, FHH 2.

DELTA DIVISION

LOUISIANA — SCM, W. J. Wilkinson, jr., W5VT — KTE reportedly is active on 7 Mc. during the summer. By the way, Jim still is EC for the section and will appreciate a line from you if you are interested in emergency operation. CEW recently worked EA8MC and PK4DA for his 144th and 145th countries. 6CHA/5 has been doing a lot of traffic work for the past couple of months. KYK has a new Millen VFO and says he is glad to get away from the crystals. NGN is keeping schedule with 4PL and ØQXO on 7 Mc. QHF is new call of 4OHJ/5. DXL has moved across the river. PUF and PVE are new hams in Monroe. PEP is working for KNOE. GMD has moved to Natchez. MBE has applied for membership in the Emergency Corps and his form has been forwarded to the SEC. CGC has received his DXCC certificate for 100 countries. WN is looking for contacts on 160 meters. Well, news is still very scarce so most of the boys and gals must be in the old swimming pool or fishing again. Consequently not much in the old column this month. Hope to have more next time. Traffic: (July) W6CHA/5 376, W5NGN 69, KYK 28. (June) W6CHA/5 105.

MISSISSIPPI — SCM, J. C. Wallis, W5DLA — New OOs: DNV and OKQ. DEJ, CUU, and DNV are devoting lots of time to 144-Mc. gear. DNS has returned home from C.A.A. School in Oklahoma City. NNZ has super-modulated rig on the air. ZVO is getting set up in that new shack. HAV should be in his new shack by now. LPL is visiting on the Gulf Coast. Bulletin 198 from Headquarters reports 144-Mc. record equalled by JTI. KYC's much-publicized kw. rig is ready to go on the air. The first time Kirk tested the rig was when the South was thrown into darkness. (The cause was discovered to be magnetic storms.) The Hattiesburg Club has voted to affiliate with ARRL. MUG is on 3.85 Mc. with 813s. FGE and NCV are on 14-Mc. 'phone. NWB made WAS. PDM received MARS call. MRH is building rig. The Hattiesburg Club, FGE, pres., is sponsoring a request to the State Legislature for recognition of amateurs regarding auto tags. Traffic: W5LPL 7, JHS 6.

TENNESSEE — SCM, Ward Buhrman, W4QT — FLS completed overhauling 14-Mc. beam and hopes the new paint job will attract some rare DX. ZZ and FEI are helping QSL Manager DDF distribute cards each week. LCB is occupied with reworking his antennas and taking care of new jr. operator. LUH and PKJ are new Nashville calls. NNJ is enthusiastic regarding National Traffic Plan. BAQ and BD renewed ORS appointments. A number of other appointments are in need of endorsement. IIY is constructing new exciter. MRD is having B.C.I. trouble. DIX is reconsidering 144-Mc. activity. PBK has new receiver and is making plans for more power. EEA is working on an 813 rig. MZK is giving the quad a try on 28 Mc. FLW submitted nice photos of Field Day at Portland, Tenn. PMR, in Johnson City, is candidate for the title of youngest ham in the section. The Kingsport Club is leading the section



IF YOU HAVE BEEN a regular reader of this page, you will recall that from time to time we have invited you to write us outlining the features you would like to have in your ideal receiver. These invitations have been accepted by a great many of our readers and their letters have been of invaluable assistance to us in designing receivers and other products, not only for amateur use but for commercial applications as well.

As might be expected, quite a few of the ideas presented to us have not been practical for inclusion in a manufactured receiver. On the other hand, many of the schemes proposed have had very definite merit and we have many times chafed impatiently when circumstances made it impossible for us to take immediate action on them. All of the suggestions, practical or impractical, have been helpful for they conveyed the story of what was wanted by the ham fraternity, thus providing us with a goal toward which to strive. The wisdom of asking for and heeding your ideas has been amply proved by your substantial acceptance of the NC-57, NC-173, and NC-183.

The well-known HRO, originally introduced in the middle 30's, was developed to meet the amateurs' requirement for a precision receiver. The HRO was so far ahead of its time that it is still a favorite and, while it has been modified in recent years in keeping with modern trends, the straightforward design and performance features which have endeared it to the critical operator have been retained intact.

Now, no receiver has ever been built that had everything every amateur wanted, but very shortly we are going to announce a receiver which will have an awful lot of what an awful lot of the boys want. Even if you are not in the market for a new receiver at this time, we are sure this new one will interest you and complete details of it are yours for the asking — immediately after the advertising breaks in next month's *QST*.

To sum up, in buying a new receiver the outstanding point among many that should be borne in mind is: "you gotta hear 'em in order to log 'em!" W. A. READY

with its excellent emergency plan. Traffic: W4PL 906, NNJ 8, PBK 6, BAQ 2, LCB 2, FLW 1.

GREAT LAKES DIVISION

KENTUCKY — SCM, W. C. Alcock, W4CDA — Activity was light for the month (July) with most of Kentucky riding out the heat wave, although five hardy souls turned in traffic reports. MKJ added Virginia and Missouri to states worked on 144 Mc. MWX is working to improve break-in system. He has a new Clapp-type oscillator frequency standard that is stable-plus! The Ohio River Valley Net drills once a month; if interested, contact 8UPB. MEY has 450 watts on 7 Mc. The KYF Net, 7200 kc., did fine with MWX, MEY, NWQ, YPR, JRA, and NZH keeping it going. JCN was on the KYB and KYP Nets this summer. EDV was bothered by the heat. TXC kept KYP Net going during the hot spell. It operates at 7 A.M., Monday through Friday. CDA is catching up on DX on 14 Mc. BAZ is anticipating better coverage on KYN Net (3600 kc.) when it opens in the autumn. FKM still is recovering from a fall and should have the brace off his back now. He needs to repair speech amplifier and put up antenna that blew down. FBJ built a 220-Mc. receiver and now is working on transmitter. KRY is newcomer on 144-Mc. net (KYX on 145.8 Mc.). So is NKQ. BPE is QRL. He got married. JRA has new grid-dip oscillator and says it's most versatile gadget in his shack. All ham clubs should notify the SCM of mailing address, or QTH of secretary, and keep us up to date on their officers. Traffic: W4TXC 10, MWX 9 JRA 5, EDV 3, MKJ 3.

MICHIGAN — SCM, Robert B. Cooper, W8AQA — Asst. SCM c.w., Joseph R. Beljan, 8SCW — SEC: GJH. PAM: YNG. RMs: GSJ, NOH, and UKV. New appointments: TTY as Asst. SCM for Upper Peninsula, CVE as OO Class IV, HUD as OO Class I and III, and ERB as EC for Houghton and Keweenaw Counties. COW, FLA, SWF, NQ, TZD, MCV, DYH, and MF are getting back into the swing of things. The hamfest at Laurium proved to be far more successful than was expected by even the most optimistic. Sincere congratulations for a job well planned and carefully executed. The Sault Ste. Marie gang is losing a valuable asset in MEV and the best of luck to him in his proposed work at Northwestern in Evanston. A serious question has been raised regarding an organized mobile club in the Michigan section. Who is interested? WO reports very satisfactory results on 144 Mc. during the Ecorse Park Rowing Races. EFY, located in the referee's boat, followed the racers, and BJZ, operating from the Police Patrol Boat, contacted DKK and DTA, who relayed the results directly to the shore crowds. WXO has been liaison station for local vacationers in North Woods along with keeping schedules on KXL Net. LTD establishes some sort of a record in getting his 813s screen grid modulated after eight months of tough luck in the trial and error process. ZWM assumes an important rule in the Naval Reserve Electronics Unit at Traverse City. ABQ has his 1st-class 'phone commercial ticket and is ready to really get to work. OAF, in Petoskey, continues to be the regular outlet for the resort traffic in that area. QFF and T.V.I. are still at odds but he hopes to master the situation soon. NKK has changed QTH but reports no satisfaction from the results in the new location yet. BLR reports the QMT Net on 28.8 Mc. Saturday evenings will welcome contacts for traffic or rag chews as the demand exists. UKV assures the organization of his coöperation through TLS in the National Emergency set-up and is in accord with the National Traffic Plan. FX has been heard on 3930 kc. with A3 emissions and is doing a nice job. AYV is using the vacation time to rebuild his transmitter. RJC had a series of mishaps with the rig which finally resulted in a power transformer failure and finds it difficult to keep schedules with low power. However, he made BPL on deliveries again and was high traffic man this month. NOH also made BPL on deliveries. Traffic: W8RJC 235, NOH 164, TRN 130, LR 23, AQA 19, CPY 19, ABQ 13, YNG 12, UGD 11, ZHB 9, OAF 5, YMO 5, WXO 4, MGQ 3, BLR 2, CRH 2, ZWM 1.

OHIO — SCM, Dr. Harold E. Stricker, W8WZ — Asst. SCMs, Charles Lohner, 8RN, and C. D. Hall, 8PUN. SEC: UPB. PAM: PUN. RM: PMJ. Your SCM attended the Miami Valley Radio Club picnic at Piqua on the 7th at which 175 were registered. We welcome the Scioto Valley Amateur Radio Club from Chillicothe into ARRL. New appointments are ICC as OO Class 4, and EXI as EC for Akron and vicinity. From the *Q-5* of the Springfield Amateur Radio Club: VFV was speaker at the Club's August meeting. He is actively engaged in the formation of the new Navy unit similar to MARS. The Club held its first picnic July 24th at George Rogers Park. OKB and BLN were the horseshoe pitchin' champs. AUP has received his 30-w.p.m. Code Proficiency certificate. CDT now has 167 countries confirmed. From the *Carascope* of the Columbus Amateur Radio Assn.: JHE had his car broken into and his mike stolen and the antenna ripped out. CPA received his Class A license and is the Club's picnic chairman. ABO has just finished a 522 CC and VFO that is one fine piece of gear. From *The Mike and Key of Greater* Cincinnati Amateur Radio Assn.: TJM has received his DXCC for 'phone. BHW has 209, JIN 198, FGX 175, and BTI 162 countries worked. KZT is calling for 50-Mc. activity. From the *Voice-Coil* from Youngstown and vicinity: The Mahoning Valley Amateur Radio Assn. met again at Mill Creek Park, Youngstown, on July 14th. There was quite an array of mobiles lined up and two visitors were present — DBU and KGD. ADX and ZCX worked mobile to California and back to Niles. BOD is in Kansas City and has a 28-Mc. rig on the air. BCJ is rebuilding his beam rotator. AI is now ILV. ELN is a new ham in Fremont and works 3.5 Mc. ICC received his WAC and has put his 14-Mc. beam up to 50 feet. IVC lost most of his equipment because of basement moisture. EIB has a new Collins 32-V transmitter. QAD has 107 countries now. JFC is rebuilding. TKS is getting set for BN. WAB is on 144 Mc. now and has a six-element beam. ROX worked the MacMillan Expedition. W2OXE/MM, with the help of AZ. DAE has been reporting in to TO and ESN and ran up the top traffic total for this month. RY and OHW are building 10-20 beams. PNJ is getting a t.v. set and says he will take it easy. TAQ added 7- and 14-Mc. folded dipoles to his antenna farm and is on low power. LBH has raised both his 50- and 144-Mc. beam to 32 feet, and has WACA and 36 states on 50 Mc. BZX has new BC-459. DGG has built a "portable" transmitter with an 813 in the final. K8AIR, at Wright Patterson Field, is putting up a new three-element 14-Mc. beam. The Cleveland Area Council of Clubs held a picnic on August 7th at Harmony Ranch with a good turnout. JNF has proposed that amateurs be given a special license tag for their automobiles. A groundwave contest was held on September 10th in Cuyahoga County. WRN states that 144 Mc. has been hot. I know that to be a fact as I was there and heard stations from Maryland, Illinois, Indiana, Wisconsin, Pennsylvania, and other states. CPA has a twelve-element beam on 144 Mc. WRN now has 12 states and is looking for more. I have been kidded that the boys haven't heard me in any CD Parties. I have been there but have never sent in a score. I will make a mental note of that and see what can be done about it. Don't forget your monthly station activity reports. Kindly look at your certificates, and if they are due for endorsement, send them in for signing. Traffic: W8DAE 75, RN 31, EBJ 28, WE 16, EQN 14, WAB 11, YFJ 9, ROX 7, AQ 6, BCJ 6, DXO 6, CBI 4, BUM 3, FFK 2, PNJ 2, QIE 2.

HUDSON DIVISION

EASTERN NEW YORK — SCM, Fred Skinner, W2EQD — SEC: CLL. PHO put in 13 hours in the CD Contest. WIK has new NC-100ASD receiver now and is working some 3.85-Mc. 'phone. LRW is DXing and is now up to 82 counties. Marce has been looking at t.v. test pattern so much it is getting burned into his eyes. 9ESM/2 just returned from Korea, where he operated J8AAA and HL1AA. He is stationed at West Point and has lots of cards left in case any of you worked him and failed to get a card. CLL logged 14 stations for operating and signal discrepancies and sent them OO notices. George is doing a fine job getting the Eastern New York AEC into shape. How about helping him by contacting your County EC to find out where YOU can fit into AEC plans? GTC has been appointed Asst. EC for Schenectady County. AWF has been using emergency rig daily while camping at Tupper Lake. HCS is getting T.V.I. licked. RMM gets out better with 35 watts than with a half-kw. See what happens when you don't burn out the other fellow's antenna coil? FEN is experimenting with new type of antenna coupler with the aid of a beautiful new homemade grid dipper. JQI says to be careful of pink tickets if you start chasing the Russians. QUJ is new OO appointee and hopes to get new rig going for fall season and then get ORS appointment. EQD has been operating 3.85-Mc. 'phone and 7-Mc. c.w. as a portable near Brainard over week ends; power input 450 watts. (Who said PORTABLE?) Traffic: W2EQD 134, CLL 100, LRW 33, PHO 25, TYC 8, WIK 1.

NEW YORK CITY AND LONG ISLAND — SCM, Charles Ham, jr., W2KDC — As all of you probably know by now, George Cooke, 2OBU, has taken over as SCM. This report is the last effort of the retiring SCM, 2KDC. It's been a great job, gang, and you've all coöperated wonderfully. Keep it up with George and let's make this the best section anywhere. Some unavoidable delays will occur in certificate-issuing so please be patient until George gets the paper work ironed out. LGK, who is supplied by reliable Consolidated Edison, found out that a power failure can happen here. On July 13th the voltage dropped to 80 volts and Joe set up the emergency rig just to prove he could do it. After contacting TJA in Forest Hills (another AEC Net member) he discovered the trouble was fairly local and was caused by a fire nearby for which his son had turned in the alarm. So let's all keep those portable batteries and rigs handy. VRC reports the Amateur Radio Society of Queens has 15 members, including AZN, BID, YHB, ZKK, and ZXQ. AZN is supplying code practice on 3850 kc. at 2030 Monday through Friday. WHB is taking a couple of weeks off in New Jersey getting ready for college in the fall. LPJ is building an 813 final. VSU is handling much summer traffic. VAF is moving and building. TYU can't quite make BPL. RTZ/2 moved the little 5-watter to a new location in Quogue. Hope is thinking of giving up radio for motorcycling. OBU is working out a traffic set-up for the Hudson

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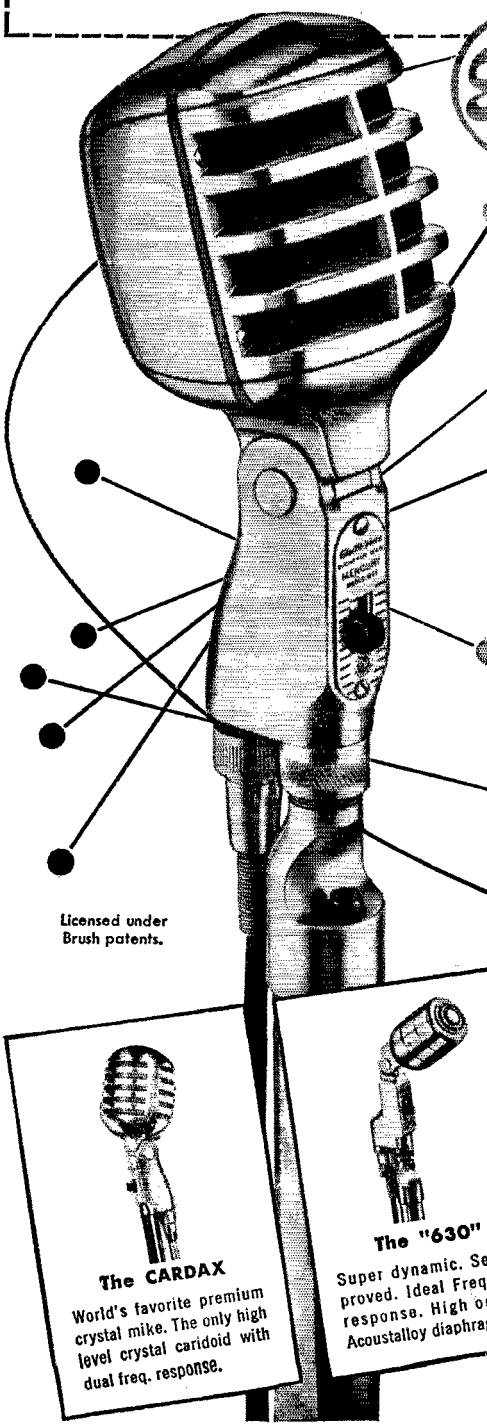

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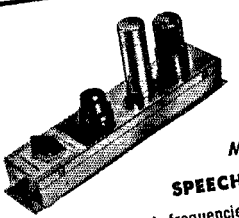

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Division Convention. YDG built electronic key. PF is back from Puerto Rico. Dave eliminated T.V.I. on 7 Mc. and somewhat on 14 Mc. KDC built new radio room on house during vacation and hopes to be doing some terrific operating now that the paper work load is being relieved. So 73, gang. You'll be hearing from George here next month and I hope to see lots more of everybody on the air. Traffic: W2TYU 381, VNJ 221, VSU 118, OBU 57, LPJ 30, PF 9, TUK 8, RTZ/2 7, GG 2.

NORTHERN NEW JERSEY — SCM, Thomas J. Lydon, W2ANW — SEC: IIN. RMs: CGG, KUS, NKD. PAM: DRA. The N.N.J. c.w. net meets Monday through Saturday on 3630 kc. at 7 P.M. The J.N. Net, which is now under the direction of KUS, meets Monday through Friday at 9 P.M. on 3630 kc. The New Jersey 75-meter emergency 'phone net meets Sunday at 9 A.M. LFR has resigned as RM on the J.N. Net. We all thank Hal for the splendid job he has done with J.N. during its first year of operation. 4NLA/2 is now ZVS with an eight-element 28-Mc. beam in Montclair. BRC put up new antenna and operated in July C.D. Party. ZEP has new receiver and is now QNI SSN. CWK is Class A. He worked LU and PY on 3.5-Mc. c.w. ZTW operated from his summer home in Rhode Island during June and July. HIH has low-power 160-meter 'phone rig. OXE/MM, with the Schooner Bowdoin, makes BPL. VQL is back on 28 Mc. after erecting new antenna pole and repairing rotator. New appointments include NIY as OO. Traffic: W2OXE/MM 543, KUS 126, NKD 65, CWK 58, EWZ 57, OXL 17, HIH 16, ZEP 14, LFR 12, CJX 2.

MIDWEST DIVISION

IOWA — SCM, William G. Davis, WØPP — On July 28th the Cedar Rapids gang met and started a club, electing YDX, pres.; GIM, vice-pres.; ICQ, secy.; FYF, treas. There were 42 present, including KTQ, Alternate Director of the division, who presided as temporary chairman during organization. PP was there for a short talk after work was done. The Manilla picnic was a great success. There were 102 present and a good time is reported by all. WMU, like a lot more of us, reports "not much activity." KØWAD now is a member of AEC. LKK reports he has an 829 on 144 Mc. and is getting much better results. AUL visited Waterloo hams July 13th and says he had a whee of a time. HMM reports that he's too busy taking up the slack that resulted when he was knocked out by 440 but says he'll be back in there slinging traffic come fall. 9RCB came over to the zero district and married the c. w. net's only YL operator, PTQ, and carried her back to South Bend, Ind. Congratulations, kids. FP is all wrapped up in t. v., literally. The Iowa 75 picnic was held at Ames, Aug. 21st. SWI is moving to Waterloo. VRD forwards the Club's address. Kinda cheating this time as PP took off for a vacation in the Rockies the morning after this report was written so a few of you who got your reports in later are going to miss this issue. Hope you'll forgive. We'll try to satisfy all concerned after we get back. Traffic: WØIHMM 93, NYX 21, SCA 17, LKK 12, WMU 12.

KANSAS — SCM, Earl N. Johnston, WØICV — UKH, who got ticket in May, has an NC-200 receiver. IYR reports CKRC active on Field Day with all-band rig making 108 contacts in 31 states and three VE districts. CKRC now is affiliated with ARRL. TSR has worked twenty-three states with 25 watts and cubical quad antenna. INW has moved to Salina. ISC (XYL) is on 28-Mc. 'phone, as is ICL. PKD has 43 states on 50 Mc. MVG has four-element beam on 50 Mc. IZJ reports CTM and TAP moving to Paris, Tex. OUU has 110 emergency supply. LIX is building all-band field strength meter. BNU and NXJ are on low-power 160-meter 'phone. LYF is putting up new A frame. KXL reports new hams are WAI, with 25-watt tuning unit NC-57 receiver, WJI, WMQ, who has Collins VFO, 400-watt Globe King 10-20 beam, and VEU, using Command transmitter and receiver on 7 Mc. KXL says Missouri "Show-me" Net is on 7222 kc. at 1600 each Sunday. KVRC, Topeka, furnished emergency communication and power for Red Cross at Lake Shawnee for All Sports Festival July 11th on 29.5 Mc. NCV set up control station (CET) 60-watt Meck with HQ-129 at Red Cross Headquarters. UPU had 30-watt station at one First Aid station, and OZF and WGM had 60-watt Meck and NC-183 at other station. ECF, ICV, KRZ, and ZMC mobiles escorted Red Cross mobile units. Code classes held by KVRC members over KØNRZ will resume schedules Mon. through Fri. 1900-2000 CST on 29.5 Mc. Sept. 12th. KVRC members ABV, GPR, HMF, HOC, KRZ, TPF, HIK, UPU, and WGM will conduct the classes. Traffic: WØNIY 37, ICV 6, LIX 5, KXL 2.

MISSOURI — SCM, Ben H. Wendt, WØICD — Hams from other sections have been complaining to this office about poor operating practices of some of our Missouri hams. If we all would take the time to study the ARRL booklet, *Operating an Amateur Radio Station*, maybe these complaints would not come in. NIP has requested to be relieved of the Net Control assignment on the Missouri Emergency Net. ICP has been selected as his successor. A visit with Branson, Mo., hams, portable operation on 3.5 Mc., vacuum-tube keyer going up in smoke, and the rebuilding of same were all part of the activities engaged in by OUD. DX and traffic are the chief interests of PME, formerly D4AGC, now at Fayette. WAP is having success in handling 7-Mc. traffic with 125 watts to an antenna just 12 feet high. QXO likes 5:00 A.M. contacts for traffic-handling, but finds too few fellows on at that hour. QMF likes Q5-ers made from BC-453s. If you like chess, contact NNH. ZZB is looking for contacts on 144 Mc. as he goes mobiling in South Missouri. CZI held a successful meeting with Boy Scouts. The rig worked fine and traffic was handled smoothly. CEX and ZZB are working two way on 420 Mc. and are trying to bridge the 20-mile gap to PTG. The Missouri Emergency Net picnic was attended by 105 hams. OUD is revamping the rig. GNX is making plans for a table-top VFO rig. RMX is rebuilding complete rig, and PTG is rebuilding on 28 Mc. New hams: VFN, Wyatt, and KØFAK, National Guard at St. Joseph. OMG is busy handling DX traffic. GNX and ZAO, Popular Bluff hams, visited with OMF and PTG. Appointments and renewals. ORS — YSS, WAP, OUD, and DU. OPS — PTG and QMF. PAM — ICP. OES — QMF and PLJ. ECs — OMG, PTG, and ZZB. Traffic: WØQXO 266, PME 130, WAP 80, YSS 71, ICP 27, DXW 23, DEA 13, PTG 10, ICD 5, OMG 4, QMF 4, SOM 4.

NEBRASKA — SCM, William T. Gemmer, WØRQK — VEC says, "Milford QRM Club went picnicking at Pioneer Park in Lincoln. DMQ has new 75A. HXH is moving to Staplehurst. WGB is proud father of a baby girl. HQQ operated fixed portable at Estes Park while vacationing. LTE is installing television antennas. RDN will teach school at Curtis." Thanks, Bob. FHA informs us of the passing of another Chadron amateur, UGK, who recently joined the amateur ranks at the age of sixty-odd years. Chadron now is represented on the air by HBQ, who has a Globe Trotter which soon will be used as an exciter for higher power, and FHA, who is getting ready for his Class A exam. Thanks, George, for keeping us up to date on Chadron news. AY is on 14 Mc. rag-chewing and DXing because of summer QRN on 3.5 and 7 Mc. GMZ is checking in the TXN Net regularly on 7150 kc. at 7 P.M. CST Monday through Friday. Thanks, Port and Sewall, for the tidbits. BBS sent in 101 confirmations for DXCC. IAJ, after a layoff of 25 years, is traffic-hunting on 7 Mc. with push-pull T55s and BC-348 feeding a folded dipole. Brownie thinks the neighbors will be committing him to an institution if he doesn t quit "peering through gaps in trees and looking around cautiously afterwards" trying to find a suitable location for a folded dipole for the fall season on 3.5 Mc. Summer QRN, vacations, rebuilding, and 50-Mc. work sure make it hard to collect information from you fellows. DNW has worked 41 states on 50 Mc. and RQK reached a total of 22 this summer. Traffic: (July) WØGMZ 21. (June) WØGMZ 2.

NEW ENGLAND DIVISION

CONNECTICUT — SCM, Walter L. Glover, W1VB — As this is being written the hottest days of the year are here, as is also the usual summer slump in activities, but by the time this is read it is hoped cooler weather has brought on ambitions for a full winter season. George Hart has released his plan for a complete traffic system, and it is hoped all the traffic hounds in the section will dig in to make it a success. IIN has been appointed manager of the Eastern Area Net, and has announced that operations will start on Oct. 3rd at 2030 EST on 3705 kc. The SCM wishes to

(*Continued on page 72*)

CONNECTICUT QSO PARTY

October 29, 30, 1949

All Connecticut amateurs are cordially invited to take part in a QSO party to be sponsored by the Connecticut Wireless Assn.

Rules: 1) The Party will begin at 6:00 P.M. EST October 29th and end at 11:59 P.M. EST October 30th. 2) Any and all amateur bands may be used, and either phone, c.w., or both. C.W.-to-phone and cross-band contacts are permitted, but no extra credit is allowed for such QSOs. 3) The general call will be "CQ CN" on c.w. and "CQ Connecticut" on 'phone. 4) The same station may be worked but once regardless of band. 5) Exchange names of towns or cities. 6) Score 1 point per contact; multiply contact points by number of towns or cities worked for final score. 7) Reports must show times of QSO, call of stations worked, town or city area of station worked. All reports must be postmarked no later than November 15th and should be sent to R. M. Smith, W1FTX, RFD 1, Granby, Conn. 8) Prizes will be awarded to the participants submitting first, second and third highest scores. All decisions of the C.W.A. Contest Committee will be final.

Here is an opportunity to see how many Connecticut stations you can work in a 24-hour period. Get on the air October 29th and 30th and meet the gang around your section!

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"Ruggedized" tubes are being developed for military use for maximum resistance to shock and impact. What's more, graphite anodes resist shock and distortion under impact and will not generate unusual microphonic or harmonic conditions. *The 838W Tube with the Speer Graphite Anode, shown above, has over 10 times the impact resistance of ordinary tubes.*

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200% to 300% higher power rating over metal anode tubes. That's due to the higher radiation emissivity and conductivity of graphite.

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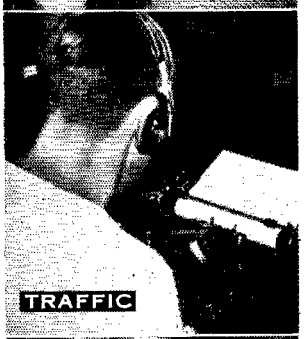
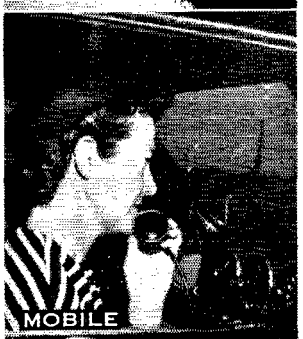
acknowledge receipt of copies of the new news sheet, *Message from MARS*, published by the Mattatuck Amateur Radio Society of Waterbury. Nice going. The club also is sponsoring an exhibit of amateur apparatus at the Bethlehem Fair in September with transmitters on 3.85-Mc. and 28-Mc. 'phone in operation. RVE has been portable/2 for the summer but now is back at the home station. BDI has been working mobile while vacationing in Maine. CUX reports 150 countries with 136 confirmed, running 750 watts. Ex-7YG now is SBA in Southbury. UGX is rebuilding. BIH announces a new jr. operator born on July 15th. QAK reports into the SSN. SJ is planning a rhombic. AW now uses a pair of 75THs on 50 Mc. BVB has licked his T.V.I. problems so is all set for the new season. Traffic: W1IIN 436, AW 177, RWS 82, BIH 50, BDI 26, BVB 24, QAK 22, KV 17, CUX 8, CTI 7, HYF 7.

MAINE — SCM, Manley W. Haskell, W1VV — NXX, our RM, says, "The Pine Tree Net will be in full swing in accordance with the new ARRL traffic system on October 3, 1949, with the following schedule: Mon., BWR; Tues., NGV; Wed., LKP; Thurs., NXX; Fri., OIL. These men will be NCS of PTN and report into the Regional Net." NGV's 250-watt final with a 813 tube is about finished. Active duty with the Naval Reserve cut into his operating time for the month but he came up with a total of 47 nevertheless. He states that BWR has moved to Augusta and will be on the PTN this fall. IOK and BIG were on the Naval cruise with NGV, making a Maine unit. LKP heads traffic list with a grand total of 176 for the month. How he does it is beyond the rest of the gang. Maine is almost a dead end for traffic at best and in the summer the amount of traffic normally is a trickle. More power to him. BDV, at York Beach, has 4 watts for c.w. and 3 watts for 'phone, yet he works into the "Deep Sea Drag Net" at 11:45 A.M. daily and hits the other Maine nets also. BOK, at Dexter, will report on the meeting of amateurs held at his QTH on August 14th. OTM, of Norway, was host to the Oxford County Radio Association August 4th, at which time that body voted to become affiliated with the ARRL. The Section Communications Manager and the Sectional Emergency Coördinator attended and presented the advantages of ARRL affiliation and coöperation. Twenty-one were present. Correction: "Doc" Hagerthy, Higgin's Beach, is W1RYM, not W1SDA. Traffic: W1LKP 176, NXX 55, NGV 47, VV 11, QUA 4.

EASTERN MASSACHUSETTS — SCM, Frank L. Baker, jr. W1ALP — Present Emergency Coördinators in this section are: RCJ, Marlboro; OBL, Bridgewater; DFS, Melrose; DW, Islington; PMC, Nantucket; BKR, Westford, Carlisle, Littleton, Tyngsboro; GAC, Hopkinton; ICO, Framingham; QUI, South Boston; QQL, Lynn; MVO, Revere; SH, Dedham; JYC, Sudbury; JSM, Waltham; UE, Wellfleet; BWH, Attleboro; QMJ, Norwell; EK, Newton; HP, Merrimac; MRQ, Groveland; MON, Stoughton; BHD, Everett; QNJ, Wenham; FIK, Lincoln; LBY, Marshfield; PIQ, Watertown; PCJ, Needham; HUP, Weston; MSF, Maynard; DDC, Ayer; IPZ, Shirley; AWA, North Reading; LJT, Brockton; MQ, Dover; AR, Belmont; MAL, Wayland; PZ, Lynnfield; MBQ, Vineyard Haven; CBY, Lawrence; COX, Lowell; KTG, Cambridge; BB, Winthrop; BBL, Manchester; ALP, Quincy; HIL, Wakefield; MF, Salem; JOJ, Ipswich; MME, Hull; LVN, Falmouth; NSP, Fairhaven; IXI, Walpole; MD, Hingham; KYX, Bedford; MCR, Dorchester; HSB, Norwood; MZR, Topsfield; JXH, Holbrook; AHP, Fall River; OLN, Haverhill. BL is our Section Emergency Coördinator. Please give these hams your assistance. KYO, in Marblehead, is now ORS. QMJ is now an OO Class 4 and made BPL this month, mostly on traffic handled with the MacMillan Expedition. The following renewed appointments: LMU as OBS and OES, BHW and GGV as OOs. IIM and HOB as OPS. JLI has moved back to Dedham. LNC/3 is in Maryland. LJT has NC-183 receiver. QVP, SI, LID, RWU, and PCR are on 28 Mc. 5WG and 6DGD attended summer meeting of South Shore Radio Club. SGW is ex-1BIV. NAV, in Needham, is on 144 Mc. BIO and FVD are going on a trip to Ohio. Others on 144 Mc. are IHF, EJU, HXT, AGR, JTF, and OED. BL has a rig in his car. KPB worked Southern New Jersey on 144 Mc. QOI went to New Jersey on a trip and worked lots of W2s on 144 Mc. with a 522 in the car. CGM is on the Brass Hat Net on 7 Mc. SS moved to Lincoln. IIM's XYL got her call, SCS, and is on 28 Mc. QKW is in Washington, D. C. The Shoreline Amateur Radio Assn. in Revere wants it known that the initials S.A.R.A. on QSL cards indicates a member of this Club in Revere. MDE took part in Field Day. Members of the Parkway Radio Assn. meet on the air Wednesdays at 9 P.M. on 3857 kc. AHP has new t.v. set. KNI worked 4 new states on 50 Mc. to make a total of 12 and is building a mobile rig. Newton Emergency Net held a drill with EK, RM, LMU, OMU, NSZ, PWV, and JOW at Fire Headquarters. LMU is on 3.85-Mc. 'phone. KVF has new rig on 28 Mc. PBM is mobile on 28 Mc. and has new NC-57. BGW is on 14-Mc. mobile. The T-9 Radio Club held a meeting at MNK's QTH. ERH, IVI, and AGC are on 3.85 Mc. K1AA/1 was on 3.85 Mc. at Camp Edwards during National Guard maneuvers. PSD made annual visit to Boston and stayed with WC. They got together with PYM, QMJ, and EMG. QMJ worked VP5BD and TG9RB on 7 Mc. BB has been working MacMillan Expedition on 14 Mc. MDU has been streamlining final stage for faster band-

(*Continued on page 74*)





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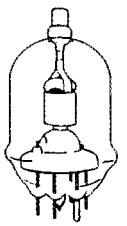
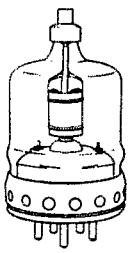


TYPE 4-65A

GENERAL CHARACTERISTICS

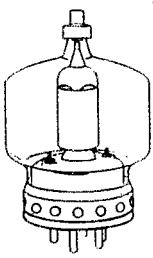
ELECTRICAL	
Filament: Thoriated Tungsten	
Voltage	6.0 volts
Current	3.5 amperes
Grid-Screen Amplification Factor (Average)	5
Direct Interelectrode Capacitances (Average)	
Grid-Plate	0.08 μμf.
Input	8.0 μμf.
Output	2.1 μμf.



TYPE 4-125A

GENERAL CHARACTERISTICS

ELECTRICAL	
Filament: Thoriated Tungsten	
Voltage	5.0 volts
Current	6.5 amperes
Grid-Screen Amplification Factor (Average)	62.
Direct Interelectrode Capacitances (Average)	
Grid-Plate (without shielding, base grounded)	0.05 μμfd.
Input	10.8 μμfd.
Output	3.1 μμfd.
Transconductance (i_b = 50 ma., E_b = 2500v., E_{c2} = 400v.)	2450 μmhos



TYPE 4-250A

GENERAL CHARACTERISTICS

ELECTRICAL	
Filament: Thoriated Tungsten	
Voltage	5.0 volts
Current	14.5 amperes
Grid-Screen Amplification Factor (Average)	5.1
Direct Interelectrode Capacitances (Average)	
Grid-Plate (without shielding, base grounded)	0.12 μμfd
Input	12.7 μμfd.
Output	4.5 μμfd.
Transconductance (i_b = 100 ma., E_b = 2500v., E_{c2} = 500v.)	4000 μmhos

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changing. RBK has new HRO-7. AYG is working on 522 for 50 Mc. Traffic: (July) W1QMJ 762, LM 131, TY 53, JCK 31, DMS 28, BB 22. MDU 18, PYM 17, RBK 14, WU 7, PC 5, CMU 3. (June) W1JCK 25, DMS 19, RS 19, BB 11, AYG 6, PU 4. (May) W1BB 12.

WESTERN MASSACHUSETTS — SCM, Prentiss M. Bailey, W1AZW — SEC: UD. RM: BVR. News is on the short side this month. We hope that everyone had swell vacations. With the summer nearly gone we anticipate new rigs and renewed activity when the active season starts. BDV did right well in the CD Contest with his 4-watt portable. Jim will be back in Whitinsville by the time you read this. GZ had many visitors. 4RS, IJE, EAX, ONB, and 3OII all visited with Nos. The power at GZ soon will be 150 watts. IBZ says his new QTH is a ham's paradise; no B.C.I. or T.V.I. JYH enjoyed the CD Contest and handled traffic from DL4 Land. COI has mike trouble and complains of the heat. Holly has been active on 144 Mc. during the summer. BVR is building bandswitching final using parallel 807s. MUN got his DXCC with 115 countries confirmed. CH is out in W6 Land again. KDW increased power on 14 Mc. EFQ is going to town on 14-Mc. DX. RHU tops the traffic list this month. Russ is rebuilding completely. His goal is 500 watts with a pair of 811s. Russ has A1 Operators Club certificate. NY took mobile rig in the car on vacation. MOK reports interest in 28-Mc. handie-talkie transmitters for emergency rigs. UD sends in a nice EC report between listening on 50 Mc. BKG is building a new home. AZW handled traffic from W2ONE/MM, the MacMillan Expedition. Traffic: W1RHC 114, AZW 26, GZ 20, JYH 8.

NEW HAMPSHIRE — SCM, Clifton R. Wilkinson, W1CRW — New officers of Nashua Mike and Key Club, Inc., are OMZ, pres.; NMB, vice-pres.; RHS, sec.; QHS, treas.; MKD, act. mgr. NMB now is on all bands with 800 watts. QKA is experimenting on 28-Mc. mobile. OMZ spends some time with new t.v. set. QJH and QCZ graduated from New Hampshire Trade School, majoring in radio. 9CEF has received his old call, 1NAZ. HTO went to VE1 Land for

(Continued on page 76)

THIRD NEW HAMPSHIRE QSO PARTY

The Concord (N. H.) Brasspounders, W1OC, announce their sponsorship of the THIRD NEW HAMPSHIRE QSO PARTY, and cordially invite all interested radio amateurs to participate. Here are the details:

(1) TIME: Saturday, October 8, 6 P.M. EST to Sunday, Oct. 9, 6 P.M. EST.

(2) No time limit and no power restrictions.

(3) SCORING: N. H. Stations count 5 points for each N. H. contact, plus 1 point per outside contact; stations outside the state count 5 points per N. H. contact; both multiply by the number of counties worked (10 maximum).

(4) Engraved certificates will be issued to all participants reporting, with special endorsements for the highest scoring stations, both in N. H. and outside, in the following categories: 'phone only, c.w. only, combined 'phone and c.w.

(5) The same station may be worked for additional credit on more than one band, 'phone or c.w. The following frequencies are suggested to congregate for this party: 1810, 3550, 3685, 3915, 7200, 14,100, 14,250, 27,000, 28,100, 29,200 kc.; 51,145 and 221 Mc.

(6) General call: "CQ NH" on c.w.; "CQ N.H. QSO Party" on 'phone.

(7) Contact information required: Report and QTH (including county of N. H. stations). Logs and scores must be received not later than October 30th; mail to Concord Brasspounders, Box 312, Concord, N. H.

(8) The new "WNH" (Worked New Hampshire) certificate will be awarded to all stations working all ten counties during this QSO Party, participating logs confirming.

The CONCORD (N. H.) BRASSPOUNDERS announce their sponsorship of the new "WNH" certificate. This will be awarded to any and all radio amateur stations submitting confirmation of contacts with all ten New Hampshire counties (Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack, Rockingham, Strafford and Sullivan) any time after 6 P.M. EST, October 8, 1949 (commencing time for the Third New Hampshire QSO Party). Contacts must be made between one fixed home location and fixed home stations in each N. H. county. Portable or mobile operation, while satisfactory for credit in the N. H. QSO Party, will not count towards the WNH award. Participating logs for the QSO Party will be considered as satisfactory confirmation, after that QSL cards will be required and should be mailed to the Concord Brasspounders, P. O. Box No. 312, Concord, New Hampshire.

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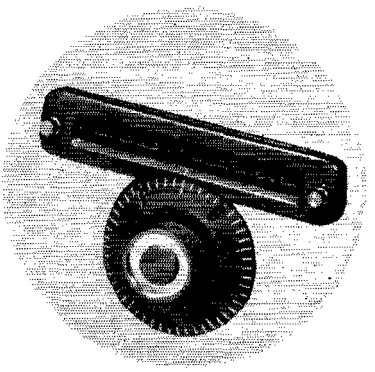

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a vacation. HQE, how's T.V.I. in the new QTH? EWF has been getting his share of DX on 14 Mc. with a kw. such as VS2, VS7, OX, VK9, CT3, and G6. RYG is working DX on 14 Mc. with his Signal Shifter. SAL expects to operate 3.5, 7, and 14 Mc. with new rig soon. QGU is located in Snowville from May to November. POK spent a vacation with BNC in Oakland, Maine. MCS had midsummer hamfest at his summer home at Partridge Lake in Littleton. CKW, CQJ, JNC, LTW, LUD, MMC, ORN, PVF, and RNE were among those present. PVF has worked 2 miles on 28 Mc. with walkie-talkie. With ORN he operated from the top of Mt. Washington on Field Day. KYG is putting the finishing touches on new kw. rig, all bands and band-switching. Two new hams in Manchester are SGK and SGD. New ORS are SAL and QGU. Traffic: (July) W1CRW 149, SAL 19, PFU 13, QJX 10, QJY 9. (June) W1QJX 12, EWF 8.

RHODE ISLAND — SCM, Roy B. Fuller, W1CJH — The NAARO expects to be operating the club station by early fall. EC NCX announces that the NAARO Emergency Net will resume its regular schedule Sept. 1st. SEC MIJ points out that there still are areas in this section that are without ECs. KNE's jr. operator has arrived as scheduled and KNE reports no upset in DX-chasing. QOG is sweating out poor summer conditions on 14 Mc. and reports some choice new countries. BFB is figuring out how to raise his beams to seventy feet for the coming DX season. NCX will operate some c.w. this fall. LWA has been bitten by the golf bug. OLW now has ten states and VE1 on 144 Mc. MJL returned from the West and says there is no place like home. Still no reports from the Providence and Newport areas.

VERMONT — SCM, Burtis W. Dean, W1NLO — AAK, AVP, BYC, ELJ, KRV, MMN, NLO, OAK, PSD, QVS, QXZ, RHQ, RNZ, and SP had an FB time at FN's Party on Liberty Hill, Rochester, Aug. 21st. A swell feed was put on by EMQ. Several of the gang brought their portable rigs along and operated on 75- and 160-meter 'phone and 3.5- and 7-Mc. c.w. Power was supplied by AAK's and MMN's generators. MEP is experimenting on 420 Mc. with 2WFB. NLO recently visited BLC, MUK, NWW, PTB, and RCO. VTN operates Mon. through Fri. on 3740 kc. at 7 P.M. RQT is on 14.1 Mc. with 807. RHQ has Cla s A ticket and operates on 75- and 160-meter 'phone. ZE and RHQ visited PTB recently. 2AAO, 2AHZ, and 2BKZ operated portable from Lake Catherine. PTB and his XYL have adopted a baby YL. DQK has returned home from Veterans Hospital. KZ3AX, 2FMQ, PLK, RNZ, and RHQ visited AVP recently. Don't forget the VERMONT HAMFEST sponsored by the Green Mt. Amateur Radio Club, Inc., Sat., Oct. 15th, at the Hotel Bardwell. Traffic: W1-KRV 7, AVP 6, NLO 2.

NORTHWESTERN DIVISION

ALASKA — SCM, Charles M. Gray, KL7IG — Activity in the Alaska section is pretty slow with the fishing season on. What activity there is seems to be up on 3.5 with 28 Mc. dead. Some of the boys are putting up 28-Mc. beams getting ready for fall. BD checked with KMZI for possible relay of emergency communication between EM, Adiak and Bethel, on 4062.5 kc. when the C.A.A. station at Adiak was flooded out. BD stood by for eleven hours but was not needed. FM has a new QTH in the form of a swell house and shack in the basement. There was a housewarming with the meeting of the Juneau Radio Club there. A fine time was had by all. FM, QSL Manager, reports he has lots of cards for fellows around the territory so if you have worked any DX he probably has one for you. Send in stamps to cover postage. Traffic: KL7BE 525.

MONTANA — SCM, Fred B. Tintinger, W7EGN — SEC: CT. RM: COH PAM: CPY. There were 114 registered at the Glacier-Waterton Hamfest this year. Of these 72 were licensed amateurs. New hamfest officers elected were: VE6MV, pres.; W7JIZ, vice-pres.; VE6DR, secy.-treas. The North Montana Radio Club has inaugurated code practice and theory sessions for anyone in that area. JIZ is digging a new basement with room reserved for ham shack. DXQ has been appointed to organize CAP 'phone net in the eastern half of the State. CT is new SEC. SMARA (Billings club) had a booth at the Midland Empire Fair and accepted out-of-State traffic via TLA. CAL worked Lewistown with portable at the hamfest. HBM has new jr. operator. NME is using a new 7-Mc. folded dipole. CBY visited FTO on the way to Billings. FEE is using BC-454B with peaked audio filters and fixed crystal converters added. One of the oldest hams in the State is the father of one of the youngest hams in the State — Earle, AHN, and Earle, jr., NLF. The Glacier-Waterton Hamfest will be held on the Waterton side next year and Doc Dobry already is thinking up some surprise entertainment. Traffic: W7CT 14.

IDAHO — SCM, Alan K. Ross, W7IWU — Downey: LQU sends in news of some of the gang. He has new 29-Mc. mobile installation. DV had the golf bug this summer and his hamming was not up to par. KOT, of Thornton, snagged an XYL, leaving LQU the most eligible bachelor-ham around these parts. ACD's XYL has her old call back, BKJ. Twin Falls: JMX returned from vacation and the Glacier Park International Hamfest. The Idaho QSO Party

(Continued on page 78)

MALLORY HAM BULLETIN

THE REPAIR AND MAINTENANCE OF COMMUNICATIONS RECEIVERS

Last month in the Mallory Ham Bulletin, we pointed out some of the more important mechanical and electrical features a replacement volume control should have in order to make it suitable for use in a sensitive amateur communications receiver.

This month we'd like to go a step further, and show you exactly how you can determine quickly and accurately the correct Mallory replacement control (or for that matter the correct replacement filter capacitor or vibrator), for use in your particular brand of communications receiver, converter or pre-selector.

Here is what you do. Make a note of the manufacturer and model of the set involved. Jot down the manufacturer's part number of the defective part, and then head for your Mallory Distributor's. In a prominent place on his sales counter you will find a Mallory metal display stand equipped with a reference book called the Mallory Radio Service Encyclopedia. This book will give you exactly the information you need, for in it you will find listed in alphabetical order by manufacturer's name more than 30,000 radio sets, including communications types, along with the recommended Mallory replacement controls, filter capacitors, and vibrators needed to do a bang-up job of servicing.

Incidentally, this book will also give you the I.F. peak of your set, the tube line-up by type, as well as special servicing hints for installing the replacement parts.

The Mallory Radio Service Encyclopedia is just one more example of the thoroughness with which Mallory operates in all phases of radio. Other helpful and informative Mallory publications which the amateur will find invaluable are the Technical Manual, the Vibrator Data Book (the only book of its kind ever compiled) and finally the new Mallory TV Encyclopedia.

Your Mallory Distributor will be glad to show you all these publications, as well as the latest in Mallory ham band switches, push button switches, controls —rheostats—potentiometers—pads, tubular capacitors, dry electrolytics, transmitting capacitors, vitreous resistors, dry disc rectifiers, bias cells, and vibrators. Almost everything you need for the construction of new equipment, or for keeping your present rig in good operating condition.

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on 7155 kc. Aug. 12th netted the following: MHI, FIS, MEJ, GHT, NDZ, ISF, and IWU. The next one will be on a Sunday afternoon later this fall. Skip and QRM are bad in the evenings. Get on 7155 kc. anytime for our 7-Mc. Idaho frequency and keep Friday evenings at 8 P.M. MST for a special effort at Idaho contacts. Serious traffic-handlers should report to the Gem Net on 3745 kc. Mon.-Wed.-Fri. at 9 P.M. MST. EMT, of Kuna, is RM. Let's have more reports.

OREGON — SCM, J. E. Roden, W7MQ — Baker: Baker Amateur Radio Club put on a real hamfest and picnic July 17th. HAZ and his gang did a real job. Bend: HHH now has all cards confirming WAC on 28-Mc. 'phone. Eugene: Valley Radio Club held its big annual picnic on McKenzie River recently. KL reports he is rebuilding and the outcome of his efforts will be a kw. FPY now has a kw. on 14-Mc. 'phone and reports lots of DX. Grants Pass: MGO reports no 3.85-Mc. 'phone until he tries for Class A again. He now has the Army version of an SX-28. AWI has moved to Cove Junction. LaGrande: HBO, KVG, and NFF are meeting with some success in getting this section of the State more emergency-minded. The local newspaper gave some publicity to the budding EC organization. NOB and NOK are two new YL operators. MEZ has new two-element rotary and says DX is fine on 14 Mc. IMM is building final using a pair of 304TLs. MWE is going high power, too. NLV is now active on 144 Mc. JOD is active on 28 Mc., and LWM is using MK-2 tank rig on 160 meters. EJS and IGI are now on 28-Mc. 'phone. Pendleton: NRR has his new license and will be active on 7 Mc. Portland: The PARC held annual Field Day at new home of DIS with five rigs going. AMQ and AXA are having FB results receiving Seattle television, 150 miles airline. IHI has radioteletype going and worked JCU. HVX reports plans are underway for OARA Convention next year. Wolf Creek: MIC received 25-w.p.m. sticker. Traffic: W7JRU 97, HDN 68, QGN 66, FY 45, KEG 39, GNJ 38, FKS 28, LT 25, AXJ 24, KL 18, LWW 16, MGO 12, MQ 12, KVG 6, MIC 6.

WASHINGTON — SCM, Clifford Cavanaugh, W7ACF — SEC: KAA. RM: CZY. PAM: CKT. KCU, CZY, FIX, and CKT made the BPL this month. JZR says summer work is about all done so he will be on WSNET regularly. We hear ETO is buying a new VFO. Things on 3695 kc. will never be the same. LEC writes that the Valley Radio Club of Puyallup had an FB picnic Sunday, July 31st. They had about fifty in attendance and two transmitters on the air. A great time was had by all. DRA is QRL helping with the canning at home. EAU is getting ready for winter traffic work. KAA is busy getting the AEC gang organized, and is doing a fine job. HWK had good results with his portable AEC gear on LO-Nite. DGN burnt up his ORS certificate in error. Guess we will have to send him an asbestos one. FWD says his ladder tower is coming along nicely. He thinks maybe he will go in for some flag-pole sitting as he sure has had the practice. ZU sends in a nice report on Lake City Pioneer's Day traffic. Both nets handled this in fine shape. The 'phone men cleared 63 messages and the c.w. gang 288. CKT bought a new mimeograph machine and soon will be getting out the *Parasite* again. APS enjoyed meeting the gang at the WSN picnic, which was held at Steel Lake on July 24th. The boys had a good time meeting the fellows they have been working for years. We understand that some of the boys who won prizes still are trying to figure out what the gadget they won is called. FIX and CZY will hold a big confab soon to lay plans to run WSNET into the National Traffic Plan. AMZ says his club is planning to have a booth at the fair down in S.W. Washington. LVB has new rig on the air. LIL is top traffic man in Tacoma. CZY reports the WCWN Net, slow speed net, is doing well but needs a few more outlets. A note to Larry will put you on the list, fellows. HGC reports his shack still is being used for a bedroom. KTL is hard at work scouting for traffic for WARTS Net. KWC reports 116 countries and 39 zones as his DX score to date. WY says conditions on 7 Mc. are bad, his best DX of late being Wake Island. GHI is on vacation and is coming up with new QRA. Martha, KCU, again tops the list in originations and makes BPL on deliveries. Traffic: W7CZY 1524, CKT 811, KCU 345, FIX 344, KAA 197, ZU 101, HWK 88, JZR 79, FWD 57, ACF 36, DGN 33, AMZ 29, WY 22, ETO 21, LVB 20, DRA 15, LEC 15, APS 13, HGC 6, EAU 5, LIL 5, KTL 4, KWC 1. (June) W7ETO 9.

PACIFIC DIVISION

HAWAII — SCM, Dr. Robert Katsuki, KH6HJ — BW, our trusty RM, outside of tearing up a lot of surplus gear for the old junk box, reports increasing activity in the Pineapple Net. LJ, QC, and QR looked in, but didn't stay. The Net still stands PL, Port Allen, Kauai; PX, Lahaina, Maui; and BW, Honolulu, Oahu. QR is leaving for school. UL, Wahiawa, is maintaining contacts to Northwest, with very satisfactory traffic schedule with W6CE. Local contacts are on 80 and 160 meters. 160-meter activity is picking up with DI, RZ, and ZI putting out good signals. KL7IU, one of the operators at UL, is returning to WI and will be on from there with 14 watts on 7 Mc. QH's kw. rig is now atop St. Louis Heights. By now, everyone should be quite

(*Continued on page 82*)

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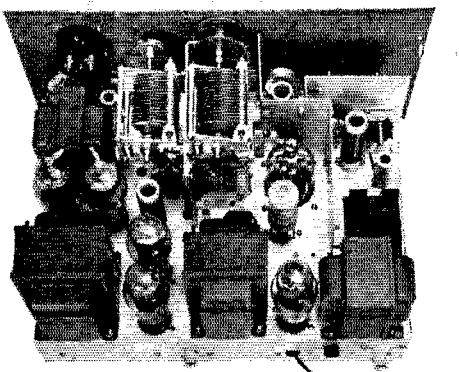

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(*Continued from page 78*)

recovered from the best hamfest KH6 has ever had. Say, gang, how about some of you capable hams applying for EC, ORS, or PM appointments. And please, fellows, mail me an activity report. Mahalo. Traffic: KH6UL 103, PL 20, BW 5.

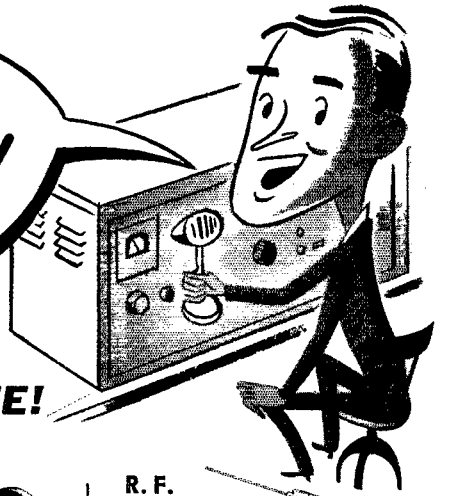
SANTA CLARA VALLEY — SCM, Roy E. Pinkham, W6BPT — WNI has built super Q-5er using six 85-kc. IFs and a 600 to 800 cycles audio filter. WJM is very busy in his new job as radio supervisor for Monterey County Sheriff's Office. RFF rewired his final amplifier using a pair of 35-Ts in push pull running 600 watts. FYK is now on 144 Mc. using a 522. WSE is mobile on 144, 28, and 3.5 Mc., all rigs mounted in the same car. BJS will be on a trip to W2 Land by the time you read this. ISX is new ORS. Frank worked 3.5- and 14-Mc. c.w. with ART-13 transmitter and BC-342N. NW is operating on 7 Mc. with a 3.5-Mc. c.w. rig under construction. He will work the nets on this band when his rig is completed. VIQ is back on the night run driving San Jose bus, so Buck can be heard working DX on 3.85-Mc. 'phone after midnight. CFK is taking his second installment vacation. HC is busy getting votes in the coming Director's Election. WGO is rebuilding SCCARA club station transmitter. JSB is acting as Net Control for the Mission Trail Net one week a month. Traffic: W6WJM 43, BPT 32, NW 26, ZRJ 21, MMG 15, KMM 8, WNI 3, RFF 2, SYW 2.

EAST BAY — SCM, Horace R. Greer, W6TI — Asst. SCM, Charles P. Henry, 6EJA. SEC: OBJ. ECs: AKB, EHS, NNS, IT, 1DY, QDE, WGM. Asst. EC u.h.f. OJU. RMs: FDR, ZM. ZM has the big rig ready to go. BUY has four-element beam on 14 Mc. working FB. PB still is worrying about QSL cards he never receives. OT is about ready to start traffic after summer slump. EJA reports DX nil because of terrific noise level. ITH now is spending 70 per cent of his time experimenting. YDI reports that lightning burned out antenna coil in his Collins 75A in sunny California. LTN passed away on May 2nd. BF is getting to be in demand as guest speaker at the radio clubs. FDR had 20-watt rig on vacation. VDR is back on the air with p.p. 24Gs. KZF made wire recordings on permenite disc of all 28-Mc. 'phone contacts for WAS on 'phone. The Mission Trail Net now is being reorganized for better streamlining. FNT got orders for sea duty. BUC and BGJ are building 28-Mc. mobile rigs. The San Leandro Radio Club held an FB dinner meeting on Aug. 1st. CTL is new Class 3–4 OO. CBF is new Class 1 OO. CMY is moving to Sacramento, and EEI to W7 Land. OBJ is getting along FB now. YMO is going high powre. ELW thinks 14-Mc. mobile is the berries. SQ is knocking 'em over. MEK now has more than 200 postwar DX countries confirmed. GEA is on project 579B. TI had his National 183 cleaned up and aligned and it works FB. TT is looking for that strong stuff called DX. IKQ is having an FB trip in Europe and thinks our oversea hams are FB people. NZ is leaving this month for Europe and plans on looking up many of the foreign hams with whom he has had QSOs. MVQ thinks as much of a new country as life itself. DYP has his 14-Mc. four-element beam really working. AKB is QRL work and play. The Oakland Radio Club is toying with the idea of changing meeting night to Friday. The SARO gang is resting up after Field Day. ZB is FB president of the San Leandro Club. The position of Pacific Division Director will be open soon. Let's be sure to get a good man on the job like our retiring Director. The spell of summer has hit the traffic gang. There is talk of a Pacific Division Convention in Reno this year, but so far no dates have been set. BIL might be changing QTH one of these days soon. QLH has taken up flying. DUB is becoming interested again in ham radio. MHB sure has the location. Watch his antenna farm grow. "Kill that plate voltage or it might kill you." Traffic: W6FDR 405, ITH 59, BF 22, YDI 22, VDR 8, EJA 3, TI 2.

SACRAMENTO VALLEY — SCM, Ronald G. Martin, W6ZF — Asst. SCMs: Northern Area, Ray Jensen, 6REB; Central Area, Willie Van De Camp, 6CKV; Southern Area, Robert Metke, 6SUP. SEC: KME. ECs: Met. Sacramento, BVK; Walnut Grove, AYZ; Dunsmuir, JDN. RM: REB. OES: PIV. OBS: BTY and AF. *Northern Area*: Mt. Shasta Club held meeting July 20th with Dunsmuir Naval Reserve Unit at K6NAY. JDN schedules 3.5-Mc. c.w. traffic in connection with EC program. GJF fired up on 3.5 Mc. *Central Area*: AF is on 7 and 14 Mc. GUV reports 12 attended July GERC meeting. GKG is on 3.5- and 7-Mc. c.w. HBM works 144 Mc. OJB took his 144-Mc. rig to Emerald Lake. LYQ and CLG worked ZEM/6 on 144 Mc. at Mt. Pinoas, a 400-mile path! *Southern Area*: Placer Club officers are ZFD, pres.; GAP, vice-pres.; Ronald Amick, secy. CTH finally has QSL from OA4AN. FFM runs 6 watts on 7 Mc. GHP works 144 Mc. OXG is experimenting with 220 Mc. KKL won a VFO at Chico Hamfest. ASE is in 28-Mc. Sac. Val. Emergency Net. ZFD works ZL with 15 watts on 28 Mc. NBW has 3.85-Mc. rig. WSI is DXing on 28 Mc. SUP is on 3.85- and 14-Mc. phone. Flash! Metropolitan Sacramento became a seaport, with the aid of KME, BVK, AUO, and ZYV, who furnished communications for Port Dedication Ceremonies on Lake Washington and Sacramento River. MWM works 14-Mc. 'phone. WLI put up 14-Mc. beam. QDT mounted gas-engine power supply under the hood of his Pontiac and now has high-power portable-

(*Continued on page 84*)

What a Sweet Running Rig! Glad I Use Ohmite!



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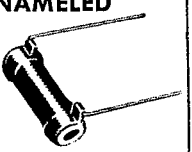

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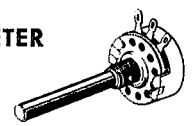

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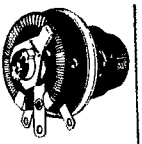

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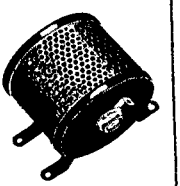

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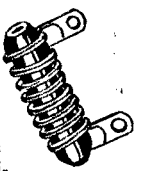

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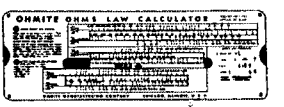

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mobile! WRD has his EI8G card. WHG is on 3.85- and 28-Mc. phone. GDJ is rebuilding new 100TH final for 14 Mc. GQS put up beam for 28 Mc. GDO has Johnson T-match 10–20 beam to go with new 32V-2. AM gave interesting lecture at SARC Aug. 2nd. GDE worked JA2CA on 28 Mc. QYQ reports 100 present at Buzzards Net picnic at San Jose. BTY has 28-Mc. beam. PIV, who entered the hospital in July, joins the gang on PN nightly with Command receiver. VKM is on 14 and 28 Mc. MIW reports new converter excellent on 144 Mc. AK and WTL make the 28-Mc. emergency nets every Thursday. John Reinartz gave T.V.I. lecture at SARC Aug. 17th. ZF is T.V.I.-ing his big rig but makes PN nightly with GF-11 emergency rig. Nominate and vote for Pacific Division Director! Traffic: W6REB 305, JDN, 57, PIV 33, ZF 15, BTY 2.

SAN JOAQUIN VALLEY — SCM, Ted R. Souza, W6FKL, Asst. SCM, James F. Wakefield, 6PSQ. SEC: JPS. ECs: PHL, VTZ, WBZ. The SJVRC publication *Skip* is enjoying wide acclaim but needs more news items. If you have something to report, call or drop a card to FKL, KMI, PSQ, JWK, or the editor, JPS. SRU attended Bell System School in Sacramento. GCF is fall housecleaning and has several items for sale. BNP is in the East working portable on 7 Mc. UVN was on a two-weeks cruise with the USNR. TV is busy with the MARS Net. NJF is back in town and working for AKK. PSQ, the busy little realtor, sold him a house. The Sheriff's Aero Squadron soon will be on with about 600 watts, and EJD is masterminding the rebuilding. JPU and PSQ have 144-Mc. rigs at their respective cabins at Shaver Lake. LBJ visited KMI while on vacation. JWK completed a new grid dipper. The SARC had a very successful Field Day. They kept three transmitters on 97 per cent of the time and worked 1-W1, 3-W2, 3-W3, 1-W4, 9-W5, 229-W6, 29-W7, 8-W8, 14-W9, 17-WØ, 7-VE, 4-KH/L, 1-ZL, and 1-VK. YGZ has moved to Bakersfield and is a technician at the Sheriff's Office station. BNW and BHI have been working 3 cm. with microwave spectroscopy in mind. WHB says he is quitting ham radio for tenth time. FZW is on active duty with the Army. DIE now is in Wisconsin. BHI is moving to Berkeley to attend U.C. PHL is working the bugs out of the new rig. FKL spent most of his summer spare time in Santa Cruz. The time for reactivating is upon us. Don't forget your reports, gang.

ROANOKE DIVISION

SOUTH CAROLINA — Acting SCM, T. Hunter Wood, W4ANK — Your SCM, BQE/ANG, has moved to Atlanta, Ga. BJE, Walterboro EC, has his emergency rig ready at a minute's notice. JGM is working on a new rig for 14 Mc. KTW has departed for Alaska. MTM says K4WAD shortly will blossom out with a new 750-watt rig from Fort Jackson. BPD claims 216 countries with 199 confirmed. FM has a new NC-183. HXM has new rig on 160 meters. GTW is working 28-Mc. 'phone from Sumter. GIT, NRC, and MSS are on 7-Mc. c.w. BIZ has new mobile rig on 3.5- and 7-Mc. c.w. which he operates at 100 watts in motion. HTR is on 28-Mc. 'phone and 7- and 14-Mc. c.w. OJM has 35-watt mobile rig on 28 Mc. DPN is on 3.85-Mc. 'phone. FMZ has a new Clapp oscillator on 3.5-Mc. c.w. BZX is back on the 3.85-Mc. 'phone net after a vacation in HH and KP4 Land. LSD and MRJ meet the S.C.'phone net. ADE is new member of the SCAN. Ware Shoals has two new calls with OSC on 28-Mc. 'phone and PLX on 7-Mc. c.w. The 75 meter net has changed its name to The South Carolina Amateur Net and meets Sundays at 9 A.M. and 3:30 P.M. and at 7:30 P.M. Wednesdays on 3935 kc. The S.C. 3.5-Mc. c.w. net will resume operation in September on 3525 kc. under the new ARRL National Traffic Plan. Traffic: W4BPD 26, ANK 23, FM 10, HXM 3.

VIRGINIA — SCM, Victor C. Clark, W4KFC — PDL and PGD joined AEC. DQB, of Norfolk, now is located in Washington and looks forward to the return of his former call, 3DQB, which is indelibly tattooed into his hide! YEJ is new OBS, NJV new OO. We regret to report the death of VA, a prominent 3.85- and 14-Mc. 'phone enthusiast. VE and CC renewed ORS appointments. IOJM, outstanding Massachusetts ham, now is looking for a good antenna site near Alexandria. EVG, who is ex-3EVG, 5FTU, and 6WMF, has new NC-240D receiver and is active on 7 and 14 Mc. KVM, roaring around the countryside in a newly-acquired jalopy, has mobile plans. SU, tiring of t.v., takes up model railroading pending the start of the 3.5-Mc. DX season. NNN passed the 190-country mark. Can any other Virginia ham top this? KQZ is on 7 Mc. with QRP rig. QY is readying an ART-13 for the SS and other fall activities. FV slipped down to 14 and 28 Mc. and promptly rounded up 100 countries. He now is sweating out confirmations. JFA is now KH6UD, active on 14-Mc. c.w. NAT is KH6YL. KP4FM/4 now is PMV and schedules KP4 Land on 14-Mc. 'phone. The spud business took KYD to New Jersey for the summer. The Virginia Net will reopen formally on October 3rd at 7:00 P.M. on 3680 kc. Be sure to dust off the 3.5-Mc. coils and join the gang. VFN, the 'phone net, continues to function nightly on 3880 kc. and will welcome newcomers. LPP, Danville, writes that MWH has Collins 32V-1 and a pair of 813s. MAV and KRK recently received Class A licenses. ISE, LPO, and LPP are in the same apart-

(*Continued on page 86*)

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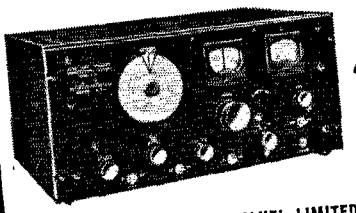

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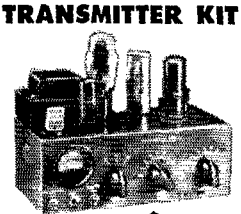

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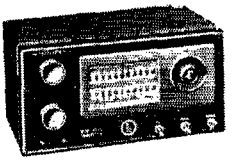

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ment building. LPP made 35 w.p.m. in first code proficiency attempt. BZE, JHK, and KFC were visited by 3EOP. KPK has beam ideas. RQR made junket to California and visited 6WNI. LRI handled traffic in connection with Ecuadorian earthquake. BZE, CC, FF, FV, IA, JFE, JLW, KFC, KVM, LRI, NJV, QWM, and VE braved the summer heat to participate in July CD Party. Traffic: W4KVM 21, KFC 12, FV 6, NJV 2.

WEST VIRGINIA — SCM, Donald B. Morris, W8JM — Asst. Directors BDD, BTV, CSF, GBF, HUK, OXO, and JM met at Webster Springs on Aug. 27th. WSL, with new 75-A Collins receiver, has accepted OO appointment. DFC visited BWI and OXO and has new NC-240 receiver. PZT visited ARRL and W1AW and reports an "FB and efficient set-up." Having assured Tom and Hookey that no one outside of West Virginia hams read this news, they OKed my telling that Tom McMullen, senior operator at W1AW and formerly 8YCK, visited the August meeting of MARA, accompanied by attractive 1RNT, of Headquarters Advertising Dept. ELX is active on 7 Mc. BOK has new Collins 30K and really has become active again. GBF, after summer rebuilding of rig and frequency measuring gear, reports, "I am ready." 3VZD, 2LZS, 4OJN, 1QVF, and 1RNT visited West Virginia amateurs. EYV keeps in touch with home from Morgantown via 'phone schedule on 3.85 Mc. BTV visited Denver amateurs. YGL supplied communications to the Civil Air Patrol during its summer camp. Remember, West Virginia 'phone and c.w. nets give you excellent traffic outlets as well as a chance to meet the gang. Hope to see you at the Roanoke Division Convention in Richmond on Oct. 22nd. Traffic: W8OXO 48, DFC 3, JM 2.

ROCKY MOUNTAIN DIVISION

COLORADO — SCM, M. W. Mitchell, WØIQZ — SEC: KHQ. RM: IC. SGG is new EC for Colorado Springs. He reports that a power shovel tore up a 'phone cable and HEM, IOH, CKJ, and 6ZJU/Ø furnished communications on 28 Mc. until the break was repaired. The Pikes Peak Amateur Radio Club reorganized with CKJ pres.; ZKM, vice-pres.; HEM, secy. ZJO makes BPL with a traffic total of 512. He holds schedule on three different nets every night of the week, which is pretty good for the good old summer time when traffic is supposed to be light! ZJO says he will have a couple of tall poles for his 80-meter antenna when the snow thaws! Egad! Traffic: WØZJO 512, MOM 14, OWP 9, SGG 3.

SOUTHEASTERN DIVISION

ALABAMA — SCM, Dr. Arthur W. Woods, W4GJW — GYD has a new HF-152A converter and ARC-4 on 144 Mc. The 144-Mc. gang now consists of GYD, BCU, GBP, and LEN. It's practically traditional that BMM and AUP vacation on the Gulf Coast and take their portable 3.85-Mc. 'phone rigs with them. HDG is getting ready to go mobile this winter. PKQ is a new call in Dothan. LUT can baby-sit and work the rig simultaneously. OJJ remained active through the summer. NLB is experimenting on 420 Mc. and also answers into AENB. CXD is starting 420-Mc. activity in Birmingham and wants co-workers. MSF has a kw. on 14 and 28 Mc. KVD is new EC for Gadsden Area. KIX claims that after 18 years all his rigs and his receiver work to suit him; now he's losing interest unless some bugs develop. JYB has 1-kw. super modulation transmitter working on all bands. MXU is radio operator on a C-74 from Brookley Field to Germany and return, which keeps him QRT about 50 per cent of the time. Traffic: W4KIX 21, MXU 17, GJW 14.

EASTERN FLORIDA — SCM, John W. Hollister, W4FWZ — Florida 'Phone Traffic Net now is on 3945 kc. Key West outlets are needed on the 7290- and 3675-kc. nets especially during the storm season. Stations are needed everywhere for the new traffic net set-up this fall on a nationwide scale. Write MNT, RP, JQ, or FWZ for information. Attention Emergency Coördinators: Did you let DQW know what your set-up is so that he can pass it on to the emergency nets? Lake City: IQV is using selenium rectifiers and isolation transformers for bias supplies, which is a good way to do it. Lakeland: NAK is ready for emergencies with auxiliary power plant. Tampa: DES got a G3 on 7285 kc. for a nice QSO. You gotta hand it to AXY, the Peanut Whistle is good. Miami: MKP is boning for radiotelegraph 1st-class exam after getting 2nd-class ticket. Look for IYT on 7290 kc. soon with high power through that new antenna tuner. West Palm Beach: POF got his license and is sporting a Collins 32V-1. OBW is new recruit to 7290-kc. net. New field appointments include AYX and NHC as OES, OBW as ORS, GZV and LMG as OPS. More applications are wanted for ORS, OPS, OES, and OO appointments. Write the SCM for full information. It's an emblem of a good operator when he has one or more of these appointment certificates brightening up the shack wall. Who needs an ARRL pamphlet and the Florida pamphlet on emergency communications? The SCM also has special cards for reporting your activities. So let's fill this column up this fall with plenty of activity reports. Send for your cards. Everyone likes to know what the other fellow is doing and how he did it and with what kind of rig, etc. Join the AEC and if

(*Continued on page 88*)

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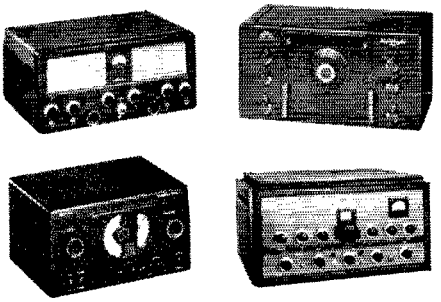

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WESTERN FLORIDA — SCM, S. M. Douglas, jr., W4ACB. DAO moved back to the city. New officers for PARC are HIZ, pres.; UC, vice-pres.; OYC, secy.; NWC, treas. NDB was transferred to the West Coast. QK has new home-hatched mobile rig. MS keeps 50 Mc. hot in Pensacola and now has 37 states. EQR is a proud papa. Seegars? AXP built a new shack anticipating fall activities. OKD, LDT, OCL, and NN had 28-Mc. mobile net set up for Optimist's Orange Crate Derby in Tally and did an FB job. TL and ACB have 3.85-Mc. mobile rigs. Fellows, thanks for your vote on the SCM job. Let's make the Western Florida section one of the best. CD appointments are open, so let me know what job you want. Also, let's have your reports by the first of each month. The Tally gang have their storm net all ready to go under EC OKD.

GEORGIA — SCM, Clay Griffin, W4DXI — MCM is new ORS and has his WAS. Bob changed his 803 final to an 814. LOR has a 50-watt 3.85-Mc. mobile rig. KGI passes along the news that ORR moved to Savannah. BVK is EC for Lownes County. Columbus: DDQ has a new 32V-2 on 28 Mc. VX has an 813 all-band rig; GIO operates mobile from his car; MBZ acquired a new Supreme 100-watt rig; CVY replaced his 813s with 5514s, running 350 watts; TIS is planning a dual 28- and 50-Mc. beam. TGU and 2URY visited CBR. BIW visited CYC. Traffic: W4KGI 8, DXI 3, MCM 3, LOR 1.

WEST INDIES — SCM, Everett Mayer, KP4KD — The PRARC Hamfest on July 4th was well attended and a good time was had by all. AM, HR, and KI transferred to W3 where 12-year-old Bob received his KP4KI call. DJ, our brand-new ORS, is doing a swell job as NCS for the C.W. AEC Net. ES was appointed SEC for West Indies and does an FB job as NCS of the 'Phone AEC Net. DJ moved into new home and is back on 3.5 Mc. with better results than from old QTH. EZ and HK transferred back to the States. HX went on leave to W5. KD added a couple of new countries but can't get QSLs from the ones already worked. PRARC plans reactivation of KP4ID during storm season if George will do it. DV is very QRL with new store in Caparra Heights. West Indies Net with KZ5, KP4, TG, YS, VP3, VP4, KV4, and VP6 is going to town on Sunday mornings. QZ is getting tired of being called "bootlegger" by KP4 brethren; he is legal and is ex-W4QZ, so take it easy on him, fellows. Traffic: KP4DJ 4, KD 4.

SOUTHWESTERN DIVISION

LOS ANGELES — SCM, Vincent J. Haggerty, W6IOX — Thanks to the gang for the fine reports this month despite the so-called summer lull. DDE came to Santa Barbara one day in July and stroboscoped CE and IOX. CE reports his new 150-watt 3-bandswitching rig is a decided improvement over his former 60-watter. He schedules four nets: SCN, PN, SBN, and NFN, as well as 7CZY, 2ZSM, 4PL, ØZJO, 5GZU, 7CKT, KH6UL, and KH6PL. CE, DDE, and YLZ made the BPL for the month. Traffic reports were received from CMN, CZF, DDE, JQB, QAE, RXT YLZ, YVJ, ZMZ, and ZQV. BHG reports the following changes in his OBS transmissions: Mon., Tues., and Fri. at 2000 PST for OBS; code practice broadcasts Mon. through Fri., except Wed., 1900 to 2000 PST. Several new hams have credited the code practice schedules of BHG for their passing of the FCC code test. Code classes, club activities, and the Southern California Net keep CMN hopping. TFC spent a week in the High Sierras and kept in touch with Los Angeles by daily schedules on 3965 kc. with his BC-474. AM just completed a ten-element Hugo Curtain (Sterba Curtain sidewise) pointed at Gibraltar and within five minutes heard ST2TC and MD2GO, both better than ever before. VAQ had a good score in the July CD Party. GTE is building a four-bandswitching exciter. FYW reports on plans for the Paso Robles Radio Club booth at the San Luis Obispo County Fair. HJL is working 7-Mc. DX with low power. DLR has been doing some v.h.f. work and is experimenting with ARC-5s on 14 and 28 Mc. BUK made his regular report but said the summer lull had gotten him. CFL submitted a fine OES report. MVK is trying to promote interest on 420 Mc. He picked up an ASB-7 and claims it is a honey. The Two Meter and Down Club's picnic was a great success with a turnout of 200 hams. GSU is a new call on 144 Mc. YHP is mobile on 144 Mc. VIX/6, near the Mexican border, worked ZRN north of Santa Barbara to claim a new record of 262 miles on 420 Mc. CKR, with WSQ and ZFU at Green Valley Lake, worked 12 stations on 420 Mc. CGQ has a 1½ Lazy H with reflector on 28 Mc. and cuts out middle section to use as stacked half waves on 14 Mc. WKO is getting back on 7 Mc. with a pair of 811s and a folded dipole. BQR, PT, and YHP are active on 50 Mc. KCF is active in AEC work on 146.7 Mc. The San Bernardino AEC Net conducted a two-hour simulated emergency drill on Sunday, July 24th. Sixteen net members participated. Local communication was established and two mobile units were dispatched to hills nearby for outside communication. It was a fast, exciting drill which served to

(*Continued on page 90*)

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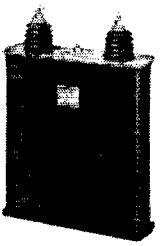

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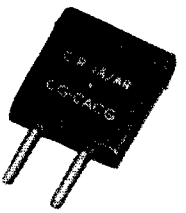
15,000 working volts DC. Pyranol filled. Brand New. *Shpg. Wt. 35 lbs.*..... **$14.95**

½ MFD. Condenser, 25,000 working v. D.C. Pyranol. Brand New. *Shpg. Wt. 35 lbs.*..... **$18.95**



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20 meter xtals for a buck! Mounted in holder with ½" pin spacing. Also 40 and 80 meter and 6 and 13 mc bands at the same low price. Specify your frequency **$1.00**

5 mc precision xtal, as shown, many uses **$1.95**

Special 8 mc xtals for 2 meter xtal control..... **1.50**

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Include 10¢ postage with your crystal order.

Type 1616 tube; Half wave, high vacuum rectifier. Filament 2.5 volts, 5 amps; peak inverse 5500 volts; peak current .8 amps; surge current 2.5 amps; average plate current .130 amps. **List price $7.50, Harvey special price, *while they last*.....95c**

All in stock for immediate delivery.

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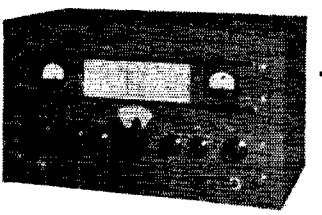

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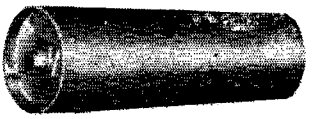
The new Collins 32V-2 is actually the 32V-1 with added features and refinements.

Fine and coarse antenna loading controls on panel; trap circuits; front panel tune-operate switch; coaxial antenna terminal; harmonic attenuating network.

(We can have your 32V-1 factory-converted to a 32V-2 for $100.)

Collins 32V-2, with all built-in features $575

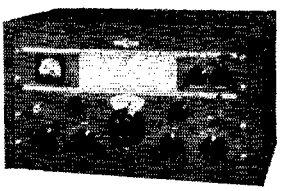
LOW-PASS FILTER



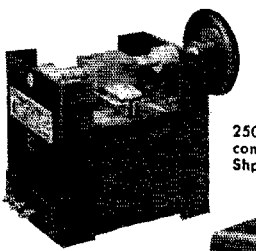
The new Collins 35C-1 50-ohm three-section low-pass filter, provides approximately 80 db attenuation of harmonic emissions at the television frequencies.

Collins 35C-1 low-pass filter..... $40

Collins 75-A $375.00



80, 40, 20, 15, 11 and 10 meter ham receiver. Automatic noise limiter, high sensitivity, double conversion. With speaker in matched cabinet. *Shpg. Wt. 93 lbs.*



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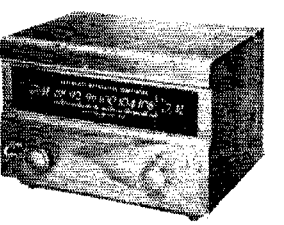

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divulge the strong and weak points of the net. Traffic: (July) W6CE 1304, DDE 237, YLZ 201, IOX 135, BHG 60, CMN 49, ZMZ 30, TFC 25, RXT 18, JQB 16, QAE 13, ZQV 12, AM 10, YVJ 7, VAQ 5, GTE 3. (June) W6CZF 34, YVJ 8.

ARIZONA — SCM, Gladden C. Elliott, W7MLL — KRC, in Nogales, is carrying on nightly 144-Mc. schedules with FGG, LFX, SLO, and LLO, in Tucson. 8SQU/7 is operating 7- and 14-Mc. c.w. in Tucson. JYZ has a new stacked 14-Mc. array and reports working 10 OKs in a row. OIF is heading an emergency net for Arizona on 3865 kc. at 7 P.M. every Thursday. JOK is handling the 28-Mc. mobile units for the Phoenix Emergency Corps and LLO is handling the 28-Mc. mobile units in Tucson. MOB and PEY report excellent results with speech clipping. New calls: Tucson — NSC, Matthews; NSJ, Bowen; NRC, Blangio; NQX, Godby; NQY, Greenstreet; NRM, Tally; NRO, Stout; NQW, Frisen; NRL, Whitehead; NRT, Paden; NRX, Tew; NRE, Alsman; NRF, Carl. KWO reports first try on 420 Mc. from Barker Butte to Roosevelt Dam was not successful. MAL is handling traffic from the Y.M.C.A. camp at Prescott to Phoenix. The Saguaro Club has a new portable power unit using a 2½-hp. engine and rewound Dodge generator. The Phoenix Club is combating T.V.I., the gang there being blamed by dealers for preventing fringe reception. MQE is Old Pueblo Club vice-president and LHD is publicity director. Traffic: W7LHI 731, MID 19, MAL 16, KWB 4, KWL 1.

SAN DIEGO — SCM, Dale S. Bose, W6BWO — Asst. SCMs, Shelley E. Trotter, 6BAM, and Gordon W. Brown, 6APG. SEC: DUP. RM: BGF. The San Diego YL Club reports YXI, BLF, and AWW took a trip up the Coast to attend a luncheon given by the Los Angeles YLs. The San Diego Council of Amateur Radio Clubs sponsored a picnic which was held Aug. 21st. FXD, the YL's Field Day station, expects to mail out its QSLs as soon as they are received from the printers. New YL officers are YXI pres.; AWW vice-pres.; Shirley Lucks, secy.; and YXM, treas. GC reports that his flying has made serious inroads into his ham operating, but he manages to keep up on ARRL activities through KW, as they both work at the same place. BYX visited DZC and found they were located only three miles apart. AD has completed an 815 emergency rig; also he is scheduling KL7VW twice a week. BGF had a short but pleasant visit from 5ZU, who is the New Mexico end of the Southern Border Net. The Orange County Amateur Radio Club is sponsoring a booth at the County Fair. BAM says he was the only one from this section on in the CD Party and sure wishes some of the rest of the boys would get on. There is no news from the El Centro gang, so I presume they still are shut down for the summer. It gets kind of warm down that way! DZC held a picnic at his place and grew a special field of corn for it. About 60 of the gang showed up and all had a good time. BWO is taking a trip the last two weeks in September and the first week in October. He will cover about 4000 miles and hopes to get in a lot of 4-Mc. mobile operation. Traffic: W6PQM 115, BGF 50, BAM 26 LDJ 16.

WEST GULF DIVISION

NORTHERN TEXAS — SCM, Joe G. Buch, W5CDU — GZU makes BPL for the sixth consecutive month. Congrats again, Forest, and keep that one-man trunkline going. PXQ is working on 28 Mc. with fifty watts input and a three-element beam. BKH makes OO and traffic report but complains of hot weather. KUJ is rebuilding and awaiting cards for DXCC. OLD is now working 3.85-Mc. 'phone. IXV, of Sulphur Springs, PRN, of Commerce, and OFV of Greenville, hold round table on 28 Mc. IXV is building 144-Mc. rig. MAW, of Noacgdoches, and IRP, of Lufkin, keep schedule on 144 Mc. IRP and his bride will attend the West Gulf Convention. LGY reports she is too busy to spend much time on the air but Helen never fails to send in a newsy report for this column. QDF, Clarendon, has been on the air one month and has worked 18 states with his 50 watts. He is hot after WAS. PXY, of Arden, is working traffic net with NTX. QEW is a new call in McKinney. ISM and MA, vacationing in New Mexico and Colorado, carried transmitters on the trip and maintained schedules with Dallas hams. Work on Convention details has kept many of the Dallas gang off the air during the past two months. AW, of Big Spring, sent in a nice report and photo of Field Day operations. The Big Spring hams have plenty of Club activity. See you next month. Traffic: W5GZU 646, PXY 80, ARK 59, CDU 14.

OKLAHOMA — SCM, Frank E. Fisher, W5AHT/AST — IOW spent vacation in Colorado, visiting AHT and other hams en route. EHC visited ØHDU, EYN, FXQ, and JWC. OWV is putting finishing touches to a new 500-watt rig for heavy traffic this fall. He is doing a nice job as Alternate NCS on OLZ. JP is building a new ham shack with house for XYL attached. QBX, ex-BGM, is new ham in Ardmore and is interested in OLZ. MEZ, from New Mexico, and MEF, from Arkansas, now call Ardmore their home. OWG has a new welded plumber's delight on 14 Mc. LHP shows up with two new commercial tickets — 1st class radiotelephone and 2nd-class radiotelegraph. Incidentally, he tried a modulator on his rig but said it didn't key worth a whoop.

(Continued on page 98)

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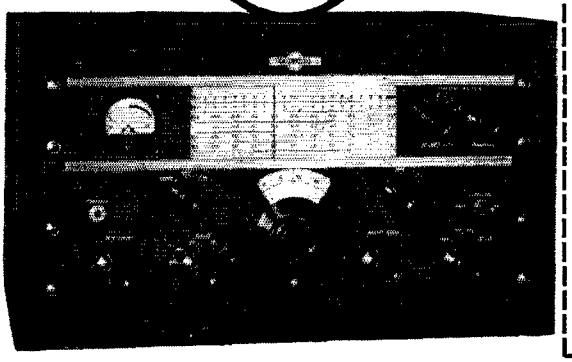

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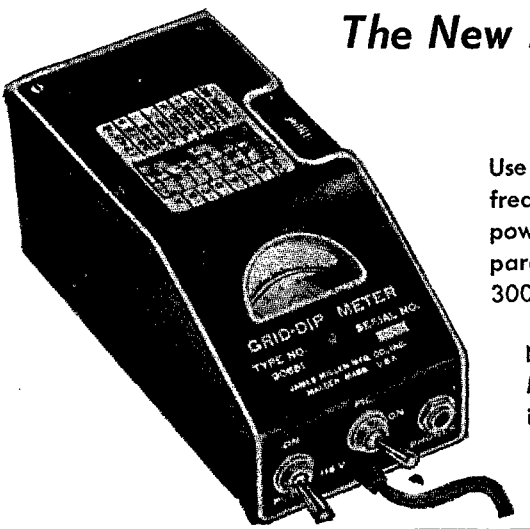

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GCM has been transferred to Germany and a new EC is needed for Pottawattomie County. MEF is about to hit 3.85-Mc. 'phone with 800 watts. The Ardmore Club completed tests on 50-Mc. emergency rig and are equipped for 3.5-, 3.85-, and 7-Mc. operation, also. 9IOK/5, president of A. & M. Radio Club, graduated with honors. The Lawton-Ft. Sill Club had W5IWZ, HXG, and KL7NQ as visitors. The latter returned to his igloo for another hitch with C.A.A. HGC has resigned SEC appointment because of business QRM. FMF has a new VFO and we hear tales about catching two moonshiners. What's it all about, Owen? Did they use your tank coil for a whiskey worm? Thanks to MBV, OWV, IOW, LHP, and K5NRJ for keeping OLZ going during the summer. K5NRJ seems to like the new BPL Certificates. Traffic: K5NRJ 502, W5MBV 132, OWV 126, EHC 2.

SOUTHERN TEXAS — SCM, Ammon O. Young, W5BDI — IRJ is on 14-Mc. 'phone working DX at night. MIF is rebuilding. PY works in both the 'phone and the c.w. STEN Nets. MVY is on 3.5- and 7-Mc. c.w. ABQ is using a 21-year-old 204A in the final. QCH has ten watts on 14 Mc. OYJ is activities manager of the Orange Club. The Orange Club has a 3-kva. gas-driven generator available for emergency work. FSC and UW are on 50 Mc. JKB is on 50 and 144 Mc. NKY is in MARS as AF5NKY. 4NVW/5, QDI, LUL, NOO, OLI, and øJTI are at Ellington Field and have a club station under way. AQK, FBC, and QFA, of Corpus Christi; NQA, OUG, NZX, and ON, of Houston; SM, AVW, DSB, and AMO, of Beaumont; KFD, of Baytown; DAA and JKB, of Kingsville; DUK, of Kemah; NMV, of Orange; OQJ, of La Porte; and VY and JLY, of San Antonio, were active in some good openings of 144 Mc. around the first part of July. NOT is now WAC. OQI built a 'phone patch that really works. MRV is working DX on 28-Mc. 'phone. LI has 300 watts on 28-Mc. 'phone. LSE is MARS A5LSE. NIT has .2 watt on 28-Mc. portable. FJA is rebuilding the final. FWC is on 3.85, 28, 50, and 144 Mc. MDZ is on 28 and 50 Mc. FJF is on 3.85 and 14 Mc. Traffic: W5ABQ 19, MIF 10.

NEW MEXICO — SCM, Lawrence R. Walsh, W5SMA — SEC: ZU. RM: NXE. PAM: FAG. The Sandia Radio Club plans to sponsor the New Mexico Hamfest, which will be held Oct. 1st at the State Fair Grounds during State Fair week. On Aug. 6th Bernard Cassidy, pres., and David Middleton, vice-pres., of the Sandia Radio Club visited SMA at Los Alamos. FAG is building a new QTH at Socorro. NRP has a new system of SS on the air. AZS now is located in Roswell. NZV is EC at Cedar Crest. The SARA Radio Club at Hot Springs reports making 2400 points on Field Day. JXH and BYX had two transmitters (25 watts) using c.w. and made about 160 contacts. JYW is trustee of the Hobbs Radio Club station. The Hobbs Club has 15 members, 10 of whom are licensed. MSG is debugging a Clapp VFO. ZU is on vacation on the West Coast. OMR and NJR are now ORS. BYX is working on call-letter license plates for New Mexico. Bill requests that every amateur contact his State Senator and Representatives in order to push this project. 1OUN/5 is building a new 200-watt final for 144 Mc. Gordon has 200 watts on 50 Mc. but no activity.

CANADA

MARITIME DIVISION

MARITIME — SCM, A. M. Crowell, VE1DQ — SEC: FQ. RM: GL. PAM: KS. BK made the BPL this month on deliveries. MK has been active in the Bluenose Net and took part in the July CD Party. He has schedule with VE3-ARS and W2OXE/MM, the Schooner *Bowdoin*. HJ, Net Control Station, was a recent visitor at MK. WC has been quite active on 7 Mc. and is in the Bluenose Net. He is building a 28-Mc. converter. QG's new QTH is St. John. He spent his vacation at Campbellton. Don is taking an electronics course at St. John Vocational School. ES is on 14-Mc. c.w. and is building a new bias supply. Several of the Halifax boys should be on 28 Mc. soon with newly-acquired and modified ex-Police mobile rigs. At long last DQ got his "pitch-prop" motor — from England. Several Halifax boys changed QTH within the city, among them LY and HD. The former acquired a fine 28-Mc. beam with home attached, recently the QTH of the latter. TA also moved "north to kilowatt alley." Our QSL Manager, FQ, still has some choice DX cards awaiting envelopes for their owners. Are yours there? Brit also is adding to his list of new countries on 14-Mc. 'phone. Traffic: VE1BK 260, MK 153, WC 29, YO 19, DB 5.

ONTARIO DIVISION

ONTARIO — SCM, Thomas Hunter, jr., VE3CP — Asst. SCM, M. J. McMonagle, 3AWJ. SEC: KM. RMs: ATR, AWE, BUR, DU, GI, TM, BMG, WX. PAMs: FQ, DD, RG. DEF is new call in Hamilton. BMG's son, age 17, is awaiting his call from Toronto. New appointments include WK as RM, BVR as ORS, DF as OPS, BTQ as EC for Clinton, and YJ as EC for London. BIX and BQL are active on 14-Mc. 'phone. Ex-3AAN is back on 3.85 Mc. from Montreal with new call, 2AIA. AIV is back on 3.85 Mc. from new home and an FB shack. BUG is after WAS

(*Continued on page 94*)

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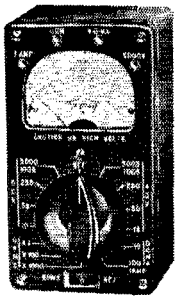

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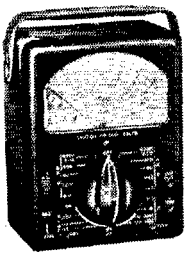
630 — Flush knobs, molded unit construction. 5½" square super-sensitive meter for accurate AC and DC measurements. AC and DC volts: 0-3/12/60/-300/1200/6000 volts. Six decibel scales. DC current: 0-60 microamperes; 0-1.2/12/120 milliamperes; 0-12 amperes. Resistance: 0-1K/10K/1 Meg/100 Megohms. With test leads and self-contained batteries.



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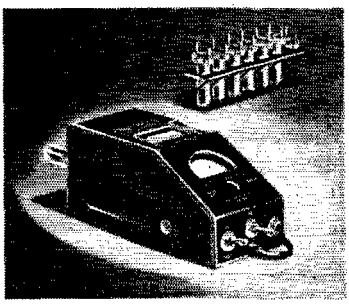
MILLEN GRID-DIP OSCILLATOR #90651



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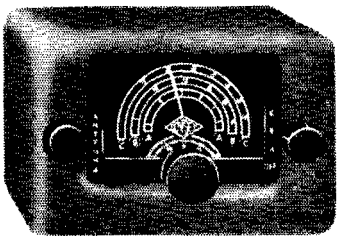

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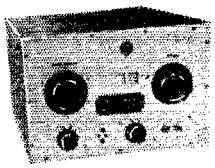

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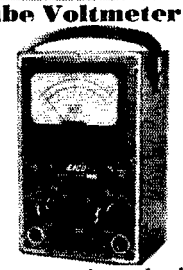

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on 3.5 Mc. with the new sky wire. BIW is back on 28 Mc. with new rig and reports fine reception on t.v. BIF, YR, UJ, ATI, AYI, and AFC are on 3.85 Mc. regularly. QB works all 'phone bands. APS, WK, and ATR possess the only BPL tickets in Ontario. AQB lost a lot of equipment from water damage because of a fire in the house. YS, IL, AUJ, DF, and YJ are new officers for the Ontario 'Phone Club (3815 kc.). BTE still is wondering how his lawn mower ran over FT's folded dipole. BL has made application as EC for Toronto. ABZ, RG, and AKZ are the newest members of the Ontario mobile gang. HK maintains watch on 3815 kc. daily at 10.15 A.M. and 5.15 P.M. for emergency traffic. His watch proved worthwhile on one occasion when a message was relayed from Brantford to Kingsville to Windsor and finally by the Windsor Police to the Montreal Police. BGK won a 5-inch 'scope tube at Iroquois Falls. AA and WQ have 28-Mc. beams working. EAA works 7 Mc. in the early morning hours. AVH has new daughter. AJV, BTV, BYV, and BGK work 7 Mc. regularly. AZZ is newest addition to A-1 Operator Club. ATR has new receiver. AXQ and BMG tried hard for a traffic total for July. The Ontario 'Phone Club picnic was a huge success with over 700 in attendance. Your SCM still is trying to promote an Ontario Convention in Toronto and there may be one after all. Traffic: VE3VD 28, BUR 26, BBM 17, APS 15, ATR 12, VD 10, WK 8, DU 6, CP 4.

QUEBEC DIVISION

QUEBEC — SCM, Gordon A. Lynn, VE2GL — The MARC held its annual picnic at Lachine CNRA grounds on July 16th with a good attendance. JN took first prize and AGU carried off second prize in the draw. QJ now has 250 watts bandswitching transmitter. ZG maintains schedules on 50 Mc. from mobile rig up to 40 miles. AIZ is a newcomer in Quebec, doing nicely on c.w. schedules. EC maintains schedules with AHK, OD, RM, EV, HZ, JAM, AT, AEM, ABJ, AIM, and AIZ. RP has ARC-5 on 3.8 Mc. from Ste. Eustache. LU seems to work considerable DX on 14-Mc. 'phone. XX received a new mike for his birthday, the old one having given up the ghost. AAO has an 815 on 28 Mc. AIA has 350 watts a.m. or f.m. on 3.5 and 14 Mc. with NC-100X receiver. XM has p.p. 812 final modulated by 807s, with rack mounted HRO. A C2 frequency meter and a 'scope completes the picture. QL also has p.p. 812s. His receiver is homemade 12-tube job. XR does some rag-chewing on 3.5-Mc. c.w. now that summer has put a crimp in the nets. NB is on 14 Mc., 'phone or c.w., with p.p. 809s, and HQ-129X receiver. BE, BG, and CA stick close together on 14-Mc. 'phone and frequently indulge in round-table rag-chews with DX stations. CA uses n.f.m. exclusively now and has new folded dipole especially for Europe in addition to his old sky wire on VK Land, which he uses every morning early in that direction. GM is getting ready for fall nets, and would like to hear from hams in districts which have not as yet been represented on the PQN. Traffic: VE2EC 26.

VANALTA DIVISION

ALBERTA — SCM-SEC Sydney T. Jones, VE6MJ — From all reports the Alberta Hamfest was a success. AO headed the delegation from Calgary. NA and ES represented Medicine Hat. VJ was the only visitor from Lethbridge. MB is attending summer school sessions at the University of Alberta. BA will be active on 3.8-Mc. 'phone shortly. W7DSS, of Great Falls, Mont., and his XYL were visitors at the Hamfest. PF and MO recently qualified for their operator's tickets as a result of the FB instruction of MY. 5FY and 5YF arrived in Edmonton in time for the Hamfest complete with family mobile rig and dog. EY finally made the ranks of A-1 Operators Club. Are there only five A-1 operators in Alberta? The July 16th flood in Edmonton proved that there is a definite need for AEC in the Capital City. Who would have thought of seeing a canoe being paddled on Jasper Avenue? OA is active on 14-Mc. 'phone during the summer months. JK is Assistant EC in Calgary. DK schedules Vancouver on 7-Mc. c.w. MY says communications between Edmonton and Calgary are poor; can't even arrange for special milk delivery. IX and SV were early-morning visitors at MJ's shack. LG did an FB job as Master of Ceremonies at Hamfest. Traffic: VE6MJ 5.

PRAIRIE DIVISION

MANITOBA — SCM, A. W. Morley, VE4AM — A very welcome report has been received from YR at the Pas, who is using a 459A for VFO to an HT-9 with a three-element beam on 14 Mc. and four-element on 28 Mc. An SX-28A hauls them in. XT is using TA12G with a folded dipole 75 feet high on 3.8 Mc. IB uses and S20R and an 807 driven by a Clapp VFO, n.f.m. 3.8 and 14 Mc. VT is using S40 and parallel 807s. DS has an S25 and a VFO driving p.p. 813 on c.w. with a modulator in the icebox. GP has an SX-25 and p.p. 807s driven by a Meissner Signal Shifter. HA uses a single 807 and an SX-43. The gang was visited by 5LS, 5KB, and 5WB, all of Naicam. WØFDO also visited the gang. ML, of Brandon, has gone to VE1 Land. GE-IF went to Chicago on holidays. IA now has a pair of 807s on DX

(Continued on page 96)

BOB HENRY
Has it in Stock . . . and Offers You a BETTER DEAL!

Henry Radio stores in Butler, Missouri and 11240 West Olympic Blvd., Los Angeles, California have complete stock of all Collins and of all other amateur receivers, transmitters, and parts. I promise you that you can find nowhere else lower prices, more complete stocks, quicker delivery, easier terms or more generous trade-ins. I give you 10-day free trial and 90-day free service. I promise that you will be satisfied on every detail. Write, wire, phone or visit either store today.

Bob Henry
W0ARA

A FEW ITEMS I STOCK ARE:

National NC-33	*$ 57.50*
National NC-57	*89.50*
National NC-173	*189.50*
National NC-183	*268.00*
National HRO-7	*292.50*
National HRO-7C	*372.45*
National HFS	*142.00*
Hallicrafters S38	*39.95*
Hallicrafters S72 portable	*79.95*
Hallicrafters S40A	*79.95*
Hallicrafters SX71	*179.50*
Hallicrafters SX43	*159.50*
Hallicrafters SX42	*275.00*
Hallicrafters SX62	*269.50*
Hallicrafters HT18	*110.00*
Hallicrafters HT19	*359.50*
RME HR-10-20	*77.00*
RME VHF-152A	*86.60*
RME DB22A	*71.00*
Hammarlund HQ-129X	*177.30*
Signal Shifter EX kit	*49.75*
Telvar T60-2	*150.00*
Harvey-Wells TBS-50	*99.50*
Harvey-Wells TBS-50A	*121.25*
Hunter 20A Cyclemaster	*169.50*
Subraco MT-15X	*79.95*
Hallicrafter & National TV sets	

Gonset, Silver, Meissner, Milen, Sonar, Stancor, Bud, Mon-Key, Vibroplex, B & W, Johnson, RCA, Gordon, Amphenol, Hy-Lite, Elincor, Workshop, Premax; I have everything for the amateur.

Some prices higher on west coast

COLLINS ITEMS STOCKED:

Collins 75A-1 receiver	$ 375.00
Collins 32V-2	575.00
Collins 30K-1	1450.00
Collins 70E-8	40.00
Collins 310C-1	60.00
Collins 310C-2	75.00
Collins 310B-1	190.00
Collins 310B-3	215.00

COMPLETE STOCKS

Henry has *everything* in the ham field.

QUICK DELIVERY

Shipments *4 hours* after receipt of order. Send $5.00 with order and shipment will be made at once C.O.D.

TRADE-INS

You can't beat Bob Henry for trade-ins. Write, wire or phone today about your equipment and Bob Henry will make you a better offer than you can get anywhere else.

TIME PAYMENT

Because Bob Henry finances the terms himself you get a better break. Save time and money, deal with Bob Henry on his personal, profitable time payment plan.

Butler 1, Missouri **HENRY RADIO STORES** 11240 Olympic Blvd. LOS ANGELES 25 CALIF.

"WORLD'S LARGEST DISTRIBUTORS OF SHORT WAVE RECEIVERS"

is heard testing on 14-Mc. phone. Super-modulation has hit the St. Boniface gang, with DY, NZ, and FK all using it. QG has the bug, too. IEO, from Halifax, was in Winnipeg. Plans are under way for both c.w. and 'phone nets for the section to tie in with ARRL National Traffic Plan. There is a place for you in it. Page 54 of August *QST* has details on CD policy and various appointments. Drop me a line for full details on any in which you are interested.

SASKATCHEWAN — SCM, J. H. Goodridge, VE5DW — HR made a trip to VE7 Land. UQ, VB, and AW coincidentally vacationed at Lake Waskesieu with portable gear. They had B.C.I., too. EP is sporting his new car. DW has moved to Regina.

A.R.R.L. QSL BUREAU

As a service to American and Canadian amateurs, ARRL maintains a QSL Bureau to make it easy for you to get your cards from foreign stations. Here is how it works: When you work a DX ham, you ask him to QSL via ARRL, then send a stamped, self-addressed stationer's size No. 10 envelope to the QSL manager for your call area, whose address is listed below. When he has an envelope full of cards for you, he drops it in the mail. Upon its receipt, you should immediately send another such envelope so that the QSL manager always has at least one on file for you.

If you've had a different call before, send an envelope to the manager for that call area; all cards are routed to the *home district* as shown in the call.

Best bet on handling cards *for* foreign amateurs is to send them to appropriate bureaus as listed on page 50, June *QST*.

W1,K1 — Frederick W. Reynolds, W1JNX, 83 Needham St., Dedham, Mass.
W2, K2 — Henry W. Yahnel, W2SN, Lake Ave., Helmetta, N. J.
W3, K3 — Jesse Bieberman, W3KT, Box 34, Philadelphia, Pa.
W4, K4 — Johnny Dortch, W4DDF, 1611 East Cahal Ave., Nashville, Tenn.
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 — Bob Donovan, W7EYS, 1530 Fairview St., Bellingham, Wash.
W8, K8 — William B. Davis, W8JNF, 4228 W. 217th St., Cleveland 16, Ohio
W9, K9 — John F. Schneider, W9CFT, 311 W. Ross Ave., Wausau, Wis.
WØ, KØ — Alva A. Smith, WØDMA, 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, 1785 Emerson St., Victoria, B. C.
VE8 — Jack Spall, VE8AS, P. O. Box 268, Whitehorse, Y. T.
KP4 — E. W. Mayer, KP4KD, P. O. Box 1061, San Juan, P. R.
KZ5 — C.Z.A.R.A., Box 407, Balboa, Canal Zone
KH6 — Andy H. Fuchikami, KH6BA, 2543 Namauu Dr., Honolulu, T. H.
KL7 — J. W. McKinley, KL7CK, Box 1533, Juneau, Alaska.

NOTE: Bold-face listings indicate changes from last-published QSL Manager list. Remember this new address when sending your next envelope.

A sensational "SURPRISE" Trade-In Allowance on your used, factory-built Receiver or Transmitter makes it possible for you to own new **NATIONAL** Communication Equipment for **far less money.** To get your fine, precision-built **NATIONAL** Receiver right away, simply tell us what you have to trade, furnishing make and model number. We'll respond with our special "SURPRISE" Allowance. Wire, write, phone or use the handy coupon below.

SAVE NOW ON NEW National

EST. 1914

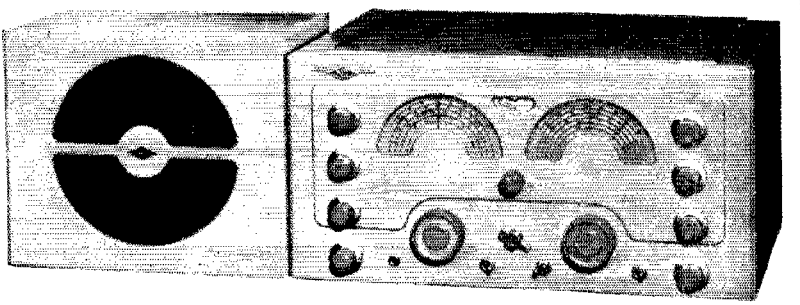
RECEIVERS

With a *Surprise* Trade-In Allowance On Your Used Communication Equipment

NC-183

For the discriminating radio amateur. Two tuned stages of RF and push-pull audio output. Complete frequency coverage from .54 to 31 MC and 48 to 56 MC with adequate band spread on all amateur bands. Shpg. WT. 80 lbs. Only..... $268.00

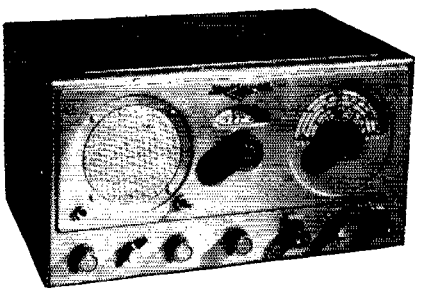
Speaker for above in matching cabinet....$14.00



NC-173 The popularly-priced Communication Receiver with high priced performance. Similar in appearance to NC-183, above. Has one stage RF and single ended audio output. Shpg. WT. 70 lbs. Only..... **$189.50**

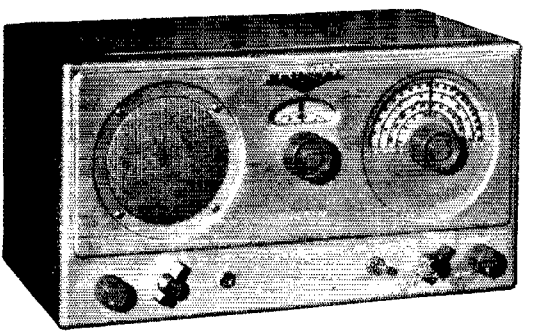
Speaker for above in matching cabinet..... $10.00

LATEST NATIONAL RADIO PRODUCTS CATALOG FREE ON REQUEST.



NC-57

A low-priced Communication Receiver with all the features of much higher priced sets. 1 stage of tuned RF. AF and RF gain controls. Electrical band spread and automatic noise limiter. Voltage regulated oscillator circuit. Freq. range .54 to 55 MC. Complete with built-in speaker. Shpg. WT. 34 lbs. Only..... $89.50



NC-33

Covers all frequencies from 500 KC to 35 MC. Built in CW oscillator and send-receive switch. Automatic noise limiter and provisions for head phone operation. Complete with built in speaker. Shpg. WT. 23 lbs. Only..... $57.50

TIME PAYMENTS • ALL PRICES F. O. B. ST. LOUIS

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☐ Rush Special "Surprise" Trade In offer on my.....
(show make and model # of used communication equipment)
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☐ Mail my Free copy of new 160 page Walter Ashe Catalog

☐ Send Free copy of National Radio Products Catalog

Name .....

Address .....

City..... Zone..... State.....

DX Contest

(Continued from page 37)

Spain

EA4LA..... 48,711- 39-419-B-38

Sweden

SM6WJ..... 52,928- 32-561-B-42
SM5UM..... 43,800- 30-489-B-52
SM5LU..... 37,034- 38-281-B-63
SM5AI*..... 384- 8- 16--- -

Switzerland

HB9DY..... 37,323- 29-429--- 70
HB9FE..... 840- 14- 23--- -

Trieste

AG2AB (Capt. R. A. Smith)
3096- 9-117-B-12

Wales

GW2UH..... 25,200- 24-353-B-41
GW3KY..... 19,041- 33-195-B-29
GW8UH..... 1631- 7- 80-B- 7

NORTH AMERICA

Alaska

KL7OO..... 7769- 17-154-A-15
KL7GW..... 1212- 12- 35-A- 6
KL7FM..... 513- 9- 19-B- 3
KL7DD*..... 75- 5- 5-B- 3

Barbados

VP6CDI.....168,445- 59-959-A-55
VP6SD.....109,296- 48-769-A-52

Bermuda

VP9DD..... 41,180- 29-477-A-26

British Honduras

VP1SJC..... 1937- 13- 51---

Cuba

CM9AB..... 47,560- 40-413-B-18
CO8BL*..... 5166- 14-123--- -
CO2MG*..... 182- 7- 9-A- -

Grenada

VP2GE..... 13,550- 25-182-A-23

Guantanamo Bay

NY4BA..... 13,552- 22-207-B-13

Guatemala

TG9AN.....143,664-48-1000-A- -
TG9JK*..... 306- 6- 17--- -

Mexico

XE2W..... 95,088- 43-668--- -
XE1PZ..... 62,307- 43-488-A- -

Newfoundland

VO2N..... 29,119- 37-263-B-22
VO2FL..... 8190- 21-131-B- -
VO2BP..... 5733- 21- 91-B-10

Panama

HP1BR..... 15,780- 30-143-A-27

Puerto Rico

KP4ES.....214,524-59-1212-B-33
KP4EZ*..... 9- 3- 1--- -

Salvador

YS2AG..... 5775- 25- 77-B-19

Swan Island

KS4AL..... 294- 7- 15--- -

Virgin Islands

KV4AL..... 7111- 13-183-B-17

OCEANIA

Australia

VK7AJ..... 61,758- 47-440-A-52
VK3AWN..... 35,770- 35-346-A-44
VK3VQ..... 6090- 29- 70-A- -
VK3XK..... 4623- 23- 67-A- 9
VK3MX..... 2040- 12- 57-A- 9
VK5LG..... 1952- 12- 49-A- -
VK5FM..... 1287- 11- 39-A- 7
VK2WD..... 720- 10- 24-A- 7
VK3ABA..... 450- 10- 15-A- -
VK2JZ..... 228- 4- 19--- -

Hawaiian Islands

KH6IJ..... 93,280- 53-590-C-32

Marianas

KG6DI..... 5451- 23- 79-B- 7
W3CHH/KG6..... 4842- 18- 90-B- -

New Zealand

ZL1MQ..... 44,121- 33-446-A-48
ZL1DL..... 41,679- 33-421---
ZL1MB..... 675- 9- 25---

Samoa, Western

ZM6AF..... 1270- 11- 40---

Sumatra

PK4DA..... 16,072- 28-193-A- -

SOUTH AMERICA

Argentina

LU3DH..... 43,008- 28-512-C- -
LU3BAC..... 14,174- 19-250-B-15
LU5BM..... 5490- 18-102-B- -
LU3EL..... 5134- 17-102-B- -

Bolivia

CP5FB..... 11,844- 14-284-B-18
CP1AS..... 950- 10- 32-B- -

Brazil

PY2CK.....146,608-49-1002-C-63
PY2NX..... 13,578-31- 147-B- -
PY1FM..... 2365-11- 73-A-

British Guiana

VP3HAG..... 5421- 13-140---

Chile

CE2BQ..... 736- 8- 31---

Columbia

HK3CU..... 54,230- 34-539-B-49

Ecuador

HC1KP.....190,400- 85-755-A- -
HC2OL.....105,662- 46-768-B-54

Netherlands West Indies

PJ5KO..... 1990- 10- 68-A- 6

Peru

OA1E..... 61,294- 38-542-A-63
OA4DX..... 2409- 11- 73-A-11

Uruguay

CX3BH..... 18,964- 22-288-A-
CX1RJ..... 2743- 13- 72-A-
CX2CO*..... 210- 7- 10---
CX1NE..... 27- 3- 3---

Venezuela

YV5BP*..... 6- 1-

SUN RADIO'S ANNUAL CLEARANCE!

CRYSTALS!

All crystals have Army MC harmonic ratings but Sun encloses directions for deriving the correct fundamental frequency in kilocycles.

JUST ARRIVED! NEW FREQUENCY CRYSTALS FOR HAM AND GENERAL USE
— FT-243 Holders, ½" pin spacing
(Fractions Omitted)

GENERAL USE

6006	6208	7873
6025	6773	7906
6040	6840	7925
6073	6873	7940
6075	6906	7950
6100	6940	7973
6106	6973	7975
6140	7740	8240
6150	7773	8273
6173	7806	8306
6206	7840	

49c each
10 for $4.50

HAM USE
2, 6, 10, 11, 20, 40 METERS

5305	5825	6273	6606	7306	7673
5675	5840	6340	6640	7340	7706
5677	5850	6373	6673	7373	8000
5700	5873	6406	6706	7406	8040
5706	5875	6425	6740	7440	8050
5725	5900	6440	6806	7473	8073
5740	5906	6450	7073	7506	8100
5750	5925	6473	7140	7540	8173
5760	5940	6475	7173	7573	8175
5773	5973	6506	7206	7606	8340
5775	5975	6540	7240	7640	
5806	6000	6573			

99c each 10 for $9.00

CRYSTALS WITH A MILLON USES

Fractions Omitted

kc	kc	kc	kc	kc	kc	kc	kc	kc	kc	kc	kc
412	422	433	442	462	481	492	503	507	511	516	522
413	423	434	443	468	483	493	504	508	512	518	523
414	424	435	444	472	484	494	506	509	515	519	
415	425	436	445	473	485	495					
416	426	437	446	474	487	496					
418	427	438	447	475	488	497					
419	429	440	448	477	490	498					
420	431	441	451	479	491	502					

49c each

Xtal. Freq. Stan. 3-prong holder 98.356Kc

Easily altered for 100kc Standard. Mounted in low loss 3 prong holder.

$3.89 each

For Crystal Controlled Signal Generators Ft. 241-525Kc

526,388	533,333	537,500
527,777	536,111	538,888
529,166		
530,555		
531,944		

99c each

I.F. Frequency Standards

kc	kc
450	461,111
451,388	464,815
452,777	465,277

99c each

200 KC CRYSTALS

Without Holders 21/32" x 23/32". Each **69c**
3 for $2.00

Assorted Miscellaneous Crystals
Fractions Omitted

372kc	379kc	384kc	387kc
374	380	386	388
375	381		
376	383		
377			

39c Each

priced at a fraction of the cost of their holders alone.

For Ham and General Use
Fractions Omitted

390kc	396kc	403kc	408kc
391	397	404	409
392	400	405	411
393	401		
394	402		
395			

79c each

CRYSTALS FOR SCR 522

5910kc	7480	
6370	7580	
6450	7810	
6610	7930	
7350		

$1.29 each

CRYSTALS FOR HAM USE

FT-243 Holder ½" Spacing

ea.
3735 KC...69c
4190 KC...39c
5030 KC...39c
5485 KC...39c

Crystals from BC 610 ¾" Spacing—2 Banana Plugs

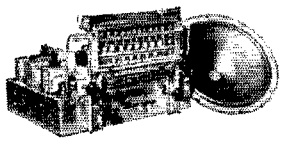
2045	2305	3202	3550
2105	2320	3215	3570
2125	2360	3237	3580
2145	2390	3250	3945
2155	2415	3322	3955
2220	2435	3510	3995
2258	2442	3520	
2260	2532		
2282	2545		
2300	2557		

$1.29 each

• Payments must accompany order. Enclose 20c for postage and handling. Minimum order — $2.00 plus postage.
Crystals are shipped packed in cloth bags inasmuch as they are shock mounted. All shipments guaranteed.

SUN RADIO
OF WASHINGTON, D. C.
938 F STREET, N. W. WASH. 4, D. C.

Save $ with Sun Super Specials!



Sensational Buy for Music Lovers

STROMBERG CARLSON Hi-fidelity AM-FM-SW, custom chassis with powerful 12" speaker, eight pushbottons, tone control, inputs for phone and TV. Has the following tube lineup: 6SG7 — RF amp., 6SB7Y — Conv., 6SG7 — 1st IF., 6SH7 — 2nd IF., 6SH7 — LIM., 6H6 — Disc., 6SQ7 — Det., AVC, 1st AR., 6SC7 — Inverter., 2 — 6V6GT — P. P. Power output., 5U4G — Rect. Covers the following ranges; a) 540–1610 kc, b) FM — 42–50 mc, c) FM — 88–108 mc, d) Band spread S.W. 8.18–10.3 mc. Audio power output — 10 watts. Original price of this unit was $169.50.

SUN'S SPECIAL PRICE — (Brand new)..... **$74.95**

HANDSETS

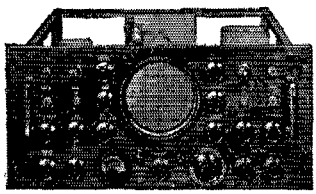
TS-13 Telephone type with high impedence phone and 200 ohm carbon mike, butterfly push to talk switch. New.. **$3.95**

MICROPHONES

T-17 B Carbon — Push to talk switch.

New

$1.29



MONITOR SCOPE UNIT

TS-121/CPN8 — Ideal for building a high quality, Precision, laboratory 5" oscilloscope, contains 115v–60cy power supply, high voltage power supply, C.R. tube shield — condensers, resistors, controls, and almost everything else needed to make this conversion, with conversion diagrams, less tubes **$39.95**

METERS

Weston: 2" r. 500 micro-amp. with scale for 0–15/600v.....**$2.97**
J. B. T. Reed Freq. Meter: 56 to 64 cy..... 9.95
Triplett: 2" sq. 0–40v. DC METER 2.97
Sun: 2" r. 0–300 V DC..... 2.97
Westinghouse: 3" sq. 0–150 V AC.. 3.49
Simpson-Foundation Meter for I–177 Mutual Conductance Tube Tester — Calibrated in Micromhos, with diagram — 1.4 MA..... 3.49
Weston: 2 range ohmmeter, new with case, 0–10/1000 ohms.....14.97
Weston: 2 range DC milliammeter, 0–150, 1500 ma — 6" fan type scale, Laboratory Standard — Model No. 1 — Accuracy 1/10 of 1% with leather case. Value $125.00.....24.95

TUBES

All new and guaranteed, some boxed, some bulk, at tremendous savings — stock up now for that fall and winter business.

1C5GT,	$ .49	6SF5,	$ .60	31,	$ .88
1H6GT,	1.10	6SH7,	.72	32L7	
1S5,	.39	6SJ7GT,	.49	GT,	.99
1T4,	.43	6V6 GT,	.72	35W4,	.45
2A6,	.59	6VTG,	.49	38,	.72
2A7,	.88	7A4,	.72	39/44,	.88
2B7,	.59	7C5,	.72	46,	.39
2S/4S,	.49	7H7,	.40	55,	.69
5V4G,	.88	7Q7,	.72	80,	.50
6A6,	.88	12A6,	.99	89,	.49
6AE6G,	.72	12SA7GT,	.49	485,	.49
6B4 G,	1.06	12SF5,	.60	954,	.50
6B7,	.59	12SH7GT,	.72	955	.55
6C5,	.60	12SJ7GT,	.60	957,	.55
6C6,	.72	12SK7GT,	.49	1619,	.55
6C7,	.59	12SQ7GT,	.54	*VR53	.19
6D6,	.60	12SR7,	.72	*Use to replace 12K7 or 12J7	
6K7GT,	.60	14A7/	.54		
6N6 G,	1.28	12B7,	.88		

Mixed quantities in lots of 100 — 10% discount from these prices

PARTS ASSORTMENTS

100 Ass't Elec. and Tubular Cond.....**$3.49**
100 Ass't Resistors..... **1.00**
100 Ass't Mica Cond, unmarked..... **1.00**
25 Ass't Pots..... **4.95**
100 Octal Wafer Sockets.... **2.95**
100 Octal Bakelite Sockets.. **3.95**

Ham Transformers — Peerless (Altec Lansing) new, not surplus, priced below cost.

Modulation Trans. — 20 w. Universal No. M-4081Q. List $9.25. Only.....**$3.70**

Modulation Trans. — 300 w. Universal No. M-2107T. List $70.00. Only.....**$28.00**

Plate Trans. — 2428 v. CT-300 MA No. P-5196A. List $45.00. Only.....**$18.00**

Fil. Trans. — 2.5 v. CT-20 Amp. 4500 v. ins. No. F-8513J. List $8.00. Only.....**$3.20**

Driver Trans. — Universal, 70 MA for 15 w. Audio No. A4237Q. List $10.75. Only.....**$4.30**

Grid Mod. Trans. — Kenyon, ...99c

HEADPHONES

HB-4 — High impedance with long rubber cord and plug.**$2.49**

PHONO ARMS

American model No. 1-j with CRIA 3.5 volt output cartridge. Unboxed. New.....**$1.65**

Astatic SL 8 and D 9 with L-26a cartridge. Standard replacement unit. Boxed. New.....**$1.89**

Phono arms less cartridge, but with all necessary hardware, straight or curved. Five (5) for.....**$1.95**

TERMS All items F.O.B., Washington, D. C. All orders $30.00 or less, cash with order. Above $30.00, 25 per cent with order, balance C.O.D. Foreign orders cash with orders, plus exchange rate.

Series-Tuned VFO

(Continued from page 46)

ing, to make a small dot on the scale and then later draw in short lines and print the appropriate frequency on the card. On the model shown, frequency is indicated every ten kilocycles and it is possible to estimate accurately to one kilocycle. If your bandspread is not as great, a check every 25 kc. or even every 50 kc. may be sufficient. It is best not to mark the basic frequency on the card unless you usually operate in the 80-meter band. Mark the frequency applicable to the band on which most of the operating is done. Special net frequencies may be indicated by a short red line.

Operation of the unit has been covered piecemeal throughout the article so will not be repeated. One fact should be noted: the VFO is *not* a frequency meter. With one of the early models designed, an ordinary mica condenser was used for the C_7 coupling to the first untuned stage. It turned out that there was a frequency drift to a maximum of 1.7 kc. over a period of two and one-half hours before it settled down. Finally C_7 was changed to a 180-$\mu\mu$fd. negative-temperature-coefficient ceramic type. Now there is no measurable drift after thirty minutes, and from a cold start with the filaments off, the maximum drift at the end of thirty minutes is only 200 cycles. For operational purposes this drift is negligible and is about the same as that experienced with a modern receiver with temperature compensation and a voltage-regulated oscillator. The note is the equal of that of the average crystal oscillator and there is no difference whether the oscillator or a following stage is keyed. If the oscillator is keyed the author prefers to bias all following stages to cutoff, although some may prefer less bias. Keying is excellent either way. From an operational standpoint this VFO is by far the best of some half-dozen constructed and its place on the operating table is assured for a long time.

Technical Topics

(Continued from page 47)

eardrums at the chosen frequency. In effect, this is saying that while very high selectivity is a good thing in theory, certain kinds of it are hard to take for any length of time in practice. The kind that is hardest to take is the kind that gives a sharp peak on one definite frequency. A somewhat flat-topped peak with the same effective skirt selectivity is much easier on the ears.

A practical selective-amplifier circuit is shown in Fig. 3. Although audio filters usually are discussed in terms of high-Q inductors that run into money, the coil we used was one of the cheapest varieties of replacement filter chokes. A filter choke of this type is a pretty low-Q device and may not give all the selectivity that can be used without ear fatigue. Consequently, in the circuit shown the attenuation at low frequencies has been increased by using a high-boost coupling system and the high-frequency attenuation has been increased by shunting either the output

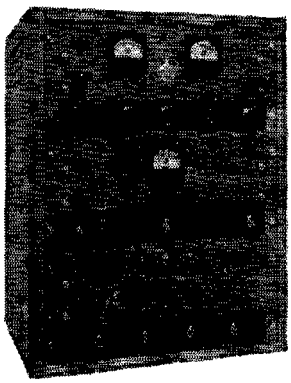
(Continued on page 108)

FULL YEAR GUARANTEE!

WHY BEAT YOUR BRAINS OUT

trying to build your own XMTR? Here's a rig for less than $1.00 per watt with a full year GUARANTEE! It doesn't pay to build your own — save money with me!

LEO I. MEYERSON
WØGFQ



THE NEW WRL "400" GLOBE KING

The new versatile, advanced design *transmitter that Hams all over the* world are talking about. Brilliant performance on all bands from 10 to 160 on phone and CW. 350 watt phone 100% modulated, and 400 watt CW make this XMTR the outstanding buy on the market. Provisions for ECO. Complete with one set of coils.

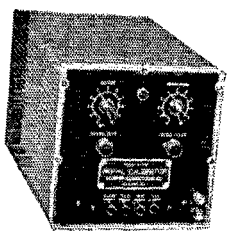
$399.45 WIRED **$379.45 KIT FORM**

Detailed specification sheet furnished on request.

10 DAY FREE TRIAL. Let me send you the New WRL "400" Globe King; so you can *install it in your shack and give it a real test.* If at the end of 10 days you don't think it's the best XMTR you've ever worked, ship it back to me—AT MY EXPENSE.

E-Z PAYMENT PLAN. If you want to keep your Globe King—and I'll bet dollars to *doughnuts you will—it'll take only a 20%* down payment with the balance payable to suit ***your*** convenience. It costs less to deal with me because I finance my own paper.

Now You Can Afford to Own a **SIGNAL CALIBRATOR**
MEISSNER PRECISION FREQUENCY STANDARD



Not a surplus item. NEW—in original cartons. A lucky purchase for us—we're passing our savings on to you!

100 KC, 50 KC, and 10 KC "markers" up to 20,000 KC—Push-button control of frequency—Delivers modulated or unmodulated signal—Easily set . . . instantly checked—Well ventilated cabinet—Precision accuracy —Now you can meet F.C.C. Regulations at low cost!

A precision type, quartz crystal operating on 100 KC is used. Model 9–1076 Signal Calibrator uses 3 type *6SJ7GT, 2 type 6N7GT, 1 type 6SK7GT and 1 type* 6X5GT tubes.

Two multi-vibrators provide output on 50 KC, 10 KC and multiples thereof up to 20,000 KC. Complete with AC power supply and 7 tubes.

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transformer or headphones by capacitor C_8.

The over-all response of the complete amplifier is shown in Fig. 4. The resonant and antiresonant frequencies can be chosen to suit the builder's taste by varying the capacitances. The choice represented by the curve was determined upon by the writer as being optimum for him after considerable listening. The selectivity is not so great as to be tiring, even after hours of operating, but the effectiveness of the filter in reducing QRM is easily demonstrated by switching it in and out when listening on a crowded band. Comments from various members of the Hq. staff who listened to it indicate that the characteristic is pleasing to the average operator. Actually, it is about equivalent, overall, to the audio selectivity obtained from a moderately-selective crystal filter, but with a different curve shape. (An audio filter will not, of course, eliminate the other side of zero beat in a noncrystal receiver.)

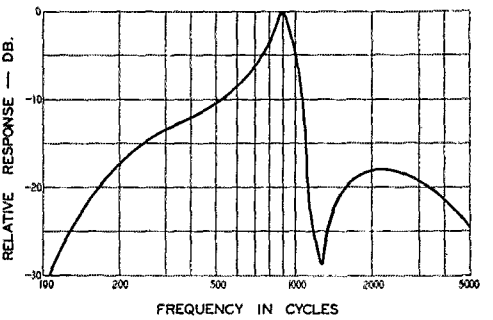

Fig. 4 — Frequency response of the amplifier shown in Fig. 3.

While this amount of selectivity is excellent for general c.w. work, it makes 'phone signals sound pretty bad. Closing S_1 destroys the resonant and antiresonant effects and gives an overall response that has no peak or notch but which is cut at both the low and high ends. This type of response curve increases selectivity in 'phone reception, but does not affect intelligibility to any extent nor does it make voices sound unnatural.

— *G. G.*

Single Sideband

(Continued from page 48)

Len Edwards, **VK7LE**, uses a filter job, starting out at 12.5 kc. with a homemade filter. It heterodynes first to 440 kc. and then to 7143 kc., where the output amplifier is a pair of AB_2 807s running 100 watts peak. A small amount of carrier is transmitted, to help in zero-beating at the receiving end. Over 100 contacts have been made since it was first used in February, and many operators have had the opportunity to observe the reduction in fading and the ability to "get through" that characterizes single sideband. All Australian states have been worked, with the best DX about 1400 miles. The first two-way single-sideband

(Continued on page 104)

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The Home of RADIO

QUALITY – PRICE DEPENDABILITY

½, 1, 2 watt Resistors in Standard R.M.A. Sizes, well known Mfgrs. Brand New.

½ watt	Each $.08	per 100	$ 6.00
1 watt	Each .10	per 100	8.50
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RS57 Sockets	.08
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100 Ft. coil #14 enamel	.83
100 Ft. coil #12 enamel	1.25
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Shure Crystal desk mike	5.00
100 Mmfd. split stator receiving condenser	3.82
National ACN Dial	3.23

TRANSFORMERS 115 Volts, 60 CYCLES

372-0-372 @ 175 Ma-5V @ 3 Amps	$ 2.95
435-0-435 @ 250 Ma-80V @ Bias Tap 5V @ 3A, 2.5V @ 3A, 6.3V @ 1.5A, 25V. @ 10A	5.88
360-0-360 @ 250 Ma-6.3V. @ 0.6A, 6.3V. @ 8A, 5V @ 2A, 5V @ 3A	12.05
350-0-350 @ 200 Ma-6.3V @ 0.6A 6.3V @ 7A, 5V @ 2A, 5V @ 3A	8.67
400-0-400 @ 300 Ma-12.6V @ 10A.C.T. 5V @ 3A, 5V @ 6A	14.55
2500V @ 5 Ma-6.3V @ 3A tapped at 2.5V @ 2A, 2.5V @ 2A	5.14
400-0-400 @ 200 Ma-5V @ 3A, 6.3V. C.T. @ 5A	7.05
350-0-350 @ 90 Ma-5V @ 3A, 6.3V. @ 3.5A	3.59
427-0-427 @ 1. Amp	7.95
.0001 Mfd. 2500VDC mica	.25
500 Mfd. 200VDC electrolytic	.75
16 Mfd. 450VDC electrolytic	.69
Ceramicon condensers from .75 MMfd to 2500 MMfd . . . per 100 assorted	10.00

CONDENSERS

1.78 Mfd. 200VAC	oil	$ .29
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7.5 Mfd. 330VAC	oil	.69
2 Mfd. 1000VDC	oil	.59
.05 Mfd. 2500VDC	oil	.95
1 Mfd. 5000VDC	oil	2.95
2x.1 Mfd. 7000VDC	oil	2.00
10 Mfd. 1000VDC	oil	1.95
.25 Mfd. 6000VDC	oil	1.69
.02 Mfd. 8000VDC	oil	.98
.5 Mfd. 7500VDC	oil	4.95

CHOKES

SMOOTHING TYPE	Hy	SWINGING TYPE	Hy	PRICE EACH MA	Price
C-80	10	C-87	4–16	150	$3.09
C-81	10	C-88	4–16	200	$3.82
C-82	10	C-89	4–16	250	$5.29
C-83	8	C-90	3–14	300	$5.59

All above 3000 Volts Insulation

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All 117 Volts to 117 Volts 60 Cy.

P-96, 40 watts	$3.60	P-98, 100 watts	$9.30
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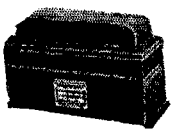
RAYTHEON VOLTAGE STABILIZERS

Positive Stabilization ±½%

Input 95-130 volts, 60 cycles single phase; output 115 volts stabilized to ±½%. *Output 6.0 or 7.5 volts stabilized ±½%.



Catalog No.	Output Watts	Net Cap. wgt. lbs.	Net Price
VR-6110	15	4	$15.00
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VR-6111	30	5	$17.00
VR-6112	60	8	$24.00
VR-6113	120	14	$31.00
VR-6114	250	25	$48.00
VR-6115	500	45	$75.00
VR-6116	1000	92	$125.00

FILAMENT TRANSFORMERS

Type 940	2.5VCT @ 10 Amps.	7500V Ins	$2.79
Type 040	5. VCT @ 3 Amps.	2500V Ins	$2.06
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Type 943	5 VCT @ 20 Amps.	2500V Ins	$5.29
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Type 947	6.3VCT @ 6 Amps.	2500V Ins	$2.79
Type 948	6.3VCT @ 10 Amps.	2500V Ins	$3.67
Type 960	7.5VCT @ 4 Amps.	2500V Ins	$2.35
Type 143	7.5VCT @ 8 Amps.	2500V Ins	$4.12
Type 146	10 VCT @ 10 Amps.	3000V Ins	$4.99
Type 961	Dual 6.3VCT @ 3 Amps	2500V Ins	$3.38
Type 041	5VCT @ 3 Amps. 6.3VCT @ 3.6 Amps.	2500V Ins	$3.38

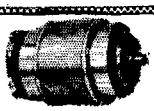
WIRE WOUND POTENTIOMETER

100,000 ohm, precision made G.R. type, 25 watt, 6" diameter. Brand New **$1.95**

GREENLEE PUNCHES

Cuts to ⅛" thick metal.

½"	$1.94
⅝"	$1.94
1"	$2.12
1⅛"	$2.25
1-3/16"	$2.25
1½"	$2.88



SELSYN MOTORS

115 V.A.C. 60 cycle #C-7824b. Can be used to turn small antennas or as indicators. Size 3½" x 5½". Price per pair **$6.95**

PLATE TRANSFORMERS

For Small Transmitters. DC Voltage Ratings are Approx. Values Obtained at Output of a 2 section Choke input Filter. Using Mercury Vapor Rectifier Tubes Pri. is for 115 V. 60 cy.

Type No.	Sec. Rms. Volts	Sec. DC Volts	Sec. DC MA.	Dimensions H.	W.	D.	Price Each
P 57	660–660† 550–550	500 400	250	4⅝	3⅛	4⅛	$ 6.76
P 58	1080–1080 500–500	1000* 400	125 150	4⅝	3⅛	5	8.23
P 59	900–900 800–800	750 600	225	4⅝	3⅛	5⅛	7.94
P 67	1450–1450 1175–1175	1200 1000	300	5¾	6⅛	4	19.84
P 68	2100–2100 1800–1800	1750 1500	300	5¾	6⅛	4¼	24.99

* For dual operation with simultaneous use of both sec ratings. † Has 40-volt bias tap.

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Smooth, efficient voltage control. 0 to 135V. output from 115V. AC line.

Type 20 (illustrated 3 amps.	$12.50
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COrtlandt 7-2612 — New York City 7

See P. 111 . . .

QSO was a crossband job with **VK7DH** on 14 Mc. The only dope we have on 7DH is that he uses a phasing job.

VK7LE says, ". . . the Postmaster-General Department, which controls amateur radio in Australia, has requested that official single-sideband stations be set up in each state. I think probably the reason for this is that the Department recognizes the fact that this type of transmission is of great benefit to the amateur radio fraternity, the idea of the official stations being to give those interested some idea of what the single-sideband signal sounds like, etc."

— *B. G.*

New Apparatus

(Continued from page 48)

larly effective at v.h.f. — and therefore especially useful as by-passes in TVI reduction — because of their small size and the fact that they can be wired in almost without leads, especially around tube sockets. There are two sizes, the 29C being slightly over one-half inch in diameter and the 36C having a diameter of ¾ inch. Capacitances in the 29C series range from 0.001 to 0.005. Single units in the 36C series are 0.01 μfd. Double units are available in both series. Maximum working voltage is 500 d.c.

Our experience with both types of condensers in harmonic filtering of d.c. and a.c. leads has been excellent. Hypass condensers in filament and 115-volt leads are particularly good, invariably doing a better job than any combinations of chokes and ordinary-type by-passes.

How's DX?

(Continued from page 51)

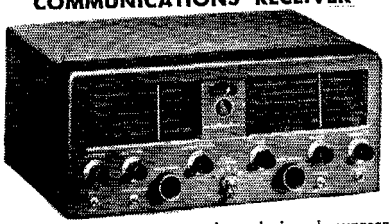
14-Mc. WAC. [Boss, are you cracking up? — *Jeeves*] Not yet, Jeeves. It so happens that some trouble-bent clown has been using his call . . . . . First interested in radio back in 1918. Jim White was dishing out Ceylon contacts as 9VX in 1928. Subsequent calls assigned were AI9VX and VS7AI. Now you know him as VS7NX. We congratulate Jim upon his new membership in the Old Timers Club . . . . . VO6EP spent a few vacation weeks back home in VE1 and we hear that WØMCF/C3 hankers to join WØPVS on a fishing jaunt in the near future . . . . . The first thing KG6DI took care of upon his assumption of Guam QSL Manager duties was to collect all the KG4 cards lying around for shipment to Guantanamo where they belong. Having rolled up some 230 countries, Clark still finds time to give the W/VE pursuers a break. He points out that the correct address out there is Box 100, Guam, Guam, Marianas Islands. No, that Guam, Guam isn't Guamanian doubletalk and % PM, San Francisco is passé . . . . . We lose a good one by KP6AA's transfer to KH6 as reported by W5HBM . . . . . ON4QF is a glutton for punishment. After completing the task of forwarding 2213 OQ5QF QSL cards what does he go and do but put LX1QF on 20! When last heard he was knocking them off like flies around 14,070 kc. . . . . W3MPM/C7 had quite a difficult time of it around Peiping so far as the confirmation business is concerned. He feels sure many outgoing cards were lost as well as some incoming. If this intrigues you write Rev. Earl Snader, jr., Panora, Iowa. Earl will be displaying a WØ label directly and was former W9GIM . . . . . 4X4AD lays claim to a 100% QSL policy and desires mail direct to Box 2713, Tel-Aviv, Israel . . . . . W1FWH passes along word concerning Yemen activity. It seems that the former SM7UR is itching to put his 807 rig on the air there. He's been in the employ of the

(Continued on page 106)

HARRISON IS HAM HEADQUARTERS

HARRISON IS HALLICRAFTER HEADQUARTERS

NEW DOUBLE CONVERSION COMMUNICATIONS RECEIVER



Here's the new SX-71, a receiver designed expressly to give superior ham band performance, incorporating features found only in the highest priced receivers — and then some!

Continuous coverage from 538 KC to 35 MC, and 46 MC to 56 MC — and look at that big directly calibrated amateur bandspread dial. Built-in limiter and balanced detector stages for hiss-free NBFM reception. Double conversion gives better than 300 to 1 image rejection.

For immediate delivery from first production, send your order now!

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LAMBDA MM-2 MODULATION MONITOR

NOW AVAILABLE IN KIT FORM!

Don't splatter all over your neighbors' reception! Have a visual check of your carrier at all times! Use the MM-2 when adjusting and/or checking modulation level, speech clipping, linearity, parasitics, distortion, etc. Place right on your operating table! (Or mount in rack with punched panels listed below) Only 3" x 5" x 10" deep — 2" CR tube with calibrated scale. Build it yourself and save $10.00! Complete kit of all parts including tubes, power supply, cabinet, etc. and full instructions to exactly duplicate the Lambda MM2 — nothing more to buy! Only $14.95.

Factory wired, tested, and guaranteed	$24.95
Punched panel for horizontal mounting	1.75
Punched panel for upright mounting	1.75

HARRISON IS TRADE-IN HEADQUARTERS

I guarantee you top allowance for your old receiver, transmitter, etc.
Tell me what you want to get, what you want to trade, and what you would call a fair deal.

Cordially,

73, Bill, W2AVA

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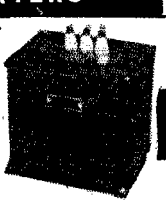

Two unbeatable plate transformer bargains! Brand new stock in factory sealed cartons. Primary is for 115V, 60 cycle AC! All ratings clearly marked! These are the BLACK ONES — conservatively rated for CONTINUOUS COMMERCIAL SERVICE at 400 MA DC! (CCS) Handsome sturdy case, completely shielded and potted, porcelain high voltage terminals! Mounts upright or inverted.

2600-0-2600 VOLTS AC AT 550 MA ICAS! — 50 lbs!
7¾" x 7¾" x 8¼" high — TP-18 $28.95
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(Add 85¢ each for crating, if shipped)

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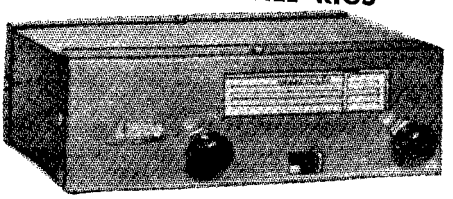
VFO for MOBILE RIGS



You'll get more QSO's per mile when you QSY to the other station's frequency with this new Lysco Mobile VFO! Stable 6C4 "Clapp" Oscillator, 6AK6 Buffer, 6AK6 Doubler provides plenty of drive to replace any 3.5 or 7 MC crystal. Compact, convenient size — 2" x 6" x 5" deep. Direct reading, illuminated, slide rule dial. Operates on 200 to 400 volts at 25 MA DC! Provision for keying (FB for home station, too!)

Complete with tubes, ready to operate. Lysco Model 360 **$21.95**

A HARRISON EXCLUSIVE — ONLY HARRISON HAS IT!

OTHER MOBILE EQUIPMENT

SUBRACO MT-15X for 10-11 Meters	Complete	$87.50
MT-15X for 20, 40 or 80 Meters	Specify	$87.50
GONSET 10-11 or 3-30 MC Converter	Specify	$39.95
NEW GONSET 1600 to 4000 KC Converter		$39.95
NEW GONSET 3850 to 4000 KC Converter		$39.95
PREMAX 96" Police Type Whip AC-196		$ 2.35
"R" Universal Mount $6.76	"NA" Bumper Mount	$ 3.53

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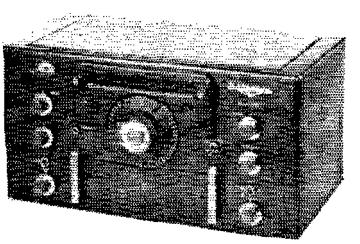
COMPLETE STOCK — RECEIVERS AND PARTS

Buying a National NC-173 or NC-183? For extra mechanical ruggedness and snappy appearance, see our display of rack models. They look like a million! Yet, the price is the same! !



Here's a preview of the NEW HRO-50! It's the best ever! LOOK! Linear dial calibrated in frequency! — Provision for isolated power supply! — Provision for NFM adapter! — Etc., etc., etc! New National HRO-50, complete with coils and matching speaker $349.00.

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government and King of Yemen for the past year or more so a tactful tug at available strings on his part may net us all a new one. Intended call and frequency? Somewhere between 4WA and 4WZ should be appropriate for the prefix and 14 Mc. seems likely. If he pulls the deal off all okay, QSL to Capt. Thorsten Akrell, % Swedish Consulate, Steamerpoint, Aden, Asia. Mail addressed elsewhere often ends up as camel fodder . _ . _ . _ G5LI and F8EO are becoming regular stops for members of the Northern California DX Club as indicated in *The DXer*. W6NZ and XYL are the latest wayfarers and are enjoying a 9-week jaunt on the Continent and vicinity . _ . _ . _ WØTKX, who works a little DX on his own accord, spent some time recently as WØTKX/KL7 on Shemya Island. Bob was relieving a regular stationce for the latter's vacation and reported Tibet much easier to raise there than from good old Minneapolis . _ . _ . _ W2KSN speaks of 11RM's recent personal visit to TA3FAS and W4GXB has it that KM6AJ pulled switches in favor of KH6. QTH: J. B. Fincher, 2333-B Ala Wai, Honolulu, T. H. . _ . _ . _ OQ5DZ may be in Ruanda-Urundi all right but he's not a new country at this time. Our almanac has both Ruanda and Urundi united administratively with the rest of the Congo. This poser uncovered by W2ZVS.

— • • • —

As if the summer weren't tough enough, Jeeves comes up with riddles. "What has nine heads, hides in the cellar and catches flies?" he asks. Of course we don't know and he says, "The Chicago Cubs, hee hee!" And this, after we practically taught him the game out at Wrigley Field.

50 Mc.

(Continued from page 54)

Rochester gang have heard DX stations maintaining that they seldom tune above 145 Mc.

The World Above 420 Mc.

Up in Tully, N. Y., where there are no other 420-Mc. stations, W2RIZ has been amusing himself experimenting with 420-Mc. gear. Like many another ham who likes to play around with equipment and circuits, Ed has found that fun on 420 does not necessarily include communication, though this would be welcome, too. He has a hint for fellows who are looking for satisfactory ways to make contact to 316-A tube pins. He finds that the small copper tubing, available from refrigeration supply houses under the name of "capillary tube" stock, is fine for this purpose. Its inside diameter is 0.055 inch and it can be enlarged slightly to make a tight fit on the tube pins. A slot down one side provides a certain amount of spring action, and such a connection will stand considerable use. W2RIZ recommends that a certain specified time be used by all 420-Mc. experimenters, so that the possibility of hearing another worker may not be so remote as at present. He suggests 8 P.M.

Evidence of 420-Mc. interest is cropping up all over the country. In the Memphis area, W4HHK has an 832 tripler rig going and is using a converter working into his HFS. W4BYN has an oscillator with a pair of 24Gs. This is the first instance we've heard of where these tubes have been used on 420, though we did hook up a pair of them as triplers in the Hq. lab, and found that they would actually go to 420.

From Milwaukee, W9STE writes that he is working nightly with W9SPZ. They are a couple of miles apart, but they work through the city buildings satisfactorily. They find that horizontal polarization is superior for this type of work. More stations are coming on now that the ice has been broken.

There is considerable interest in amateur television on 420 Mc. in the San Francisco area, if newspaper clippings received here mean anything. Communication with several of the principals mentioned in news reports has failed to provide any further information. We would be glad to have complete details of amateur TV work in this or other sections of the country. W6VEG, of Los Angeles, is another who is interested in this angle. He would like to hear from others so inclined.

Up in Natick, Mass., W1EZV is working on 420 with W1ROA at Lexington, a distance of 11 miles. Elevations are 260 and 210 feet respectively, with a 360-foot rise in between. W1QFH and W1JUL are also on 420. All stations are using 16-element vertical arrays.

(Continued on page 108)

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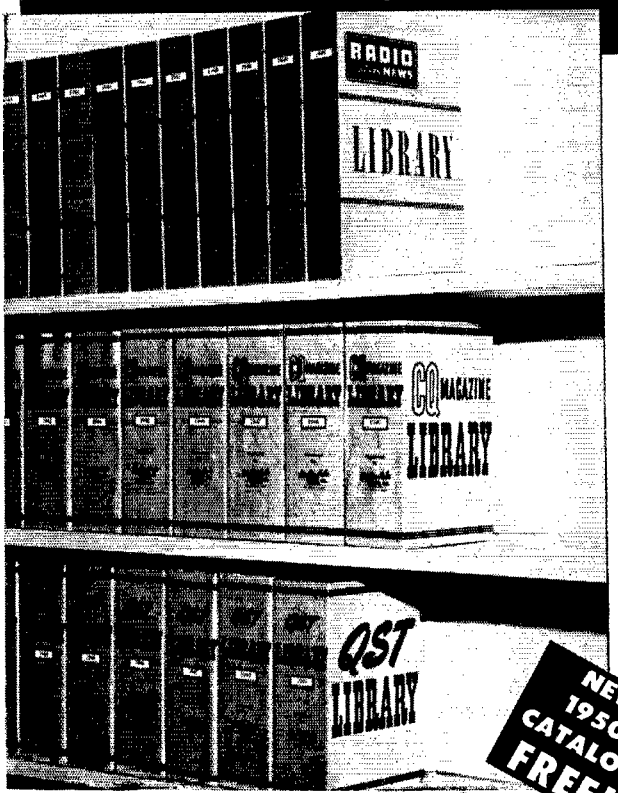

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In Denver, Colo., WØSNH still works out regularly with WØLAQ. Rod has found that the regenerative triode oscillator (November, 1948, *QST*) may be used to good advantage to operate 7-Mc. crystals on their 5th harmonic, making it possible to get from 7 Mc. to 420 Mc. in four tubes.

Chicago area interest is picking up, according to W9VX, secretary of the Midwest V.H.F. Club. He is working with W9AYM, both stations using APT-5s. W9s HXS, PK, KFK and MMV are on or nearly ready. A special meeting devoted to 420-Mc. discussion is planned by the Midwest V.H.F. Club for October 6th. The place is 1400 N. Humboldt Blvd. Anyone interested in 420 Mc. is invited to attend.

W2NPJ, Elizabeth, N. J., lists the following stations worked recently on 432 Mc., using an 832 tripler, crystal-controlled: local W2s PIX, NUM, PHD, AFG, BLF, MLF, and K2AH, all within 10 miles; HWX, 20 miles, BQK, 23 miles, BAV, 35 miles, BAV/2, 45 miles, W1PBB, 55 miles, and W1IYO, 70 miles — 3 states and 2 call areas on 420.

Reports indicate that California leads the country in the number of 420-Mc. stations, but we do not have as much detail on their work as we would like. How about sending along the dope on your 420-Mc. activities, W6s, so we can let the rest of the country know what you're doing? W6CFL, Los Angeles, writes that W6NLZ, also of L. A., works W6KKG at East Highlands, a distance of 70 miles. W6CFL joins in this QSO when conditions are good, but he says that his superregen cannot compete with the ASB-5 and APS-13 surplus jobs. What this country needs, he says, is a better receiver than the superregen, but one that is not too complicated for the average v.h.f. enthusiast.

Amen!

TVI Tips

(*Continued from page 55*)

large surface of the chassis will have considerably less inductance than a wire. With careful attention to the reduction of inductance the resonance point in even a large amplifier usually can be moved up above 100 Mc.

An alternative to rebuilding the tank circuit is to find a setting of the tank condenser that either shifts the resonance above 90 Mc. or into a TV channel not in use in your locality, and then adjust the inductance of the regular tank coil so that the circuit tunes to the fundamental at that setting of the tank condenser. The disadvantage of this is that it may result in an amount of tank C that is not desirable from the standpoint of fundamental Q, but it will nevertheless reduce TVI if a particular harmonic has been built up by a v.h.f. resonance.

These subsidiary resonances are not always bothersome, since they may not always be harmonically related to the fundamental frequency at a given setting of the tank condenser. But if the harmonic output in the TV range is particularly strong from an 80- or 40-meter transmitter, or if the harmonic amplitude shows marked variations when the tank condenser is tuned just a bit either side of resonance at the fundamental, it's time to get suspicious. A bit of investigation with the grid-dip meter usually will show where to put the blame.

— *G. G.*

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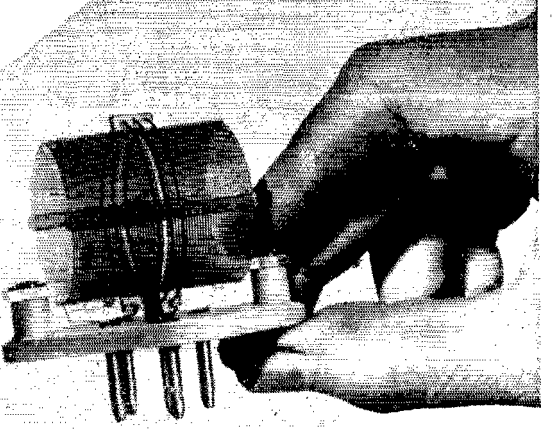

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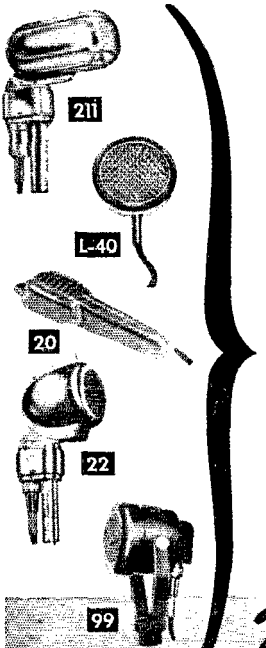

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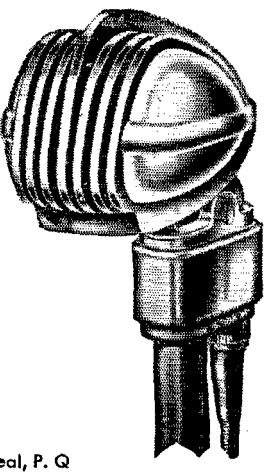

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RANGE	DESCRIPTION	MODEL	PRICE
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0-1	4¼" rd.	432	4.25
0-1	4½" sw. board	142	4.25
0-1	4½" rect.	742	4.25
0-1.5	2½" rd.	422	3.25
0-1.5	2½" sq.	522	3.25
0-1.5	3" sq.	532	3.95
0-1.5	3½" rd.	432	4.25
0-1.5	4½" rect.	742	4.25
0-3	2½" sq.	522	3.25
0-5	2½" sq.	522	3.25
0-5	3" sq.	532	3.95
0-5	3½" rd.	432	3.95
0-5	4½" sw. board	142	4.50
0-5	4½" rect.	742	4.50
0-10	3" sq.	532	3.50
0-10	3½" rd.	432	3.50
0-10	4½" sw. board	142	3.50
0-10	4½" rect.	742	3.50
0-10	4½" rd.	442	3.50
0-15	2½" sq.	522	2.95
0-15	3" sq.	532	3.50
0-15	3½" rd.	432	3.50
0-15	4½" sw. board	142	3.50
0-15	4½" rect.	742	3.50
0-15	4½" rd.	442	3.50
0-25	2½" rd.	422	2.95
0-25	2½" sq.	522	2.95
0-25	3" sq.	532	3.50
0-25	4¼" sw. board	142	3.50
0-25	4½" rect.	742	3.50
0-30	2½" rd.	422	2.95
0-30	2½" sq.	522	2.95
0-30	3" sq.	532	3.50
0-30	3½" rd.	432	3.50
0-30	4½" sw. board	142	3.50
0-30	4½" rect.	742	3.50
0-50	2½" sq.	522	2.95
0-50	3" sq.	532	3.50
0-50	3½" rd.	432	3.50
0-50	4½" sw. board	142	3.50
0-50	4½" rect.	742	3.50
0-50	4½" fan shaped	842	3.50
0-50	4½" rd.	442	3.50
0-75	2½" rd. (5 amp. mov't)	422	2.95
0-75	2½" sq. (5 amp. mov't)	522	2.95
0-75	3" sq. (5 amp. mov't)	532	3.50
0-75	3" sq. (75 amp. mov't)	532	3.50
0-75	3½" rd. (5 amp. mov't)	432	3.50
0-75	3½" rd. (75 amp. mov't)	432	3.50
0-75	4¼" rect. sw. board (75 amp. mov't)	142	4.25
0-75	4½" rect. (75 amp. mov't)	742	3.50
0-75	4½" rd. (75 amp. mov't)	442	4.95
0-100	2½" rd. (5 amp. mov't)	422	2.95
0-100	2½" sq. (5 amp. mov't)	522	2.95
0-100	3" sq. (5 amp. mov't)	532	3.50
0-100	3½" rd. (5 amp. mov't)	432	3.50
0-100	4¼" sw. board (5 amp. mov't)	142	3.50
0-100	4½" rect. (5 amp. mov't)	742	3.50
0-100	4½" fan shaped	842	3.50
0-100	4½" rd. (5 amp. mov't)	442	4.95
0-150	2½" sq. (5 amp. mov't)	522	$2.95
0-150	3" sq. (5 amp. mov't)	532	3.50
0-150	3½" rd. (5 amp. mov't)	432	3.50
0-150	4¼" sw. board (5 amp. mov't)	142	3.50
0-150	4½" rect. (5 amp. mov't)	742	3.50
0-150	4½" fan shaped	842	3.50
0-200	2½" rd. (5 amp. mov't)	422	2.95
0-200	2½" sq. (5 amp. mov't)	522	2.95
0-200	3" sq. (5 amp. mov't)	532	3.50
0-200	3½" rd. (5 amp. mov't)	432	3.50
0-200	4¼" sw. board (5 amp. mov't)	142	3.50
0-250	3" sq. (5 amp. mov't)	532	3.50
0-250	4¼" sw. board (5 amp. mov't)	142	3.50
0-250	4¼" rect. (5 amp. mov't)	742	3.50
0-300	2½" rd. (5 amp. mov't)	422	2.95
0-300	2½" sq. (5 amp. mov't)	522	2.95
0-300	3" sq. (5 amp. mov't)	532	3.50
0-300	3½" rd. (5 amp. mov't)	432	3.50
0-300	4¼" sw. board (5 amp. mov't)	142	3.50

AC AMMETERS

RANGE	DESCRIPTION	MODEL	PRICE
0-300	4½" rect. (5 amp. mov't)	742	3.50
0-300	4½" fan shaped (5 amp. mov't)	842	3.50
0-400	4½" sw. board (5 amp. mov't)	142	3.50
0-400	4½" rect. (5 amp. mov't)	742	3.50
0-500	4½" sw. board (5 amp. mov't)	142	3.50
0-500	4½" rect. (5 amp. mov't)	742	3.50
0-600	4½" sw. board (5 amp. mov't)	142	3.50
0-1000	4½" sw. board (5 amp. mov't)	142	3.50

AC MILLIAMMETERS

RANGE	DESCRIPTION	MODEL	PRICE
0-10	2½" rd.	422	2.95
0-10	2½" sq.	522	2.95
0-10	3" sq.	532	3.50
0-25	2½" rd.	422	2.95
0-25	2½" sq.	522	2.95
0-25	3" sq.	532	3.50
0-25	3½" rd.	432	3.50
0-50	2½" rd.	422	2.95
0-50	2½" sq.	522	2.95
0-100	2½" rd.	422	2.95
0-100	2½" sq.	522	2.95
0-250	3" sq.	532	3.50
0-250	3½" rd.	432	3.50
0-400	3½" rd.	432	3.50
0-500	2½" rd.	422	2.95
0-500	2½" sq.	522	2.95
0-500	3" sq.	532	3.50
0-500	3½" rd.	432	3.50

AC VOLTMETERS

RANGE	DESCRIPTION	MODEL	PRICE
0-1	2½" sq.	522	$2.95
0-1	3" sq.	532	3.50
0-1	3½" rd.	432	3.50
0-1	4½" sw. board	142	3.50
0-3	3½" rd.	432	3.50
0-3	4½" rect.	742	3.50
0-5	2½" sq.	522	2.95
0-5	2½" rd.	422	2.95
0-5	3½" rd.	432	3.50
0-5	4½" sw. board	142	3.50
0-10	2½" sq.	522	2.95
0-10	2½" rd.	422	2.95
0-10	3" sq.	532	3.50
0-10	3½" rd.	432	3.50
0-10	4½" sw. board	142	3.50
0-10	4½" rect.	742	3.50
0-15	2½" sq.	522	2.95
0-15	2½" rd.	422	2.95
0-15	3" sq.	532	3.50
0-15	3½" rd.	432	3.50
0-15	4½" sw. board	142	3.50
0-15	4½" rect.	742	3.50
0-25	2½" sq.	522	2.95
0-25	2½" rd.	422	2.95
0-25	3" sq.	532	3.50
0-25	4½" sw. board	142	3.50
0-25	4½" rect.	742	3.50
0-30	2½" sq.	522	2.95
0-30	2½" rd.	422	2.95
0-30	3" sq.	532	3.50
0-30	3½" rd.	432	3.50
0-30	4½" sw. board	142	3.50
0-30	4½" rd.	442	3.50
0-50	2½" sq.	522	2.95
0-50	2½" rd.	422	2.95
0-50	3" sq.	532	3.50
0-50	3½" rd.	432	3.50
0-50	4½" sw. board	142	3.50
0-50	4½" rect.	742	3.50
0-75	3½" rd.	432	3.50
0-100	2½" sq.	522	2.95
0-100	2½" rd.	422	2.95
0-100	3" sq.	532	3.50
0-100	3½" rd.	432	3.50
0-100	4½" sw. board	142	3.50
0-100	4½" rd.	442	3.50
0-150	2½" rd.	522	3.25
0-150	2½" rd. (metal case)	422	3.25
0-150	2½" rd.	422	3.25
0-150	3" sq.	532	4.50
0-150	3½" rd.	432	4.50
0-150	4½" sw. board	142	4.50
0-150	4½" rect.	742	4.50
0-150	4½" fan shaped	842	4.50
0-150	4½" rd.	442	4.50
0-250	2½" rd.	422	3.50
0-250	4½" sw. board	142	5.25
0-300	2½" sq.	522	2.95
0-300	2½" rd.	422	2.95
0-300	3" sq.	532	4.50
0-300/600	3½" rd. (300v. mov't) w/res.	432	4.50
0-300	4½" sw. board	142	4.95

AC VOLTMETERS

RANGE	DESCRIPTION	MODEL	PRIC
0-300	4½" rect.	742	4.
0-300	4½" fan shaped	842	4.
0-300	4½" rd.	442	4.
0-500	4½" sw. board	142	4.
0-500	4½" rect.	742	4.
0-500	4½" fan shaped	842	4.
0-500	4½" rd.	442	4.
0-600	2½" sq.	522	3.
0-600	3½" rd. (150v. mov't) w/res.	432	4.
0-600	3½" rd. (300v. mov't) w/res.	432	4.
0-600	3½" rd. (600v. mov't) w/res.	432	4.
0-600	4½" sw. board	142	4.
0-600	4½" rect.	742	4.
0-600	4½" rd.	442	4.

DC AMMETERS

RANGE	DESCRIPTION	MODEL	PRIC
0-1	2½" rd.	421	$2.
0-1	2½" sq.	521	2.
0-3	2½" sq.	521	2.
0-25	2½" sq.	521	2.
0-200	2½" rd. (50 m.v. mov't)	421	2.
0-200	2½" sq. (50 m.v. mov't)	521	2.
0-500	2½" rd. (50 m.v. mov't)	421	2.
0-500	2½" sq. (50 m.v. mov't)	521	2.
0-1000	2½" sq. (50 m.v. mov't)	521	2.
0-1000	2½" rd. (50 m.v. mov't)	421	2.
0-1500	2½" rd. (50 m.v. mov't)	421	2.
120-0-120	2½" sq. (50 m.v. mov't)	521	2.

DC MILLIAMMETERS

RANGE	DESCRIPTION	MODEL	PRIC
0-5	2½" rd.	421	2.
0-5	2½" sq.	521	2.
0-10	2½" sq.	521	2.
0-15	2½" sq.	521	2.
0-30	2½" rd.	421	2.
0-100	2½" rd.	421	2.
0-100	2½" sq.	521	2.
0-200	2½" rd.	421	2.
0-200	2½" sq.	521	2.
0-750	2½" sq.	521	2.
0-1000	2½" rd.	421	2.
0-1000	2½" sq.	521	2.

DC MICROAMMETERS

RANGE	DESCRIPTION	MODEL	PRICE
0-50	2½" sq.	521	6.9
0-50	2½" rd.	421	6.9
0-100	2½" sq.	521	5.5
0-100	2½" rd.	421	5.5
0-300	2½" sq.	521	3.9
0-300	2½" rd.	421	3.9
0-500	2½" rd.	421	3.9

DC VOLTMETERS

RANGE	DESCRIPTION	MODEL	PRIC
0-3	2½" sq.	521	2.
0-5	2½" sq.	521	2.
0-5	2½" rd	421	2.
0-15	2½" sq.	521	3.
0-40	2½" sq.	521	2.
0-100	2½" sq.	521	2.
0-200	2½" sq.	521	2.
0-300	2½" sq.	521	2.
0-300	2½" rd.	421	2.

RF AMMETERS

RANGE	DESCRIPTION	MODEL	PRICE
0-5	2½" sq. w/simpson 0-006115 ext. thermocouple	523	4.95
0-5	3" sq. w/simpson 0-006115 ext. thermocouple	533	4.95
0-10	3" sq. w/simpson 0-006158 ext. thermocouple	533	4.95
0-10	3" sq. w/simpson 0-006159 ext. thermocouple	533	4.95

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Correspondence

(*Continued from page 58*)

4818 South Wayne Avenue, Fort Wayne 6, Indiana

Editor, *QST*:

I am in complete agreement with the editorial in August *QST* and the Board's action regarding the FCC proposals. I like some and dislike others of the proposals for new regulations. I particularly liked the proposals designed to attract new blood into our ranks, but I agree with the Board that planning and direction by government are intolerable. . . .

— *George R. Fann, W9AQO*

Mizpah, Minnesota

Editor, *QST*:

Any organization which is for government regulation but against government "direction" should be supported by every freedom-loving American. You have my congratulations for your editorial in the August, 1949, issue of *QST*. More power to you.

— *Curtis J. Siats*

1630 Park Road, N.W., Washington 10, D. C.

Editor, *QST*:

"It Seems To Us" in August issue expresses my sentiments 100%.

— *Joseph D. Curtice, W3LTM*

2904 N.W. 43rd St., Oklahoma City, Oklahoma

Editor, *QST*:

Just want to express my sincere appreciation for your editorial in the August *QST*, and my vote of confidence in the Board and its stand, relative to the FCC's proposed actions. Keep up the good work.

— *Murray McCulley, W5MEG*

CONTEST NOTE

The League does not expect to schedule an ARRL member party in January, 1950. Review of participation in this activity in recent years indicates the desirability of all concerned taking part in the regular quarterly get-together of League appointees (known as the ARRL CD Party) which will be held in January at the usual time. Write to Headquarters for information on how you may get lined up to receive a League appointment and be eligible to take part in the January ARRL CD Party.

Hints and Kinks

(*Continued from page 57*)

CURING CHIRP IN COMMAND TRANSMITTERS

My BC-459A chirped, and from what I've heard on the air, most everybody else's does, too. I tried various methods of keying, and extremes of voltage stabilization, but the chirp persisted.

Checking with a good v.t.v.m. showed 12.6 volts on the filaments with the key up, but from 18 to 22 volts when the key was closed! The added voltage was r.f.

To remedy this situation, shielded filament wire was substituted in the rig, with by-passes at each end of the wire. Old microphone cable (with high r.f. losses) seemed best. A heavy copper

(*Continued on page 114*)

Astatic Crystal Devices manufactured under Brush Development Co. patents

THE ALL-TIME, leading popularity of Astatic Microphones now goes DOUBLE. All models shown are available with ceramic as well as crystal elements. The growing acceptance for the ceramic types has placed them almost shoulder to shoulder—in point of preference—with the tried-and-true favorites, the crystal units. Here, to aid you in your personal choice, is the technical data on each:

SPECIFICATIONS

Model	Output Level	Range	Response Characteristics
D-104	—48 db.	30-7,500	Rising
T-3	—52 db.	30-10,000	Substantially flat
JT-30	—52 db.	30-10,000	Substantially flat
JT-40	—52 db.	30-10,000	Rising
200	—52 db.	30-10,000	Substantially flat
241	—52 db.	30-10,000	Rising
D-104-C	—58 db.	30-7,500	Rising
T-3-C	—62 db.	30-10,000	Substantially flat
JT-30-C	—62 db.	30-10,000	Substantially flat
JT-40-C	—62 db.	30-10,000	Rising
VC	—62 db.	30-10,000	Substantially flat
VC-1	—62 db.	30-10,000	Rising

Letter "C" in model number designates ceramic unit.

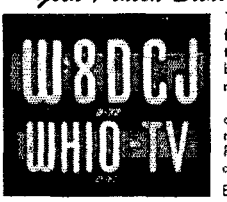
GIFTS *for the Amateur and for the Commercial Broadcaster*

Beautiful *Man Sized* Microphone Ash Tray

with call letters in satin-finished aluminum against a black crackle-enameled background on top of the polished microphone. The lustrous black Daka-Ware base is fire and acid resistant and will retain its sheen indefinitely. 7-inch diameter, 6-inches high. Accommodates up to five letters. The perfect gift for your fellow ham.

Type AT-80 . . . . . **$5.00** Postpaid

Gold Plated Silhouette Call Letter Pins



These beautiful gold plated pins with fine safety catch are the ideal gift for the XYL or the girl friend. The OM will be pleased to receive one, too – for year-round wear. Illustrations are actual size.

We suggest B-72 for 4 or 5 letter calls and the smaller B-71 for longer calls and names, such as WHIO-TV or W8VZM-XYL. *Price includes 5 letters only – for each* additional letter, dash, etc. add 20¢.

Either style pin . . . **$2.25** Postpaid

Bronze Ash Tray

Solid cast ornamental bronze ash tray with silhouette call letters. Antique finish, with edges of tray and letter faces highly polished. Size: 5" x 2½". Accommodates up to six 1-inch, eight ¼", or ten ½" high letters.

Type AT-72. . **$3.70** Postpaid

Lapel Buttons

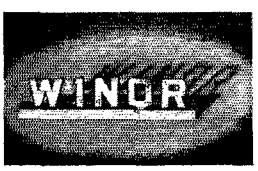
An attractive metal button with highly polished raised letters against a black background. Other colors 50¢ extra.

ACTUAL SIZE

$1.10 Postpaid

Type A-26P With Pin Backing *Type A-26L With Screw Backing*

Silhouette Desk Plate



The cut-out satin-silver letters on the beautiful desk plate stand out in relief against the crackle-enameled back bar, with the edges of the letters also painted to accentuate the silhouette effect. Accomodates five 1¼" high bold block type letters.

Type D-21 **$3.95** Postpaid

Call Letter Plates

$2.95 Postpaid

A large sturdy cast aluminum plate with satin-finished letters and border against a black baked enamel background. Red, green, dark blue, light blue, or gray – 50¢ extra. Size 2¾" x 8¼" with 1½" letters.

Type A-18 – For Your Car
Type A-19 – For Panel Mounting

NOTE – The letters on our A-18 Auto Plate can be inverted for mounting below the license plate on 1949 Fords and other cars. Plate measures 3-3/8" from center of mounting holes down to bottom when inverted. Specify type A-18-INV.

Send remittance with order. Allow three weeks for delivery. No orders accepted for Christmas delivery after December 1.

SREPCO, Inc. STANDARD RADIO & ELECTRONIC PRODUCTS
135 E. Second St. DAYTON 2, OHIO. Tel. FUlton 2174

strip was run across the chassis, and the "cold" ends of the 1625 filaments and the cathodes were connected to it to get a good ground. This change resulted in chirpless keying for me, and has done the same for all others to whom I have passed this hint. — *Alfred Scott Cline, W6LGU*

LOW-DRIFT CONDENSERS FROM BC-375-E

THE low-frequency BC-375 tuning unit, TU-26B, 200–500 kc. range, contains many high-quality high-voltage mica condensers, among which are two special types having a very low temperature coefficient, especially made for use in frequency-determining tank circuits. The capacitance and temperature coefficient have been individually measured and stamped on each one. The nominal capacitance is 400 $\mu\mu$fd., a useful value for VFO tank circuits. In my case, it was the exact value needed, which led to inquiry about its characteristics, which was a pleasant surprise, since the list price is about twelve dollars each. This is the Cornell-Dubilier type 641-15AH, the only one for which I have any information, although apparently similar ones are made by Sprague and Sangamo. Substitution of one of these condensers for an equal-capacitance silvered mica unit in my VFO reduced total warm-up drift from about 400 cycles to 100 cycles. — *R. V. McGraw, W2LYH*

AN IMPROVED "TWIN-LAMP"

IN the usual "Twin-lamp," the pick-up loop is permanently connected to a short length of Twin-Lead which is then inserted in, or added to one end of, the feed line when s.w.r. checks are to be made. With the pick-up loop shown in Fig. 5, disturbing the feed line is not necessary, because the Twin-lamp is *pinned* to the feed line at any desired point. This is made possible by having the junction of the two lamps terminate in a sharp, stiff pin. The point of the pin is pushed

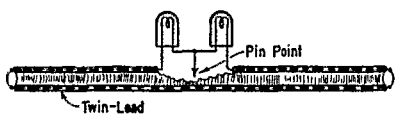


Fig. 5 — Here's a simplified "Twin-lamp" that requires no disturbance of your feed line, and which can be connected to the line at any point without cutting. A pin point is used at the junction of the two lamps, as shown.

through the insulation to make the required contact with one wire of the feed line. The ends of the pick-up loop may be temporarily taped to the feed line with Scotch Tape. The degree of coupling between the Twin-lamp and the feed line is adjusted by spacing the two slightly.

If desired, the pick-up loop can be made on a small scrap of sheet Lucite, or other insulating material, with the sharp point of the pin extending through the back of the sheet. — *J. R. Fisher, VE3ALQ*

LOOK

AND THEN ACT QUICKLY!

★★★ BC-348 RECEIVER

EXCELLENT CONDITION

$119.50

The finest, and now the scarcest, military receiver for amateur use. We located just 38 of these BC-348. Has 2 RF, 3 IF stages. A compact 250 volt, 50 ma. power supply can be built into 28 volt dynamotor space. Sorry, we do not have receiver schematic, see QST.

6-band switching—200–500 kc; 1.5—18 mc.

Constant sensitivity on all bands.

Automatic noise compensator.

Temperature-compensated oscillator.

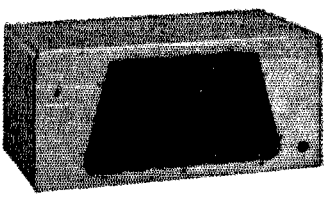
Crystal filter • AVC • MVC • BFO.

Output at 500 or 4000 ohms.

Smooth vernier tuning; 90 turns of tuning knob for each band.

TUBE LINE-UP

1st RF—6K7
2nd RF—6K7
RF Osc.—6C5
1st Det.—6J7
1st IF—6K7
2nd IF, CW Osc—6F7
3rd IF, 2nd Det—6B8
Aud. Out—41
V.R.—991



UTC SC-3 TRANSFORMER, 24 volts, will eliminate filament rewiring..... **$4.00**

PRICES NET, F.O.B. CINCINNATI, OHIO. WE DO NOT EXPORT.

FAMOUS SPEAKER. Two-position tone switch. 500-ohm input. Heavy-duty PM type, 6 by 9-inch oval size. Cabinet size 18½ in. wide by 8½ in. high by 9⅝ in. deep. Ship. Wt. 19 lbs. Special..... **$17.95**

Steinbergs

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Components for filter type SSSC exciters and receiver adapters. Complete filter as described in June 1949 *QST* except using machine wound inductors

Uncased	$29.95
Housed in metal case, 2¼" x 3 x 3 3/16"	34.50
Western Electric core P476930	1.65
Western Electric core P284395	1.85

Write for details on other filters and components

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HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.
(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others.
(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 takes 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.

Please note the 7¢ rate on hamads is available to ARRL members only.

QUARTZ — Direct importers from Brazil of best quality pure quartz suitable for making piezo-electric crystals. Diamond Drill Carbon Co., 719 World Bldg., New York City.

QSLs. 100, $1.25 up. Stamp for samples. Griffeth, W3FSW, 1042 Pine Heights Ave., Baltimore 29, Md.

AMATEUR radio licenses. Complete theory preparation for passing amateur radio examinations. Home study and resident courses. American Radio Institute, 101 West 63rd Street, New York City.

QSL'S. SWL'S. Finest stock. Fairest prices. Fastest service. Dossett, W9BHV QSL Factory, 857 Burlington, Frankfort, Ind.

QSLS! Kromkote cards at a fair price. Dauphinee, WIKMP, Box 219, Cambridge 39, Mass.

QSL Quality cards priced right. Samples. Ferris, W9UTL, 1768 Fruitdale, Indianapolis, Ind.

SUBSCRIPTIONS. Radio publications a specialty. Earl Mead, Huntley, Montana, W7LCM.

DON'S QSL's. "The finest". Samples. 2106 South Sixteenth Avenue, Maywood, Illinois.

CRYSTALS: Precision low drift units. Type 100A in 80, 40, and 20 meter bands. Two units plug in one octal socket. Plus or minus 5 Kc. One dollar each. Exact frequency, $1.95 ea. Rex Bassett, Inc., Ft. Lauderdale, Fla.

DISTINCTIVE SWLS-QSLS. McEachron, 1408 Brentwood, Austin, Texas.

QUARTZ crystals: without holders, highly active, assorted frequencies 5600 to 8400 kilocycles, 6 for $1.00. For FT-243 holders. Holders and mounted crystals available. Breon Laboratories, Williamsport, Penna.

QSLs: Original designs priced to fit hams' pocketbooks. Stamps for samples. Leonard's Print Shop, 854 View, Hagerstown, Md.

FOR Sale: TEMCO 599GA transmitter and Collins 75A1 receiver like new. Will sell together or separate. Best cash offer will take. B. O. Reynolds, Lake Geneva, Wisconsin.

QSLS, SWLS. Those who want the best in QSLs. C. Fritz, 1213 Briargate, Joliet, Ill.

SURPLUS xtal kit. Two FT — 243 holders, two blanks each in 3.5 and 7 mc range, abrasives, etch fluid. $2.00 postpaid. The Vesto Company, Parkville, Mo.

WANTED: Following surplus items for radio set SCR-284-A: 3 each of metal mast sections MS-54-55 and 56; six each of counterpoises CP-12 and CP-13, and of antenna mast guys GV-11 and GV-12; three loudspeakers LS-7; three sets of legs LG-13-A; several bags BG-154 and BG-102-A, and BG-58's. Sumner B. Young, W9CO, "Maplewoods", Village of Woodland, Rt. No. 3, Wayzata, Minnesota.

WANTED: Marconi magnetic detector, multiple tuner, DeForest responder; early G-E and RCA receivers; other wireless gear prior to 1925. Franklin Wingard, Rock Island, Ill.

MACKAY receiver FTR-128, AC-DC, 15-650 Kc in 4 bands. Cabinet weight 42 lbs. F.o.b. Boston, $55.00. RCA communications receivers CGR32-2 (1937 twins), 1.43-26.24 Mc. in 6 bands, AC or batteries, 12 tubes. U. S. Coast Guard Marine service super-het circuit, with service manual, 19" x 10½" panel; depth 16½". Wt. of pr. in cabinets 180 lbs. F.o.b. Boston, Pair: $395.00. Box 81, Chestnut Hill 67, Mass.

CRYSTALS: Etched precision low drift, FT243 or 5 pin type holders, 5 to 8.5 megacycles ± 5 kc, 95¢. Exact frequency $1.75. Money back guarantee. Lattin-Field Laboratories, 320 West Main, Owensboro, Ky.

METERS repaired. Springfield Testing Laboratory, 815 North 12th, Springfield, Ill.

QSLS! G. L. Taylor, Sumrall, Mississippi.

WANTED: HRO general coverage and bandspread coils, all bands. State type and price. J. G. Hines, P.O. Box 5100, Albuquerque, N. M.

HAMS, Technicians, Engineers! Send one dollar for copyrighted report concerning Why, How, Where for top-paying electronics jobs. Mid-Continent Research Bureau, P.O. Box 121, Wichita, Kans.

NEW YORK CITY hams: Sale! National 173 practically new. Reasonable. Burt, Dickens 2-4313, Evenings.

RECEIVER, RME 45 plus VHF 152 converter practically new, $150.00. Walker, 115 Fourth Street, Hasbrouck Heights, N. J.

LATE NC-173 $135.00. Plus express. VP-557 never used $25.00, signal shifter complete $25.00. Randolph Neal, 713 Spring St., Atlanta, Ga.

FOR SALE: Kleinschmidt perforator in A-1 condition. Best offer over $225.00. W6OWP, 2210 Cipriani Blvd., Belmont, Calif.

SELL: New condition. Black wrinkle relay rack 31" high, $6.00. Steel ventilating grille rack panel 5¼" high, $2.00. Antenna matching network on 5¼" high rack panel with two 0-2 amp. thermocouple meters, 3 variable condensers, 2 plug-in coils and mounts, antenna transfer relay. Parts alone worth more than $20.00. Will ship c.o.d., f.o.b. W3KB, 214 Runnymede, Jenkintown, Penna.

SELL: BC 654A trans. rcvr. including pwr. cable, PE 104A, PE 103A, LS7 speaker, T17 mike, extra tubes, frame rack FM-41-A, hand generator GN 45 in canvas bag with cranks and seat, legs for 654A, instruction manual and canvas bag including counterpoise and misc. items. Unit is in excellent condx. and requires only 6 volt battery and antenna and is ready to operate. $60.00 or best offer. Erlee Wise, WØAAL, Rembrandt, Iowa.

FOR Sale: BC-348-R. Completely converted to 110 V. a.c. Added stage of audio. Separate 5" spkr. in metal cabinet. Finish like new. Completely covers 20- 40- 80-meter bands. Yours for only $110.00. Eugene Gates, W6ERG, 450 N. Sycamore Avenue, Los Angeles 36, Calif.

SELL: SX-28 with speaker, excellent condition, $85.00. Navy TCS transmitter and receiver with 110 V. a.c. power supply. Modified slightly $75.00. H. E. Paul, W4LCO, Route 10, Box 85-F, Jacksonville, Florida.

BARGAIN for N. Y. City vicinity ham. Complete station of W2HQZ from mike to beam. 500w AM; 1000w FM. Push-to-talk. Commercially built. Receiver, extras. Sell or trade. Phone St 4-2153.

QSL's, Reasonable, attractive, free samples. Thompson, W9JIP Print, 5301 N. New Jersey, Indianapolis, Indiana.

FOR Sale: 1 kw. modulation xformer; 10.00. ½ kw. final and heavy duty power supply. P.P. 8005's with spare 8005, 866a's and filter condenser, $80.00. Want HF 10-20. W2WFV, 255 E. Pkwy, Brooklyn, N. Y.

MUST SELL: New PE103A with Cannon plug; factory reconditioned SX-25; new Supreme 543 multimeter; all parts needed to build 120 watt plate modulated phone transmitter including 750-volt supply, 500-volt supply, separate filament transformers, transformer coupled audio with Stancor A3893 modulation transformer, coils for ten, Bliley xtal, all tubes, meter, dials, switches, new chassis, Bud cabinet, many extras. Best offer over $200.00 takes all. FOB West Des Moines or send your check or money order and I will prepay. George Clark, 716 Fourth, West Des Moines, Iowa.

SURPLUS: ARR-1 Receiver with 4 tubes, type 954's, easily converted to 10- 6- 2-meters. ARR-2 Receiver with 11 tubes, 4-6AK5, 6-9001's, 1-12A6. Dynamotor mounted 24 volt input, output 250 V at 60 ma. Both units for $12.00. Wanted: Complete units or parts for airborne, ground, or marine radio, radar, transmitting or receiving, and test equipment. Send us your list. You may have items we need. G. J. Schultz, Inc., 639 W. 24th Street, Norfolk, Virginia.

SELL: PE 103-A dynamotors five new, complete in original overseas moistureproof crates $15.50 each. Millen 90501 Secondary Frequency Standard $39.00. Miscellaneous Quartz Crystal processing equipment, Finishing positions, saw, lap, etc. HRO receiver, power supply, speaker, 1.7 to 30 Mc. general coverage and ham band spread coils $95.00. Howard 437-A communications receiver .55 to 43 Mc. $35.00. RCA ACR-175 communications receiver .5 to 60 Mc. $45.00. W6KEG 1124 Parkway Drive, El Monte, California.

SELL: Clean perfectly working Hammarlund Super-Pro (BC779-B) receiver regulated power supply and new 10" speaker $125.00 or swap for television receiver. W2TJZ, 101 Christie St., Tenafly, N. J.

AMPHENOL twin-lead antennas are always in stock at northern New England's foremost amateur radio supply house. Evans Radio, Concord, N. H.

WANTED: Transmitter; BC610E, 150B, HT9, etc. Could collect within couple hundred miles. Also want VHF-152, tape recorder, teletypewriter. Give full details and price. John Longley, W2ANB, Slingerlands, New York.

NEW Crystals for all commercial services at economical prices, also regrinding. Over fourteen years of satisfaction and fast service! Eidson Electronic Co., phone 3901, Temple, Texas.

SELL: S20R rcvr $45.00. Sonar XE-10 NBFM exciter with crystal mike and xtal $20.00. Millen 90700 VFO and 6AG7 — 807 xmtr with 700 volt regulated power supply. Coils for 10- 20- 40-meters. $40.00 or swap for mobile rig. f.o.b. Los Angeles. W6SIB 1245 El Paso Drive, Los Angeles. Albany 3379.

WANTED: High power rifle. Have amplifiers, transmitter, battery receiver, binocular, and many tubes and parts. W2PLS, 40-25 206th St., Bayside, N. Y.

SELL: QST back file, 1931 through 1948, complete except for 2 issues 1942, 2 issues 1945 and 1 issue 1946. Make offer. F. V. Hunt, Cruft Laboratory, Cambridge 38, Mass.

QSL's-SWL's Postpaid! Samples. WIHJI, Box 32-A, Manchester, N. H.

"TAB" Sensational 6v Carter Dynamotors 400V/150ma. $3.98 250V/100 ma. $4.98, both $12.49. Guaranteed tubes! 6J6, 6AK5, 6AG5, @ 37¢; 6C4 @ 24¢; 388A @ 40¢; 954 @ 14¢; 955 @ 16¢, 1N34 Crystal 84¢. GE2J1G1 Selsyns used tested Pair $1.49. Tuning meter 5ma., 98¢. Circular Slide Rule 98¢. 30CM/12" UHF mobile hamband antenna AT5/ARR1 39¢, 4/$1.00. Write for bargain "Tabogram" "TAB" 109 Liberty Street, New York, N. Y.

SELL: Amertran 6200 V. ct. 2Kw. transformer, $39.50. Also SX-28 receiver, poor appearance but good working condition, $75.00. All inquiries answered. W6KEV, Rt. 1, Box 185, Acampo, Calif.

BARGAINS — New and used transmitters — receivers — parts: Globe King $299.00; New 150 watt phone $199.00; 60 watt phone $99.00; Globe Trotter $57.50; HT-17 $39.50; New Meissner Signal Calibrators $29.95; TR-4 $19.95; MB-611 $39.00; Pierson Kp-81 $219.00; HRO 5TA1 $199.00; SX43, NC-173, HQ129X $139.00 each. RME45, SX25 $99.00; Howard 430 $29.50; S38 $29.95; S41 $22.50, latest signal shifter $59.00; DB22A $49.00; BC610's, 32V1's and many others. Large Stock Trade Ins. Free trial. Terms financed by Leo, WØGFQ. Write for catalog and best deal to World Radio Labs., Council Bluffs, Iowa.

OFFERING a large collection of radio periodicals and books; complete file of QST, Vol. 1, #1 through Vol. 31, #11, including "Ban off!" supplement, October 1919; ARRL Handbooks 1927, 1933, 1936, 1941–45; other ARRL publications, all in sound condition and ARRL certificates signed by Hiram P. Maxim; radio and experimenters handbooks and manuals, instruction books, texts, all early vintage, fine for collector's library or ham who likes research. Will consider selling entire lot, or individual items. QST run is in exceptionally fine condition. Mrs. Fred F. Flanders, 18 Springdale Ave., Wellesley Hills, Mass.

WANTED: Walkie-talkie, army surplus, hand-held. Nomenclature unknown. Covers at least 75 meter band. Telescoping antenna. Pictured popularly in war stories. Must be in good condition. Charles Ellis, W1VBV, University Club, Bridgeport, Connecticut.

NEW Westinghouse Hypersil transformers 2400 v.c.t. at 1500 ma. 110–220 at 60 cycles; 42 lbs. $16.00 f.o.b. Overbrook Company, Overbrook, Mass.

QSL's — Snappy new line — Send for samples. Larry's QSL Shop, Opportunity, Washington.

SURPLUS: BC221 Frequency Meters, clean and in perfect condition $49.50 each. Send orders to Monarch Electric Company, 411 Wood Street, Pittsburgh 22, Penna.

HALLICRAFTERS SX-28 in top condition. Just realigned. First $100.00 takes it. J. Duff. 200 West Bachtel, North Canton, Ohio.

CRYSTAL control on two meters! Transmitter and Superhet receiver available. Also NC 1–10, HRO-5, and portable gear. Richard Houghton, Littleton, Massachusetts.

WANTED: Several type CGQ-60133 Navy Crystal Calibrator Units — hold ten mounted crystals. BC610E back cover; exciter tuning boxes. State condition, price. Sell: Millen 90700 VFO, 80- or 40-meter output. New Speedex DeLuxe Wire Stripper Kit — 8 sets blades. 50W, 2 ohm adjustable resistors for milliammeter shunts, two for $1.60. Postpaid within 1000 miles. Walt Straesser, 15384 Birwood Avenue, Detroit 21, Mich.

SELL: new Collins 310-B-1 in original carton $150.00. Willis Weaver, W3AVO, R.D. 7, York, Penna.

QSL's-SWL's. Meade, WØKXL, 1507 Central Avenue, Kansas City, Kansas.

KILOWATT: 10–40 meter cw-FM phone rig in 5 foot open rack, 4 power supplies; BC459A, V.F.O. with calibrated dial and voltage regulated power; P.P. 81 final using kilowatt B&W butterfly condenser, coils, all stages link-coupled. Complete with Shure 708 mike and desk stand. 110 volt a.c. Just connect antenna and you're on the air. A steal at $300.00. Brand new, guaranteed — not surplus — Taylor 813 tubes, $19.50 pair. Al Zeitziff, W7MLQ. 132 Vine Street, Reno, Nevada.

SELL: HQ-129-X with speaker. All like new condition $110.00. C. Horn, 325 E. 163rd Street, New York 56, N. Y.

SELL: NC-46 and speaker, used 10 hours, $65.00. P. Casey, 102 West 93rd St., New York, N. Y.

ALUMINUM tubing, etc. Beams for Amateurs, TV, FM. Lists free. Willard Radcliff, Fostoria, Ohio.

MUST sell! BC312 converted to AC with speaker, $50.00 BC312, with xtal unconverted, $25.00. Meck T60 with 12 xtals, $85.00. Latest signal shifter, $55.00. VHF 152A, $59.00. HRO 5TA1 with speaker, no power supply, excellent condition, $160.00. Write M. R. Woodrow, W2WZA with offers. 25-24 E. 97th, E. Elmhurst (Queens), N. Y.

MORSE code practice reels for students or schools. Full lesson, 400 feet, $1.25; six for $7.00, postpaid. Abbe, 503 Fifth Ave., New York 17, N. Y.

FL-8A filters, $1.37, BC453 receiver, $12.95 new, BC-455, $6.95 new, T-20/ARC-5 xmtr, $8.95 new. New surplus tubes at lowest prices in country. Write for free monthly bulletin. Lectronic Research Laboratories, 1021-Q Callowhill St., Philadelphia, Penna.

WANT stamp collection. Will swap radio tubes, parts, equipment. Murray Fisher, 1023 Callowhill St., Phila., Penna.

W1ALJ selling out. Harvey 700R phone/cw transmitter, 750 watts, plate modulated, $200. Navy CO-9 phone/cw transmitter, 125 watts, plate modulated, $100. NC240C receiver, $120. All excellent condition. Whole for $400. C. B. Gardner, 19 Sweet Fern Lane, Peace Dale, R. I.

SURPLUS new mobile antenna rods, 84" long, stainless steel. Base threads ¾", 24 male. $3.00 each. Continental Communications Co., 1836 Euclid Avenue, Cleveland, Ohio.

MUST sell complete station. No time to operate it. HT-9 complete with tubes, 3 sets coils, instruction manual, 8 good crystals, Turner S22X mike RME-45 with matching speaker; Micro-Match model MM1; Trans-Meter model 905. All in like-new condition; used very little; appearance perfect, no scratches; circuit and components exactly as left factory; ready to operate. Also Premax 10-meter beam set up; Premax Rotomount; small oscilloscope. QST's since 1933. Make cash offer for any or all. Inspection and inquiries invited. W5DUW, J. G. Baker, Box 910, Lubbock, Texas.

FOR sale: complete working 50-watt CW station, ARR-7 (Surplus SX-28A), 80-meter ARC/5, 40-meter BC-459A, 20-meter BC-459A with power supplies. On air now with Idaho Gem and UI Nets. All inquiries answered with photograph. Will share express bill to best offer over $100. Good buy. Hugh Pettis, W7MVA, Elk River, Idaho.

FOR sale: Pushon screw-holding screw-drivers, holds screw at end of 8-inch blade enabling operator to set screws in tight places. Ideal for hams, builders, servicemen. $1.50 postpaid, Paul Wolf, W6RLP, 1815 Union, San Francisco, Calif.

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FOR sale: Hallicrafters SX-42 with matching bass reflex speaker, in perfect condition. Both for $200. William Moon, 449 Marmora Ave., Davis Island, Tampa, Fla.

75A-1 receiver, one month old. Operates perfectly. $300.00. WØDUD.

SELL: VFO from Collins ART-13 transmitter, with diagram, $9.50. WØCRZ, 1240 Orchard Drive, Ames, Iowa.

TWO xmitters for sale: both phone 40 watts, $30.00; 200 watts, $125.00. Both rack and panel complete with power supply. No mikes or xtals. C. O. Massie, 2019 East 20th Ave., Denver, Colorado.

BARGAINS: New and reconditioned Collins, National, Hallicrafters, Hammarlund, RME, Millen, Meissner, Sonar, Meck, etc. Reconditioned S-38, $25.00; S20R, $39.00; S40A, $59.00; HT18, $69.00; SX-42, $179.00; NC57, $59.00; NC173, $139.00; NC240D, $149.00; HQ-129X, $129.00; RME-45, $99.00; DB22A, HF-10-20, VHF 152A, RME-84, HFS, NC-183, HRO-7, Super Pro, SX-43, SX-25, SX-16, SX-28A, BC610E, T350XM, Collins 75A1, Collins 32V1, etc. Cheap. Shipped on approval. Terms. List free. Henry Radio, Butler, Mo.

FOR sale: 100-watt cw xmitter, 80-40 m. coils; 6L6 to pp T20, all ckts individually metered, 36" rack, separate power for osc (xtal) and PA. Also McElroy tape keyer, some spare parts and tubes. Reason: young OP on way. $200 or best offer. Write or phone H. C. Bohle, jr., 173 Riverside Drive, NYC, TR 7-1917. New York 24, N. Y.

BC-221-D frequency meter for sale, has AC power supply, extra tubes and chart. Perfect condition. First $50.00 takes it. W9PNB, Oliver Johns, 128 Berteau Ave., Elmhurst, Illinois.

SELL or trade IAS accounting course, general and cost, good as new. Need: signal shifter BC-221, 3-element 20-m. beam, Super Pro. W4POA, Fort Eustis, Va.

TRANSMITTER, Los Angeles area: 200 w. phone, 250W cw. Conservative design. Quality parts. Cabinet. Speech amplifier and mike; 3-element Premax beam. No junk. Also 40 and 80 meter 459s with power supply. All $225.00. Come around and look it over, or call Atlantic 27409. Cliff Lindsay, 702 South 7th St., Alhambra, Calif.

SUPER-PRO SP-400-X nearly new condition. Laboratory aligned. Selling complete with power supply, manual, speaker. Best offer. Also 1938 Sky Champion S-18 less speaker, $20.00. L. H. Orpin, W2WFU, 370 Estall Road, Rochester, N. Y.

SELL BC348N converted, in excellent condition, $75. Charles Liese, 43–17 Bowne St., Flushing, L. I., N. Y.

MEISSNER 150-B with spare tubes and Vibroplex key. Guaranteed to be in good condition. All letters answered. WØZRG, 1204 Tyler, Lexington, Nebraska.

SELL or trade: 21 years QST Jan. '25–Dec. '45, $39. Thordarson matched 1000/1250 VDC 300 MA. 8¾" Bud gray rack panel, X100 Guardian overload relay, dual bias 0–200 and 0–200 VDC same chassis, only bias used, best parts and construction, cost $69.48. Sells for $53. Dials new National NFW-0, $4.90 NP-0 $6.75. HRO-W complete, very good, $129.00. Many other items. Want beam, rotator, Super-Pro, HRO-7. NC-240-D, 38 cal. automatic, Savage 99EG 250/3000, outboard motor. Myron Lawson, W5ACL, 4010 River Drive, Houston 17, Texas.

SELL: BC-610-E, complete. Excellent condition in and out. Spare 250TH and Bud VFO. Best offer above $550.00 Telephone 14-W. F. N. Lambour, W3DCY, Nicktown, Pa.

SELL: Silver Models 700 and 800, Telrad frequency standard, new. Tr4 with 6J6 detector, miscellaneous other gear. Write for complete list. W1JUL, 62 Fisher St., Natick, Mass.

FOR sale, all or in part: cool KW-RF amplifier, modulator, power supply, meters, relays, clipper, in two cabinets, 35 watt amplifier 3" scope, full automatic bug. Arthur C. Dailey, 1431 35th Ave. Seattle 22, Wash.

FOR sale: New SX-42 with matching speaker both in perfect condition. $200.00. Paul M. Kersten, WØWIT, 826 Watson Ave., Topeka, Kans.

SELL: HF 10–20, $50, Q5'r, $9.00; Jensen JAP60, 15" coax speaker, $35.00, with baffle, $42; Howard FM converter, $26. J. M. Fischer, W4MQY/6, Apt. 208, Homoja Area, Port Hueneme, Calif.

FOR sale: New BC-348-0, not converted, New SCR 522, new radar xmitter, best offer. H. C. Ford, jr., W5CHE, Box 296, Granite, Okla.

NC-183, new (with guarantee) speaker and NFM adaptor, first offer over $190.00. Richard Gysan, W1MUO, 902 Hanna Building, Cleveland, Ohio.

SELLING out: HRO Senior: coils and broadcast: 10 meter 4 element beam; prop-pitch rotators; selsyn indicator; 15 foot tower; 400 watt fone/xmitter 10–20 meters; remote control; A-1 operating condition. All offers considered and answered. Also miscellaneous brand new xmitting and television tubes; meters, variable condensers, transformers. Write for list. W2IBN, George A. Treiber, 114–30–127 Street, South Ozone Park, 20, L. I., N. Y. VI 3–7709 (tel.)

BRING your Ninth Edition of Nilson & Hornung up to date with "Key and Answers" to New Radiotelegraph Questions". $1.00 postpaid. McKenzie, W2SOU, 245 Poplar, Hackensack, N. J. Watch for announcement about Element Seven.

BEST offer: RC 184 IFF set consisting of receiver, transmitter, power supplies, control and indicator units; 75 tubes, 115 volts, A.C., new, inquire R. Graham, 246 Queen Anne Road, Bogota, N. J.

WANTED: Service manual for T22/ARC-5 transmitter and BC-348Q receiver. J. Turchin, W6EQF, 641 Chalcedony St., San Diego 9, Calif.

SELL: 1 Kw. transmitter, complete Hallicrafters HT-18 VFO and NBFM to p.p. 807's to pp 811's to pp 250TH's. Separate H.D. power supplies. Completely switched and metered. Universal antenna tuner. Highest quality parts used throughout. Over-rated for safety. B & W condenser and coil assembly, turret, etc. 600W modulation transformer & 810 modulators. Well built and well designed. $550.00. Will consider small transmitter as part payment. H. A. Wark, W2VZW, R.D. #1, Lafayette, N. J.

BC-684A, BC-604A, BC-683A, BC-454B for sale or swap. Contax II or Leica late model. Write for details. E. M. Adams, W1ILN, Hope St., Seekonk, Mass.

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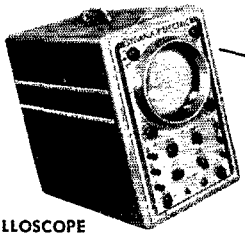

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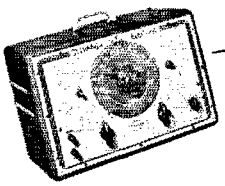
OSCILLOSCOPE

The Sylvania Oscilloscope, Type 132 (Giant 7-inch screen) shown, and Type 131, (3-inch screen) are ac operated general purpose cathode ray instruments. Excellent for AM, FM, TV circuit analysis, transmitter and vibrator wave-form checking. Price: Type 132, $144.50; Type 131, $89.50.



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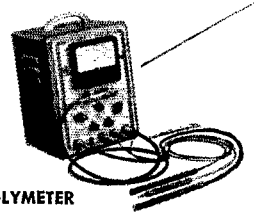

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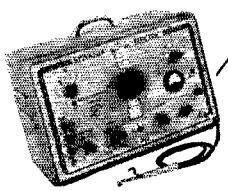

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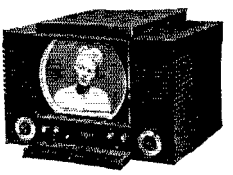

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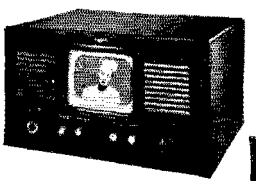

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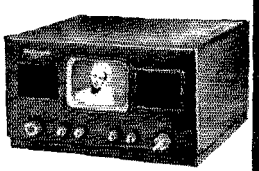

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