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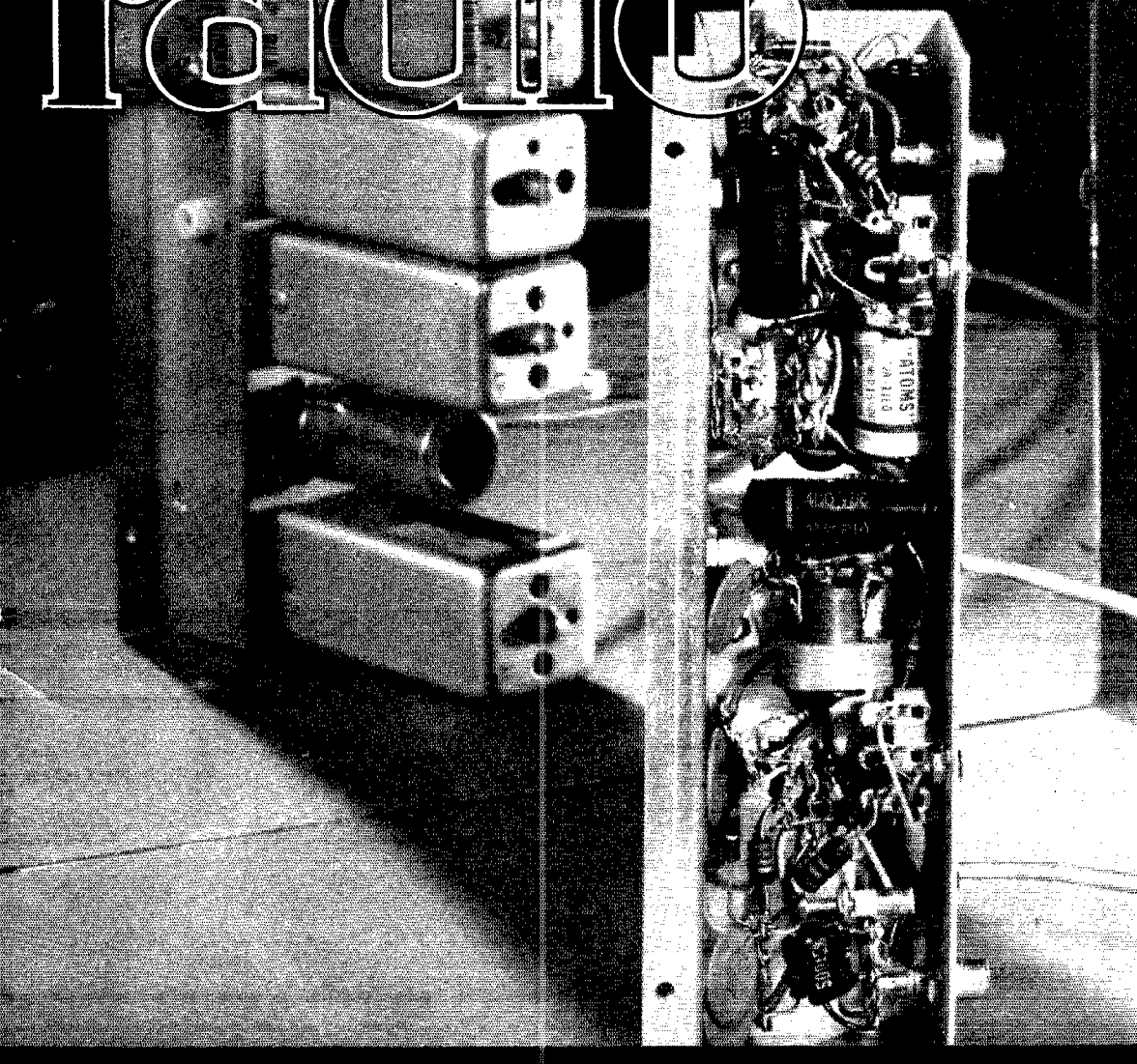

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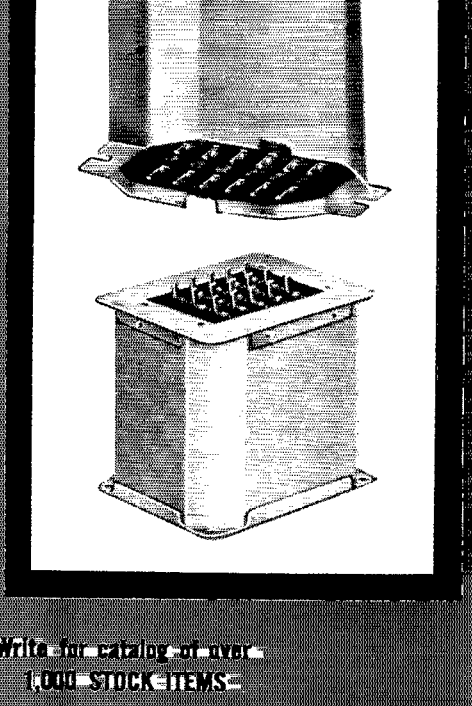

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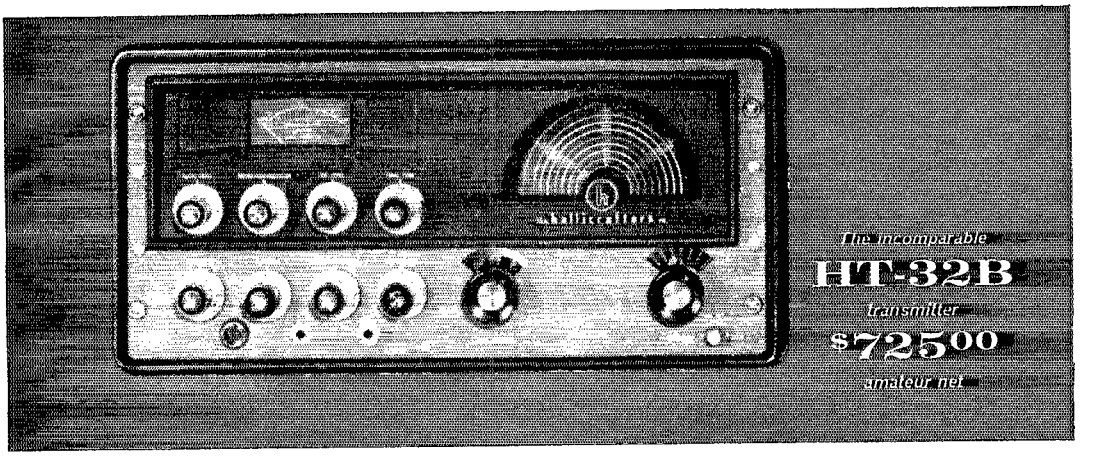

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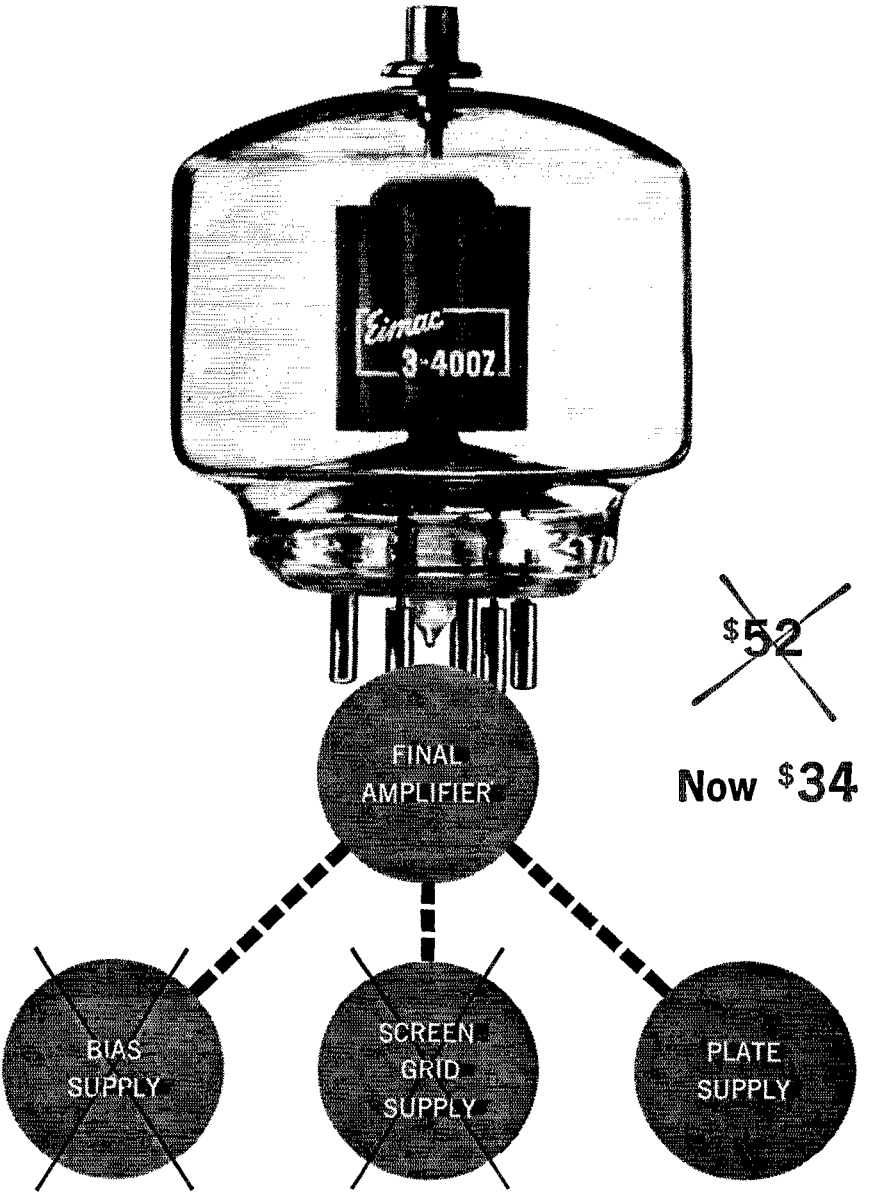

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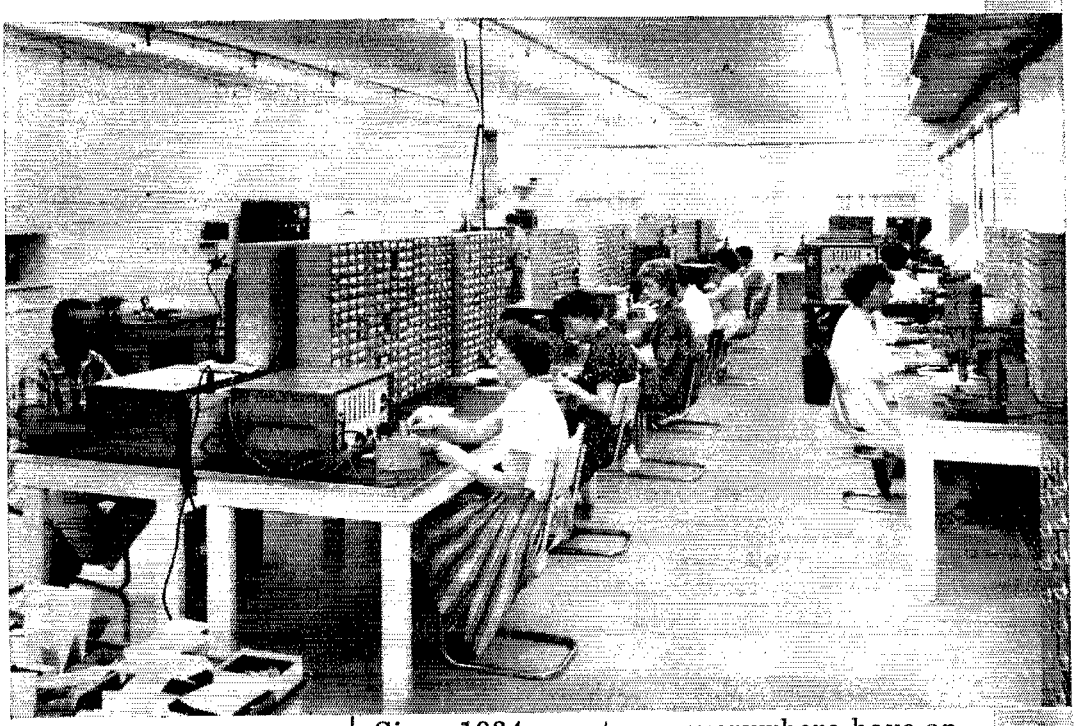

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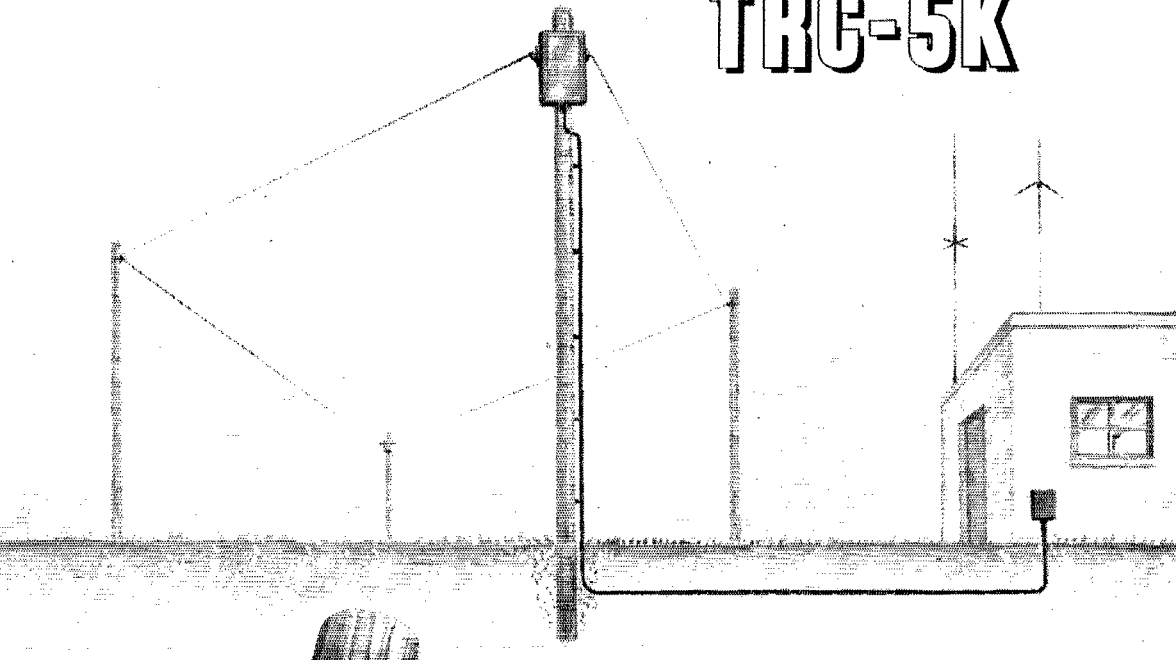

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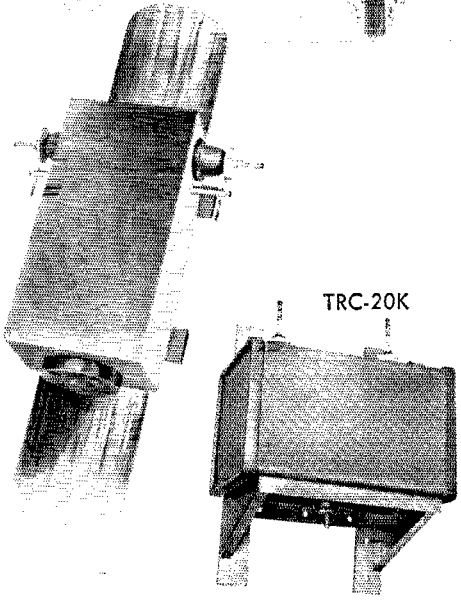

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It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. 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.

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Southwestern Division

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West Gulf Division

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P.O. Box 1656, Corpus Christi, Texas

Vice-Director: Ray K. Bryan W5UYQ
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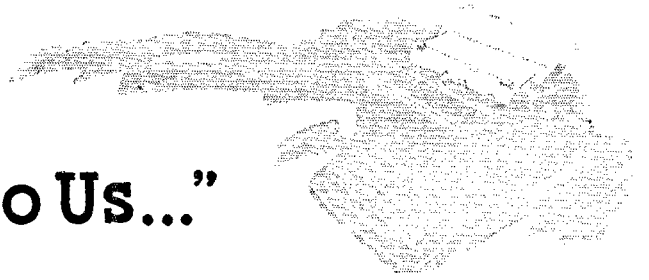


"It Seems to Us..."

THE YEAR IN REVIEW

As we commence 1963 entries in our logbooks, let's take a look at the events of the past year.

The number of amateur licensees hit the quarter-million mark in the U. S., and nearly 10,000 in Canada; the world total climbed well above 350,000. ARRL membership rose past 100,000. Herbert Hoover, jr., W6ZH. became the fifth President of the League in May. The new post of Associate Counsel for Canada was filled by Arthur K. Meen, VE3RX. The year marked the fiftieth anniversary of amateur licensing, and a commemorative banquet saluted those whose amateur activity covers the span of half a century. This year was a big one for Hq., too, as work actually began on the new League administrative building in Newington. Building fund donations slowed a bit in the Autumn, but they are once again on the upswing. With luck, late this Spring we'll be settled in our new quarters.

While the eyes of the world watched the skies for satellites and spaceships, amateurs went to work and managed another "first" — and, we might add, a "second" as well. Oscar I, the world's first non-government orbital satellite, went up on December 12, 1961. Oscar II was successfully orbited on June 2 last year. Both were designed and built entirely by hams, at no cost to the public; both functioned properly, and their cheerfully beeped "hi" became familiar all over the world. As this is written, tests are being made on Oscar III, a translator-type unit, which picks up a fifty-kilocycle hunk of the two-meter band and retransmits the whole thing elsewhere in the band. Hopefully, this one will go up within a few months. For outstanding contributions to amateur technical progress, the Project Oscar Association, Sunnyvale, California, was awarded the 1962 ARRL Merit Award. This year's Edison Award went to William Welsh, W1SAD/WA6VTL, for his untiring efforts in helping over 2800 persons obtain their licenses.

The sunspot cycle relentlessly moves on, and the amateur bands reflected consequent changes in activity and interest. The ten-meter band showed definite signs of deterioration this past summer, as did 15 and even 20. With more and more activity building up on the lower frequencies, the League embarked on a crusade for good operation, clean signals and properly functioning equipment. General interest in v.h.f. and u.h.f. grew by leaps and bounds; several enthusiasts are now aiming their antenna systems at the moon. A lot of hard work paid off for KH6UK and W1BU when they succeeded in establishing two-way contact on 1296 megacycles via moonbounce; W1BU thus followed up a similar triumph with W6HB in 1961. With several amateurs now either building moonbounce equipment or actually on the air, it appears that the higher portions of the amateur spectrum are being used much more extensively than in the past; there are still many challenges left for '63!

Along regulatory lines, U. S. hams no longer have to worry about Conelrad monitoring; the regulations were revoked in July. El Salvador signed a third-party traffic agreement with the U. S., and Canada added Costa Rica, Honduras, Mexico and Chile to its list of countries with which VE/VO amateurs have similar arrangements. Thailand was again added to the U. S. list of countries with which amateur communication is forbidden. FCC shifted responsibility for the amateur service from the Public Safety Division to the new Amateur and Citizens Radio Division. Several changes were made in the Communications Act: It is now possible to renew your ticket at any time during the license term; if you move, you can renew and apply for a change in address on the same form. Notarization is no longer required on any amateur application forms. For the small minority who insist on breaking the rules, FCC can now also levy small fines of up to $100 for rules infractions.

As this is written, word is received that the Commission has granted the League's petition for removal of the power restriction on 420 Mc.; see "Happenings" in this issue for details. In other actions, FCC turned down a petition for expanded 14-Mc. phone privileges, as well as denying one which proposed Technician Class operation on the ten-meter band. Still pending are rulings on application fees, dual RTTY identification procedure, expanded 160-meter privileges, simplified mobile logging, and slow-scan ham TV on ten and fifteen meters. The reciprocal licensing bill bogged down in Congress; another attempt will be made this year. Only recently, the

(*Please turn the page*)

League petitioned the Post Office Department for the issuance in 1964 of a postage stamp commemorating the fiftieth anniversary of organized amateur radio.

Before we give the impression that, other than launching satellites and bouncing signals off the moon, amateurs twiddled their thumbs, we had better touch upon a few of the other activities which kept them busy in '62! On the world scene, an international amateur radio station, bearing the call letters 4U1ITU, was opened and dedicated in June, in the new headquarters building of the International Telecommunications Union at Geneva, Switzerland. Numerous DXpeditions put a lot of scarce new countries within grasp, giving many people a boost in their DXCC totals.

Domestically, hams put a great deal of energy into a wide variety of activities. Congratulations go to the hard-working groups in British Columbia and New York State on their success in obtaining call-letter license plates. This leaves only Manitoba and Ontario in Canada and Massachusetts, Kentucky and New Jersey in the U. S. without the special plates. Compliments also go to hard-working sponsors of many conventions and hamfests held during the year. Some 1800 people made the trip to Portland, Oregon, for the twelfth ARRL national Convention on Labor Day Weekend. A new wrinkle at this and several other ARRL conventions this past year was the new portable League booth, which will be making its appearance at future division conventions and at state conventions whenever possible.

Between conventions, a lot of on-the-air activity took place! The June Field Day found a record 15,000 participants in the hills and dales for the weekend, and some 1450 logs were submitted. The September v.h.f. party broke no records, what with poor conditions, but there were still over 450 logs received testifying to the interest shown. The results of the November SS were just coming in as this was being written, but from all indications the scores are still going onward and upward. The DXCC committee added three new countries and deleted three in 1962, and a new Honor Roll listing system was inaugurated in the April issue; totals now show the number of countries worked and confirmed, as well as a lesser figure which takes into account the deleted countries. Interest in WAC, WAS and DXCC continued to grow, and there was a lot of "wallpaper" passed out to successful applicants for these and other awards.

On the more serious side, hams continued to show desire to be of service, with members of RACES and the AREC turning out in numbers to help find missing children, provide communications for fire fighters; in disasters involving tornadoes, floods, and snowstorms; providing rapid medical assistance and aiding speedy relief to victims of all sorts of accidents. The West Coast floods and the recent Guam disaster were particularly noteworthy cases of amateur public service on a large scale. A little under two-million message-handlings testifies to the interest in traffic work.

With all the time devoted to emergency work, bouncing signals off the moon, launching satellites, DXing, going to hamfests and conventions, traffic work, contests and certificate hunting, where and how did anybody find opportunities to build equipment and just "chew the fat"? Needless to say, this was a pretty busy and eventful year! Whatever your favorite ham activity, may '63 be your best yet . . . Happy New Year! QST

January 1938

. . . Announcement was made of the first ARRL QSO Party — a chance for ARRL members to work each other.

. . . A. L. Budlong began a two-part article describing how amateurs got their present bands and what the upcoming Cairo conference would mean to amateur radio. This was a treatise on international amateur regulations.

. . . Technical articles included a 5-band exciter, by W8ZU (and W7ZU, ex-W8ZU, tells us that he still has that exciter panel in use!), how to determine true north by observation of the sun, an article on directional antennas by W8JK, crystal control on 56 Mc., a continuation of the dope on modern television by W2KJL, and a bunch of hints and kinks.

. . . W1BES described some new ham gear that was being shipped to Andrew Young at Pitcairn Island.

. . . In IARU News was presented an up-to-date countries list, which had been worked up with the help of W6QD and others.

. . . High claimed SS scores included W6ITH, who worked all 70 sections on phone, and W3BES, who worked 438 stations on c.w. QST

OUR COVER

Our cover this month shows a loran pulse blanker built by the League's technical director, W1DF, in accordance with directions supplied by the League's president, W6ZH. What? You say you want to build one too? Fine — just turn to page 24 of this issue.

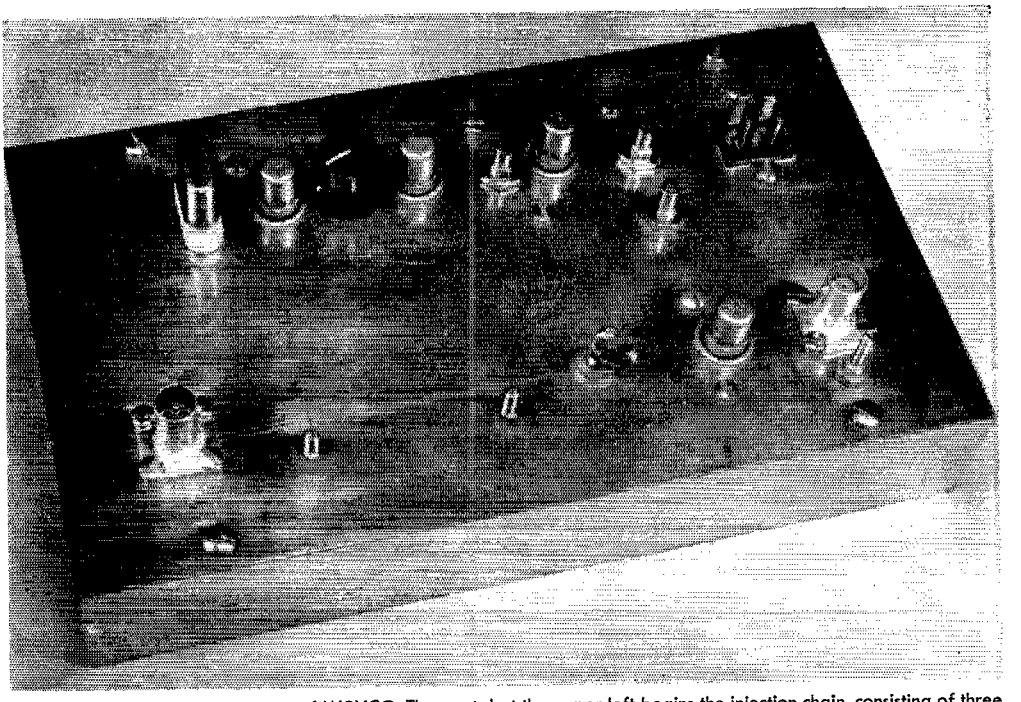
Strays

The cumbersome term "micromicrofarads" (abbreviated $\mu\mu$f.) will be replaced with the more compact "picofarads" (abbreviated pf.) beginning with this issue of *QST*.

An All-Nuvistor Converter for 420 Mc.

Top Performance with Rugged and Inexpensive Tubes

BY MARTIN L. KAISER,* W2VCG



Top view of the 432-Mc. converter of W2VCG. The crystal at the upper left begins the injection chain, consisting of three 6CW4 Nuvistors. The 6CW4 at the lower right is a grounded-grid i.f. amplifier stage. The two 8058 r.f. amplifier stages are inside the case.

In amateur work at 432 Mc., some very special converters and r.f. amplifiers are used in aiming for the ultimate in weak-signal reception. Such converters are likely to be difficult to build, and expensive as well, and some of them are rather delicate. The converter described here is capable of digging down into the noise for the weak signals that ordinary converters miss, and at the same time it is rugged enough to withstand a reasonable amount of r.f., in case of antenna relay leakage or failure.

The combination of sensitivity and ruggedness was brought about by the use of the new 8058, a plate-cap version of the Nuvistor, designed especially for grounded-grid amplifier service at frequencies up to 1200 Mc. Its characteristics indicated that it should be ideal for use at 432 Mc., so an experimental converter was designed around it, and put into service. During the first month of its use at W2VCG, this converter made possible 432-Mc. QSOs with 9 states and 4 call areas. This is top performance, as a peek at the 420-Mc. standing in *QST* will confirm.

* 418 Hale St., Pennington, N. J.

Circuitry

Two 8058 Nuvistors, V_1 and V_2, are used as grounded-grid amplifiers, with ordinary coil-and-capacitor tuned circuits. The mixer, CR_1, is a 1N82A diode, with output at 16 Mc. This frequency was chosen as the low end of the i.f. tuning range for reasons having to do with the receiver at W2VCG, and also to permit the use of an inexpensive 7.7-Mc. crystal in the injection chain.

The Nuvistor, exhibiting a combination of ruggedness, low cost, and excellent noise characteristics for receiver applications, quickly made a place for itself in the v.h.f. world. The latest version of this tiny tube, the 8058, was designed especially for grounded-grid amplifier service in the u.h.f. range. Two of them are used here by W2VCG, to provide lower-noise reception in the 420-Mc. band than has been possible heretofore with anything but the most expensive tubes and sophisticated techniques.

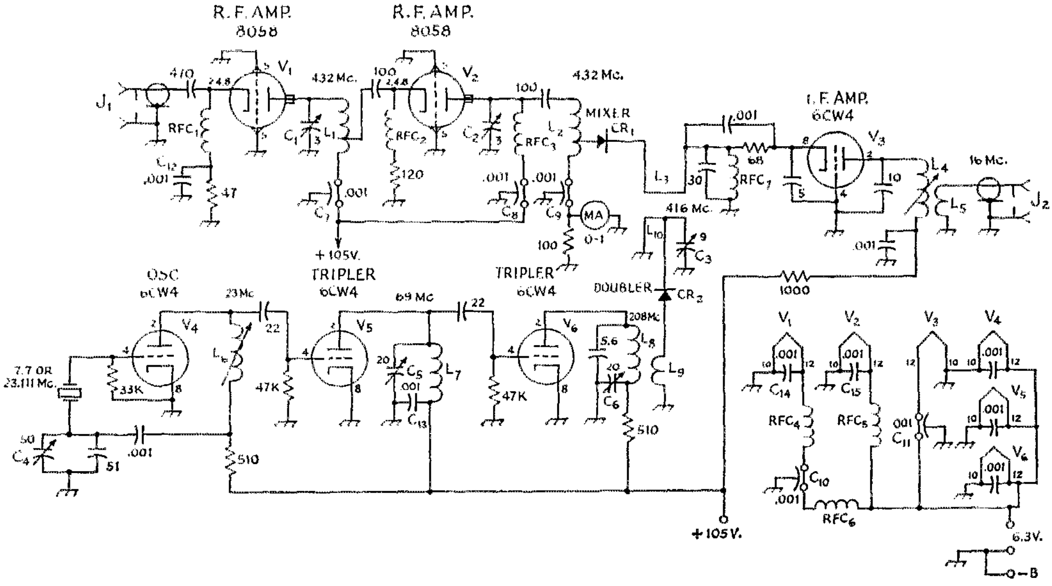


Fig. 1—Schematic diagram and parts information for the 432-Mc. converter. All resistors are ½ watt. Decimal values of capacitance are in µf., others in pf. (µµf.) All capacitors ceramic unless specified.

C_1, C_2—0.7-to 3-pf. ceramic trimmer (Erie 535-OR7).
C_3—9-pf. miniature variable (Johnson 160-104 or 9M11)
C_4—50-pf. ceramic trimmer.
C_5, C_6—20-pf. miniature variable (Johnson 160-110 or 20M11).
C_7–C_{11}, incl.—0.001-µf. feedthrough (Erie 357).
C_{12}–C_{15}, incl.—0.001-µf. button-ceramic (Sprague 507C).
CR_1, CR_2—1N82 diode.
J_1, J_2—BNC-type coaxial fitting.
L_1, L_2—3 turns No. 14, ¼-inch diam., spaced ⅛ inch. Tap at 1 turn.
L_3—U-shaped loop of spaghetti-covered No. 20, adjacent to L_{10}.
L_4—5- to 9-µh. iron-slug coil (North Hills 102C).
L_5—2 turns No. 30 insulated wire on cold end of L_4.
L_6—3- to 5-µh. iron-slug coil (North Hills 102B).
L_7—4 turns No. 20, ½-inch diam., spaced 1/16 inch.
L_8—2 turns like L_7.
L_9—1¼ turn like L_7.
L_{10}—U-shaped loop made of 2½ inches No. 14, as per Fig. 3.
RFC_1 to RFC_6, incl.—11 turns No. 22 enam., close-wound on ⅛-inch form.
RFC_7—4.7-µh. solenoid r.f. choke.

No changes, other than suitable crystal substitution, would be needed to use the more conventional 14-Mc. low-end frequency. The crystal required would then be 7740.67 kc., if the oscillator is used in the manner shown. A simple triode oscillator, in which the crystal and the plate-circuit bypass capacitor are returned to ground, could be used with crystals at 23.111 or 23.222 Mc., respectively, for 16 or 14 Mc. as the low end of the i.f. range. A crystal at 34.666 or 34.833 Mc. could be used, by reducing the inductance of L_6, and running V_5 as a doubler.

Three 6CW4s, V_4, V_5 and V_6, are used in the injection system, and another, V_3, is a grounded-grid i.f. amplifier stage. The latter is a bit unusual but convenient way to provide broadband low-noise i.f. amplification. This assures that the communications receiver will not be a factor in determining the over-all noise figure of the receiving system, even though its performance may be poor at the intermediate frequency of the converter. The combination of grounded-grid r.f. and i.f. stages makes possible a flat response from 431 to 436 Mc. The final stage of the injection string is another 1N82A diode, CR_2, doubling from 208 to 416 Mc.

Use of crystal diodes in the mixer and final multiplier stages simplifies the circuitry required at these points. The tuned circuits are U-shaped loops, L_3 and L_{10}, inductively coupled. The 30-pf. capacitor at the i.f. end of L_3 bypasses the circuit for the u.h.f. energy, but permits the signal at the intermediate frequency to pass on to the cathode of the i.f. amplifier V_3. The choke RFC_7 is a d.c. path for the cathode of V_3. Note the small capacitors from cathode and plate to ground in this stage. These should be connected with absolute minimum lead length. Without them there may be oscillation in the vicinity of 1600 Mc. This may be detectable by a large increase in crystal current; probably producing a higher reading on the crystal-current meter than does the desired injection voltage.

Construction

The converter is built on a flat plate of copper or brass, 1¾ by 8½ inches in size. If there is difficulty in locating a chassis of these dimensions, any convenient larger size may be used. It is recommended that the general layout shown in the drawings and photographs be followed, so complete dimensions for the necessary metal-

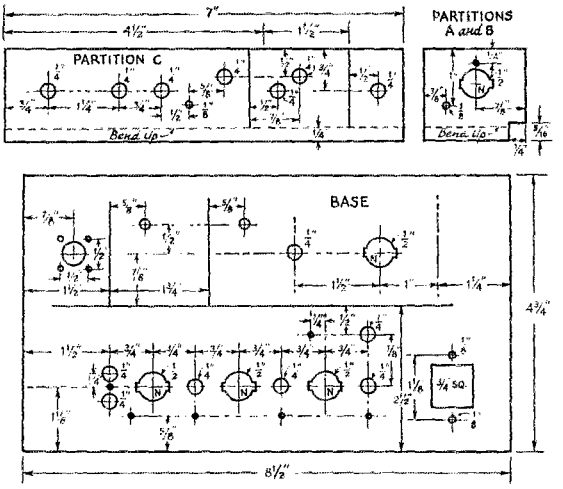


Fig. 2—Layout drawings for the converter chassis and shield partitions. Material is ½-inch sheet copper or brass. Partitions A and B are identical, except that the ⅛-inch hole shown in the lower left portion of the drawing of these parts is omitted in Partition B. Dimensions should be regarded as approximate, and checked with parts to be used, before drilling.

work are given in Fig. 2. It is well to check all hole sizes and locations, as differences in parts may make minor changes necessary. The shield partitions may be bolted to the chassis, but soldering them in place is recommended. It will be seen that the grid of the 8058 is connected internally to the tube shell. Good grounding is important here, too; solder the socket tabs to the chassis. There is a special socket available for the 8058, having finger stock for making the ground connection to the shell, but this was not found necessary here, and sockets intended for the 6CW4 were used. The sockets for the injection stages are all mounted with their plate terminals toward the power plug.

Mount all the larger components to the chassis before proceeding with the wiring. Start at the crystal socket (lower left of the bottom view) and proceed in a counterclockwise direction around the partition. Keep all leads short. In the u.h.f. portions of the converter there must be substantially no leads at all.

The 416-Mc. diode multiplier inductance, L_{10}, is shown in Fig. 3. It is soldered to a ground lug at the bent end, and to the stator of C_3 at the other, in a vertical position about ½ inch from partition C, and between the second and third holes from the left side of the partition. L_3 is a piece of spaghetti-covered No. 20 wire, running from the common point of RFC_7, the 68-ohm resistor, and the 0.001-μf. and 30-pf. capacitors, through the second hole, adjacent to the upper half inch of L_{10}, and back through the third hole to the diode, CR_1. The other end

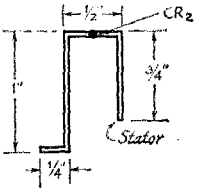


Fig. 3—Detail of the inductance L_{10}, used in the output circuit of the crystal-diode multiplier stage.

of the diode is soldered carefully to L_2. The resistor that provides the d.c. return for the crystal is on the top side of the chassis. The crystal current meter is connected at this point also. The resistor value depends on the type of meter used.

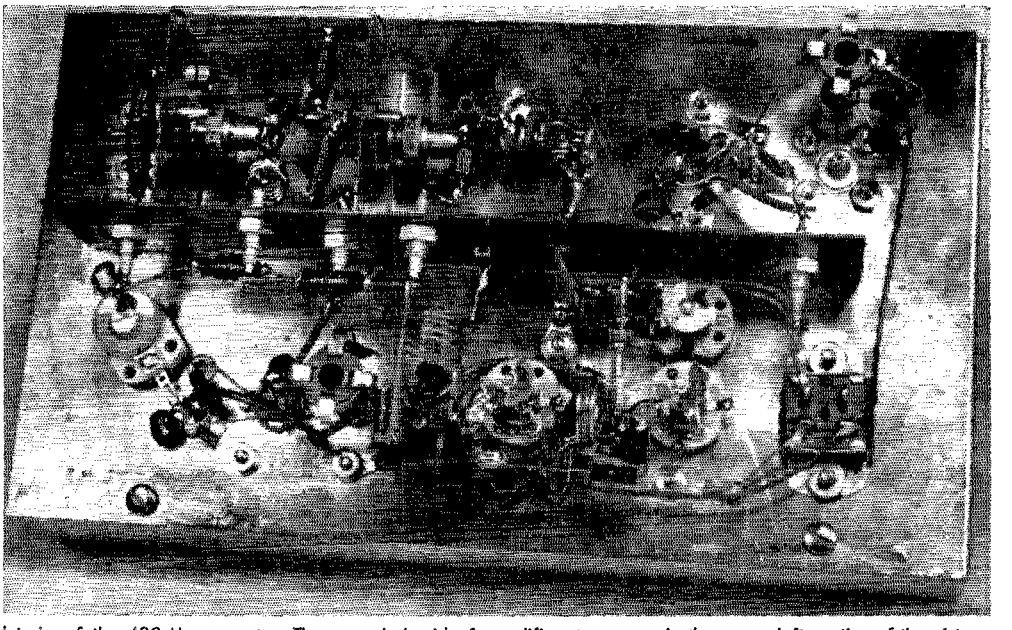
The plate blocking capacitor (100 pf. between L_2 and the plate of V_2) should have leads of no more than ⅛-inch. Solder all three cathode leads of the 8058s together to provide low-inductance paths in the cathode circuits. When wiring is completed, check carefully for errors, and dress power wiring close to chassis surfaces where necessary.

Operation

Power requirements of the converter are 6.3 volts at 2 amp., and 105 volts, regulated, at about 40 ma. Start with C_4 set at minimum capacitance, and tune L_6 for maximum output from the oscillator at 23.1 Mc. Adjust C_4 and L_6 for maximum output, coincident with easy starting of the oscillator each time the plate power is applied. Tune each succeeding stage for maximum crystal current. There should be at least 0.2 ma. at this point. Use the crystal-current meter as an indicator, and retouch all controls for maximum output from the injection chain. A grid-dip meter of the ordinary variety will serve as an indicator during the initial adjustment of all circuits except diode doubler.

With all controls peaked, adjust the spacing between L_3 and L_{10} for maximum crystal current. It is worthwhile to consider leaving the crystal-current meter permanently connected, as it will be useful in several ways. It provides a constant check on the operation of the injection stages, and it will indicate antenna relay failure by full deflection when the transmitter is turned on. It is also useful as a tuning meter when adjusting the transmitter, as it is likely to show some rise when the transmitter is on. With the injection chain adjusted properly and the transmitter off, the crystal current will be about 0.4 ma.

Connect the converter output to a suitable



Interior of the 432-Mc. converter. The grounded-grid r.f. amplifier stages are in the upper left portion of the picture. The lower portion contains the injection stages. The mixer diode is above the main partition, right, center, and the multiplier diode is just below it. The i.f. output coil is in the upper right corner, and the power plug at the lower right.

receiver, tuned to the desired intermediate frequency, and peak L_4 for maximum noise. The third harmonic of a 2-meter transmitter stage provides a good signal for aligning the converter. This is very simple: Merely connect a suitable antenna to the converter input, and peak C_1 and C_2 for maximum response, as indicated on the receiver S meter.

The transconductance of the 8058s tends to go up in the first 15 minutes of operation, before reaching maximum efficiency. It is recommended that the converter B plus be kept on at all times, therefore, even when transmitting.

Whether your interest lies in adding points to your v.h.f. contest scores, hunting DX on 432, or just in having local ragchews while getting acquainted with a new band, this converter will fill the bill in all respects. See you on 432! Thanks to Bill Ruch, WA2WIL, for valuable assistance in the preparation of this article. QST

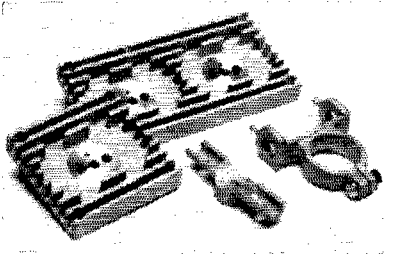
• New Apparatus

New Aluminum Castings

The transistor heat sinks and antenna mounting accessories shown in the photograph are just a few examples of aluminum castings made by Continental Electronics & Sound Co., of Dayton, Ohio.

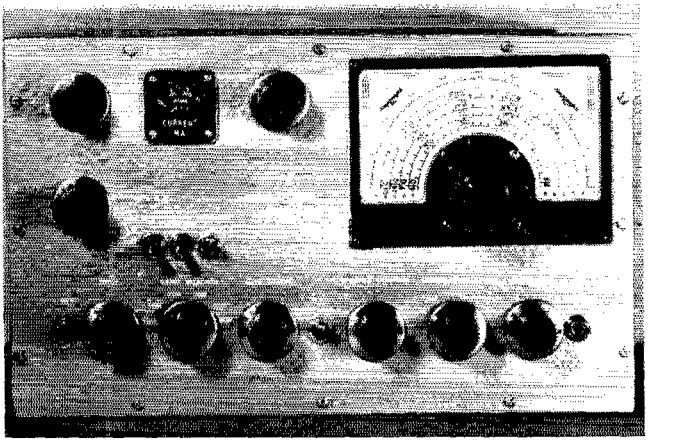
All of the heat sink castings are of aluminum bullion with a copper additive. The texture of the finish is "rough" and is actually made up of thousands of small pinnacles which give additional radiating surface.

The Cesco heat sinks come in a variety of sizes and can accommodate from one to four transistors or silicon rectifiers. A model is available unfabricated so that any desired hole arrangement can be made. The photograph shows type HS-2-1 (left) which measures 3 inches long, 3 inches wide and $\frac{5}{8}$ inch deep. As supplied, it is fabricated for one round transistor or stud silicon rectifier; however, it can easily be modified for oblong or diamond transistors. Two transistors can be mounted on the HS-4-2 shown at the rear. It too can be modified for oblong or diamond transistors. It measures $5\frac{3}{4}$ inches long, 3 inches wide and $\frac{5}{8}$ inches deep.



The two castings at the right are clamps for constructing Yagi antennas. Three sizes are available: The small clamp at the left is recommended for 144 Mc. and up and will fit 1, $1\frac{1}{4}$ and $1\frac{1}{4}$ inch booms and handle $\frac{3}{8}$ inch elements; the large clamp at the right is for $1\frac{1}{4}$ inch booms and $\frac{3}{8}$ inch elements. There is also a super Yagi clamp (not shown) for $1\frac{1}{4}$-inch booms and $\frac{1}{2}$-inch elements. No hardware is furnished with the small clamp but the large and super sizes have a screw and nut for attaching the clamp to the boom, plus two self-tapping screws for clamping the elements to the casting.

— *E. L. C.*



Lined up along the lower side of the panel, from left to right are the key jack, drive control, band selector, grid-tuning control, p.t.t. in-out switch, carrier-balance control, sideband selector, audio gain control and the microphone jack. To the left of the meter is the loading control, with the mode switch to the right. Below are the plate tuning control, filament switch, high-voltage switch, and remote in-out switch. The v.f.o. dial is a National SCN.

The W4JWV S.S.B. Exciter

90-Watt (P.E.P. Output) Unit for Multiband Operation

BY COL. R. D. CURTIS,* W4JWV

THE exciter described here is an indirect result of Ted Crosby's excellent receiver-construction article published in the October 1959 issue of *QST*.[1] A few weeks after reading Ted's instructions for building the HBR-16, I completed one of the little beauties. Its performance exceeded my most optimistic expectations, and enabled me for the first time (I had been using a war-surplus receiver) to listen in conveniently on the s.s.b. fraternity. Inevitably I felt the urge to join in too, particularly since the s.s.b. mode has been collecting devotees rapidly, including some of my old a.m.-c.w. rag-chewing friends. In preference to the still-considerable investment that commercial gear represents, I undertook the design and construction of a rig that would meet personal preferences. The exciter described here is the result of several months of spare-time tinkering, and is passed on in the hope that it will be the deciding factor in inducing other homebrewers to join the s.s.b. crowd.

This little rig has the following characteristics:

1) It is capable of 140 watts input on s.s.b. or c.w. modes, and a carrier input of about 70 watts on a.m.

2) It operates efficiently on four bands, 80 meters through 15 meters, and should work as well on 10 meters if, or when, I buy two additional crystals. All necessary coils have been wound and tuned, and two switch positions are available.

3) Band switching is accomplished by a single front-panel control, as is sideband selection.

4) On-the-air reports give the signal quality top marks. Carrier is not detectable, even on local contacts and, except for inconsequential "garbage" well down in amplitude on the opposite sideband, the signal may be considered to be completely clean. This "garbage" is a characteristic of the filter which, though remarkably steep-sided, lets through a bit of opposite sideband below the 6-db.-down point at which the carrier oscillator is set. (This could be reduced, if necessary, by moving the carrier farther off.)

5) Total price for all components should not exceed $100 to $150, and this can be reduced somewhat, as it was in my case, by accepting the compromises and economy of surplus or "bargain" parts.

6) It can be constructed and aligned with a minimum of test equipment. Only a v.t.v.m. with r.f. probe, a grid-dip meter, and the station receiver are absolutely essential, although access to a frequency meter will greatly simplify setting of the carrier frequencies, adjusting temperature compensation in the v.f.o., and calibrating the dial.

7) The whole rig — power supply, v.f.o. and all — is contained in a single neat package 15 by 11 by 9 inches.

The straightforward design of this exciter should appeal especially to those who are searching for a pattern to follow in their first attempts at s.s.b. transmitter construction. This does not mean that anything in the way of performance has been sacrificed in reducing the circuitry (and the physical size) to attractive dimensions.

* 801 S. Court House Road, Arlington 4, Virginia.

[1] Crosby, "The HBR-16 Communications Receiver," *QST*, October, 1959.

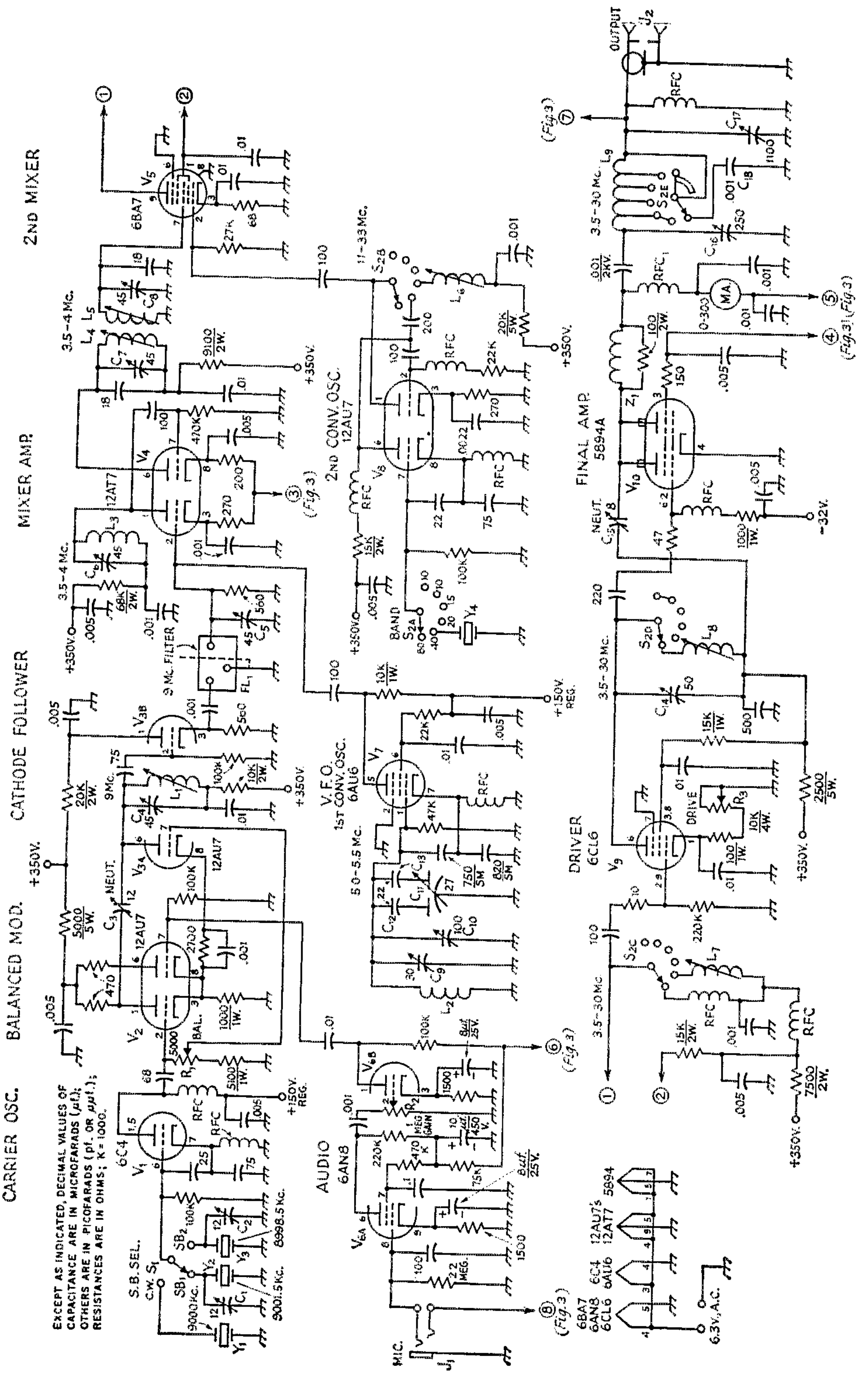

CARRIER OSC.
BALANCED MOD.
CATHODE FOLLOWER
MIXER AMP.
2ND MIXER
AUDIO
6AN8
V.F.O.
1ST CONV. OSC.
6AU6
2ND CONV. OSC.
12AU7
FINAL AMP.
5894A
DRIVER
6CL6
EXCEPT AS INDICATED, DECIMAL VALUES OF CAPACITANCE ARE IN MICROFARADS (μf.); OTHERS ARE IN PICOFARADS (pf. OR μμf.); RESISTANCES ARE IN OHMS; K = 1000.
S.B. SEL.
C.W.
9 Mc. FILTER
3.5-4 Mc.
3.5-30 Mc.
11-33 Mc.
5.0-5.5 Mc.
9000 Kc.
9001.5 Kc.
8998.5 Kc.
BAND
NEUT.
BAL.
DRIVE
GAIN
MIC.
OUTPUT
6.3V. A.C.
+350V.
+150V. REG.
-32V.
(Fig. 3)

Fig. 1—R.f. circuits of the W4JWV s.s.b. exciter. Fixed resistors are ½ watt unless indicated otherwise. Fixed capacitors of less than 0.001 μf. are mica, except those marked SM, which are silver mica. Others are disk ceramic. Excepting *RFC*'s, which should have a rating of 1 ma., 200 ma. or more, all r.f. chokes are 2.5 mh., 50 ma. (National R-50 or equivalent). Items not listed below are identified for text-reference purposes.

C_1, C_2, C_3—3–12-μμf. ceramic trimmer.
C_4, C_5, C_6, C_7, C_8—7–45-μμf. ceramic trimmer.
C_9—30-μμf. air-trimmer type (Johnson 25J12/157–3).
C_{10}—100-μμf. miniature air variable (Johnson 100J12/157–6).
C_{11}—27-μμf. differential capacitor (Johnson 25LA15/167–32).
C_{12}—NP0 ceramic.
C_{13}—N750 ceramic.
C_{14}—50-μμf. air-trimmer type (Johnson 50J12/157–4).
C_{15}—8-μμf. air-trimmer type (Johnson 7J12/157–1).
C_{16}—250-μμf. midget air variable (Hammarlund MC-250-M).
C_{17}—Triple-section air variable, 365-μμf. or more per section, sections in parallel (Broadcast-replacement type).
C_{18}—Ceramic or mica.
FL_1—9-Mc. crystal filter (McCoy SSB-9).
J_1—Three-conductor open-circuit phone jack.
J_2—Chassis-mounting coaxial receptacle.
L_1–L_6—See coil chart.
R_1—Linear control.
R_2—Audio-taper control.
R_3—Wire-wound control (Mallory M10MPK).
S_1—Single-pole 3-position rotary switch (CRL 2501).
S_2—Ceramic five-section 6-position rotary switch (CRL P-272 index plus ¼-inch bakelite-rod extension—see text; five type XD wafers).
Y_4—7-Mc. band—11 Mc.
—14-Mc. band—9 or 18 Mc. (see text).
—21-Mc. band—12.5 Mc.
—28-Mc. band, low end—16.25 Mc.
—28-Mc. band, high end—16.5 Mc.
Z_1—Parasitic suppressor—6 turns No. 18 wound on and spaced to length of associated 100-ohm 2-watt resistor.

8) Finally, for you other happy HBR owners, it matches acceptably the HBR-16 in appearance.

Construction of a duplicate of that illustrated should be a feasible undertaking for the reasonably competent and experienced homebrewer. I don't recommend the attempt to those who have had kit-only experience unless you're willing to devote the extra time and patience necessary in deciding, essentially for yourself, where best to locate each of the myriad of components. For those who do not wish to duplicate this rig exactly but who are interested in s.s.b. construction, I can recommend study of the circuitry and layout. It works well, as it should, and includes a few ideas and innovations I have not seen elsewhere.

Sideband Generator

So much for introduction. Let's go on to a look at the circuitry. V_1, a 6C4 in the very familiar Colpitts circuit, is the carrier oscillator. Y_2 and Y_3 are crystals furnished with the McCoy filter and are tuned to exact frequency by ceramic trimmers C_1 and C_2. The third crystal, Y_1, at 9 Mc. is used for tune-up and c.w. It permits very accurate setting of the carrier balance control located on the front panel. More about this later when we come to tune-up procedure.

The balanced modulator, V_2 and V_{3A}, is the "Transformerless Single-Sideband Modulator" from the ARRL single-sideband manual. In the configuration shown here, it has produced at least 50 db. of carrier suppression, is simple to build and align and, once aligned, has required no further attention.

Audio is furnished by V_6, a 6AN8, in a conventional circuit. A 12AX7 would probably work as well here, but I had the 6AN8 and it does the job very effectively.

V_{3B} is a cathode follower used to match the impedance level of the 9-Mc. double-sideband signal, taken from the tuned circuit made up of L_1 and C_4, to the input impedance recommended for the filter.

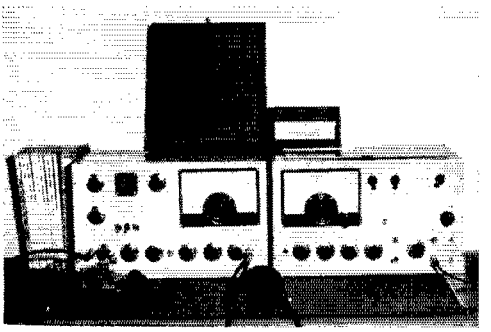
V.F.O. and First Mixer

The v.f.o., V_7, is a 6AU6 in a very high-*C* Colpitts circuit. This v.f.o. has produced almost incredible stability, primarily as a result of the technique used for temperature compensation. This technique, borrowed from a "Recent Equipment" article on a Hallicrafters product, uses a differential capacitor, C_{11}, to adjust the relative capacitances of an NP0 capacitor, C_{12}, and an N-750 unit, C_{13}, in the tuned circuit. This permits simple and very accurate adjustment of temperature compensation. I used a BC-221 frequency meter to adjust this v.f.o. and, when finally set correctly, it maintained zero beat with the meter for 15 minutes. I decided that that was good enough, haven't touched it since, and have yet to receive a complaint of drifting signal.

One half of V_4, a 12AT7, is used as a first mixer. The grid resistor of 560 ohms is not ideal for this purpose, but is necessary to match the output impedance of the crystal filter. C_5 is adjusted for maximum output from the filter.

The second half of V_4 is used to beef up the 3.5- to 4.0-Mc. output of the first mixer for proper injection to the second mixer. Although this triode stage is not neutralized no trouble with oscillation has been experienced.[2] The three tuned circuits, in the plate circuits of both V_4 triodes and in the grid circuit of V_5, have proved capable of getting rid of unwanted mixer products to an acceptable degree without resort to any other

[2] This is quite possibly the result of a fortunate arrangement of components. The use of a triode-pentode, such as the 6U8A, the pentode section being used as the amplifier, would seem to be a safer proposition. If the dual triode is used, and trouble is experienced with oscillation, the difficulty could probably be remedied by applying link neutralization. — *Editor*



The W4JWV exciter (left) is packaged to complement the HBR-16 receiver (right).

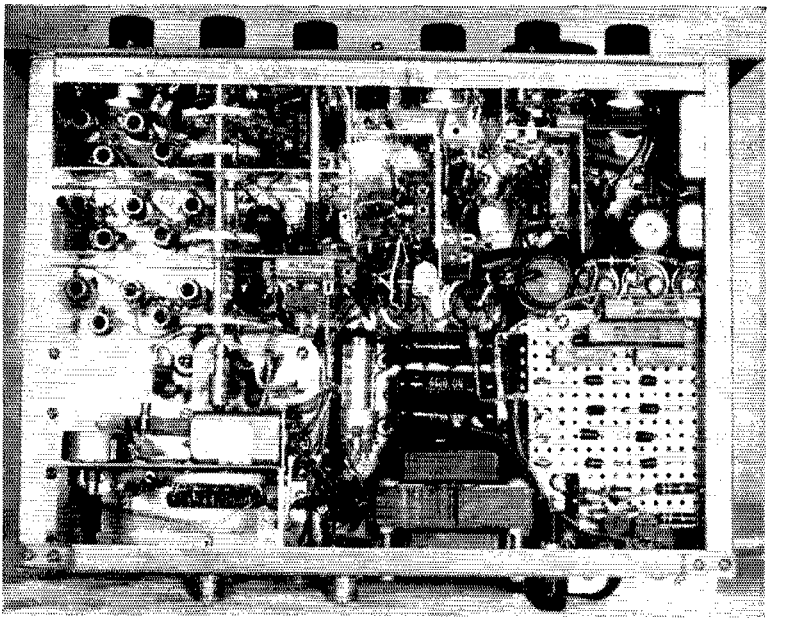
devices. Both cathodes of V_4 are keyed for c.w. and push-to-talk s.s.b. or a.m. operation.

Second Conversion

You will note that, so far, no band switching is provided. For all bands, the s.s.b. signal is generated at 9 Mc. and mixed in V_4 with output from the v.f.o. to the 80-meter band. The v.f.o., tuning 5.0 to 5.5 Mc., permits tuning the entire 80-meter band and, when the signal is mixed again, covers the 40-meter, 20-meter, and 15-meter bands with some to spare. For 10-meter operation, two switch positions are provided permitting a total coverage of 1 Mc. in this band.

The second mixer, V_5, is a 6BA7 wired conventionally. On the 80-meter band this tube operates straight through and, since there is very ample drive available and no additional filtering is required, an r.f. choke is used in the plate circuit. If you find there is too much drive available from this circuit, a resistor of appropriate value to obtain the output you wish may be substituted for the r.f. choke. On the other bands V_5 operates as a mixer, and a tuned coil of appropriate frequency (L_7) is switched into the plate circuit.

V_8 is the source of r.f. which, when mixed in V_5 with the 3.5- to 4.0-Mc. s.s.b. signal, provides output to the driver, V_9, for the other four bands. V_8 is wired in such a way as to provide output both on fundamental crystal frequency and on multiples with a minimum of switching. For 40-meter output, an 11-Mc. crystal was chosen, and the output level of the first triode of V_8, using an r.f. choke as plate load, was found to be just right. For the other bands, the second triode of V_8 operates as a doubler, and output is adjusted by tuning or detuning the tuned coil (L_6) switched into its plate circuit. Although the author used crystal frequencies as shown, it is possible that sufficient output could be ob-



Under-chassis view of the exciter. The band-switching assembly occupies the left-hand portion of the chassis. The L_6 coils are in the compartment close to the panel; the first of the two switch sections is for the Y_1 crystals. The next lower compartment contains the L_7 coils. The large compartment contains the final-tube socket, the L_8 coils, and C_{14} mounted on the shielding strip just above the socket. The final-amplifier band switch is in the small compartment at the bottom which has a slot opening for the leads to the coil above deck.

The upper right-hand corner is divided off into three small compartments by S-shaped shields. Components associated with V_1 and V_6 are in the right-hand section, while those associated with V_2 and V_3 are in the center section. C_3 is fastened to the horizontal section of the right-hand S shield, and C_4 (below) is mounted on the end of L_1. Components for V_4 circuits are in the left-hand compartment with C_5 above and C_6 below.

Power-supply components occupy the lower right-hand corner. The 0A2 regulator is mounted horizontally on a bracket.

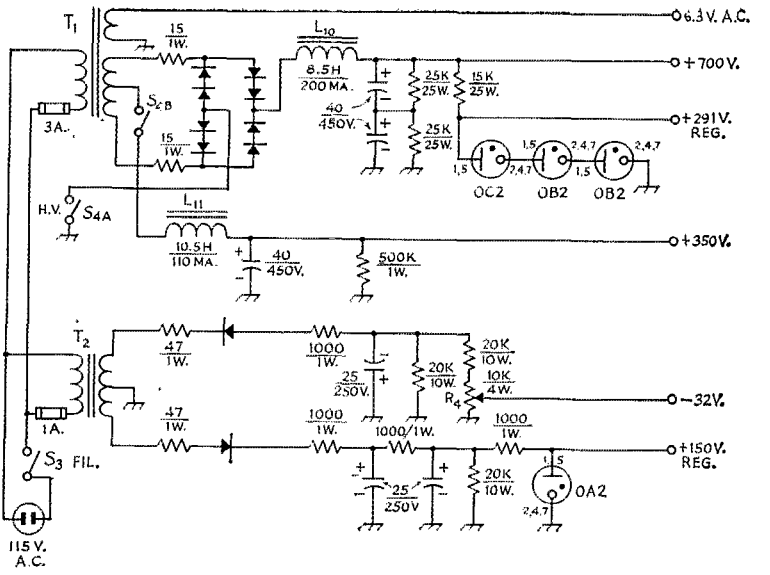


Fig. 2—Circuit of the power supply for the W4JWV s.s.b. exciter. Capacitances are in μf. and capacitors are electrolytic. Resistances are in ohms. All diodes are rated at 600 volts, 750 ma. at 50 degrees C. (RCA 1N547, Mot. 1N2615).

L_{10}—8.5-hy. 200-ma. filter choke (Stancor C1721).
L_{11}—10.5-hy. 110-ma. filter choke (Stancor C1001).
R_4—Wire-wound control (Mallory M10MPK).
S_3—S.p.s.t. toggle switch.
S_4—D.p.s.t. toggle switch.
T_1—Power transformer: 800 volts, r.m.s., c.t., 200 ma.; 6.3 volts, 5 amperes (Stancor PC-8412).
T_2—Power transformer: 360 volts, r.m.s., c.t., 40 ma. (Thordarson 22R38).

tained using other crystals and tripling, or even quadrupling in this circuit.

Driver and Final Amplifier

The 6CL6 driver, V_9, operates straight through on all bands. You will probably find that drive is very generous on 80, 40, and perhaps on 20 meters. With the circuit values shown, drive is sufficient to push the final amplifier into grid current on 15 meters, and therefore should work well on 10 meters with no further changes. However, should drive prove to be a problem, smaller values of series plate and screen resistance may be substituted to increase the respective voltages above the present values of 250 and 150 volts. Drive is adjusted from the front panel with the 10K control in the cathode circuit of the 6CL6.

V_{10}, the power amplifier, is a 5894 operating in Class AB_1. I am somewhat surprised that this tube is not found more often in homebrew transmitting gear. It is about the size of the more popular 6146, and it will handle a considerably greater input. As used in this rig, it operates conservatively at 700 volts and 200 ma. as recommended by the manufacturer. I've seen these tubes advertised surplus for as little as $4, and they're readily available at $10.00 each [3] and well worth it. I know of no other tube that can be built into a final amplifier of the size shown that will handle this much power without exceeding the manufacturer's recommendations or making special provision for cooling. V_{10} is neutralized in conventional fashion and feeds the familiar pi-network output circuit. The only metering provided is in the plate circuit of V_{10}, and this has proved to be quite adequate. More about this later when we come to tune-up procedure.

Power Supply

The power supply (circuit shown in Fig. 2) is of the "economy" type which has now become very familiar.[4] Silicon rectifiers are substituted for the original vacuum tubes to conserve space and reduce heat. The main power transformer, T_1, and filter chokes L_{10} and L_{11}, are from a surplus source. (Suitable standard substitutes are listed under Fig. 2.) The two electrolytic capacitors in the high-voltage filter are of the plug-in type, also surplus. If tubular-type capacitors are used, it should be possible to mount them beneath the main power transformer, making available additional chassis space for VOX components if you wish to add this feature. The silicon rectifiers and associated resistors are mounted on a small rectangle of vector board, with the wiring completed on the reverse side before the vector board is bolted finally in place.

A second power transformer, T_2, subchassis-mounted, provides bias voltage and a separate source of 150 volts regulated for the v.f.o., carrier oscillator, and transmit-receive switch tube. It would be possible, of course, to obtain these voltages from T_1. However, a second transformer

[3] E.g., Lou-Tronics, Inc., 131 Lawrence St., Brooklyn 1, N.Y.

[4] Grammer, "More Effective Utilization of the Small Power Transformer," *QST*, November, 1952.

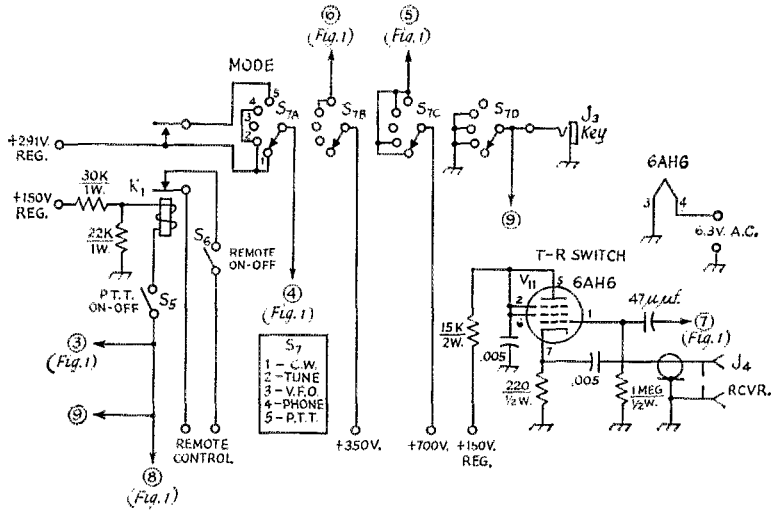


Fig. 3—Control circuits of the W4JWV s.s.b. exciter Resistances are in ohms and capacitance except as indicated in μf.

J_3—Open-circuit jack.

J_4—Chassis-mounting coaxial receptacle.

K_1—5000-ohm d.p.d.t. relay (Potter & Brumfield LM11).

S_3, S_6—S.p.s.t. toggle switch.

S_7—Phenolic four-section five-position rotary switch (CRL P-270 index with two type KD wafers).

was used so that the v.f.o. can operate continuously (for stability) and to provide power to the transmit-receive switch tube when the high voltage is turned off during c.w. or manual phone operation, or for just listening. (With plate and screen voltages applied to V_{10}, it was found to be quite impossible to hear signals over the noise generated by electron flow within the tube.)

Control System

As will be seen in Fig. 3, the mode switch, S_7, has five positions. In the c.w. position, voltage is applied to the screens and plates of V_{10}, and external keying is accomplished by grounding the cathodes of V_4 at J_3. In the tune position, voltage is applied to the screens and plates of V_{10}, and the cathodes of V_4 are grounded by switch section S_{7D}. In the v.f.o. position, no power is applied to V_{10}, but the V_4 cathodes are grounded. In the phone position, voltage is applied to V_{10} and to the audio tube, V_6, and the V_4 cathodes are grounded. In this position the high-voltage switch S_4 controls operation of the exciter. The push-to-talk position routes the screen voltage of V_{10} through one section of the p.t.t. relay K_1, connects the plate voltage to V_{10}, provides voltage to the audio tube V_6, and leaves the cathodes of V_4 ungrounded. When the push-to-talk switch on the microphone is depressed, V_4 is keyed and screen voltage is applied to V_{10}. Additionally, an extra set of switch contacts is provided on the p.t.t. relay to operate a remote control. My receiver is wired so that plate voltage to its r.f. amplifier and first mixer may be controlled externally. The second set of contacts of the p.t.t. relay is used for this purpose.

So that the purposes of the various switches may be less confusing, S_3, marked FILS on the front panel, turns on a.c. power to T_1 and T_2. This provides filament voltage to all tubes, furnishes bias voltage to V_{10}, and powers the v.f.o., carrier oscillator, and the transmit-receive switch tube. S_4, marked HIGH VOLTAGE on the panel, provides positive voltage for all other functions. S_6, marked RECEIVER on the panel, provides remote control to some exterior device; in this case it remotely controls my receiver. S_6 must be in the on position for proper operation of the remote feature. S_5, marked PUSH-TO-TALK and located on the panel between the grid-tuning and balance-control knobs, connects the p.t.t. switch in the microphone to the relay. With S_5 in the off position, it is possible to push and talk onto exact frequency without putting a signal on the air.

The transmit-receive switch circuit, including V_{11}, was cribbed from a *QST* article.[3] Building this circuit into the transmitter permits the very simplest external wiring. You need only attach the antenna and receiver to the two coax connectors, connect the remote receiver control wiring, plug in the key, microphone, and power plug, and you're in business.

Construction

Unfortunately, it is not feasible to provide step-by-step assembly instructions in an article of this length.[4] However, I will cover, in general, the various constructional steps and provide specific recommendations where such appear to me to be important.

[3] McCoy, "A Novice T.R. Switch," *QST*, January, 1961.

[4] Following the advice of Ted Crosby and Alex Stewart ("The HBR-16 with an Eddystone Dial," *QST*, June, 1961), who were inundated with requests following publication of their articles, the author is making available a set of three 8 × 10 photographs at a cost of $2.00. Full-size templates for locating the major components on the chassis and front panel are similarly available at a cost of $1.00. Requests should be sent to the author at the address given in the footnote on page 15.

As a first step, I would advise obtaining all major components, the chassis (10 × 14 × 3-inch aluminum), and the cabinet (this one is the Wyco CR-7725 as used for the HBR-16 receiver). Additionally, I bought another aluminum chassis of the same size and used the sides, cut off with an ordinary wood saw, as material for the shields and brackets. The power-supply components are positioned first and are arranged as compactly as possible. Thereafter it is a matter of moving the additional parts about until the best place for each is identified and marked. A study of the various views of the rig will help you determine how best to locate the components. Notice particularly how the shielding is placed, since adequate shielding is a must if undesired coupling is to be avoided in such close quarters.

Next, the shielding is fabricated. To make the right-angle bends, I used the corner of a file to scratch a V groove about halfway through the metal, and then bent the metal with my fingers. The ganged band-selector switch is built up in two parts (see bottom view). The first part consists of the first four wafers of S_2 and the two straight shields which isolate V_8 from V_5, and V_5 from V_9. In the second part, the fifth section of S_2 is mounted on an L-shaped shield on which the bias control R_4 is also mounted. It is necessary to make an extension for the shaft of S_2 to reach the fifth section. Make this of bakelite rod to avoid undesired coupling of r.f. The only holes through these shields should be those necessary for mounting the switch parts, clearance for the shaft and mounting of C_{14} (on the center shield), one for mounting R_4, and a single ⅛-inch hole through each straight shield for leads to the grids of V_5 and V_9.

S_{2E} is modified as follows: One side of the PISD wafer has a long shorting segment, while the other side has a short shorting section. View the latter side, holding the wafer so that the stationary contacts are to the left. Remove the lowermost stationary contact, and move it two holes to the right. Connect C_{18} to this stationary contact. Viewing the opposite side of the wafer, with the stationary contacts toward the top, the "arm" connection is the stationary contact lowermost to the left.

You will note in the top view that the two brackets on either side of the final amplifier have been drilled for sheet-metal screws. I had intended to enclose this area with perforated sheet as an anti-TVI measure, but this was found to be wholly unnecessary. Accordingly, you can consider these shields only as brackets on which C_{15}, C_{16}, and C_{17} are mounted.

The v.f.o. is wired and tested separately, prior to being bolted finally onto the chassis. Make this unit as rugged mechanically as is possible within the space you have available. Use RG-8/U for the coupling line from the v.f.o. to Pin 2 of V_4.

C_{10} is the main tuning capacitor, C_9 is the band-set capacitor (used to center the tuning range of C_{10} on the dial) and C_{11} is the temperature-compensation adjustment. Changing the spacing of the turns of L_2 by bending the inductor wire is the method used to adjust the 5.0- to 5.5-Mc. tuning range over approximately 95/100 of the dial.

I would advise temporary mounting of each major component, and completion of as much of the sheet-metal work as possible before the wiring is started. Drilling or punching of additional holes becomes very difficult, once you start packing in the many small components. Further, stray metal shavings, lodged in variable capacitors or shorting between tube-socket pins, can cause immediate and expensive problems.

Wiring

Virtually all d.c. and filament wiring was done with shielded wire. Although preparation of each end of each wire becomes a laborious task, the convenience of being able to solder (from the shield to a suitable grounding point) each wire solidly and permanently in place as you route it about the chassis makes the additional effort well worthwhile. It also permits bypassing to ground any stray r.f. energy picked up through inadvertent inductive or capacitive coupling between adjacent wires. I recommend that you buy 20 or

Coil-Winding Data

All coils, except L_2, L_3 and L_9, are wound on ⅜-inch iron-core ceramic forms (Miller 4400 or similar.) Turns are approximate, and will vary with type of coil form used, placement, and length of leads. However, circuits must resonate at frequencies indicated below as checked initially with grid-dip oscillator and later optimized during alignment procedure. Turns are close-wound and wire is enameled, unless otherwise indicated.

L_1 — 9.0 Mc. — 26 turns No. 30.

L_2 — 5.0–5.5 Mc. — 8¼ turns No. 18, 1-inch diam., ¾ inch long (Air Dux 810).

L_3 — 3.7 Mc. — 80 turns No. 32, ½-inch diam., close-wound on polystyrene rod 1½ inches long.

L_4 — 3.7 Mc. — 60 turns No. 30.

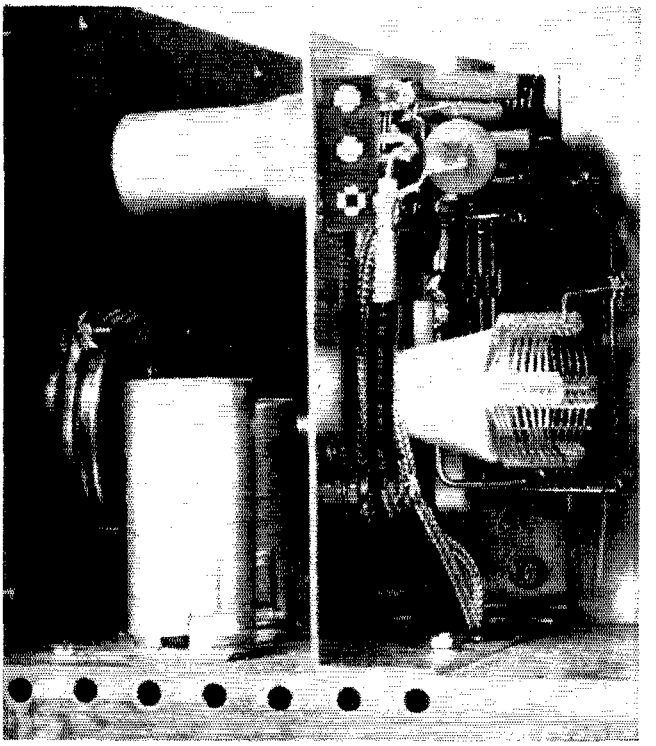
L_5 — 3.8 Mc. — 60 turns No. 30, form spaced ¾ inch, center to center, from L_4.

L_6 — 18 Mc. (20-meter band) — 18 turns No. 24, paralleled with 10-$\mu\mu$f. mica capacitor.
— 25 Mc. (15-meter band) — 14 turns No. 24, paralleled with 10-$\mu\mu$f. mica capacitor.
— 32.5 Mc. (l.f. end of 10-meter band) — 14 turns No. 24.
— 33 Mc. (h.f. end 10-meter band) — 14 turns No. 24.

L_7 — 7.2 Mc. — 30 turns No. 30, paralleled with 18-$\mu\mu$f. mica capacitor.
— 14.2 Mc. — 18 turns No. 24, paralleled with 10-$\mu\mu$f. mica capacitor.
— 21.2 Mc. — 12 turns No. 24, paralleled with 5-$\mu\mu$f. mica capacitor.
— 28.7 Mc. — 8 turns No. 22.
— 29.2 Mc. — 8 turns No. 22.

L_8 — 3.5 Mc. — 35 turns No. 30.
— 7 Mc. — 25 turns No. 24.
— 14 Mc. — 14 turns No. 22.
— 21 Mc. — 9 turns No. 22.
— 28 Mc. — 6 turns No. 22, spaced diameter of wire.

L_9 — 10 turns No. 14 at 6 t.p.i. (input end), plus 12 turns at 12 t.p.i., 1½-inch diam., tapped at 5, 6, 10, and 14 turns from input end (Illumitronic Pi Dux 1212D6 with 13 turns removed from close-spaced end).



Close-up view of the v.f.o. circuitry. Capacitors C_9, C_{11} and C_{10} are mounted in that order in a vertical line to the rear. The coil is cemented securely to a 1-inch cone insulator. End turns have been pinched in final adjustment of the inductance. Holes in foreground are for ventilation.

30 disk ceramic capacitors of 0.001 to 0.005 μf. in addition to those shown on the schematic diagrams. Use these liberally to bypass every filament and d.c. connection (where r.f. is not wanted, of course) as close to each tube socket as possible. This is sound anti-TVI practice but, more important here, it helps avoid reinsertion of the carrier or filtered sideband that you've laboriously eliminated.

Wiring will be greatly simplified if you complete as much as possible of each circuit before adjacent shielding is inserted finally. The wiring order followed in this rig was generally as follows: Install and wire the power supply; wire V_1 and V_6; install the adjacent S-shaped shield; wire V_2 and V_3; install the second S-shaped shield; wire V_4; install the balance of subchassis shielding and complete the wiring. The socket for V_{10} is mounted $\frac{5}{8}$-inch below chassis level, as recommended by the manufacturer, and is installed after all shielding is completed. After modification, L_9 is mounted on $1\frac{1}{4}$-inch lengths of $\frac{1}{2}$-inch polystyrene rod attached to the supporting strip.

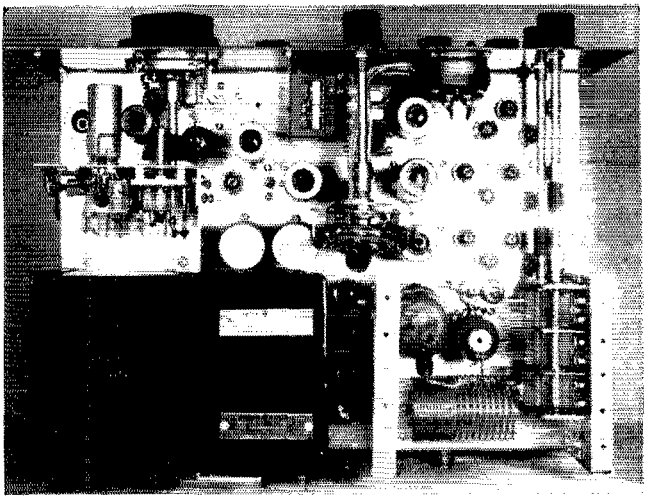
Just another final word about shielding: The rather compact construction of this rig effectively precludes generous spacing of parts. Accordingly, it is necessary to fit the shielding carefully and bolt it securely. Further, holes through the shielding should be made for r.f. leads only, orienting tube sockets so that connections to the grid pins are as short and direct as possible. All other leads are routed around the ends of the shields, using shielded wire, and bypassing as mentioned earlier.

Adjustment

After you've carefully checked and rechecked all wiring, you're ready for testing and alignment. With the mode switch in the v.f.o. position, no voltage other than bias is applied to V_{10}, so that's the position you'll want to use until all but the power amplifier is checked out.

Turn the sideband-selector switch to the c.w. position, selecting the 9-Mc. crystal, Y_1. Now, using the v.t.v.m. with r.f. probe, measure the r.f. voltage output of V_1 (at Pin 1 or 5 of V_1). If you have r.f. here of 6 to 8 volts, you know the oscillator is working as it should. Move the r.f. probe to the hot end of the 9-Mc. tuned circuit consisting of L_1 and C_4. Adjust the balance control R_1 for minimum r.f. voltage, then adjust neutralizing capacitor C_3 for a further minimum. Your balanced modulator is now adjusted for maximum carrier suppression

Unbalance the balanced modulator by turning R_1 to the zero-resistance position (in respect to Pin 2 of V_2). Move the r.f. probe to the input pin on the 9-Mc. crystal filter. Adjust either C_4 or L_1 until you have 2 volts of r.f. into the filter. (That's the maximum recommended by McCoy for the SSB-9 filter.) With 2 volts into the filter, you'll get approximately 0.1 to 0.2 volt out, and you'll need approximately 2 volts of r.f. from the v.f.o. to mix properly in V_4. Disconnect the filter, or remove V_3, and measure the r.f. at Pin 2 of V_4 to see that you have the 2 volts from the v.f.o. It was necessary to use RG-8/U coax as a transmission line from the v.f.o. to V_4, as



To the left of the mode switch is the v.f.o. compartment with its tube mounted horizontally. Other tubes, from left to right are V_1, V_6, V_2 (without shield), V_3 and V_4. In the "slot" to the rear of the switch are the two 0B2s, the 0C2 and the 6AH6 t.r. switch. To the right of the switch, from top to bottom, are V_8, V_5, V_9 and the final, V_{10}. Y_2 and Y_3 are below the v.f.o. dial mechanism, flanked by C_1 and C_2. (Y_1 is soldered directly to S_1 below deck.) Band crystals are under the mode-switch shaft, to the right of the sideband filter.

Final-amplifier components are mounted between two aluminum brackets in the lower left-hand corner. Tank and loading capacitors are mounted on the right-hand wall. Neutralizing capacitor C_{15} is mounted on the left wall, close to the top of the 5894A.

mentioned earlier, to get 2 volts r.f. in this rig. Reconnect the filter, reinsert V_3, and remove V_7. Then, with the r.f. probe still at Pin 2 of V_4, adjust the 45-$\mu\mu$f. ceramic padder C_5 for maximum r.f. voltage.

Reinsert V_7 and tune the v.f.o. until you hear a signal at 3.7 Mc. with the station receiver loosely coupled to the hot end of L_3. Connect the r.f. probe to the hot end of L_3 and tune C_6 for maximum r.f. voltage. Check the S meter on your receiver to be sure it's the 3.7-Mc. signal to which you're tuned, because the 5- to 5.5-Mc. signal from the v.f.o. will peak more sharply than will the 3.7-Mc. signal you're after. Move the r.f. probe to the hot end of L_4 and tune C_7 for maximum. Retune the v.f.o. for a 3.8-Mc. signal at L_4 and, with the r.f. probe at the hot end of L_5, tune C_8 for maximum.

Turn the band-selector switch to the 80-meter position, and turn the drive control to the minimum position (maximum resistance from cathode of V_9 to ground). You should now be able to measure r.f. voltage at Pins 6 and 2 of V_{10} and be able to peak the voltage sharply with the grid-tuning control, C_{14}. Be careful you don't burn out the r.f. probe as you adjust C_{14} and the drive control.

Now neutralize V_{10} by tuning C_{15} for minimum r.f. voltage measured with the r.f. probe at the antenna coax connector, and with both grid and plate circuits of V_{10} tuned to resonance. Check the bias voltage at the grid, Pins 6 and 2, of V_{10}, and turn the bias-control potentiometer R_4 to the maximum negative-voltage position.

Turn off the high-voltage switch and connect a dummy load, such as a 150-watt light bulb, to the antenna coax connector. Turn the mode switch to the c.w. position, and turn on the high-voltage switch. Adjust the bias-control potentiometer for an idling current of 30 ma. on the plate-current meter.

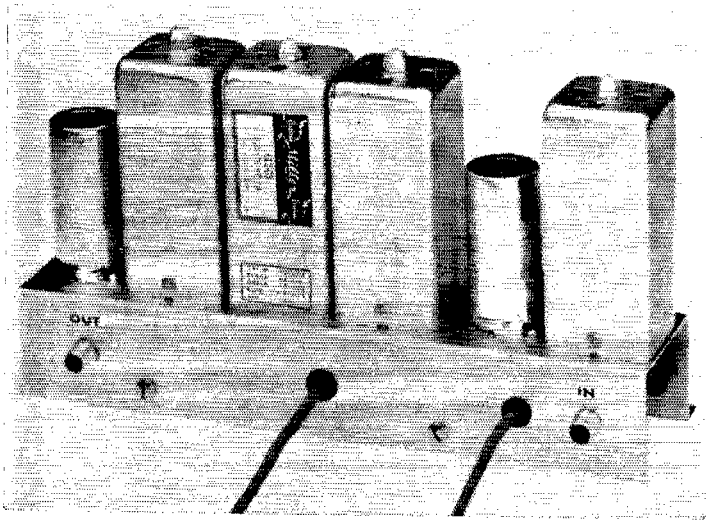
You now have an 80-meter c.w. transmitter ready to go on the air. However, before you go any further, it's wise to get the v.f.o. settled down so far as temperature compensation is concerned. To adjust temperature compensation, it's necessary only to leave the rig and frequency meter (or the station receiver) turned on sufficiently long to assume normal operating temperature. Then zero-beat the rig and the meter or receiver, and adjust the temperature-compensating capacitor C_{11} until the signal stops drifting.

Now, with the mode switch again in the v.f.o. position, select either upper or lower sideband (Y_2 or Y_3) and, by tuning C_1 or C_2 as appropriate, adjust the frequency to that marked on the crystal. If you have use of a frequency meter, it will be a simple matter to set the meter at the correct frequency and adjust C_1 or C_2 for zero beat. If you must tune these crystals using the station receiver, it will be necessary to tune up for phone, as follows, and then talk and tune until you're satisfied with the sound of your voice on the sideband you're after and, at the same time, have eliminated most of the opposite sideband.

For sideband operation, the rig is tuned up first with the sideband selector in the c.w. position, and the carrier unbalanced. When the rig is loaded properly to a plate current of 200 ma., reduce drive until the milliammeter shows a slight current drop. Then tune the balance control for minimum plate current. Plate current will probably not drop to the normal idling current of 30 to 40 ma. until you select either sideband. The exciter is now ready for 80-meter sideband operation.

For operation on the other bands, it is necessary first to adjust the various coils in the plate circuit of V_8 for 4 to 8 volts, r.f., measured at the hot end of the coil selected. Then, with the r.f. probe at the hot end of the appropriate coil in the plate circuit of V_5, tune the L_7 coil for maximum r.f. voltage on the operating frequency selected. Again use the S meter on your station receiver to confirm that you're tuning to the correct frequency. Tune-up procedure for all bands is

(Continued on page 154)



This blanker circuit is built on a U-shaped chassis formed from sheet aluminum. The chassis is 8¾ inches long, 1½ inches high, and 2 inches deep (not including the ½-inch mounting lip). Phono connectors are used for the i.f. input and output leads, which should be made of r.f. cable such as RG-58/U and should be no longer than necessary. The center plastic-covered cable (3 wires) is for heater and plate supply. The one at the right goes to the on-off switch and noise-amplifier gain control. Transformers T_1, T_2, T_3 and T_4 are in that order from right to left.

Minimizing Interference from Loran on 160 meters

Noise-Silencing Circuit Optimized for Loran Pulses

BY HERBERT HOOVER, jr.,* W6ZH/K6ZH

AMATEUR activity on the 160-meter band has experienced a substantial increase in the last year or so, primarily because of improved transmitting conditions during the present phase of the sun-spot cycle. Furthermore, there is every reason to believe that "top band" activity will continue to grow as conditions further improve during the next few years.

One of the discouraging things about operation on 160 meters is the ear-splitting interference from loran in this part of the spectrum. The interference is especially bothersome during contacts between the East and West coasts. West Coast stations, for example, must listen for the East on 1800-1825 kc., which is the same part of the spectrum used by the West Coast loran transmitters. Conversely, East Coast stations must listen for the West on 1975-2000 kc. through the heavy interference from close-by loran transmitters in the same part of the band. The situation is not as bad as it might first appear, however, because a considerable amount — if not all — of this type of interference can be eliminated within the receiver. But before going into some of the methods of minimizing the interference, a brief mention of the nature of the loran signals themselves is in order.

Loran is a long-distance navigational aid designed primarily for aircraft on over-water flights. The transmitters are located at many points along the Atlantic, Pacific and Gulf coasts, as well as in outlying points in Alaska, the Hawaiian Islands, Puerto Rico and elsewhere. The loran transmitters send out a non-directional pulsed signal having a peak power output of a million watts or more. Each pulse rises to a peak and decays within a period of approximately 80 microseconds.[1] The pulses are repeated at a rate close to 33 times per second, the exact repetition rate varying slightly between groups of stations

* President, ARRL; c/o American Radio Relay League, 38 LaSalle Road, West Hartford, Conn.

[1] The Coast Guard advises that the pulse width is 40 microseconds at the half-power points, about 80 microseconds at the zero power points, and that the rise time is 20 microseconds between 10% and 90% of full power.

The nature of loran pulses is such that they lend themselves to self-destruction in the receiver with a minimum of disturbance to the intelligence in a desired signal. The blanker circuit described here uses the Lamb noise-silencing principle with modern components and circuits to attain maximum effectiveness on loran QRM.

as a function of the navigational system. While every effort has been made to shape the pulse so as to minimize sidebands (i.e., avoid "key-clicks"), it simply is not possible to turn on and off such a large amount of power in such a short space of time without creating a broad signal. Furthermore, the intensity of a loran pulse will be at least 5000 times larger than the signal from an average 200-watt amateur station at the same distance, assuming that equally good antennas are used in each instance. This is a highly improbable assumption, however, since the loran stations use 300-foot vertical radiators and elaborate ground systems.

The only encouraging thing about this situation from an amateur viewpoint is that the length of each loran pulse is short compared with the time between pulses. A little arithmetic shows that each pulse occupies only about ¼ of 1 per cent of the time between pulses. If the receiver can be blanked out effectively during the pulse period, and recover its sensitivity quickly and without introducing a lot of unwanted transients, there is enough time between pulses to provide good readability of weak signals.

Conventional noise limiters — those placed at the end of the i.f. system or early in the audio amplifier — often do little good. Investigation soon shows that while the limiter may be functioning satisfactorily, the strength of the loran pulse is so great that (a) the amplifier stages ahead of the noise limiter are overloaded or blocked and (b) the shock from the pulse starts a series of transients in the i.f. filter system. Unfortunately the sharper the i.f. system, the worse will be the transients.

Some measurements made on a 75A-4 receiver at K6ZH showed that loran pulses received in the 1800–1825-kc. band reached a magnitude on the order of 10 volts, peak to peak r.f., at the *input* of the i.f. system. No wonder the i.f. stages became blocked and transients generated in the receiver appeared to fill up the spaces between pulses. The ordinary noise limiter had little chance to be effective.

As a result of a number of years of struggling with loran interference at K6ZH the only solution proposed so far that has seemed really effective is the type of noise blanker first developed by Jim Lamb in 1936,[2] and described with some modifications in the current 1962 ARRL *Handbook*. The circuits shown, while helpful in minimizing loran interference, have a tendency to introduce additional transients of their own during the blanking cycle, as well as occasionally introducing cross-modulation from strong adjacent-channel signals.

The circuit shown in Fig. 1 gives considerable improvement and was developed from some ideas gleaned from the Collins noise blanker,[3] with appropriate changes and simplification to adapt it

[2] "A Noise-Silencing I.F. Circuit for Superhet Receivers." J. J. Lamb, *QST*, February, 1936.
"More Developments in the Noise-Silencing I.F. Circuit." J. J. Lamb, *QST*, April, 1936.
[3] *Fundamentals of Single Sideband*, Collins Radio Co., 1959.

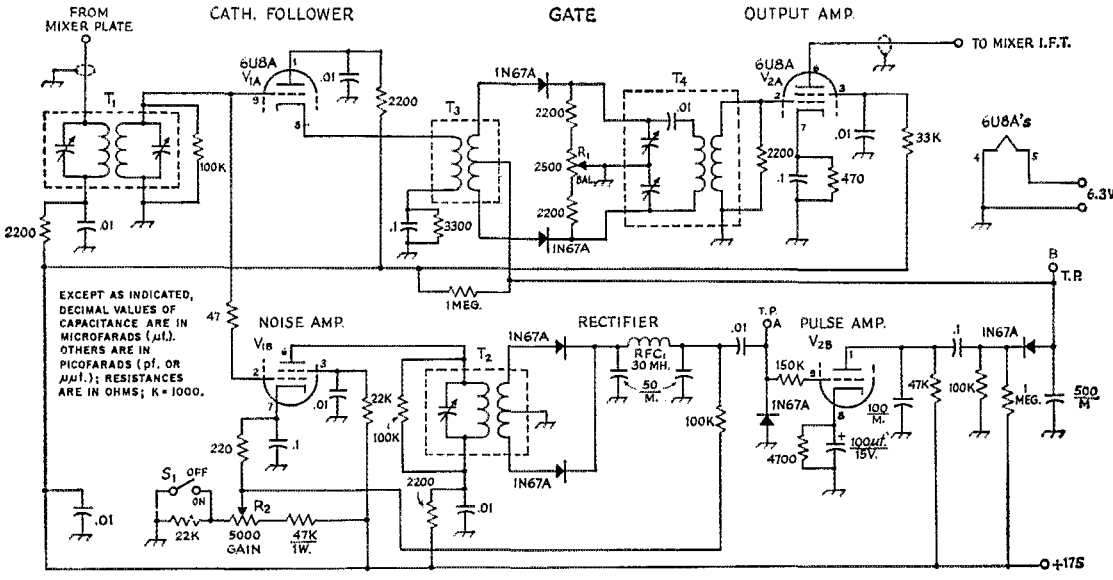


Fig. 1—Circuit diagram of the loran blanker. 0.01-μf. capacitors are ceramic; 0.1-μf. capacitors are paper; M = mica. Except as indicated, fixed resisters are ½ w. Plate supply voltages from 150 to 200 volts are satisfactory.

R_1—2500-ohm control, linear taper.
R_2—5000-ohm control, linear taper, with switch (S_1).
S_1—S.p.s.t., on R_2.
T_1, T_4—Interstage i.f., 455 kc. (Miller 612-C2) modified as described in text.
T_2, T_3—Push-pull diode i.f., 455 kc. (Miller 612-C3) modified as described in text.

for loran pulses. Briefly, the device is inserted between the second mixer and the input to the i.f. filter and amplifier system, as in the Lamb noise silencer. A pair of diodes are used in a balanced blanker circuit, however, instead of a single-ended mixer-type tube. An additional i.f. amplifier, rectifier and voltage-amplifier are used to provide negative-going blanking pulses to the balanced diodes. In normal reception the diodes are held in the conducting region by a steady positive bias.

Construction

The device was assembled on a $3 \times 5\frac{1}{2} \times 1\frac{1}{2}$ inch chassis so that it could be located in an existing space in the rear of the 75A-4 receiver. Supply voltages were taken from the receiver power system.

The only complication in construction was modification of the i.f. transformers T_2, T_3 and T_4. At the T_2 position best results seem to be obtained by using close coupling between the coils and tuning the primary alone. For T_3 and T_4 nothing appeared to be available commercially that would match the low impedances involved in the blanking circuit. Inasmuch as no selectivity was needed or desired at this point in the circuit, standard i.f. transformers were also modified to give maximum coupling between primary and secondary, and in these instances tuning was dispensed with altogether.

In the standard units which were chosen the primaries and secondaries are wound on a cardboard core, spaced about $\frac{3}{4}$-inch apart, with a powdered-iron core about $\frac{1}{2}$-inch long centered under each winding. A wooden spacer approximately $\frac{3}{8}$-inch long separates the two iron cores. The modification consists of removing the section of cardboard core separating the two windings so that on re-assembly the coils are immediately adjacent to each other, and centered on a single iron core common to both windings.

First, remove the leads to the top winding (i.e., the coil located farthest from the trimmer capacitors) using care not to break any strands of the Litz wire. As a check, measure the d.c. resistance of each coil before beginning the operation — and then again after the unit is finally reassembled.

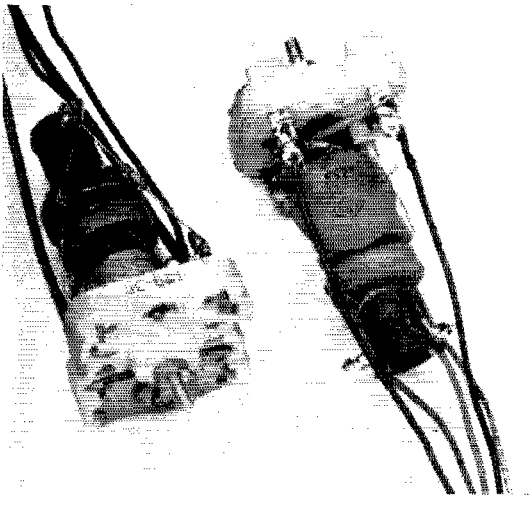
Second, using a razor blade or sharp knife, make a circular cut around the cardboard core about half-way between the two windings. When the cut is sufficiently deep the top coil and its iron core can be pulled free from the bottom assembly. This will expose the separator between the iron cores, which should be removed. Next, melt the wax from the inside edges of both windings by holding near a hot soldering iron. Carefully make another circular cut around the remaining sections of the cardboard cores as close as practical to each of the windings. This will expose the two iron cores, which should also be removed from the tube. Using cement to hold the parts in place, insert a single iron core into the cardboard tube so that when the windings are brought together the core will be centered equally beneath both. When finished, the coils should be about $\frac{1}{16}$- to $\frac{1}{8}$-inch apart. Set aside to dry.

To facilitate final wiring of T_2, T_3 and T_4, a small double insulated tie point should be cemented to the bottom of each of the cardboard cores. This is desirable in T_2 so that the secondary trimmer may be dispensed with, and in T_3 so that one side of each of the trimmer capacitors can remain disconnected. In T_4 the tie points are also needed so that the trimmers can be rewired and used as balancing capacitors.

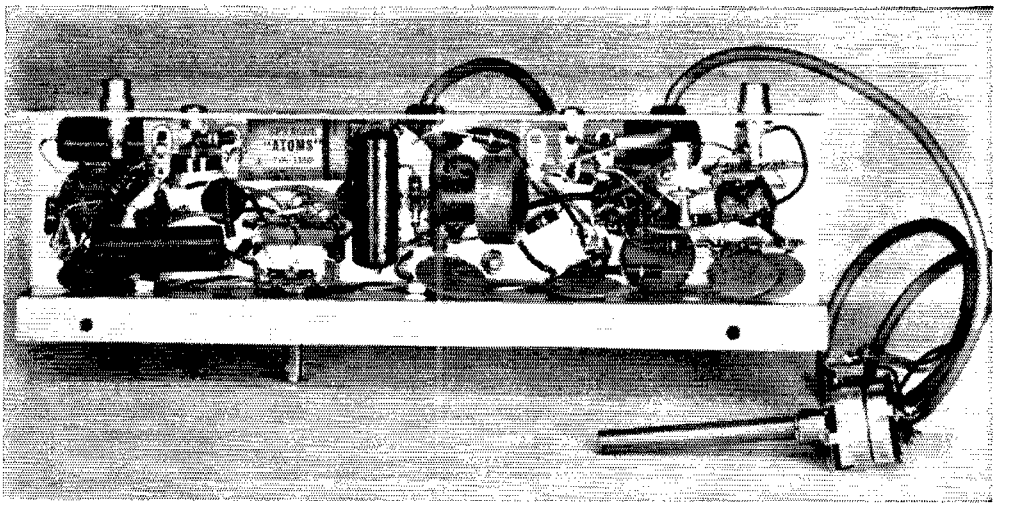
The chassis layout should be such that all leads and bypass capacitors are as short and direct as possible to avoid feedthrough during the blanking cycle, and also prevent regeneration or oscillation — especially in the pentode section of V_1.

Adjustment

Before installing the silencer, make a relative check of receiver gain by noting the S-meter reading (antenna disconnected) of the crystal calibrator at, say, 28.5 Mc. and again at 1.8 Mc. These data will be useful in comparing over-all gain



Two of the modified transformers. To save space and for convenience in wiring, the diodes associated with T_2 and T_3 are mounted on the transformer assemblies. Unused trimmer capacitors have been removed in order to make the mounting holes in the ceramic piece available for tie points made by clipping the lugs from the capacitor plates. In other respects the modifications are as described in the text.



Underneath view of the blanker. The r.f. choke at the center is one (Miller 988) made for printed-circuit boards, here mounted by soldering its leads to a tie-point strip. The balancing potentiometer is on the lower wall at left center. Stray coupling to i.f. leads should be minimized by keeping such leads as short as the layout will permit, keeping them close to the chassis, and separating them from other i.f. leads as much as possible.

and in adjusting the silencer after the installation has been completed.

After the silencer is wired and in place, the following tune-up procedure is recommended:

1. Turn on the receiver, with the antenna disconnected and the silencer switched off.

2. Tune in the calibrator signal and adjust the primary and secondary of T_1 to resonance. Overall gain of the receiver will probably be 1 or 2 S points higher than before. (Do not re-adjust sensitivity controls at this time.)

3. Switch on the silencer. Connect a high-resistance voltmeter or v.t.v.m. between Test Point "A" and ground. Advance the silencer gain control until a voltmeter reading is obtained. Tune primary of T_2 for resonance.

4. The balancing controls are next adjusted. Tune in the calibrator at 1.8 Mc. with an S meter reading of 40 to 60 db. over S9. Start with R_1 potentiometer at middle of its range and the balancing capacitors (across the primary of T_4) backed off about 2 turns from maximum. Connect a small source of d.c. voltage between Test Point "B" and ground so that the balanced diodes are biased about 10 to 15 volts positive. This should hold the silencer in the "blanked out" condition. The calibrator signal should now be 30 to 40 db. weaker than before. Adjust the balancing capacitors and R_1 for minimum S-meter reading. The settings are broad and non-critical. Remove the voltage from Test Point "B" at the conclusion of the adjustment.

5. Replace the antenna on the receiver and tune in a strong loran signal. Advance the silencer control. If the device is working properly a marked reduction or even elimination of loran interference should take place as the silencer control is adjusted.

6. As a final check of the silencer, connect an oscilloscope between Test Point "B" and ground, and adjust the sweep frequency in the vicinity of 30 cycles per second. Square-topped blanking pulses, corresponding to each of the received loran pulses, should appear as the silencer control is advanced.

A further suggestion may be helpful on the lower frequencies when strong interference is encountered. It is usual amateur practice to use the transmitting antenna for reception because it obviously has the best chance of pulling in distant signals. If the antenna is resonant near the receiving frequency — which it usually is — the loran signals, static bursts or other interference may be so strong at the receiver input that overloading will occur somewhere along the line *prior* to the blanking circuit. The answer, of course, is to put an attenuator in the antenna lead to the receiver. This is good practice on the lower frequencies in any event because the general background noise, as well as the wanted and unwanted signals, are far above the internal noise of the receiver. An old broadcast-band tuning capacitor, placed in series with the antenna lead as a variable attenuator, will often do wonders in helping to pull in the weak ones.

If you are in a good location and the loran interference is not bad, consider yourself lucky. But if this form of interference seems to paralyze everything — as it does for many of us — then build yourself a blanking device, and sit back and enjoy the "top band." QST

Editor's Note: The loran blanker shown in the photographs was built at ARRL Headquarters in order to try out a different physical arrangement than that used by W6ZH. The narrow shape may be better adapted to fitting the space available with certain receivers — for example, the blanker

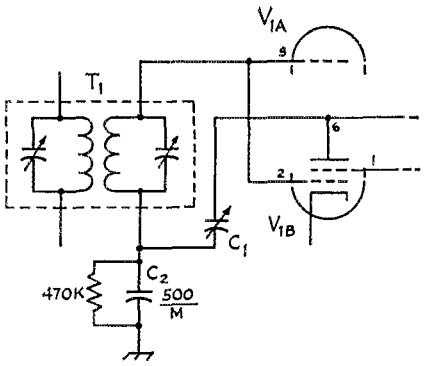


Fig. 2—Neutralizing circuit for V_{1B}. The neutralizing capacitor, C_1, is a tubular trimmer (Centralab 829-3) having a capacitance range of 0.5 to 3 pf.

can be mounted on the inside cabinet wall or lid, projecting over the receiver components. The volume is almost exactly the same as that of the chassis construction used by W6ZH.

The circuit is the same as given in Fig. 1, with one principal exception: To avoid the regeneration that has been found to be undesirable in the noise amplifier stage, this stage has been neutralized using the capacitive bridge method. The circuit modification is shown in Fig. 2. A twisted-wire "gimmick" capacitor can be substituted for the small TV-type trimmer used for neutralizing, but the latter is more readily adjusted after the blanker is installed in its permanent location. The adjusting screw can be reached with a plastic alignment tool through a hole directly over the screw head (see bottom view). A heavy wire soldered to the mounting nut serves as one support for the capacitor; the stator lead is the other, running directly to Pin 6 on the 6U8A socket.

The neutralizing adjustment is easily carried out by turning on the receiver's b.f.o. and allowing V_{1B} to oscillate by running the neutralizing screw out. First align T_1 with the noise amplifier off. Then set R_2 for maximum gain and swing the trimmer on the primary of T_2 through its range; a beat note will be heard when the circuit goes through resonance. Slowly increase the neutralizing capacitance, while swinging the T_2 trimmer through resonance, until oscillation stops. Then shut off the b.f.o. and carefully adjust the neutralizing capacitance until a setting is found where the T_2 trimmer can be swung through resonance with only a normal change in amplitude of the background hiss, with none of the typical "hollow" sound that accompanies regeneration. Proper neutralizing will minimize "ringing" and lengthening of the blanking pulses.

The leads from the receiver's mixer circuits to and from the blanker should be kept short, since the capacitance of the input cable adds to the tuning capacitance across the primary of T_1, and the capacitance of the output cable is added to the i.f. circuit to which it connects. If the input cable has to be more than six inches long, it will probably be necessary to take turns off the primary of T_1 in order to resonate the circuit. W6ZH suggests taking about 25 turns off this coil to compensate for added cable capacitance.

Hamfest Calendar

California — The annual joint meeting of the Northern California DX Club and the Southern California DX Club will be held 26-27 January at the Continental Wayside Inn, Paso Robles, California, located half way between Los Angeles and San Francisco on Highway 101. Most of the top DXers of California will be there and talks and other presentations by leading DX operators are scheduled. All hams with an interest in DX are invited. Registration prior to 12 January is $7.00. Registration at the meeting is $7.50. Registration fee includes Saturday night banquet and Sunday morning breakfast. Send registration fees, and address all inquiries, to Lloyd Colvin, W6KG, 111 Purdue Ave., Berkeley 8, California.

Michigan — The annual northwestern Michigan Swap Shop will be held at the Manistee Armory on January 19, sponsored by the County Radio Association of Manistee and the Wexsaukee County Radio Club. For further info write to Henry Rozmarek, K8LKO, at Box 88, Manistee, Mich.

SOUTHEASTERN DIVISION CONVENTION

The Southeastern Division Convention will be held on Saturday and Sunday, January 19 and and 20, in Miami. Major activities will be centered at the Miami Bayfront Park Auditorium. There will be a display of the latest equipment from leading manufacturers daily from 9:30 A.M. to 5 P.M. in one of the two exhibition halls, while the convention program proceeds in the other hall. Special booths will include a Swap Shop, operating station, and a DX exhibit. The Saturday daytime program will include technical speakers from various manufacturers, meetings, auctions of used equipment, and contests. The Floridora International Sidebanders will provide a buffet luncheon for all licensed YLs, gratis, at the nearby Alcazar Hotel.

The Convention banquet Saturday evening will be held at the Biscayne Terrace Hotel, and will feature ARRL President Herbert Hoover, jr., W6ZH. Following the banquet, at midnight, the Southeast Florida chapter of the QCWA will conduct the initiation ceremony for the Royal Order of the Wouff Hong, for ARRL members, at the Biscayne Terrace.

Sunday's program will include a technical talk by Harold Vance, K2FF, on silicon diode power supply design, and the Florida DX Club will show slides and movies of recent expeditions to Baja Nuevo and Serrana Bank. The ARRL general meeting that afternoon will be attended by President Hoover, ARRL President Emeritus Goodwin L. Dosland, and Southeastern Division Director James P. Born.

Running concurrently with the convention will be an exhibit of antique equipment prepared by

(Continued on page 160)

S4 + 30 Db.

BY JOHN G. TROSTER,* W6ISQ

HELLO ZL2GX ZL2GX. This is W6ISQ. Can you copy today, Jock?"

"W6ISQ de ZL2GX. Oh yes. Very nice signal here. Good solid S9. As a matter of fact, you're the only W6 I can hear down here."

"Jock — only S9? No db. over?"

"W6ISQ—ZL2GX. No, the meter here is straight up to a good S9. But I say again, you're only W6 I can hear — very fine sig considering conditions."

"ZL2GX–W6ISQ. Well, Jock, I suspected I had troubles here but I didn't know it was that bad. If you have a little time there I'd like to run a few checks to see if I can find out what's wrong here."

"W6ISQ de ZL2GX. Look, old man, you're a solid S9. Can't be much wrong."

"ZL2GX–W6ISQ. Well, Jock, quite frankly, in most contacts I never get less than a S9 plus *at least* 15 db. Most of the time it's 40 db. over S9. So when I drop down to an S9 . . . well . . . Break."

"Well, nobody else is even up to S6 here today, Jack, old man. I wouldn't worry. How's the weather up there today?"

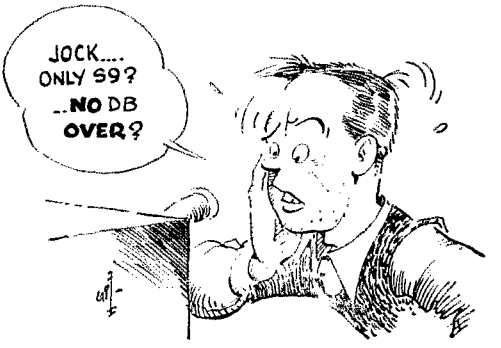
"Jock, I tell ya something is wrong here. Last night I QSO'd our friend Eric, ST2AR, for over an hour and he said I never got over an S8. That's why I was anxious to run a few checks with you today. Wonder if I'll have to replace those tubes in the final?"

"W6ISQ–ZL2GX. Glad to hear you talked to Eric. What did he have to say for himself? We were talking about a DXpedition once — a little jaunt up to some legendary QTH! Wonder if he ever got permission to go. Did he say anything about getting down the Nile to visit some of those ruins before they get flooded? Your tubes are OK — sig sounds fine. Go ahead."

"Jock. Maybe if I changed the bias. Bet that's it. I'm sure I'm not exactly AB! Wish I could work this darn thing Class C — a few more percent efficiency would sure . . . There, Jock, I touched up the bias a little. How many db. over am I now?"

"W6ISQ–ZL2GX. Still the same. S9. What did you say about ST2AR?"

"ZL2GX–W6ISQ. Oh this miserable rig. I sweat on this thing and what do I get. Hold it — I see it, Jock. I'm not full power. Let me touch up the tuning a bit. Now watch your meter, Jock — I'll probably go 40 db. over now. Right now my voltage is . . . ahhh . . . 2905 . . . crank that Variac . . . ahh, back to 3000 volts. Mils . . . let's see . . . 305 . . . hold it, might as well run the max . . . ooooppppps — she jumped to 340. That wouldn't be cricket, would it — ha — Back now . . . 333 mils. Little shy but good



enough I hope. OK, Jock, how many db. over am I now? Break."

"W6ISQ–ZL2GX. Still the same. S9. What time did you say you heard ST2AR?"

"ZL2GX de W6ISQ. Jock — I just realized my trouble. It's the antenna. It's tuned for the c.w. part of the band, see — so my s.w.r. here on the fone end is up to 1.4:1. No wonder the sig is down. Of course, on the c.w. end it's a flat 1:1 . . . maybe even 0.9:1, ha! Tell ya what. It'll only take about 15 minutes for me to fix this thing. Just touch up the gamma a bit, Jock, and I'm sure I can get the blinkin' s.w.r. back to tolerable limits! My gosh — a 1.4:1 mismatch! A wonder I'm getting out of the back yard. Ya got about 15 minutes there so's I can retune this crazy antenna?"

"W6ISQ–ZL2GX. Hold everything, Jack. It's all my fault here. It's my receiver. While you were pouring out your troubles there I checked my own set-up — and, what do you suppose? I was reading my S meter wrong! Sorry I gave you that inaccurate S9 report — actually you're S4 plus 30 db.! Nice solid sig. Loudest sig on the band and the only W6 I can hear. Is that better? Go ahead.'

"ZL2GX–W6ISQ. Well, Jock, as I was saying about ST2AR. Eric says he hasn't had a chance yet to organize his DXpedition to the legendary land of Prester John, but will let me know about it. Of course, I volunteered to go along to keep the equipment running in perfect condition. He might have a little trouble keeping the antenna at peak condition, you know, with all the dust and humidity, and stuff. And, oh yes, of course, we touched on the salvage work along the Nile there. Don't know how we managed though, 'cause like I said, I never did get over an S8 there. I'll tell ya more about it, Jock, if you can still copy — am I still 30 db. over? — ZL2GX–W6ISQ."

"Sure, you're still S4 + 30. Go on about ST2AR."

(Continued on page 150)

*45 Laurel Street, Atherton, California

Using the 4X250B as a Frequency Multiplier to 432 Mc.

Optimum Operating Conditions for the New Power Limit

BY EDWARD P. TILTON,* W1HDQ

IN ANTICIPATION of the 420-Mc. power limit being lifted, we became interested in the performance capabilities of tubes of the external-anode type (4X150A, 4X250B, etc.) when used as frequency multipliers. This is likely to be the most popular method of generating a reasonable amount of power on 432 Mc. for most of us, since the driving power needed is much more readily obtainable at one-half or one-third the desired frequency than it is in the 420-Mc. band. It is also much easier to put such drive as may be available into the tube's grid circuit at the lower frequency.

In order to give various ideas a whirl, we went to work on the 4X250B amplifier described by W1VLH in *QST* for February, 1957,[1] and shown on the cover of the December, 1956, issue. This job has detachable tank circuits for the plate of the tube, and a two-band grid circuit capable of tuning to both 144 and 220 Mc. The amplifier has rendered meritorious service over a period of several years at W1DXE, where it was used mainly as a 144-Mc. a.m. linear, and more recently at W1HDQ, where it has served as a Class-C 220-Mc. amplifier for a.m. and c.w. It was run at about 300 watts input in both stations.

Because of the 50-watt power limit, the amplifier was not tested on 432 Mc., at anything like its full capabilities. When the writer attempted to run it at more than about 300 volts on the plate, it was found that the design had to be modified considerably to provide reasonable efficiency. Jacking up the plate voltage shifted the operating conditions so that a different output coupling loop was needed, and the higher power showed need for changes in the plate circuit construction that were not apparent at low power levels.

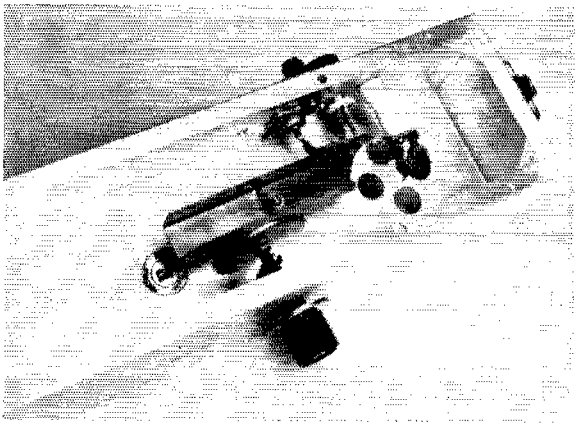
The New 432-Mc. Plate Line

Originally the plate lines for all three bands were pieces of copper tubing $\frac{5}{8}$ inch in diameter. Bolted to the tube end of the line was a copper strap, which in turn was bolted to a fuse clip used as the plate connector for the detachable line assembly. When we ran up the input, these machine-screw-assembled parts of the 432-Mc. line (L_5 in the original article) began to heat up, and efficiency dropped markedly. Taking the works apart, buffing the contact surfaces with steel wool, and reassembling in the original form helped some. Contact resistance had gone up appreciably in five years, as might be expected. But a better approach turned out to be to do away with bolted-together pieces where possible.

The result was the folded flashing-copper line shown in Fig. 1, and in the photograph. This is all in one piece, except for the connection between the trough and the fuse clip – and these were soldered as well as bolted together. The bent-up edge of the line toward the front of the assembly serves as the fixed plate of the tuning capacitor, so only a movable disk is required for tuning. The line is supported by the same standoffs as used originally.

Output Coupling

When high plate voltage was applied with the original line in place, it was found that the coupling loop and tuning capacitor, L_6 and C_8 in



The new tank circuit for the 4X250B frequency multiplier. The flashing-copper line is mounted on the same standoff insulators as were used for the original tubing version. Note the new coupling loop, and revised position for the series capacitor used for tuning it.

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

[1] Southworth, "Using the 4X250B on 144, 220 and 432 Mc.," *QST*, February, 1957. Issue no longer available, but photocopies can be made for 25 cents per page, or $2.25 for the complete article.

the original article, would not transfer power to a 50-ohm load with optimum efficiency. The loop would not resonate and it was far too tightly coupled for the high-voltage operating condition.

No modification of the loop could be made to tune to the operating frequency so long as the series capacitor and output coaxial jack remained in their original positions. The series capacitor was moved to the rear wall of the enclosure, and the coupling loop changed to a short strap of flashing copper, of the dimensions and shape shown in the lower portion of Fig. 1. This U-shaped loop is soldered to the series capacitor and the coaxial fitting, with its main portion about ¼ inch from the vertical side of the plate line. This provides efficient coupling at approximately the low-r.f.-voltage point of the line, where it exerts the minimum of detuning effect on the plate circuit. The result is not particularly beautiful or convenient to use, but it does work well, which is the main thing, at this frequency.

Improving the Tuning Capacitor

It is not easy to get a good tuning capacitor for these frequencies, particularly for relatively high power levels. Some sort of disk on a lead screw seems to be about the only device that is both readily available in commercial form and satisfactory for the purpose. W1VLH used the movable element in a disk-type neutralizing capacitor, designed for high-power transmitter service.

Even this has its disadvantages. The lead screw doesn't always make the best contact in the world, and fluttering output as the shaft is rotated is the result. We found that solid contact to the enclosure was of utmost importance here; otherwise the shaft tends to act like an output coupling loop. At one time we found the metal rim on the tuning knob hot for r.f., and discovered that the screw was well carbonized where it passed through the shaft bushing in the front of the enclosure. Taking everything apart, buffing perfectly clean, and reassembling, with particular attention to mechanically-tight mounting to the aluminum enclosure, made a world of difference. The lead screw was shined up and coated lightly with a silicone lubricant, and so far it has given no further poor-contact trouble.

Operating Conditions and Results

The amplifier was first tested with the biasing originally provided. This includes a 10,000-ohm resistor in the "multiplier" position of the mode switch, plus regulated 75 volts from the bias supply. At the drive level available (10 ma. grid current) this meant about 175 volts bias, total. Screen voltage is 250, regulated. This came from an external 400-volt supply, the regulation being provided by the VR tubes built into the original unit. These bias and screen conditions seem to be satisfactory for all plate voltages from 300 to 1200, the latter being the maximum that we have run with the 4X250B operating as a frequency multiplier.

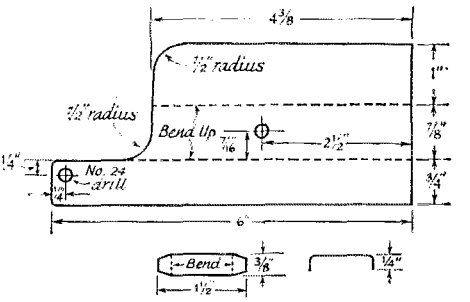


Fig. 1—Inner conductor of flashing copper, to replace the copper-tubing line originally used with the 4X250B amplifier on 432 Mc. The revised coupling loop, also of flashing copper, is shown below in both its flat and U-shaped forms.

The driver used in running the stage as a doubler is the 220-Mc. rig described in several recent editions of the *ARRL Handbook*, using a 6252 dual tetrode in the final, running at 20 to 40 watts input. An 8000-kc. crystal was used, putting the 6252's output on 216 Mc. A variable-voltage supply on the exciter allows checking the effect of varying drive levels to the amplifier. This same exciter has been used in all 220-Mc. operating with the 4X250B amplifier at W1HDQ.

Under these conditions it was found that the operating efficiency of the 4X250B as a doubler held substantially constant at all levels of plate voltage, being around 40 per cent. This is about all that can be expected of a doubler on any frequency, unless the drive and bias are increased markedly. We tried more drive, and extra resistance in series with the 10,000 ohms, and found that efficiency could be raised to about 50 per cent without inordinate amounts of drive.

Doubling was a lot better than tripling, the latter being rather disappointing unless very high drive was applied. At the same drive level that gave 40 per cent efficiency doubling, the tripling efficiency was only about 20 per cent. If you have 50 watts output or so on 144, and you want to use it to drive a tripler, you can very likely develop respectable efficiency, but a limiting factor here is the maximum grid dissipation of the 4X250B, which is only 2 watts. This would indicate that it is not safe to go much higher than we did with the doubling condition: 175 volts bias and 10 ma. grid current.

While we were about it, we tried out some of the above ideas on the tank circuits for 144 and 220 Mc. as well. Some improvement in 220-Mc. operation was effected by tuning loop modifications similar to those made in the 432-Mc. tank; moving the series capacitor over to the same side of the assembly as the coaxial output fitting, and making the loop of copper strap. It was also found that the tuning capacitors in both units benefited by cleaning and tightening and lubricating of the lead screws, which is not surprising, after five years of use.

In assessing the value of this transmitter design it should be remembered that it is capable of being used on three bands. Unquestionably

higher efficiency could be obtained if the amplifier were built for any one of the bands, but that is another story, which we hope to get to at a later date. Meanwhile, a doubling efficiency of 40 per cent is not bad at 432 Mc., and the 50 to 100 watts of antenna power readily obtainable with this type of unit operating as a frequency multiplier is an attractive way of developing a more potent signal on that band than we have been able to have legally heretofore.

Signal on the Driving Frequency

Areas where there is substantial activity on 432 Mc. have ample evidence that one must watch the conditions under which frequency multipliers are operated, or he will be radiating a considerable signal on the driving frequency. Where the driver is a 144-Mc. exciter, this is not too bad, though the 2-meter locals may not appreciate your potent signal on their band. If you follow the writer's suggestion and put your driver on 216 Mc. and double, you had just better be sure that the 216 Mc. stays at home, as the upper end of TV Channel 13 is at 216 Mc.

This driver radiation problem has been with us from the earliest days of tripling to 432 Mc., but it appears that most of the driver signal may be eliminated when high-Q shielded tank circuits are used in the exciter and amplifier, even when the output stage is a frequency multiplier. Years ago, the writer used a 5894 tripler driving another 5894 as a straight-through amplifier on 432 Mc. This was an unshielded layout, with untuned inductive antenna coupling to the parallel-line plate circuit of the amplifier. With this lashup, our 144-Mc. signal was audible over clear paths, up to at least 25 miles. There was low modulation on the 144-Mc. signal, however, indicating that most of it came from driver radiation, rather than from the modulated amplifier.

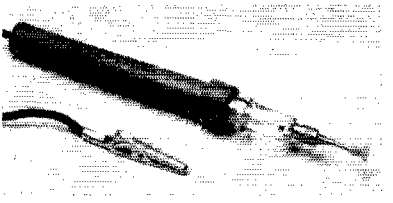
With the 4X250B amplifier and its 216-Mc. driver completely shielded, we can find no evidence of 216-Mc. energy, using a selective pickup device at that frequency in the immediate field of the 432-Mc. antenna. The 216-Mc. signal can be heard in the same room with the transmitter, however, and it is likely that extensive filtering and shielding would be necessary to eliminate this. If you can hear it, so can a TV set, though the slight separation from the sensitive portion of Channel 13 may be enough to prevent interference. There is no Channel 13 signal available in the Hartford area, but running the rig as described makes no pattern on our Lab TV set on that channel.

A good check as to how the driver signal is being radiated is to check its level at a distant receiver, first with the transmitter feeding the 432-Mc. antenna, and then with it running into an effective dummy load. If the driver signal disappears under the latter condition, it is probably being radiated by the antenna. The cure then is the insertion of a coaxial filter in the line to the antenna. This is a desirable step, in any case, since it will be helpful in both transmitting and receiving in the elimination of spurious signals. QST

• *New Apparatus*

Continuity Checker

The "Cirkit" Chaser," the continuity tester shown in the photograph, is a plastic tube containing a battery, a lamp (inside the clear plastic near the tip), a probe, and a lead terminated with an alligator clip. The lamp lights when a complete circuit is made from probe to clip. Such a simple gadget is handy for checking out a circuit, feed line, etc., and it is not necessary to take your eyes off whatever you are checking, since the light is easy to see even without looking directly at it.



One interesting note about the battery case: The batteries (two penlight cells) fit inside a cardboard tube which then fits inside the plastic case. In case the batteries run down, leak and swell up, they can still be removed from the case by first taking out the tube. The Cirkit Chaser is made by the Continental Electronics & Sound Co., Dayton 18, Ohio. — *E. L. C.*

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A Novice 40-Watter

Simple Construction In A Two-Band Transmitter.

BY LEWIS G. McCOY,* W1ICP

This article describes the construction of a simple 80- and 40-meter transmitter, crystal-controlled, with a self-contained power supply. The transmitter can be run at about 40 watts input. This unit is easy to build and makes an excellent first project for the Novice.

Circuit Details

The oscillator is a grid-plate type using a 6BQ5 tube. Referring to Fig. 1, either 80- or 40-meter crystals can be used in the oscillator, depending on the band, and an 80-meter crystal can be used for both 40 and 80. C_1 is the feedback capacitor used to control the crystal excitation. The output side of the oscillator is untuned but RFC_2 was chosen to be more or less resonant in the 40-meter range, thereby providing more drive to the amplifier on 40 from a 40-meter crystal.

The amplifier tube is a 6GJ5 which is operated with 350 volts on the plate and a plate current of about 120 ma. A pi network is used for the tank circuit. C_3 is the plate tuning capacitor. The entire coil L_1 is used on 80 with turns shorted out by S_2 when going on 40. C_4, the loading capacitor, is a three-gang broadcast type t.r.f. unit with the three stators connected in parallel to provide a total capacitance of about 1200 pf. RFC_4 is used as a protective device in the event that the plate blocking capacitor should fail. If this happens, the output line is shorted directly to ground through the choke, thereby preventing the d.c. plate voltage from appearing on the output line. Z_1 is a v.h.f. parasitic suppressor.

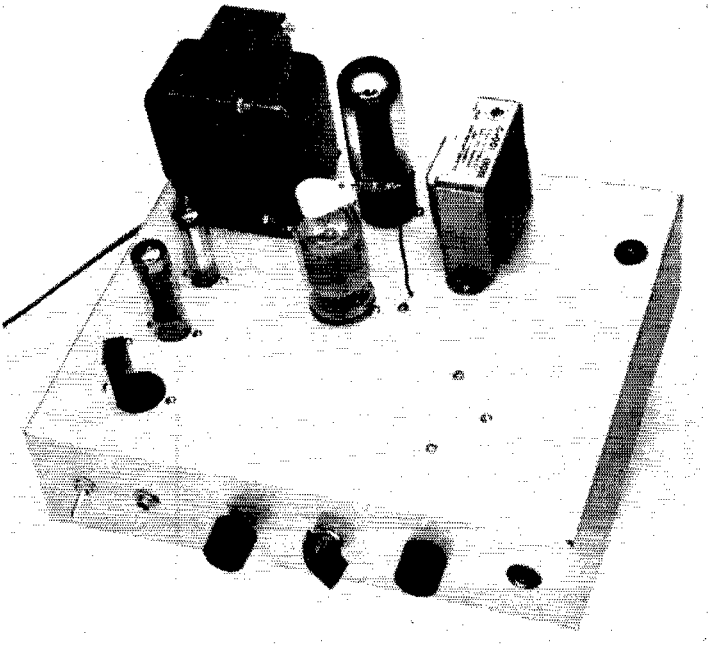
In order to keep the construction costs at a minimum, no plate meter is used in the rig, although one can be added if desired. I_1 is a dial lamp that is connected in series with the plus-B line to the 6GJ5 plate. The lamp serves as a resonance indicator. I_2 is another dial lamp which is used as an output indicator.

Both the oscillator and amplifier are keyed. The cathodes of the tubes are connected to J_1 the key jack. The oscillator and amplifier screens are regulated at 150 volts, which helps reduce any chirp.

Power Supply Details

The power supply uses a 5U4G in a full-wave rectifier circuit with capacitor input. The filter

* Technical Assistant, *QST*.



This top view of the 40-watter shows the arrangement of tubes and power transformer and choke. The octal socket at the left-hand corner is the crystal socket. Along the chassis front from the left are S_1, J_1, C_3, S_2, C_4 and I_1. The output indicator I_2 is on top the chassis at the upper right corner.

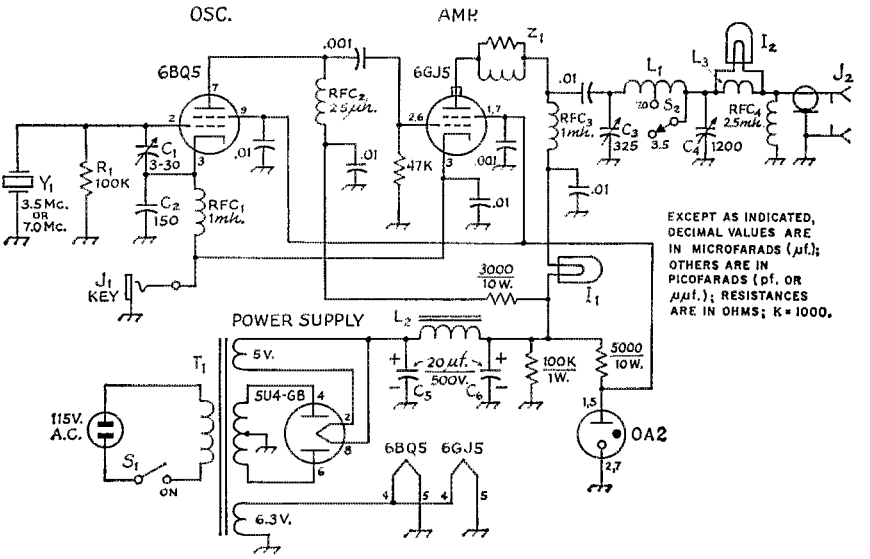


Fig. 1—Circuit diagram of the Novice 40-Watter. Resistors are ½ watt unless otherwise specified. All decimal-value capacitors are 1000-volt disk ceramics. All other capacitors are listed below.

C_1—3–30-pf. mica compression trimmer.
C_2—150-pf. mica.
C_3—325-pf. variable (Hammarlund MC-325-M).
C_4—Approx. 1200-pf. variable, three-gang, t.r.f. type capacitor; three stators connected in parallel.
C_5, C_6—20-μf., 500-volt electrolytic.
I_1—6–8-volt, 250-ma. dial lamp, type 44.
I_2—2-volt, 60-ma. dial lamp, type 48.
J_1—Key jack, open circuit.
J_2—Coax chassis connector, type SO-239.
L_1—27 turns No. 18, 16 turns per inch, 1¼ inch diameter; 40-meter tap is 7½ turns from output end of coil (B & W Miniductor type 3019).
L_2—10.5 hy., 110 ma. (Stancor C-1001).
L_3—See text.
R_1—0.1 megohm, ½ watt.
RFC_1, RFC3-1-mh. r.f. choke (Millen J300-1000, 34300-1000).
RFC_2—25 μh. (Millen 34300-25).
RFC_4—2.5 mh. (Millen J300-2500).
S_1—Single-pole, single-throw toggle switch.
S_2—Single-pole, two-position wafer switch (Centralab 1460).
T_1—Power transformer, 360-0-360 volts a.c., 120 ma. 6.3 volts, 3.5 amps., 5 volts, 3 amps. (Stancor PC-8410).
Y_1—3.5- or 7-Mc. crystal.
Z_1—9 turns of No. 16 or 18 wound on a 1-watt resistor (see text).

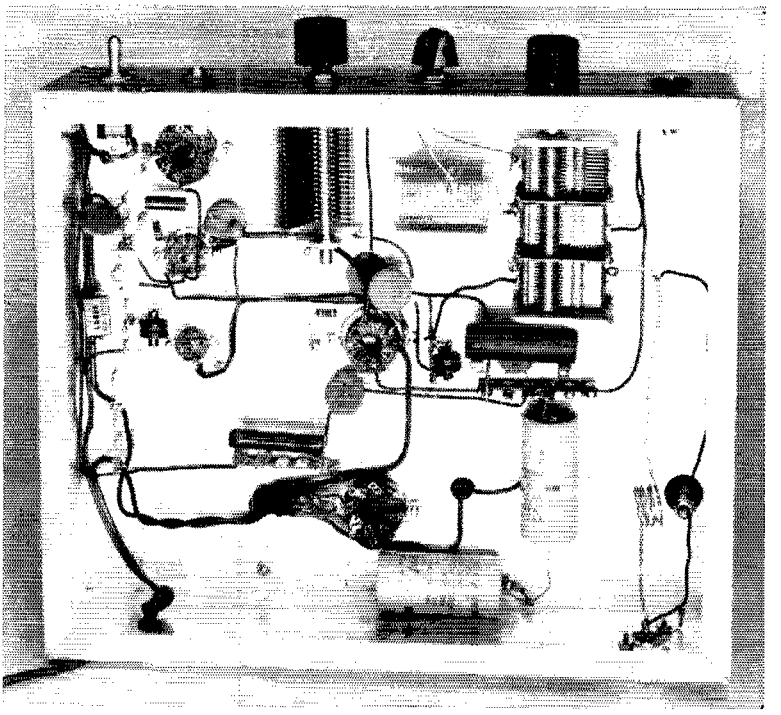
network consists of L_2 and two 20-μf. electrolytic capacitors. A 0A2 is used for regulating the oscillator and amplifier screens. The plus-B voltage out of the filter is approximately 350 volts at a load of about 120 ma. A 3000-ohm, 10-watt dropping resistor is used in the line to the oscillator plate, which runs at a plate voltage of 300 when the transmitter is fully loaded.

Construction Details

The complete rig and power supply is mounted on a 3 × 10 × 12 inch aluminum chassis. T_1, L_2 and the 5U4G are mounted on top of the chassis and along the rear. The two 20-μf. electrolytic capacitors are mounted below the chassis. Also on top of the chassis are the oscillator and amplifier tubes, the crystal socket, and the output indicator I_2. All the remaining components are mounted below deck and on the chassis front. There are no critical layout dimensions, but it is a good idea to follow the general layout shown in the photographs.

If this is your first construction job, a few hints about wiring are in order. If you want the finished product to look neat, make all wiring parallel with the chassis sides. Mount all components parallel to the chassis sides. Don't stack components over tube sockets but mount them around the socket. Liberal use of terminal tiepoints will help in keeping the wiring neat. When soldering, make sure the work and the iron tip are clean. Use resin core solder and only use enough to actually make a connection. Beginners are inclined to put big globs of solder on connections, but this isn't necessary for good electrical connections.

There are no hard and fast rules about what should be wired first. We usually start with the power supply and heater wiring and complete that before proceeding with the r.f. section. The reason for this is that it gets rid of all the long transformer leads which can get in your way if you leave the power supply wiring until later. Another advantage is that you can check out the supply and make sure it is working if you have a voltmeter. One word of caution here. Whenever you turn the supply off, short the output side of the filter (L_1 and the 20-μf. capacitor) to chassis ground using an insulated screwdriver for the purpose. Even though a supply is turned off the



Below deck, the oscillator components are grouped in the upper left hand corner in this view. L_1 is mounted between C_3 and C_4 near the upper center. The coil is supported by its own leads and the tap lead to S_2. L_3 is at the lower right next to I_2.

electrolytic capacitors can retain a charge, which of course could give you a dangerous shock. The 100,000-ohm bleeder resistor should drain off this charge but it is always safer to make sure there is no charge when working on a piece of gear.

R_1, C_1, C_2, and RFC_1 are mounted on a terminal strip. It will make your wiring job easier if you mount these components on the strip and then mount the strip on the chassis. In the amplifier, the pi network coil L_1 is mounted between stator terminals on C_3 and C_4. All three of the stator terminals on C_4 should be connected together. The lead from C_4 to J_2 should be made from No. 14 or No. 16 solid wire. Wind four turns in the wire, making the turns about ½ inch diameter, and position the turns as shown in the bottom view. This is L_3. The output indicator, I_2, is mounted in a rubber grommet on top of the chassis, and leads from the base tip and shell of the bulb are connected to the output lead on both sides of the coil. The plate current indicator, I_1, is also mounted on a rubber grommet on the front of the chassis. Make sure that the leads to both indicators are insulated from chassis ground.

The parasitic suppressor, Z_1, can be wound on any 1-watt resistor that is more than 1000 ohms. The resistor is only used as a coil form. Z_1 should be mounted directly at the plate cap of the 6GJ5.

Tune-up and Testing

In order to familiarize yourself with the tuning procedure a dummy load should be put on the transmitter. A 40- or 60-watt light bulb is excellent for this purpose. Connect a lead from the center pin of J_2 to the base tip of the bulb and another lead from chassis ground to the screw portion of the bulb base. Plug a key into J_1, turn on the power and let the rig warm up, leaving the key open. (When the key is open the cathodes of both tubes are also open and the tubes will not draw any current; the key serves the same function as a standby switch). Plug an 80-meter crystal into the crystal holder, set both C_3 and C_4 at maximum capacitance, plates fully meshed, and switch S_2 to the 80-meter position, the entire L_1 coil in the circuit. Next, close the key and then tune C_3, gradually decreasing the capacitance for a dimming point on I_1. The dimmest point is resonance. The dummy load may light up, but if it doesn't, slowly decrease the capacitance of C_4 and retune C_3 for the dimmest setting again. The dummy load will increase in brilliance as you load up the amplifier. You'll also notice that I_2 will get brighter as the dummy load gets brighter. As you decrease the capacitance of the loading capacitor, C_4, you'll find that you'll reach a setting where the dummy load gets no brighter. In fact, it may get dimmer. The ideal setting of C_4 is the one that provides the most output with the most capacitance in the circuit. When you put an antenna on the rig you'll use I_2 as an output indicator and the same tuning procedure as with a dummy load.

If you are in the bucks or can promote a plate meter, you can substitute the meter for I_1. Any meter that has a full-scale value of 200 ma. or more can be used. The meter is installed in the circuit in place of I_1. The lead that comes from

(Continued on page 154)

Fig. 1—In W7QBR's modified HBR-16 the Q-multiplier controls are grouped in the lower left corner of the panel. The a.g.c. and detector selector switches are at the lower right.

The panel is anodized aluminum and the cabinet is sheet steel, bent and formed in the home shop.

Nomenclature is lettered directly on the panel, using India ink.

Added Versatility for the HBR-16

B.F.O. Switching, Audio A.G.C., Q Multiplier and I.F. Noise Limiter

BY WILLIAM E. McKAY,* W7QBR

VERY few receiver articles have caused as much furor in the amateur radio do it-yourself ranks as has the HBR-16 receiver article by Ted Crosby. Having felt the need for a better ham-band communications receiver for some time, I set out to build the HBR-16. Ted's article, plus a fine set of "HBR Notes" from Ed Kent, K8EML, made this receiver a whopping success! The only change effected in Ted's original design was the addition of the now famous Eddystone 898 slow-motion drive for the dial mechanism. This receiver served in the home QTH for about six months.

Then an s.s.b. exciter was constructed and need was felt for a receiver more fully compatible with s.s.b. operation. Hence, a new modified HBR-16 was constructed. This modified version of the HBR-16 has (1) provision for switch selection of the proper b.f.o. frequency for c.w., upper and lower sideband; (2) selectable time-constant audio-actuated a.g.c. circuitry; (3) a 7360 beam-deflection-tube product detector; (4) a *Q* multiplier at the 100-kc. 2nd i.f.; and (5) a Bishop-type i.f. noise limiter.

The basic HBR-16 circuitry remains intact. All coil-winding data are the same. I refer you to these back issues of *QST* containing current general information: October and November 1959, June 1961, and June 1962.[1] Things discussed in any other past issues of *QST* now can be considered as "water over the dam."

Detector Modifications

The 7360 beam-deflection-tube product detect-

* 8-D South Fairway, Pullman, Washington.

[1] The October and November 1959 issues are out of print and no longer available from ARRL Headquarters. However, the information, with the exception of the circuit diagram and pictures, is contained in the "HBR Notes" prepared by K8EML; these notes also list sources of circuits, photographs, templates, etc., and contain a large amount of additional constructional and alignment data. They are available at $1.50 per set from Edward W. Kent, K8EML, 424 19th St., N.W., Canton 9, Ohio. — *Editor*

If you have built an HBR-16 receiver or are thinking of building one, these additions to W6TC's popular receiver design may be features you'd like to have. The same ideas can be applied to other receiver circuits, too, by exercising a small amount of ingenuity in adapting them — and with due regard for the actual intermediate frequency in the case of the Q multiplier.

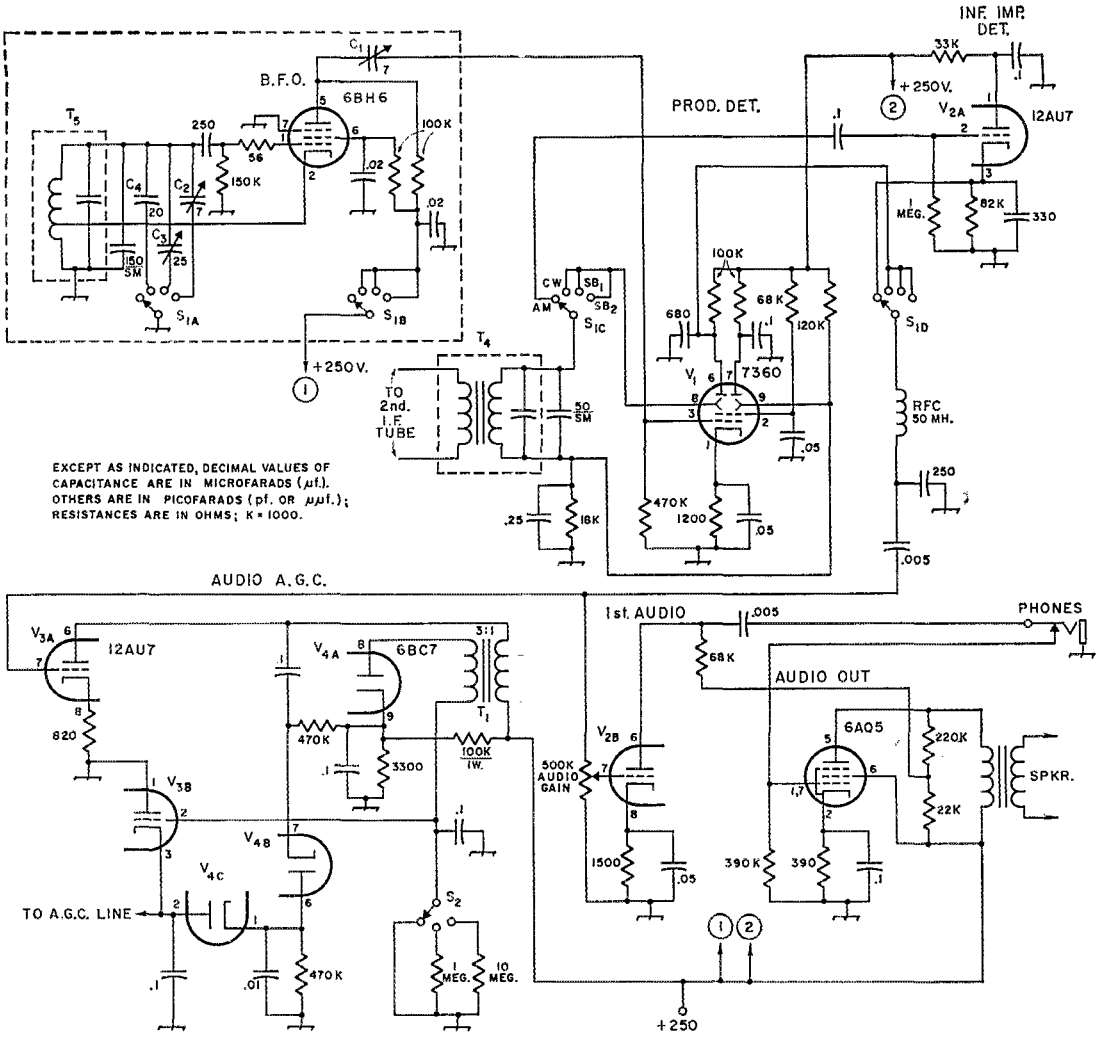


Fig. 2—The product detector and audio-activated "hang" a.g.c. circuit. T_4 and T_5 are the same as in the original HBR-16 circuit (October 1959 QST). SM—Silver mica.

C_1, C_2—1.5–7-pf. NP0 trimmer (Erie type *557*).
C_3—5–25 pf. NP0 trimmer (Erie type *557*).
C_4—20-pf. silver mica.
S_1—Ceramic rotary, 2 sections, 2 poles per section, 4 positions (Centralab PA-2010).
S_2—Phenolic rotary, 1 pole, 3 positions.
T_1—3:1 audio transformer (Triad A-31X).
T_4—Last i.f. transformer (original circuit designation).
T_5—B.f.o. coil (original circuit designation).

or described by John Filipczak (*QST*, December 1960) is used for c.w. and s.s.b. Although somewhat more complicated than the 6BE6 product detector used in the original receiver, the 7360 more than makes up for this complexity by providing an amazing tolerance to wide ranges of signal levels and by reducing distortion to inaudible proportions.[2] A measure of noise limiting is provided by the 7360 because of its deflecting-electrode peak-current limiting characteristics. The original infinite-impedance detector is utilized for a.m. The circuit changes are shown in Fig. 2.

[2] The 6BY6 product detector now recommended by W6TC is not overdriven by the exceptionally high signal voltages appearing across the secondary of T_4 as was the original 6BE6 product detector.

The proper detector is automatically chosen by the function switch, S_1. This switch also selects the proper beat frequency from the b.f.o. for c.w., u.s.b., or l.s.b. reception. No provision was made for shifting the h.f. oscillator simultaneously with the b.f.o., so it is necessary to move the main dial when an incoming signal is shifted from one sideband to the other, in order to keep the signal in the receiver's passband.

The b.f.o. is housed in a $2\frac{3}{4} \times 2 \times 4$-inch steel Minibox mounted beneath the chassis just behind the detector selector switch (see Fig. 4). One wafer of the 4-pole, 4-position switch is mounted between the front of the chassis and the Minibox. This wafer selects the detector to be used. The second wafer, mounted inside the Minibox, turns the b.f.o. on and selects the proper

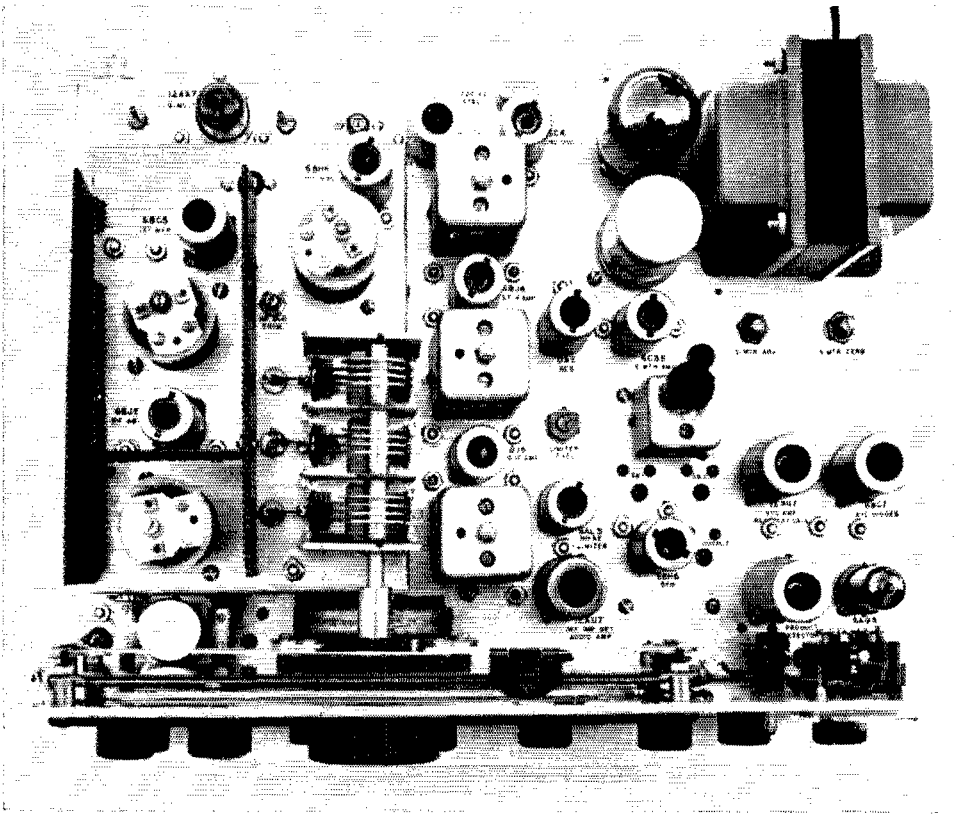


Fig. 3—Top view of the chassis, showing the Q-multiplier tube and coil-adjustment screws on the left rear corner of the chassis. The b.f.o. is to the right of the chassis center in the front section. The product detector and a.g.c. tubes are clustered in the right front corner.

value of capacitance for c.w., l.s.b., or u.s.b. reception. Capacitors C_1, C_2, and C_3 are mounted under the chassis on spacers in such a manner that they may be adjusted from above the chassis. The b.f.o. coil (T_5 in the original circuit) is mounted on top of the chassis at the rear of the enclosure. All leads entering or leaving the b.f.o. enclosure should be shielded. Proper orientation of the 7360 socket will produce a b.f.o. signal lead length of only ¾-inch.

A short explanation of the adjustment of the b.f.o. is included here: Turn S_1 to the c.w. position and turn the knob on the top of T_5 until the b.f.o. is zero beat with a steady unmodulated carrier fed into the front end of the receiver. Now turn the knob clockwise until a note of about 400 c.p.s. is heard. Turn S_1 to the SB1 position and adjust C_3 until a note of about 800 c.p.s. is heard. Lower sideband is received in this position on 80 and 40 meters; upper sideband on 20, 15, and 10 meters. Turn S_1 to the SB2 position and adjust C_2 until a note of about 800 c.p.s. is heard. Upper sideband is received in this position on 80 and 40 meters; lower sideband on 20, 15, and 10 meters.

A.G.C.

My experiments with the 7360 product detector revealed that unless very careful shielding of the b.f.o. signal lead and proper dressing of the T_4 secondary leads are used, b.f.o. activation of the a.g.c. will result.

One method of eliminating this possible source of trouble is to use one of the "audio-activated" a.g.c. systems. The audio-activated a.g.c. system herein recommended for use with the 7360 product-detector tube is described on page 102 of the 1961 and 1962 editions of the *ARRL Handbook*. Slightly modified for use in my receiver, two values of resistance are selected by S_2, to provide fast (0.1 second) or slow (1 second) discharge times for the a.g.c. action. Figs. 3 and 4 show the placement of the additional components required in this a.g.c. system.

Q Multiplier

A search of the available literature revealed very little information on Q multipliers applicable to the 100-kc. low-frequency i.f. used in this receiver.

The Q multiplier used in this modified HBR-16 was designed using the criteria set forth by O. G. Villard.[3] The result is the circuit shown in Fig. 5.

[3] Villard, "Flexible Selectivity for Communications Receivers," *Electronics*, April, 1952.

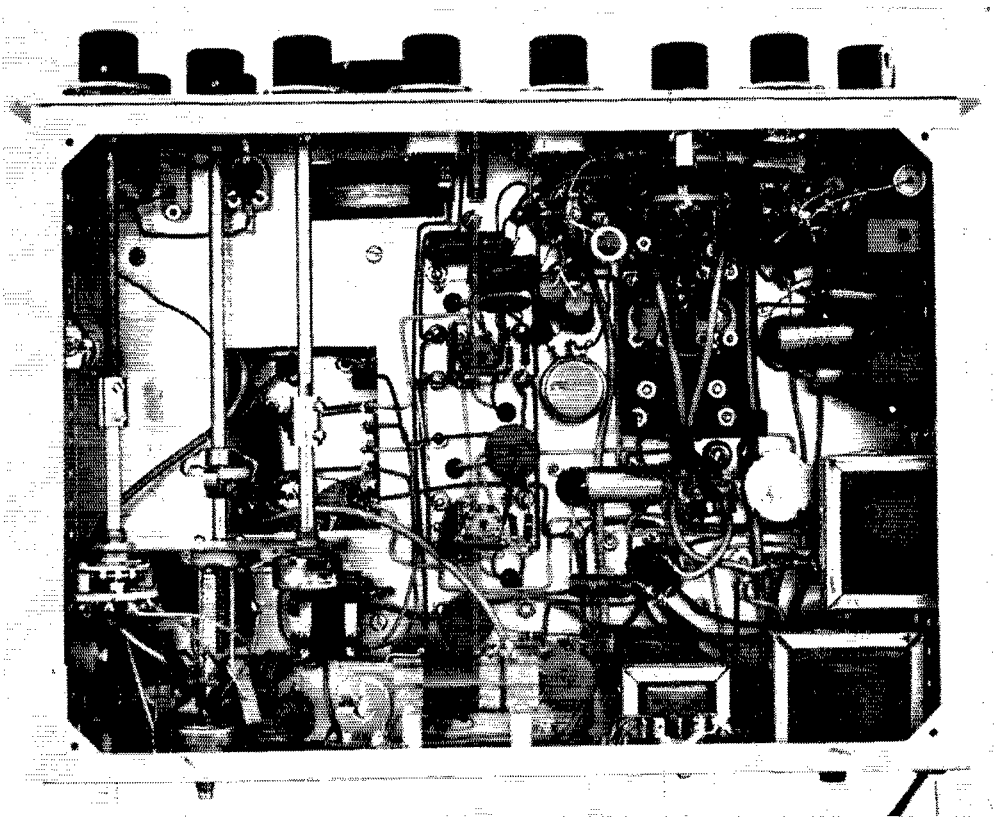


Fig. 4—The b.f.o. enclosure is shown (right front) with the cover removed. Switch S_1 has one section between the panel and b.f.o. enclosure and one section within the enclosure. The Q multiplier is controlled by the shafts extending from the panel to the bracket near the rear of the chassis. The audio output transformer and a.g.c. transformer are located near the panel between the b.f.o. enclosure and the chassis wall.

In addition to providing an adjustable bandpass, the Q multiplier, in the null position, makes it possible to move a 50-db.-down rejection notch across the passband of the receiver. This is extremely useful in eliminating those heterodynes on the crowded bands.

The 8–60-mh. coil, L_2, and 0.002-μf. capacitor are used to tune out the reactance of the connecting coax cable that is needed when the Q multiplier is mounted externally. For inclusion in new receiver construction, these two components may be omitted and the i.f. transformer retuned to compensate. The Q multiplier is connected to the plate (Pin 5) of the 6BC5 second mixer.

The 12AX7 for the Q multiplier is mounted in the space between the $5 \times 7 \times 2$-inch subchassis and the rear of the main chassis (see Fig. 3). The three panel controls (bandwidth, frequency,

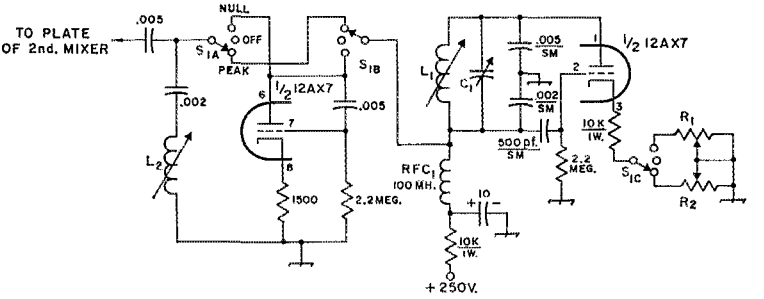


Fig. 5—The Q-multiplier circuit. Except as indicated, capacitances are in μf., resistances are ½ watt. SM—silver mica; other capacitors may be mica or ceramic.

C_1—140-pf. variable (Hammarlund APC-140-B).
L_1—0.5–5 mh. (Miller 6313).
L_2—8–60 mh. (Miller 6319).
R_1—10,000-ohm control, screwdriver adjust
R_2—10,000-ohm control, wire-wound.
RFC_1—100-mh. r-f. choke (Miller 960).
S_1—Ceramic rotary, 1 section, 3 poles, 3 positions (Centralab PA-2006).

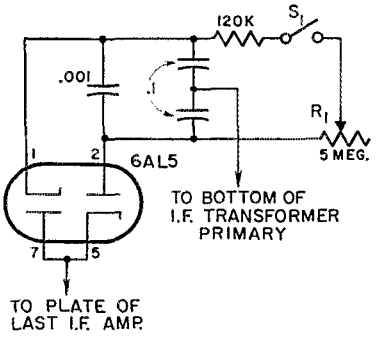


Fig. 6—The i.f. noise-limiter circuit. Capacitances are in μf.; resistances are in ohms.

R_1—Linear control. S_1—S.p.s.t. toggle.

and peak/null) are mounted on an L-shaped bracket beneath the chassis about 2½ inches from the rear apron. Shaft couplers and ¼-inch rod are used to bring the three controls out to the panel. The null-depth potentiometer is mounted on the rear apron of the main chassis since it is adjusted once and left.

If the *Q* multiplier is built as an outboard addition to an existing receiver, the entire unit can be housed in a 3 × 4 × 5-inch box with controls placed to suit the builder. Regardless of the layout, the coils should be at least two diameters away from the metal housing.

Adjustment of the *Q* multiplier is as follows: With S_1 in the "off" position, peak L_2 (if used) for maximum signal. Turn S_1 to the peak position. The signal will probably be much weaker, but by adjusting R_2 and L_1 it will be possible to bring the circuit into resonance. If R_2 is advanced past about 80 per cent of its rotation, the *Q* multiplier will break into oscillation. It is possible to use this condition to copy exalted-carrier single sideband. R_2 is the panel control and is used to control the bandwidth. C_1 should be set at mid-capacitance during this adjustment.

Turn S_1 to the null position and tune in a steady unmodulated carrier with the b.f.o. on and a.g.c. off. Tune C_1 until the beat note drops to a minimum in volume. Adjust R_1 for a better null. Juggle R_1 and C_1 until no further improvement in the null can be noticed. R_1 can then be left in this position and C_1 used to move the notch across the passband.

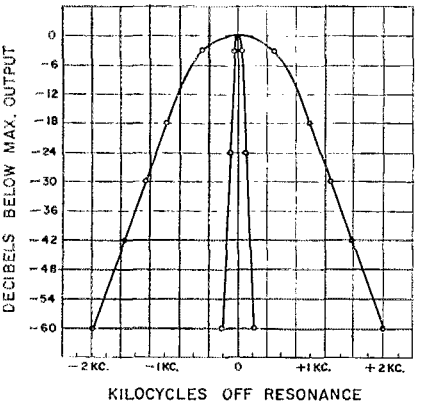


Fig. 7—These curves represent this particular receiver's bandpass. The symmetrical shape is the result of using a sweep generator and scope to do the alignment. The average builder will not have these instruments available and probably must be content with something less ideal than these responses.

TABLE I

Receiver Performance Data from Laboratory Tests

Sensitivity

Frequency	*Microvolts Input for 50 Mw. Output* *
3.5–4.0 Mc.	0.28 μv.
7.0–7.3 Mc.	0.35 μv.
14.0–14.35 Mc.	0.37 μv.
14.0–17.0 Mc.	0.49 μv.
21.0–21.45 Mc.	0.55 μv.
28.0–29.7 Mc.	1.0 μv.
50.0–54.0 Mc.	1.1 μv.

Selectivity

	Normal I.F. Bandwidth	*With Q Multiplier Sharpest*
−3 db.	950 c.p.s.	80 c.p.s.
−60 db.	4000 c.p.s.	450 c.p.s.

Noise Figure: 4.5 db. or less.
Image Rejection: 72 db. or greater
A.G.C. Characteristics: Audio output increases 10 db. for signal increase from 50 μv. to 50,000 μv.

* With normal selectivity; test signal modulated 30 per cent.

Noise Limiter

The i.f. noise limiter is the Bishop limiter described by Stiles.[4] Of several systems tried, this provided the best over-all performance with a minimum of components. The threshold adjustment is mounted on the chassis and adjusted just once. The limiter is connected to the plate (Pin 5) of the last i.f. amplifier tube (6BJ6) and is switched in and out by a toggle switch on the panel.

Performance

After spending many hours adjusting and pruning the front-end coils, I at last was convinced that I had exacted the optimum performance possible from my receiver. I was very fortunate in that I had available the facilities of a good electronics laboratory in which to check the performance of the receiver. Table I is a condensation of my findings.

(Continued on page 160)

[4] Stiles, "I.F. Noise Limiter," *QST*, June, 1960.

Annual ARRL Novice Roundup Competition

NOVICES, this is your one and only opportunity to participate *as a Novice* in your own operating activity, the Twelfth ARRL Novice Roundup Competition. You're only a Novice once, you know, so don't miss this chance to operate in this contest for Novices. The Novice Roundup begins on Saturday Feb. 2, 1963, at 1800 local time, and runs *through* Feb. 17, Sunday 1800 local time. Operating, listening, and logging time must not exceed 40 hours.

How to Participate

Just get on the air any time during the two week period and contact as many Novices and non-Novices as possible, exchanging QSO number, and ARRL section. Non-Novices work only Novices, of course. "CQ NR" means CQ Novice Roundup and you can either answer such a call or call "CQ NR" yourself to get contacts. Here's an example. KNØBPO in Minnesota hears KN1QFC in the Western Massachusetts section calling CQ NR.

CQ NR CQ NR CQ NR DE KN1QFC KN1QFC KN1QFC K

KN1QFC KN1QFC DE KNØBPO KNØBPO KNØBPO AR

KNØBPO DE KN1QFC R HR NR 3 WMASS BK

KN1QFC DE KNØBPO R HR NR 1 MINN BK

ROUNDUP PERIOD

Starts	*Ends*
Feb. 2	Feb. 17
6:00 P.M. Local Time	6:00 P.M. Local Time

KNØBPO DE KN1QFC R TNX ES 73 SK DE KN1QFC

On his next contact KNØBPO would send NR 2 (meaning contact number 2) then NR 3, NR 4, etc.

Scoring

A certificate is awarded to the highest Novice scorer in each ARRL section. Complete results will be in *QST* including the scores of those non-Novices that enter as well. To obtain your final score simply add the total of your NR QSOs to the highest w.p.m. from your Code Proficiency certificate. Multiply the sum by the number of *different* ARRL sections (see page 6, this *QST*) worked during the contest. That CP certificate really helps out your score, and you still have time to qualify, so don't miss out. Full details on the Code Proficiency Program are on page 96, this *QST*.

Novices should keep a look out just above and below the Novice frequencies (3700–3750 kc.; 7150–7200 kc.; 21,100–21,250 kc.; 145–147 Mc.) for the higher-power Generals.

Log forms like the one in the sample are yours for the asking simply by writing to: ARRL Communications Dept., 38 LaSalle Road, West Hartford 7, Conn. Study the rules below carefully, and then stand by for the fun of your Novice career, the ARRL Novice Roundup Competition! But don't forget to send in a copy of your log to make your entry official; logs must be postmarked by March 1.

(*Continued on page 150*)

SUMMARY OF EXCHANGES ARRL NOVICE ROUNDUP

Call. KNØBPO.. Section...MINN..... (See page 6 QST)

BAND	TIMES ON OR OFF AIR	DATE, TIME OF CONTACT	MY NR SENT	MY SECTION	HIS NR RCVD	HIS CALL	HIS SECTION	NUMBER EACH NEW SECTION AS WORKED
80	1800	FEB. 3						
		1803	1	MINN.	1	KNØAKM	MINN	1
		1815	2		3	KN9WRX	ILL	2
	1835	1820	3		2	KN9ZDL	ILL	
15	1400	FEB. 6						
		1412	4		15	KN7MNL	NEV	3
	1425	1418	5		7	KN1QFC	WMASS	4

Summary: (Enter below on last sheet used)

Bands used.....80,15.....; Nr. diff. stns. wkd..5.....; Nr. diff. sections...4.....
Total hours operation....1.00.....; Code Proficiency award credit.....10.....w.p.m.
Type transmitter (tube line-up if home-built).....
Receiver.....; Antenna.....

SCORING:

.....5.....QSOs plus....10....c.p. points times....4.....sections equals 60

I have observed all competition rules as well as all regulations established for amateur radio in my country. My report is true and correct to the best of my knowledge.

Signature and call.....
Address.....
.....

This is a sample log form that must be used by all contestants and also shows how to score. You can obtain these forms free by writing to ARRL.

This is the second of four articles by the author describing a series of transistor units which may be used individually or eventually combined to form a complete high-performance transistor communications receiver. The first article, which appeared in the December issue, covered a 2- to 4-Mc. tuner which is the basic tuning element of the system. This tuner was designed to feed the i.f. and detector systems described here.

Selective Transistor I.F. Strip and Dual Detector System

455-Kc. Units with A.G.C.

BY B. E. HARRIS,* W6ANU/4

A FEW years ago, the construction of a three-stage i.f. amplifier, complete with selective filter on a $4\frac{1}{4} \times 1\frac{7}{16}$-inch base, would have been a strain on the imagination. Transistors, of course, with the miniature components that have been developed for them, are the answer. The circuit diagram of such an amplifier is shown in Fig. 1. The arrangement consists of three conventional transformer-coupled, common-emitter stages, with a Collins 3.1-kc.-bandwidth mechanical filter between the first and second stages. The base of the input transistor (Q_1) is fed directly by a low-impedance line. The 47-ohm resistor shunting this line serves to reduce the input signal to compensate for the more-than-sufficient gain of the i.f. amplifier when used with the tuner described previously.[1] Loading the individual stages, or possibly a partial feedback loop, would be better for gain reduction, but the single resistor is adequate and does not significantly degrade the over-all noise figure.

The input and output windings of the mechanical filter, FL_1, are series-resonated by the 100-pf. capacitors in parallel with C_1 and C_2. Values for C_1 and C_2 are selected for maximum gain at the time of initial alignment of the amplifier. Capacitive impedance-matching networks at the input and output of the filter might provide additional gain, but there is more available than is needed as it is, as mentioned. The series-resonant impedance of the input and output coils of the mechanical filter is around 1000 ohms.

A.g.c. is applied to the first and second stages of the amplifier (and also to the r.f. stage of the tuning unit). Conventional decoupling filters are used in both a.g.c. and collector supply leads between the first and second stages to avoid the possibility of unwanted feedback or degraded selectivity by feedthrough around the filter. The bandpass characteristic for the complete amplifier is essentially the same as the published characteristic for the filter.

* Chief Engineer, Polaris Project Office, Patrick AFB, Fla.

[1] Harris, "A Tunable I.F. Amplifier Using Transistors," *QST*, December, 1962.

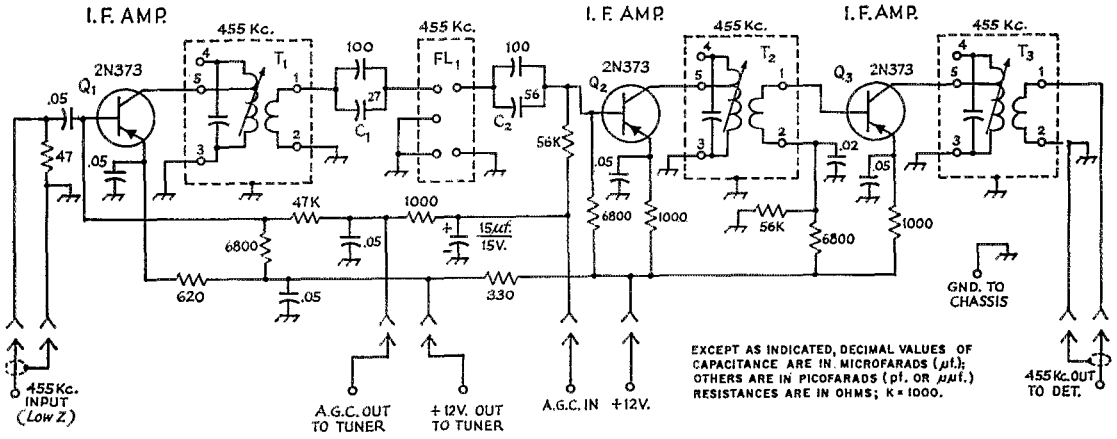


Fig. 1—I.f. amplifier circuit. (A.g.c. and 12-volt output connections refer to a 2- to 4-Mc. tuner described in a previous article.) Resistances are in ohms, and resistors are ¼ watt. Fixed capacitors of decimal value are disk ceramic or mylar; others are mica or NPO ceramic, except capacitors marked with polarity, which are electrolytic. All plugs and jacks indicated are single-circuit miniature (CTC 2379-1 and 2378-2). Components not listed below are identified for text-reference purposes.

C_1, C_2—Approximate value; see text.
FL_1—3.1-kc. i.f. filter for 455-kc. i.f. (Collins F-455-Y31)
T_1, T_2, T_3—Miniature transistor 455-kc. interstage i.f. transformer (Lafayette MS268A).

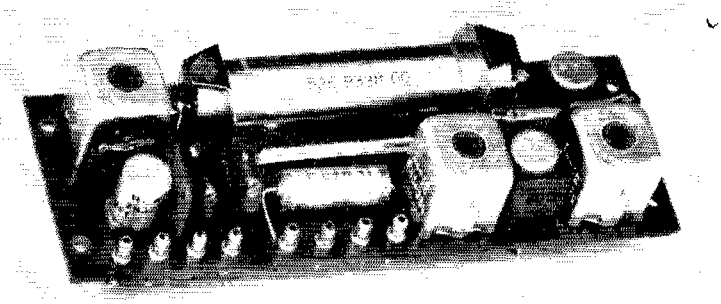


Fig. 2—Top view of the i.f. strip. The input transistor and first i.f. transformer are to the left, followed by the Collins mechanical filter and the two remaining i.f. stages.

The components are assembled on a base of $\frac{1}{16}$-inch copper-coated phenolic sheet measuring $4\frac{1}{4}$ by $1\frac{7}{16}$ inches. The arrangement of components is visible in the top and bottom views shown in Figs. 2 and 3.

Alignment of the i.f. amplifier is carried out by feeding a 455-kc. signal into the base of Q_1 and adjusting all of the tuning cores for maximum output. Feed-through around the filter can be checked by measuring the width of the passband and making a rough check of the rate of drop-off on either skirt. The passband shape should closely approximate the published filter characteristics.

The bias networks are adjusted for 1 to 1.5 ma. collector current in each stage with no a.g.c. voltage applied.

Detector/A.G.C.

The circuit of a detector/a.g.c. unit which may be used with the i.f. amplifier just described is shown in Fig. 4. Input at 455 kc. is applied to product and diode detectors in parallel. The impedance level to the diode detector, CR_1, is stepped up by an i.f. transformer, T_1, turned backwards to provide sufficient voltage for satisfactory operation of the series noise limiter, CR_2.

A portion of the diode-detector output is tapped off from a voltage divider to be fed to the a.g.c. amplifier. (In the complete receiver, this connection is made through a selector switch, S_1, which provides a choice, as to a.g.c. source, between the signal from CR_1 and one from the audio section to be described later. The audio source is preferable in s.s.b. and c.w. reception. For the r.f. source only, the output terminal from CR_1 and the input terminal to the base of Q_4 are connected directly.)

Audio output from the diode detector is fed to the output jack through the series noise limiter, CR_2. With no external voltage applied to the limiter control terminal (S_3 in the off position) CR_2 is biased in the conducting region for all signal levels. By adjusting R_5 (with S_3 closed) the bias can be set just above the conduction point for the signal, and noise pulses which exceed the signal will then cut CR_2 off. It is essential that CR_2 be a low-storage-time, high-back-resistance silicon diode of the "computer" type. This type of noise limiter has high distortion, but it does work fairly well on impulse noise. A separate noise i.f. amplifier, fed in parallel with the signal i.f. amplifier and controlling a high-speed gate in the signal i.f., would be better, and this is planned as a later modification.

Product Detector

The product detector[2] input is tapped off the low-impedance line from the i.f. through a voltage divider (R_1R_2). The detector arrangement consists of a signal emitter follower (Q_1) feeding the base of the mixer (Q_2), and a b.f.o. emitter follower (Q_3) feeding the emitter of Q_2.

The b.f.o., designed around Q_6, is a high-C Colpitts oscillator tuned by C_1, a Pacific Semiconductor type V56E voltage-variable-capacitor diode. The diode capacitor operates on the principle of variation of the p-n junction width with

[2] Patent applied for.

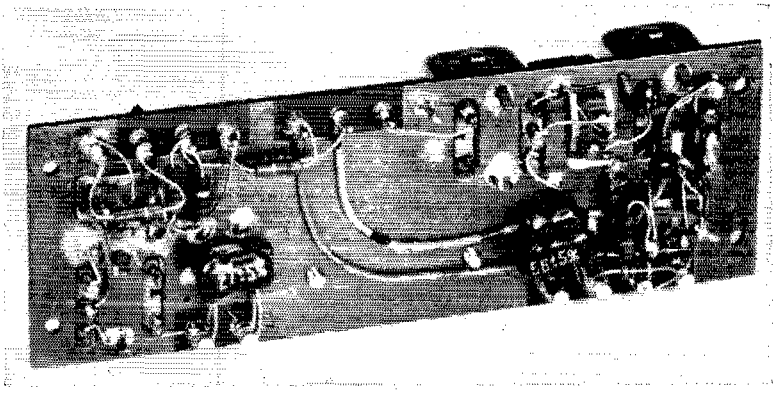


Fig. 3—Bottom view of the 455-kc. i.f. strip.

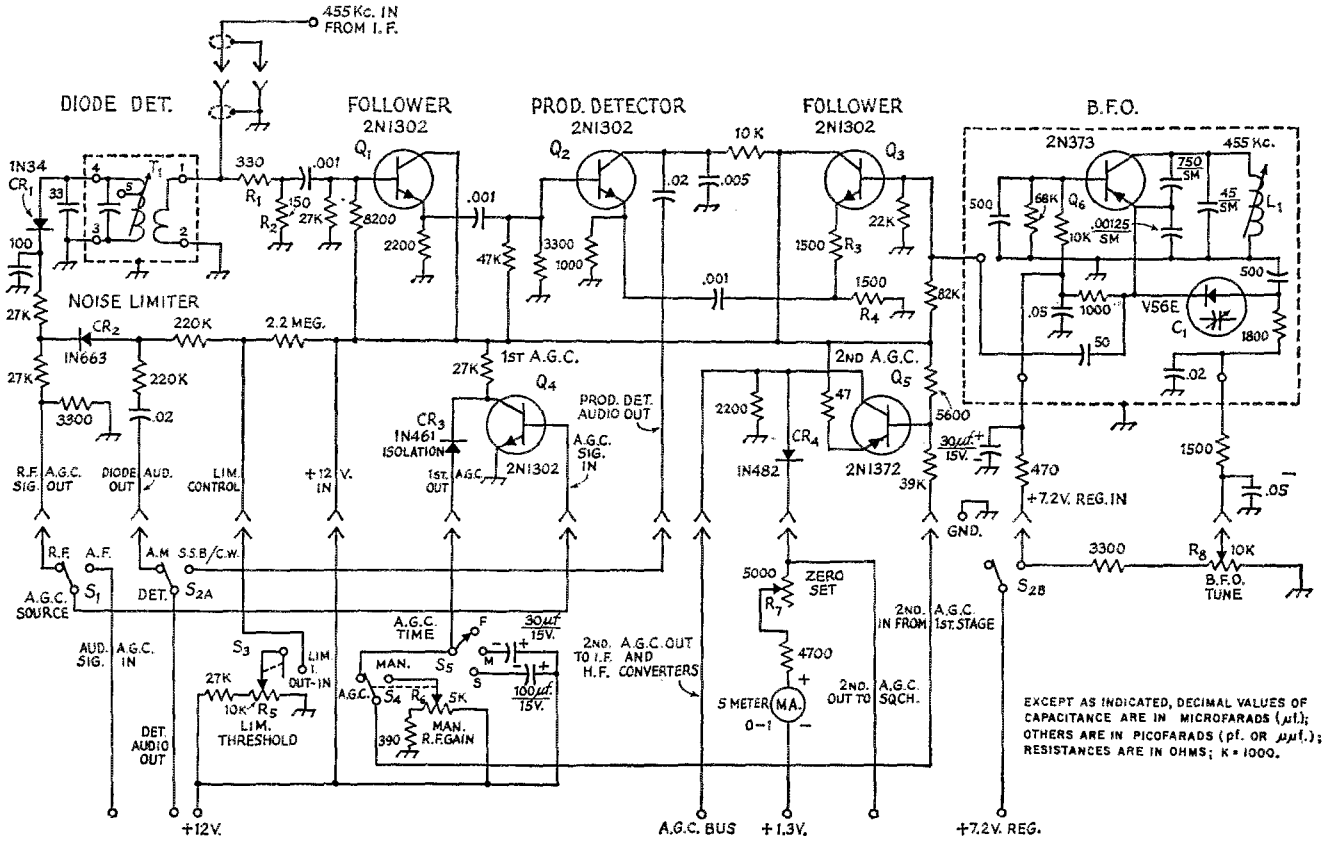


Fig. 4—Detector and a.g.c. circuits. Control circuits (shown connected through a series of plugs and jacks) are external to the unit. A.g.c. output terminal designations refer to h.f. converters and a squelch system to be described in later articles of this series.

Resistances are in ohms, and resistors are ¼ watt. Fixed capacitors of decimal value are disk ceramic or mylar; others are mica or NPO ceramic, except capacitors marked with polarity, which are electrolytic, and those marked SM, which are silver mica. All plugs and jacks indicated are single-circuit miniature (CTC 2379-1 and 2378-2). Other components not listed below are identified for text-reference purposes.

C_1—Voltage variable-capacitor diode (Pacific Semiconductor).
L_1—Approx. 250-μh. ceramic iron-slug coil (CTC 2060-8).
R_1, R_2, R_3, R_4—Nominal value; see text.
R_5, R_6—Linear control.
R_7—Linear control, screwdriver shaft.
R_8—Audio-taper control.
S_1—S.p.d.t. toggle switch.
S_2—D.p.d.t. toggle switch.
S_3—S.p.s.t., attached to R_5.
S_4—S.p.s.t., attached to R_6.
S_5—Single-pole three-position rotary switch.
T_1—Miniature 455-kc. transistor interstage transformer (Lafayette MS268A).

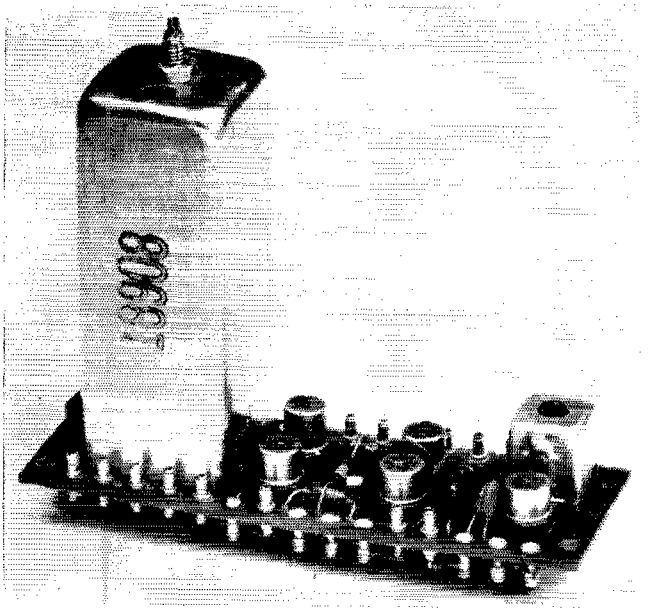


Fig. 5—Detector/a.g.c. unit. The b.f.o. components are enclosed in an old i.f. transformer can. The input i.f. transformer is to the right.

applied voltage.[3] The one used here has sufficient capacitance variation to swing the b.f.o. through about 6 kc., which is ample to allow setting the b.f.o. on either side of the i.f. passband. The capacitance variation with voltage is a nonlinear function, and an audio-taper potentiometer, R_8, is used to compensate for this effect.

The b.f.o. is not temperature-compensated, and it drifts slightly with temperature changes. This is not enough to do more than to change high-pitched voices to low and vice versa, but it is enough to make temperature compensation worthwhile. A crystal-controlled b.f.o. with upper- and lower-sideband crystals selected by a switch would be somewhat more convenient for single-sideband use. The tunable b.f.o. has some slight advantage for c.w. use. The main reason for using the arrangement shown was a desire to experiment with the voltage variable-capacitor diode.

Switch S_2 selects output from either the diode detector (for a.m. reception) or the product detector (for c.w. and s.s.b. reception). In the s.s.b./c.w. position, S_{2B} applies voltage to the b.f.o.

A.G.C. Amplifier

The a.g.c. amplifier consists of two direct-coupled common-emitter stages. An n-p-n transistor (Q_4) is used in the first stage to accommodate the positive-going close-to-ground voltage available from the diode detector. A p-n-p transistor (Q_5) is used in the second stage so that the output load resistor can be solidly connected to ground. The output is positive-going with increasing signal because of the double phase reversal in the two-stage amplifier.

The input stage is operated without any fixed base bias and, as a result, is practically cut off when no signal is applied. When receiving signal input from the diode detector (S_1 in the r.f. position), Q_4 is turned on, and the collector draws current through the 27K load resistor. Via CR_3, Q_4 also draws current (S_4 in the a.g.c. position) through the 39K and 5600-ohm voltage-divider network connected to the base of the output stage, Q_5. This supplies the necessary current to Q_5 to turn it on, and a.g.c. voltage appears across the 2200-ohm load resistor in the collector circuit of Q_5. If the time-constant switch (S_5) is in either the medium or slow position, the appropriate time-constant capacitor is charged rapidly by this same action, and the capacitor then provides the current to hold Q_5 on for a short period.

Silicon diode CR_3 prevents the time-constant capacitor from discharging through the 27K load resistor of Q_4. When the input stage (Q_4) is receiving input from the audio side of the a.g.c. source switch, it acts as a combined rectifier and amplifier, but otherwise the operation is the same. The manual r.f. gain control (R_6) is connected into the circuit by a switch (S_4) ganged with it.

The a.g.c. bus is connected to the collector of Q_5 and feeds the bias networks of each of the controlled stages. The bias network currents flow through the 2200-ohm load resistor of Q_5 and establish a voltage of about +1 volt on the a.g.c. bus in the no-signal condition (Q_5 turned off). This voltage is taken into account in calculating the values of the resistors in the individual bias networks. The a.g.c. saturates with a bus voltage of about 10.5 volts.

The isolation provided by the product detector and filtering of the power and tuning circuits is effective enough to prevent any noticeable influence on the a.g.c. system when the b.f.o. is switched on. For this reason, the manual r.f. gain control is seldom employed, regardless of the mode in use.

[3] Giacoletto and O'Connell, "A Variable-Capacitance Germanium Junction Diode for UHF," *RCA Review*, Vol. XVII, No. 1, March, 1956, p. 68.

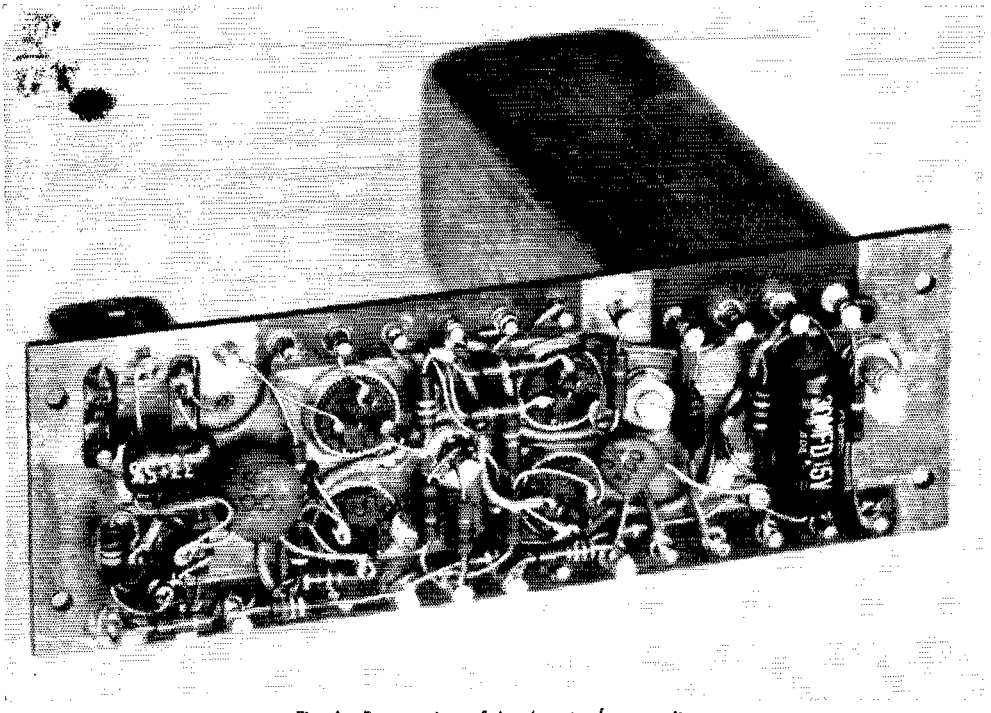


Fig. 6—Bottom view of the detector/a.g.c. unit.

Considerations in A.G.C. Design

There are two general types of a.g.c. used in transistor amplifiers. One is called "reverse" or "current" a.g.c. and the other is called "forward" or "voltage" a.g.c. Reverse a.g.c. is used on all controlled stages in this receiver. The action is analogous to a conventional vacuum-tube a.g.c. system in that the a.g.c. voltage reduces the forward bias on the bases of the controlled stages, and this reduces the collector current and hence the gain. In "forward" a.g.c., a resistor is inserted in the collector supply circuit of the controlled stage and the a.g.c. voltage is arranged so that it increases the base forward bias and hence the collector current with increasing signal. Although the collector current increases, the drop across the resistor in the collector circuit reduces the supply voltage and produces a net reduction in gain. There are many possible variations of these basic systems, including direct control of collector or emitter voltages by the a.g.c. Some fairly subtle differences exist between the systems in the areas of noise figure obtainable, resistance to overload, and stage detuning. Some further a.g.c. design effort might produce improved results, especially if difficulty is experienced with overload by very strong adjacent-channel signals.

S Meter

The S meter is an adjustable-range voltmeter made up of a 0-1 milliammeter and two series resistors, one of which (R_7) is a screwdriver-adjustable rheostat. A microammeter of any range, or a low-range milliammeter, can be used by properly proportioning these resistors. To prevent the meter from reading the fixed a.g.c. bus voltage, the negative side of the meter is returned to a fixed 1.3-volt reference voltage. The S meter is prevented from reading below zero by the silicon diode, CR_4.

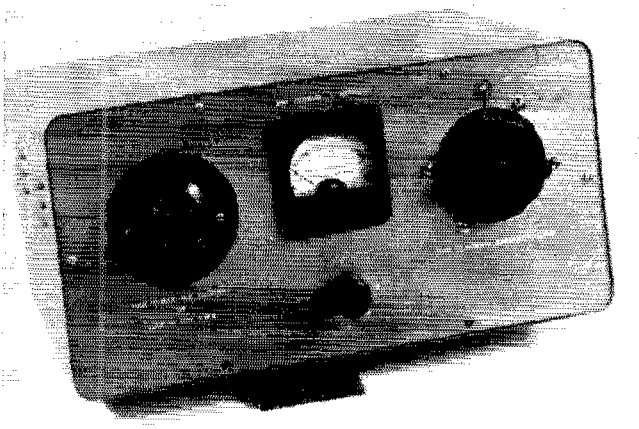
Construction

Top and bottom views of the detector/a.g.c. unit are shown in Figs. 5 and 6. The b.f.o. components, including Q_6, are mounted in a shield can removed from an old i.f. transformer. The tuning slug of L_1 projects from the top of this can. This subassembly and the other components of Fig. 4 (except for the controls) are mounted on another $4\frac{1}{4} \times 1\frac{7}{16}$-inch base of copper-coated phenolic sheet.

Adjustment

The product detector is biased in the linear portion of the transfer characteristic. Adjustment is carried out by disabling the b.f.o. and adjusting the signal input level by means of the voltage divider R_1R_2 until no significant audio output can be heard on strong signals. The b.f.o. is then turned on and the b.f.o. level adjusted by means of the voltage divider R_3R_4 in the emitter of Q_3. Alternatively, the b.f.o. output can be adjusted itself if desired. The injection level should be set for satisfactory audio output without distortion.

Care should be exercised with the 2N1302 transistors. They are somewhat unusual in that the base is connected to the metal case, and this can result in a high transistor mortality if it is not kept in mind in mounting. QST



W4JA's "Easy Match" has been made up neatly into a small cabinet. Practically any parts arrangement can be used, although the r.f. leads should be kept short and reasonably well separated.

Easy-Match for High-Impedance Antennas

Simple Transmatch Circuit for Single-Wire Feed

BY GILBERT L. COUNTRYMAN,* W4JA

Most transmitters today, both factory models and home brew, are designed for output at around the 50- or 75-ohm level. Some of them will match higher impedance loads, but operation becomes marginal as 500 or 600 ohms is approached. This makes it almost impossible to use two old stand-by antennas having unbalanced high-impedance feed.

The first of these is the good old Windom — a half-wave wire, cut for the lowest frequency to be used, with a single-wire feeder attached 14 per cent of the total antenna length off center. This is an excellent radiator, easy to erect, and operates well on its harmonics. True, it does not discriminate too well and some harmonic suppression is advisable in addition to that provided by the usual pi-network tank.

The other antenna is the simple "long wire" with one end brought right into the shack. If cut so that the over-all length of the wire is approximately one-half wave at the lowest frequency to be used, it is an excellent radiator and also operates well on its harmonics — with additional suppression desirable as mentioned above. True, if your shack is in the cellar or in your home bomb shelter, bringing one end of the antenna virtually underground is a practice not generally considered acceptable. However, if your shack is on the second or third floor, don't overlook the possibilities of a direct end-fed antenna. It will give surprisingly good results, if operated against ground and in connection with a good matching device. There are locations where it is the only practicable type of antenna that can be readily erected.

Either of these two antennas may be operated with no special ground connection, but for best results a good r.f. ground must be included in the system. It helps to bring up the ground lead outside the shack just below where the antenna enters. Use a gap-type lightning arrester for safety.

A half-wave "direct-fed" antenna with one end brought into the shack has been much maligned. This is because of the early practice of coupling by tapping the end of the antenna on one of the turns of the output plate tank coil through a small fixed capacitor for d.c. blocking, so there was no discrimination against harmonics. Furthermore, little if any attempt at matching was made except by the selection of a tank coil turn, and as a ground was seldom used it sometimes resulted in "r.f. in the shack."

With either antenna the use of some coupling device is necessary, not only for proper impedance matching but also to permit using either an s.w.r. meter or a low-pass filter, or both, in a coaxial line from the transmitter. The L network is a natural for the required impedance matching. It is discussed in Chapter 2 of *The Radio Amateur's Handbook*, and the March 1957 issue of *QST* covers the ground more thoroughly.[1]

The simple L network shown in the photographs is designed to match a high-impedance antenna or unbalanced feeder to the low-impedance pi-network output of the transmitter. If you can use junk box and surplus material the cost is peanuts.

The uncomplicated circuit is shown in Fig. 1. The inductance is a rotary 40-turn variable

* 75 East Bay St., Charleston, S. C.

[1] Grammer, "Simplified Design of Impedance-Matching Networks."

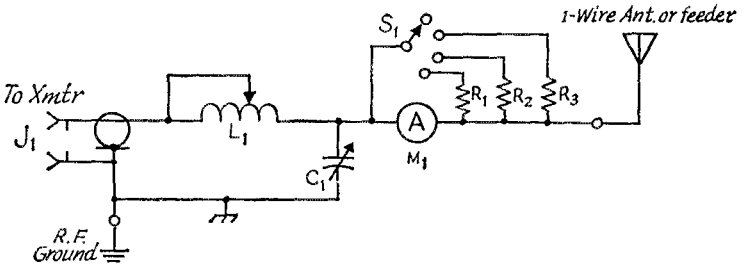


Fig. 1—The L matching network. J_1 is a chassis-mounting coax receptacle, SO-239. R_1, R_2, and R_3 are shunts for the r.f. ammeter; see text for discussion of these and other circuit values.

inductor with a spring-loaded pulley-wheel type contact, and comes from a piece of surplus military gear. These can be bought for a buck or so, when found, and if you are lucky you can get one with the vernier dial, which reads directly in coil turns. This is the one pictured. If this exact type is used, a 3½-inch hole should be cut in the panel to permit the 3-inch dial to turn freely, and the coil should be positioned when mounted so that "0" turns is indicated at the top when the wheel is against the stops. The maximum inductance is just under 40 microhenrys. E. F. Johnson Co. manufactures excellent rotary inductors which can be used. If you prefer a tapped coil, a 4-inch length of 8 turns-per-inch, 3-inch diameter, manufactured low-loss coil can be used with a 12-position heavy ceramic switch for shorting out unused turns.

The variable capacitor came out of a tuning unit for the BC-375-E. It is the one stamped T-7660443P, and has a capacitance of 19 to 116 pf. It works fine for the long end-fed antenna, but for matching a 600-ohm load at lower frequencies it would be better to have a capacitor with a maximum of close to 250 pf. Surplus capacitors of this value are available; two of the 116-pf. jobs from the BC-375-E can be used in parallel, or a 2500-volt mica transmitting-type fixed capacitor of about 100 pf. can be arranged to be switched across the variable, or plugged into the circuit using banana plugs and jacks. Voltages with the end-fed long wire are high, so wide plate spacing is necessary for medium- or high-power transmitters — about 2000 volts breakdown. You will be safe if you use spacing equivalent to that in the plate tuning capacitor in your pi-network output tank (not the lesser spacing for the output loading capacitor).

The meter in the photograph is a surplus 0-2 r.f. ammeter. A 1- to 2-amp. scale will be adequate for single-wire feed and an end-fed half wave. A switch and shunts can be used across the meter for different transmitter outputs and for end-fed antennas when the impedance happens to be low. In the model shown, position 1 has no shunt and positions 2, 3, and 4 have one, two and four lengths, respectively, of individual strands from ordinary lamp cord, each about 2 inches long, across the meter. R.f. meters are available in surplus stores for a couple of dollars, and a ceramic coil switch from the BC-375-E could be used in place of the 90-degree indexing type shown.

There are several methods of placing the network in use. If you are using a Windom antenna, the approximate settings for the capacitance and inductance can be determined from data in the *Handbook*, taking into consideration the output impedance of the transmitter to be matched. In the case of the end-fed long wire it is not so simple, as the impedance at the end cannot be calculated, although it may be assumed to be some thousands of ohms.

One approach is to set up the pi-network output of the transmitter using a dummy load of either 50 or 75 ohms, noting the various settings for the different frequencies and thereafter not changing transmitter control settings except to change bands. All further adjustments should be made with the L-network controls, the object being to load the transmitter normally without changing the transmitter pi-network settings. With the optimum settings, maximum r.f. current should be indicated on the meter. The dummy antenna is not needed if an s.w.r. meter is inserted between the transmitter and the L network.

Without an s.w.r. meter or dummy antennas the transmitter and L network can be tuned up merely by adjusting all controls to give normal amplifier output (with the final "dipped") and for maximum r.f. current indication in the L-network meter. Once settings are determined, they should be logged for future use.

If a low-pass filter is necessary, the transmitter should be set up on a dummy load as described above if no s.w.r. meter is to be used. This will insure that the impedance will match the 50- or

(Continued on page 152)

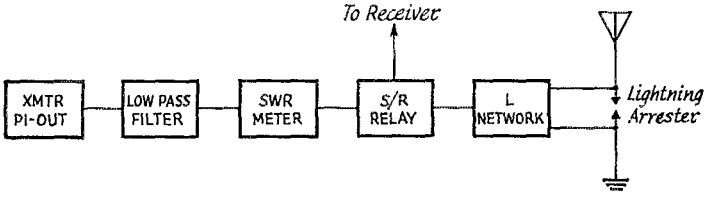
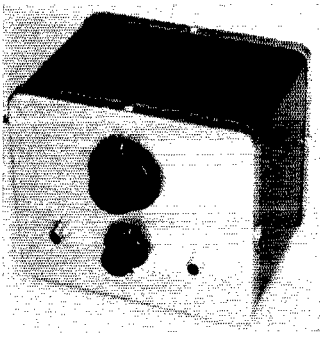


Fig. 2—Showing how various accessories are used in conjunction with the transmitter and L network. Coax cable, either 52 or 75 ohms, is used for interconnections.

Transtenna Model 101 T.R. Switch and Preselector



ELECTRONIC transmit-receive switches have acquired a somewhat unfortunate reputation because of such things as signal "suck-out," [1] TVI, and the sometimes temperamental operation of the tube. The Transtenna Model 101 t.r. switch not only overcomes these but has some built-in features that add to its versatility. Provision is made for biasing a final amplifier beyond cutoff and for sidetone monitoring of keying. A new principle of operation, which can probably be better understood by looking at the simplified diagram of the unit in Fig. 1, is used in the t.r. circuit.

Unlike conventional t.r. circuits that feed the r.f. voltage from the transmitter's tank circuit to the control grid of the t.r. tube, the Transtenna employs the No. 3 grid of a 6AS6 pentode as the element to which the r.f. is applied. During transmission, a low-level r.f. signal is coupled from the transmitter tank circuit through the internal capacitance of the switching tube to the tuned circuit L_1C_2 and thence to the diode CR_1, where it is rectified. This develops a negative d.c. bias at the grid of the biasing tube, V_2, which stops conducting, placing the full negative 150 volts on the control grid of the switching tube V_1, and biasing it off. The receiver, which is connected to the output terminal in Fig. 1, does not overload because both V_1 and V_2 are completely biased off. The possibility of television interference because of harmonics generated in the switch tube is eliminated since there is no rectification in this tube. The negative cutoff bias is also used to power a built-in transistor sidetone oscillator. Output from the oscillator is available at a connector at the rear of the cabinet.

During reception, the proper positive bias is developed for the No. 1 grid of the switching tube (this isn't shown in the simplified circuit, Fig. 1) so that the tube operates as a linear amplifier, boosting the signal arriving from the transmitter's tank circuit and antenna. The amplified output is developed across L_1C_2 and is fed to the receiver antenna input.

The switching tube, V_1, and its associated components are mounted in a separate outboard unit designed to be contained inside the transmitter as close as possible to the transmitter tank circuit. This is similar to Sabaroff's t.r. switch [2] described several years ago.

Many additional components and tubes not mentioned above or shown in Fig. 1 contribute to the finer working of the unit. For instance, there is a d.c. amplifier which develops a negative bias for receiver muting. A neon lamp is connected in series with the plate supply for the switching tube so that the operation of the unit may be monitored from the front panel.

The Transtenna is designed to operate in the amateur bands 80 through 10 meters and is band switching. It provides 20- to 30-db. gain over the signal level developed with the antenna connected directly to the receiver. The t.r. switch may be attached to transmitters running the maximum legal input and employing parallel

[1] Campbell, "Variations in T-R Switch Performance," *QST*, May, 1956.

[2] Sabaroff, "A Novel Electronic Transmit-Receive Switch," *QST* June, 1957.

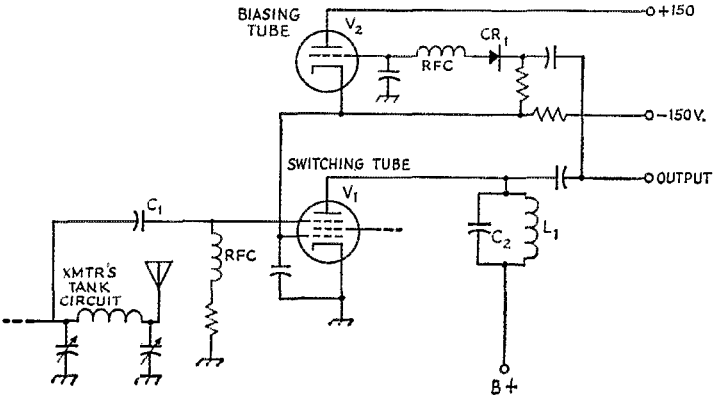
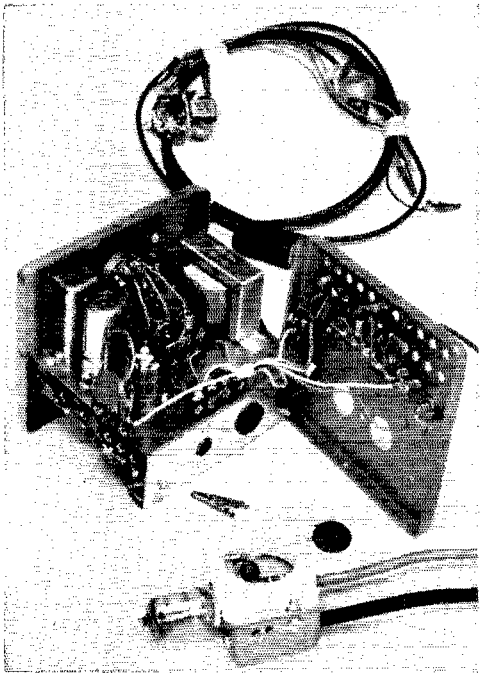


Fig. 1—Simplified diagram of the Transtenna Model 101 T.R. Switch.



This view shows the Model 101 with the cabinet removed. The box with the tube at the bottom of the photograph is the outboard switching unit which mounts in the transmitter. Leads and components at the top of the photograph are for s.s.b. voice control and external transmitter control circuits.

feed to the final tank circuit with a d.c. plate voltage not more than 3000 volts.

Front-panel controls and connectors on the main unit include the band switch, a tuning control for peaking up the received signals, the neon lamp indicator, a receiver mute connector, and the receiver antenna connector. These connectors mate with phono plug connectors which are furnished. A key jack at the rear of the Transtenna can be connected to the transmitting key when operating c.w. so that the Transtenna biasing circuit is triggered the instant the key is closed, thus muting the receiver. The time constant is such that the receiver is held off for a moment after the key is opened.

Other connectors on the rear of the Transtenna include a tone output jack, two sockets that connect to the outboard switching unit and a six-terminal relay socket. The relay socket is intended to provide power for an external relay that can be used for mechanical receiver muting, linear-amplifier biasing (the bias, −160 volts, is furnished by the Transtenna), and to tie in the Transtenna for s.s.b. VOX operation. The external relay must have a 5000- to 10,000-ohm coil.

A Transtenna Model 102 is also available. It is similar to the Model 101, except that the switching tube is mounted inside the control unit. This requires the conventional t.r. hookup — that is, the switch tube is connected across the transmission line from the transmitter to the antenna. Thus signal suck-out can occur with this model. Two standard coaxial sockets (SO-239) are provided at the rear of the unit for making the connection. Panel layout and controls are the same for both models.

— *E. L. C.*

Transtenna Model 101

	Control Unit	Switching Unit
Height:	4¼ inches	1⅝ inches
Width:	5 inches	1⅝ inches
Depth:	4 inches	4 inch

Power Requirements: 117 volts, a.c.

Price Class: Model 101, $70; Model 102, $65.

Manufacturer: Fichter Electronics, 33 Myrtle Ave., Cedar Grove, New Jersey.

Inverters for Ham Use

A CONVENIENT method of powering equipment, sometimes overlooked by amateurs, is the d.c.-to-a.c. inverter. Field day, Civil Defense, mobile, and emergency operation require a source of power other than 117 volts from the mains. Gasoline-powered generators are fine but are quite expensive, even for low-power units. Vibrator, transistor or dynamotor supplies can do the job, but their output is direct high voltage, making it necessary to dig into the equipment and bypass the existing a.c. power supply.

One solution to the problem is the use of an inverter. Although inverters have been around for many years, they have become increasingly popular recently and a variety of models are available for powering 117-volt a.c. tape recorders, dictating machines, electric razors, and similar equipment from the automobile d.c. power supply. Inverters are not restricted to low-voltage d.c. input and 117-volt 60-cycle output Models are available for other input and output voltages and frequencies, such as those found in aircraft, marine, and military vehicles. Power output and efficiency of the various available inverters range over a large area and depend somewhat on whether the inverter is of the vibrator or transistor type.

Some typical inverters and their specifications — which might suggest to the reader some further uses and applications — are discussed below. The inverters described were chosen not only because they represent three different power output levels, but also to show some of the different methods used to convert the d.c. to a.c.

ATR Model 12-DME, 50 Watts

This low-power package is representative of a whole series of inverters that are designed for temporary hook-ups. A plug that will mate with most automobile cigarette lighters is furnished and also doubles as the on-off switch — when it is desired to use the inverter, just plug it in.

The 117-volt output is available at a standard receptacle mounted on the inverter case. The case measures 5½ inches wide, 2¾ inches high and 5 inches deep. It's small enough to store in the car glove compartment, yet is husky enough to power equipment such as the Heath "Sixer" or "Twoer". Efficiency of this inverter is approximately 50 to 75 per cent, which is representative of what can be expected from vibrator type inverters. The principle of operation is simple: The d.c. input is "chopped" by a vibrator, and then stepped up to the required output voltage by a transformer. The output waveform is essentially square wave.

ATR has a complete line of inverters ranging from 15 watts to over 400 watts output, and with d.c. inputs from 6 volts to 220 volts. Some of the high output models are designed for a more permanent installation and include a remote-control unit with an under-dash control panel that permits installation of the inverter in the car trunk. ATR inverters are manufactured by the American Television & Radio Co., St. Paul, Minnesota.

The ATR 50-watt inverter. The plug in the foreground inserts into the car cigarette lighter, for d.c. power pick-up. Output, 117 volts, 60 cycles, appears at the receptacle just to the left of the name plate.

Heathkit Model MP-10, 240 Watts

This inverter kit is an all-transistor model that provides 117 volts a.c., 60 cycles, at 240 watts intermittently or 175 watts continuously with 12 volts d.c. input. The unit will also operate on 6 volts d.c. with a reduction in rated power output to 120 watts, intermittent or continuous.

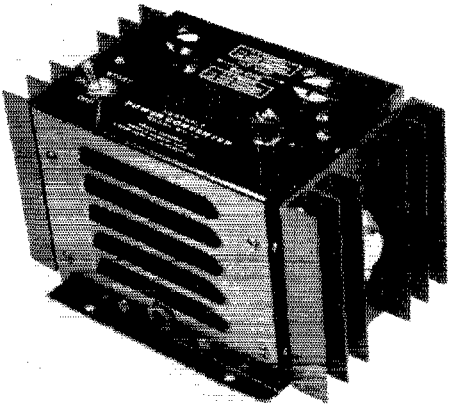
The transistor circuit is similar to the vibrator inverter except that, instead of a vibrator, a pair of transistors are used as switches to chop the d.c. Efficiencies in the order of 80 per cent are possible with the transistor supply. As in the case of the vibrator supply, the output is a square wave.

Comparing efficiencies alone, the transistor inverter is favored over the vibrator type. However, the transistor model doesn't have the close frequency tolerance of the vibrator unit. This is a factor that should be considered when the inverter is powering frequency sensitive items such as clocks, tape recorders, etc. The problem is actually one of holding the input voltage constant in order to maintain a constant frequency. This is difficult in the automobile electrical system where the voltage can swing over a range of three or four volts, depending upon the engine speed (charging rate), load, etc.

The old transistor bugaboo — power capacity reduced at high temperatures — doesn't hold true with this model; it can be operated at full output in ambient temperatures up to 165 degrees F.

In case you have had the idea to connect two of these inverters in parallel to increase the power output, it can be done. The transistor oscillators (switches) will lock to each other and adjust themselves as to output voltage, frequency and power.

Power output of the MP-10 is high enough to run transmitter-receiver combinations in the "Communicator" class and still have enough left over for operating a lamp or a soldering iron. The supply measures 7⅜ inches long, 5⅛ inches wide, and 4¾ inches high and is made by the Heath Co., Benton Harbor, Michigan.



The Heathkit model MP-10 240-watt inverter. D.c. connections to the unit are made to lugs on the bottom of the unit. A terminal strip, also on the bottom, contains jumpers for either 6- or 12-volt operation. Two output receptacles, 25-amp. fuse, and the on-off switch are on top of the unit. The transistor heat sinks are shown here for horizontal operation of the supply. If the inverter is mounted on a vertical surface, the heat sinks must be rotated 90 degrees for optimum cooling.

The Terado 300 watt inverter. The frequency control reed is visible between the 12-volt d.c. input terminals on the main unit. Cables at the right of the photograph are for connections to the battery and to the control unit at the left. The control unit, which can be mounted at a remote location, houses the output receptacle, voltage selector switch and indicator lamp. Although they are partially hidden in this photograph, cooling fins for the transistors are at each end of the main unit.

Terado Model 50-191, 300 Watts

Called the "Continental Converter," the Terado transistorized inverter not only represents a high-power model but also one of good frequency stability. Rated at 12 volts d.c. input, it has a continuous output rating of 275 watts and 300 watts intermittent, and can hold the output frequency at 60 cycles regardless of changing input voltage or load. The secret to this stability is a tuned vibrating reed that controls the switching action of the four-transistor circuit.

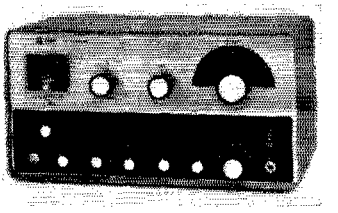
As shown in the accompanying photograph, the necessary cables for installing the inverter are part of the package, including those for connecting to the 12-volt battery. The main unit, which measures 11 inches wide, 6 inches deep, and 7½ inches high, can be mounted in the car trunk and controlled remotely from the under-the-dash control head. On the head, which is 4 inches wide, 2½ inches deep and 1½ inches high, is the output receptacle, a voltage selector knob and lamp indicator. The voltage selector has five positions and is advanced from the lowest numbered position until the indicator lamp just barely lights. This indicates that the output voltage is at the correct value. If a larger or smaller load is applied to the inverter, the voltage selector can be adjusted to compensate for a voltage fall or rise.

One interesting feature of this particular unit is that some of the inverter output is used to run a built-in fan for forced-air cooling of the transistors.

With the power available from this supply even relatively large — up to ¼ h.p. — electric motors and appliances can be operated. If the d.c. power were available, a complete 100-watt station, including receiver, could probably be handled. On Field Day this could mean a healthy battery multiplier!

Terado also has a complete line of inverters, including cigarette lighter plug-in models. They are manufactured by the Terado Co., 1068 Raymond Ave., St. Paul 8, Minn. — *E. L. C.*

Knight T-150 Transmitter Kit



AMONG the many reasons for the drift toward buying rather than building, one stands out crystal-clear - in the case of kit equipment, it's cheaper. Most kits can't be matched in price by buying individual components to build up the same circuit. As an added inducement, kits also offer a kind of coordination — in the form of specially tooled cabinets, chassis, and mechanical parts — that are beyond reach for the designer who must use the materials listed in catalogs. The Knight T-150 is an excellent example; a quick tabulation shows that the cost of individually purchased components of equivalent characteristics — exact duplication of many features is of course impossible — would run to nearly 20 per cent more money than the kit price.

With this observation out of the way — and it's intended as a statement of simple fact, not as an argument for or against — a look at the kit itself shows that it appears to fill a niche that hasn't earlier been occupied by the many transmitter kits now on the market. Its final-stage c.w. input is 150 watts. There is a built-in v.f.o., as well as provision for crystal control. The range of ham bands covered is 80 to 6 meters, inclusive. It has a.m. phone, in the form of controlled-carrier screen modulation. The power supply uses semiconductor rectifiers. The entire transmitter is smaller than many receivers, and weighs less than most.

The tube line-up is shown in Fig. 1. The v.f.o. uses the series-tuned Colpitts circuit with electron coupling. There are three frequency ranges, as shown in the block diagram, with each range spread over the entire 180 degrees of dial movement. Individual calibration scales are given on the v.f.o. dial for all bands.

The 6CL6 second stage has a dual purpose: it is

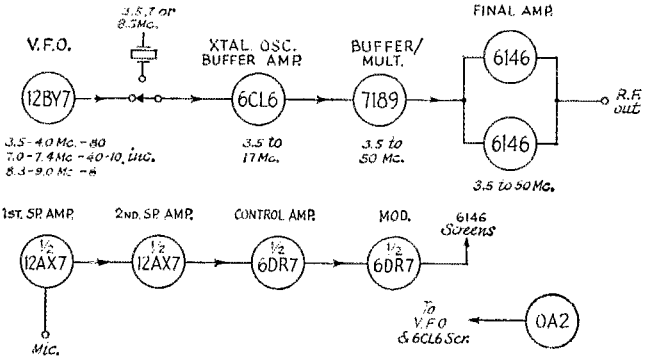


Fig. 1—Block diagram of the T-150 transmitter.

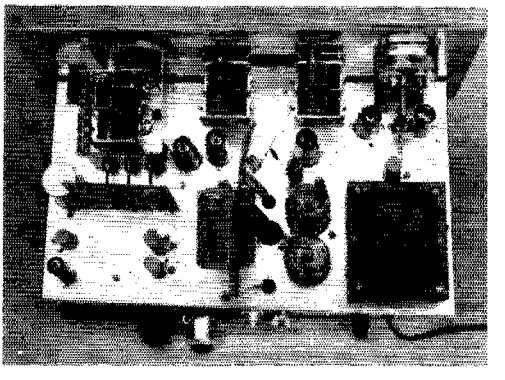
a Pierce crystal oscillator when crystal control is used, and is a buffer or frequency multiplier when the v.f.o. is in operation. The third stage operates either straight through or as a frequency multiplier, depending on the frequency band. It uses a 7189, a type which so far as we know has not previously had any attention for r.f. use in amateur transmitters. Made for audio hi-fi amplifiers, it is a rather "hot" tube and takes some taming in r.f. work. In the T-150 the input and output circuits of this stage are resistance loaded on those bands where the stage operates straight through, to prevent self-oscillation. Also, — rather a rarity in anything except a final stage — there is a v.h.f. parasitic suppressor in the plate lead.[1] The plate circuits of the 6CL6 and 7189 are individually tuned by variable capacitors, appropriate coils being cut in by the band switch. The same switch takes care of band changing in the output amplifier.

The final stage has a pair of 6146s in parallel, neutralized by the capacitive bridge method. The plate tank is a (what else is there?) pi network with constants adjusted for working into coax lines. The two tubes have individual v.h.f. parasitic suppressors. The stage operates straight through on all bands. The frequency combinations for various output frequencies are as follows, in round figures:

Band	*V.F.O.*	*6CL6 Plate*	*7189 Plate*	*6146s*
3.5	3.5	3.5	3.5	3.5
7	7	7	7	7
14	7	7	14	14
21	7	7	21	21
28	7	14	28	28
50	8.5	17	50	50

The phone line-up is much like that in the earlier T-60 kit[2], with minor changes in circuit values because the modulated tube is of a different type — besides, there are two in parallel. The modulation percentage at the point of maximum peak capability of the transmitter is not quite as high as in the T-60. Up to the overload point the audio quality is excellent, the distortion being negligible as compared with most systems of this type. There is plenty of speech gain for amateur-type microphones.

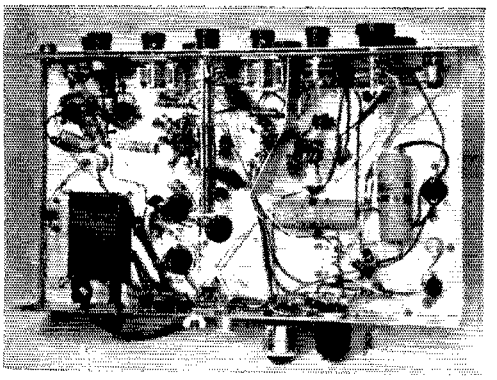
The keying is very good, especially considering the handicaps that have to be overcome in order to make break-in operation available in a low-cost transmitter. All four stages are keyed in the cathode circuits of the tubes. A 2200-ohm resistor across the key limits the rise in voltage across the contacts with the key open, but the voltage developed in it is enough for cutting off the oscillator. The final amplifier takes a small resting plate current with the key up. On the two lowest bands some care is required in tuning the 6CL6 and 7189 stages in order to get the cleanest note and chirpless keying; with four stages all working on the same frequency in one rather small box this is not surprising. The signal should be monitored when making these adjustments. On the higher bands, where the v.f.o. is on a lower frequency than the final stage, the tuning from this standpoint is much less critical. (Parenthetically, 7-Mc. also can be made noncritical by putting the v.f.o. on 3.5 Mc. for this band. This requires mentally



The v.f.o. tuned circuits are in the subchassis at the left in this view of the T-150. The shield between the v.f.o. and the rest of the transmitter minimizes interaction between the circuits. The two variable capacitors on the panel are for final tuning and loading. Speech circuits are at the right close to the meter.

[1] The kit described here includes modifications made after the transmitter was marketed initially. These modifications include a number of component substitutions and some rearrangement of parts underneath the chassis, plus the shields shown in the top and bottom views. Owners of the original transmitter can obtain modification kits free of charge by writing Allied Radio Corp., 100 North Western Ave., Chicago 80, Ill., specifying modification kit 040159 and giving the date of purchase of the T-150 kit.

[2] "Recent Equipment," *QST*, May, 1962.



The band switch is a little to left of center, with the 7189 and 6CL6 plate tuning capacitors on either side. Speech-circuit components are at the upper right. The v.f.o.-crystal switch, function switch, and key jack are on the right hand part of the panel. The small shield runs between the 12BY7 and 6CL6 sockets to help isolate the v.f.o. from the buffer. A.c. input, fuse, and line filter are on the bottom chassis apron at the left. The components near the coax connector are in the r.f. rectifier circuit for the output meter (other positions on the four-point meter switch read amplifier plate current, amplifier grid current, and 7189 grid current).

doubling the 3.5-Mc. dial readings to get the actual output frequency.)

The function switch has a position for v.f.o. spotting along with the usual a.m., c.w., and stand-by positions. There is an accessory socket at the rear, from which heater and plate voltages can be taken for auxiliary equipment, along with a 115-volt circuit which is activated when the function switch is in the a.m. and c.w. positions. The obvious use for this is in operating an antenna change-over relay.

One feature which should head off some "how-do-I-do-it" queries is a rear-mounted socket to which the plate and screen connections of the final stage are brought out. Plate-and-screen modulation can be introduced through this socket if the owner wants to up his phone power. A jumper plug completes the d.c. circuits when such an accessory modulator is not used. This plug makes a handy disconnect device for the final when the set is out of the cabinet for working on other parts of the transmitter, and for neutralizing the final stage.

The power supply uses the full-wave voltage-doubler circuit with silicon rectifiers. The output voltage at full power is approximately 600. A tap taken between the series-connected filter capacitors supplies 300 volts for the r.f. stages and the 6146 screen (through a dropping resistor in the latter case). A gas voltage regulator stabilizes the voltage for the v.f.o. tube. The 6CL6 screen voltage also comes from the regulated source.

Although the transmitter is not physically large, considering the power level, there is little or no crowding in its layout. The v.f.o. chassis is wired separately before installation on the main chassis, and is quite rigid mechanically; the oscillator is substantially unaffected by mechanical shock and vibration. The extra shield between the v.f.o. and final, and the small interstage shield underneath the chassis, contribute to the isolation that is necessary between circuits working on the same frequencies.

T-150 Transmitter Kit

Height: 9 inches.
Depth: 9½ inches.
Width: 17¼ inches.
Weight: 26¾ pounds.
Power Requirements: 115 volts, 60 cycles; 350 watts at maximum input.
Price Class: $120.
Manufacturer: Knight Electronics (Allied Radio), 100 North Western Ave., Chicago 80, Ill.

We were quite favorably impressed by the excellent packing of this kit and the way in which parts are segregated for easy identification. Composition resistors are mounted on cards, arranged with the resistors in numerical order according to circuit designation. Other small parts are grouped in a number of plastic transparent bags and do not require pre-sorting. Hook-up wire comes cut to the proper lengths (a different color of insulation is used for each length) and with the ends trimmed. Assembly and wiring took a little under 20 hours.

The cabinet is a welded one-piece wrap-around with a welded back having an opening for the terminals on the rear chassis apron. Six sheet-metal screws around this opening fasten the chassis to the back (the set slides in from the front) and ensure good electrical contact between the chassis and cabinet if the paint is scraped from the inside of the latter where the chassis butts against it. This over-all shielding is probably enough to take care of harmonic leakage in most TV locations, but since there is no electrical bond between the front panel and cabinet there can be leakage out the front. It is possible that something would have to be done about this in TV fringe areas.

The cabinet finish is gray, with the upper half of the panel gray of lighter tone and the lower half black. Bright metal trim is used on control knobs. The appearance of the set, to us, strikes a nice balance between the modern styling that fits into living-room surroundings and the technical flavor that a piece of transmitting equipment ought to have. —*G. G.*

IMPORTANT NOTICE
Changes of Address

Important postal changes in handling second-class mail matter are now in effect. Please advise us *direct* of any change of address. Four weeks notice is required to effect change of address. When notifying, please give old as well as new address. Your promptness will help you, the postal service and us. Thanks.

1963 ARRL International DX Competition

Phone: Feb. 9-10 and Mar. 9-10

C. W.: Feb. 23-24 and Mar. 23-24

CONTEST PERIODS

Phone Section:

Starts	*Ends*
Feb. 9, 0001 GMT	**Feb. 10, 2400 GMT**
Mar. 9, 0001 GMT	**Mar. 10, 2400 GMT**

C. W Section

Starts	*Ends*
Feb. 23, 0001 GMT	**Feb. 24, 2400 GMT**
Mar. 23, 0001 GMT	**Mar. 24, 2400 GMT**

ANNOUNCING the 1963 ARRL DX Contest . . . your opportunity to show your DX prowess, bag a few "new ones" for DXCC, and to have a lot of fun working the world . . . also for the DX stations to complete those difficult states for their WAS certificate, and provinces for WAVE. This contest is nothing new by any means, the 1963 version being the 29th running with the usual two week ends for c.w., and two week ends for phone . . . phone being all modes of phone work like s.s.b., a.m., etc. See above for dates and times.

The object is for DX stations to work as many W-K-WA-WB-VE-VO-KH6-KL7 stations as possible per band, and for the U.S.-Canadian stations to work the DX.

Certificates are awarded to the top single-operator phone and c.w. scorer in each country and ARRL section. A special certificate goes to the highest scoring multioperator from countries and sections of at least three such entries. You may also credit your score to your ARRL-affiliated club for separate club aggregate listing total of all club members' scores) . . . with an engraved cocobolo gavel to the club with the highest total, and a certificate to each club's top phone and c.w. scorer. For club credit make sure your logs are clearly marked: "Participating for club award in the ..... (club)."

The award and scoring system is designed to encourage widest use of our bands with flexibility of operation rewarded. Repeat QSOs on additional bands are permitted. For example, W3GRF works F8VJ on 10, 15, 20, and 40 meters; both stations have added to their contact-point total, multiplier, and score. For the DX the multiplier is the total of the U.S.A.-Canada call areas (not states) worked *per band.* For U.S.A.-Canada stations the multiplier is the total of different countries contacted *per band.* No credit for W/VE-to-W/VE QSOs is allowed.

Here is a list of the 21 call areas and state/province abbreviations used by U.S.A.-Canada stations in those areas:

W1, K1 — CONN MAINE MASS NH RI VT
W2, K2, WA2, WB2 — NJ NY
W3, K3 — DEL MD PA DC
W4, K4, WA4 — ALA FLA GA KY NC SC TENN VA
W5, K5, WA5 — ARK LA MISS NMEX OKLA TEXAS
W6, K6, WA6, WB6 — CAL
KH6 — HAWAII
W7, K7 — ARIZ IDAHO MONT NEV ORE UTAH WASH WYO
KL7 — ALASKA
W8, K8, WA8 — MICH OHIO WVA
W9, K9, WA9 — ILL IND WIS
W0, K0, WA0 — COLO IOWA KANS MINN MO NEBR NDAK SDAK
VE1 — NB NS PEI
VE2 — QUE
VE3 — ONT
VE4 — MAN
VE5 — SASK
VE6 — ALTA
VE7 — BC
VE8 — NWT YUKON
VO — NFLD LAB

U.S.-Canadian amateurs have quotas on c.w. (see rule 10) but none on phone. DX amateurs have no quotas; they will QSO as many stations as they can in the 21 call areas on each band.

Check the rules which follow below. Keep a neat and accurate log like the sample shown in this announcement. Send a copy of your log at the conclusion of the contest to: ARRL Communications Dept., 38 LaSalle Road, West Hartford 7, Conn., U.S.A. You can obtain log forms free for the asking at that address. Logs must be postmarked by April 29, 1963, to be eligible for awards and *QST* listing. All reports big and small, are welcome.

Rules

1) *Eligibility:* Amateurs operating fixed amateur stations in any and all parts of the world are invited to participate.

2) *Object:* Amateurs in the United States and Canada will try to work as many amateur stations in other parts of the world as possible under the rules and during the contest periods.

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

4) *Entry Classifications:* Entry may be made in either or both the phone or c.w. sections: c.w. scores are independent of phone scores. Entires will be further classified as single- or multiple-operator stations. Single-operator stations are those at which one person performs all the operating functions. Multiple-operator stations are those obtaining assistance, such as from "spotting" or relief operators, or in keeping the station log and records.

5) *Contest Periods:* There are four week ends, each 48 hours long: two for phone work and two for c.w. The phone section starts a 2400 GMT, Friday, February 8 and Friday March 8 ends 2400 GMT, Sunday, February 10 and Sunday, March 10. The c.w. section starts at 2400 GMT, Friday, February 22 and Friday, March 22, ends 2400 GMT, Sunday, February 24 and Sunday, March 24.

6) *Valid Contacts:* In the phone section, all claimed credits must be made voice-to-voice. In the telegraph section,

LOG[1], ARRL INTERNATIONAL DX COMPETITION

Sheet 1 of 33 CALL FP8BX ARRL Section — or Country ST. PIERRE ET. MIQUELON

DATE & TIME (GMT) 2/23	STATION WORKED	COUNTRY	RECORD OF NEW COUNTRIES FOR EACH BAND 1.8	3.5	7	14	21	27	28	EXCHANGE SENT	EXCHANGE RECEIVED	POINTS
0051	W8FGX	W8			1					599050	589 OHIO	3
52	W8JIN				1					599 "	589 "	
53	W3MSK	W3			2					599 "	589 MD	
54	K4TML	K4			3					599 "	579 FLA	
0114	VE2TZ	VE2		1						599 "	579 QUE	
25	W3MSK	W3		2						599 "	349 MD	
26	W1QMM	W1		3						589 "	549 VT	V
27	W4KXV	W4		4						589 "	- VA	2
27	W4ZYS			4						589 "	559 FLA	3
0217	W2UOB	W2		5						599 "	359 NJ	
23	W3WJD			5						589 "	569 PA	
0313	W2VL			5						599 "	589 NY	
21	W2KQT			5						599 "	479 NJ	
1725	W4QCL			5						589 "	559 VA	

Total points:

[1]This report form to be used by all phone entrants and by those c.w. participants outside W/K and VE/VO.

CD-55 (1/56) -over- Printed in U.S.A.

Sample log form that must be used by W/VE phone entrants and all participants outside U. S. and Canada, phone and c.w. This example is a DX c.w. log. U. S.-Canadian phone logs would reverse information in the "Sent" and "Received" columns; their "Sent" column would show exchanges like "59CAL," "57ONT." All DX stations, both phone and c.w., use this type log report.

only c.w.-c.w. contacts count. Crossband contacts may not be counted.

7) *Exchanges:*

a) *Amateurs in U. S. and Canada* will transmit a three-figure number, representing the RST report, plus their state or province. (The latter may consist of an appropriate abbreviation.) Phone participants will transmit a two-figure number consisting of the readability-strength report plus the state or province. *Example:* W6YY might transmit "579CAL" on c.w., "57 California" on phone.

b) *Amateurs outside W (K) and VE/VO* will transmit six-figure numbers, each consisting of the RST report plus three "power" numbers; the power indicator will represent the approximate transmitter power input. Phone contestants will transmit five-figure numbers, each consisting of a readability-strength report and the three "power" numbers. *Example:* VK2GW, with 100 watts input, might transmit "569100" on c.w., "56100" on phone. If the input power varies considerably on different bands, the "power" number should be changed accordingly.

8) *Scoring:*

a) *Points:* One point is earned by a W (K) or VE/VO station upon receiving acknowledgment of a contest exchange sent, and two points upon acknowledging an exchange received. Two points are earned by any other station upon receiving acknowledgement of a contest exchange sent, and one point upon acknowledging an exchange received.

b) *Final Score:* W (K) and VE/VO stations multiply total points earned under Rule 8(a) by the number of countries worked on one band plus the number of countries worked on each other band. All other stations multiply total points earned under Rule 8(a) by the sum of the number of W (K) and VE VO licensing areas worked on one band plus the number of W (K) and VE/VO licensing areas worked on each other band.

There are 21 licensing areas: 12 in the United States (W1-Ø, KH6, KL7), 9 in Canada (VO, VE1-VE8).

9) *Repeat Contacts:* The same station may be worked again for additional points if the contact is made on a different frequency band. The same station may be worked again on the same band if the complete exchange for a total of three points was not made during the original contact on that band.

10) *Quotas:* The maximum number of points per country per band which may be earned by W, K, KL7, KH6 stations *in the c.w. section* is 18, and contacts made on the same band with the same country after the quota is filled will not count.

EXPLANATION OF DX CONTEST EXCHANGES

Stations in U. S. and Canada Send:

	RS or RST Report of Station Worked	*Your State or Province (or Abbreviation)*
Sample (c.w.)	579	ORE
Sample (phone)	57	Oregon

Stations Outside U. S. and Canada Send:

	RS or RST Report of Station Worked	*Three-Digit Number Representing Your Power Input*
Sample (c.w.)	579	075
Sample (phone)	57	500

SUMMARY, ARRL INTERNATIONAL DX COMPETITION

Entry............ (CW or Phone) Call............ ARRL Section............or Country..............

Name........................ Address..

Transmitting Equipment...

....Power Input.........................

Receiver......................... Antenna(s)......................................

(Non-W/K/VE/VO entrants show number of U.S.A. and Canadian call areas worked, instead of number of countries QSOd.)

Bands	1.8 Mc.	3.5 Mc.	7 Mc.	14 Mc.	21 Mc.	27 Mc.	28 Mc.	Totals
Number of Countries QSOd								*
Number of Contacts								

Number of Different Countries Worked..... Number of Hours of Station Operation.........

....

Assisting person(s): name(s) and call(s)

** .... X .... = ...

(Points) (Multiplier) Claimed Score

Participating for club award in the.. (name of club)

I certify, on my honor, that I have observed all competition rules as well as all regulations established for amateur radio in my country, and that my report is correct and true to the best of my belief. I agree to be bound by the decisions of the ARRL Award Committee.

.... Operator's Signature and Call

*Figure in this box is the multiplier.
**Count 3 points per completed QSO; see contest rule 8a in January QST.

Sample summary sheet that must accompany all reports.

Thus complete exchanges with 6 stations in one country on one band fill the band quota for that country. The maximum number of points per country per band which may be earned by VE/VO stations *in the c.w. section* is 24, and contacts made on the same band with the same country after the quota is filled will not count. Exchanges with 8 stations in one country on one band are thus permitted Canadian participants. There is *no quota* for stations in the c.w. section *outside* of the U. S. and Canada. There is *no quota* for *any* stations in the phone section.

LOG[1], ARRL INTERNATIONAL DX COMPETITION

Call...W1AW......... ARRL Section......CONN.......

Band......14.........Mc. Sheet...1....of....15..........

Country*	Station Worked	Date	Time (GMT)	Exchange Sent	Exchange Received
SPAIN	EA4CE	2-23	1300	569 CONN	479100
	EA5EI	2-23	1345	579 "	579075
ENGLAND	G4CP	2-23	1306	599 CONN	469150
	G6BQ	2-24	1245	579 "	469150
	G2DC	2-24	1255	569 "	579130
	G2QT	3-23	1430	469 "	559150
	G3EYN	3-23	1822	579 "	589150
	G3APN	3-24	1851	479 "	459150
UKRAINE	UB5M2	2-23	1245	599 CONN	599100
AUSTRALIA	VK2GW	2-23	1003	569 CONN	569100
	VK2APK	3-23	1101	569 "	559120

*Canadian entrants should allow two "blocks" for each country, but may record no more than eight contacts therein.
[1]This report form to be used by W/K and VE/VO c.w. participants.

CD-24 12/62 over Printed in U.S.A.

Sample of log form that must be used by W/VE c.w. participants. When a station is worked for less than the maximum number of points allowed, the additional contact to make up the points not earned in the first contact should be entered at the bottom of the sheet. Canadian entrants should allow two blocks for each country, but may record no more than eight contacts therein. A separate set of sheets should be used for each band.

11) *Reporting:* Contest work must be reported as shown in the sample forms. Each entry must include the signed statement. Contest reports must be mailed no later than April 29, 1963, to be eligible for *QST* listings and awards. All DX Contest logs become the property of the American Radio Relay League and none can be returned.

12) *Awards:* To document the performance of participants in the 29th ARRL International DX Competition, a full report will be carried in *QST*. In addition, special recognition will be made as follows:

a) A certificate will be awarded to the high-scoring single-operator phone and to the high-scoring single-operator c.w. entrant in each country and in each of the mainland U. S. (plus Alaska and Hawaii) and Canadian ARRL sections (see page 6, *QST*) from which valid entries are received. In addition, a certificate will be awarded to the high-scoring multiple-operator station in each section or country from which three or more valid multiple-operator entries are received.

b) A suitable certificate will be awarded to the operator making the highest single-operator phone score in each ARRL-affiliated club, provided the club secretary submits a listing of a minimum of three phone entries by members of the club and that these scores are confirmed by receipt at ARRL of the individual contest logs from such members. The highest single-operator c.w. scorer in each club will be awarded a certificate under the same conditions. Only a bona fide resident member, operating a station in local club territory, may compete for club certificates.

c) ARRL will award a gavel to the affiliated club submitting the greatest aggregate phone and c.w. score by its members, whether single- or multiple-operator entries, provided such scores are confirmed by receipt at ARRL of the individual contest logs from such members. Only scores of bona fide resident members, operating stations in local club territory, may be included in club totals.

13) *Judges:* All entries will be passed upon by the ARRL Awards Committee, whose decisions will be final. The Committee will void or adjust entries as its interpretation of these rules may require.

14) *Disqualifications:* Each participant agrees to observe the contest rules as well as all regulations established for amateur radio in his country. Violation of any regulation, as confirmed by a single FCC citation or advisory notice or two ARRL accredited Official Observer reports, may constitute grounds for disqualification. Some examples of practices which can result in disqualification: off-frequency (out-of-band) operation, harmonics, spurious emissions, low tone reports in logs, key clicks, splatter, excessive sidebands, W (K) stations working banned countries. QST

Frequency Stability of Third-Overtone Crystal Oscillators

Measurements of the Effects of Tuning, Temperature and Supply Voltage on the Stability of V.H.F. Converters

This information on overtone crystal operation was submitted as an OES Report by W4LNG. In view of its interest to v.h.f. enthusiasts, we are happy to pass it along to *QST* readers in full detail.

BY RUTHERFORD L. ELLIS, JR.,* W4LNG

PROBABLY the most popular system of achieving local oscillator stability in v.h.f. converters for amateur use is the third-overtone crystal oscillator, followed by such multiplier stages as may be needed to develop energy at the desired injection frequency. The subject of this report is the simple triode oscillator recommended by the International Crystal Mfg. Co., using the triode portion of a 6U8 as the oscillator and the pentode section as a frequency multiplier.

The application is in the converter used for 144-Mc. reception at W4LNG. A 32.5-Mc. third-overtone crystal is used, with the 6U8 pentode doubling to 65 Mc. A 6CB6 doubles to 130 Mc. The oscillator is on a separate chassis from the converter, to permit experimentation, and to help in isolating the injection system and preventing unwanted frequencies from reaching the mixer.

Tests were made to determine the effect of temperature and voltage variations on frequency. A Hewlett-Packard v.h.f. counter was used to read frequency directly, and the oscillator was operated in a small environmental chamber to provide temperatures from 20 to 110 degrees Fahrenheit. These items of test equipment were provided by Aeroscience Electronics, Inc., in Atlanta. Checks were also made to determine the amount of pulling of the crystal frequency that could be obtained by the various schemes often employed for shifting the frequency of fundamental-crystal oscillators.

*77 Karland Drive N.W., Atlanta 5, Georgia.

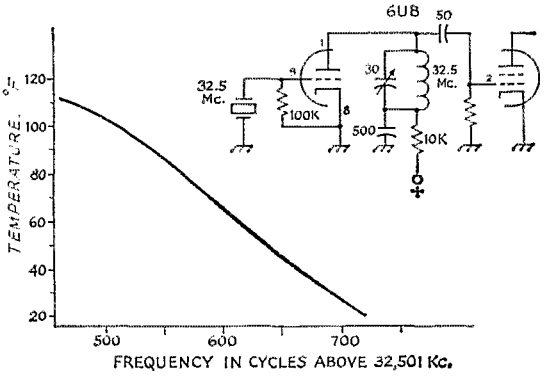


Fig. 1—Effect of temperature (environmental) on the frequency of an overtone crystal oscillator on 32.5 Mc. Frequency of reception with a crystal-controlled 144-Mc. converter would be varied by four times this amount. Simple crystal oscillator circuit, using the triode portion of a 6U8, was used for all tests.

TABLE I

Effect of Plate Circuit Tuning

Condition of Plate Circuit	*Frequency of Oscillation, Kc.*
Maximum Capacitance	32,501.889
Maximum Output (near Max. *C*)	32,501.808
Near Middle of Oscillation Range	32,501.533
Minimum Capacitance	32,501.472

The first test was to determine the effect of plate-circuit tuning on frequency. In this type of oscillator the plate circuit must provide a feedback voltage at the overtone frequency, through the grid-plate capacitance of the tube, in order for the circuit to oscillate on the overtone frequency. (Inadequate plate-circuit *Q*, or mistuning, may occasionally allow oscillation to take place at the *fundamental* frequency of the crystal, which is approximately one-third the marked frequency.) It is not surprising that tuning affects the frequency to some extent. Table I gives the frequency at which maximum output occurs, the frequencies at which oscillation ceases as the circuit is tuned either side of resonance, and the frequency at the middle of the tuning range. It will be seen that the total variation is less than 500 cycles at the frequency of oscillation, or less than 2 kc. at the frequency of reception in a 2-meter converter.

The effect of changes in temperature, with the plate circuit tuned for approximately maximum output and the supply voltage held constant, is shown in Fig. 1. Signal-frequency change over this range would be less than one kilocycle.

Effect of supply-voltage changes is shown in Fig. 2. Here the ambient temperature was maintained at about 82 degrees F. and the tuning was unchanged.

Fundamental-mode crystals can be "pulled" over a limited frequency range by changing the shunt capacitance across the crystal (antireso-

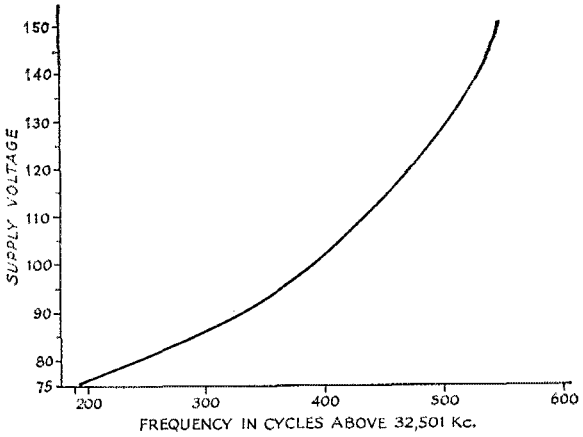


Fig. 2—Effect of varying supply voltage on the same crystal oscillator as used to obtain the data in Table I and Fig. 1. Temperature and tuning were held constant.

nant circuits) or by changing the series capacitance or inductance (series-resonant circuits). Fig. 3 shows the results of a study made to see if the frequency of an overtone crystal could be pulled with parallel capacitance. Series L and C had little effect.

These tests show that third-overtone crystal oscillators can be entirely satisfactory for crystal-controlled converter applications, if used at low drive levels and with reasonable precautions as to voltage regulation and temperature maintainance. With use of VR-tube regulation, and in normal room environment, such crystals can give a stability of plus or minus 100 cycles at the reception frequency. The crystal used in the tests was ordered as having a tolerance of 0.01 per cent. The actual room temperature frequency, 32,501.54 kc., is within 0.005 per cent of the 32,500.00 kc. requested.

Transmitter Applications

Overtone crystals definitely are not recommended by the writer for use in transmitters, except for very low-powered battery units. In order to achieve completely satisfactory transmitter stability, such crystals must be operated at very low power levels, so additional stages must be used to build the power level to usable proportions, thus nullifying the assumed economy or simplicity of such circuits. Their use does make it somewhat easier to avoid spurious frequencies by not generating any signals below the v.h.f. range to be passed on through frequency-multiplier stages, but fairly simple circuitry can accomplish the same objectives readily.

A few hours of critical listening on the v.h.f. bands, using a selective receiver and a beat oscillator, should convince anyone of the value of stable fundamental-mode crystal control. Chirpy c.w. keying and phone signals that drift rapidly across the band are often the results of overtone oscillators being run above their capabilities. They are all too common in amateur v.h.f. work today. Of course, fundamental crystals can be guilty of the same faults to some extent, if improperly used, but they will take a lot more abuse before exhibiting unsatisfactory frequency control capabilities. QST

Overtone crystals (fifth, seventh and higher *odd* overtones, as well as the third, mentioned by W4LNG) are processed and mounted in special ways to enhance their ability to operate in the overtone mode. These cuts and mounting methods are in part responsible for the instability he describes. When fundamental-type crystals are made to operate on their odd overtones by adding various regenerative circuit devices, as described in many *QST* and *Handbook* articles, the voltage and temperature characteristics are essentially the same as those obtained with the same crystals operated on the fundamental mode, and followed by frequency-multiplier stages. The degree of regeneration required varies from one crystal to another, however, and adjustment for overtones above the third is a tricky business, so achievement of good stability is somewhat more complicated than with the same crystal operated on its fundamental mode. — *Editor*

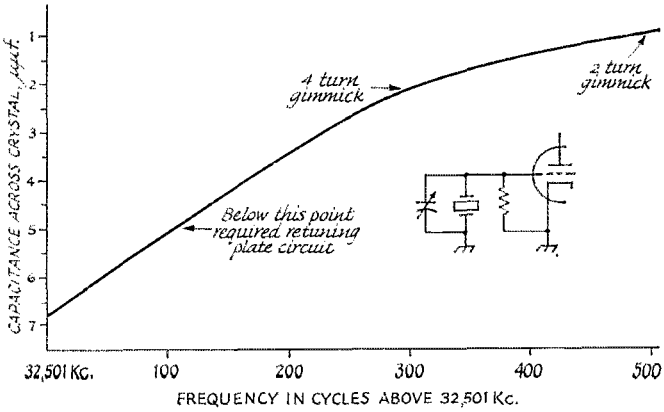


Fig. 3—Pulling of the overtone crystal oscillator frequency by adding capacitance across the crystal. Circuit ceased oscillating with 5 μμf. added, until plate circuit was retuned.

Hints and Kinks For the Experimenter

TRANSISTOR SQUELCH CIRCUIT

I BUILT the transistor communications receiver described by Priebe,[1] installed it in my car as a mobile receiver, and used it to monitor the local mobile radio club frequency. For convenience, I decided to add a squelch to the circuit.

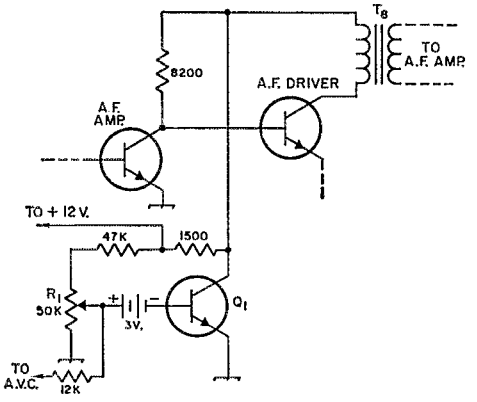


Fig. 1—KØPOX transistor squelch circuit. Transistor Q_1 is a 2N94 or equivalent.

The squelch circuit, shown in Fig. 1, is quite simple, yet effective. Basically, it is a d.c. amplifier which supplies the current to the a.f. driver section of the receiver. When transistor Q_1 is conducting (no signal), the voltage at its collector is practically zero, and the audio driver section of the receiver will be inoperative. However, when an incoming signal causes the a.v.c. voltage to drop, the resulting bias on Q_1 cuts off the transistor so that the collector voltage of Q_1 will rise up to the supply voltage, and the a.f. driver stages will become operative.

The squelch threshold point is controlled by the potentiometer R_1.

— Don C. Springer, KØPOX

[1] Priebe, "All-Transistor Communications Receiver," *QST*, February, 1959.

HOMEMADE HONEYCOMBS

THE NAA receiver article in October *QST* brought back fond memories. In fact, it inspired me to dig out one of my early log books in which I found, along with stations worked, how-to-make-it instructions for honeycomb coils. For those who would like to wind their own, here are the original instructions:

Procure a circular block of wood, 2 inches in diameter. Drive 1¼-inch wire brads into the wood at equal distances, about 20 on each side. Space the two rows about ¾ of an inch apart as shown in Fig. 2. Now wind with d.c.c., No. 22 or 24, after putting a strip of cardboard or stiff paper around the disk between the row of nails. Wind until sufficient number of turns is secured, and then soak thoroughly with shellac or coil dope. The number of turns needed when used in shunt with a variable .001 μf. condenser [1] are as follows:

Turns	*Wavelength in Meters*
25	120 to 375
35	180 to 515
50	240 to 730
100	450 to 1460
250	1300 to 4000
400	2050 to 6300
500	3000 to 8500
1500	15,000 to 24,000

Other values can be found readily by interpolation.

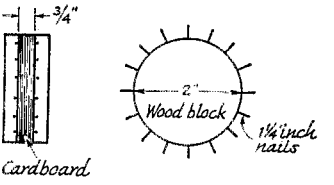


Fig. 2—The honeycomb coil is wound on a 2-inch wooden disk.

Allow to dry and then remove the nails. Wind tape around the outside and then remove gently from the disk. Fasten the coil to a blown-out fuse cartridge by wrapping with tape. The coil is now ready and can be plugged into the fuse clip socket. If the coil coupling is to be made adjustable, the fuse mounting needn't be used. Coils can be mounted on wooden doweling and slid back and forth.

With so many local b.c. stations on the air now it will probably be necessary to use three coils with some arrangement for loosening the coupling between the antenna-ground coil and the tuned grid coil. If there is only one local b.c. station, either a series- or shunt-type wave trap can be easily constructed to eliminate it.

— Hartwell M. Hughes, WA6VXN (ex-1BIP)

[1] Editor's Note: Capacitor.

MORE ON EQUIPMENT FEET

THE "Hint & Kink" in November *QST* describing some No Scratch Equipment Feet reminded me of my own efforts along this line. I have my solution to the problem: simply drill ¼-inch holes in each corner of the project's bottom plate and pop in some ¼-inch rubber grommets! *— Anthony L. Pinto, WA2YJX*

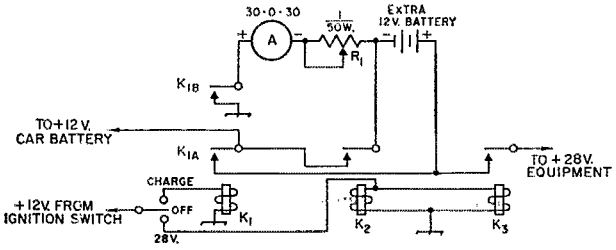


Fig. 3—W8MNX circuit for 28-volt mobile operation.
K_1—D.p.s.t. 12-volt relay, 15-amp. contacts (Advance PG/2X/12VD).
K_2, K_3—Dynamotor starter relays, 12-volt coil (Advance ES/1A/12VD).
R_1—1-ohm, 50-watt rheostat.

28 VOLTS FOR MOBILES

A LOT of war-surplus equipment applicable for mobile use is available, but this equipment usually requires 28 volts d.c. for operation. There have been many systems described in the past for obtaining 28 volts for use in automobiles, but none of them satisfied me.

The circuit in Fig. 3 uses two readily available and inexpensive dynamotor starters, a 10-amp. relay and an extra 12-volt battery. Features of the circuit are: the auxiliary battery may be switched completely out of the circuit; there is no danger of shorting the battery through relay sequence or stuck relay contacts; charging the extra battery is selective and the charging rate is adjustable and monitored; the 28-volt equipment cannot be operated unless the ignition switch is turned on.

The purpose of the 1-ohm rheostat is to limit the current from the auxiliary battery in the charging condition. If a heavy load is applied to the car battery, the rheostat will limit the current from the extra battery to a level that will not harm the low current contacts on K_1.

The dynamotor starting relays are also war surplus, although others are available new, but at a much higher price. I have used this circuit now for over eight months with satisfactory results.

— *John G. Gilliam, W8MNX*

230 VOLTS FROM 115-VOLT GENERATORS

MOST houses today are wired for single-phase, 230-volt, center-neutral service. If you have an emergency generator that supplies 115 volts, only part of the circuits in the house can be powered at one time, since the 230-volt circuit is usually split into two 115-volt circuits.

The circuit in Fig. 4 shows how a 115-volt single-phase generator can be used to power a 230-volt circuit by using an autotransformer. Any old transformer with a 115/230-volt primary winding and a wattage rating equal to one half the load will do. The unused secondary winding

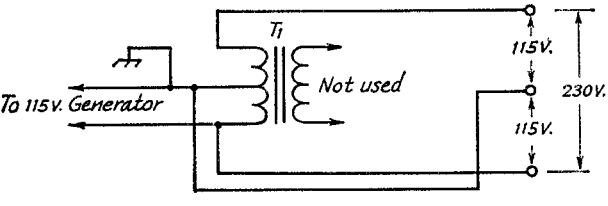


Fig. 4—W8YHX's autotransformer.

can either be disconnected or removed. It is a good idea, also, to ground the frame of the generator and transformer. Try to put the generator across the leg with the heaviest loading.

— *Norman A. Godwin, W8YHX*

WHAT CAR VOLTAGE?

MOST equipment available for mobile use today is designed for 12-volt d.c. operation. If you are in the market for a new or used car and are considering mobile operation, the car battery voltage is an important factor. The list below shows the battery voltage of most American cars up to the present. It may not be too long before this table is obsolete — there is talk in automotive circles about going to 24-volt d.c. systems in cars!

Car Year	*Voltage*
1952 and before	All cars are 6-volt.
1953	Olds, Cadillac, Buick 50 and 70 series, Chrysler Crown Imperial are 12-volt.
1954	Olds, Buick, Cadillac, Chrysler Crown Imperial, Nash Metropolitan are 12-volt. All others are 6-volt.
1955	GM, Chrysler Crown Imperial, Packard, Nash Metropolitan are 12-volt. All others 6-volt.
1956 to present	All cars are 12-volt.

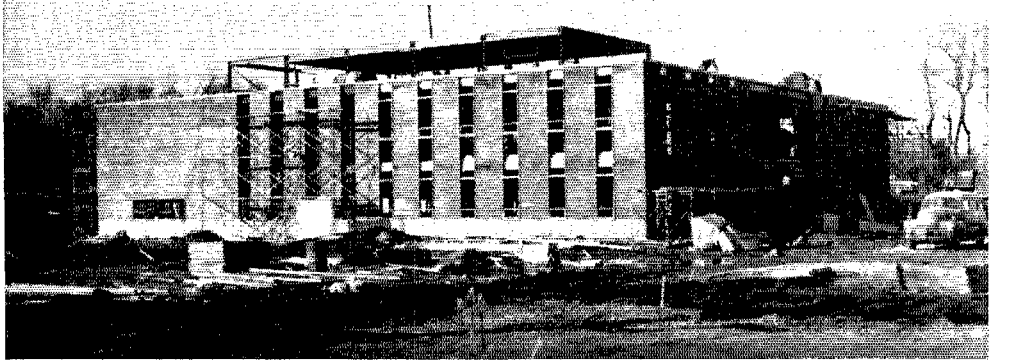
— *Laird Campbell, W1CUT*

CHASSIS AND PANEL LAYOUT

A COMMON practice in the machine-shop and sheet-metal industries is to coat the metal to be fabricated with a blue-colored alcohol base dye, known as "layout blue." The dye enables the worker to scribe accurately the dimensions of holes, bending lines, etc. Once the item is fabricated, the layout blue is removed with either paint thinner or a commercial vapor degreaser.

I recently discovered that the common felt-tipped "Magic Markers" available in most stationery, five-and-dime, or drug stores will work exactly like layout blue. Using the marker pencil, it is possible to color areas where drilling, punching, bending, etc., is required. Scribe lines as required and proceed with the fabrication. When finished, remove the ink with common nail-polish remover. This technique lends itself to more professional and accurate chassis and panel work.

— *Robert F. Aberle, W2QPP*



Building Fund Progress

More than 5,000 League supporters have, at copy time late in November, contributed upwards of $65,000 to the ARRL Building Fund, or slightly more than one-fourth of our goal. An increase in the flow of contributions during October and November, including a pleasing response from members of the Quarter Century Wireless Association, pushed the drive up a couple of more notches on the tower. Response to President Hoover's reminder letter in our December issue is just commencing as we write, and by the end of the year we would hope for achievement of well over one-third of our goal.

The breakdown by divisions, with percentage of quota received, is as follows as of November 23rd:

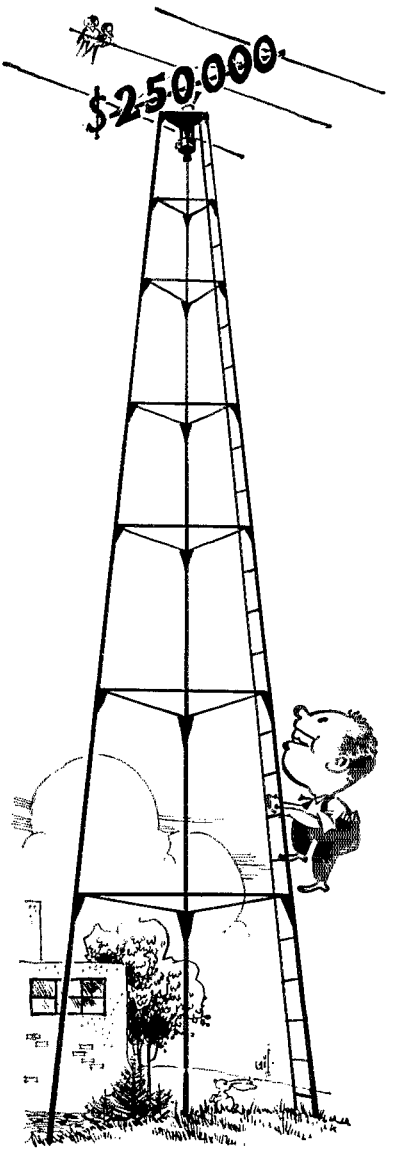
Hudson	36.9%	Atlantic	22.3%
Central	34.8	Canada	20.3
Roanoke	29.7	Delta	20.2
Dakota	28.9	Midwest	19.6
New England	27.6	Rocky Mt.	19.4
Southwestern	26.3	Great Lakes	17.6
West Gulf	24.7	Pacific	16.0
Northwestern	24.5	Southeastern	14.5

—...—

Construction of the building itself has moved quite rapidly; compare the picture on this page with earlier *QST* illustrations of the site! All concrete floors have been poured, outside masonry is nearly complete, the roof is finished, and after extensive delays in procurement of materials the window subframes are installed and glazing is now in progress. The result will be to get the building closed in sufficiently so that the inside work of plumbers, plasterers, carpenters and electricians may proceed despite New England's winter weather.

—...—

No date has been set specifically as the target for accomplishing our goal. However, it is our hope to have the drive largely complete by the time of occupancy, now estimated as May or June of 1963. To do this, we'll have to keep moving ahead! If you have not already done so, fill out the form in December *QST* (or if not convenient, send us a check and *we'll* take care of it), and add your name to the growing list of participants in the Building Fund. Let's shortly find ourselves obliged to adopt WØERS' suggestion and, in the interests of safety, put a lineman's belt on our tower-climbing ham! QST—



Members Are Saying . . .

Here is my contribution, and I wish it could be larger. I have been a member of the League since about 1920, and this seems little enough support for all the things the League has done for amateur radio from the beginning of time: instructor in the art; defender against hungry commercial interests; representative to the government; promoter of good operating practices; devisor of contests; encourager to the initiate; pioneer in technique; cultivator of international friendship; tenacious guardian of our precious rights and privileges; in every phase of our hobby the League has been Mr. Ham Radio. Without the ARRL, I doubt there would be amateur radio anywhere in the world today. — *W8FVT.*

Last night our club held an auction, at which all items were donated by members with the express purpose of the funds being sent to ARRL for the new building. Enclosed is a check representing all the proceeds. Best wishes from all the gang for success. — *Irvington Radio Amateur Club.*

Although I have been a ham for only three years, I realize that I owe a lot to the League. Seeing how at the last international radio conference the amateurs of other countries lost some of their frequencies, but the U. S. kept all theirs, it appears quite obvious that, if there had been no League to voice a unified opinion, most if not all amateur privileges would have been lost by now. Hope that sometime I will be able to go east and see the new headquarters. — *W1GJXH.*

Enclosed is a cheque. Some weeks ago I attended a club meeting at my previous location in which a contribution for the club was brought up. The president said he couldn't see what ARRL had done for anyone. A few minutes later someone brought up the idea of a local code-practice net; the president's next statement was all one had to do is tune into W1AW!

I'm not a ham, but a staunch League member. — *Lawrence C. White, Prescott, Ont.*

Don't look for any red lights — it's go all the way! I'm glad that ARRL was here before I was born, and I want to see that it's here long after all of us are gone. There's no other better way to participate than to jump right in; sorry I couldn't splash more water on you with the enclosed. — *W15CON.*

We recently voted to donate to the fund. The League has done much to guide, coordinate and organize the activities of thousands of radio amateurs in the past and we are sure it will continue to do the same in the future. — *Atlanta Radio Club.*

I do not consider the enclosed check a donation but an investment in the League and the future of ham radio which I fully intend to enjoy for another 34 years of membership. — *K4TNA/KL7.*

Herewith a check. In addition, the club membership is being canvassed for individual contributions. All such donations will be forwarded sometime in the near future. We wish to express our appreciation for the many fine services offered by the League and its contributions to amateur radio. — *Nittany Amateur Radio Club, Pa.*

We have made a collection to support the building fund and hope you will accept the enclosed as a symbol of your efforts for the amateur movement. — *Gothenburg Radio Amateur Society, Sweden.*

Enclosed is my contribution. I am a fairly new amateur and member of the League (haven't even been on the air yet) but I can still appreciate the work you have done and the need for the organization and representation provided by ARRL. — *W1SFOT.*

I think ARRL helps all the amateurs around the world and I want myself to help for the new building. Please find contribution enclosed. — *FG7XT.*

In arriving at an amount for the fund I could not go along with the suggestion of one dollar for each year of license. Heck, boys, I have had my ticket for only four years. However, although I am 52 years young I hope to be around for another 25 years. So my contribution is keyed to the future and not to the past. — *K3QEV.*

Enclosed is a check. I am especially indebted to the League, for it is through amateur radio that I developed an interest in and knowledge of electronics. I plan to study for a degree in electrical engineering, and I have gained enough knowledge of electronics through ham radio already to work as an electronics technician. It is quite evident that, without the League, amateur radio would not exist as we know it today. — *W7IST.*

Am an s.w.l., just too dumb to get code, I guess. But am proud to be an associate member; here's my check. — *Al Sanderse, Clifton, N. J.*

To really know the value of ARRL, it seems almost necessary that one be outside of its beneficial environment for a time. I operated KR6GH for a year after becoming interested in ham radio overseas, and I can honestly say that the small contribution I can give to the fund is only a drop in the bucket in comparison to the warm feeling of returning to the states as an ARRL member. Best wishes in the campaign. — *K7NIA.*

After 30 years enjoyment of the world's best hobby, the enclosed is only a small donation, but every little bit helps to house our organization in adequate quarters to carry on the very fine work of many years past. I am most appreciative of all the efforts the League has put forth in our behalf. — *W9PGW.*

If I were to try and evaluate the good I have received from ARRL the bill I would owe in recompense would be staggering. So I hope you realize the small amount enclosed is exactly what I can afford; would it could be more. In all the years I have been a ham, it has been my policy to encourage new hams to belong to the League, but I am sorry to say not always successful. If perhaps the League itself took a more positive attitude and bigger efforts in the blowing of its own horn there might be a larger response. So many of the newcomers are not aware of the part played by the League in our very existence. — *W4TRS.*

Happenings of the Month

Examination Schedule

420 Power Limit Removed

Director Election Results

Commemorative Stamp

Easier Mobile Logging Proposed

Reciprocal Licensing

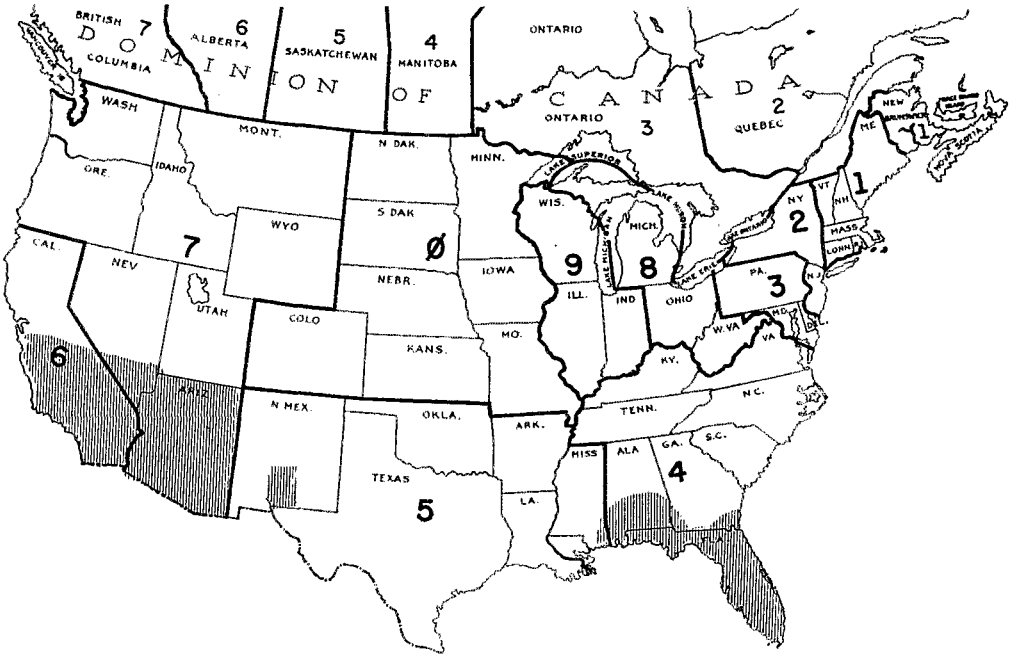
DIRECTOR ELECTION RESULTS

The contested portion of the ARRL autumn elections has resulted in the re-election of all five directors who faced the ballot. Thus, for the second time in five years, there are no "freshman" directors on the Board.

Central Division amateurs re-elected their director, **John G. Doyle, W9GPI,** by the resounding total of 2837 votes to 1142 for Kermit A. Slobb, W9YMZ. **Milton E. Chaffee,** W1EFW, garnered 1736 votes to 1308 for Robert York Chapman, W1QV, in retaining the New England director's post. On the opposite coast, longtime Northwestern Division director **R. Rex Roberts, W7CPY,** with 878 votes, defeated Harold W. Johnston, W7PN (791 votes) and Robert B. Thurston, W7PGY (462 votes). In the Rocky Mountain Division, **Carl L. Smith, WØBWJ,** was re-elected over Robert B. Miller, W7QPP, 674 to 250. **Raymond E. Meyers, W6MLZ,** won re-election in the Southwestern Division with 2200 votes to 1545 for Howard F. Shepherd, jr., W6QJW.

Former Southwestern vice-director **Virgil Talbott, W6GTE,** has returned to that post after a two-year rest by defeating Lyle G. Farrell, W6KGC, 2164 to 1639. In the Northwestern Division, there was no eligible candidate for vice-director; therefore, in accordance with By-Law 6, the incumbent, **Robert B. Thurston, W7PGY,** will continue in office until the next regular election.

As we reported in November (page 61), Directors Kahn of the Hudson Division, Anderson of Roanoke and Best of West Gulf, vice-directors



The shaded areas on this map indicate the approximate sections where 420-450 Mc. power inputs are still restricted to 50 watts. See the text of the Report and Order at the end of this department for exact boundaries.

Haller (Central), Dannals (Hudson), Green (New England), Abernathy (Roanoke), Sampson (Rocky Mountain) and Bryan (West Gulf) were declared re-elected, as the only eligible candidates for their respective posts. The new terms for directors and vice-directors commence at noon (EST) January 1, 1963.

420–450 Mc. POWER LIMIT REMOVED

The FCC has adopted amendments to the amateur rules as requested by the League and proposed in Docket 14610, removing the 50-watt power limit on the 420–450 Mc. band except in some areas of the South and Southwest. In the areas where the restriction remains, individual amateurs may be able to get permission to run higher power on a case-by-case basis. Application should be made to the District FCC Engineer-in-Charge, who will clear it with the Military Area Frequency Coordinator. The text of the Report and Order appears at the end of this department.

FCC PROPOSES SIMPLIFIED MOBILE LOGGING

Acting on a petition filed by the League, FCC has issued a Notice of Proposed Rulemaking, Docket 14853, to simplify mobile log-keeping by eliminating the need for individual time entries during a period of continuous mobile operation. If the proposal is adopted, section 12.136 (a) would read as follows, the addition being indicated in italics:

> The date and time of each transmission, *except that for a period of continuous mobile operation, the time of each transmission may be omitted, provided that the dates and times of commencing and terminating such mobile operation are entered in the log.* (The date need only be entered once for each day's operation. The expression "time of each transmission" means the time of making a call and need not be repeated during the sequence of communication which immediately follows; however, an entry shall be made in the log when signing off so as to show the period during which communication was carried on.)"

Interested persons may file comments in this docket on or before December 31, 1962, an original and fourteen copies being requested.

RECIPROCAL LICENSING BILL

In the past session of Congress, Senator Barry Goldwater introduced a bill, S.2361 (H.R. 9684 in the House), which would have amended the Communications Act to allow the issuance of licenses to amateurs from other countries whose governments will issue licenses to U. S. citizens. The bill made considerable progress behind the scenes, getting approval in principle (but with some administrative problems raised) from the government agencies who were asked to "clear" the bill. However, the Communications Sub-Committee of the Senate Commerce Committee was so tied up with the administration's satellite bill that it was not able to schedule our hearings. Senator Goldwater has informed us that he is rewriting the bill to include suggestions received from the government agencies, and will introduce it into the 83rd Congress early this month. Keep an ear out for late information on W1AW's regular bulletin schedules.

FCC GETS TOUGH

Recently, the FCC issued an "Order to Show Cause" looking toward the *revocation* (not suspension!) of an amateur station license because the licensee failed to answer a notice of violation and two follow-up letters. This policy has been in force for some time in respect to the Citizens' and other radio services, but so far as we know it is the first time it has been used on amateurs. There are indications that "Orders to Show Cause" will henceforth be issued to all amateurs and other licensees who do not answer their mail from FCC. The moral is simple: if you should happen to get a notice of violation from the FCC, answer it promptly and honestly if you value your license!

LEAGUE REQUESTS COMMEMORATIVE STAMP

In accordance with a motion adopted at the 1961 meeting of the Board of Directors, the League has written the U.S. Postmaster General requesting the issuance in 1964 of a commemorative stamp honoring radio amateurs. Since it is impossible to set an exact date for the beginning of amateur radio itself, the Board felt that the fiftieth anniversary of organized amateur radio i.e., the foundation of the League, would be a suitable date on which to seek issuance of a stamp. The request is, however, for a stamp honoring the amateur radio service, not specifically our organization.

The letter mentions the emergency service work of amateurs, including Field Day and the Amateur Radio Emergency Corps; pioneer technical work, such as the Transatlantic Tests of the early twenties and the propagation studies of the International Geophysical Year; amateur space exploration, i.e., Project Oscar; amateur radio as a training ground for engineers and technicians in the electronics industry; and recognition of the amateur service's achievements by the various states, as through declaration of Amateur Radio Weeks and issuance of call-letter license plates.

The support of various organizations and publications in the stamp-collecting world is being sought to strengthen our request. Letters to Congressmen are not particularly useful in seeking commemorative stamps. Amateurs and club groups interested in supporting the project should register endorsement by writing the Postmaster General.

STAFF ANNIVERSARIES

Twenty-five members of the ARRL Ten-Year Club held their second meeting of the year in October to welcome three new members (if the

adjective "new" can be applied to people who have been around for ten years to qualify!) and to honor one achieving the 25-year mark. Miss Marion Bayrer, who started her labors for ARRL as a file clerk in 1937, now holds the title of Circulation Assistant, inadequate to express the many tasks she performs with quiet efficiency at headquarters: supervision of all outgoing mail, the handling of individual orders for publications, ordering of office supplies, securing temporary clerical help, overseeing the reception desk and switchboard, straightening out difficulties in *QST* delivery, and the like. She has been particularly active in our ARRL Girls' Club, as one of the original members and several terms an officer.

Marking off ten years at Hq., Bob and Ellen White, W1WPO and W1YYM, are no strangers to contest and awards enthusiasts. Bob is, of course, in charge of the DXCC desk, carefully checking each card (yes, that's right!) submitted, doing background research on each place proposed for addition to the countries list to assist the DXCC Committee in arriving at its conclusions, and keeping up the records of more than 8500 DXCC participants. He is also in charge of TVI matters.

Ellen is Assistant Communications manager, a title which covers a great variety of jobs: supervising the contest log-checking team, writing up contest results, coordinating and laying out the copy submitted by the department for *QST*; editing the CD and LO bulletins and several other tasks. The Whites have had several ham calls each: Bob has held W6QFZ, W2QPZ, KH6QJ and W6YYN; Ellen has worn out W2RBU, KH6QI and W6YYM, under which she was SCM of San Diego Section.

Charles R. "Chuck" Bender, W1WPR, after ten years, is equally at home with a mike, bug, keyboard, soldering iron and hearty handshake. As one of two full-time men at W1AW, he must be greeter, fixer and operator, in almost equal proportions. A native of Pittsburgh, Chuck held the call W3ODU until he came East a decade ago.

CITIZENS RULES PROPOSALS

Generally speaking, we feel it is not *QST*'s business to report on activities in the Citizens Radio Service. FCC has recently proposed, in Docket 14843, rather sweeping changes in the Citizens rules, however; for the benefit of those ARRL members who also hold CB licenses we present a brief summary.

A key sentence in Docket 14843 follows: "While the permissible communications in the Citizens Radio Service are considerably broader in scope than in most of the other Safety and Special Radio Services, there has been no intention to permit the operation of radio solely for the amusement of the operator or as a hobby in and of itself." The proposed changes will make the Commission's intent more apparent.

One proposed rule would cut down on CB antenna abuses by allowing CB antennas only at the 20-foot level of, for instance, a 100-foot tower supporting a TV antenna. Another would restrict communications between units of different stations (that is, licensed to different people) to channels 12, 13, 14, 15 and 23; would restrict such communications to those directly related to and necessary for the efficient conduct of the business or household of either or both of the licensees or to effectively control the movement of vessels, aircraft, vehicles or persons; and further reduce the duration of such communications to three consecutive minutes, after which a five-minute silent period must be observed. These restrictions do not apply to units of the same station communicating with each other, such as a store-owner talking to delivery trucks, or a salesman talking to his office.

Use of CB stations for Civil Defense purposes is completely spelled out in the proposal, including a provision that drills of a radio unit alone must be limited to one hour per month, though drills involving other branches of CD, in addition to the CB radio units (such as radiation detection units) are not so limited. There is an extensive list of prohibited uses, one of which reads: "A citizens radio station may not be used . . . for transmitting communications to stations of other licensees which relate to the technical performance, capabilities, or testing of any transmitter or other radio equipment, including transmissions concerning the signal strength or frequency stability of a transmitter." A number of rules, concerning operation of a station by other than the licensee; repairs to a transmitter; record-keeping and notification; intercommunication, and so on would be tightened or clarified by the proposed amendments.

The Notice of Proposed Rulemaking, which runs 23 mimeographed pages, will undoubtedly be covered more completely in magazines catering to the Citizens Band. Perhaps, if demand does not exceed supply, copies may be obtained from FCC in Washington. Interested parties may comment on the docket on or before January 15, 1963. An original and 14 copies of statements, briefs or comments shall be furnished. Reply comments are due January 31.

EXAMINATION SCHEDULE

THE Federal Communications Commission will give Extra and General Class amateur examinations during the first half of 1963 on the following schedule. Remember this list when you need to know when and where examinations will occur. Where exact dates or places are not shown below, information may be obtained, as the date approaches, from the Engineer-in-Charge of the district. *Even stated dates are tentative and should be verified with the Engineer as the date approaches.* No examinations are given on legal holidays. All examinations begin promptly at 9 A.M. except as noted.

Albuquerque, N. M.: April 6, at 11:00 A.M.
Anchorage, Alaska, 53 U. S. Post office Bldg.: By appointment.

Atlanta, Georgia, 718 Atlanta National Bldg., 50 Whitehall St., S.W.: Tuesday and Friday at 8:30 A.M.
Bakersfield, Calif.: Sometime in May.
Baltimore 2, Md., 415 U. S. Customhouse, Gay and Water Streets: Monday and Friday, 8:30–10:00 A.M. and by appointment.
Bangor, Me.: May 8.
Beaumont, Texas, 301 P. O. Bldg.: By appointment only.
Billings, Montana: Sometime in May.
Birmingham, Ala.: March 6, June 5.
Boise, Idaho: Sometime in April.
Boston, Mass., 1600 Customhouse: Wednesday through Friday 9:00 A.M. to 10 A.M.
Buffalo, N. Y., 328 P. O. Bldg.: 1st and 3rd Fridays.
Charleston, W. Va.: Sometime in March and June.
Chicago, Ill. 826 U. S. Courthouse: Friday.
Cincinnati, Ohio: Sometime in February and May.
Cleveland, Ohio: Sometime in March and June.
Columbus, Ohio: Sometime in January and April.
Corpus Christi, Texas: March 7, June 6.
Dallas, Texas, 401 States General Life Insurance Bldg.: Tuesday.
Davenport, Iowa: Sometime in January and April.
Denver, Colo., 521 New Customhouse: 1st and 2nd Thursdays, 8 A.M.
Des Moines, Iowa: Sometime in March and June.
Detroit, Mich., 1029 Federal Bldg.: Wednesday and Friday.
El Paso, Texas: June 13.
Fairbanks, Alaska: Sometime in May.
Fort Wayne, Ind.: Sometime in February and May.
Fresno, Calif.: Sometime in March and June.
Grand Rapids, Mich.: Sometime in January and April.
Hartford, Conn.: March 13.
Honolulu, Hawaii, 502 Federal Bldg.: Monday through Friday.
Houston, Texas, New Federal Office Bldg., 515 Rusk Ave.: Tuesday.
Indianapolis, Ind.: Sometime in February and May.
Jackson, Miss.: June 5.
Jacksonville, Fla.: April 18, 19.
Kansas City, Mo., 3100 Federal Office Bldg.: Thursday and Friday, 8:30 A.M. to 1:00 P.M.
Klamath Falls, Ore.: Sometime in May.
Knoxville, Tenn.: March 20, June 19.
Little Rock, Ark.: February 6, May 1, 1:00 P.M.
Los Angeles, Calif., 849 So. Broadway: Wednesday, 9:00 A.M. and 1:00 P.M.
Louisville, Kentucky: Sometime in February and May.
Marquette, Mich.: May 8, 10 A.M.
Memphis, Tenn.: January 10, April 4.
Miami, Fla., 312 Federal Bldg.: Thursday.
Milwaukee, Wis.: Sometime in January and April.
Mobile, Ala. 439 U. S. Courthouse and Customhouse: Wednesday by appointment.
Nashville, Tenn.: February 6, May 1.
New Orleans, La., 608 Federal Bldg., 600 South St.: Monday at 8:30 A.M.
New York, N. Y., 748 Federal Bldg., 641 Washington St.: Tuesday through Friday.
Norfolk, Va., 105 Federal Bldg.: Friday only.
Oklahoma City, Okla.: January 18, April 19.
Omaha, Nebr.: Sometime in January and April.
Philadelphia, Pa., 1035 New U. S. Customhouse: Monday through Wednesday, code tests 8:30–10:00 A.M.
Phoenix, Ariz.: Sometime in January and April.
Pittsburgh, Pa.: Sometime in February and May.
Portland, Maine: April 9.
Portland, Ore., 201 U. S. Courthouse: Friday, 8:45 A.M.
Rapid City, S. D.: May 11, 8 A.M.
Roanoke, Va.: April.
St. Louis, Mo.: Sometime in February and May.
St. Paul, Minn., 208 Federal Courts Bldg.: Fri., 8:45 A.M.
Salt Lake City, Utah: March 9, June 7, 1:00 P.M.
San Antonio, Texas: February 7, 8, May 2, 3.
San Diego, Calif., Fox Theater Bldg.: Wednesday, by appointment.
San Francisco, Calif., 323-A Customhouse: Friday.
San Juan, P. R., 323 Federal Bldg.: Friday.
San Pedro, Calif.: Wednesday, 8 A.M.
Savannah, Ga., 214 P. O. Bldg.: By appointment.
Schenectady, N. Y.: March 13–14, June 12–13.
Seattle, Wash., 806 Federal Office Bldg.: Friday.
Sioux Falls, S. D.: March 19, June 18, 10 A.M.
Spokane, Wash.: Sometime in April.
Syracuse, N. Y.: Sometime in January and April.
Tampa, Fla., Room 201, 221 No. Howard Ave.: By appointment.
Tucson, Ariz.: Sometime in April.
Tulsa, Okla.: January 16, April 17.
Washington, D. C., 1101 Pennsylvania Ave., N.W.: Tuesday, and Friday. Code tests 9:30 A.M. and 1 P.M.
Wichita, Kansas: Sometime in March.
Williamsport, Pa.: Sometime in March and June.
Wilmington, N. C.: June.
Winston-Salem, N. C.: February, May.

NOTE: Only General Class and Amateur Extra Class license examinations are given at FCC offices and examining points listed above. All examinations for Novice, Technician and Conditional Class licenses are conducted by volunteer supervisors.

Minutes of Executive Committee Meeting
No. 290
November 19–20, 1962

Pursuant to due notice, the Executive Committee of The American Radio Relay League, Inc., met at the Shoreham Hotel in Hartford, Connecticut, at 7:55 P.M. November 19, 1962. Present: President Herbert Hoover, jr., in the chair; First Vice-President W. M. Groves; Directors Robert W. Denniston, John G. Doyle, Noel B. Eaton and Morton B. Kahn; General Manager John Huntoon; Vice President F. E. Handy; and Treasurer David H. Houghton. General Counsel Robert M. Booth, jr., was also present.

On motion of Mr. Doyle, unanimously voted to APPROVE the minutes of the September 29 meeting.

On motion of Mr. Denniston, after extended discussion, unanimously VOTED that the President is requested to prepare for the consideration of the Committee a statement of principles as to frequency band usage, minimum power, minimum bandwidth, etc., to amplify the Committee's action of July 9, 1962, in the matter of reducing congestion in the amateur bands.

On motion of Mr. Groves, after discussion, unanimously VOTED that the Secretary request Maxwell Meyers, W2BIB, to submit a written statement and proof in support of his charges of improper action and conduct by certain League officers and employees, and that action upon Mr. Meyers' application for membership be deferred until he has replied to the request.

On motion of Mr. Denniston, unanimously VOTED that Messrs. Kahn, Houghton and Huntoon, acting jointly, are granted authority to proceed with negotiations for the sale of the League property at 38 LaSalle Road in West Hartford, Connecticut.

Considering the matter of a pamphlet proposed by the Public Relations Committee containing information on amateur radio for the general public, on motion of Mr. Kahn, unanimously VOTED to accept an offer of outside professional help in preparing such a pamphlet.

On motion of Mr. Groves, unanimously VOTED to approve the holding of a West Gulf Division Convention in McAllen, Texas, June 21–23, 1963.

On motion of Mr. Doyle, unanimously VOTED to amend the first portion of paragraph 4 of the Rules and Regulations Concerning Affiliated Societies to read: "At least 51% of the voting members of an affiliated society must be Full or Associate members of the League: . . ."

On motion of Mr. Eaton, affiliation was unanimously GRANTED to the following societies:

Beaches Amateur Radio Society	Jacksonville Beach, Fla.
The DX Amateur Radio Club	Camden, South Carolina
East Coast V.H.F. SSB Association	Passaic, N. J.
Edgewood Amateur Radio Society	Covina, Calif.
Ellsworth Amateur Radio Club	Ellsworth AFB, So. Dak.
Illinois Medical Center Wesley Foundation Amateur Radio Club	Chicago, Ill.
Keesler Amateur Radio Club	Keesler AFB, Miss.
Lynchburg Amateur Radio Club	Lynchburg, Va.
Lake Shore Amateur Radio Association	West Springfield, Pa.
Marina Amateur Radio Club	Torrance, Calif.
North High Amateur Radio Club	Binghamton, N.Y.
Schuykill County Amateur Radio Club, Inc.	Pottsville, Pa.
Southern Piedmont Amateur Radio Club	Hickory, N.C.

(Continued on page 156)

The Templeton Case

BY JACK NAJORK*, K9ODE

Author's Note: **The Templeton case is now history. It was reported in piecemeal fashion at the time because of the security measures involved. Copies of letters, telegrams and newspaper clippings tell the story far better than I can, and my primary purpose here is to present them in the correct sequence. Those portions of the case not documented have been reviewed and approved by the principals involved, with the exception of the late Godfrey Smith. Those portions of the history not included in clippings and letters have been reconstructed from the notes I took during the time I lived in Templeton.**

News Item, Templeton *Daily Star* April 15, 1958.

Frank P. Stevans, Executive Vice President of Templeton Broadcasters, Inc., announced today that the FCC had approved the sale of WKOO-TV to Godfrey Smith Associates of San Francisco. The new management will take over the station on May 1, 1958.

Godfrey Smith is well-known in engineering, business and political circles. He was graduated with high honors from Stanford University in 1928, and holds a Ph.D. in physics from Princeton. From 1933 to 1940 he was associated with Anderson Research Corporation. During the war years he served as Assistant Secretary of War for Advanced Projects, supervising the research and development work of the various universities. After the war, he entered politics, with two terms in the California Assembly and one in the California State Senate. In 1952, he refused another term, preferring to take over active management of his broadcast interests. He has, however, remained a powerful voice in party counsels. Mr. Smith has announced that he will serve as General Manager of WKOO-TV and will retain the present staff for the time being.

Ted Collins, engineer on duty at WKOO-TV, received the first telephone report four minutes after WKOO-TV began 7 A.M. programming. A viewer at Bonfire Hills reported the picture full of black lines. Seconds later a second call came in, this time from the Bruno subdivision some twenty-four miles south . . . "big black lines in the picture . . . no, they don't flash on and off . . . just stay there all the time . . . my little girl can't watch Droppet's Moppets. . . ."

After that the telephone switchboard started to light up like a haywire pinball machine. By 8 o'clock, as TV receivers clicked on in the 200,000-set market area of WKOO-TV, over a hundred reports of interference had been phoned in and the switchboard was jammed. A thorough check at the transmitter and studio showed the interference was positively external and, moreover, it was saturating practically the entire WKOO-TV primary and secondary coverage areas.

At 9 o'clock Ted Collins, together with Chief Engineer Jerry Barnes and two other technicians, set out to take some triangulation bearings with a Yagi antenna and field strength meter. They returned several hours later, muttering to themselves and visibly shaken. Their efforts to take bearings on the interference had failed for a very simple reason. The interference showed absolutely no directivity!

This, then, was how it started. The date was May 1, 1958. Strangely enough, it was just four years earlier on the same day that WKOO-TV began operations. Until then, Templeton had been a ham's haven, the nearest TV transmitter some 220 miles away. With WKOO-TV on the air, however, the situation changed overnight. Most hams in Templeton were aware they would now have TVI problems but they were totally unprepared for the events which followed.

Godfrey Smith, owner and general manager of WKOO-TV, had powerful political connections at both local and national levels. Within a week he had bulled legislation through the Templeton City Council which required all amateur radio stations in greater Templeton to pass inspection by the city's electrical department. Pending such inspection and approval, all amateur operation was restricted to the hours between midnight and 7 A.M. When Templeton hams openly refused to obey this ruling (now known as "Smith's midnight order") Smith ruthlessly attacked the hams at the state level and only quick action by the League stopped pending legislation at this point. Despite Godfrey Smith's powerful Washington affiliations, his next attempts to restrict amateur operation through direct orders from the FCC ended in failure. At this point he returned to Templeton and started a local attack through full-page newspaper spreads which placed all responsibility for any poor reception of WKOO-TV on local amateur operators.

Templeton became the city where it was best not to hint that you had an interest in ham radio. "Invisible" antennas became the vogue, along with shielding, filtering, low-pass filters and all the myriad accessories required to prevent TVI.

News Item, Templeton *Daily Star* May 2, 1958.

WKOO-TV engineers reported today that the strange interference which is blotting out TV sets in a forty-mile radius of Templeton has not yet been located. Godfrey Smith, general manager of WKOO-TV, reported that FCC engineers have been asked

*926 Cedar Lane, Northbrook, Ill.

to assist in the search for the mysterious signal which was first noticed yesterday morning. WKOO-TV's switchboard was swamped with calls from viewers shortly after the station went on the air yesterday and station officials have asked viewers to refrain from calling the station. Smith was confident FCC engineers would locate and eliminate the interference within twenty-four hours. He further stated he believed the trouble was caused by an amateur radio sending set somewhere in the city.

Telegram From FCC Field Office to WKOO-TV. May 3, 1958.

AS OF THIS DATE HAVE BEEN UNABLE LOCATE SOURCE CO-CHANNEL INTERFERENCE REPORTED THIS OFFICE BY YOU MAY 1. OUR SURVEYS INDICATE INTERFERENCE SOURCE CANNOT BE LOCALIZED BY CONVENTIONAL MEANS AND WE HAVE ASKED FOR ASSISTANCE FROM WASHINGTON. CONFIDENT THIS WILL ENABLE US TO TRACK AND ELIMINATE SHORTLY.

JOHN T. HARRIS
Inspector-in-Charge

Telegram From Godfrey Smith to Honorable Rockford Smithers, Senate Building, Washington, D. C. May 4, 1958.

FCC NOT YET LOCATED INTERFERENCE WE DISCUSSED ON PHONE YESTERDAY. WE MUST HAVE IMMEDIATE HIGH LEVEL ASSISTANCE IN LOCATING AND REQUEST YOU CALL IN FBI BECAUSE OF SUSPECTED SUBVERSIVE SOURCE. TRUST YOU WILL DO AND ADVISE ME.

GODFREY

News Item, Templeton *Daily Star* May 5, 1958.

Efforts by the engineering staff of WKOO-TV and the FCC to locate the mysterious interference now plaguing viewer's screens for the fifth day have been without success. Godfrey Smith, general manager of WKOO-TV, reported he has asked the FBI to investigate inasmuch as local FCC engineers have not made any apparent progress in finding the strange signal. The FCC stated more elaborate tracking equipment is being flown in from Washington and expressed confidence this would enable them to find and eliminate the trouble.

WKOO-TV has offered a $500.00 reward to the person or persons locating the interference which was first noted on the morning of May 1. Since that time reception of WKOO-TV has almost been blotted out of the majority of homes in the greater Templeton area.

Letter From Hadley Consulting Engineers to Godfrey Smith. May 10.

Dear Mr. Smith:

We are enclosing detailed results of our survey and studies of Channel 2 co-channel interference in the Templeton area in accordance with our contract terms. We regret to advise you this accumulated data does not enable us to reach a definite conclusion concerning the source and location of the interference. Our engineers have summarized their findings as follows:

1. The interference shows no directivity or polarization at 12 survey sites.
2. Field strength of the interference is generally uniform over a forty-mile radius centering on the metropolitan area of Templeton. Beyond this radius the interference drops off in a normal, logarithmic manner.
3. Oscillographic observations of the demodulated interference signal indicate the power source is not synchronous to 60-cycle power generated by the Templeton Electric and Gas Company. This has been further verified by the May 8 power interruptions made by this utility in cooperation with our tests.
4. Frequency measurements of the interference show it to be relatively constant at 55 megacycles with short and long term frequency variations not exceeding several hundred kilocycles.
5. Spectrographic analysis of the entire usable spectrum indicate no other known signals are present to produce intermodulation products at the interference frequency.
6. In our opinion the interference is being generated and propagated in a manner entirely foreign to the current state of the art.

We are, of course, extremely sorry to advise you we have exhausted all possible means of locating and/or identifying this interfering signal. Please extend our sincere appreciation to members of your engineering staff who cooperated during our tests.

Very truly yours,
THOMAS F. HADLEY, President
Hadley Consulting Engineers.

News Item, Templeton *Daily Star* May 11, 1958.

Washington FCC engineers together with officials of an independent consulting engineering firm admitted today that no solution is in sight to the mysterious interference which has distorted ninety per cent of the TV screens in greater Templeton for the past ten days.

The consulting firm was brought in by WKOO-TV on May 7 after local and Washington FCC officials were unable to find the strange signal. Mr. Thomas Hadley, head of the firm, today expressed the belief the unusual distortion is being created and sent out by some method not known to radio engineers and for this reason his engineers were unable to offer a solution to the problem.

Godfrey Smith, general manager of WKOO-TV said he expected the FCC as well as the FBI to continue full-scale investigations until the interference is found and eliminated. He reiterated his original belief that the cause of the trouble is very likely an amateur radio sending set. Experts have discounted this theory, however, pointing out that such a signal could easily be tracked down by conventional means. Reports that the strange signal is emanating from outer space were also discounted by the experts, although it was later admitted no evidence is at hand to discount this theory.

A survey by the *Star* indicates approximately 150,000 of the 200,000 TV sets in the area are unable to receive a clear picture from WKOO-TV because of the interference. Just prior to press time WKOO-TV increased to $1000.00 the reward offered for information leading to the source of the interference.

Author's Note: During the period between May 11, 1958 and late June, 1958 no progress was made in tracking down the interference. Newspaper items on the topic continued, together with many reader comments but most of this material was repetitious and is not included here, in the interests of brevity. It has been verified that early in June, 1958, the Central Intelligence Agency issued a top secret report which was later sent in modified form to Godfrey Smith. The essence of the report was direct and chilling: The top electronic minds in the nation were baffled by the Templeton interference and no immediate solution was expected.

The complete CIA report has never been released and it now appears doubtful that it ever

will be, when one considers the final outcome of the Templeton case.

Letter From Godfrey Smith, General Manager WKOO-TV. July 1, 1958.

Federal Communications Commission
Washington, 25, D. C.
Gentlemen:

At a WKOO-TV stockholders meeting held this morning it was unanimously voted that WKOO-TV request permission from your office to discontinue operations effective August 1, 1958. This request is contingent on the continuance of the interference condition of which the Commission is aware. As a matter of record we are herewith citing the facts in support of this request:

1. Strong and uninterrupted co-channel interference on Channel 2 has reduced primary and secondary coverage of WKOO-TV from 35 to 50 miles to approximately four miles. This interference began on May 1, 1958 and all attempts to locate and eliminate the source have failed. The Commission's engineering staff as well as independent engineering firms have participated in this search without success.
2. WKOO-TV's receiver penetration has been reduced from approximately 212,000 sets to less than 30,000. A detailed audit of this survey as well as interference contour maps are attached as exhibits.
3. WKOO-TV has lost 90% of normal advertising revenue as a direct result of this decreased coverage. Inasmuch as we enjoy no network affiliation, this loss in income cannot be subsidized.

Our attorney, Mr. Benjamin Farley, has requested an early hearing with the Commission and we respectfully request the Commission grant this hearing as soon as possible.

Very truly yours,

GODFREY L. SMITH
General Manager

News Item, Intercontinental News Service. Washington. July 29, 1958.

Washington. In unprecedented action, the FCC today authorized television station WKOO-TV at Templeton to discontinue operations effective August 1, 1958. The action was requested by WKOO-TV as a result of mysterious co-channel interference on Channel 2 which began on May 1. All efforts to locate the interference have failed. FCC engineers as well as the FBI and the CIA are continuing full-scale investigations into the source of the interference but WKOO-TV officials declared loss of revenue due to greatly reduced coverage made curtailment of operations necessary. The FCC action was contingent upon continuance of the interference and approval has been granted WKOO-TV to resume operations upon elimination of the mysterious signal.

The FCC had earlier suggested that WKOO-TV consider a shift from Channel 2 to Channel 5. Mr. Benjamin Farley, counsel for WKOO-TV, rejected this suggestion on the grounds that the financial burden of such a change could not be borne by WKOO-TV at this time. Farley also stated that until the exact source of the interference could be determined, WKOO-TV had no assurance a shift in channels would not also result in a shift in the interfering signal. This inference by Farley that the interference was of a deliberate, man-made nature was not challenged by the FCC.

Officials of the FBI and CIA declined to comment on the progress being made in the search for the interference. A reliable government spokesman again discounted the widespread belief that the interfering signal is originating in outer space. The same official admitted, however, that no evidence is at hand to refute this theory.

WKOO-TV has offered a $10,000 reward for information leading to the detection and elimination of the interference.

Author's Note: August 1, 1958 was a day of joy for the ham population of Templeton. However, the lure of $10,000 was strong and almost every ham and technician within several hundred miles became a searcher. With WKOO-TV off the air the interference could be chased with less confusion by even the most inexperienced. . . . Channel 2 Yagi antennas sprouting out of cars became a common sight on the streets and countryside of Templeton. The local ham club printed up copies of a simple Channel 2 converter that could be fed into a car radio. Sales of meters for signal-strength indicators boomed at the local parts houses. Aside from the search aspect, other interesting developments were recorded. An application was filed for a new f.m. station. The city's three movie houses enjoyed a substantial rise in attendance while the Templeton Electric and Gas Company noted a seven percent decrease in kilowatt-hour consumption. TV technicians turned to hi-fi and appliance servicing and grouped together to offer an additional $1000.00 reward. Several Sunday sermons hinted at the intervention by divine providence. Statistics released by the city's industries cited a four percent decrease in morning tardiness. And, of course, ham activity blasted the bands unmolested night and day as unshielded and unfiltered rigs were dragged out of cellars and attics and fired up.

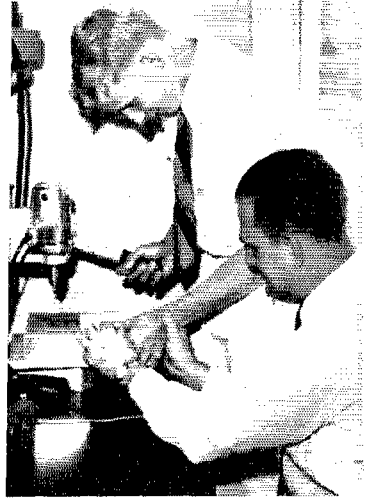
News Item, Templeton *Daily Star* August 15, 1958.

BULLETIN: TV INTERFERENCE STOPS! WKOO-TV TO RESUME OPERATIONS IMMEDIATELY! Godfrey Smith, General Manager of WKOO-TV, confirmed today that his station would resume telecasting within 48 hours as a result of the cessation of the strange interference which forced the station off the air on August 1. No details could be obtained from Smith concerning the location and elimination of the weird problem but Smith assured reporters the problem had "been taken care of." Local FCC and FBI officials were not immediately available for comment but indications are that full details will not be made public for some time.

Author's Note: A careful search of all published material relevant to the Templeton case indicates no official statement was ever issued explaining why or how the interference was located and stopped. It is known that the FBI tapped Godfrey Smith's home telephone, however, and an undisclosed source disclosed that the following message was taped on the night of August 2, 1958:

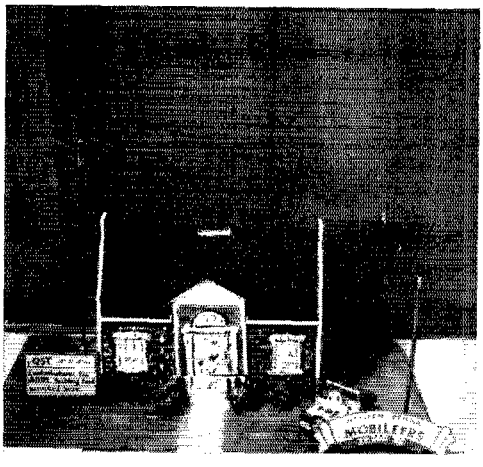
"The interference will stop for five minutes at nine o'clock tonight. I can eliminate it permanently but the reward must be increased to $25,000. Send it to Drawer 34, Berne International Bank, Switzerland. When the money is deposited, the interference will disappear permanently."

(Continued on page 158)



The curriculum of the New York Institute for the Education of the Blind offers courses leading to the General Class amateur license, with Bob Gunderson, W2JIO, as instructor. Here Bob assists in preparation of a chassis for assembly; conducts a class in code, and guides a student learning to solder. As field representative of the Institute, he has presented to a number of radio clubs a demonstration of specialized electronic equipment for blind amateurs and technicians, and an outline of the special problems of teaching and the need for texts. Club activities chairmen looking for an interesting program should contact Bob in care of the Institute at 999 Pelham Parkway, New York 69, N. Y.

The Permian Basin Amateur Radio Club set up a station at the recent Permian Basin Oil Show. Some 150,000 people attended the show, and many of them stopped by to look at the ham station in operation. About 270 messages were handled during the course of 250 QSOs. Left to right are K5UCT, W5NW, and K5HGR.



K3PIB built a model of W1AW, in the form of a bank, which the Western Pennsylvania Mobileers used at their Fall Roundup on October 19 to collect contributions to the ARRL Building Fund. The model is now on display at ARRL Hq.

A mock-up of Oscar I was on display at the Radio Communications Exhibit in London. Bert Allen, G2UJ (l.) guides the hands of Angus McKenzie, G3OSS (r.) blind v.h.f. enthusiast who was the first European ham to hear Oscar I.

CQ de AP Land

BY KATASHI NOSE,* KH6IJ

A BLOWN fuse for the U. S. amateur just means a trip to the radio store. In Pakistan I blew a fuse and ended up making my own.

The few amateurs in Pakistan scrounge around the junk dealers and may even find an ARC-5 but most of the time all equipment is stripped down to the last nut and bolt and piece of hookup wire since it brings a better price. Radio equipment must be registered with the Posts and Telegraphs and importation of transmitting parts is prohibitively costly.

The licensing board meets once every three months. The amateur application must include a circuit diagram of all apparatus, map of the location, antenna system layout and a valid reason for wanting a license. After this, a police investigation is made to check on one's loyalty. The code requirement is 12 words per minute.

If you are among the fortunate few, you get a license which is good for one year. AP5B, E.A. Elkington, a UK citizen, is one of the few who have been issued a call, but he has put in 30 years with the Posts and Telegraphs in Karachi (West Pakistan).

Amateur Rules

The basis for licensing is the "Telegraph Act of 1885" and it is patterned after the British system. Among conditions of grant to conduct experiments in "Wireless Transmission and Reception" are:

The use of 'spark' transmission is specifically forbidden.

The station shall always be equipped for reception as well as transmission — DXers note!

Transmissions shall not commence without listening in on the frequency to be used — Round-table crashers note.

For those who yearn for pre-1934 freedom — *Not more than one ordinary gramophone record may be used during the course of a day with the exception that the same record may be repeated.*

This is never-never land for the long caller because *In calling up another station its call sign should be sent not more than 3 times and the calling station not more than 3 times.*

I've often wondered where the long CQ'er goes after he has crossed the river Styx but now I know — *The use of the general call 'CQ' is expressly forbidden.*

For the "Hallo test" fan, this is *the* place because *the word 'test,' followed by the station call, may be sent out when essential for the licensee's experiments, but must not be continued in any case when a reply is not received within 15 minutes.*

For those interested in v.l.f. experiments, look elsewhere, because *if power for working of the wireless station is taken from a public electric supply, no direct connection shall be made between the supply mains and the aerial.*

In actual practice AP amateurs disregard these rules.

Old timers will recall working VU2AN in Baluchistan about 27 years ago on 40-meter c.w. Baluchistan is now part of West Pakistan, which itself was created in 1947. West Pakistan terrain is characterized by the Alpine-like provinces in the north and the desert plains on the edge of the Arabian Sea.

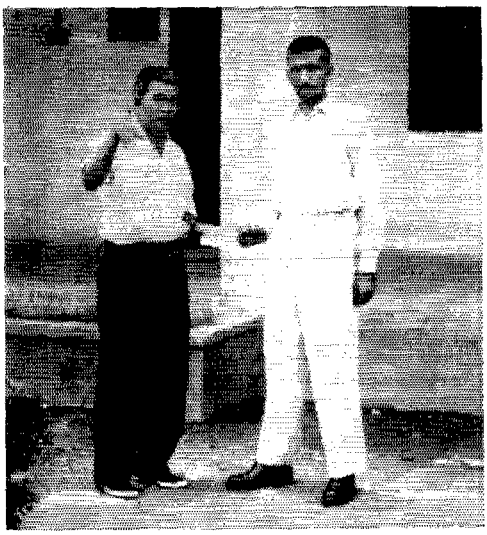
East Pakistan by contrast is lush and humid with abundance of coconut, banana and pine-apple, and in the monsoon season the region is one huge flood plain. It is separated from West Pakistan by 1200 miles of Indian territory and borders Nepal, Bhutan, Sikkim and Burma.

Karachi, on the Arabia Sea, teems with over two and a half million people. Camel and donkey carts and rickshaws compete with modern cars of every description. The horn is a vital piece of equipment but there are no women drivers.

AP5CP

Up to May 21, 1961, East Pakistan was one of the rarest of countries and although AP5CP was licensed in 1952 it had not been active. On that date AP5CP made its first contact through VS6EP and has maintained a terrific pace together with its satellite stations AP5JA, AP5AH, and AP5SS. Thanks to them, East Pakistan is no longer a rare country and far surpasses previous activity from West Pakistan.

I was the first foreign visitor to AP5CP and was given a royal welcome plus a write-up on



KH6IJ and AP5CP, with KH6IJ's QSL being delivered personally by Mohammed.

* Physics Department, University of Hawaii, Honolulu, Hawaii.

This is the radio gear which KH6IJ helped install at a technical school in Pakistan. Abid Ali, sitting behind KH6IJ at the right, is a radio instructor and is studying to be a ham. The other two fellows, at the left, are radio students Aftab and Daniel.

the history of AP5CP at the inauguration of the Tiger Amateur Radio Club, the club station of the East Bengal Signal Regiment.

This club will conduct a Pakistan DX Contest and will issue a WAT (Worked All Tiger) and a WA-AP (Worked East and West Pakistan) certificates. Its purpose is to increase activity of the radio amateur in Pakistan. An invitation has been extended to experimenters and the public to take advantage of its facilities through extensive local publicity, and the club is going all out to promote ham activity.

It subscribes to *QST* and the *RSGP Bulletin*, and practically every DX Club in the USA must be sending them bulletins.

In a country which has been hostile to amateur radio, this kind of activity is indeed a revolution and may well be the opening wedge. This is all the more remarkable in that AP5CP is strictly military in origin (and that martial law has only recently been lifted). It is the hobby club station of the East Pakistan Signal Regiment, whose division insignia is the Bengal Tiger.

I had visions of red tape and all kinds of security clearances to visit with AP5CP. What a pleasant surprise it was to walk into the signal compound unannounced and to receive a cordial welcome. Capt. Afzal greeted us over a cup of tea. Major Iftikar Ahmed, who is the guiding light of AP5CP, showed me around. I finally ended up with tea with Lt. Col. Chowdhury, who in turn invited me to meet Gen. Khwaja Wasiuddin at the Tiger Amateur Club inaugural. So, from the general on down, everyone is proud of AP5CP and its accomplishments and amateur radio has found at least one group of staunch friends in Pakistan. Even President Ayub Khan visited AC5CP and gave his blessing to its stamp collection.

AP5CP equipment consists of a British Panda Cub (equivalent to 807 final) and an R-209, a British version of the BC-312. The 50-cycle, 230-volt mains and v.f.o. gives AP5CP a characteristic T6 note. The antenna is a dipole between two WW2 surplus poles. A BC-610 is available but is not in use and a Hammarlund HQ-145 is in the repair shop.

Operator Mohammed

The constant activity of AP5CP might give the impression of a multi-operator station but it turns out that all the operating is done by one enlisted man who goes by the non-de-plume of Mohd. (abbreviation for Mohammed, the Pakistan equivalent of Smith). Mohammed has the patience and enthusiasm of ten because he seems to be on the air all the time. The commanding officer tells me he even falls asleep at the operating table.

Mohammed understands English with difficulty, one reason why you don't find him on phone. Moreover, he is the silent type, over six feet four, lean and lithe. He says he has talked to a VK on phone. Of course, a Lt. Col. showing me around might have had something to do with his reserve.

I was amazed at the detailed and intricate logging and cross indexing system. He looked up our contact, referred to a cross index and located the book which showed our QSO-recorded words "AP5CP de KH6IJ. Thanks report. I'll see you this summer QSL 73 AP5CP de KH6IJ".

Well-kept records for certificate hunting are maintained for the three other satellite stations, which are also under military auspices, located at Comilla (AP5JA), Chittagong (AP5SS) and Jessore (AP5AH). By contacting all four stations after August 14, 1962, you are eligible for a WAT (Worked All Tiger) award.

An Amateur's Bad Dream

This might sound like a bad dream, but here I was surrounded by two complete ham stations, one for West and one for East Pakistan, consisting of KWM-2's, Collins 32S-1 with 30S-1 Linear, 75S-3, crank-up tower with tri-band beams, the makings of a rhombic, all-band vertical, spare parts, model 28 teleprinter, mobile equipment and complete test equipment for a electronics shop. To top this off I was just a stone's throw from YA, EP, YI, 4W1, AC3, AC5, XZ and with plenty of spare time, but no permission to operate from any place — no reciprocity. QST

The World Above 50 Mc.

CONDUCTED BY SAM HARRIS,* W1FZJ

V. H. F. SWEEPSTAKES — JANUARY 5 AND 6.

THE complete rules for this contest are in December *QST*, page 56. Note the new sections multipliers. Effective December 10, Delaware becomes a separate section and will be counted as such for the first time in this contest. VES, though not officially an ARRL section, counts as such in this contest, making a total of 74 sections. Note also that this is the first contest in which the new 420-Mc. power limit can be used. The complete details on the 420-Mc. rule change can be found on page 64 of this issue.

144 Mc. and Up

Two meters is hopping again, and proof comes from Tony, VE3DIR, who sez: "Just to let you know I was a very lucky fellow last Saturday, November 17, — I worked a W7 in Wyoming on two meters! I had skeds lined up for Colorado, Wyoming and South Dakota but didn't expect too much after hearing nothing on November 14, 15, and 16; however on the 17th at 0807 EST I got 30 seconds of calls, S4 steady (no bursts). After several calling periods, Harold came back to me at 0826 with calls and reports, rogers, fine business and 73. Two minutes with S9 signals both ways; if that was a random E-W meteor, it must have been as big as a jeep." Almost forgot to mention that the fellow at the other end of that fortunate contact was Harold, K7HKD.

W4WNII also let us know that Harold, K7HKD, was involved in another Leonids contact; this one with Shelby (W4WNII) making it state #31 and 9 call areas for Shelby. He would like to know if anyone knows what station or stations operated on approximately 144.008, c.w., at 0630 EST, August 11; or at 0700–0800 EST, on November 17 and 18. Hope is still high at his QTH in Elizabethtown, Kentucky, that he'll be able to hold skeds during the period of December 10–14.

Skeds paid off for others too; among 'em is Ernie, W7LHL, who nabbed state #6 on October 21 when he worked WØENC in South Dakota. Out in Billings, Montana, W7JRG picked up WØLFE for state #16 and W7LHL for #17 during the Leonids. Ken got complete calls from K9AAJ but could get no further; hopes to get him and maybe some others during the coming Geminids.

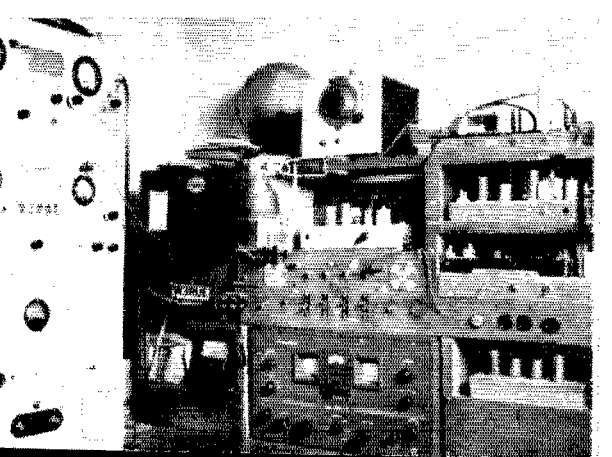
A new state for Paul, W4HHK, on 432 Mc. when he worked W5SWV on October 9 for state #8 on that band; also the first Texas-Tennessee QSO on 432 Mc. W5SWV was first contacted on 144 Mc. and then both stations switched to 432 Mc. While tuning for Daily, Paul heard W5HTZ in Wewoka, Oklahoma, calling him; seems that Lyman had been reading the mail on 144 Mc. Paul reports that the tropospheric opening on 144 Mc. occurring at the same time was excellent. From his location the good conditions appeared to extend from Alabama west to the Texas panhandle. Most of the stations worked were in Oklahoma, although for the first time (from his station) a station was worked in the panhandle, near Amarillo, Texas, W5YYO, at a distance of about 700 miles. Paul used only s.s.b. on 144 Mc. and worked two stations in Oklahoma and one in Texas who were also using s.s.b. Stations worked frequently from Collierville on 144 Mc. are W4RFR and K4ZQM, both on s.s.b.; and W4TLV, W5RCI, W5ML, W5JWL W4ZNV, W4LOJ and W4HJQ. These regulars represent, Alabama, Mississippi, Arkansas, Louisiana, Tennessee and Kentucky at distances from 70 to about 350 miles.

Another "first" on 432 Mc. on November 7 at 2343 EST, when K2CBA, Jud, and VE2ZX, Court, made it on c.w. Signals were weak, Court's 12½ watts out of a 7377 through 85 feet of RG-8/U just about made it. Jud had matched his antenna carefully a few days before and gained 6 db. on K2GRI's signal. Two days after we received the above information from K2CBA, we received another card saying: "Must be my tower wasn't big enough, it took five years to blow down. This morning (Nov. 10) at 0920 I heard a minor crash, and while it didn't sound loud enough to be the tower, it was! The whole 130 foot of it, including 64 elements on 1296 Mc., 64 elements on 432 Mc., 52 elements on 220 Mc., 26 elements on 144 Mc., and 36 elements on 50 Mc.! A few weeks work should have it back up. About 95% of the antennas can be salvaged after some work, and about 70 to 80% of the tower is usable. Have ordered 40 foot of tower just to be safer." Our sympathies on the disaster, Jud, and our congratulations on the 40 foot of new tower. I take it that that will go atop the 110 feet that is still usable.

In Geneva, Illinois, W9CUX, finally decided it was about time to do something when he realized he hadn't worked a new state in more than a year on 144 Mc. In 1961 he worked WØYSJ in North Dakota (where's that QSL?) for state #22, and on October 21, 1962 he worked WØEYE for state #23, 7 districts and 1000 miles. Transmitting gear at Al's, W9CUX, consists of a 7034/4X150A running 300 watts into a 13-element Yagi. The frequency is 144.100 Mc. controlled by a VXO which covers the lower 400 kc. of two meters. The converter is a nuvistor model and has proven very reliable and trouble free as compared with the 416-B job previously used.

Leroy, W5AJG, sez that he is getting good signals from W5ML in Louisiana on 432 Mc. these days, and that little by little the band is getting populated. WØRVA tells us that WØVOM and K9SFX have had a successful contact on 1215 Mc. using APX-6's at both ends. (St. Louis, Missouri to Columbia, Illinois); that WØDQY in St. Louis works regularly into Kansas City on 144 Mc.; that WNØBUC has a new "J" beam for 144 Mc. up about fifty feet; and that a new father-and-son team on two is WNØDSO and WNØDSN.

Dan, K8BHH, in Alliance, Ohio, sez that on October 10 two meters was fair to the northwest with Michigan and Ontario, Canada coming in. Dan worked VE3EYX in Glenheim with good signals both ways. In Seattle, Washington, K7ASX has been building for the 3500-Mc. band. Tom sez: "The main work accomplished consists of the testing of a bi-conical horn antenna in the 3500-Mc. band. The antenna



Well-known v.h.f.-man W3RUE, Ted Fabian, *cannot* be seen at the moment at his operating position. This is it, and Ted is sitting just out of sight at the far right of the photo. Just plain shy!

QST for

*P.O. Box 334, Medfield, Mass.

was made from two copper screen cones placed tip to tip. This type of antenna is omni-directional and is intended for the day when we can set up a multi-station net in this area using these frequencies. The antenna constructed showed a gain of about 15 db. While this can't compare with a parabolic, *it is still pretty good for these frequencies.*" *It's pretty* good to know that there are a few of the gang working at these frequencies too! Actually, there are more than we realize and we hope to have room in a forthcoming column to give them space and acknowledgment.

In Benton Harbor, Michigan, W8PT sez that during the Orionids meteor shower he had a routine m.s. contact with WØEYE in Boulder, Colorado. (Isn't it won'erful what's become "routine" on 144 Mc. during the past few years?) Jack is looking for meteor skeds with Maine, New Mexico, Arizona, Nevada and Idaho. K7CZT sez that the WL 417A Klystron appears to be too touchy in the polar-plexor circuit to show much improvement over the 726B above 3500 Mc., and that Don, K7QLC is going to put an APX-6 on 1215 Mc.

On October 8 Maury, *W9FBC, noted an aurora on 144* Mc. and during the short half-hour duration heard W8GGH, K2YCO, WØIFS and K8LTO. Seems the two-meter gang in that area are busy getting up new beams; W9DKY and K9WNZ have new five-element beams. W9BCH has a new stacked 10-element job, and W9FBC has just put up 7 elements. K1TLY has a parabola on 420 Mc. and is experimenting with antenna gain; Jim sez the parabola gives a total gain of about 12 db. He is mounting it on a 14-ft. boom and has had trouble calculating the correct degree measurement. The reflectors give a highly directional gain, *but Jim wonders if anyone has any ideas for more gain.*

WA6ZIP is another of the many converting the APX-6 to 1215 Mc. WAØDZH (ex-WA6OQZ & -W9OEV) has recently moved from California and is now back on 144 Mc. in Iowa. Lon would like to sked anyone who needs Iowa and would like to sked Kansas, or South Dakota. His rig consists of a 10-B, 6BQ5 mixer, 6360 Driver to a 4X250B running 300 watts input on c.w., a.m., or s.s.b. Frequency is 144.047, although he can v.f.o. Antenna is 13 elements 60-ft. high. K4EUS noted a good opening on two on the nite of October 19 and morning of the 20th, when he worked W1AJR, WA2IJI, WA2OQJ, K2IEJ, K1RGO, W2BBG K1PSK, W1MEO, K2AOP, W1RFU, K2RTH and K1RAB. Sam sez: "Worked two others, but they were specials; my first triple plays and two in one night at that. W2III and WA2VVV — they'd be a knockout on c.w."

Out in Detroit, Michigan, Craig, K8JEE has finally received his model 15 RTTY and is now in the process of cleaning it up and building gear to put it on the v.h.f. bands. A tropo opening on two meters is reported by Art, W4AWS, who sez that on October 11 the stations in Georgia and Alabama started coming in with good signals. Opening lasted from about 2000 EST until 2400 EST, and during that time Art worked (among others) W4EQM in Langdale, Alabama *with 30 watts.* W4MNT *and K4NTD also* got in on that opening, working stations in both Alabama and Georgia.

At Jensen-Beach, Florida, Wes, WA4AME sez that although the two-meter band has not been good at all (noise level very high) his new 40-element quad seems to be working very well. W9VPU and W9AXT have been conducting propagation tests on 144.900 Mc. every Tuesday at 2000 CDST. Check is made not only of their own signals but those of Wisconsin and Indiana stations. W9VPU is planning to conduct cross-band operation with K9ZXE (1296 Mc. & 144 Mc.) *as soon as the equipment is ready at both* ends of the circuit. Probably be near the end of November.

In Darien, Connecticut, Paul, K1SDX hasn't given up hope although he sez he has yet to QSO his first station on 1215 Mc. with his APX-6. He's heard no other identifiable signals on the band and wonders if there is anyone else, within range, on that band. W6GGW is now running 40 watts input on 223.2 Mc., and is working on equipment for 432 and 1215 Mc. W3ZR reports stations active on 220 Mc. in the York, Pennsylvania area include K3NUZ, K3PXP, W3AJD, W3CAJ and W3ZRJ; all operating between 220.050 Mc. and 222.220 Mc.

K8ANG in Warren, Ohio, is looking for skeds at the low end of 220 Mc. for Friday and Saturday evenings, or Saturday and Sunday mornings. In Wilmington, Delaware K3OBU remarks that the opening of October 15 was the best of the season for him on both six and two meters with both bands being loaded. Also good openings for Joe on two meters on October 19 and 20. He reports that W3LML is now using an 8-over-8 beam for 144-Mc. work, and that W3CGV is continuing his 432-Mc. activity. October 12 was a good one for K8RXD on two meters, when he was hearing W8KAY, W8LCY, K8AXU, K2IEJ, W8BKI, K9UIF, W3RUE and many others. Dean missed quite a few because of rotator troubles.

W4FWH reports good two-meter activity during the first part of October, W5BAU coming in almost nightly with

2-METER STANDINGS

W1REZ	32	8	1300	W6WSQ	15	5	1390
W1AZK	28	8	1205	W6NLZ	12	5	2540
W1KCS	24	7	1150	W6DNG	9	5	1040
W1RFU	24	7	1120	W6AJF	6	3	800
W1AJR	23	7	1130	W6ZL	5	3	1400
W1MMN	22	8	1200	K6HMS	4	3	850
W1HDQ	22	6	1020	K6GTG	4	2	800
W1IZY	20	7	1080	W6MMU	3	2	950
K1CRQ	19	6	800				
W1AFO	18	6	920	W7JRG	17	6	1280
K1AFR	17	5	450	K7HKD	15	5	1150
				W7LHL	6	3	1050
W2NLY	37	8	1300	W7CJM	5	2	670
W2CXY	37	8	1360	W7JIP	4	2	900
W2ORL	37	8	1320	W7JU	4	2	235
W2BLV	36	8	1020				
K2GQL	35	8	1365	W8PT	39	9	1260
K2LMG	29	8	1290	W8KAY	38	8	1245
W2AZL	29	8	1050	W8SSDJ	37	8	1220
K2IEJ	27	8	1060	W8IFX	35	8	980
K2CEH	25	8	1200	W8SPG	34	8	1040
W2AMJ	25	6	960	W8LOF	33	8	1060
W2ALR	24	8	1100	W8GGH	32	8	1180
W2RXG	28	8	1200	W8BAX	32	8	960
W2SMX	23	7	1090	W8RMH	32	6	910
K2HOD	23	7	950	W8NOH	31	8	1090
W2DWJ	23	6	860	W8SVI	30	8	1080
W2PAU	23	6	753	W8EHW	30	8	860
W2LWI	21	6	753	K8AXU	29	8	1050
K2KIB	21	5	700	W8LPD	29	8	850
W2ESX	21	6	750	W8WRN	28	8	680
W2UFH	20		880	W8DX	26	8	720
W2WZR	19	7	1040	W8ILC	25	8	800
W2RGV	19	8	720	W8JWV	25	8	940
W2RLG	17	6	980	W8WNM	25	8	900
K2JWT	16	6	550	W8GFN	23	8	540
				K1CRQ/8	22	8	690
W3RUE	33	8	1100	W8LCY	22	7	680
W3EPH	32	8	1000	W8BLN	21	7	610
W3GKP	30	7	880	W8GTR	17	7	550
W3SGA	31	8	1070	W8NRM	17	7	550
W3TDF	30	8	1125				
W3KCA	28	8	1110	W9KLR	41	9	1160
W3BYF	28	8	1070	W9WOK	40	9	1170
W3LNA	21	7	720	W9GAB	34	9	1075
W3LST	21	6	800	W9AAG	34	9	1050
W3NKM	20	7	730	K9AAJ	31	8	1070
W3LZD	20	7	650	W9REM	31	8	850
K3HDW	12	6	1015	W9ZTH	30	8	830
				K9UIF	28	9	970
W4HJQ	39	8	1150	W9PBP	28	8	820
W4HHK	37	9	1280	W9LVC	27	8	950
W4LTU	34	8	1160	W9OJT	27	8	910
W2XI	34	8	954	K9SGD	26	8	1100
W4MKJ	33	8	1149	W9ZHL	25	8	700
W4WNH	31	9	1050	W9BPV	25	7	1030
W4AO	30	8	1120	K9AQF	24	7	900
W4LVA	26	8	1000	W9CUX	23	7	1000
K4EUS	26	7	1130	W9LF	22	7	825
W4EQM	25	8	1040	W9KPS	22	7	690
W4AIB	25	8	900	W9ALU	18	7	800
W4TLV	23	7	1000	W9WDD	16	5	500
W4JCa	23	6	725				
W4VVF	23	6	724	WØBFB	37	9	1350
W4RMU	21	7	1080	WØIHD	31	8	1030
W4IKZ	20	6	720	WØSMJ	29	9	1075
W4OLK	20	6	720	WØLFE	28	7	1050
W4LNG	19	7	1080	WØQDH	27	9	1300
W4RFR	18	9	820	WØRUF	23	7	900
K4YUX	08	8	830	WØLC	22	7	1360
W4CPZ	18	6	650	WØMOX	12	6	1150
K4VWH	18	6	590	KØITF	21	6	940
W4MDA	17	6	757	WØINI	21	6	830
				WØTGC	21	7	870
W5RCL	38	9	1280	WØENC	21	6	1100
W5FYZ	33	9	1275	WØRYG	20	8	925
W5AJG	32	9	1360	WØDQY	20	7	700
W5JWL	29	7	1150	WØAZT	18	7	1100
W5DFU	28	9	1300	WØJAS	18	6	1130
W5PZ	27	8	1300	KØAQJ	16	6	1120
W5LPG	25	7	1000	WØIFS	16	6	1100
W5KTD	23	8	1200				
W5SWV	20		960	VE1CL	8	4	800
W5ML	16	6	700	VE3DIR	36	9	1330
W5KFU	13	4	1300	VE3AIB	2	2	134
W5FSC	12	5	1390	VE3BFR	24	7	950
W5HPZ	12	5	1250	VE3BQN	20	7	790
W5CVW	11	5	1180	VE3AQG	18	8	1300
W5NDE	11	5	620	VE3DER	17	8	1340
W5VY	10	3	1200	VE3HW	17	7	1350
W5WAX	8	5	735	VE2ABF	10	4	580
W5EDZ	8	5		VE6HO	1	1	915
W5YYO	7	4	1330	VE7FJ	2	1	365
W5UNH	6	3	1200	KH6UK	2	2	2540

The figures after each call refer to states, call areas and mileage of best DX.

S3 to S7 signals. Many Florida stations were heard on October 11 with W4MNT being the strongest worked. First report received from KØFK in Dell Rapids, South Dakota, sez that he's using KØESC's Seneca for a short time and got on the air with it on 144 Mc. on October 31. Worked four stations in Brookings and three in Sioux Falls, and sounds like he's going to be another of the two-meter gang in that area.

During the temperature inversion of October 14 and 15, K4IMF in Norfolk, Virginia worked the following stations: W3LVL, K4TVJ, W3PBV, W3HB, W3HY, W3TFA, K4GRJ and W3PBU. WA9BAS sez that ground wave on two meters has been very good and that he's looking for Saturday morning skeds (0800–0900) into Michigan on either 2 or 6 meters. WA4DKG reports a very good opening throughout the state of Florida on October 8; Tom says it's the first time he's heard so much QRM on 2 meters. Balance of the month average.

Out in Las Vegas, Nevada, K7ICW sez that on October 6 at 0800, W6NLZ signals on 144.020 were so good that "I asked him to shift to s.s.b. Due to some difficulty, I was unable to nullify the carrier and read any more than call signs, but I'm sure that a better s.s.b. receiver here would have made him quite readable." George also mentions that the southern California gang will soon resume 220-Mc. skeds with Nevada stations.

Another of our friends to the North, VE3ESE, reports no unusual openings noted — the usual stations heard were VE3BRI in Woodstock, Ontario; K3NAU in Pennsylvania; W8KAY in Ohio. Don sez that "the amazing part of the September VHF Contest was the very high activity shown in VE3 land, with well over 150 stations in southern Ontario participating."

Clubs and Nets

On November 6, various members of the Vermont Amateur Radio Club participated in an exercise to provide rapid communication of Barre City election results to the local radio stations. K1MFG, Charlie Collins, was responsible for getting it whipped into shape. We are happy to report that their efforts were greatly appreciated by WSKI, WSNO and WDEV, and the club members had valuable first-hand experience in setting up and operating under what might be termed emergency conditions. There were six units operating on 145.8 in the six wards of Barre and reporting the results for each office when counted to a net control station where election results were accumulated and relayed, when necessary, to stations representing the three broadcast stations.

Members of the HY-Rangers (Ft. Worth) furnished communications for the American Legion Auxiliary's Benefit on November 1 and 2. About forty messages were sent and received. Most of the traffic was handled on 51.15 Mc. Two meters was also used on the first day.

The Pack Rats (Mt. Airy VHF Club) are now issuing a certificate for working 30 members of their club on any of the v.h.f. bands. Normal certificate rules apply, but send list of contacts with proper information (do *not* send QSLs) to Joseph Kilgore, W2EIF, #5 Sunnybrook Court, Stratford, New Jersey.

The Microwave Society of Long Beach, Incorporated will celebrate its second birthday on January 2, 1963, and many events have been recorded in this short space of time.

Starting in December 1960, a meeting of v.h.f., u.h.f., and microwave radio amateurs was suggested by Ralph Steinberg, K6GKX, of Long Beach, California, to form a club to further study the techniques of the higher frequencies. The meeting was held in January 1961, with fifteen charter members attending. In 1961 the society increased its membership to thirty and at the present time membership stands at sixty.

The past year has brought many fine programs and speakers to the members of the group, including the Oscar Program and W6TNS, the Telstar program and the MARS program. The Society has participated in Project Oscar events. At the southwestern ARRL convention at Disneyland, a tracking station was installed by the group to track Oscar II, and another tracking station will be in operation at the club's quarters when Oscar III is put into orbit in early 1963.

Projects are a statewide repeater system on 432 Mc., a MARS net to be organized for 432 Mc., and an elaborate moonbounce station for 1296 Mc. These and several others will be completed in early 1963.

The Microwave Society of Long Beach is assisting the Boys' Clubs of Long Beach in training boys for their ham license. Last April the society put on a city-wide drive for ham gear for the boys and it was a huge success. A club station is being installed at one of the branches of the boys' clubs.

Radio amateurs in the southern California area are invited to attend and join this fast-growing society. Meetings are held on the first Wednesday of each month at 5107 East Ocean Blvd., Long Beach at 8:00 P.M. For further information write Ralph Steinberg, K6GKX, P.O Box 3303, Long Beach, California."

50 Mc.

Soon to join the s.s.b. gang on 50 Mc. is Charlie, K4JQY, in Greenville, South Carolina, who has tested his 100-watt s.s.b. rig on the air and seems to be doing fine; while Mike, K8PBE sea that progress is coming slowly on his 6-meter s.s.b. rig. Mike comments that W8CZD, WA8BJT and K8VGL in his area are all using homebrew sideband rigs. W8CZD has worked Wisconsin, Ohio, Indiana, Michigan and Pennsylvania during the month of October.

K9DWR sez that his 50-Mc. s.s.b. mixer is on the air but he still needs the s.s.b. exciter. In Sunbury, Pennsylvania, K3ARR mentions that local activity is very poor and that there are a number of people either on s.s.b. on 50 Mc or talking of building s.s.b. rigs. Among these are K3NHF K3IBM, W3WLF and K3ARR. K3HNP sez that local

220- and 420-Mc. STANDINGS

220 Mc.

W1AJR	11	4	480
W1AZK	9	3	412
W1HDQ	11	5	450
K1JIX	10	3	450
W1OOP	12	4	400
W1RFU	15	5	480
W1UHE	11	4	385
W2AOC	13	5	450
K2AXQ	9	3	240
WA2BAH	4	2	167
K2CBA	13	6	650
K2DIG	4	3	140
W2DWJ	15	6	740
W2DZA	12	5	410
K2ITP	11	5	265
K2ITQ	11	5	265
K2JWT	6	3	244
K2KIB	12	4	300
W2LRJ	10	4	250
W2LW1	12	4	400
W2NTY	12	5	300
K2PPZ	11	4	490
K2QJQ	13	5	540
W2SEU	9	3	225
K2UUR	4	3	105
W3AHQ	4	3	180
W3FEY	11	5	350
K3IUV	8	3	310
W3JYY	8	4	295
W3JZI	4	3	250
W3KKN	10	4	255
W3LCC	9	5	300
W3LZD	15	5	425
W3RUE	10	5	480
W3UJG	13	5	400
W3ZRF	5	4	112
K4TFU	8	4	400
W4TLC	5	1	315
W4UYB	7	5	320
W5AJG	3	2	1050
W5RCI	8	5	700
K6GTG	2	1	240
W6MMU	2	2	225
W6NLZ	3	2	2540
K7ICW	1	1	250
K8AXU	10	5	1050
W8JJG	9	5	475
W8LPD	6	4	480
W8RNM	8	4	390
W8PT	10	5	660
W8SVI	6	4	520
W9AAG	9	4	660
W9EQC	11	5	740
W9JCS	6	2	340
W9JEP	9	4	540
W9OVL	6	3	475
W9UED	4	4	605
W9ZIH	10	5	500
KØDGU	5	3	425
KØITF	6	3	515
KH6UK	1	1	2540
VE3AIB	7	4	450
VE3BPR	3	3	300

420 Mc.

W1AJR	11	4	410
W1HDQ	8	3	210
W1MFT	8	3	170
W1OOP	11	3	390
W1QWJ	9	3	—
W1RFU	7	4	410
W1UHE	6	4	430
W2AOD	6	4	290
W2BLV	12	5	360
K2CBA	7	4	225
WA2DTZ	6	3	200
W2DWJ	10	4	196
W2DZA	5	3	130
WA2HQE	8	4	280
K2KIB	4	2	100
W2NTY	3	2	100
W2OTA	10	4	300
K2UUR	9	3	280
W2VCG	9	4	280
K3CLK	9	4	—
K3EOF	6	3	250
W3FEY	8	4	296
K3IUV	7	3	310
W3LCC	7	3	—
W3RUE	3	2	270
W3UJG	6	4	350
W4HHK	8	4	550
W4VVE	7	4	430
W4TLV	3	2	225
W5AJG	5	1	425
W5HTZ	5	3	440
W5RCI	12	3	660
W5SWV	7	3	525
W6GTG	1	1	180
W7LHL	2	1	180
W8HCC	3	2	355
W8HRC	3	2	250
W8JLQ	4	2	275
W8NRM	3	2	390
W8PT	6	3	310
W8RQL	4	2	270
W8TYY	9	5	580
W8UST	3	—	225
W9AAG	8	4	525
K9AAJ	7	3	425
W9GAB	9	4	608
W9OJI	6	3	330
K9UIF	6	3	240
K9UTF	3	2	185

The figures after each call refer to states, call areas and mileage of best DX.

activity on 50 Mc. is strong in his area (Levittown, Pennsylvania) with many additional s.s.b. stations now on the air; and K3MLI comments that he is now running 100% s.s.b. on six meters, and there isn't enough s.s.b. activity on the band.

Looks like the s.s.b. reports are coming mostly from Pennsylvania 'cause K3ADS reports east-coast six meter s.s.b. is increasing rapidly with close to 100 stations from Richmond, Virginia to southern Connecticut. Most of the activity is in the New York and Philadelphia regions. The East Coast VHF Society s s.b. net meeting has around 30 stations checking in each Sunday morning. W4OAB in Charlotte, North Carolina reports good groundwave on six meters during the late evening hours; he claims that everybody is going to bed too early and doesn't even know there are good conditions. Clif now has his new homebrew d.s.b. rig going on 50 Mc. with good results so far, and is working on a 50-Mc. linear for s.s.b. and d.s.b. rigs. He's looking for a Kentucky sked in the southeastern part of the state. W4EJ tells us that W4DXC, W4DYE, K4HDU, W4UMK and W8SNC/4 are all on 50-Mc. RTTY.

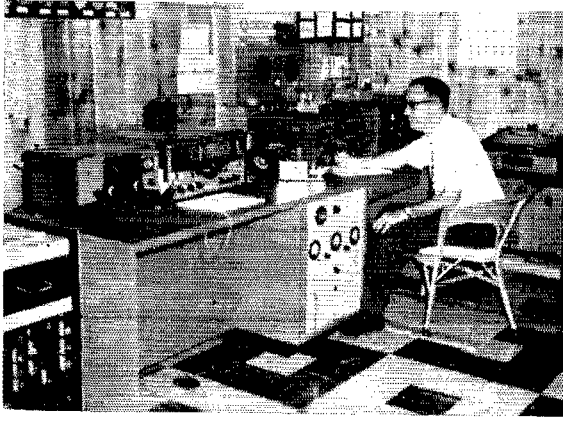
WØPFP in Ames, Iowa seems to have had a good month in October. "While talking to a local, KØKPG, on the 7th, W6QCV and K6SUE broke in and we had a 26-minute QSO. On the 8th, I heard aurora and worked KØCJC, W9HGE and K8CBD. During morning sked on October 20, I worked K3HFL and K8UBA, whose signals sounded like scatter and weak sporadic *E*. On the 2 st worked W1BKI, K1PBE and K1OHU, t ien W5UNU. About an hour and a half later heard W7EGN in Montana and shortly thereafter heard K7BAG in Washington." All sounds good to me.

Opposed to the foregoing report we hear from Dan, W9CMI, in Missouri that "Six has finally given up the ghost on good skip openings, with one only during the month, occuring on October 28. This opening was very erratic and about the only thing that could be done was copy the other guy's call and pass 73's." KØFPC, also in Missouri, noted openings on the 26th and 28th of October. The first into New Mexico and the second into Florida, Texas and assorted points in between. Bob sez that if anyone else is interested he's willing to get an A1 or A2 transmitter on six for either general contacts or code practice. W9DFS reports many new stations now operating 50 Mc. in his area and a number of the old ones back on again. Ken also noted the opening of October 28 to Florida and Texas.

From Vince, K8REG: "In regard to comment made in November *QST* concerning an unmodulated carrier on or about 50.162 Mc.: I have noted the following items. I have heard this carrier on numerous *Es* openings to the east coast during the summer. It is always the strongest signal on the band. During the Perseids I had skeds with W3HZU in York, Pennsylvania and at this time I noted this unmodulated carrier again. It had a signal strength of S1 to S5 on scatter! It was on for most of that evening and several days and nights hence. The carrier was shut off for short periods of time, but was on most of the time with no modulation or other intelligence. My location is near Dayton, Ohio and the carrier peaks to the northeast. I have not been able to find out anything else about it but surely would like to make scatter skeds with that fine signal. Incidentally, I was partially successful in completing my sked with W3HZU on a.m. phone. Average signal strength on both ends was one S unit above the noise. It would have been solid on c.w. but we wanted to see if a.m. would get through on scatter."

In Needham, Massachusetts, K1WTX reports the October 28 opening with 4's and 9's in Florida and Illinois being observed. John also comments that signals from New Hampshire, Maine, Rhode Island and Connecticut were unusually steady during the month of October. K9ILJ in Brookfield, Illinois, heard 8 Texas stations during this same opening. QSB was heavy though and he had difficulties getting contacts WA8AJY, Els of Novelty, Ohio, reports working 104 Michigan stations in seven evenings, which entitles her to the "Michigan Century Award" from the Michigan six-meter club. Cities contacted were in Jackson, Battle Creek, Detroit and suburbs.

K3LNU sez that the only new thing around his shack is the s.s.b. unit which he hasn't been able to get working yet. Bill comments that on October 7 he was part of a three-way duplex operation on 51 and 53 Mc; stations concerned were WA2IDT in New Jersey, K3MBD in Philadelphia and K3LNU in Rosemont, Pennsylvania. Very interesting experiment, sez Bill, and he'll probably try more of same after the first of the year.



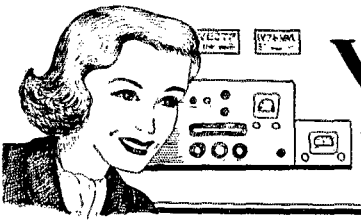
After laying off 144 Mc. for a year, W9CUX came back to this spot to nab state #23 in October.

From Gillett, Pennsylvania, W3BKF has been working stations in Rochester, New York, fairly consistently. Earl sez that although his QTH has an elevation of about 1150 feet, he is in a valley with peaks reaching 1800 feet surrounding him. K3KPA has been experimenting with frequencies between 53 and 54 Mc.; his reaction — "Wow! Is it ever touchy up there!" Ground wave to John's QTH in Philadelphia was very good from north and south during October with North Carolina and Virginia coming through on and off for the entire month. New York and Connecticut were heard almost every night.

Out in Nevada, K7ICW observed *E* type openings on October 4, 6, 14 and 26; they were of short duration with erratic signals being heard from Texas, Oklahoma and Missouri. George said an improvement was noted over previous month on tropo type openings. W4RIX in Memphis observed good ground-wave conditions during the month of October and on the 28th of that month an opening into Florida when he worked K4OCK and WA4JBM, and WA4GDC, and heard K4RNG and W4WTO.

From South Dakota and KØFKJ we hear that he observed an aurora on October 7 with four c.w. stations being heard, but only KØMVI in Minnesota being identified, and that six was open on October 6 and 26 with K7MBI in Arizona being worked on the 6th, and Texas and Louisiana heard on the 26th. Down Florida way WA4BMC heard K5QWU, K5GDH, W5FJD, K5VFF, W5DLW on October 14; while Les, K4RNG noted openings on seven days during the month and excellent ground-wave conditions on 4 days of the month. During the opening of the 26th, W5EUB told Les that he had just finished working Cuba at 1800 Texas time. The opening of the 28th seemed to be the best of the month for Les with Ohio, Pennsylania, Wisconsin, Kansas, Michigan, Indiana, Missouri, Iowa, Illinois, Tennessee, and Nebraska being heard. QST

Part of the QRM at the Syracuse VHF Roundup in October. L. to r.: W2ALR, Larry and VE2FF, Bob.



YL NEWS AND VIEWS

CONDUCTED BY ELEANOR WILSON,* W1QON

1962 marked the tenth year of reporting activities of YLs 'round the world in this radio journal. A good year it was, too. As is our annual custom here, we'll take one backward glance before plunging into the whirlpool of the new year.

In the March column we tried to satisfy the popular query "How many YLs are there?" We considered it safe to assume that of some 225,000 amateurs approximately 8000 were YLs. In 10 years we have multiplied our ranks eight times over. A calculation of closer to 9000 would probably be more up-to-date right now — and we're not done growin' yet!

New YL clubs introduced brought the total number of clubs specifically for women hams to about forty. The new ones include the Buckeye Belles, YL Certificate Hunters Club Chapter Four, the Jersey Tomaters, and the Upper Peninsula YL Club. Several new nets were initiated (see October column for listing of 45 different YL phone and c.w. nets), and four or five more YL certificates became available to the certificate seekers. The YLRL conducted its annual YL-OM Contest (13th annual) and the Anniversary Party (23rd annual), plus the newer activities, "Howdy Days" and the second YL v.h.f. contest.

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

Diane Price, K9TRP, outgoing president of the Ladies Amateur Radio Klub, turned over gavel and antenna tower to 1963 President Connie Kalinowki, W9UON, at the officers' installation party in September. Other LARK officers for the coming term are V.P. K9IWR; Secy. K9BWJ; Treas. K9ZWV; Pub. Chairman W9GJB.

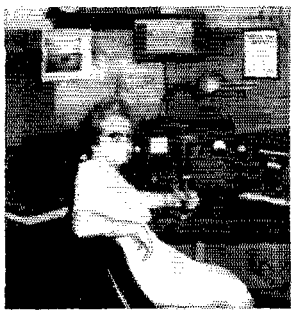
Katherine Johnson, W4SGD, became the first YL to make YLCC/1000 — confirmed contact with 1000 different YLs. (OM W2QHH received his 1000 endorsement in 1959.) Thelma Bomyea, WA2RLU, supplied the long-awaited answer to the question, "Who will be YLRLer #1000?", when she joined the YLRL early in the year. And when Shirley Stroup, KN7UDP, joined the ARRL after receiving her license last January, we conjectured that ARRL members could hardly come any younger. Miss Stroup could be an eight-year-old member of the Barbie-doll set, but it appears that Shirley has set her dolls on a shelf in favor of playing with shiny new radio gear.

The annual flurry of YL get-togethers and conventions around the country kept a YL hopping if she wanted to take in as many events as she could. The Portland Roses YL club worked hard and long to make the YL-XYL program of the ARRL National Convention in Portland on Labor Day weekend the success that it was. Announcement of the Fourth International Convention of the YLRL was made by YLRL President Onie Woodward, W1ZEN. To be held in June 1964 in Ohio, the convention will be hostessed by the Buckeye Belles and will be part of the 25th anniversary celebration of the YLRL.

For the eleventh consecutive year amateurs assisted with communications for the All Woman Transcontinental Air Race. Carolyn Currens, W3GTC, served as chairman of the net for the fifth year.

YL participation in the 1962 Field Day seemed

The appointment of Edie McCracken, K1EKO, as new editor of *Harmonics*, has been announced by club President Jean Kincheloe, K6OQD. Edie takes over duties from Gladys Eastman, W6DXI, Jan. 1, '63. Send copy for *Harmonics* to K1EKO at P.O. Box 285, Westwood, Mass.







Meet seven members of the Upper Peninsula YL Club (Michigan), which gets together every Monday at 1400 GMT on 3920 kc. The UPYLs will hostess the 13th Midwest YL Convention at Newberry, Mich., on June 23. Top row, l. to r.: Vi Lehtinen, W8JXJ, of Ishpeming, wife of W8IOC and mother of K8NYP, is supervisor of nurses at a local hospital (Vi's ham time is primarily limited to 75-meter mobile); the XYL of W8PVU and mother of four harmonics, Jane Hastings, K8SRO of Ensadine is active on several bands c.w. and s.s.b.; Faye Leightonen, K8PNA, of Newberry, is owner and operator of a fishing and hunting resort in an area where ham radio is the only means of communication with "civilization" (Faye holds a public service award); Former teacher, Clarice Baullanger, WA8AHY, of Mass, is a newcomer to the UPYL net (Clarice is the XYL of WA8AHX). Bottom row, l. to r.: Myriam Gregg, K8ILN, mother of four harmonics aged 2 to 5 years, is serving her second term as president of the Twin Soo Radio Club (Myriam and her OM W8HDI live in Sault Ste. Marie); Merle Slade, K8TGX, and Muriel Reid, K8SUP, have a few things in common. They are twin sisters, each is married to a ham, each has one boy harmonic and has won championship awards with the bow and arrow. (Photos via W8HAV).

to have dropped off from previous FD performances, but with Field Day a ham always looks ahead to "next year", and now next year is only six months away.

The number of YLs who attained Brass Pounders League honors last year was greater than ever before, and our YLs moved thousands of messages in 1962.

As we said, 1962 was a good year for the YLs of amateur radio. We are about to find out what 1963 holds in store for us. Happy New Year to all!

1962 BPL YLS

As stated in our summary of 1962 YL activities, the number of YLs who achieved Brass Pounders League honors in 1962 was greater than ever before. Several YLs made BPL almost each month of the twelve. Mae Burke, W3CUL, topped all other BPLers January through December again — nothing new for Mae who has been placing first, second or third (usually first) in BPL for 13 consecutive years!

Bertha Willits, WØLGG, continued another record of excellence in traffic-handling for at least six years by placing second or third on the BPL list almost each month. Martha Shirley, WØZWL, Louise Moreau, W3WRE (now WB6BBO) and Lydia Johnson, WØKJZ, have all been BPL winners many times over in past years.

Beatrice Dietz, WA2GPT, and Ruth Vollrath, KØONK, both were consistent BPL winners in 1961. KØONK's collection of some 70 BPL cards is tribute to a talented, ambitious YL who is sightless.

Congratulations to all aforementioned YLs and to Ruth Nissen, W4BWR, Ann Pitcher, K4RDX, Elaine Harts, K3GSU, Adah Elliott, W9RTH, and Maria Mateo de Fernandez, KP4WT, for achieving BPL honors in 1962.

In the following tabulation the number in parenthesis following a call denotes 1st, 2nd, or 3rd place position in the monthly BPL listing, which appears in the "Traffic Topix" section. The information for any given month is for traffic handled during the month three months previous to publication. The BPL is open to all amateurs in the United States, Canada, and U.S. Possessions who report to their SCM a message total of 500 or more or 100 or more originations plus deliveries for any calendar month. All messages must be handled on amateur frequencies within 48 hours of receipt, in standard ARRL form.

1962 YL BPL Certificate Winners

Jan. . . . . W3CUL (1), WØLGG (2), KØONK, W3WRE, K3GSU, WA2GPT, WØZWL, W9RTH, W4BWR, K4RDX, KP4WT

Feb. . . . . W3CUL (1), WØLGG (3), KØONK, WA2GPT, WØZWL, W3WRE, W9RTH, K4RDX

March . . . W3CUL (1), WØLGG (3), W3WRE, WØZWL, WA2GPT, WØKJZ, W9RTH

April . . . . W3CUL (1), WØLGG (3), K3ONK, WØZWL, W3WRE, WA2GPT, W9RTH

May . . . W3CUL (1), WØLGG (3), W3WRE, WØZWL, WA2GPT, KØONK

June . . . W3CUL (1), W3CUL/4 (3), WØLGG, KØONK, WØZWL, W3WRE, WA2GPT

July . . . . . W3CUL (1), WØLGG (3), W3CUL/4, KØONK, W3WRE, WA2GPT, W9RTH

August . . W3CUL (1), WØLGG (3), KØONK, WA2GPT, W3WRE

Sept. . . . . W3CUL (1), WØLGG, WA2GPT, W3WRE

Oct. . . . . W3CUL (1), WØLGG, WA2GPT

Governor Wesley Powell signs the bill proclaiming the week of Nov. 3–10, 1962, as the first Amateur Radio Week in New Hampshire as amateurs K1OGU, K1NZK, K1JFQ, K1PCZ, and W1IIQ (l. to r.) look on. (see "Two N.H. Firsts")

Nov.....W3CUL (1), WØLGG, KØONK, WA2GPT
Dec.....W3CUL (1), WØLGG, WA2GPT

Dear OM . . .

Do you remember in grammar school how one would be given a simple paragraph to analyze sentence by sentence? Maybe they don't do that sort of thing nowadays, but after reading a nice little letter sent to us by a proud OM, we just can't resist presenting the writer's statements — all five of them — one at a time. We trust that W6BMM will pardon us. He should know, if he has glanced at these pages before, that we really cherish our OMs and our comments are only for play.

Opening statement: "I thought I'd let you know that after fourteen years of marriage my XYL, Ruby, finally got her ticket — WN6BYD." Now, the key word here is "finally". Any woman who finally gets her ham ticket after 14 years of marriage is to be heartily congratulated, whether she has been trying for 14 years to pass the exam or whether she has been married for 14 years and just recently 'finally' decided to seek her own license.

Second statement: "I, of course, was her first contact — I operated automobile c.w. to do this." There could be diverse reactions to this statement. The "of course" bothers us a little, of course. The romance of having one's own beloved as a girl's first contact is of undeniable importance. But just possibly at a time like that, a wife might long to throw togetherness to the wind for a few fleeting moments and seek a contact with a flattering Frenchman in gay Paree for her first one. Still, over-all, the act on the part of the OM must be considered gallant — not every man goes to the extent of operating automotive c.w. for a rendezvous with his wife.

Third statement: "This was also my first licensed YL contact in 15 years of hamming!" Well! We declare! In this day and age? How could this be? If this is true, girls, we have some work cut out for us.

Fourth statement: "I don't count the time a YL told me to get my maritime mobile station off 'their' 15-meter S.C.B. net frequency — I QSY'd." Again, girls, this one is definitely on us. We should know better.

Daddy is a ham too!

Final statement — in fact it was written as just a little p.s.! "We have six harmonics (2, 4, 6, 8, 10, and 12 years old) but they can't stay interested long enough to work for the 'coveted' — they claim they're just too busy." Aha! This statement affords a deeper comprehension of the first statement. In view of this new tidbit of information, we can only congratulate Ruby still more heartily upon "finally" getting her ham ticket. In fact, we congratulate Bill, too. It's obvious he is making his contributions to ham radio and the world in general!

Two N.H. "Firsts"

The five amateurs shown in the photo observing Governor Wesley Powell proclaim Amateur Radio Week in New Hampshire constituted the committee in charge of the first N.H. Amateur Radio Week and the first N.H. luncheon and meeting of the Women Radio Operators of New England. Maxine Andrews, K1OGU, Mary Goulart, Beatrice Bean, K1JFQ, Barbara Roberts, K1PCZ, and Ellis Millar, W1IIQ, ARRL N.H. SCM, (l. to r. in the photo) were primarily responsible for the effectiveness of the two N.H. ham "firsts". (Missing from the photo was Louise Reneker, K1SLS, formerly of Laconia, N.H., now of Elkhart, Indiana.)

The Amateur Radio Week proclamation endorsed by Gov. Powell urged all citizens to show their appreciation of services rendered by amateur radio operators. All radio clubs throughout the state held open house during Amateur Radio Week to acquaint the public with the hobby. Granite State hams endeavored to give as many on-the-air contacts as possible with hams throughout the world.

On Saturday, Nov. 3, the first WRONE luncheon-meeting in New Hampshire was held at Concord. WRONE President Mary Hadley, K1ADY, of Brewer, Maine, presided. Special guests present were Onie Woodward, W1ZEN, YLRL President; Blanche Randles, K1IZT, V.P. of the YLRL; and Shirley Rex, K8MZT, and her OM K8MZS. K8MZT, general chairman of the National Convention of the YLRL to be held in Ohio in June, 1964, extended a cordial invitation to the some 100 amateurs present to attend the event.

Mr. Samuel Allsup, sales manager of a large radio equipment company, spoke on preparedness within the home for a national emergency. Mr. William Lenney, K1OGX, spoke on proper procedure in communications in case of a national emergency. A fully-equipped Civil Defense truck was open for inspection, and K8MZT had her own portable radio station set up and contacts were made with hams throughout the country.

K1IZT advised that the following rules must be followed explicitly by all amateurs interested in obtaining the WRONE certificate. Work 6 WRONE members, after May 1, 1959. Three of the N.E. States must be represented. To qualify for a sticker you must work a WRONE member in all three of the states not worked for the original certificate. When you have received both the certificate and the sticker, you will have worked 9 WRONE members and all 6 N.E. states. Send QSL cards or copy of log certified by an officer of your radio club (or two amateurs) that the cards are in order, plus 20¢ to cover mailing cost.

And In Her Spare Time . . .

Did you say you were too busy to get on the air? Hear of one YL who is a bit busy at times (see photo for seven reasons why), but in the two years she has been a ham she claims she has "had a continuous ball" on the air. The seven children of Helen Maziarz, K8NQD, of Lorain, Ohio, don't really impede Helen's operating — in fact, the whole family enjoys it when Mother and Daddy, K8MLI, take to the air.

Helen writes, "Ham radio is certainly a blessing to anyone with a large family. It is an inexpensive hobby and enjoyed so much by all nine of us here."

The only YL of the AREC in Lorain County, Ohio, Helen was also the first YL member and first YL officer of the Lorain County ARA. She is an active member of the Buckeye Belles and Chix on Six and the AREA. Two of Helen's children have their own calls already — 15-year-old Joe, K8BIU, and 14-year-old Mary Frances, WA8BJM. Six more to go and it might be the biggest all ham family ever!

(*Continued on page 150*)

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

Who:

We should have known him by the beat and haunted expression on his face. But he came into our shack with the rest of the gang almost unnoticed, and slid into our operating chair with an uneasy grace. The seat fractured with a startling snap.

He started to tune 20 on our homebrew t.r.f. after Jeeves supplied another chair. Two knobs immediately fell off the receiver in his hands, a trouble we had never encountered before. We jammed them back on as he mumbled an apology, but then the set went dead. A blown 80, by golly, our first burnout in years.

Having his ticket with him, a crumpled, greasy thing, he made ready to answer a TU2's CQ. We had him sign the log before he did so (would have been a new one for us!) and his pen went dry halfway through the scribble. Too late — the TU2 got away. Now an FR7 showed up down-band, so the peculiar fellow grabbed our bug to nab us another would-be new one. The key's U-spring suddenly wrapped itself around the dot-contact post. We frantically corrected this while he hammered on a paralleled straight key, shattering its knob.

The FR7 let out a heart-stopping QRZ W9? just as our final belched forth a mushroom-shaped cloud of vaporized power transformer. We threw the antenna onto our buffer-driver just in time to hear the FR7 settle for a K2. Our man had a knack, however, for he next raised a VQ9 on a short QRP CQ. This, too, would have been a new one for us if only the Seychelles chap had gotten our call right. No matter how clearly our visitor sent it, the VQ9 had us irrevocably logged as W9DRB. He faded out before we could wise him up.

Twenty was really getting hot as our buffer meter pegged its needle with a nasty B-plus short. We slapped the antenna tuner on the v.f.o. as our eager guest operator began to call a gurgly AC3. Wow — he came back to W9B?? on our peppy two watts! Another new one — almost. Our boy was giving the AC3 a clarifying call when the whole shack shuddered with a dismaying thud. Our four-element wide-spaced beam obviously had collapsed, for one element was jammed through the shack window like a spear from outer space.

We were attempting to figure out what had simultaneously caused our v.f.o. and monitor to spout acrid smoke when two or three fire engines pulled up out front and began pouring water on the roof. Our fallen tower apparently had nipped a hot line. We grabbed our determined guest by the collar and pulled him out the door to safety. Alas — not even time to save our precious shoebox QSL files.

It was an eventful evening, all right. More grief than a barrel of Field Days, Jeeves observed, and almost as much fun. This remark called forth a sudden familiarity. We inquired of our visitor if we hadn't met somewhere before. The fellow gave us a sheepish grin as he flicked some burnt-QSL ashes off his sodden coat and prepared to depart.

Said he, "You've heard of Murphy's Law, haven't you?"

We all nodded emphatically.

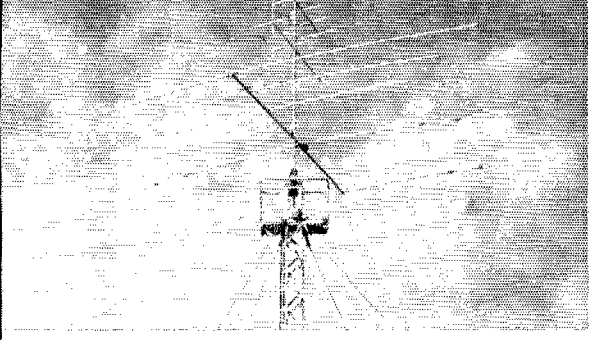
"Well, *I'm* Murphy. CUL."

What:

Not if we can help it, he won't. What a way to start the new year. Good thing it was only a bad dream. . . . Gee — next month is ARRL DX Contest time already! Better roll out the "How's" Bandwagon to see what's cooking on 10 through 160. In the text to follow, as usual, frequencies are in parentheses in number of kc. above the lower band limits, times in GMT outside parentheses. E.g., "TU2AP (55) 2-3" means that TU2AP was reported on 14,055 kc. at 0200-0300 GMT if the paragraph deals with 20 meters. Okay, let's go. . . .

10 phone makes quite a comeback. Good to see 28 Mc. in such good DX shape albeit temporarily. **Ws** 2ELW 9CSC, **Ks** 1MOD 1QGC 6MQG 9YDY 0GSV, **WAs** 2PJL 2RUB 2WMH 6VAG and 6VAT gobbled up **CE8PM**, **CN8s** HB (500) 14, HP, **COs** 7HQ 8JK (600) 22, **CRs** 6BS 6BX (456) 17, 7GH, **CTs** 1HX 2AK 3AF, a dozen CXs, **EAs** 4GR 7FT, **EL2F** (800) 17, **Fs** 2QX, 3OX, **FG7XP**, **HCs** 1BK 2RC 4CD 5NW, **HH2RS**, **HI8s** AT MV (770) 22, lots of **HKs** including **0AI** of San Andres, **HP1JC**, **HR1BB** 1NM, **KG4BII**, **KH6JQ**, **KP4s** BAU (720) 17, BY (600) 19, **KZ5CD**, scads of LUs and PYs, **OAs** 1D 4CR 4OG (700) 15, **PJs** 3AO 5MC (560) 19, **TGs** 5HC 9ED, **TI2s** ES WA, **TN8AD** (300) 18, **VK2FU**, **VPs** 2LA 4TR 5AH 5TK 6TR 7NB 8GO, **VQ2s** BK JC (300) 18, **VR3O** on s.s.b., **XEs** 1CCB 2AJ 3AQ, **XT2Z**, **YNs** 3KM 4CB 6HH, many YVs, **YS1LA** (450), **ZD6HK** 17, **ZEs** 1JJ 2JA 2JE (400) 18, 6JL 7JV 8JY, **ZLs** 1AUO 1RI 2ATV 2BE (350), 3QK,

*7862-B West Lawrence Ave., Chicago 31, Ill.



G8FC/G3RAF, installation of the Royal Air Force Amateur Radio Society at Locking, Somerset, is well worked as G8FC on 80 through 10 meters, single-sideband or c.w., and as G3RAF on straight a.m. or c.w. on 160 through 10 meters. At left is the station's beams for 28, 21, 14 and 144 Mc.; left center shows (left to right) G3IRK, G5UG, F/Lt. N. Griffiths and G3GNS talking things over in the club room; right center gives a full view of the gear available; and right is a snap of G3IRK manning G8FC equipment. G8FC/G3RAF recently completed an extensive rebuilding program and has been very active on DX bands since November. RAFARS, by the way, celebrates its 26th birthday this year.

ZSs 3HT (260) 17, 7L and a dozen other South Africans, **5A**s TW (455) 15, 5TW, **5H3**IW, **5N2**JKO (440) 16, **9L1**s HB and GM.

10 **c.w.** also makes a curtain call, **W**2ELW, Ks 1MOD 9YDY and **WA**6VAT accounting for **CE**4AD, **GT**1JY, **DL**6EZA, **DM**3IGY, EA7CP, **PY**5CFW 18, **VP5**s GT 18, TK, **VQ2**EW (10) 16, XE1s PJ VT, YV1CK, **ZS**s 2PX 6AJH 7L and **6W8**DD. Yes, indeed, you'd better keep your 28-Mc. twirler handy in the upcoming ARRL DX Test in case a red-hot week end comes along.

15 **phone** also lecked in solidly as the old year drew to its close. **W**s 1BPM 7POU, **K**s 1MOD 1QGC 6MQG 9CZV 9QNV 9TZK ØGSV. **WA**s 2JIS 2MUA 2PJL 2PXI 2RUB 2UEV 2UJM and 9AEA scored with **CE**4BP, **CN8**s IU (256) 13, J1 (210) 19, MY (256) 15, **CO8**s JK RA, **CP**s 1BJ 5EZ (90), **CR6**s CN (256) 20, CF (245) 21, EA (256) 20, FJ (245) 21, FZ (256) 20, JA (245) 20, JL (234) 19, **CT**s 1JD (200) 19, 2AK (256) 15, EA8CR (255) 20, **FG7**XS, **HC1**BS (400 s.s.b.) 17, **HH**s 2CE 4VB, **IT1**AI (80), **JA7**UJ, **LX1**DC (243) 18, **OA4**CV (345) 17, **OE5**BY, **PI1**BTD of Holland, **PJ2**CR (220) 14, **PZ1**s BZ (249) 21, CE (255) 20, **TG9**UP (245) 22, **TI2**JR (256) 17, **TN8**AD (270) 19, **TT8**AL, **TU2**AP, **VP**s 2KJ (240) 21, 2KP/a (240) 22, 2KZ (267) 17, 2SY 5BL (256) 20, 6WR 7CT 7NC (256) 14, **VQ2**JC (230) 19, **VR5**AR (400) 2, XEs 1FFV (449) 16, 2SO 3AQ, **XT2**Z (300) 11, **YV7**AX, **ZB1**CR (243) 15, **ZE**s 2JS 7JV (245) 20, **ZS3**IT (180) 20, **3V8**CA (100 s.s.b.) 19, **5A**s 3CW 5TW (235) 17, 5TV (256) 13, **5H3**IW (243) 17, **5R8**BX, **9G1**EE (220) 20, **9Q5**CK (268) 18, **9U5**s BB (220) 19-20, DM (245) 20 and PC (236) 20.

15 **c.w.** booms when the 21-Mc. phone subband grows congested. Reports are in from **W**s 1GDQ 6RCV 7DJU 7LZF 7POU (95/83 countries worked/confirmed), 7YAQ 8YGR, **K**s 1MOD 1QGC 1RHZ 2JUA 3CNN 3CUI 4SQS 6MQG (180/157), 9CZV 9TZK ØGSV ØGVA ØJPL, **WA**s 2JIS 2MUA 2PJL 2RUB 2UJM 4ARE 5CVK 6HRS 6VAT 9AEA ØATT ØBHL, DL9LI, 1IER and ZS2U on the subject of **CO2**EV, **CP5**EZ (87) 20, **CR6**s CA (56) 20, 6DX (75) 21, 6JS (100) 17, 7DX 7IZ (55) 19, **CT2**AI, **EA8**DL 18, **ET2US**/ET2 (56) 12, **FG7**XP (51) 23, **HC1**s DC 17, JU, **HL9**KN, **JA**s 1AOB 1CIB 1DFQ 1EFE 1EJA 1ERB 1EZP 1FAF 1IRS 1JAN 1JCQ 2BUR 2CEZ 3YT 4AS 5ADR 5FQ 7AZN 7BDW 7XF 8ABH 8QQ 8ZO 9VS ØSU, **GC2**CNC (67) 14, **KC6**BD, **KG**s 4AM 4BB 6NAA, **KM6**CE, **KS6**AN, **KV4**CY (110) 23, **KX6**BK, **TI2**JR, **TT8**AA (40) 19, **UA**s 2KAA (65) 12, 2KAW (90) 15, ØEK (60) 23, VE8RG, VK6RU, **VP**s 2MV 5GT 15, 5MJ 7NT 8FX (45) 22, **VQ2**s AE (100) 20, 1E W (25) 19-20, **VS**s 4RS 9ARC (56) 16, 9MB (34) 16, W6ZDF/**KM6**, **YV5**s BFQ BHI, **ZB1**CR (89) 12, **ZD6**GA (95) 18, **ZE5**JF (12) 19, **ZS**s 3SF 9P (39) 19, 3V8CA (45) 16-17, 4X4MB (98) 14, **5A**s 3CJ (67) 14, 5TR, **5B4**s FB (56) 18, OS (56) 13, RF (45) 12, **5H3**IP (45) 18, **5R8**AB (60) 18, **5Q5**IG (77) 16-19, **6O1**ND, **6W8**s DD 15, DE (80) 18-19, DF (60) 18-19, **9Q5**s AV (50) 20, FR (78) 17, KS and **9U5ZZ** 8.

15 **Novice** news finds **K**Ns TZQ (39/32), VTH VWL, **KN3**s 8ME UOV, **WN4**IPC, **WV2**s YYJ and ZVJ coming to grip with stuff like **CX2**AZ, **DJ**s 2KS 2KX 3KR 7CX, EA3GV, **Fs** 2RQ 3ZA, **Gs** 2AYY 2HDT 2HDU 3BHL 3ILS 3PFB 6RC, **GC2**CNC, HA5AM, **HB9**s AAF XU, **HK**s 1QQ 3LX, 1IOL, **KP4**BBN, **KZ5**s CY GW TJ, **LU8**BFH, **LZ1**KBD, **OE**s 1FF 9KI, **OH2**XF, **OK**s 1AFC 2KOJ, **ON4**s FU TA, **PAØ**WVR, **PJ2**CR, **PZ1**CJ, **SP2**AEO, **UA2**AK, **WP4**s BJJ BJU, YU2OB, **ZS**s 2PU 8NZ, **5N2**JKO and **5R8**BX. Hang on, men!

20 **phone** hangers-on are riding out ionospheric storms like old salts. **W5**DNL, **K**s 1JFF 1MOD 1QGC 2TDI 2UYG 5GBS 9CZV 9YDY ØGVA, **WA**s 2HLH 2KHW 2MUA 2PJL 2PXI 2RQZ 2UEV 2UJM 9AEA and XZ2DW give us the goods on submariner **CE**ØZI/p (345) 3, **CR6**s CA (335) 22-23, CY (272) 20, **CT3**AV (109, 278) 21, **EL**s 2X* 2E (342) 22, 3A (346) 21, 6A (345) 21, **ET3**LM (300) 20-21, **FG7**XT (300) 22, **GB2**SM of England, **HC1**HC (335) 23, **HH**s 2PB* 2PW 9DL (343) 5, **HI8**CLU (312) 22, **HL9**KO (345) 5, **HP1**AP*, **HR1**MD (320) 22, **KG4**s AA AM, KL7DBG/**KS6** (317) 3, **KP6**AX (290) 3, KX6BQ (328) 21, **OE1**SC (320) 21, **OX3**AI (300) 13, **PJ**s 2AA 5MB (109) 21, **ST2**AR, SV1AR, **TF2**s WHB (292) 21, WHJ (302) 22, **TG5**WH (275) 20, **TI2**s PT (256) 2, SS, **VP**s 2AF (198) 21, 2KP (245) 19, 3RS (315) 11-12, 4SS* 6KL (312) 17, 7NT* 9AL*, **VQ**s 1GDW (381) 21, 2AB (290) 22, 4RF (300) 21, **VR**s 2DS (306) 8, 30 (339) 13, **VS9**AAS (219) 18, W4NXL/mm off Madagascar, W4WQQ/**VP9**, **XT2**Z (330) 23, YN1GM 1, **YS1**MM*, **ZE1**JO (288) 20, **ZS3**E (342) 19, **5N2**HJA (306) 21, **5X5**IU (320) 21, **9G1**s DT (98) 2, EB (340) 22, GN, **9Q5**US (320) 21 and **9U5ZZ**, the lonely asterisks representing non-s.s.b. entries.

20 **c.w.** continues its daytime DX bargain sale. **W**s 1GDQ 2JBL 4HOS (125/110), 6RCV 7DJU 7LZF 7YAQ 8KX 8YGR 9CED, **K**s 1JFF (104/101), 1MOD (235/215), 1QGC (81/70), 1RHZ 2JUA 2UYG 3CNN (109/81), 3MNJ 5GBS 6MQG 6TZX (92/82), 8BSH 9CZV 9UHH (200), 9YDY ØGSV ØGVA ØJPL ØVSH, **WA**s 2HLH 2KHW 2MUA 2PJL 2PXI (36/17) 2RQZ 2RUB 2UEV 2UJM 4ARE 6HRS 6VAT 9AEA, 1IER, DL9LI, VE7BBB and ZS2U crowded the counter to snap up **AP**5s AH CP 14, SS, **CE**s 2FZ 3AD 3AG 4AD ØAB (40) 5, **CN8JF** (56) 21, **CP3**KA (41) 23, **CR6**s 6CA (78) 20, 6CH (15) 21-22, 8AC (42) 13, **CT3**AV (56) 21, **DM3**s ML RBM YCJ, **DU7SV**, EL2PN (65) 23, **ET**s 2US 16, 3RC 17, **FO8**AA (17) 1, **FS7GS**, **FY7**s YF 3, YI (65) 22, **HA**s 1KSA 3KGC (70) 20, 6NI 7KPF, **HH2**LD, **HI**s 3PC (3) 10, 8XA, **HL9**s KH (43) 23, KQ (10) 0-1, **HR2**s BS (32) 0, FG, **HZ1**AB 18, numerous JAs, **JT**s 1AG (55) 1, 2KAA, K1YOO/**KP6** (9) 17-1, K8KHX/VE8, **KG**s 1AD (12) 1, 1BO 1BX 4AM (78) 16, 4AN, **KC6**BK (78) 12, **KR6**BK (76) 13, KV4AA (81) 20, KX6BC 12, far-south **LU**s 1ZG 2ZG (67) 1 of So. Orkneys, 3ZF of Antarctica, OA4s FM (5) 0, FN, **OX3**s AY (30) 20, DL (30) 20-21, BZ (63) 22, JD (45) 11, UD (30) 20, **PJ2**MI, **ST2**AR, **SU1**IM, **SV0**WI, **TG9**AD, **TT8**AL (50) 20, **UA**s 1KAW/2 of Antarctica, 1 KED (45) 14 of F.J.L., 2KAK 2KAW ØCJ ØEQ ØKKD ØKKF ØKQB (60) 12, ØKYA (30) 1, ØZK (41) 20, **UB5**s DQ KST (60) 19, XA, **UC2CS**, **UD6**BE, UF6FE, **UG6**GW, **UH8**s BI BO, **UI8**s FB KAE LB, **UJ8**s AC AM, **UL7**s AQ CH FA IJ KBK KCF NB, **UM8**s KAA KAB, **UN1**BK, **UO5**AS, **UP2**NN (50) 18, **UQ2**s GA KAR, UT5BB (56) 21, VE8TU who is 400 miles from the pole, VK1SG of Canberra, **VP**s 2KJ (14) 22, 2SH (65) 21, 3RS 5AB (110) 22, 6LN (56) 10, 7NT 7TT 8GB 8GQ (34) 10, 8GR (38) 23, 8GU, **VQ**s 2IE (23) 4, 4IN 4IV (56) 5, 8AI, **VS9**LN (40) 15-16, **VR**s 2EB (18) 16, 3L 4CV 5AA 6TC (167) 5, **VS**s 4RS (78) 13, 6EC (65) 13, 9AJA 9ARW 15, **VU2**s AJ (51) 16-17, BK 1, KU 1, MD SU, W5YMIX/**CT2**, ship XR2A/mm (34) 22, YN1GM 1, YO2KAB, **YS1**O, **YV2**s CJ CU, ZE1BE (34) 5, **ZK1**AR, **ZS7**M (76) 20, **4S7**s EC (97) 17, PG (76) 17, WP (87) 22 1, 4X4s DH (45) 18, FU (78) 18, HO (34) 19, MB (56) 14, NJ (45) 13, WF (23), **5A3**CJ (28) 7, **5H3**IP (65) 18, **5U7**AC (67) 21, **6O1**s MT (65) 21, ND (10) 21, **9G1**DT (98) 20-21, **9M2**s GJ (70) 16, UF, **9Q5**s AAA and US.

40 **c.w.** carrying an increasing load of nighttime DX traffic, makes it possible for **W**s 1GDQ 4HOS 6RCV 7DJU 7LZF 7POU 7YAQ 8YGR 9NN (176 on 7 Mc.), 9CED, Ks 1MOD 2JUA 3CNN 3OKC 6MQG 8BSH 8DCP ØGVA ØJPL ØVSH, **WA**s 2HLH 2PXI 2RUB 4ARE 5CVK 6PIB and ØATT to put the bite on **CE**2FZ (25) 3, **CR8**AC, GT1VB, **DU6**TY, **FG7**XM (36), **HC1**s JU LE (25) 22, **HI**s 3PC 8XAG (12) 2, **HK**s 1QQ 7AJF 7XI, **HL9**s KH KW, **HM**s 5BF (21) 5, 8BG (21) 5, **HZ1**BT (20) 3, **JA**s 1BBP

1CWL 1DCY 1EEO 1EFE 1FNR (29) 11, 1IBX 1ISB 1JRE 1JUX 1KFN 2BAA 2BDY 2CA 2DCN 3BQU 3DKT 3EGE 3ELY 4AWX 4BOC 6BVJ 7AMH 7BDW 7TI 9FB around breakfasttime. **KGs** 1FD 6NAA, **KM6**BI, **KR8**AS, **LZ**1KBL (20) 3, **OA**4AV, **OX**3BZ 8, **SL**5ZL of Sweden, **TG**9AD (1) 5, **UA0s** KKB KIF LU ZK 8, UB5ES/**0**, **UW0s** FD 15, IJ, VKs and ZLs galore, **VPs** 3RS 5CC 5MJ 5UA 7NT 8GQ 9BO (16) 2, **VRs** 2EH 15, 3A 3O 8, 5AR 14, **VSs** 1FJ 15, 1LJ 4RS, several XEs and a flock of YVs, **ZE**3JO, **ZSs** 1A (9) 5, 5KI 15 and scrumptious **5T**5AI (66) . . . . K1MOD finds **KP4**BCL (256) 2 and **KZ5**MQ (209) responsive on **40 phone** but this DX proposition seems to be too baffling for most of the voice DX gang. Any 7-Mc. mike luck over your way?

160 and 80 suffered a sharp relapse after promising openings in late summer and early fall. Someone must have dropped an electronic curtain. But the season is young, so W1BB and friends urge your participation in this month's 160-Meter Transatlantic and World-wide DX Test week ends — the 6th and 20th in particular (see last month's column for amplification) — and let Stew and "How's" know how you're making out. G'luck!

Where:

Asia — ARRL Asst. Secy. W1ECH, tapping the voluminous correspondence crossing his desk, advises that XW8AS (address in the list to follow) will attempt to relay QSLs to other unlisted XW8s . . . . . OD5CN, QSL chief in Lebanon, tells W1ECH his bureau cannot handle incoming cards to OD5s with the letter "D" after the numeral, for these would be nonmembers of RAL . . . . . W9VZP would like a higher percentage of self-addressed stamped envelopes from W/Ks seeking his services as HL9KH QSL aide, according to WGDXC. Lack of such enclosures results in bureau shipment at monthly intervals . . . . . The Gulf gang also hear that W1HGT has volunteered for QSL duty regarding a tentative Turkey DXpeditionary effort by W/Ks this month . . . . . "I'm returning to the U.K.," announces ex-VS9APH, GW3IEQ, via W1WPO. "Any further QSL claims by W/K/VEs should be made through W3IIQO, my QSL manager. Others can write direct to GW3IEQ."

Africa — More from the archives of W1ECH: ON4QZ, UBA QSL manager, points out that cards for Burundi and Rwanda 9U5s can go to Boite Postale 14, Usumbura, Burundi, and that they should be addressed in French [Quick, Boss, some Berlitz. — *Jeeves.*] . . . . . VQ8AD tells W1ECH that cards bound for Mauritius, Rodriguez, Chagos and St. Brandon VQ8s may be sent through him . . . . . ZS1BH still has his ZS7H logs of a few years back and invites QSL inquiry, according to W1ECH . . . . . "Patience is requested from those awaiting 'TT8AJ cards," pleads K2UYG. "I'm running into that well known problem of slow log deliveries. As soon as they come through I'll distribute the QSLs pronto." . . . . . "No postage or s.a.e. required," declares VE3EUU, doing North and South America QSL chores for 28-Mc. specialist ZS6BDU. . . . . VE3BQL/VE1, formerly VE3BQL/SU, pens: "Stations who have not received QSLs for my contacts in the Middle East can contact me at [the address to follow] and I will be very pleased to respond. I QSLd 100 per cent, so if anyone has not received his QSL this is due to something beyond my control." . . . . . WGDXC confirmatory observations: QSLs for 9G1DP's most recent XT2Z maneuver will be getting around this month. . . . 9U5DR cards were delayed at the printers level but much better late than never. . . . . Ex-ZD8RN now welcomes QSL inquiries at the address in the roster to follow . . . . . Regarding his recent Bechuanaland binge as ZS6PC/ZS9, Lee affirms that QSL requests to his Johannesburg address will receive direct reply if s.a.e. and postage defrayal are supplied . . . . . LA5HE pooh-poohs reports of resident amateurs on Bouvet isle, declaring that the place is uninhabited and has no meterorological station.

Oceania — "WA6JSA/KM6 secured on August 4th," notifies the OM himself. "I've answered all s.a.s.e.-accompanied QSLs on the day of receipt, but these represent only a fraction of all QSOs. Now I know why DX stations get riled! Cards addressed to me via addresses other than my home QTH or the Bureau should be resent, for other routes have proved unreliable." . . . . . W1ECH reminds us that W1HGT does QSL honors for YJ1MA, VRs 1M and 4M . . . . . WGDXC finds that K8RTW desires s.a.s.e. to expedite his ZM6AB (KS6AN) QSL managership efforts for late autumn QSOs . . . . . The *DX Bulletin* of WGDXC also has it from VK2ANB that all remaining Norfolk VK9GP QSLs will soon be disseminated.

Europe — K3CUI, perspicacious peruser of world-wide ham literature, notes in an East German journal that the DM QSL Bureau address now is Postbox 30, Berlin NO-55, E. Germany (D.D.R.) . . . . . Regarding his LX3TA sortie with DL1TA, DJ0HZ (K3KMO-W4UWA) writes, "U.S. stations should enclose s.a.s.e. bearing eight cents U.S. postage for direct reply. Non-U.S. applicants should provide s.a.s.e. with German postage, or appropriate International Reply Coupons. All cards received will be answered."

South America — "At present I'm acting as QSL manager for VP3RS," states K5BGS. "The usual s.a.s.e. requirement will prevail. Also, I have logs for my s.s.b. operation of FY7YI in April, 1962, should anyone have missed his card." . . . . . Enlightenment from VP4NC: "DX hounds should note that Trinidad & Tobago now has a post office box number to help speed QSLs along the way. Address VP4 cards to P.O. Box 756, Port of Spain, Trinidad." . . . . . VERON'S *DXpress* suggests this address for operator Alberto of CE9AS: A. Sir, C. Valparaiso 120, Dept. nr. 72, Vina del Mar, Chile . . . . . YV5BFT, RCV secretary, insists that only YVØs AA and AB have legitimately operated from that call area. Scratch AC FG, etc.

Hereabouts — Lots of "QSLers of the Month" this month: CTs 1TT 3AB, DL5KM, ET3LM, FB8XX, HC1JU, HI8MY, HK3HY, HL9KO, KG4AM, KV4CY, SU1AI, TT8AG, UAs 1KED ØLL, UJ8AC, VQ9AA, VSs 4RS 9MB, W6ZDF/KM6, YS1O, ZK1BY, 5A3CJ, 5N2-JKO, 6W8BQ and 9G1EE, as well as QSL managers Ws 2CTN 8EWS and 5R8BC. Nominations come from W4AU, Ks 1QGC 1RHZ 3CNN 6MQG 6TZX 9UIHH, WAs 2RUB 4ARE 6VAT, VE2ANK and ZS2U in appreciation of swift QSLs. Any commendable QSLers in *your* log and mailbox lately? . . . . . K6MQG offers a helping of "Worst QSLers of the Century" but we had better continue accentuating the positive. Hi! . . . . . K1QGC and WN4IPC offer their good offices to assist deserving overseas DXers with QSL chores . . . . . Ex-HI8DGC explains, "Logs of HI8DGC are still in customs and may be there for another month or two until I am permanently established in Canada. I will advise once we are acknowledging QSLs again." . . . . . K8ITH apprises W1ECH that he will handle YN9DL's cards while the latter tours the States . . . . . "Anyone who still needs FP8PR's QSL can send s.a.s.e. to K1MEM or myself," invites K1MOD . . . . . WGDXC designates K8ONV as QSL charge for the late'62 Montserrat swing of VP2KJ & Co. . . . . W8GIU seeks a lead toward whereabouts of the TA3AF he worked in '54 as W4VCH . . . . . In FDXC's *DX Report* K4HF mentions instant QSLs in response to brief accompanying messages to overseas stations in their native languages, Swahili or lower Hindustani, anyone? . . . . . Now our monthly directory of definitive DX data, mindful of the consideration that they are neither "official", complete nor accurate — necessarily:

CE0ZI/mm/p (to KC4AAA)
CR6DX (via LARA)
CR7IZ, R. da Graca, Box 95, Porto Amelia, Mozambique (or via SARL)
CR8AC, A. F. de Brito Seco, Capitania dos Portos, Dili, Portuguese Timor
CT2AK, J. Raposo, Box 143, Ponta Delgado Azores
CT3AV (via W3KVQ)
CX1CA, R. Mir, Box 37, Montevideo, Uruguay
DJ1ZG/M1 (to DJ1ZG)
DL5UW, H. W. Lufkin, FTD 904L, APO 132, New York, N.Y.
DL9XO/M1 (via DJ1ZG)
EA8DO, A. Martin, Box 215, Tenerife, Canary Islands
ex-EP2AG, G. Buchanan, K5ODC/4, 707 W. Blount St. Pensacola, Fla.

HM1AP is "one of the most ardent hams I have ever encountered," to quote W3MVK, just back from a stint as HL9KN. Last month we showed Cho visiting HL9KR (W4WNY). Here's a picture of HM1AP at his own cozy operating position wherefrom plenty of W/K/VEs have been worked.

ET3LM, APO 319, New York, N.Y., or P.O. Box 1014 U.S. Embassy/AID, Addis Ababa, Ethiopia
ET3RC (via K1KOM)
ET3RS, Box 3005, Addis Ababa, Ethiopia
F2NH, P. Laval, 7 rue Honegger, Toulouse, France
FA2MN (via REF)
FA9UO (via W2CTN)
FG7XT (via K5AWR)
FP8EI (via WA2PVW)
ex-FQ8AF (to TU2AF)
FY7YI (see preceding text)
HC1HC, c/o U.S. Embassy, Quito, Ecuador
HK1QQ (via K4LDR)
HK2GW, P.O. Box 885, Cucuta, Colombia
HL9KO, c/o K7MGZ, 1840 N. 16th Av., Phoenix, Arizona
HL9KQ (via W9VZP)
HMs 5BF 8BG P.O. Box 4, N. Pusan, So. Korea
JA1DLN (via W6FQJ)
JT1AG, Box 639, Ulan Bator, M.P.R.
JY2TAI (via W4VPD)
KG4AAA, U.S. Antarctic Research Program, USNS *Eltanin*, FPO, New York, N.Y.
KG4AM (via W2CTN)
KG4BH, P.O. Box 36, Navy 115, FPO, New York, N.Y.
KJ6BZ, R. Lange, 1957th Comm. Gp., Det. 1, APO 175, San Francisco, Calif.
KL7DBG/KS6 QSL to 11750 S. Homan, Box 17A, Chicago 55, Illinois
KV4GY, Box 1767, St. Thomas, V.I.
LH4C (via W4ECI)
LX3TA (to DL1TA or via DARC)
LZ1HA, c/o WØEUO, A. Lawarie, 2133 W. Arbor Av., Littletown, Colo.
OX3KC (to OZ9KC or via W2CTN)
PJ5MC (to W3ZQ)
PZ1DA, P.O. Box 494, Paramaribo, Surinam
SV0WL, Box 134, Salonika, Greece
SVØWZ, S. Horn, Box 518, Iraklion Air Stn., Crete (or via ISWL or W7FTU)
TF2WGU, AF Unit, Box 6, H2, FPO 568, New York, N.Y.
TG5WH (via W5PZG)
TU2AP, G. Cravet, P.O. Box 7002, Abidjan, I.C.R.
ex-VE3BQL/SU, WO/2 E.C. Veale, VE3BQL/VE1, Nova Scotia Signal Sqdn., Ahern Av., Halifax, N.S., Canada
VE8RG (via VE8JJ)
VK9BM (via K8RTW)
VP2DB, G. Stedman, c/o Barclays Bank DCO, P.O. Box 4, Roseau, Dominica, W.I.
VP2GAC (via W4OPM)
VP2KJ (via W4SSU or direct)
VP2KP/a (to VP2KP)
VP2SH/VP2, R. Nelson, Dept of Agriculture, St. Vincent, W.I.
VP3RS (via K5GBS)
VP5MJ (via KØTYO)
VP6WR (via W9JFJ)
VQ1GDW (via RSEA)
VQ2AB (via W6BAF)
VQ8BFA (to VQ9HB)
VR4CB (via W7PHO)
VR5AC, I. Robertson, Box 40, Singapore
VR5SF, G. Harrison, Marine Dept., Nukualofa, Tonga Islands
VS9ACH (via RSGB)
VU2JA (via W4YWX)
W1ECK/KJ6 (to W1ECK)
WA6JSA/KM6 (to WA6JSA)
XT2Z (via HB9ZY)

Banned Countries

U.S. amateurs may not work amateurs in the following countries:
Cambodia, Viet Nam, Indonesia, and *Thailand.*
Canadian amateurs may not work the following:
Cambodia, Viet Nam, Indonesia, Thailand, Laos, Roumania, and *Jordan.*

XW8AS, Lt. H. Sherrod, jr. (K5OSQ), Box 94, Navy 128, FPO, San Francisco, Calif.
YN9DL (via K8ITH)
YV5BFZ (via RCV)
ex-ZC5SF (to VR5SF)
ZD6JJ (to ZE3JJ)
ZD6JO (to ZE3JO)
ex-ZD8RN, D. Davies, HMS *Caprice*, BFMO, Singapore 27, Malaya
ZD9AM (via W4ECI)
ZK1BS (via W7ZAS)
ZM6AB (via K8RTW)
ZP5CN (via K4RSM)
ZS4PB/ZS9 (to ZS4PB)
ZS5s OA/ZS8 RS/ZS8 (to ZS5s OA RS)
ZS6BDU (via VE3EUU)
3A2BP (to K9ICG)
5A2TC, D. Beagles, Box 922, APO 213, New York, N.Y.
ex-5A5TW-DL4UW (to DL5UW)
5X5IG (VQ5IG, via W2CTN)
7G1A (via CAV, attn. OK1PD)
9G1GN (via VE4IM)
9Q5AV (to DL4AV)
9Q5FD, P.O. Box 75, Jadotville, Katanga
9Q5KS, Box 590, Kolwezi, Katanga
9Q5OB, Box 39, Faro, Portugal
9U5BM, P.O. Box 1, Usumbura, Burundi
9U5DR, D. Riley, Kwisumo-Ruyigi, Burundi

The preceding QTH catalog comes courtesy generous **Ws** 1AEW 1BPM 1ECH 1UED 1WPO 2GBB 4HOS 7LZF, **Ks** 1JFF 1MOD 1QGC 2TDI 2UTC 2UYG 3CUI CMNJ 3OKC 6MQG 6TXZ 9UHH 9YDY ØJPL, **WA2HLH**, VE2ANK, DJØHZ, LA5HE, American SWL Club *SWL* (J. Howard, 6204 E. 109th Ter., Kansas City 37, Mo.), DARC *DX-MB* (DLs 3RK 9PF), Florida DX Club (*DX Report* (W4CKB), International Short Wave League *Monitor* (B. Brown, 196 Abbey St., Derby, England), Japan DX Radio Club *Bulletin* (JA1DM), Long Island DX Association *DX Bulletin* (W2MES), North Eastern DX Association *DX Bulletin* (W2DGW), Northern California DX Club *DXer* (K6CQM), Okinawa Amateur Radio Club *Keystone Karrier* (KR6DI), VERON *DXpress* (PAØs FX LOU VDV WWP) and West Gulf DX Club *DX Bulletin* (K5ADQ). Well done, colleagues!

Whence:

Europe — More from G3IRK on venerable G8FC/G3RAF, station of the Royal Air Force Amateur Radio Society: G8FC was born at Cranwell, Lincolnshire, in 1936, serving as a meeting place for RAF hams. As members left the base for assignments throughout the world, they were able to keep in touch by working skeds with G8FC which eventually became known as the "headquarters station". The installation closed down during WW-II, of course, and reopened in 1947 with war-surplus equipment on c.w. and a.m. By this time many prewar members had strayed from the fold and the rest had lost touch, but soon the membership was on the increase once more. Present RAFARS strength is over 500. In 1950 the equipment was long overdue for replacement, so, after lengthy discussions, it was decided to re-equip with commercial gear and efficient aerial systems for all bands. A generous grant from the Nuffield Trust for the Forces of the Crown made it possible to purchase the nucleus of the new station. On September 22, 1962, G8FC/G3RAF was formally reopened by the society's president, Air Commodore W. D. Disbrey, CBE AFC. The call G3IRS also is assigned for RAFARS use. Continued good luck and good DX huntin', OOs! _.._.._ Ex-VE3BQL/SU, now VE3BQL/VE1, brings us up to date with happy news. "In September I married DJ3YL, a prominent DXer for the past few years. She will be getting her own VE1 license as soon as we are set up in Halifax, and we both shall be watching for our 10-, 15, and 20-meter DX friends. DJ3YL and I maintained almost daily schedules during my year in the Middle East and we owe our marriage to amateur radio." _.._.._ W9WNV, K5IKL, W2WZ, K6EVR and WA6DNM were high U.S.A. scorers in that order for last year's U.S.S.R. DX Test, results forwarded by W1ECH. _.._.._ K3CUI observes that Russian calls ending in "/K" appear to be official monitoring stations who keep an ear on the operating procedures and practices of U stations. UAs 1MU/K and 3AN/K are examples. Ted also notes that U.S.S.R. Novice and 2nd Class amateurs now

may use single-sideband on 80 meters . _ . _ . _ G3IRM's announcement of the Tops C.W. Club's December 15th-16th 3.5-Mc. DX contest arrived too late for *QST* QSP but, if you wondered what was going on, be now advised. TCWC also held an 80–40–20 get-together in November . _ . _ . _ Rockall island, officially annexed to the U.K. in 1955, is 220 miles from the Outer Hebrides, 470 miles from Glasgow and 470 miles from the Faeroes. GM3OGJ writes, "If any keen DXers do go to the place they had better use a helicopter. The ocean swell never drops below ten feet and there is absolutely no anchorage. It's 70 feet high and very steeply sided." . _ . _ . _ W1UED is informed by OH2XK of SRAL that Finnish amateurs now may run 10 watts on 1830–1845 and 1915–1955 kc., a welcome addition to 160-meter DX targets. OHs 2HK 2SE 2TK 2YV 3NY 3PP 5RH and ØNI already are rarin' to go on top band . _ . _ . _ K8WUX/1 enjoyed a mid-'61 visit among the EA gang . _ . _ . _ DL1TA and DJØHZ (K3KMO) had a Navigator, a 2B, 14-AVS and 80-meter wire functional as LX3TA in late November . _ . _ . _ DL5UW (ex-5A5TW) likes 75-meter sideband and hopes to obtain 1.8-Mc. authorization, too . _ . _ . _ K9ICG had a DX ball as 3A2BP in October but W8KX writes, "I'd like to see more Monaco junkets. It's the only European country I have never worked." . _ . _ . _ K2UYG hears that G2BVN shipped a rotator to OY7ML, so Martin's new QTH should soon be on the beam . _ . _ . _ WGDXC mentions a prospective jaunt to Jordan by IT1s TAI and ZGY . _ . _ . _ VERON points out the s.s.b. potentialities of LA8SE/p, Jan Mayen.

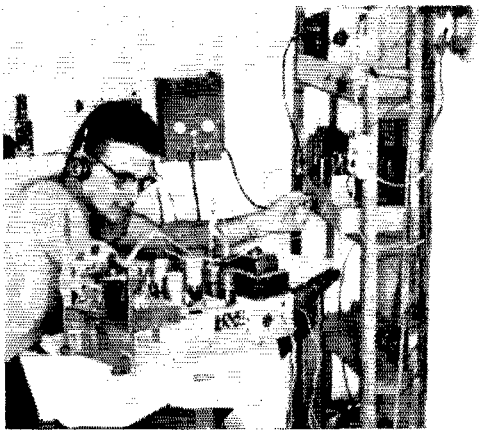
Asia — "Regarding that DXpedition to the Kuria Murias, transport difficulties have unfortunately delayed plans indefinitely," writes ex-VS9APH (GW3IEQ) to ARRL DXCC Deskman W1WPO. "VS9AAA's Kamarans trip also was delayed due to the local situation." . _ . _ . _ No better news from Turkey via K1QGC: "There are some dozen Stateside hams cooling their heels in TA-land. I was to handle QSLs for K1EBY who had hoped to operate at TA3US last year but it is still difficult to obtain the necessary permission to operate. The boys are listening on their S-120 and long-wire, however." . _ . _ . _ W3MVK (ex-HL9KN) mentions hearing plenty of delicious Asian QRM while he was in Korea but HL-HM stations are prohibited from working amateurs in the Red regions. "I cannot estimate the number of stations replying to my HL9KN CQs and QRZs that I was not allowed to work." . _ . _ . _ W9JKC and family recently visited with JAs 1FMQ 1KF 1KS 1YF 7DF and other Rotarians in Tokyo . _ . _ . _ Eastern items via club organs: HM5BF and his XYL, HM8BG, lurk around 7020 kc., 1300 GMT. . . . CR9AK is a fresh Macao candidate, 7- and 14-Mc. s.s.b., 1300–1600 GMT. . . . One of TA4RZ's two-man staff returned Stateside and the remaining OM isn't very active. . . . Okinawa ramblings via OARC's *Keystone Kurrier*: KR6ML hits all long-haul bands with his new homebrew 500-watt final, KR6s AH and BY swapped antennas to see whose really is best, KR6BY awaits a new 2B inhaler, KR6MO is QRO with a 4–1000 g.g. job, KR6GY continues his c.w. onslaught on the low edges of 20 and 15, codehound KR6NG has departed, and KR6s LD LJ and OH traditionally infest 10 phone each Sunday morning. . . . VU2AX (ex-FN8AD-AC4AX) is said to be stationed in Sikkim but hamming obviously is somewhat unfashionable in those regions at present.

Africa — Amateur radio remains on precarious footing in some of the newly autonomous African nations, at least temporarily. ON4QZ tells W1ECH, "Hams in Rwanda and Burundi are merely tolerated, not specifically authorized. No very steady call-sign list can be established because of the sudden disappearance of calls there." . _ . _ . _ *LA5HE* gets credit for cutting red tape so that W4BPD could be assigned the call LH4C for Bouvet isle. The place still will carry the normal LA/g prefix for Norwegian citizens . _ . _ . _ Natives of Tristan da Cunha, homesick and rather exiled in Britain after their volcano-inspired evacuation a year or so ago, may soon return to the island. W5HOY forwards a newsclip to this effect, a development that could put ZD9 back in the DXCC running permanently as of old . _ . _ . _ Ws 1FAI and 4WHD, of USNS *Valdez*, report a pleasant Capetown visit with ZS1s AW BW HP OS TP TZ VN and others . _ . _ . _ Via W8KX: "6O1MT is experiencing the phenomenon of ionospheric dispersion in the declining years of this sunspot cycle. Best openings on 15 and 20 occur around 2 or 3 A.M. Mauro's local time." 6O1MT is one of Africa's most avid certificate-chasers and is working on quite a few "almost-gots" . _ . _ . _ More Africanograms from club sources: ZS6IF planned a ZS7-8-9 c.w. splurge to close out the old year, ZS5s OA and RS aimed for a ZS8 s.s.b. invasion, and ZS4PB had similar ideas anent ZS9-land. . . . ZS2RM hopes to join ZS2MI on Marion isle for some April or May DX developments. Meanwhile the latter appears on 20 c.w., Sundays, around 1500 and 2000 GMT. And then there's talk of one ZS9AD on Prince Edward island, a Marion suburb. . . . VQ1GDW expects to keep Zanzibar workable for another year or more, 14,011-kc. c.w. and 14,315-kc. sideband, mostly around 2100 GMT. . . . 5A2TC, 21,405 kc. at 1500–1800 GMT, concentrates on Fives near Ft. Worth, his home town. . . . 9L1HB frequently displays the new Sierra Leone label on 14,255-kc. sideband, 2100–2300 and 0500–0700 GMT. Neighbor 9L1GM likes 28,500-kc. a.m. around 1800 GMT when ten is open.

Oceania — Pacific dispatches thanks to FDXC, NEDXC, NCDXC, VERON and WGDXC: VK5AB's Willis isle and Timor plans proceed apace. . . . More and more KG6 interest centers on Saipan and Rota. . . . ZK1BY, VP2VB/-mm of *Yasme III*, managed 2.8 kiloQSOs in a couple of weeks at Suvorov, then headed for Pago Pago and Samoa. . . . KX6AW quite often shows on 14,050 kc. at noon GMT of a Saturday. . . . KG6AJB offers details on that diploma available to DXers who work five Guam stations since 1958. . . . VR5AR guns for Europe almost daily on 14,050- or 14,080-kc. c.w. at 0730–0830 GMT. . . . KH6EDY keeps Kure radioactive with s.s.b. traffic skeds around 14,270 and 21,409 kc. . . . VS4RB joins VS4RS in Sarawak with a 15-watt military portable. When 21 Mc. is flat you might find VS4RS down on 14,078 kc., 1300 GMT or so. . . . VK9LA's new HT-37 radiates tempting sideband near 14,115 kc., 1200–1500 and 0300–0600 GMT.

South America — VP4NC's good DX intentions on Tobago were frustrated by beautiful weather, superb beaches and some overactive young harmonics. Larry managed sixteen countries there nevertheless. VP4NC reports that VP4LO and Radio Society of Trinidad & Tobago now issue a regular newsletter to help keep the ham ball spinning on the northern VP4 front . _ . _ . _ W4HOS lauds the tapelike 20 w.p.m. emanating from OA4FM on 20's low edge near zero GMT . _ . _ . _ W8KX finds that HCØNE's six-week FO-type activation in late '62 occurred in memoriam of pioneer Ecuadorian amateurs now among Silent Keys. HC1JU-HC8JU, one of HCØNE's staff, has held the calls 9AII 5AQW 9GO W9ZMT W2NEV W4ZO K6HMI HC1XJ and HC9JU . _ . _ . _ WGDXC says that VP8EL puts So. Georgia on 14,063-kc. c.w. each week end, plus or minus 1830 GMT . _ . _ . _ VERON perceives that CE3AG's DXpeditionary interest is aroused concerning San Felice island off Chile.

JA5FQ makes a rare Japanese call area much less rare with this effective layout at Tokushima. The quad and ground-plane are fed by a homebrew 200-watter while a Super Pro receives. (Photos via WA6PMK)



PY4AP's DX specialty is 40 c.w. where his homebuilt 150-watter and superhet have collected more than 100 countries. Hipacio is completing a chemical engineering education in Belo Horizonte.

Hereabouts — VE8RG writes from the cold country: "DX is very good up here. I managed to work 108 countries on 20 and 40 c.w. between April and August with a Ranger, HQ-129X and 7-Mc. double-Zepp from Bathurst Inlet, N.W.T. After a month's vacation I returned to Contwoyto Lake, N.W.T., with an HT-37, 2B, Hornet tribander and 7-Mc. inverted Vee. Got 18 more countries quickly, mostly on sideband. VE8JJ and I are active almost every day on s.s.b., straight a.m. or c.w., 40, 20 and 15 meters. Karl has an Eldico exciter, 811A linear and homegrown triplecon up here. We use the same antennas on a shifts arrangement. In other local news, VE8BC QSYd to VE5 or VE6, VE8DU returned to B.C., and VE8NP became VE8NP/4. VE8s ML and TU are quite active from Alert, VE8s BA BY DD RX and SL also are heard on DX bands." . . . . W8YGR feels that ARRL's annual Sweepstakes has Russian jamming techniques beat all hollow. W1ECH salutes the bang-up '62 SS performance of KG4AM whose prefix helped spice up the affair on several bands . . . . . "I'm interested in corresponding with a Stateside ham between the ages of 20 and 25," declares VP2DB whose QTH appears in "Where" . . . . . Thirteen-year-old WA6VAG knocks off good stuff on 10 phone when he's not QRL with his closed-circuit TV layout . . . . . W9NN and others decry local QRO rag-chewing on the low edges of 40 and 80 when the long skip is in. Most overseas DX stations are limited to use of narrow band segments just above 7000 and 3500 kc. whereas W/Ks can freely roam hundreds of kilocycles . . . . . W1BDI calls attention to DXer W5MMD's new status as a Fellow of the Instrument Society of America. How about coming up with an honest S-meter scale, OM?

Ten Years Ago in "How's DX?" — Interesting varieties of operating-chair "body english" are discussed in the opener for January, 1953 . . . . Seventy-five phone is getting hot on our east coast with QSOs reported involving EA2CQ, HB9MS, OK1MB, OX3WX, VQ3BU, ZS6s DW KD and OW . . . . . Eighty c.w. is right in there, too, with EA9AP, OE13RN, VPs 4LZ 5BH, ZD4AB and 4X4BX . . . . Forty's faithful favor FF8AG, KM6AX, KX6AH, MP4BAU, ZS91 and 3A2AB . . . . . Fifteen's best are plenty good: AC3PT, OQ5GU, TA3AA, ZD9AA, ZK2AA and 9S4AX . . . . Twenty c.w. has its usual quantity plus quality, including CR5s AC JB, F9QV/FC, FD4AD, FK8BC, LB6XD, MB9BJ, MF2AG, MI3s JV SL US, OE13s HL HS, OQ5s LL RA, ST2GL, VK1s JN PN and ZD7A . . . . Twenty-phone nifties are HZ1MY, KA0IJ, MI3LK, SU5CC and TA2EFA . . . . . Even 160 gets gay with transoceanic signals from Gs 3GGN 3HYG 6BQ and GW3FSP . . . . Jeeves rattles our v.f.o. with his new electric train under the Christmas tree . . . . Pictures of an HK group, HB9GJ, VP3LF and OX3SF enter your "How's" album of overseas DX personalities. QST

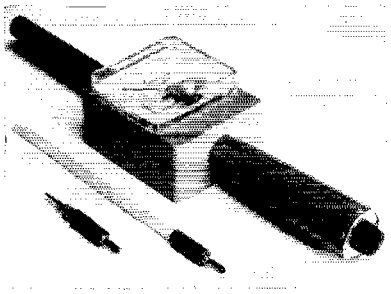
• New Apparatus

Wideband Wavemeters

The Cesco Fieldometer shown in the photograph is a "coilless" wavemeter that will indicate relative field strength over the frequency range of 1 kc. to 1000 Mc. The unit is not frequency or polarization sensitive over this frequency range.

The device consists of the main hand-held unit, a sensing rod, and a direct probe tip. A sensitivity control at the bottom of the handle can be used for reference settings and also prevents "pegging" the meter in a strong r.f. field. The Fieldometer is available in two sensitivities, a standard model containing a 100-μa. meter, and an ultrasensitive model containg a 20-μa. meter.

When the instrument is in use, the probe end is held near the r.f. field and the handle control is adjusted for the desired sensitivity. For extremely weak fields (microwatt intensity) the sensing rod is plugged into the probe tip. The direct probe tip can be inserted for pick-up by actual contact to the r.f. circuit.



Three other Fieldometer models are available: an aircraft, marine, mobile unit that has a U-shaped mounting bracket so that the indicator can be attached to a windshield rim, rear-view mirror bracket, cabin or cockpit; a lab unit that has the meter and the sensitivity control mounted in a meter case with an external probe connected by a 3-foot cable; and a multitester adapter model consisting of a corded probe which can be plugged into any multitester with a basic movement of 50 or 100 microamps. The Fieldometer is manufactured by the Continental Electronics & Sound Co., Dayton 18, Ohio.

— *E. L. C.*

FEEDBACK

Contrary to the information shown on page 88 of December *QST*, Arthur St. C. Farmer, VP6AF, advises that there is no longer a QSL Manager for Barbados. He requests that until a new one can be recruited, cards should be sent directly to VP6 DXers. See future IARU News items in *QST* for a new QSL Manager.

— • • • —

In Fig. 2 of "Phasing Filter S.S.B. Generator," by VK2AC in the October issue, the 6BU8 cathode resistor should be 270 ohms instead of 270K.

— • • • —

In the circuit of the thyratron-regulated power supply, page 28 of the November issue, the 0A3 VR tube should be omitted, the cathode of the 6CB6 being connected directly to R_7.

Correspondence From Members-

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

SPARK FOREVER?

¶ Why don't we get some courageous leadership out of ARRL for a change? I have reference to the elimination of a.m. from the 1.8- to 32-Mc. ham bands. The League has argued indirectly that a.m. takes up too much space, and only recently you decried the "chaos" on 20 phone.

Let's get on the ball and ask FCC to give the a.m. boys six months to go s.s.b. or follow "spark." — *K. A. Fichthorn, W1BGJ, Southington, Conn.*

BELLWIRE AND HONEYCOMB COILS

¶ "An NAA Receiver," in October *QST* is just what the doctor ordered for a sluggish ole timer.

Befuddled and lost in the present day ultra-high this and that, all mashed down six layers deep in tiny flea-sized metal compartments, this elbow-room breadboard "Code" receptor is a real kick in the spine.

Many thanks to you and W3QY.

Wow! What am I doing; while writing this I could be building one. Here goes for the attic and those old honeycombs. — *Earl R. Linder, K3BXV, Havertown, Pa.*

TECHNICIANS

¶ The November editorial pertaining to Technicians, and also the FCC's reasons for the denial of tech operation on 10 meters, are very true and most fair. You can be sure that the real Techs are satisfied and would not deviate from their original purposes of becoming Technicians instead of General Class. — *Paul N. Franusich, W6RSZ, Elk Grove, California*

¶ This is a challenge to those who have the necessary power to keep amateur radio a hobby for all, and remove the existing ticket fence. (Don't close your eyes and ears as it will be still there when you open them).

Isn't it the policy of ARRL to pursue and help change existing rules & regulations where they are wanted by the affected members? Or is this an organization controlled by higher than Techs?

By your own admission there were a number of Techs unhappy; this is true from my observations, too. This is a sign that the tech. ticket was of a poor design, and is in need of a change. — *J. Keating, WA2FVL, Union Beach, New Jersey*

¶ I was beginning to think I was the only one left who still thought the license class was for the experimenter or technician. I have always considered this license class needed for those like myself who would rather experiment than just rag chew.

To me the true technician or experimenter (regardless of the license he may hold) more nearly protrays the true meaning of amateur radio than any other. — *Randy Kimbler, K5BRN, Wichita Falls, Texas*

¶ . . . There has never been any obligation for any amateur to *remain* indefinitely in any particular group of license privileges. No one is denied the right to advance his status or to change his status as an amateur. . . .

. . . Now that techniques exist for space communications on such frequencies as the Technician now enjoys, there could be a mad rush to use them. Does anyone remember the early '20's when all *frequencies higher than 160 meters* were looked upon as being fairly useless? Many of us still do. . . . Let each amateur regard his status without jealous intentions or covetousness of the status of others, strive to achieve the most, both for himself and his fellow man, by contributing the best that is in him according to his lot and talents. — *Roy R. Campbell, W4DFR, Lenoir City, Tennessee*

OPPORTUNITY KNOCKING

¶ According to ads in *QST*, or rather, according to ads *not* in *QST*, there isn't a single ham supply house in any of the Gulf Coast States.

Since receiving my Novice license I have spent more than a thousand dollars with a firm that *does* advertise in *QST*.

I would much prefer to deal with a firm closer to my home, to get quicker service and to be able to look the equipment over before buying. I don't see why I should have to look all over the section for a supply house that doesn't want ham business enough to advertise in the ham's magazine. — *G. T. Boyett, WN5ATE, South Lake, Texas*

DOGGY OP

¶ Re the picture of the dog on page 14 of November *QST*, that is "old hat" around our house. My dog, besides being very proficient on the straight key, runs the bug at a rather rapid pace. She absolutely refuses to let her picture be taken for *QST*. You know how some dogs are. She has a little better than 20-20 vision and does not wear glasses.

She is wild about f.s.k., too. — *Bob Lundstrom, W9FUR, Sterling, Ill.*

ROTTEN QRM

¶ In the past ten years I have seen a vast growth in over-power, over-modulating and down-right disregard on the 75-meter band. As an NCS and an officer of the New York State Fone Traffic and Emergency Net, I often want to fight fire with fire, but I try to remain a gentleman even though some thoughtless fellows call CQ while someone is passing traffic. I realize that some fellows hate nets with a passion. But, I would remind them that if as little as a third of the fellows standing by on nets listening for traffic should decide to look elsewhere for a QSO the band would be so loaded that no one would be able to carry on contacts because conditions would be impossible — *Dick Sparling, K2DPA/KH6USA, APO, San Francisco, Calif.*

QST, 1963

¶ I've sent in my contribution to the Building Fund and paid my dues for next year so I feel entitled to my two bits worth.

It seems to me that *QST*'s technical articles and correspondence assume just a bit too much knowledge on the part of us hams. Take the November issue for example. On page 33 we have "Amateur TV — the Easy Way" (if you've got $495 to spare) and here you are still in paragraph one when the author (who most certainly knows what he is talking about) suggests that it's possibly too big a bite all at once for the would-be TV enthusiast.

Over on page 51 there is an interesting treatise on a tunnel diode superregen receiver. Sure wish I could find out where the antenna hooks on this one.

I also read the article on logic for amateurs, and if this is for *amateurs*, I'd better go back to school for my Ph.D.

It's getting so about all us ordinary hams can understand is "Beginners and Novice" and John Troster. Honestly, fellows, don't you think it's time to come down to earth and give *QST* back to the hams? . . . — *Dick Baldwin, K4ZQR, Louisville, Kentucky*

QSY, PLEASE

I realize that the bands are for everyone, and no one has any exclusive right to any segment, portion or frequency. However, since you seem to be always campaigning for "gentleman's agreements," how about doing a little for the RTTY gang? With all the spectrum that is available, there is absolutely no need for c.w. in and around the 3620 area, or the 14,090 area. RTTY *does* exist, and a clear channel in this area would be very much appreciated by the RTTY boys — who, incidentally, are increasing in numbers. — *N. K. Thompson, W1LWV, Millinocket, Maine*

COOPERATION . . .

From time to time in "Correspondence from Members," there have been letters criticizing other amateurs for transmitting during the code practice from W1AW. However, there are also a number of amateurs who respect our organization enough to QSY off frequencies used for code practice by W1AW. I cannot justify the QSO that takes place on the frequencies used for code practice by W1AW. But, I must point out that there are some amateurs who respect the help that our organization is trying to give beginners and they pause long enough in their QSO to QSY. To those amateurs and gentlemen I must say THANKS! — *Larry E. Knain, K7IAE, Seattle, Washington.*

YOUR NOVICE ACCENT

Enclosed please find my renewal of membership. May I take this opportunity to register disapproval with certain League policies. In many ways it is in fact living in the past.

The pamphlet *Your Novice Accent* is filled with ridiculous prescription of old-fashioned techniques which have lost the currency claimed for them — given way to more effective ones. Those old timers who stick to them are the "isolated linguistic group." I'm not referring to operating courtesy — I mean "*QST* English" which is as ineffective and primitive compared to more modern "QSO English" as Anglo Saxon is next to modern English.

We still owe great debts to the League but if it remains as static as it is now that condition won't last long. — *Jeff Sydney, K1VAA, Westport, Conn.*

As a brand new Novice I would like to say thanks for the *QST* reprint *Your Novice Accent* by Keith S. Williams, W6DTY.

Not having an older operator to learn from I must confess that my "accent" was showing and I was plenty confused by the abbreviations. Was never quite sure whether they were abbreviations or poor copy on my part.

The reprint was very informative and as a Novice who still has procedure to learn I feel a lot more confident now after having read the article. You do everyone, particularly the Novices, a good service by making it available to them. Again, thanks. — *Sid Hammond, K1IYJI, Hartland, Vermont.*

BK

While operating on the Novice bands, I observed very poor operating techniques. The FCC requires that an amateur station identify itself at least once every 10 minutes. But some c.w. stations still persist in repeating their calls 5 or 6 times after each short transmission. This is unnecessary and inefficient, while causing QRM. This long-winded method might be avoided by using "breaks" instead of time-consuming waste. — *John C. Buonora, WB2CEW, Belle Harbor, N. Y.*

MORE ON TEN

I was very glad to see the letter from Mr. Griffin concerning ten meters in the September *QST*, since it brings up a problem I have been worried about for some time. Whenever I happen to turn on my ten-meter converter and listen to all those 1700 kilocycles of relatively unused and empty spectrum, I begin to worry about all the commercial interests that would just love to get themselves some more space. I begin to wonder why more hams don't try, at least, to use ten meters when the lower bands are in the mess they often are. . . .

It seems probable that many, many openings are missed on ten simply because there is no one around to discover them. This suspicion was confirmed and extended by Mr. Griffin's account of recent operating experiences on that band. When people say that ten meters is dead now, they are right; not because there are not any openings, but because there is seldom anyone on either end of the skip. — *Richard Palm, K7NPU, Seattle, Washington.*

MORE ON GMT

Please consider including in some issue another explanation of the correct use of GMT.

Midnight at my QTH is seven P.M., and when I express QSO time in GMT (for QSOs held between seven P.M. and midnight, local time), I naturally take the date to be the day following.

In several cases, the other boys have gone out of their way to tell me that I worked them the day before.

I am sure that many of the fellows don't understand that midnight is the end of the day, and that one minute after midnight is 59 minutes before one o'clock of the day following.

Please fix this up. Thanks. — *Roland Garieppy, K9IHA, Fort Wayne, Indiana.*

RIGHT IDEA — WRONG ACTION!

This library wishes to acknowledge, with appreciation, a replacement copy of the September, 1962, issue of *QST*. Now, I have to ask if you can supply us with a copy of the October, 1962, issue. Our October was received in the library on Monday, October 1, and disappeared on Tuesday, October 2. Apparently someone likes your magazine! — *Laura Kersey, Speed Scientific School Library, University of Louisville, Louisville, Kentucky.*

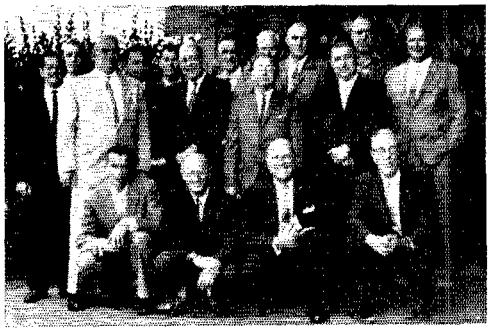
Operating News

F. E. HANDY, W1BDI, Communications Mgr.
GEORGE HART, W1NJM, Natl. Emerg. Coordinator
ROBERT L. WHITE, W1WPO, DXCC Awards
LILLIAN M. SALTER, W1ZJE, Administrative Aide.
ELLEN WHITE, W1YYM, Ass't. Comm. Mgr., Phone

Handling V.F.O.s . . . Careful Operating Technique Called For. The League appreciates the help of club and regional bulletins in writing up items that cite good and bad examples of operating. This in effect helps widen our bands by improving operating conditions. Such articles buttress the ARRL program on improving technical and operating techniques. We must all be alert to show operating courtesies and should avoid conditions that provoke or produce "selfish" signals. Only so can we reduce QRM and improve our band occupancy. All praise to editor W3NL for his item in the Oct. issue of *Auto-Call* on v.f.o.-operating techniques. He stresses *proper* v.f.o. use to "move out from under" interfering signals, also for working truly zero beat in nets or round-tables etc. Here's the excerpt from *Auto-Call:*

"This gripe is aimed at those users of VFOs who have not yet learned or arranged their stations to set transmitter frequency or change it without putting a full blown signal on the air (I) and especially at those operators who swish with full power across a frequency blotting out everything but the swisher for seconds on end! If THE OLD MAN were still alive, he would call down the punishment of the Wouff-Hong and the Rettysnitch against the offenders! Whether thoughtlessly or deliberately done, all good operators should refuse to carry on communications with operators identified as the sources of such abominable practices."

Pre-determined settings of transmitter and tuning devices, proper switching *off* of final amplifiers when changing frequency and use of dummy loads when adjusting equipment are "musts" in every good station. Let's confine any frequency changing-about and tune ups entirely to one's own receiver and operating room. To "swish" on the air is about as stupid and crass as one can show himself.



This imposing group of Pacific Division leaders met in August of '62 at a director-called caucus. From left to right: W6OPL ex-SCM S. F., WA6AUD SEC S. F., W6BIP SCM S. F., WA6EIC SEC-elect S. C. V., K6KCB RM-RN6 S. C. V., W6HC Dir. Pac. Div., K6IKV SEC Sac. V., W6BTY SCM Sac. V., K6DYX SCM S. C. V., W6OJW SCM E. Bay, W6ZRJ SCM-elect S. C. V., W6KZF SEC E. Bay, W7VIU SCM Nevada. Kneeling: WA6MIE SEC E. Bay, W6JPU SCM S. J. V., W6ZF Vice Dir., W1BDI ARRL Hq.

Be Versatile in Band Use. The universal use of bandswitching transmitters for quick change to the optimum band or frequency has become the key to efficient amateur work over different distances, as desired. *Local* use of the v.h.f.'s, also regional use of 160-meters now on the increase, can be the key to regular and successful netting these winter evenings, whether you use c.w. or phone. Many newer amateurs apparently don't appreciate the effect of "skip" on the 3.5- and 7-Mc. bands as well as on the higher frequency bands. These "skip" conditions were so pronounced last season that we have had to resume 1.8-Mc. OBS and code practice from W1AW better to reach such points as Boston and New York this year.

Ten meters is highly recommended too during this part of the sun-spot cycle for local cross-town working. The rule to "always listen before you transmit" on a frequency, likewise should be observed *whatever the band* to help insure the success of your own contacts. Unnecessary interference to others can put your call on a black list. Let's all of us use the high end as well as the low end of bands. Looking for holes where QRM is less and most important, spreading out our occupancy, can reduce practical interference *very* appreciably; also switching to the less utilized bands *and* band-sectors.

We hope many operators will install auxiliary v.h.f. and 160 equipment this season to help their results. For efficient operating and maximum results in traffic handling and casual work this year *use that band switch!*

Just a DXer? William L. North, W4GEB, Engineering Assistant to the FCC Chairman, addressing amateurs at the ARRL National Convention in Portland, Oregon, expressed FCC's appreciation of the public service job we amateurs do, emphasizing that we have a right to be proud of our service record. He offered also the thesis that it must be said for the man busy *only* with working DX, that he is *just* a DXer. The same principle goes of course for amateurs who work only in other specialized areas, too, without engaging in broader work touching on our community interest.

Examples of the useful work of amateurs in emergencies may be found in "With the AREC" in *QST* each month, this month no exception!

Mr. North's concern "that none of us succumb to the tendency to rest on our laurels" and engage in more than one type of activity, however, might be a good motif for a first-of-the-year resolution for all amateurs. That goes especially, we think, for amateurs *not* now aligned with the AREC or RACES or any League net or SCM-appointment. Why not make '63 the year to progress in know-how and lend your weight to club and organized operating patterns? You get more in results that way and our amateur radio will be stronger.

There were some key questions in W4GEB's address, asked of each amateur: (1) Are you in a local communications group for organized disaster assistance? (2) Can you handle a key well with reasonable speed? (3) Do you have emergency powered equipment? (4) Did you build your own rig? (5) Can you explain why "ten" is or is not open? What makes the rig operate the way it does? (6) Are you familiar with good voice and c.w. procedure? Here are some highlights from W4GEB's conclusions.

Not all of us can do all things. But all of us should take *some* active part (a) in those useful patterns that are a training ground for operators (b) in practical aliguments for giving help in national or local emergency work or traffic handling (c) or to further our service's production of knowledge of the art (d) in serving the public by making ourselves useful through our ability to provide radio communications. W4GEB emphasized his belief that allocations are not wholly justified by casual use. He extended a personal suggestion as an amateur that we each reflect on the thesis of making our station and operating services a real public resource, something the public *cannot do without*. On conclusion of the remarks the Convention Chairman reflected our own convictions, saying, "Lew, you were loud and clear and we shall keep tuned to your frequency."

Making Best Use of '63. Of course you'll continue to collect those pasteboards for WAS and DXCC, more especially if you are new on the air or haven't completed two-way work with 50-states or 100 countries. A Code Proficiency certificate, and the QSLs for these awards are milestones for each licensee. But they need hardly represent your sole aim or goal for '63. As contests come along and are announced in *QST*, you can get in them and pick up states countries to add to a check-off list. But thousands of amateurs enjoy additional prestige and fun in traffic and emergency nets . . . in those organized activities SCM-recognized through *appointment holding* and identified with the AREC or RACES. Why not you?

Basic Posts Available Through SCMs. Member operators who mostly work 40 and 80 (h.f. bands) can qualify for Official Phone Station (OPS) or Official Relay Station (ORS) appointments. All specializing in the v.h.f.s and active there are eligible for the Official Experimental Station (OES) appointment. The booklet *Operating an Amateur Radio Station* gives the purposes and full description and qualifications for each ARRL station and leadership post. You can go after any Official Station appointment in the League's field organization and add to your operational and fraternal accomplishment, whether you prefer h.f. or v.h.f., c.w. or voice.

RESULTS, SEPTEMBER FREQUENCY MEASURING TEST

The September 12, 1962 FMT, open to all amateurs, brought entries from 212 participants who made a total of 671 measurements. Of these, 102 ARRL Official Observers submitted 327, and 110 Non-OOs made 344 readings. All taking part have received individual reports of their readings. The standings accredited to the more precise in each group appear below; all listed show ability of the highest order in Frequency Measurement. February *QST* will announce details on the next ARRL FMT.

Observers	*Parts/ Million*	*Non-Observers*	*Parts/ Million*
W8GBF	0	K8VLI	0
W4JUI	0	W6KT	.1
W1BGW	.1	W4TVI	.1
W8VCP	.3	W1PLJ	.3
W5FMO	.7	VE2LU	1.0
K6MZN	1.2	W5AAJ	1.1
W6GQA	1.6	K4IAK	1.2
W6ASH	3.1	K2AHS	2.4
W3MBN	4.2	W5OOF	2.9
W6YCF	4.5	W6NCP	3.1
K3CYA	5.1	R. Ireland	3.4
K1I6EGL	6.6	W4NTO	5.0
W6UWL	8.1	K1NNC	6.0
KZ5KR	8.3	W8CXS	6.7
K6EC	9.6	K6HI	7.6

Net promotion is ordinarily through Route Managers (c.w.) or Phone Activities Managers. Emergency Coordinators lead in local emergency plans. Your member-elected Section Communications Manager (see his address and invitation on page 6 of *QST*) welcomes reports monthly of your station's activities and results, also your application for Station Appointment in one of the following categories:

OES Official Experimental Station. Works on 50 Mc. and/or above. Takes part as feasible in v.h.f. traffic work, reports same, supports v.h.f. nets, observes procedure standards . . . collects and reports v.h.f.-u.h.f.-s.h.f. propagation data.

OPS Official Phone Station. Sets high voice operating standards and procedures, furthers phone nets and traffic.

ORS Official Relay Station. Traffic service, operates c.w. nets; noted for 15 w.p.m. and procedure ability.

OBS Official Bulletin Station. Transmits ARRL and FCC bulletin information to amateurs.

OO Official Observer. Sends cooperative notices to amateurs to assist in frequency observance, to insure *high-quality signals, and prevent FCC trouble.*

For application blanks for these appointments drop a line to your SCM whose address is given on page 6 of *QST*. Or just report your traffic or other radio work for the past month to your SCM and ask about *one post*, h.f. or v.h.f., in which your report shows your interest and qualifications!

Code Proficiency Schedules Needed. From our many requests for Code Practice helps we believe amateur radio could profit in '63 by regular operations of more on-the-air practice stations. Volunteers? We invite operators who can follow continuing schedules and predict them more

than 6 weeks ahead to ask us for a Code Practice Schedule form. When you receive this please note your frequency, days, times, call, speed ranges and how long you will observe said schedule. We propose and suggest use of v.h.f. bands for club groups that need to cover their cities or membership areas. *Ten meters* is an excellent band for local ground-wave coverage at the hours this band is not suitable for DX, which is a good deal of the time during this part of the sun spot cycle.

VHF-SS and Other Activities. The VHF-SS is the opener for ARRL's contests in '63. *QST* will announce the usual varied activities. We suggest getting into the different tests at least briefly to check how your station gets out. Also in '63 we suggest you get identified with *an appointment* and a local emergency group or a net, so you can face up to the challenge as posed in the remarks of W4GEB at Portland. The VHF-SS is announced in this issue for Jan. 5–6; there are the January CD Parties for all SCM-appointees (either voice or c.w.) as announced by bulletins, and other activities throughout the year command your attention. Follow the Activities Calendar to avoid missing major ARRL operating events. Best luck in all . . . and how about getting lined up with your SCM or EC if you haven't. Help us make '63 the best operational year ever.

—*F. E. H.*

OCTOBER CD PARTIES

The following *high-claimed* C.D. Party scores show claimed score, number of QSOs and sections. Final results will appear in the January '63 *C.D. Bulletin*.

C.W.

K4BAI	205,590-616-66	W4LK	106,400-380-56
K4ZYI	191,730-577-66	K1LPL	105,560-370-56
K4TEA	175,150-561-62	W6BES	105,315-350-59
W9RQM	172,630-559-61	K9WIE	102,175-331-61
K8MTI	168,320-519-64	W1EOB	102,080-312-64
W9YT[5]	153,090-480-63	W6LRU	100,500-328-60
W0NYU	152,100-500-60	K4KWQ	100,480-338-59
W2JAE	151,200-504-60	WA6GFY[3]	175,175-539-65
W1AW[1]	146,240-450-64	K3JCT[4]	118,440-419-56
W9LNQ	144,585-454-63		
K5OCX	143,220-456-62	PHONE	
W1EJJ	136,030-440-61	W1PYM	10,560- 91-22
W9YYG	131,904-405-64	W2ZVW	10,400- 73-26
W9SZR	131,670-400-63	K1LPL	9600- 89-20
K3NZV	127,185-417-61	W1FJJ	8930- 88-19
K8HGT[2]	126,850-426-59	W1SWX/1	8375- 60-25
W1SWX/1	126,600-415-60	K2QDT	8165- 71-23
K4CFD	123,220-400-60	K3MNT	8030- 68-22
W8VPC	122,090-404-58	K4TEA	5320- 52-19
W4DVT	110,330-367-59	K3ANU	5280- 43-22

[1] W1ECH, opr.; [2] K8HVT, opr.; [3] WA6HRF, W6CUF, W7WJB/6, oprs.; [4] K3s JCT JJG, oprs., [5] K9ELT, opr.

Our American way of life is no different from any other way of life in that it requires adequate leadership, but different from some in that it makes greater demands on its leaders and keeps them in check — and, if the leadership is deemed inadequate or inimical, tosses them out. We require not only to be led, but also to be led properly, competently, and in the right direction.

Your Amateur Radio Public Service Corps organizations are small parts of the American Way of Life, and their leadership must be of the same caliber, in its field, as the over-all leadership if progress is to be made in their common objective: to serve the public welfare in the name of amateur radio.

The implementation of the above principles has been evident in many parts of the country in a resurgence of interest in AREC organization which we might term "the new AREC." The pressure is on the inactive EC either to get something started or vacate the appointment so someone else can. SCMs are feeling the pressure to keep their SECs on the ball. Even the League's policy-makers, the directors, are feeling some of the pressure, although the problems are more in the organizational-operational than in the policy field. And of course it all comes home to roost at headquarters, where the lot is a greater volume of correspondence, a bigger SET, more reports to process, a larger and more complete net directory, and more demand for headquarters representation in the field. The "new AREC" is not yet a bigger, but already is a much better AREC than its supine predecessor of former years. With its new virility, it will soon start growing.

It may seem that the membership has little to do with selecting local ECs, an appointive function of the SCM on recommendation of the SEC, and in a purely elective sense this is true; that is, the membership elects the SCM who appoints the SEC who recommends EC appointments and countersigns their certificates. But experience has shown that the membership can and does speak even at the local level, and when it speaks the SCM almost invariably obeys. Your EC is, in most cases, the man *you* select to take the lead locally in emergency communications preparedness. Suppose we look objectively, for a moment, at some of the qualities of leadership requisite in an EC appointee.

The cynical will place at the top of the list a personal friendship with the SCM or SEC, but we believe that the great majority of SCMs are strictly impartial — and besides, we said we were going to be *objective* in this discussion. Nevertheless, one of the most inimical aspects of unenlightened democracy is the selection of "best-liked" types for jobs requiring ideas and ability. Sometimes they have them, often they do not. Since the popular are usually also the "vote-getters," it turns out that the appointive function as often brings out the desired man as does the elective. The quiet, retiring type of person who would not think of considering himself a candidate for the job as often as not makes a better leader than the loud, pushy type who attracts a lot of attention with his "aggressiveness" and "drive." The former will feel flattered and accept gladly if called upon to do so; the latter will want to be coaxed, and will give the impression that he is doing you a favor by accepting. Unfortunately, it is almost invariably the latter type who gets the nod.

While personality, location, financial and social status may all be things to consider, they should be minor considerations, not major ones. A big business executive who drives a Cadillac, smokes expensive cigars, has a roomful of modern commercial equipment and exhibits other symptoms of "success" should not, for those reasons alone, be automatically considered qualified for leadership. Conversely, neither should consideration of another amateur be neglected because he works behind the counter at a local radio store, drives a rickety car, can't afford cigars and operates low-powered equipment he built himself. You will say these things are fairly obvious and nobody needs to be told this.

Still, a great many groups select leaders *solely* on the basis of popularity, influence and volubility — because it's easier to be impressed by the loud-mouth than to *seek out* the needed qualities of enthusiasm and ability for the job to be done.

Often the most desirable type will demur on the grounds that someone else could do a better job. While generally speaking it is always wise to accept a refusal to serve (an unwilling leader usually lacks the requisite enthusiasm — or if he just wants to be coaxed, he isn't the desirable type at all), in this case he should be urged to let the recommending group be the judge of his ability and whom they want for their leader. If his reason is personal circumstances, it is much better to accept his declination and look elsewhere.

Once you have a leader, it is not good to expect him to do, or let him do, all the work himself, even if he is willing. Such a man could perhaps obtain immediate results, but they would at best be temporary — that is, until he burned himself out. Meanwhile, other members of the group become lazy, adopt a "let George do it" attitude. He who is willing to do everything will find himself with everything to do. AREC organization is a teamwork proposition. One-man teams are spectacular, until something happens to the one man, then they flop badly and loudly. Those who tend to do more than their share should be held down, and those who want to do less should be jacked up. The holding down and jacking up processes cannot be left up to your leaders entirely. You must apply them to yourselves. Are you doing all you can for your AREC group? If not, volunteer for something. Are you doing *more* than your share? If so, let someone else take some of the jobs. — *W1NJM.*

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The severe flooding which hit the west coast on Oct. 12-13 activated many emergency groups from Washington down through Central California. Let's start up North and work down the coast.

In Washington, SEC W7HMQ gives us an excellent boil-down of activity in Whatcom, Grays Harbor, Clark and Pierce Counties. Assistant EC W7DQM of Whatcom County says that the Mt. Baker Radio Club received high praise for 15 hours of assistance following storm damage. New EC K7KJB, of Grays Harbor County, activated ten amateurs for 21 hours of continuous operation; those answering the call were *K7s* NCG/7 GPU KFP, *KN7s* THD THV, *W7s* RGE CPE TZ WPQ.

In Clark County, EC W7SAP reports 30 hours on emergency power, with emergency communications handled on five channels in three bands. The county was without communications of any type except from car to car after the storm hit; but within an hour the amateurs were on the air and furnishing communication for law enforcement agencies, Red Cross and civil defense. The power was off at various points a minimum of 48 hours, a maximum of 78. The following participated in the operation: *W7s* AZN WFP SAP CHH SAX YTM WFO, *K7s* BCC RZZ AMF KNZ ENZ, *KN7s* SUX SPS.

The Pierce County AREC was activated on Oct. 12 at 1930 and operated continuously for 27 hours on emergency power, handling thirty messages for community, county, and state agencies.

EC W7RVN, of Multnomah County, Oregon, forwards thru his SCM a detailed report on the activities there. The storm struck with virtually no warning on Friday afternoon, Oct. 12, yet within minutes disrupted communications were re-established by amateurs and continued until noon of Oct. 17. Mobiles were first on the air, when Assistant EC K7PQF dispatched K7KWP to set up a net control point on Rocky Butte, overlooking the city of Portland. K7OWF also established contact with police and the "outside world." Mobiles operated from police precincts, carrying policemen and reporting fires, wires down, store windows broken, trees down, unauthorized persons abroad, etc. Assistance was also furnished in obtaining emergency power for hospitals and other necessary services. This type of service was continued into the early morning hours of Saturday and was performed by *K7s* EPA QBA ROY DAH CIP, *W7s* UJF SAO AZD WLL HHD and RVN.

Home station operation started very soon after the storm hit, and point-to-point communication was continued around the clock into and out of Portland on behalf of the Red Cross, the telephone company, police officers and many others, high priority on 3875, health and welfare on 3885, while one station always kept watch on the Oregon Emergency Net of 3840 and another roamed the band to pick up any traffic for Portland. The AREC c.w. net and the Oregon State Net handled traffic through the National Traffic System. Portland home stations active during this period were *K7s* OPI PMG PHP PED KWP ADI MMK, OYU, *W7s* DIS AZD ENU PJO RCL RXO KYC GUD ZFH. Six and two meters activities were started by W7GWT at c.d. headquarters. During the 36 hours of operation, 4 mobile units were patrolling, each with a police officer; they were *K7s* AUE IPT, *W7s* TIB and YKX. Operators at c.d. headquarters were *K7s* OQN HIX, *W7s* GWT GUH JVH QXF. W7PJO furnished contact with Red Cross in other distressed cities. It is estimated that between five and six thousand messages and contacts were taken care of during this operation. Other amateurs participating, but not mentioned above: *K7s* ATX AUZ BBM KWA EWG OYM CWG OYK LCR, *W7s* WZJ ZB TWO DWO PXD VIS HIA PFW LBC LZO WAA DSG WWH HBO UUD REX UYR LI PTJ QQF QWF RQP ZFU UUB DPV FVF.

WØYHT, EC for three counties in Southeastern Missouri, decided to get something started or "throw in the towel," so he called a meeting of area amateurs. Many of those who showed up were Novices and Technicians, but the area now has a going AREC organization. In picture, bottom row left to right are KNØBOJ, WAØBOI, KØWJB, KØFZO, KNØBOK; top row, left to right, WØYHT, WAØBGV, WAØBIL WNØCXG, WØHAD, WØOMG.

In the San Francisco Bay Area of California, W6FDJ reports that over 12 inches of rain fell in 48 hours and the Red Cross activated its disaster services, including amateur Red Cross Station W6OT. By 1800 Sunday six 6-meter mobiles had responded to the call and by 1830 mobile coverage was general throughout the Oakland area, with one mobile at each Red Cross evacuee center handling traffic regarding food, cots and blankets, while other mobiles scouted the area for possible evacuation problems. People were stranded in underpasses, others needed boats for evacuation, and there were auto accidents, road slides and hospital cases. The screening and handling of all such matters meant working closely with local c.d., police and fire departments and other public offices. Road reports and information on hazardous areas to be avoided were relayed to local broadcast stations. Transportation for key personnel had to be arranged for by radio. There is no doubt that amateur radio activities helped to hold loss of lives and property to a minimum. The following amateurs were listed by W6FDJ and WA6MIE to have been active: *K6s* DOQ DEL GNX IMV JPR KQD KLY KTF LWA OXK OBB OCF PIL POR SAS VXY, *W6s* CVL EZA FDJ FAR HOF IT IDW LKE LGW NBS OVN QEN RVC SPF SJA TKL URA WIT YQB, *WA6s* ASL AGA BXS DKG EJA EWP FBS FBN GRO GXN GCU GPB JTY JCD KOS KUF MDI MJM MIE MBN NCD NEL NFF OLF PTU QZA QAZ RWC TIO VQF VXP YLR, *WV6s* VMI VZX.

Santa Clara Valley SEC, WA6EIC, reports the following AREC and RACES groups active during the storm: Mission City, San Jose, Palo Alto, Santa Clara County, and Sunnyvale. Redwood City Radio Officer K6TQN reports that prompt action by the amateurs there prevented what might have become a major disaster. Mobiles were active on six and two meters in full flood and gale conditions in support of the Redwood City police, fire and street departments, making communications possible when all else failed, some-

times for periods of up to a half hour at a time. Special commendation goes to *K6s* GXH OEJ TQO MPN ANN TQN, *W6s* TJJ DEF, *WA6s* HRY GIM.

The damage in San Jose was not too heavy, but the Santa Clara County Amateur Radio Assn. station, W6UW, was activated and manned by EC WA6HVN and Assistant ECs K6YKG and WA6HVM. San Jose civil defense activated their 2-meter net and sent mobiles to investigate trouble spots. This was led by Net Manager WA6LRD, assisted by K6UEY, *WA6s* VBK and LTJ. Over 175 messages and calls were logged. The operation was terminated shortly after midnight. WA6HVN lists the following additional amateurs as having taken part: *K6s* AUN BJL DYT EPH HNN RQG SDZ SRG TCN UCY UHZ UUC, *W6s* CJY COI HZW OOX ZRJ, *WA6s* BXN HNE IAK MKE NHI RPI SRI SLY TAJ TIP UAM UJX VHI VXF YLC NAV, WV6WLP.

Not much damage in Sacramento, but some of the local 2-meter gang got on the Sacramento c.d. frequency and proceeded to prepare for emergency operation, including nine AREC members.

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On Sept. 22, the father of a runaway girl contacted W4BUZ seeking assistance in getting messages to police authorities in Texas, California, Louisiana, Alabama and Mississippi, which states could not be covered by the N.C. Highway Patrol. In less than 24 hours, all specified points had been contacted. The contact with the Jackson, Miss., police (via W5CAC), was the one which paid off. The car was spotted in that city from the description on the amateur radio message and the girl was apprehended.

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On Aug. 25 the Anne Arundel County (Md.) Net was alerted by NCS W3NAE, at the request of county police, to assist in the search for a 7-year-old boy reported missing from his Sun Valley home. Sixteen mobiles with 12 hand-carried units, plus the club's communications van, turned out. W3OXN/mobile with KL7CWO/3 as a passenger found the youngster playing unconcernedly in a sand pit a mile from his home.

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In addition to the operation on Aug. 25, noted above, Anne Arundel Radio Club members were involved in two other instances of public service communications, both of these in October. On Oct. 7, twelve club mobile units assisted county police in a man hunt. One of them acted as net control on the median of route 2 and the others patrolled the roads in the area. The suspect was apprehended in the early afternoon. In the middle of this operation, a fire drill by club mobile units was held at Corydale, Md. In all, 21 mobiles, six hand-carried units and three base stations took part in the combined operation.

On Oct. 15, late in the evening, the county police again requested assistance for a lost hunter in the Millersville, Md., area. Fourteen club mobiles and 12 hand-carried units rendezvoused with the various service units and coordinated their messages for eight hours, throughout the night, until the hunter was found the next morning.

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K8JSQ, EC for Erie County, Ohio, uses a message symbol system for local emergency traffic. Each message is identified by the symbol AREC (pronounced A-Reck on phone) and a numeral indicating the message content, followed by a digit indicating how many. The answer is given in the same way, but the numeral is followed by the letter A, a slant bar and a digit to indicate how many, if appropriate.

An example best illustrates. AREC 1 means "doctors needed"; AREC 1A means "doctors dispatched." A message with the text AREC 1/3 would mean that three doctors are needed; one with the text AREC 1A/3 would mean that three doctors have been sent. K8JSQ assigns text numbers from 1 to 9, but of course any number required can be added.

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The Southern Michigan 6 Meter Net was activated at 1830 GMT on Sept. 14 because of tornado warnings in that area. Amateurs in the area followed the storm fronts and submitted weather reports. When the weather seemed unusually severe, the sheriff's department was notified of conditions. Damage was done in Battle Creek, Marshall, Albion, Homer and Ceresco. K8WPO and K8AEM lost their antennas in the high winds. Net operations were cleared by 2400 GMT. — *K8AEM, EC Calhoun County, Mich.*

Well, in September we broke all records for SEC reports. *Forty-two* SECs reported, representing 16,887 AREC members. Five new sections reported, making the total sections heard from in 1962 *fifty-three*. This represents an average of 402 AREC members per section and gives us an estimated 30,000 total AREC members. Some mighty big sections are not included in the 42, and some of those who did report based their figures only on EC reports received, so their total AREC members was low. We still think we have about 40,000 AREC members altogether, and interest in the ARPSC is rising rapidly in the amateur ranks.

Sections reporting (new ones in italics): S.N.J., E. Mass., Ont., Mo., Alberta, W. Va., S. Texas, Ind., Mich., W. Pa., N. Dak., S. Dak., Tenn., Ohio, NYC-LI, Kans., W. Mass., *Montana*, Ore., Wash., Nevada, E. Bay, N.C., *S.C.*, Colo., Utah, N. Mex., E. Fla., Ga., Los A., N. Tex., Iowa, W. Fla., *B.C.*, S.C.V., *R.I.*, N.N.J., *La.*, Okla., E. Pa., Maine, Miss.

RACES News

This office maintains monthly contact with OCD's Warning and Communications Division in Washington in order to keep in touch with the RACES situation at top level. The latest inquiry brought a response from an old friend and amateur, Bob Arrowsmith, formerly K8DFA when OCDM was at Battle Creek. Bob is now established in Washington and will be monitoring the RACES program from that level. However, new RACES applications are being processed at OCD Regional level at the present time, so don't send Bob your applications; they continue to be processed at state and regional levels, then go to FCC.

It is good to have an amateur back in our branch of OCD, although we have never been treated badly by non-amateurs in federal civil defense.

RE NET DIRECTORY

If you're thumbing through these pages looking for the list of nets that usually appears in January *QST*, forget it. These listings have been discontinued to conserve badly needed *QST* space. However, by the time you read this the annual printed cross-indexed net directory should be available, free of charge. If you want a complete list of all known amateur radio public service nets, just drop us a line. Please address your requests to the ARRL Communications Department, 38 La Salle Road, West Hartford 7, Conn.

A.R.R.L. ACTIVITIES CALENDAR

(*Dates shown are per GMT*)

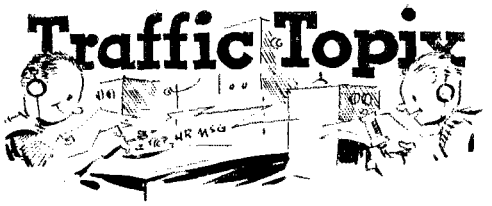
Jan. 4: CP Qualifying Run — W6OWP
Jan. 5–6: V.H.F. Sweepstakes
Jan. 12–14: CD Party (c.w.)
Jan. 16: CP Qualifying Run — W1AW
Jan. 19–21: CD Party (phone)
Feb. 9–10: DX Competition (phone)
Feb. 2–17: Novice Roundup
Feb. 7: CP Qualifying Run — W6OWP
Feb. 15: Frequency Measuring Test
Feb. 23–24: DX Competition (c.w.)
Feb. 21: CP Qualifying Run — W1AW
Mar. 9–10: DX Competition (phone)
Mar. 23–24: DX Competition (c.w.)
June 8–10: V.H.F. QSO Party
June 22–23: Field Day

OTHER ACTIVITIES

The following lists date, name, sponsor, and page reference of *QST* issue in which more details appear.

Jan. 19–20, 26–27: Ninth Annual VE1 Contest, New Brunswick Amateur Radio Assn. (p. 146, this issue).

Jan. 26–27: Fourth New Mexico QSO Party, CHC Chapter #1, of Albuquerque (p. 136, this issue).



We would like to give credit where credit is due, but we can't remember where we read, recently, a bulletin about a net which is issuing certificates on the basis of points for various net operations. The details are unimportant, but it is something like this: One point for reporting in, one point for each message handled, five points for being net control station, five points for conducting liaison with another net, and a standard number of points required per month or per quarter to qualify for a certificate showing that you are a member in good standing.

Actually, this is not a new idea. Many years ago W7FIX in his "*PAN News*" and WØNIY in "*Midwest Clirs*" proposed similar point systems to supersede the present BPL, on the theory that traffic count was only one mark of achievement in traffic handling these days and that some recognition should be given for other traffic activities even more difficult than the actual handling of the traffic. Headquarters was sympathetic but unable to comply, and thus arose the Master Traffic Handler's Certificate (MTHC) and the Brotherhood of Radio Amateur Traffic Society (BRAT), still being observed in some nets.

Well, headquarters is still sympathetic, but still unable to operate a complicated point setup for traffic men, and so we pass this idea along to all and sundry in the traffic ranks. The BPL will remain as is, but section traffic leadership may wish to set up some such point system to qualify for certification or other type of honors. It's something worth thinking about, in these days of avid certificate-hunting.

SPECIAL ARRL QN SIGNALS FOR NET USE

QNA* Answer in prearranged order.
QNB* Act as relay between.....and.....
QNC All net stations copy.
I have a message for all net stations.
QND* Net is directed (controlled by net control station).
QNE* Entire net stand by.
QNF Net is free (not controlled).
QNG Take over as net control station.
QNH Your net frequency is high.
QNI Net stations report in.*
I am reporting into the net. (Follow with list of traffic or QRU.)
QNJ Can you copy me?
Can you copy.....?
QNK* Transmit messages for.....to.....
QNL Your net frequency is low.
QNM* You are QRMing the net. Stand by.
QNN Net control station is.....*
What station has net control?
QNO Station is leaving the net.
QNP Unable to copy you.
Unable to copy.....
QNQ* Move frequency to .....and wait for..... to finish handling traffic. Then send him traffic for.....
QNR* Answer.....and receive traffic.
QNS Following stations are in the net.* (Follow with list.) Request list of stations in the net.
QNT I request permission to leave the net for..... minutes.
QNU* The net has traffic for you. Stand by.
QNV* Establish contact with.....on this frequency. If successful, move to.....and send him traffic for.....
QNW How do I route messages for.....?
QNX You are excused from the net.*
Request to be excused from the net.
QNY* Shift to another frequency (or to.....kc.) to clear traffic with.....
QNZ Zero beat your signal with mine.

ARRL Communications Department Operating Aid No. 9

*For use only by Net Control Station.

In addition to points for reporting in, handling traffic (either sending or receiving), being NCS and handling a liaison assignment, the net management may wish to assign additional points for reliability, dependability, regularity, for excellence in operating ability and performance, even for quality of signal and fist. Points may be included for reporting. In any case, we suggest that points be added for each desirable trait of the net station, but that none be subtracted for *anything*. This can ruffle feelings and sharply reduce the population of the net. That is, if a net member commits a *faux pas*, he would not be given points for operating ability; if he doesn't show up for an NCS assignment, he of course would not receive points for this function.

The various desirable traits can be weighted in accordance with their importance to the objectives of your particular net; thus, there is one advantage to not having a standardized point system. Perhaps, some time in the future, we may be able to adopt such a point system for NTS nets, but chances are that other nets will be encouraged to set up their own.

As for changing the BPL and including points for things other than the straight individual traffic total — some day, maybe. Not today, not tomorrow, but some day. — *WINAM.*

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We want to mention in passing that it is not necessary for SCMs or prospective BPL medallion recipients to notify us when stations have made their third BPLs. We keep a meticulous record of all BPLs (up to three) made by all stations, and the medallion goes to them automatically after (1) they have signed a statement affirming their compliance with ARRL's traffic-handling rules, and (2) the copy of *QST* in which their third BPL listing appears is in print.

So, don't be in such a big hurry, fellows and gals. You'll get your medallions about six weeks after you make your third BPL — *without* inquiring about it. If more than three months go by, *then* is the time to start wondering.

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October Net Reports.

Net	*Sessions*	*Check-ins*	*Traffic*
Mike Farad	57	614	564
Northeast Area Barnyard	—	853	11
7290	—	2199	1426
Fourth Region Day	31	240	148
Early Bird Transcon	31	...	46
20 Mtr. S.S.B.	23	468	1136
Central New England	27	379	2

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National Traffic System. We wish to remind all and sundry that the standard on all NTS nets is for someone to QNG (take over as NCS) three minutes after scheduled net time if the regular control station does not show up. This can happen to the best of nets, but the best of nets will have it all pre-arranged by having an alternate NCS assigned beforehand. One never knows when an NCS operator will be called away at the last minute, or be unavoidably late, but the net must go on regardless. *Three minutes only* is allowed, then someone else takes over.

If the NCS does not show up at the appointed time and start calling the net, this should not be a signal for a lot of buck-passing and Alphonse-Gaston bowing, even if no alternate is pre-assigned. Get the matter settled quickly, then get on with the net. Non-appearance of the NCS should also be no signal for panic, and some net station "grabbing" the NCS job who is not really qualified to do so. Get the matter settled *before* the three minutes is up, *wait* the three minutes before QNG, then go to it. If the regular NCS shows up late, it is usually not recommended that the reins be turned over to him; this takes time and can cause errors and confusion.

We have never heard of the following idea being practiced, but it might not be a bad one. How about each NTS

Got your handy file-card-sized operating aid card on QN signals for net use? It's yours without charge from the ARRL Communications Dept., 38 La Salle Rd., W. Hfd. 7, Conn. Just ask for Operating Aid No. 9.

net manager designating certain stations who are regular reports-in as "qualified net controls." This would mean that these stations have the operator-station qualifications required (in the manager's opinion) for efficient net control operation, and that *only* such stations are qualified to QNG at any time if or when a regular NCS does not show up. This would prevent a perfect stranger from grabbing, or trying to grab, the NCS spot when the regular, for some reason fails to show.

Nets without adequate control stations are a mess. Let's eschew them like the dickens on NTS. — *W1NJM.*

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October reports.

Net	Sessions	Traffic	Rate	Average	Representation (%)
EAN	31	1103	.723	36.0	100.0
CAN	31	1297	.858	41.8	100.0
PAN	31	1029	.641	33.2	97.8
1RN	58	431	.336	7.4	75.6
2RN	55	329	.415	5.9	97.8
3RN	62	587	.314	9.5	98.9
4RN	60	521	.315	8.7	92.2
RN5	62	423	.209	6.8	79.0
RN7	59	424	.194	7.2	69.9
8RN	62	241	.176	3.9	81.2
9RN	62	675	.481	10.8	74.5
TEN	67	622	.429	9.3	63.2
ECN	29	79	.157	2.7	64.4[1]
TWN	31	221	.413	7.1	69.6[1]
Sections	1316	6592		5.0	
TCC Eastern	124[2]	384			
TCC Central	93[2]	912			
TCC Pacific	120[2]	682			
Summary	2016	16532	CAN	7.2	EAN/CAN
Record	1778	24452	.928	12.3	100.0

[1] Region Net representation based on one session or less per day. Others are based on two or more sessions per day.

[2] Section nets reporting: (45): MDD & MDDS (Md.-Del.-D.C.); EPA (Pa.); EMN (Mass.); WSSB, WIN (Wis.); SCN (Cal.); NCN & NCSN (N.C.); Wolverine, QMN Fast & QMN Slow (Mich.); BUN (Utah); SCN (S.C.); GEM (Idaho); KYN (Ky.); TLCN (Iowa); NEB (Nebr.); VN, VSN & VSB (Va.); GSN (Ga.); W. Fla. Phone; GBN (Ont.); BN (Ohio); RISPN (R.I.); ETPN, TSSN & TN (Tenn.); WSSN & WSN (Wash.); AENT, AENP Eve, AENP Morn, AENO, AENM, AEND, AENB & AENR (Ala.); CN & CPN (Conn.); OQN (Ont.-Que.); MJN, MSPN Noon & MSN (Minn.)

[3] TCC functions reported, not counted as net sessions.

This month we far exceeded the record number of net sessions held, but fell quite a bit behind the record amount of traffic for the month. So the trend continues — more amateurs handling less traffic. The number of section net reports received for October was gratifying. We hope it will continue, for each one adds to the NTS traffic total.

EAN makes 100% representation of all regions for the first time in many months. CAN Manager W9DYG would like to see more traffic articles in *QST*. PAN certificates have been awarded to W7GIP, K7IWD, W4UGI/Ø and WA6RGD; special commendation goes to W6RSY, K7JHA and K7NWP. Seven net reports were missing from 2RN for October; WA2GQZ puts out a most interesting 2RN net bulletin. W3UE is hard pressed for time to be 3RN manager, but wants to hang on at least until his tenth anniversary (we don't notice that the net is suffering much). K4AKP has been appointed RN5 manager, replacing W5GY. RN7 has started an early session at 0145 and moved its late session to 0530 on 160 meters. W8CHT reports that 8RN has taken a similar step, eliminating its late session and replacing it with one at 2315; 8RN is looking up, he says. WØBYV is working hard to bring TEN back to its previous high position among regionals. VE3BZB is closing up "leaks" in the system in Ontario and trying to get better ECN representation from all sections. WØFEO's TWN Bulletin is stirring up some interest, and representation from New Mexico and Arizona is improving.

Transcontinental Corps. W1SMU is hard put trying to find time to keep Eastern TCC going. Speaking of being busy, K4AKP will have his hands full with both RN5 and TCC-Central to manage. W7DZX is girding TCC-Pacific for the expected Christmas deluge.

October reports.

Area	Functions	% Successful	Traffic	Out-of-Net Traffic
Eastern	124	79.0	875	384
Central	93	89.2	1932	912
Pacific	120	89.5	1362	682
Summary	337	85.6	4169	1974

The TCC roster: Eastern Area (W1SMU, Dir.) — *W1s* EMG NJM SMU, K1TSD, W2EZB, WA2OPG, *W3s* EML FAF, W4DLA, *W8s* CHT UPH, *VE3s* FAS FES. Central Area (K4AKP, Dir.) — K4AKP, *K9s* DHN UGY, *W9s* ZYK JOZ DYG VAY FSP, KØYRQ, *WØs* SCA LGG. Pacific Area (W7DZX, Dir.) — W4UGI/Ø, *K6s* KCB DYX GID, *W6s* EOT HC, *K7s* NHV NWP, W7DZX, *WØs* WHE/7 WME KQD.

SS Trophy

How'd *you* do in the last SS? The highest scoring single-op will be receiving a trophy, donated annually by W3GJY. For the '62 SS it will be known as the *Mickey Unger, W8YIN, Memorial Award.* Logs starting to come in by the bushel and high-claimed score totals will appear in Operating News next month.

BRASS POUNDERS LEAGUE

Winners of BPL Certificate for October Traffic:

Call	Orig.	Rect.	Del.	Rel.	Total
W3CUL	240	1792	1418	364	3814
K6BPI	96	1767	1369	128	3360
WØLGG	284	764	728	30	1806
W0SCA	32	547	536	0	1115
K7KBN	136	204	533	197	1070
W8UPH	12	471	401	69	953
W7BA	9	451	402	47	909
K4AKP	29	396	308	87	820
W6RSY	25	397	273	87	782
W9JOZ	10	372	390	1	773
W3EML	41	377	317	22	757
W1TXL	100	309	281	21	711
W1PEX	48	324	300	21	693
W9DYG	67	315	255	15	652
K7JHA	24	333	272	4	633
W7DZX	6	318	280	8	612
K6EPT	11	291	246	45	593
K6QXV	28	286	271	5	590
WA2TQT	174	203	197	6	580
W1AWA	8	277	253	19	557
W9FSP	22	253	229	18	522
W9ZYK	20	239	252	9	520
K1TSD	33	241	221	18	513
W3VR	21	243	235	6	505
W6WPF	28	238	209	29	504
W8CBT	27	252	210	11	500
Late Reports:					
W0SCA (Aug.)	11	979	989	4	1983
WØPZO (Aug.)	3	328	298	30	659

More-Than-One-Operator Stations

Call	Orig.	Rect.	Del.	Rel.	Total
W6IAB	76	1176	1123	47	2422
W6YDK	1062	283	245	38	1628
KR6GF	780	277	115	162	1334
W4PFC/4	28	400	385	13	826
KR6MD	105	215	198	17	535
Late Report:					
W6YDK (Sept.)	1070	91	70	30	1251
W3IVS (Sept.)	30	451	401	50	932

BPL for 100 or more *originations-plus-deliveries*

K7NWP	242	VE3CFR	155	WA4BMC	122
KP4CGB	212	W6GYH	154	WA6MIE	113
W9NZZ	207	WA9AJF	154	K8KMQ	113
K0HGI	179	W6YPM	149	W8DAE	112
WØBIV	171	W7APS	149	W2EW	111
WA2GFP	165	K6GZ	144	WØAYB	108
W2FXR	156	W4NPR	136	WA6EIC	107
K4HOE	156	VE7BDJ	125	WA2CCF	101

Late Reports:

K3DFS/3 (Aug.) 230
K3DFS/3 (July) 218

More-Than-One-Operator Stations

KR6MH	249	W1AW	160	KR6DI	114
W5AC	226	K6FCT	125	KR6MB	112
		W6CER	119		

BPL medallions (see Aug. 1954 *QST*, p. 64) have been awarded to the following amateurs since last month's listing: K1KSH/4, K1RYT, WA4JFY, K9ARW, KØGFA.

The BPL is open to all amateurs in the United States, Canada, and U. S. Possessions who report to their SCM a message total of 500 or more or 100 or more originations plus deliveries for any calendar month. All messages must be handled on amateur frequencies within 48 hours of receipt in standard ARRL form.

NATIONAL CALLING AND EMERGENCY FREQUENCIES (KC.)

3550	3875	7100	7250
14,050	14,225	21,050	21,400
28,100	29,640	50,550	145,350

During periods of communications emergency these channels will be monitored for emergency traffic. At other times, these frequencies can be used as general calling frequencies to expedite general traffic movement between amateur stations. Emergency traffic has precedence. After contact has been made the frequency should be *vacated immediately* to accommodate other callers.

The following are the National Calling and Emergency Frequencies for Canada: *c.w.* — 3535, 7050, 14,060; *phone* — 3765, 14,160, 28,250 kc.

SUGGESTED RTTY OPERATING FREQUENCIES

3620, 7040, 14,090, 21,090 kc.

GMT CONVERSION

To convert to local times subtract the following hours:

ADST —3, AST —4, EDST —4, EST —5, CDST —5, CST —6, MDST —6, MST —7, PDST —7 PST —8, Hawaii —10, Central Alaska —10.

CODE PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW will be made Jan. 16 at 0230 GMT. Identical tests will be sent simultaneously by transmitters on 1805, 3555, 7080, 14,100, 21,075, 28,080, 50,700 and 145,800 kc. The next qualifying run from WGOWP only will be transmitted Jan. 4 at 0500 Greenwich Mean Time on 3590 and 7129 kc. *CAUTION:* Note that since the dates are given per Greenwich Mean Time, Code Proficiency Qualifying Runs in the United States and Canada actually fall on the evening previous to the date given: *Example* In converting, 0230 GMT Jan. 16 becomes 2130 EST Jan. 15.

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

W1AW conducts code practice daily at 0230 GMT on all frequencies listed above with speeds of 15, 20, 25, 30, and 35 w.p.m. on Tuesday, Thursday, and Saturday, and at 5, 7½, 10, and 13 w.p.m. other days. Approximately 10 minutes' practice is given at each speed. To check your copy, the texts used on several transmissions are listed below. The order of words in each line of *QST* text is sometimes reversed. To improve your fist, try to send in step with W1AW.

Date	Subject of Practice Text from Nov. *QST*
Jan. 3:	*How To Run Your Linear*, p. 11
Jan. 4:	*Filter-Type Sidebander*, p. 15
Jan. 7:	*Power-Supply Control*. . . . , p. 26
Jan. 9:	*Low-Noise Transistor*. . . . , p. 30
Jan. 12:	*Amateur TV — The Easy Way*. . . . p. 33
Jan. 16:	*A Simple Three-Band*. . . . , p. 42
Jan. 22:	*Technical Correspondence*, p. 48
Jan. 25:	*Recent Equipment*, p. 54

W1AW SCHEDULES

(January 1963)

Operating-Visiting Hours

Monday through Friday: 3 P.M.–3 A.M. EST.
Saturday: 7 P.M.–2.30 A.M. EST.
Sunday: 3 P.M.–10.30 P.M. EST.

The ARRL Maxim Memorial Station welcomes visitors. The station address is 225 Main St., Newington, Conn., about 4 miles south of West Hartford. A map showing local street detail will be sent on request. The station will be closed Jan. 1, New Year's Day.

Operating Frequencies

C.w.: 1805, 3555, 7080, 14,100, 21,075, 28,080, 50,700 145,800
Voice: 1820, 3945, 7255, 14,280 (s.s.b.), 21,330, 29,000, 50,700, 145,800

Frequencies may vary slightly from round figures given; they are to assist in finding the W1AW signal, not for exact calibrating purposes.

Official Bulletins

Bulletins containing latest information on matters of general amateur interest are transmitted on the above frequencies according to the following schedule in Greenwich Mean Time:
C.w.: Monday through Saturday, 0100; Tuesday through Sunday, 0500.
Voice: Monday through Saturday, 0200; Tuesday through Sunday, 0430.

Caution: Note that in the U. S. and Canada, because times are GMT, bulletin hours actually fall on the evening of the previous day.

W1AW CONTACT SCHEDULE

Would you like to work W1AW? W1AW welcomes calls from *any* amateur station in accordance with the following schedule:

GMT	*Sunday*	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*	*Saturday*
0030–0100	.....	.....	7255*	.....	7080	.....	7255*
0120–0200[1]	.....	.....	7080	3555	7080[2]	3555[2]	7080
0210–0230[1]	.....	.....	3945	50.7 Mc.	145.8 Mc.	3915	3915
0330–0430	.....	.....	3555	3945	7080	1820	3555
0440–0500[1]	.....	.....	3945	14,280	3945	14,280	3945
0520–0600[1]	.....	.....	3555[2]	7255*	3555	7080[2]	3945
0600–0700	.....	.....	14,280	14,100	3555	14,100	.....
0700–0800	.....	.....	7255*	3945	7080	3945	7255*
2000–2100	.....	.....	14,280	21/28 Mc.[3]	14,100	.....	.....
2100–2200	.....	14,280	21/28 Mc.[3]	14,100	21/28 Mc.[3]	21,330*	.....
2200–2300	.....	14,100	14,280	21,075[2]	14,280	14,100	.....

[1] General-contact period on stated frequency begins immediately following transmission of Official Bulletin which begins at 0200 and 0430 on phone and at 0100 and 0500 on c.w. Starting time is approximate.
[2] W1AW will first listen for Novices before checking the rest of the band for other contacts.
[3] Operation will be conducted on either 21,075, 21,330, 28,080 or 29,000 kc.
* Operation may be on s.s.b. as announced at the beginning of the period.

DX CENTURY CLUB AWARDS

Honor Roll

The DXCC Honor Roll consists of the top ten numerical totals in the DXCC. Position in the Honor Roll is determined by the first number shown. The first number represents the participant's total countries less any credits given for deleted countries. The second number shown represents the total DXCC credits given, including deleted countries. Positions in cases of ties are determined by date of receipt. All totals shown represent submissions received from October 1, thru October 31, 1962.

W6CUQ....308/322
W2AGW....308/321
W3GHD....308/321
W1GKK....308/322
PY2CK....308/321
W8BRA....307/320
KV4AA....307/321
W2HUQ....307/320
W4DQH....307/320
W9RBI....306/320
W8KIA....306/319
W8JIN....306/320
W8DMD...305/317
W6AM....305/319
W8BKP....305/317
W3KT....305/318
CE3AG....305/318
W9YFV....305/318
G4CP....305/318
W5ASG....305/318
W3JNN....304/317
W1ME....304/317
W8BF....304/316
W7GUV....304/317
W5ADZ....304/316
W0QVZ....304/315
W8UAS....304/316
W6LBG....304/318
LU6DJX....304/317
4X4DK....304/315
G2PL....304/316
G3AAM....303/316
W2HMJ....303/315
W1CLX....303/315
W2RXA....303/316
VE7ZM....303/315
W5MMK...302/314
W7PHO....302/313
W6GPB....302/314
W1BIH....302/315
W7GBW....302/315
W9HUZ....302/314
WØDU....302/314
CX2CO....302/315
HB9J....302/316
K2GFQ....302/315
W8KML....301/313
W9LNM....301/315
W3LMA....301/313
W9NDA....300/313
W1JYH....300/313
W2LPE....300/313
W8LKH....300/312
W4TM....300/313
W8DAW....300/313
WØELA....300/312
W2WZ....299/312
W4OGW....299/310
W8JBI....299/312
W2JT....299/311
WØAIW....299/311

Radiotelephone

W3RIS....309/323
PY2CK....308/321
W9RBI....306/318
W8GZ....305/317
W8BF....303/315
VQ4ERR...302/315
CX2CO....302/315
4X4DK....302/313
W8PQQ....301/312
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From October 1, thru October 31, 1962 DXCC Certificates and Endorsements based on contacts with 100-or-more countries have been issued by the ARRL Communications Department to the amateurs listed below.

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W4MQB....100
WA6GLD...100
K6ISN....100
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Station Activities

• All operating amateurs are invited to report to the SCM on the first of each month, covering station activitiesfor the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all CMs will be found on page 6.

ATLANTIC DIVISION

EASTERN PENNSYLVANIA—SCM, Allen R. Breiner, W3ZRQ—SEC: W3DUI. RM: W3EML. PAM: K3BHU. V.H.F. PAM: W3SAO. OES appointments go to W3ZRJ and W3CHC; ORS to K3OWE; also an Observer appointment to W3ZRJ, who is in the York Area. K3ADS is curious to know where all the 220-Mc. activity is. We welcome W9EHR, who has moved mto the Philadelphia Area. KN3SME has been on 15 meters for 5 months and worked 29 states and 8 countries. W3LUW, the Germantown ARC, sends code practice Mon. and Thurs. on 50.7 and 29.1 Mc. at 0030. W3BNR still is looking for E.Pa. contacts from Wyoming. W3BKF participated in 5½-hours worth of sports car rallies. Kansas was the 28th state added to the list for K3QNC. The Lehigh Valley ARC has started code instruction classes under the leadership of K3JTW; K3UCK is teaching the theory. New Gear Dept.: W3GRS a 7-Mc. ground plane with 30 radials; a new high-voltage transformer to K3RFH for the SS Contest; a pair of 4X150s in the 6-meter final to K3EMG for better area coverage; an additional 803 to W3EML's final for E. Pa. coverage; an s.w.r. bridge to K3ARR. K3UOW is now a Technican. W3JPS has a new jr. operator. Also W3SAA has a new jr. operator, which made W3ID an uncle and W3SKL/DL a cousin. K3DSM is anticipating "ten meters or bust." K3SPU is now a General. New officers of the South Philadelphia ARC are K3LKB, pres.; W3FAI, vice-pres.; W3ORS, secy.; W3ZMO, treas. The club frequency is 50.82 Mc. The Delco ARC held a "White Elephant Sale," followed by its Annual Banquet Nov. 2. K3OWE is NCS for the ERN Net Wed. and Fri. on 3560 kc. The E.Pa. C.W. Net had 323 QNI and 214 QTC for October. Manager W3EML invites newcomers to join this net, which meets nightly at 2330 on 3610 kc. The NCS will slow down for you. Season's Greetings to everyone. Traffic: (Oct.) W3CUL 3814, W3EML 757, W3VR 505, W3IVS 333, K3JSX 231, K3MQE 109, K3AIK 178, W3HNK 175, K3BHU 115, K3ONW 102, W3ZRQ 95, W3FAF 90, K3OWE 74, W3AXA 60, K3CAH 59, W3AHZ 57, K3MVO 40, K3ARR 37, W3ID 30, K3LKQ 30, W3ITI 27, W3DUI 25, W3BKF 20, K3EMG 20, W3EEN 17, W3LC 16, W3JKK 15, W3BFF 14, W3GJAJ 14, K3DCB 10, W3BNR 8, K3UBA 8, W3ADE 6, W3BUR 6, K3DSM 6, K3AKN 5, K3ANU 4, W3OY 4, K3MDG 3, W3NNL 3, K3MNT 2, W3VSD 2, K3HTZ 1, K3NLW 1. (Sept.) W3IVS 932. (Aug.) K3DFS/3 314. (July) K3DFS/3 285.

MARYLAND—DELAWARE DISTRICT OF COLUMBIA—SCM, Andrew H. Abraham, W3JZY—Asst. SCM Del.: Skip Nelson, W3GKF. SEC: W3CVE. RM: K3JYZ for MDD Traffic Net, which meets on 3649 kc. at 0000Z daily. MDDS 9 (slow) Net is trying out 28.1 Mc. daily except Sun. at 0130Z MEPN is on 3820 kc. MWF at 2300Z on Sat. and Sun. at 1800Z. Del. Emg. Net meets on 3905 kc. at 2230Z on Sat. Delaware: K3AXW has been appomted OO. K3AZK is looking for AREC members. K3EBB has a 14-watt rig on 220 Mc. W3EEB takes part in the CD Parties. K3KAJ is busy with home work. K3OZM is on 2 meters. K3QBF is the call of the Mt. Pleasant H.S. Radio Club. K3OBU reports good ground wave on v.h.f. during October. K3GKF is SCM of the new Delaware section. Send your activities reports to Skip for the Delaware section only. *Md.-D.C.*: W3BKE was in the SS Contest. W3CDG is plagued with line noise. W3CDQ did not hear any YL on 40 meters during the YLRL Contest. W3CVE is busy with AREC activities. K3DJX, of Bethesda, is a Silent Key. K3DNO is busy at U. of M. W3ECP reports K3AHB, K3HDQ and W3SXL have completed modifications to their ART-13 and are on the air with very FB signals. W4EXM/3 hopes to be on s.s.b. with a KWM-2 transceiver from Teheran, Iran, soon. Art is teaching code and theory to a few natives during his off-duty hours. K3GZK is teaching code; W3PRC and K3IQK are teaching theory two nights a week for 8 weeks at the Hartford County Amateur Radio Club. W3IVC is all set for holiday traffic. W3IPO has moved to a new QTH on high ground overlooking the little Seneca River. K3JYZ reports that W3ZNW and the MDDS are testing out 28.1 Mc. as a secondary frequency. K3LFD, please summarize your traffic on your reports. K3LLR has everything set for winter traffic. K3NCM reports that traffic is picking up. W3NO is working all bands, c.w. and phone. W3MSR will be more active now. K3RGD has been appomted EC for the Baltimore Area. The AREC Net meets on 28.680 kc. Mon. at 8 P.M. W3YZI has DXCC 200 confirmed. K3JNN has a new antenna. K3DCP and W3IRA have new tri-band beams. W3TLN built a subminiature transistor VXO-s.s.b. 20-meter transceiver with 100 millawatts input. W3ZAQ will be more active this winter. W3ZNW is trying out 28.1-Mc. c.w. with the MDDS Net this winter. K3PRN is building a d.s.b. rig using printed circuit boards and is looking for a parametric amplifier schematic for a 432 converter. K3QKF is a new amateur in Carroll County. The Carroll County Club call is K3PZN. The Frederick County Amateur Radio Club is running a code and theory class for 15 weeks. The Antietam Radio Club in Hagerstown had a course of instructions in c.d. survival for four weeks. W3CWC will be using a 32-element beam on 2 meters for direct contact with W3CBW in Pikesville, Md. K3SOY is a new Technican in Washington County, and KN3SRE and KN3VJL are new stations there. The Baltimore Amateur Radio Club is progressing and meets on the air each Monday on 28,800 kc. at 8 P.M. K3EZD, at Ocean City, is putting in good signals up on Snowy Mountain on 2 meters. Traffic: W3IVC 195, W3TN 95, K3JYZ 71, K3LFD 70, K3OSX 52, W3ZNW 51, K3WBJ 45, K3LLR 31, W3EOY 30, K3RGD 29, W3ECP 25, W3BKE 22, W3EER 17, W3NO 16, K3NCM 15, W3GQF 9, K3GZK 9, K3AZH 6, K3EBB 6, K3KAJ 5, K3EWK 4, K3LJB 2, W3LUL 2, K3AXW 1.

SOUTHERN NEW JERSEY—SM, Herbert C. Brooks, K2RG—SEC: K2ARY. PAM: W2ZI. RMs: W2HDW and WA2VAT. NJN Oct. totals were 31 sessions and 217 traffic. WA2BLV, W2RG and WA2WLN are regulars on the net. WA2LBL is attending school in Salisbury, Conn. The McGuire Amateur Radio Club meets the 1st and 3rd Tue. in the MARS station on base. K4RGV/2 is the club's secy. W2BZJ, Pennington, advises there is a need for operators at State Control Station, especially c.w. operators. N.J. Emerg. Phone and Traffic Net totals: 31 sessions, QNI 572, traffic 131. W2ZVW, Burlington Co. EC, attended a meeting of the Conn. Wireless Assn. at the home of W2ADE. WA2NXV, Gloucester, is building a new kw. transmitter. SJRA top DXers are K2DCA, W2FXN, W2ZX, K2OEA, W2QDY and W2PTM. SJRA's Christmas Party chairman is WA2KRX. The club plans a new code and theory class in Jan., 1963, under the direction of W2HBE and K2BZK. The SCARA meets at the Storck Reserve Training Ctr., Northfield. The club plans a 10-meter AREC net. K2YZY is back on the air. The club's monthly magazine, *SCARA NEWS* is loaded with information. The Gloucester County ARC 6-Meter Net is very active with a fine number of QNIs. K2ECY, Riverton, is in Thule for a short time. W2BVE, Maywood, is portable in Palmyra. WA2EMB and W2REB attended the recent Syracuse V.H.F. Hamfest. W2LBX, W2OSD, W2LY, K2DEI and WA2NHE assisted in the recent International Motorcycle Endurance Contest. Club secretaries are urged to supply me with lists of newly elected officers. Appointees are required to make monthly reports to their SCM. Check your certificate and, if you are active, request endorsement for another year. Traffic: WA2WLN 133, W2BZJ 84, W2RG 60, W2ZI 35, WA2BLV 30, W2ZVW 22, WA2KAP 10, WA2NXV 7, WA2ARJ 5, K2JJC 1.

WESTERN NEW YORK—SCM, Charles T. Hansen, K2HUK—SEC: W2LXE. RMs: W2RUF, W2EZB, W2FEB. PAM: W2PVI. NYS C.W. meets on 3670 kc. at 1900, ESS on 3590 kc. at 1800, NYSPTEN on 3925 kc. at 1800, NYS C.D. on 3610.5 and 3993 kc. at 0900 Sun. and 7102.5 kc. at 1930 Wed., TCPN 2nd call area on 3970 kc. at 1900, IPN on 3980 kc. at 1600, 2RN on 3960 kc. at 0045 and 2345 GMT. Appointment: WA2KQG as ORS. Endorsement: W2RQF as OPS. The Massena ARC was recently organized with WA2STK, pres.; K2PQE, vice-pres. and act. mgr.; WB2CET, secy.-treas. K2TPB is running 20 watts into a ten-element beam on 6 meters. W2IDM is on 2 meters with 90 watts into a ten-element beam and has a new 417-A converter. WA2TUI and W2CET are new Conditionals. The RAGS activated K2NYS at the N.Y. State Exposition. WA2QMJ was instrumental in getting a special call and setting up the station with help from K2LXN. The RARA is running

(Continued on page 110)

THE first issue of this series, published in the February, 1955, issue of *QST*, was devoted to a statement of our aims in publishing this series. Perhaps it is time to restate these policies.

1. THIS is *your* page. It is our goal to publish articles of general interest, technical information, and other news of general interest to hams.

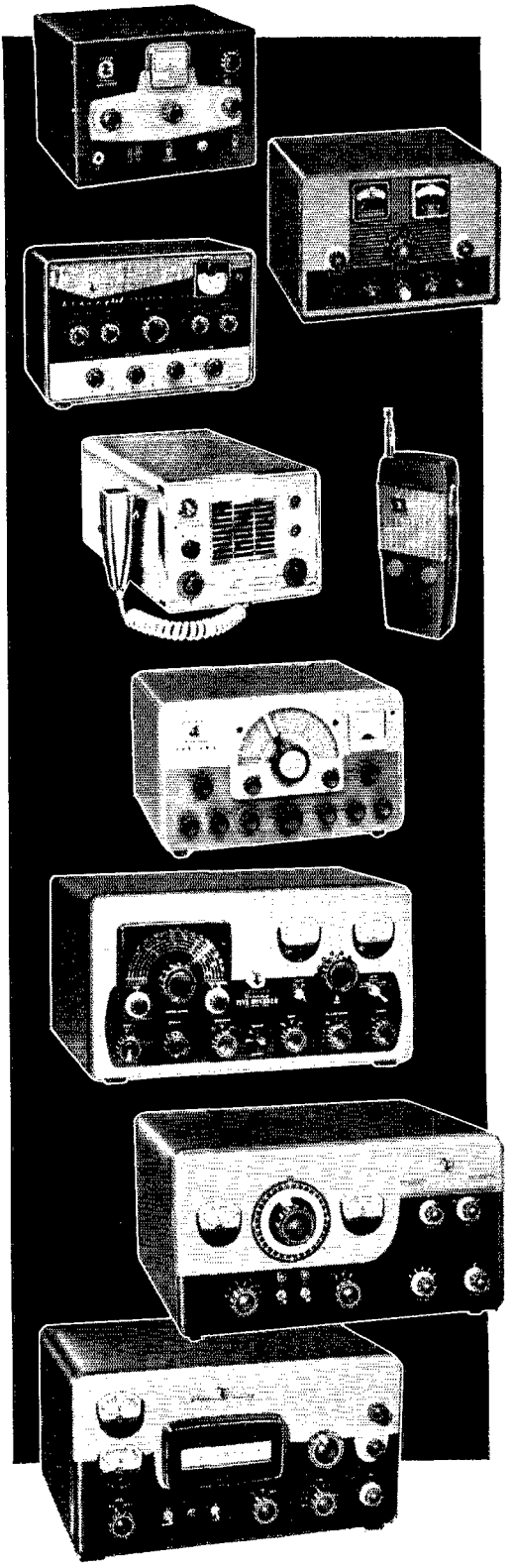
2. WE WILL welcome articles which fall into this category, from amateurs outside the Hallicrafters organization. If you have a topic on some specific aspect of amateur radio which you feel needs airing, why not submit your article to us? You can be sure that it will receive serious consideration.

3. PERHAPS there are subjects which you would like to see discussed in this space. If you will advise us of your wishes in this respect, an attempt will be made to provide material which follows your suggestions.

4. IF YOU KNOW of an individual, or an organization, which you feel deserves recognition because of a signal contribution to the advancement of amateur radio, such recognition is available here . . . just give us the details.

Bear in mind — we have no way of knowing what you want — unless you tell us. So, from here on out think of this as your page, with the facilities of our entire company at your disposal.

W. J. Halligan W9AC Lewis Marshall K9EBE for hallicrafters



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ADVENTURER—Self-contained . . . 50 watts CW input . . . rugged 807 transmitting tube . . . instant bandswitching 80 through 10 meters. Crystal or external VFO control—wide range pi-network output—timed sequence keying. With tubes, less crystals.
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CHALLENGER—70 watts phone input 80 through 6; 120 watts CW input 80 through 10 . . . 85 watts CW on 6 meters. Two 6DQ6A final amplifier tubes. Crystal or external VFO control—TVI suppressed—wide range pi-network output. With tubes, less crystals.
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Cat. No. 240-182-2 Wired, tested ..... **Net $169.75**

6N2—Rated 150 watts CW and 100 watts phone—instant bandswitching coverage 6 and 2 meters. Fully TVI suppressed—use with "Viking I, II", "Ranger I, II", "Valiant" or similar power supply/modulators. Operates by crystal control or external VFO with 8-9 mc. output. With tubes, less crystals.
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10 METER "MESSENGER"—A compact, superbly-engineered transceiver. Ideal for fixed location or mobile operation. Completely crystal controlled, the 10-Meter "Messenger" contains 10 tubes (including rectifier). Instant selection of five frequencies in the range of 29.4 to 29.7 mcs., within a 300 kc. segment of the 10-meter band. Superheterodyne receiver has excellent sensitivity and selectivity. ANL, AVC—positive action "squelch" . . . wide range pi-L network output . . . push-to-talk ceramic microphone! Transmitter section uses a 7054 crystal oscillator coupled to a high gain 7061 final amplifier—delivers a clean, crisp, well modulated signal! Unit is light weight, easy to install. With power cords, tubes, microphone and 29,640 kc. crystals for National Calling and Emergency Frequency.
Cat. No. 242-201 115V AC only ..... **Net $129.75**
Cat. No. 242-202 115V AC/6V DC ..... **Net $139.75**
Cat. No. 242-203 115V AC/12V DC ..... **Net $139.75**

10 METER "PERSONAL MESSENGER"—Two models: 100 milliwatts for short range; 1 watt for extended range—11 transistors and 4 diodes—super-heterodyne receiver with tuned RF amplifier gives excellent sensitivity, two stage transmitter pumps signal home. "Quiet" control silences receiver on standby. With battery compartment for penlight cells (less cells). Rechargeable cadmium battery and other accessories available.
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Cat. No. 242-104 10 Meter "Personal Messenger", 1 watt, with 29.640 crystal, 8 penlight cell battery case ..... **Net $129.50**
Cat. No. 251-806 Leather carrying case and strap . . . . Net $8.50
Cat. No. 250-804 Rechargeable nickel cadmium battery. Plugs into 115 V AC outlet to recharge . . . . . Net $19.95

RANGER II—Now—a new version of the popular 75 watt CW or 65 watt AM "Ranger". The "Ranger II" transmitter also serves as an RF/audio exciter for high power equipment. Completely self-contained instant bandswitching 160 through 6 meters! Operates by built-in VFO or crystal control. High gain audio-timed sequence keying, TVI suppressed. Pi-network antenna load matching from 50 to 500 ohms. With tubes, less crystals.
Cat. No. 240-162-1 Kit ..... **Net $249.50**
Cat. No. 240-162-2 Wired, tested ..... **Net $359.50**

FIVE HUNDRED—Full 600 watts CW—500 watts phone and SSB (P.E.P. with auxiliary SSB exciter). Compact RF unit designed for desk-top operation. All exciter stages ganged to VFO tuning—may also be operated by crystal control. Instant bandswitching 80 through 10 meters—TVI suppressed—high gain push-to-talk audio system. Wide range pi-network output. With tubes, less crystals.
Cat. No. 240-500-2 Wired, tested ..... **Net $1050.00**

"6N2 THUNDERBOLT"—1200 watts (twice average DC) input SSB and DSB, Class AB1; 1000 watts CW, Class C; and 700 watts input AM linear. Continuous bandswitched coverage on 6 and 2 meters. TVI suppressed. Drive requirements; approx. 5 watts Class AB1 linear, 6 watts Class C CW. With tubes and built-in power supply.
Cat. No. 240-362-2 Wired ..... **Net $549.50**

"THUNDERBOLT"—The hottest linear amplifier on the market—2000 watts P.E.P. (twice average DC) input SSB; 1000 watts CW; 800 watts AM linear. Continuous coverage 3.5 to 30 mcs—instant bandswitching. Drive requirements: approx. 10 watts Class AB2 linear, 20 watts Class C continuous wave. With tubes and built-in power supply.
Cat. No. 240-353-2 Wired, tested ..... **Net $659.00**

New Catalog

The E. F. Johnson Co. also manufactures other transmitters and accessories . . . all described in our newest amateur catalog. Write for your copy today!

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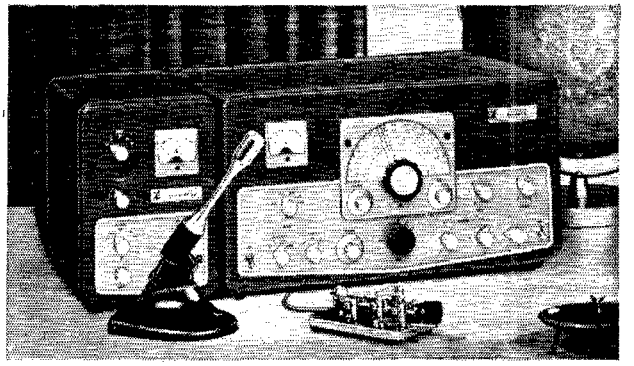

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Outstanding performance on SSB, AM and CW with absolutely no compromise on any mode!

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INVADER 2000—Here are all of the fine features of the "Invader", plus the added power and flexibility of an integral linear amplifier and remote controlled power supply. Rated at a solid 2000 watts P.E.P. (twice average DC) SSB, 1000 watts CW, and 800 watts AM! (250 to 300 watts output—upper sideband and carrier.) Wide range output circuit (40 to 600 ohms adjustable). Final amplifier provides exceptionally uniform "Q". Exclusive "push-pull" cooling system. Heavy-duty multi-section power supply. With power supply, tubes and crystals.

Cat. No. 240-304-2 Wired, tested.....Net $1229.00

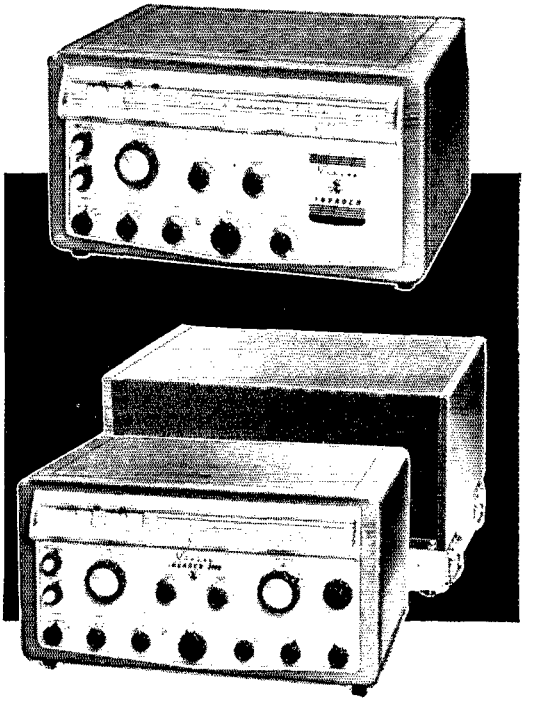
HIGH POWER CONVERSION—Take the features and performance of your "Invader" . . . add the power and flexibility of this unique Viking "Hi-Power Conversion" system . . . and you're "on the air" with the "Invader 2000". Wired, tested, includes everything you need—no soldering necessary—complete conversion in one evening.

Cat. No. 240-303-2.....Net $619.50

"VALIANT II"—Outstanding flexibility and performance—bandswitching 160 through 10 meters—delivers 275 watts input CW or SSB (with auxiliary SSB exciter or Viking SSB adapter) and 200 watts AM! Low level audio clipping—differentially temperature compensated VFO provides stability necessary for SSB operation! High efficiency pi-network tank circuit—final tank coil silver-plated. Other features: TVI suppression; time sequence (grid block) keying; high gain push-to-talk audio built-in low pass audio filter; self-contained power supply; and single control mode switching. As an exciter drives any popular kilowatt level tubes and provides quality speech driver system for high power modulators. Provision for plug-in SSB operation with no internal modification. With tubes, less crystals.

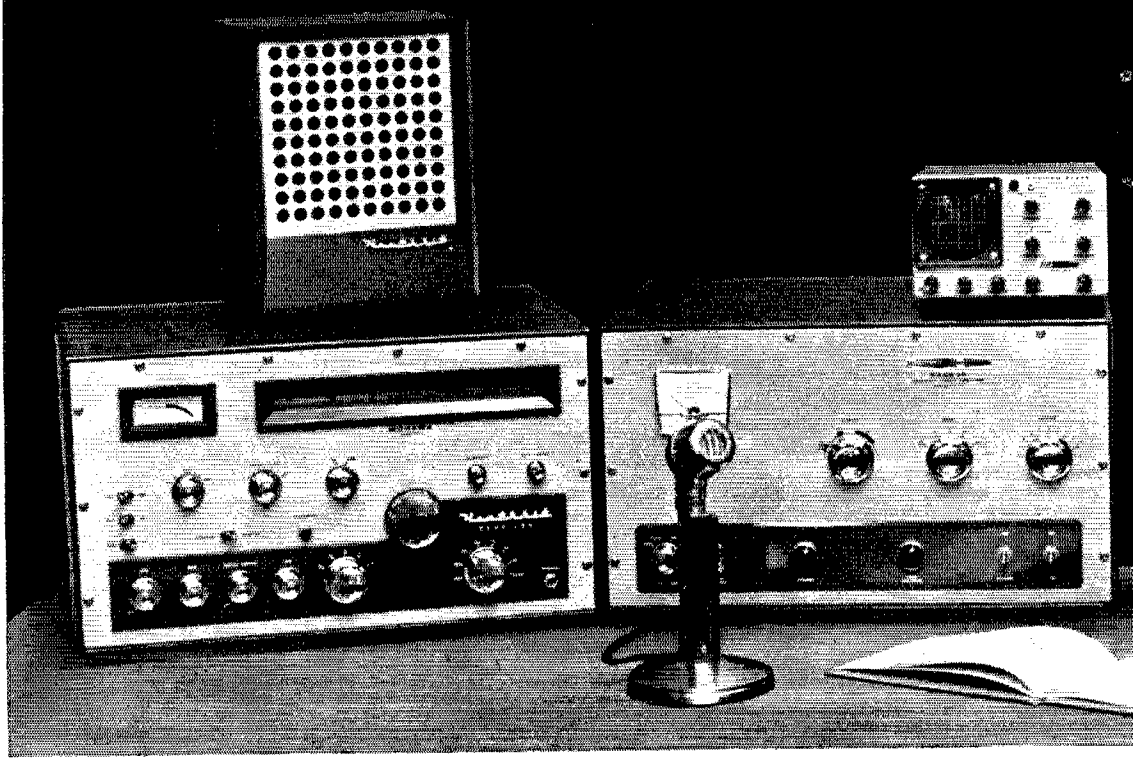
Cat. No. 240-105-1—Kit.....Net $375.00

Cat. No. 240-105-2—Wired, tested.....Net $495.00



E. F. JOHNSON COMPANY
WASECA, MINNESOTA, U.S.A.

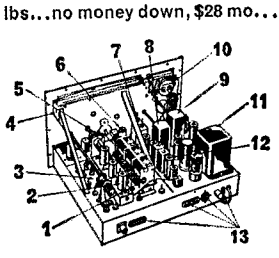
all modes...



HEATHKIT "MOHAWK" DELUXE AMATEUR RECEIVER

1. Amateur band coverage only for maximum accuracy and stability. **2.** 1 uv sensitivity for 10 db S/N ratio—160 through 10 meters. **3.** Prebuilt, prealigned coil/bandswitch assembly. **4.** Rotating slide-rule dial. **5.** 15 tube double conversion superheterodyne receiver. **6.** Upper and lower sideband selection (crystal controlled). **7.** 5 selectivity positions (5 kc to 0.5 kc). **8.** Bridged T-notch filter. **9.** Stable, variable BFO. **10.** Panel "S" meter. **11.** Rugged well-rated components used throughout. **12.** Built-in 100 kc crystal calibrator. **13.** Terminals for antenna (50 or 300Ω), speaker (8 or 500Ω), accessories (B+, fil. muting), 117 V AC.

Kit RX-1..69 lbs...no money down, $28 mo.....**$299.95**



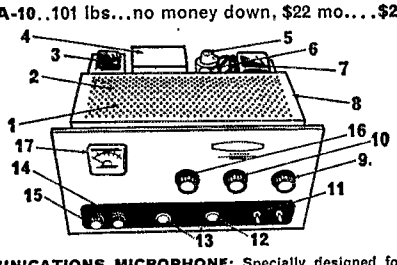
ACCESSORY SPEAKER KIT: Styled to match the "Mohawk". Heavy-duty 8" PM speaker. 8 ohms impedance. 4.7 oz. magnet. 7 lbs.

Kit AK-5.....**$10.95**

HEATHKIT "WARRIOR" DESK-TOP KILOWATT LINEAR AMPLIFIER...OPERATES SSB, AM & CW—80 THROUGH 10

1. Four 811A's **2.** Fan cooling **3.** 5-50 hy. swinging choke **4.** 8 ufd, 2 KV, oil-filled filter capacitor **5.** Two 866A's **6.** Monitor scope output with level control **7.** 1500 v. Power transformer **8.** Internal RF shielding **9.** Loading control **10.** Band switch, 80 through 10 meters **11.** Power and High Voltage interlocked switches **12.** High Voltage pilot light **13.** Power pilot light **14.** Relative Power sensitivity control **15.** Meter switch with Grid, Plate, Relative Power, and High Voltage positions **16.** Tuning control with band markings **17.** Meter

Kit HA-10..101 lbs...no money down, $22 mo....**$229.95**



COMMUNICATIONS MICROPHONE: Specially designed for SSB communications. Response limited from 300 to 3000 cps voice frequencies. Stand has grip-to-talk switch with lock position. Hi-Z output. 3 lbs.

HDP-21....no money down, $5 mo.....**$29.40**

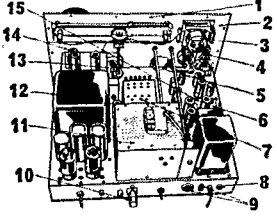
all HEATHKITS

choose from the widest selection at the lowest prices . . . choose quality engineered Heathkits!

HEATHKIT "MARAUDER" SSB TRANSMITTER.. UNMATCHED AT LESS THAN TWICE ITS PRICE!

1. Operates SSB (upper or lower sideband), CW, AM and FSK. **2.** 180 watts P. E. P. on SSB and CW—80 through 10. **3.** Panel meter (grid, plate, HV, ALC, Rel. Pwr). **4.** VOX controlled break-in CW operation. **5.** Automatic level control for higher talk power. **6.** Multi-section, hermetically sealed crystal band-pass filter. **7.** Dual conversion, crystal controlled heterodyne oscillator. **8.** FSK input. **9.** Accessory sockets. **10.** Monitor scope output. **11.** Air-cooled, shielded final amplifier. **12.** Heavy-duty power supply. **13.** 165 to 1 gear drive tuning assembly. **14.** Preheated, temperature compensated VFO—100 cps stability. **15.** Carrier suppression, 50 db; unwanted sideband suppression, 55 db.

Kit HX-10 92 lbs. no money down, as low as $22 mo. **$334.95**



HEATHKIT MONITOR SCOPE KIT: Specially designed for Amateur Radio use! Shows SSB/AM envelope, RF trapezoid and RTTY patterns. Handles 5 watts to 1 KW, 160 through 6 meters. 11 lbs.

Kit HO-10....no money down, $6 mo..... **$59.95**

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GOTHAM VERTICALS DELIVER THE CONTACTS

THE ULTIMATE PROOF OF THE FINE PERFORMANCE OF THE GOTHAM VERTICAL ANTENNAS IS IN THE ACTUAL FIELD RESULTS, BY HAMS ALL OVER THE WORLD.

PROVEN! PROVEN! BY THESE EXCERPTS FROM UNSOLICITED TESTIMONIALS:

CASE HISTORY #71

"I am very delighted with the first V80 and want another for a different location." A. C., California.

CASE HISTORY #159

"I ordered a Gotham V40 Vertical Antenna and found it so successful that several others are wanting them, too. Will you please send me four more." W. A., Alaska.

CASE HISTORY #248

"I just wanted to let you know how pleased I am with my Gotham V80 antenna. I have worked a W.A.S. of 46/43, a WAC of 3/3, and DXCC of 14/12 in about 12 months." G. W., Maryland.

CASE HISTORY #111

"The V160 did a beautiful job on a VE1 for me. Also, I forgot to take it down during the hurricane of last week. It is just as straight as it was when bought it." D. S., New Jersey.

CASE HISTORY #250

"I have one of your vertical antennas and have been having fine results on 10, 15, and 20 meters." N. S. P., Missouri.

CASE HISTORY #613

"I have never been happier with any antenna than I have been with the V80. I have worked all bands with it and have had tremendous success — i.e., DL4s, ZS3, etc., all solid copy." R. D. S., Penna.

CASE HISTORY #483

"My V80 is working wonders. I am able to maintain a 1:1 SWR all across the 40 meter band. After many years on 10, 15, and 20, the XYL and I are getting great kicks out of some of the lower bands." J. A., New Mexico.

CASE HISTORY #123

"I am full of praise for your vertical. In the recent field day, we went up to the mountains near here and QSO'd a KA2, KZ5, and an XE at 2100 PDST on 15 meters. We got a 59 plus from the KA and KZ and 58 from the XE." D. P., Nevada.

CASE HISTORY #398

"Some months ago I purchased one of your V80 vertical antennas. I have had wonderful results with this antenna, and I think it was of far greater value than the small amount I paid for it." R. C., Utah.

CASE HISTORY #766

"The Gotham vertical takes almost no room. I don't see how I could have used any other type very well. Sure do appreciate the fine record this antenna has made so far." H. C., Haiti.

CASE HISTORY #146

"I have had very good luck with mine (my V80) feeding it with a Johnson Adventurer; works fine on all bands." B. I., Nebraska.

CASE HISTORY #555

"Being an owner of your V80 vertical I would like to let you know of the excellent results I am getting with it, both working the DX and the local stations on the lower bands. It certainly is an excellent antenna system." F. H. Jr., New York.

CASE HISTORY #84

"A few months ago I purchased your V40 vertical and have achieved outstanding results on the air." K. G. B., North Carolina.

CASE HISTORY #407

"I recently purchased a Gotham V80 vertical antenna and I am very pleased with the results. Up until now my home brew antenna has had a very high SWR, but with the V80 the SWR is 1:1." J. D. R., Virginia.

CASE HISTORY #414

"Just a quick note to tell you how pleased I am with my 2 day old V80. My old SX-28 just seems to be re-born. An excellent receiving antenna as well as a fine transmitting antenna." D. J., Utah.

FREE

Catalog of all Gotham antennas, including 47 different beams covering 2 meters through 20 meters, free on postcard request.

ANNOUNCEMENT!

GOTHAM proudly announces our appointment as an *AUTHORIZED FRANCHISED DEALER* for *ALL LEADING MANUFACTURERS OF TRANSMITTERS AND RECEIVERS.*

We feature a unique plan that absolutely guarantees proper installation and operation.

ORDERS AND INQUIRIES SOLICITED

WHY

THE GOTHAM VERTICAL ANTENNA IS THE BEST ALL-BAND ANTENNA

- Absolutely no guying needed.
- Radials not required.
- Only a few square inches of space needed.
- Four metal mounting straps furnished.
- Special B & W loading coil furnished.
- Every vertical is complete, ready for use.
- Mount it at any convenient height.
- No relays, traps, or gadgets used.
- Accepted design—in use for many years.
- Many thousands in use the world over.
- Simple assembly, quick installation.
- Non-corrosive aluminum used exclusively.
- Multi-band, V80 works 80, 40, 20, 15, 10, 6.
- Ideal for novices, but will handle a Kw.
- Will work with any receiver and xmitter.
- Overall height 23 feet.
- Uses one 52 ohm coax line.
- An effective modern antenna, with amazing performance. Your best bet for a lifetime antenna at an economical price.

73,
GOTHAM

DO YOU KNOW

1. YOU WILL HAVE NO DIFFICULTY INSTALLING YOUR GOTHAM VERTICAL ANTENNA IN JUST A FEW MOMENTS, REGARDLESS OF YOUR PARTICULAR PROBLEM, SO ORDER WITH CONFIDENCE EVEN IF YOU HAVE RESTRICTED SPACE OR A DIFFICULT SITUATION.
2. LOADING COIL NOT REQUIRED ON 6, 10, 15 AND 20 METERS. FOR 40, 80, AND 160 METERS, LOADING COIL TAPS ARE CHANGED MANUALLY EXCEPT IF A WIDE-RANGE PI-NETWORK OUTPUT OR AN ANTENNA TUNER IS USED; IN THIS CASE BAND CHANGING CAN BE DONE FROM THE SHACK.
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Airmail Order Today — We Ship Tomorrow

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Enclosed find check or money order for:

☐ V40 VERTICAL ANTENNA FOR 40, 20, 15, 10 AND 6 METER BANDS..... $14.95

THE V40 IS ALSO MADE FOR CITIZENS BAND OPERATION, WITH SPECIAL INSTRUCTIONS. DESIGNATE CB-11 ANTENNA. PRICE SAME AS THE V40

☐ V80 VERTICAL ANTENNA FOR 80, 40, 20, 15, 10 AND 6 METER BANDS. MOST POPULAR OF THE VERTICALS. USED BY THOUSANDS OF NOVICES, TECHNICIANS, AND GENERAL LICENSE HAMS... $16.95

☐ V160 VERTICAL ANTENNA FOR 160, 80, 40, 20, 15, 10 AND 6 METER BANDS. SAME AS THE OTHER VERTICAL ANTENNAS, EXCEPT THAT A LARGER LOADING COIL PERMITS OPERATION ON THE 160 METER BAND ALSO..... $18.95

HOW TO ORDER. Send check or money order directly to Gotham. Immediate shipment by Railway Express, charges collect. Foreign orders accepted.

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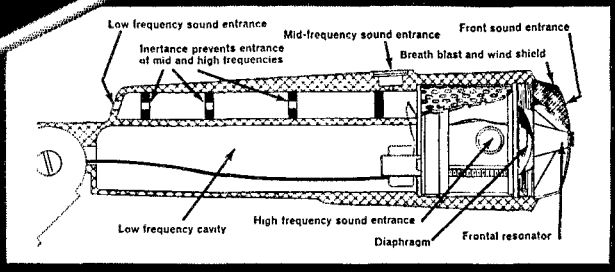
The Least Expensive Way to Increase

Flat response penetrates QRM more effectively because it permits an actual increase in RF power output! More effective cardioid pattern, essential for SSB, cuts accidental tripping of VOX circuit!

MODEL 664



HERE'S HOW IT WORKS

Exclusive E-V Variable-D* (Variable Distance) provides three sound-cancelling entrances at different fixed distances in back of the diaphragm. These entrances, utilizing the proper acoustical impedances, combine to form an effective front-to-back spacing which varies in distance from the diaphragm inversely with frequency. The resulting phase and amplitude conditions provide a uniformly true cardioid pattern at all frequencies. **Pat. Pending*

Here's What the Top Radio Amateur Operators in the World Say About These E-V Microphones:

CX2CO "My new 664 resulted in better and more consistent QSO's."

W8KML "The 664 surpasses its claims in difficult operational environments."

ZL1HY "During QSO's . . . everyone preferred the 951."

W3JNN "I am really sold on the 664."

W8BF "I have had many unsolicited compliments since using the 729."

VQ4ERR "The performance of the 664 matches its thoroughbred appearance."

PY2CK "My 664 microphone vastly improved my SSB transmission."

Average Peak-Power and Intelligibility!

CHOOSE AN Electro-Voice® MICROPHONE

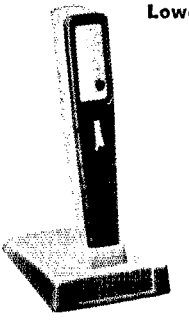
Model 664 for Highest Front-to-Back Discrimination Manufactured, Plus Peak-Free Wide-Range Response!

The effective strength of all sounds arriving at the sides of the 664 are reduced by as much as 50%, and arriving directly at the back of the microphone by as much as 90%. This uniquely effective design permits you to work at twice the distance from the microphone . . . a perfect invitation for "arm chair" QSO's—with no VOX tripping problems.

Smooth, peak-free response guarantees maximum P.E.P. Remember, a peak in response in or *out* of the voice range will limit maximum modulation and result in reduction of P.E.P. You do not have to talk with your lips on the mike. For best results, sit back and talk naturally.

Virtually indestructible Acoustalloy® diaphragm withstands high humidity, temperature extremes, corrosive effects of salt air and severe mechanical shock. Extra ruggedness means extra service, year after year.

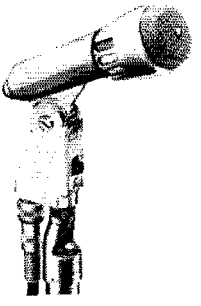
MORE 664 FEATURES: Output—55 db. On-off switch (can be wired for relay control). 150 ohms or Hi-Z output selected at cable connector. Satin chromium finish. High-pressure die-cast case. Pop-proof filter plus magnetic shield. 90° swivel mounting. 18 ft. cable. 7 3/16 in. long (less stand coupler) by 1 7/8 in. diameter. Net Weight 1 lb., 10 oz. Amateur Net, $51.00. Matching desk stand with DPDT switch. Model 419S, $9.00. Less switch. Model 419, $6.00.



MODEL 729SR

Lowest-Cost Ceramic Cardioid Available ...Includes Every Feature Essential For SSB Operation. Flat, Smooth Response From 300 To 3,000 CPS!

Rugged enough for mobile operation, the slim, small Model 729 fits easily in your hand or slips into the desk stand or floor stand adapter provided, without any hardware adjustments. Hi-Z output -60 db. Two-tone grey, pressure die-cast and plastic construction. Shielded, 8½ ft. cable. 7¾ in. long by 1½ in. wide. Net weight 1 lb. Ceramic element unaffected by high heat, humidity. Model 729. Amateur net, $14.70. Model 729SR with relay-control switch. Amateur net, $15.90.



MODEL 951

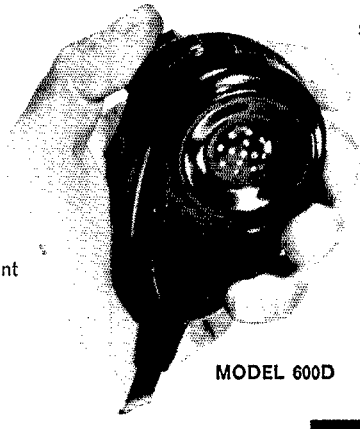
First True Crystal Cardioid With Variable-D Design. Combines High Output With Excellent Noise Rejection At Modest Cost!

Finest crystal microphone available for SSB. Variable-D design of Model 951 cuts room noise, interference from receiver speaker to a minimum. Allows greater working distance to microphone. Peak-free rising response for high intelligibility. Hi-Z output -60 db. High-pressure, die-cast finished in Metalustre grey. On-off switch. Shielded, 18 ft. cable. 5¾ in. long (less stand coupler) by 1¾ in. diameter. Net weight 1¼ lbs. Model 951 Amateur net, $32.70. Matching desk stand with DPDT switch. Model 418S, $9.00. Less switch. Model 418, $6.00.

The World's Finest Mobile Microphone. Model 600D Dynamic Widely Known As Military Types T-50 And M-105/U!

Designed for high articulation under rugged mobile conditions, the Model 600D provides all the advantages of a dynamic element with peak-free, flat response for maximum P.E.P.

High-impact case soaks up physical abuse, feels comfortable at any temperature, fits hand naturally. Extremely high output of -55 db. is ideal for mobile equipment with severe audio requirements. Available in 50, 250 ohms or Hi-Z. DPDT switch. 6 ft. coiled cord. Panel mounting bracket included. Model 600D Amateur net, $28.50.



MODEL 600D

See your Electro-Voice distributor and choose an Electro-Voice Microphone . . . For the fastest, easiest and least expensive way to boost the efficiency and quality of your rig! Satisfaction is guaranteed or your money refunded!

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THERE IS GOOD REASON WHY Mosley IS THE WORLDS FAVORITE!

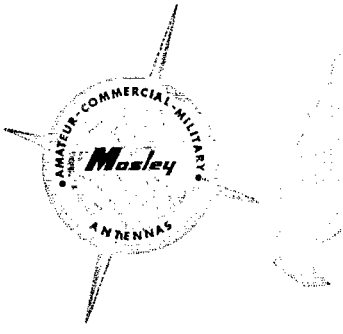
Have you ever tuned the amateur bands and observed how many Mosley Antennas are in use today the world over? Have you ever noticed the outstanding signals that come from these Mosley Antennas?

When you choose Mosley, you choose the best because Mosley Engineers are hams and know what it takes to give the best performance. Mosley designs quality into each Antenna So That Each Part Fits. All holes line up and all tubes are machined and polished completely so that no burrs or rough edges remain. Only 6061-T6 heat-treated drawn tubes are used. This provides the strength needed during maximum wind and icy conditions. All parts are coded so that the Antenna can be installed with ease and without the use of a "yardstick". All you need is a screwdriver and pliers.

When Mosley says that an Antenna is rustproof, we really mean it, because all parts are made of materials that are truly rustproof. Hardware is made of stainless steel so that it is never necessary to treat it to rust-proof it. Mosley does more than guarantee its Antennas for a given warranty period. If for any reason during the life of the Antenna it becomes necessary to replace parts, these parts will only cost the material charge plus a slight handling charge. Mosley wants you to enjoy your hobby with the least maintenance costs.

When you buy a Mosley Antenna, you can be sure that the Antenna has been proven in service. For example - - the traps of the Mosley Trapmaster TA-33 Junior or Senior are produced under original design. They were designed for a given power rating and they are taking that rating today. You can be sure that either the TA-33 Junior or Senior Mosley Trapmaster will give you top performance because Mosley guarantees by test that each trap is identical to a permanent standard.

Mosley makes available to all hams special technical or engineering information. Won't you write to us today and tell us your problems? You will be pleased with the prompt service you receive.



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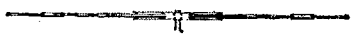
Bridgeton, Missouri

YOUR DREAM ANTENNA FOR 10-15-20-40 METERS WITH A PLANNED BUDGET

1



MODEL TA-31

Start today with the purchase of the inexpensive Model TA-31, and in three additional steps you can have the famous MOSLEY TA-33 TRAPMASTER BEAM plus the New TA-40K to add 40 Meters.

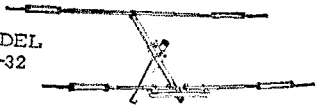
Amateur Net $25.85

+ Mosley TA-31/32 Conversion Kit

NEXT purchase the Kit to convert the TA-31 to a TA-32. Kit consists of reflector element, seven foot boom and all necessary hardware.

Amateur Net $43.65

2



MODEL TA-32

This extra element gives your Antenna additional gain and directivity over the single rotatable dipole.

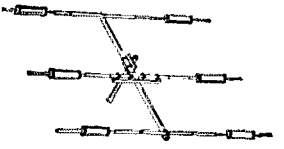
Amateur Net $69.50

+ Mosley TA-32/33 Conversion Kit

For your third step to outstanding performance, purchase the kit to convert the TA-32 to a TA-33. This includes a director element, seven foot boom, boom splice and all necessary hardware.

Amateur Net $30.25

3



MODEL TA-33

This is model TA-33 MOSLEY TRAPMASTER famous world wide for mechanical construction quality and performance. *(for 10, 15 and 20 meter bands)*

Amateur Net $99.75

+ Mosley TA-40K Conversion Kit

Finally, you can add 40 meters to your TA-33 without affecting the characteristics of the TA-33. Kit contains all necessary hardware. WITH THE 11-YEAR SUN-SPOT CYCLE in effect, 40 meter operation becomes more important than ever.

Amateur Net $39.95

4

MODEL TA-3340

NEW!

MOSLEY TA 3340 TRAPMASTER is now available as a complete package ready to install. Package contains TA-33 and TA-40K complete with all parts and hardware.

Amateur Net $139.70

ALL MOSLEY ANTENNAS CONSTRUCTED OF:

- *6061T6 Heavy Gauge Aluminum!*
- *100% Rust/Corrosion Proof!*
- *High Grade S. Steel Hardware!*

NOTE: A Model AK-60 Mast Plate Adapter for 2" OD Mast is available. Complete with aluminum angle and hardware.

Amateur Net $4.78

SEE YOUR DEALER TODAY OR WRITE

Mosley Electronics Inc.

4610 N. LINDBERGH BLVD. - BRIDGETON, MISSOURI

Station Activities

(*Continued from page 98*)

a code class under the direction of WA2EIP. Helpers include WA2AIL, WA2SKS and K2SQI. Let us all pledge to start the New Year with the true ham spirit and back up our good intentions with action, be we individuals or groups. When your overworked club officers are looking for volunteers surprise them! Only *you* can benefit in the long run. The Cuban crisis focused public attention on civil defense and many projects have been dusted off and money has been made available from the local budgets to purchase needed RACES equipment. It is our duty, whether through RACES or AREC, to be fully prepared to function in a professional manner when the chips are down. There is no other organization with our latent ability and capability. Now is the time to take a fresh look at *your* community and assess what action should be initiated to fulfill your obligations to organizational preparedness in time of need. Clubs are invited to suggest capable individuals who may be qualified to act as Emergency Coordinators in their geographical area. Traffic: (Oct.) W2EZB 230, W2OE 186, W2FEB 152, WA2KQG 151, WA2IYB 143, W2RUF 138, K2BBJ 71, WA2NXB 63, W2RKU 63, K2SPO 42, K2QDT 33, WA2ANE 30, WA2DAC 27, W2RQF 26, WA2LKW 20, K2OFV 19, WA2KZQ 18, WA2TDE 18, K2IMI 17, WA2WEE 16, K1BVI/2 15, K2MQA 13, W2PVI 12, K2RYH 12, K2TDG 12, WA2GLA 11, WA2HEC 10, K2PBU 10. WA2RLV 10, WA2ENV 8, K2HTG 7. W2EMW 2, W2QHQ 1. (Sept.) WA2IYB 74, K2BBJ 54, K2QDT 47, K2RTQ 20, WA2HEC 19, K2HOH 5.

WESTERN PENNSYLVANIA—SCM, Anthony J. Mroczka, W3UHN—SEC: W3LIV. RMs: W3KUN and W3NUG. The WPA Traffic Net meets Mon. through Fri. at 2400 GMT on 3585 kc. The Keystone Slow Speed Net (KSSN) meets at 2330 GMT on 3585 kc. Mon. through Fri. We regret to record the death of W3MPO, of Pittsburgh. A new General Class license is K3PJH. K3VAP, formerly K8HUI, is now in Butler. New officers of the Greater Pittsburgh V.H.F. Society are W3HWU, pres.; K3JTH, net mgr.; W3EWV, treas.; K3QBI, secy.; K3BAK and W3OMY trustees. The Western Penna. Mobileers "Fall Roundup" was well attended. The Pittsburgh Chapter of the Quarter Century Wireless Assn. is active under the guidance of W3AVY and W3UGV. The Butler County Party Line meets Wed. at 0300 GMT on 29. Mc. K3KYT is running a kw. on s.s.b. Operation SET went very well for the Blair County AREC group under the sponsorship of W3LIV (SEC) and W3ISZ (EC). Up Erie way: K3AFO is located in Turkey; W3ZUL is now on 6; KN3TPK is working for WAS; K3AXS vacationed at the Worlds Fair. The Coke Center RC reports: Ex-K3HTG is now WB6BVB; the club rummage sale went over big; W3TTV and K3PLQ are working 10. The Horseshoe RC reports via *Hamateur News*: K3QFB has a new HQ-110; K3BDI is on 6; W3UBP is on 2 meters. The South Hills Brass Pounders and Modulators RC is purchasing a Lafayette transceiver for 10 meters. K3QIX and K3KYT now edit the Bedford County RC paper *Shorts*. New officers of the Uniontown ARC are K3RTG, pres.; K3OQP, vice-pres.; W3CAV, treas.; W3UUZ, secy.; W3CAV, W3PQR and W3RUK, trustees. K3SCH now is General Class. W3SYY is going RTTY on 6. The Steel City ARC reports via *Kilowatt Harmonics*: W1UED, from Headquarters, spoke at the club's October meeting; the W3APN family recently received twins; W3SHT is operating mobile s.s.b. New officers of the Etna RC are W3BEC, pres.; K3EBX, vice-pres.; W3DMK, secy.; K3LKP, treas.; W3MFA, act. mgr.; W3NSQ and W3OJM, directors. Participation in both the WPA and KSSN Traffic Nets has been very good, reports W3KUN, Route Manager. Don't forget, ECs, mail monthly reports to W3LIV. Traffic: K3OOU 150, W3MFB 137, W3KUN 124, W3JHG 80, W3IYI 47, K3EDO 42, W3UHN 34, K3AKR 10, K3DKE 10, W3OEO 8, W3SYY 7. K3COT 4, W3UIU 4, W3KWO 3.

CENTRAL DIVISION

ILLINOIS—SCM, Edmond A. Metzger, W9BRN—Asst. SCM: Grace V. Ryden, W9GME. SEC: W9RYU. RM: W9USR. PAM: W9VWJ. EC of Cook County: W9HPG. Section net: ILN; 3515 kc. Mon. through Sat. at 1900 CST. W9IMN, K9KRW. K9UCG, K9VLE, W9YTQ. W9VOX, W9REC. W9ITV/9 and W9FLQ participated in the latest ARRL Frequency Measuring Test. W1NJM, the League's National Emergency Coordinator, was guest speaker at the September meetings of the River Park Amateur Radio Club and the Chicago Suburban Radio Association. A new call heard in the Springfield area is K9FSY. The Bogan High School (Chicago) Radio Club held a fund-raising dance with radio's disc jockey Dick Biondi as m.c. and honored new Novices WN9FPY, WN9FQH, WN9FHQ and WN9EYY. K9QMJ reports FB results with his new home-brew 2- and 6-meter nuvistor converter. Officers of the new Quigley South Radio Club are WA9BJX, K9BPM and WN9BJF. K9UKM has a new Finney 6- and 2-meter beam. W9GDI is back in operation with his 44-ft. vertical on 3.5 and 7 Mc. Chuck Baer and his Enterprise contributed to the ARRL building fund with a percentage of his receipts at the League meeting. W9QVA was speaker at the November meeting of the Rockford Amateur Radio Association. W9EET has a new 220-Mc. beam 66 ft. high consisting of eleven elements. With the Cuban crisis most of the civil defense communications systems were given a much-needed boost. Now is the time to check with your local EC and/or RACES Officer and offer your support with both manpower and equipment. New appointments are WA9AWP as OBS, WA9AJF as ORS and W9RQR as OO. The 1962 SET held Oct. 6-7 was disappointing. It was discovered that a surprising number of amateurs did not seem to know how to originate and/or route a message. K9YKV and W9EGI were married in November after a 6-meter romance. The Bogan High School Radio Club was approved by the League's Executive Committee for ARRL affiliation. W9OKM has a new TA-33 beam. W9YYG is using a product detector for s.s.b. W9ERU has completed installation of a new 20- and 40-meter beam. WA9AJF was the only recipient of the BPL certificate in October. Traffic: (Oct.) WA9AJF 405, K9KZB 294, W9IDA 285, W9AKV 108, W9AZ 104, K9BTE 80, W9JXV 61, K9ZQT 50, K9NBH 46, K9DRS 40, W9YYG 39, K9VUL 34, WA9DEW 29, K9UFK 13, K9TVA 11, K9CRT 9, W9MAK 8, W9PRN 8, K9UCG 7. W9VWJ 5. (Sept.) W9JXV 58, W9AZ 52, K9UMH 12.

INDIANA—SCM, Donald L. Holt, W9FWH—Asst. SCM: Clifford M. Singer, W9SWD. SEC: W9SNQ. PAMs: K9KTL, K9CRS, K9GLL. RMs: W9TT, K9SGZ, K9WET. Net skeds: (all times in GMT) IFN, 1300 daily and 2300 M-F on 3910 kc. ISN (s.s.b.), 0030 daily on 3920 kc. QIN (training), 0000 M-W-F on 3745 kc.; QIN, daily at 0030 and RFN, 1300 Sun. on 3656 kc. New appointments: W9HQF as EC of Warrick Co., W9BLK as EC of Clay Co., and K9DHN as ORS. The president of the E. Frankfort Ky. Optimist Club expresses his thanks and sincere appreciation to the amateurs of Indiana for handling their Optimist Club traffic for the past year. New officers of the Michigan City ARC are W3BPG, pres.; K9URA, vice-pres.; K9MZU, secy.; WN9CLA, treas.; K9HYV, General Class director; K9GLK, Novice Tech. director. The call K9WWJ listed as a Silent Key in Nov. *QST* activities column should have been K9WJJ. W9DGA made 41,310 points in 6 hours in the Oct. CD Party. K9VEC is Asst. EC for Fulton County, which has a net operating on 52,525 f.m. each Sun. at 1400. Those making BPL were W9JOZ, W9ZYK and W9NZZ. *Amateur radio exists as a hobby because of the service it renders.* Oct. net reports: IFN 323, ISB 268, QIN 163, QIN training 3, Hoosier V.H.F. 51, RFN 50, RFN for Sept. 33, 9RN traffic 675, with Indiana represented 100 per cent. Traffic: (Oct.) W9JOZ 773, W9ZYK 520, W9NZZ 326, W9VAY 292, K9SGZ 242, W9QLW 202, K9JHN 192, K9IVG 175, K9KTL 112, W9SVL 111, W9SNQ 100, K9RWQ 68, W9PMT 67, W4BDG 63, W9FWH 63, W9QYQ 56, W9TT 53, K9ZLB 53, K9CRS 43, K9WET 37, K9BSL 35, W9RTH 35, W9DGA 33, K9GLL 32, W9SWM 29, K9INF 25, W9EJW 23, W9KLX 23, K9WWJ 22, K9ILK 21, W9BUQ 20, W9CC 20, W9YYX 19, K9UEF 18, W9BTZ 17, W9OG 17, W9DOK 16, K9YZC 15, W9DZC 14, K9VEC 13, W9RE 11, K9HYV 10, K9ARW 9, K9QVZ 9, K9ZCA 9, K9DUV 8, W9IGD 8, K9CIF 7, K9FHQ 7, W9ISV 5, W9AB 4, K9DZP 4, W9ETI 4, W9BDP 3, K9MWC 3, W9YVS 2. (Sept.) W9VAY 158, W9TT 136, W9CC 20, K9MWC 17, W9BDG 12, K9HYV 12, W9DZC 10, K9DZD 10, K9FHQ 6, W9ETI 3, K9TKC 2.

WISCONSIN—SCM, Kenneth A. Ebneter, K9GSC—SEC: W9BCC. RMs: W9VIK and W9VHP. PAMs: W9SAA, W9NRP and W9NGT. Nets: WSBN, 3985 kc. daily at 2315 GMT; BEN, 3950 kc. daily at 2400 GMT; WIN, 3535 kc. daily at 0115 GMT; WSSN, 3535 kc. Tue. through Sat. at 0030 GMT. New appointments: K9GDF as OO Class I, W9FSP as OO Class IV, W9RYA as EC for Ozaukee County, K9LGU as OPS. Renewed appointments: K9WIE as ORS; W9RQM as OPS, ORS and OES. K9GDF has received the "W99W" Award Nr. 4 from the Racine Megacycle Radio Club. The Oshkosh Amateur Radio Club helped the police at Omoro keep order on Halloween. A new high school club is being formed at Plymouth. W9EKZ has a new 6- and 2-meter v.f.o. W4VRD has left Madison for Tennessee. W9CBE is on 10 meters with a converted CB unit. We regret to announce three Silent Keys, W9TLP, W9DOS and K9UCX. Mark your calendars to attend the Southern Wisconsin QSO Party, sponsored by the Racine Megacycle Club, May 25, 1963. September FMT results: K9GSC 25.3, W9VSO 27.5, W9LFK 45.0, W9UEB 52.4, K9GDF 62.5 and K6DDO/W9AIW 4,712.0 p.p.m. New in Hortonville is WN9FMQ. W9PTN has received his 100th card for DXCC. Those making BPL for October traffic: W9DYG, his 46th; W9FSP his second. Traffic: (Oct.) W9DYG 652, W9FSP 522, W9NQW 194, K9LGU 145, W9SAA 138, K9IMR 135, K9BLN 109, K9GSC 87, W9VHP 50, K9UUT 37, K9BQQ 30, K9WIE 29, K9GDF 28, W9NRP 25, W9SZR 21, W9UEB 18, W9OTL 16,

(*Continued on page 112*)

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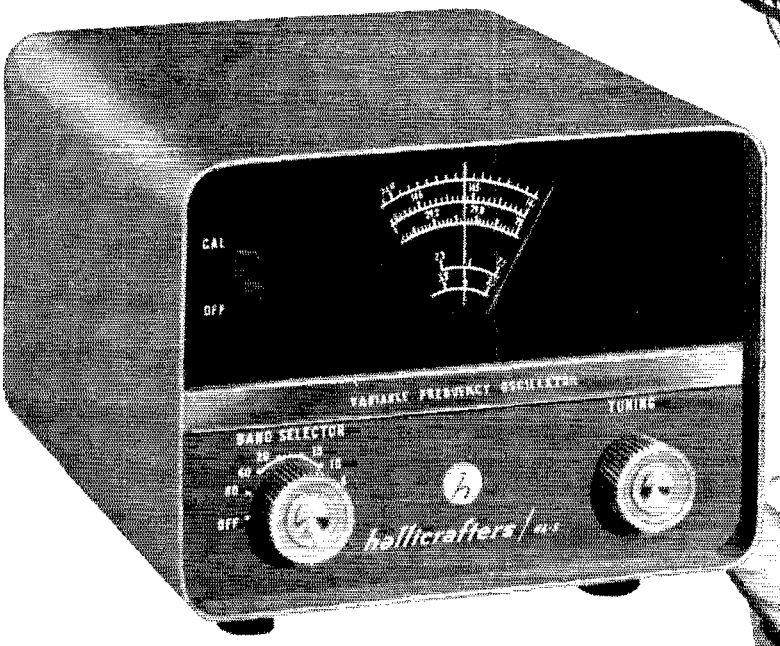

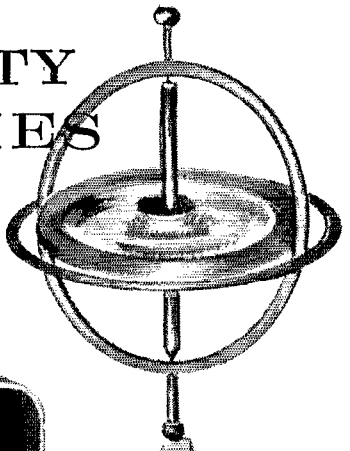

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W9YT 16, W9VIK 15, W9CBE 13, K9DOL 11, W9HPC 8, W9ONI 6, W9IQW 5, K9UTQ 1. (Sept.) W9VHP 48, K9BOJ 4.

DAKOTA DIVISION

NORTH DAKOTA—SCM, Harold A. Wengel, WØHVA—SEC: WØCAQ. PAM: KØTYY. RM: KØQWY. The North Dakota 75-meter Phone Net reports 27 sessions in October with 557 check-ins, a maximum of 28 check-ins per sessions and a minimum of 11, 38 formal messages were handled and 74 informal with 12 relays. At 1830 CST, Oct. 9, the N.D.S.U. Amateur Radio Society completed 100 hours of continuous operation. Contacts were made with hams in all 50 states, 18 counties and 5 continents. This was a test of equipment and operators and participants included WØVCQ, WØGBQ, KØFQA, KØJYL, KØRRY, KØMPH, KØJRE, KØRRZ, KØGJS, KØPVH, KØPEO, VE4VW and WNØARX. A new Conditional class licensee in Bismarck is WAØAVS. The BARK has increased its club treasury by auctioning donated articles. Traffic: (Oct.) KØITP 90, WØYCL 68, KØFRP 21, KØTYY 18, WØIRN 16, KØGGI 14, WØHAT 7, WØBHF 2, WØIHM 2, WØAYJ 1. (Aug.) KØITP 34. (May) KØITP 29.

SOUTH DAKOTA—SCM, J. W. Sikorski, WØRRN. SEC: WØSCT. The Watertown Amateur Radio Association is operating again and is conducting classes for beginners with WØURD, WØNIW and KØESP as instructors. KØFKJ, Dell Rapids, received an OES appointment. WØFAM has moved to Fort Meade. WAØCCX has purchased a beam from KØKYK. KØWEN and KØWEM operated mobile near Ellendale, N. Dak., to provide contacts with that rare state for about 30 stations. WØPHR has a DX total of 210. WØSMV has 231; WØSMV has his beam mounted at new QTH. WNØCWW and KØFKJ are on 144 Mc. WØZWH has returned to the ham bands, operating CWI. KØBSW is driving a new Mercury, without the mobile. WØYQR is building a linear for his GSB-100. Traffic: WØSCT 355, KØBMQ 187, WØDVB 134, KØAIR 55, WØCFP 39, KØZBJ 32, KØVYY 29, KØZMA 24, WAØAOY 22, WØGWW 21, KØYGZ 21, WØNNX 17, KØTXW 16, KØBSW 12, WØRWX 12, WØFJZ 11, WØRWM 11, KØCXL 8, KØDUR 8, KØTVJ 8, WØIGG 6, WØDIY 4, KØKOY 4, KØPDW 3, KØUXC 3, KØZMA 3, KØGSY 2, KØJGM 2, KØTAM 2, KØYJF 2, WØAPL 1, WAØAZC 1, WAØCFC 1, WNØDOF 1, WØEQV 1, KØFGH 1, KØGCF 1, WØGWL 1, KØJMW 1, WØNIW KØTLD 1, KØTWT 1, KØTXU 1, KØZMP 1.

MINNESOTA—SCM, Mrs. Lydia S. Johnson, WØKJZ—Asst. SCM: Charles Marsh, WØAIW. SEC: KØKKQ. RMs: KØIZD, KØUXQ. PAMs: WØGCR, KØEPT. SSBN Mgr.: WØHEN. Nets: S.S.B. on 3805 kc. at 1730Z and 3812 kc. at 0045Z. MSPN, Noon 1805Z on 3820 kc. and Evening at 2400Z; C.W. MSN at 0030Z and MJN (slow-speed) at 0100Z, both on 3595 kc. Please contact your PAMs for phone net participation and your Route Managers for c.w. nets. All interested in AREC, direct your applications to our SEC, KØKKQ, Pine City. WØWVM was given the *QST* Cover-award for his article, "Space-Age Antenna Ideas," which appeared in June *QST*. The award is one of the first in our call area. It was given to Chuck at a surprise luncheon in Minneapolis and was presented by our Director WØBUO. In attendance were the WCCO-TV and radio staff, co-workers of Chuck's. They were as follows: WØs SYG, YKF, EG, BCT, AUS, BPK, HHU, IFS, WAØBYO; WØPAM and WØLER "Oscar Trackers"; WØCRO from Starks; and your SCM as League representative. Our sincere thanks go to the WCOO "brass" who were responsible for the luncheon. The following participated in the September FMT: WØKLG, WØWMA, WØHEN, WØJHS and KØESN. WØPHD applied for AREC membership. KØRSL has a radio club going in the Luverne Area. WNØEDC is a new Novice in Hardwick. A most recent member of MJN is WNØDIE, in Minneapolis. KØJFJ earned his CP-35 from ARRL. Novices, please take note, check your signals (80 meters) for harmonics on 7.4 Mc. and higher. ORS KØOTH was in Minneapolis to sing for the MEA. WØYCR gave a talk at the Rochester Club on "Contest Operating." WØAXS earned his CP-30. Members of the St. Louis Park C.D. group are WØs GBC, COX, OEM, HCZ, OZI, VOI, KØKIO, ELX, WAØs AAJ, CAC. Traffic: WØKJZ 297, WØATO 188, WØBIV 181, WAØABU 143, WØYC 134, WAØBYO 98, KØIHD 65, KØJFJ 58, KØWPK 57, WØHEN 51, WØRTQ 51, WØGCR 38, WØOPX 37, WØALW 30, KØIJU 30, WØTHY 29, KØVPJ 25, WØWMA 25, KØGCJ 18, WØKLG 17, KØFLT 15, WØUMIX 14, WØBUO 10, KØMGT 8, KØZRD 8, KØCNI 1.

DELTA DIVISION

LOUISIANA—SCM, Thomas J. Morgavi, W5FMO—Louisiana stations are especially invited to check into RN5, which meets daily at 7.45 P.M. and 9.30 P.M. CST on 3645 kc. W5QXV made the Brass Pounders' League in October with 590 pieces of traffic handled. W5NDV complains that other activities interfere with his hamming but he manages to make RN5 each day. K5FYI has been very active as net control for the Jefferson Net. W5CEZ finally got his RTTY going. The Jefferson ARC secured the call of the late Al Lestelle, W5GAD. The Springhill Radio Club was assigned the call WA5EPP. All Springhill AREC members participated in the last SET, along with W5QIX in Cotton Valley, Shreveport, Monroe, West Monroe, Springhill, Algiers, Lake Charles, Jefferson, New Orleans, Lafayette and other locations took part in the SET operation with 102 stations and nearly 200 AREC members. K5KTV has a Thunderbolt linear tacked onto his 20-A. W5ZBC is handling traffic again. W5AJY has been handling some traffic to Antarctica. W5JBK has been doing a fine job as Emergency Coordinator in Alexandria. The club has been holding code classes twice a week with 8 students. There are over 50 AREC members in the club. Two new Official Bulletin Station appointees are W5JHV and WA5CWD. W5JHV will send the ARRL Bulletins on 50.46 Mc. Tue. and Thurs. at 1800 CST and Sun. at 1330 CST. WA5CWD will transmit Official Bulletins Mon., Wed., and Fri. on 145.35 Mc. at 1800 CST. Traffic: K5QXV 590, W5CEZ 302, W5MXQ 87, W5ZBC 69, K5WOD 12, W5AJY 11, K5KTV 11, W5EA 6, K5FYI 6, W5NDV 3, K5TJG 2, K5UYL 2.

MISSISSIPPI—SCM, S. H. Hairston, W5EMM—SEC: K5SQS. I want to express my appreciation for having been elected your SCM. The Natchez group W5KHB, K5MDX, K5IMT, W5IHP stood by for emergency during "Operation Chlorine." WA5AMB is now on 80 and 40 meters. K5MDX worked No. 276 for DXCC; VK/ZL phone, 101 QSOs, 4500 points; CQ WW DX phone 349 550s. 210K points; CD Phone Party 31 QSOs, 3600 points. K5MPL reports an increase in AREC interest in Clay Co. Stations, please check on RN5. K5OPG reports Keesler Club activity is greatly increased. Check-ins from stations during the SET were the best ever. Several Meridian boys are now on 6 meters. New appointments K5VAK as EC; W5EWE as OPS; K5WSY as OO. Several appointments are still open. Traffic: W5MUG 61, W5EMM 22, W4CJD/5 12, K5MDX 3.

TENNESSEE—SCM, David C. Goggio, W4OGG—SEC: W4WBK. PAMs: W4LLJ, K4WWQ. RMs: W4OQG K4AKP. Section net reports: TN-QTC 64, QNI 189, TSSN-QTC 49, QNI 608; ETPN-QTC 46, QNI 538. Effective Nov. 1, the C.W. Net moved liaison to RN5 from 4RN. The acting mgr. of RN5 is K4AKP, top traffic man in the state. New appointments: K4BXV, Hardin Co., W4DWT, Marshall Co., K4EPS, Tipton Co. as ECs; W4RMJ as OPS; K4LNM and WA4AJC as OBSs. The recent Simulated Emergency Test was an outstanding success with 15 EC groups participating. K4VOP, Anderson Co. EC, received some nice newspaper publicity. *Coming Events*: CD Party (c.w.) Jan. 12, (phone) Jan. 19. All stations holding ARRL appointments are eligible. V.H.F. SS Jan. 5. Your Director, W5MUG, would like to see more activity "first Sat. nights of month" and in LO Parties. SECs, PAMs, RMs and ECs are eligible. Suggested meeting places—3925 kc. 2330 GMT and 3905 1400 GMT. Your SCM requests that club secretaries send lists of new officers. The Loudon County ARC sponsored a bingo party for the ARRL Building Fund. The Chatter ARC meets the 1st Fri. The Frye ARC meets the 1st Tue. and last Fri. of the month. The Kingsport ARC meets the 3rd Thurs. The Johnson City Radio Assn. meets the 3rd Thurs. The MARA is conducting a school for Novices and Technicians. Reports were received from ECs K4APJ, K4AQA, W4BQG, K4BXV, K4EPS, W4FLW, W4IGW, K4ILW, W4JVM, W4KAT, W4NGO, W4PFP, K4PVH, W4SZE, W4TYV, W4TZG, W4TZJ, K4VIR, W4VNU, K4VOP, K4YUJ, W4ZBQ; OESs W4HHK, W4RIX; OOs WA4FPS, W4ZBQ, K4RIN, W4HHK worked state No. 8 on 432 Mc.: W5SWV, Dallas, Tex., 425 miles. Traffic: K4AKP 820, W4MXF 82, W4ZJY 82, W4OGG 68, W4PQP 68, W4OQG 63, K4WWQ 52, W4TZG 40, W4LU 34, WA4AVX 33, W4JVM 32, W4LLJ 22, WA4-BNF 21, W4WBK 18, K4PVH 11, K4VOP 10, WA4AIS 9, W4RMJ 9, K1YLI/4 8, W4ZAC 8, W4SGI 7, W4CZE 6, K4JXG 4, K4RGB 4, WA4CRH 3, WA4GAX 3, W4-DTL 2, K4RQP 2, W4CVG 1.

GREAT LAKES DIVISION

KENTUCKY—SCM, Elmer G. Leachman, W4BEW—SEC: W4TFK. PAM (a.m.): W4SZB. PAM (s.s.b.): K4-ECJ. RM: W4CDA. PAM (v.h.f.): K4LOA One of our best loved and respected hams has become a Silent Key Albert E. Hall, K4CSH, died at 9:43 P.M., Sat. Oct. 27, 1962. Al was a lifetime member of the ARTS (Louisville) and was loved and respected by all who knew him. MKPN reports 30 sessions, 561 QNIs, 65 messages on the 0830 net and 15 sessions, 167 QNIs, 16 messages on the 0630 net. The evening KPN, now officially organized with K4ECJ as manager, reports 25 sessions, 486 QNIs, 50 messages, with 5 NCSs appointed. The Warren County Radio Club was very active in the

(Continued on page 114)

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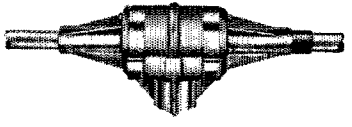

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MODEL NO.	FREQ. MC	WEIGHT	NET PRICE
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AREC with 13 stations reporting in on a recent drill on 6 meters. The Owensboro Club is busy with Bluegrass Awards, the first going to K4HHG. Get this—the next five are going to KH6DKA, DL9KP and ZM7DA. Congratulations to K4NYO on his first harmonic (a boy). K4ZQR is working KC4USB on a new beam. Six-meter activity still is climbing, with K4GWA and K4QIO coming on. K4QIO, ARTS president is NCS for the evening KPN. The civil defense bus, Louisville, is in operational readiness under the call WA4-YFH, with the crew furnished by the Kentuckiana Club. KYN (c.w.) meets daily in two sessions (one slow) and needs more members. Kentucky is now divided into 21 areas for emergency planning. An EC will be appointed in each. Traffic: W4RHZ 285, K4KWQ 171, K4HOE 163, W4CDA 52, W4BGY 48, W4SZB 42, W4BEW 37, K4NYO 29, W4YYI 28, K4OZG 26, K4ZQR 26, WA4APU 22, W4EON 14, W4KJP 13, K4LOA 13, K4YZU 13, K4QIO 11, K4VDO 10, K4WJI 9, W4HKT 8, K4HSB 8, WA4-CQG 4, W4JUI 3.

MICHIGAN—SCM, Ralph P. Thetreau, W8FX—SEC: W8LOX. RAMs: W8EGI, W8IXJ, W8FWQ, K8-KMQ. PAMs: W8LQA, W8CQU. V.H.F. PAM: W8PT. Appointments: W8ELW, K8MKG, K8QLL as ORSs; W8-DSW as OBS; K8WQV as ORS. New officers: Motor City RC W8VWY, pres.; W8BNF, vice-pres.; W8MPD, secy.; K8OVJ, treas. New Island Radio Club, Grosse Ile, WN8EUD, pres.; WN8FQF, secy.; K8ALG, treas. W8-DMH, K8JHI and W8LPQ are Silent Keys. Lawrence Tech. ARC is using W8PQA as its new call. K8IDJ works the SS *Hope* on 28 Mc. using 10 watts. Officers of the Metropolitan Ragchewers Club (SE Mich.) are K8NSR, pres.; K8YAV, vice-pres.; K8KKK, secy.; K8SIZ, treas. W8DOO stowed away his sailboat. W8REB, is "tower-erecter delux." W8WQH has a "new" CE20A and Globe LA-1 linear. W8ZLK retired his HRO for a new SX-101A. At "Aurora Acres" W8EMD is putting up "nested rhombies" with data from Boulder Labs, Bureau of Standards, and from W6AM. New officers of the Grand Rapids ARA are K8ZVG, pres.; K8DCS, vice-pres.; K8ILR, secy; K8HQT, treas.; W8IIE and W8SPX, dir. W8AAM has a new Valiant II, K8KWO a GSB-100, W8HSQ a Viking II, W8WWT an SX-111, and W8EGI a new Viking Navigator exciter. W8FZE is in the Navy. W8AHV now runs 120 watts on 144 Mc. but W8BCI runs 400 watts on 144 Mc. WA8CHD made General Class. W8TQN tried to convert a 75-meter Swan to all bands. Wonder how he made out. K8QKT is in the Navy. K8QEI is a freshman at M.S.U. W8ZHB has TVI. K8KVV hasn't time to get W8PGW on at the U. of M. K8CKD is back on the BR Net regularly. K8-UOP/8 is on 7-Mc. f.m. at Lockbourne AF Base, Ohio, and wants skeds on 7-Mc. phone. K8BZL moved to 520 Linden, Big Rapids, and is OBS for the WSSB Net. W8YAN has a new Hammarlund HX-50. By this time W8EMD should be on all bands from 1¼ to 160 meters. K3UDD, heard on QMN, is ex-W8YKC, formerly of Detroit. The new "QMN 100" Club will start soon. Traffic: (Oct.) K8KMQ 217, W8IXJ 182, K8NJW 102, W8FWQ 85, K8QKY 85, W8DSW 75, W8PBO 58, K8HLR 52, W8IBB 52, W8FX 49, W8RTN 47, W8LOX 45, W8EU 44, K8WQV 41, K8PYW 39, K8QLL 37, W8ELW 33, W8EGI 31, W8TBP 27, K8GOU 23, W8ACW 20, W8EOI 20, W8ILP 19, W8BEZ 17, W8SWF 17, K8VDA 17, W8ZHB 17, W8DSE 16, K8JED 15, W8OCC 15, W8-AUD 14, W8AHV 11, W8HKT 8, K8GJD 7, W8PGW 6, K8CKD 5, WN8EUD 4, W8SCW 2, K8UOP 1. (Sept.) W8IBB 35.

OHIO—SCM, Wilson E. Weckel, W8AL—Asst. SCM: J. C. Erickson, W8DAE. SEC: W8HNP. RMs: W8BZX, W8DAE, W8VTP and K8ONQ. PAMs: W8VZ, K8BAP and K8UBK. W8CHT received the A-1 Opr. Award. K8RMK advises the 1963 officers of the Indian Hills RC are WA8AAV, pres.; K8STK, vice-pres.; K8TSG, secy-treas. Your Great Lakes Director, Dana Cartwright, W8UPB, and your SCM attended Cleveland's Mid-America Radio Convention, at which more than 1000 amateurs registered. 136 took the General Class license exam with 58 passing the code test. WA8BOM, WN8EWH, WN8COQ, WA8DFB, W4SC, W8OPI, W3-VYH, W8AY, K8HVH, W3ETD, W8NVP, K8YEN, W8-THV, W8DAE, K8VYT, K8ZGW, K8OUK, W8SUS and W8SSI won prizes. Speakers were W1UED, Asst. Secy. ARRL, W8UPB and W8AJW. Over 350 attended the banquet where K8ITH, K8HKU and W8OIS received cups as awards and heard G. Merritt Preston, Chief of Pre-Flight Operations and Manager of Cape Operations, speak on Communications in Support of Project Mercury. Ohio lost one of its very hard-working OOs when W8HZJ joined Silent Keys, as did K8DRE and K8JHZ. K8AKN spent a couple of weeks in Florida. Dayton ARA's *R-F Carrier* informs us that W8ENH told them What's Inside the Drake 2-B receiver. W8-DPW gave a talk on Amateur Participation in Satellite Communications and W8SEK joined Silent Keys. Toledo's *Ham Shack Gossip* names K8YJG as its Ham of the Month and states that K8QCR visited in Hungary.

(*Continued on page 116*)

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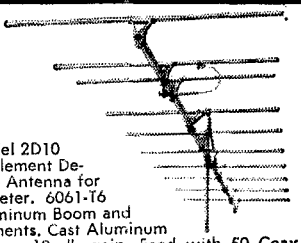

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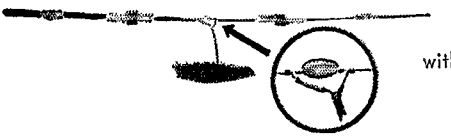

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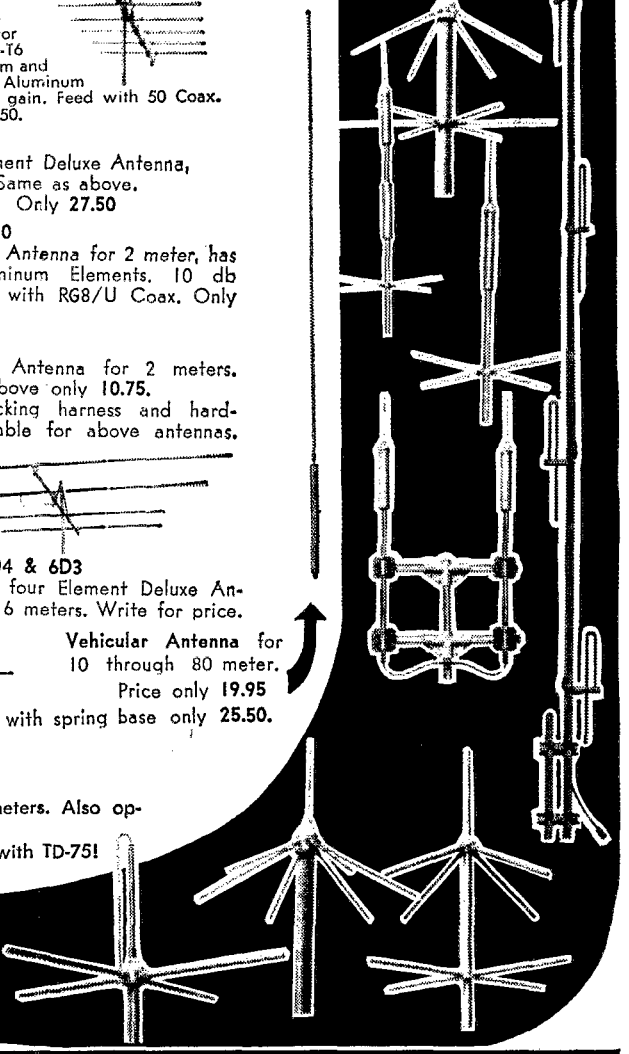

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WA8DOM vacationed in Alaska. A Chillicothe family has five hams: WA8DAS, WA8FGW, WA8FGX, WA8FGY and WA8FKL. K8QDQ is operating 20-meter mobile with a new Swan rig. K8BXT has a new TA33 beam and tower. Canton ARC's *Feedline* says W8NTQ is now K3TVF, W8BYK is in CT2-land with the Air Force, K8QNT has a new TA33 jr., K8SWE has a new TH-4, W8QAZ has a new TH-3. W8MND and K8UBK have joined the QCWA. W8UPH received Colonial America, WWCNY and Confederate States Awards. The Seneca RC played a tape from VE3GG which told of his ham radio experiences since 1913. Inter-City RC's *IRC News Bulletin* passes this along: The club meeting night has been changed to Thurs. and John Wheats, a Westinghouse engineer, demonstrated and explained methods used in measuring currents and voltages in radio and electronic circuits. Parma RC's *P.R.C. Bulletin* tells us its code and theory classes have started, the club station, located in Crile VA Hospital, has a new Drake 2-B receiver and the club held an auction. Springfield ARC's 1963 officers are K8QWE, pres.; K8MHJ, vice-pres.; W8AJK, secy.; K8AEW, treas. and *The Q-5* states W8RMF visited the club. Six-Meter Nomads' *The Amateur Extra* says K8CDA, W8CWL, W8JBS and K8VGF were elected trustees. Warren ARA's *Q-Match* tells us that WA8EWT and WN8FBF are new hams in the area. Greater Cincinnati ARA's *The Mike and Key* states club members saw two motion pictures, The Big Bounce and The Voice of Mercury. Columbus ARA's *Carascope* informs us that members were told about maser and lasers, what they are, how they work and what they do. W8CHT, W8DAE and W8UPH made BPL in October. W8UPH made BPL in August. W8IBX received the College Wireless Award. Findlay RC's *W8FT News* says that the club's code and theory classes have started. The Babcock & Wilcox ARC is electing 1963 officers. Amateur Radio Editors Association's (AREA) 1963 officers are W3KPJ, pres.; W8BAH, executive vice-pres.; W3ZXV, 1st vice-pres.; K4URX, 2nd vice-pres.; W4DKJ, 3rd vice-pres.; WA6VTL, 4th vice-pres.; W8BAH, secy.-treas. Traffic: (Oct.) W8UPH 953, W8CHT 500, W8DAE 421, K8LBU 289, K8SQK 175, W8BZX 173, K8UBK 108, K8PCL 86, K8UZY 48, K8VWN 32, K8RXD 30, W8ZYU 29, W8AL 25, K8DGT 25, W8CXM 22, K8TKG 17, W8IEP 16, W8KCN 16, W8WYS 11, K8KXS 8, K8BNL 6, W8YGR 3, W8IBX 2, K8KLA 2, K8LGA 1. (Sept.) W8CHT 157, K8RFU 7, W8IEP 4. (Aug.) W8UPH 1948, W8CHT 249, K8RXD 10.

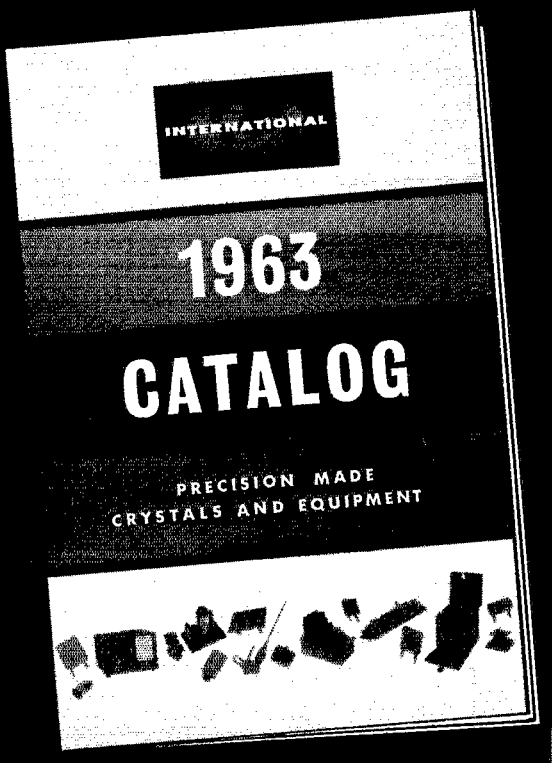
HUDSON DIVISION

EASTERN NEW YORK—SCM, George W. Tracy, W2EFU—SEC: W2KGC. RMs: W2PHX and K2QJL. PAM: W2IJG. Section nets: NYS on 3670 kc. nightly at 0000 GMT; NYSPTEN on 3925 kc. nightly at 2300 GMT; ESS on 3590 kc nightly at 2300 GMT; MHT (Novice) on 3716 kc. Sat. at 1800 GMT; Interclub on 28,690 kc. Mon. at 1030 GMT. Endorsements: K2HNW as EC and OPS. October was "Auction Month" at the Albany, Schenectady and Ulster County Clubs, all highly successful. W2DSK was chairman of "Old Timers Nite" in Albany. ECs K2SJN, K2IES, WA2QEQ and WA2TIA, plus representatives of services and agencies, discussed AREC activities with the SEC, W2KGC, in New Rochelle on Oct. 17. Larchmont is establishing a strong RACES program under K2IES, who is both EC and Radio Officer for RACES. WA2NRB has a new Marauder. The RPI Club, W2SZ is settled in a new shack and reports 51 members, of which 38 appeared on campus with amateur licenses ready to operate. New Rochelle reports 60 registrants in its Novice/Technician/General training programs. W2WGE is a new Asst. EC under Greene County EC, W2FQL. They have established 2-meter nets for local and inter-county AREC activity. The new state RACES Control Center in Albany has three kilowatt rigs on the l.f. bands plus v.h.f. gear for statewide and local coverage. Amateur license application or renewal forms no longer require notarization, according to the FCC. Those new call letter plates are very attractive. Traffic: W2THE 161, WA2HGB 116, W2EFU 114, K2HNW 52, WA2UZK 43, WA2VYS 26, K2SJN 24, K2TXP 22, W2URP 20, WA2JWL 14, K2MPK 10, WA2LYP 7, WA2YHA 5, WA2TJX 2.

NEW YORK CITY AND LONG ISLAND—SCM, George V. Cooke, jr., W2OBU—SEC: K2OVN. RM: W2WFL. PAM. K2HCU. V.H.F. PAM: W2EW. Section nets: NLI, 3630 kc. at 0015Z nightly; NYCLIPN, 3908 kc. at 2230Z nightly; V.H.F. Net, Tue.-Wed.-Thurs. on 145.8 Mc. at 0100Z and Fri. through Mon. on 146.25 Mc. at 0000Z; Mike Farad, on 7238 kc. at 1700Z; All Service Net, at 1800Z Sun. on 7270 kc.; Q5 Net, 3935 kc. at 2100Z daily. BPL certificates have been issued to WA2TQT, WA2GFP, W2FXR and W2EW for October traffic. A new group called the Long Island DX Association has been formed, covering only Brooklyn, Queens, Nassau and Suffolk Counties, with officers as follows: W2MES, pres.; W2FGD, vice-pres.; W2ESZ, treas.; K2UYG, secy. In order to join this select club you must be a

(Continued on page 118)

FREE 1963 INTERNATIONAL CATALOG



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member of ARRL and hold proof of at least 100 confirmed DX contacts. The membership is limited to 25 members and a bi-monthly bulletin is available for interested amateurs. W2GKZ received his DXCC certificate for 101 countries worked s.s.sb. using a Chippewa. W2BNJ moved to Huntington from New Jersey and has a new 50-ft. crank-up tower going. W2PBG has returned to the air with a new Marauder. K2JJR is using 3 phased verticals for 7-MC. DX work and with 1 kw. on c.w. is working plenty of rare ones. A new 6-meter traffic and emergency groups has gotten started in northeastern Queens under the leadership of WA2-WIH meeting Wed. at 1845 EST on 50.2 Mc. The net manager of the group is WA2VFM. W2FXR, the station at Manhattan College, has been activated and is running a new kw. rig. W2MTA, an OT in the traffic game, now is located in Levittown. WA2IUQ received HTH Class G and WWCNY Awards. W2OME has been appointed EC for the Islip Township Area. W2PF attended the 1st hamfest at the San Francisco International Airport and met many old friends. Section net certificates have been issued to WA2HRZ, WA2CYY, WA2MAH, WA2UCP, WA2UTR, WA2HVV, K2RYF, K2JCW and W2YFP for participation in the Kings County AREC and RACES Net for 2 meters, and to W2YCW, K2UPA, WA2HUF, WA2OGU, WA2OAX, W2-EHA, WA2JVG, W2FGD, K2SDM, WA2PNC, K2JLE, WA2EER, WA2MDZ and WA2LLG in the Nassau 10-Meter Net. WA2GAB has received an Asst. EC appointment to promote AREC at the Brooklyn Veterans Hospital and with K2RYF, K2JCW, WA2QGG and WA2HVV aiding, code and theory are taught, traffic is handled and amateur radio is explained to many of the patients. The local police in Massapequa were augmented by WA2MIW, WA2ENH, WA2HPC, K2OTZ, K2HSY, K2OVN, K2ULS and WB2BHP on a Halloween patrol and turned in a good job. LU8CW paid a nice visit to the Five Towns RC and gave a nice talk on hamming in Argentina. K2RKL is rightly proud of his new YL jr., operator; W2OTA is the godfather. WA2TGI is active again having put up a new five-element Telrex and an AR-22 rotator. The Lawrence HS RC now is on the air with a new call, WB2EJZ using an SX-111 and an HT-37. The club elected the following officers: WA2OKD, pres.; WA2TNY, vice-pres.; WA2YZG, secy.-treas.; W2FGD, club faculty advisor. Eight members of the Levittown RC, W2GLO the base station, aided in a Halloween patrol in their area. Contact WA2-BWM about the Gas House Gang certificate award for 10-meter contacts with its membership. W2IAG announces the Queens 10-Meter AREC Net is changing to 0100Z Mon. Traffic: WA2TQT 580, WA2GPT 486, WA2-GFP 469, K2UBG 368, W2FXR 313, W2EW 228, WA2QJU 123, W2WFL 117, WA2IJS 103, WA2RMP 64, K2KYS 63, WA2IUQ 32, W2GKZ 30, WA2GAB 28, W2GP 26, W2OME 24, WA2EFN 19, K2AAS 18, W2DBQ 18, W2EC 18, W2-JGY 16, WA2VLK 16, WA2RAQ 11, WA2RZJ 10, W2PF 9, K2UFT 9, WA2PUE 6, W2CLE 5, WA2IMH 2, WA2-WEA 2, WV2ZDT 2.

NORTHERN NEW JERSEY—SCM, Daniel H. Earley, WA2APY—SEC: K2ZFI. RM: W2QNL. PAM: K2-SLG. V.H.F. PAM: K2VNL. Names, times and frequencies of the New Jersey NTS nets: NJN. 2400Z daily on 3695 kc.; the NJPN, Mon. through Sat. 2300Z. Sun at 1400Z on 3900 kc.; the NJ 6 & 2, Mon., Thurs. and Sun. on 51.15 Mc. at 0300Z Tue. and Sat. on 146.70 Mc. at 2200Z. Net reports, sessions, attendance and traffic: NJN 31,—, 217. NJPN 31, 572, 131. NJ 6 & 2 21, 104, 18. K2KDQ was made an OES. K2UKQ had her ORS appointment renewed. There are fellows looking for appointments as OO and OBS. It is the policy to keep these at the minimum number necessary to do the job. The appointments will be made as soon as a vacancy exists. Lack of reporting and activity of some of the appointees will soon leave a few vacancies. Those who attended the convention enjoyed it and the few who did all the work deserve a pat on the shoulder. The NJPN had its annual dinner and the SCM made that one, too. Among those present were the S.N.J. SCM, K2BG; the V.H.F. PAM: K2VNL; PAM K2SLG and the NJPN RM, W2ZI. Too numerous to mention are the AREC units that helped out on Halloween. The SEC would be glad to hear of these activities. I hope all you ECs are reporting. K2ZFI, the SEC, has some fine ideas in the fire and he can use your cooperation. WA2CCE has been appointed Radiological Monitor for the Morris Co. C.D. WA2UNQ has a new Valiant. K2-AGJ has received the A-1 Operators Award. K2UKQ got the CHC plaque. She says she would like two husky OMs to put her 40-meter dipole back up. W2BVE also operates under WB2ENY. WA2OVK is kept busy in the RACES drills. W2CWK has a kw., his first time in excess of 180. My sympathy to all of you with not enough time to be on the air. I have the same problem; guess the young guys will have to keep the ball rolling. WA2-SRK and WA2OVK have received their 2RN certificates. WA2FVL reports great success with the local c.d. Congrats to WA2JHQ for making A-1. WA2ZQH has

(*Continued on page 120*)

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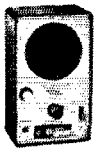

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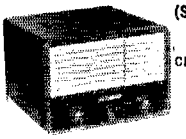

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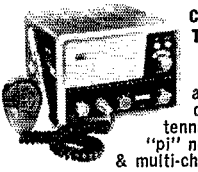

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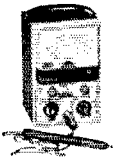

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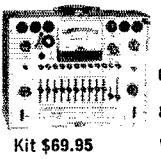

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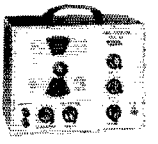

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40 states confirmed. I will report the doings of the NJN Annual Meeting in next month's column. W2CFB is doing some DXing. The results of the FMT were very gratifying in that there were a lot of OOs participating and the accuracy shows they are the right men for the job. A lot of you fellows are very active in the c.d. I wish that you would throw the AREC a bone, contact the SEC and see what can be done about unifying the two. WA2CCF made the BPL again. Traffic: (Oct.) K2UCY 252, K2VNL 156, WA2SRK 139, WA2CCF 133, WA2GQZ 92, WA2WSB 91, WA2OVK 79, W2DRV 48, W2QNL 46, W2CVW 40, WA2JTZ 34, K2JTU 27, WA2ZQH 22, K2SLG 19, W2CFB 15, WA2IGQ 11, WA2APY 10, W2BVE 9, K2VNK 9, WA2JHQ 8, W2NKD 8, W2OXL 7, WV2ZKT 6, W2EWZ 5, WA2OQP 5, K2AGJ 4, K2EGP 2, W2NIY 2, K2UKQ 2. (Sept.) WA2CCE 71, W2DRV 15.

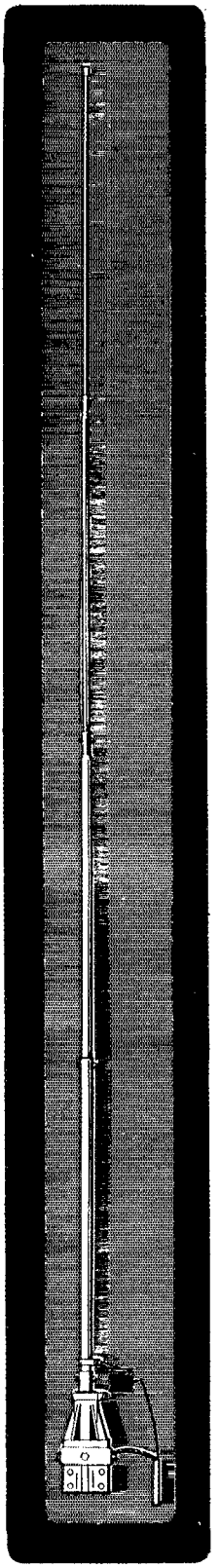
MIDWEST DIVISION

IOWA—SCM, Dennis Burke, WØNTB—SEC: KØEXN. PAMs: WØPZO and WØLSF. New OO: WØUSL. New ECs: WAØASM and WØOXY. KØFDZ wants contacts in the Omaha Area on 6 meters. Try 50.4, Gary, you will hear somebody. There has been renewed interest in AREC and RACES because of the troubled international conditions. The 160-Meter Net reports QNI 850, QTC 42 in 31 sessions. The 75 Meter Phone Net reports QNI 1220, QTC 194, 27 sessions average 7.22; for September QNI 1173, QTC 203, 25 sessions average 8.12. The Tallcorn Net for October: QNI 255, QTC 210, 23 sessions average 9.1. Mr. Frank Osier, WØCPC, with the aid of Fr. Devine and the officials of the Iowa State Training School has formed a club, and secured a license with the call WAØEBU for the purpose of interesting these boys in a worthwhile project which will be of value to them when they return to their homes. Traffic: (Oct.) WØLGG 1806, WØSCA 1115, WØPZO 139, WØNTB 92, KØUAA 59, KØAUU 55, WØBDR 51, KØUAB 47, KØVBM 45, KØEXN 41, WØGQ 40, WØDUA 26, WØQVA 20, WØTTT 19, KØAFG 15, KØJSI 15, WØYDV 14, WØBLH 13, WØBTX 12, KØKAQ 11, KØEVC 10, WØFDM 9, WØQVZ 8, WØNWX 7, KØHGH 6, WØJPJ 6, KØLHH 4, WØNGS 4, KØQKD 4, KØYDS 4, WØFMZ 3, WØBQJ 2. (Sept.) WØPZO 659, KØWKT 24, KØYLN 33. (Aug.) WØSCA 1983.

KANSAS—SCM, Leland Cheney, WØALA—SEC: KØBXF. Asst. SEC: KØEMB. PAM: KØEFL. RM: WØSAF. New appointments: WØYZB as EC; KØLHF as OBS; WØVBK and WØPFG as OOs. New 40-meter c.w. and s.s.b. nets should be well organized and operating at this time; 6- and 2-meter nets are next. If interested, contact your SCM. OESs report sporadic activity on 6 meters and local activity on 2 meters. The McPherson ARC Civil Defense Net is now located in the American Legion Building. KØHGI made BPL. The picnic at Yates Center was a big success. Nets: KPN, 3920 kc. Mon.-Wed.-Fri. 1245Z, Sun. 1400Z; 18 sessions; QNI high 55, low 15, total 447, average 24.83; QTC high 23, low 0, total 84, average 4.66; NCSs KØQKS, KØEFL, WØFHU, KØYTA, KØGII and KØMER. QKS, daily 3610 kc. 0030Z; 31 sessions; QNI high 10, low 3, total 218, average 7; QTC high 10, low 0, total 113, average 3.6; NCSs KØBXF, KØEFL, KØIRL, WØQGG, WØSAF, WØTOL, KØYTA and WØBYV. HBN, 7280 kc. Mon. through Fri. 1800Z; 23 sessions; total 201; NCSs KØYWT, KØHGI, KØICB, KØWNZ and KØNAB. KSBN, 3920 kc. Sun. 1330Z. KSWN, 3840 kc. Mon. through Sat. 0001Z. The next section meeting will be held in Kansas City in January, the date to be announced through the SCM bulletin service. Traffic: KØHGI 286, WØBYV 203, KØYRQ 198, KØYTA 100, KØLHF 71, WØRJF 63, KØEFL 29, KØQKS 27, KØLPE 20, KØGII 17, WØALA 16, KØEMB 12, WØABJ 10, WØTSR 8, WØYZB 7, KØPSD 6, WØIFR 5, KØVQC 5, WØWSD 4, WØJID 1.

MISSOURI—SCM, C. O. Gosch, WØBUL—SEC: KØWNZ. RMs: WØOUD, KØONK. PAMs: WØBVL, WØTPK, WØLFE (v.h.f.). Net reports (Oct.): MoSSB (3963 kc. 2400 GMT. Tu-Th) 9 sessions; QNI 165; QTC 27; NCSs: WØECA 3; WØOMM 6. MSN (3517 kc. 2200 GMT M-F. 1400 GMT S) 30 sessions; QNI 46; QTC 27; NCSs: KØONK 8, KØVPH 5, KØFPC 4, WNØCWV 6, KØGFA 1. SMN (3580 kc. 2200 GMT Su) 4 sessions; QNI 21; QTC 7; NCS: WØOUD. MON (3580 kc. 0100 GMT Tu-S) 27 sessions; QNI 158; QTC 128; NCSs: WØOUD 12, WØKIK 6, KØFPC 4, KØVPH 5. MEN (3885 kc. 2400 GMT M-W-F) 13 sessions; QNI 302; QTC 181; NCSs: KØVPH 4, KØONK 2; KØKUD 2. WØTPK 5. It is with considerable regret that the SCM must submit his resignation effective with this month's column. As stated two months ago, a change in employment has forced this, time simply is not available. Grateful thanks are extended to all those who have cooperated so whole-heartedly the past four years with the SCM. Good wishes are extended to the fortunate amateur who will be selected for this post. BCNU and very 73.—*Chuck, WØBUL.* Traffic: WØAYB 214, WØ-

(Continued on page 122)



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Now...available for immediate delivery through your favorite Hy-Gain Distributor...Hy-Gain's new, all band vertical antenna...the Model 18V.

Here's a highly efficient, 18 ft. vertical that can be tuned to any band—80 thru 10 Meters—by a simple adjustment of the feed point on the matching base inductor. Designed for 52 ohm coax feedlines, the Model 18V is amazingly efficient for DX or local contact. Highly portable—knocks down to an overall length of 4 ft.—it can be quickly installed on a short 1⅝" mast driven in the ground. It is also adaptable to roof or tower mounting. The Model 18V is a tremendous buy in a self-supporting radiator with multi-band capability. Remember, you can pick one up today from your favorite Hy-Gain Distributor—or, if shipment from a Distributor is necessary, the Model 18V's portability lends itself to low cost Parcel Post shipping charges.

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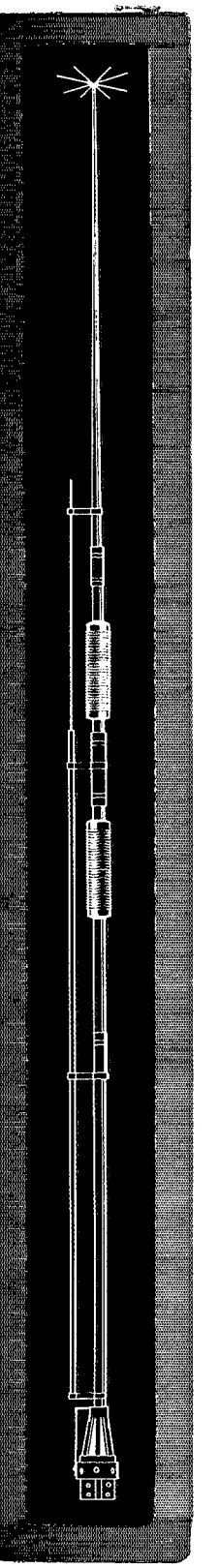

TPK 206, KØONK 198, KØVPH 131, KØVBT 101, WØOUD 89, WØKIK 75, WØZLN 44, WØOMM 42, KØFPC 36, KØRWL 19, WØBUL 16, KØFZT 16, WØBAZ 13, KØVNB 13, WØBVL 12, WØEPI 10, WØEOJ 8, KØIHY 6, KØVSH 6, WØKCG 4, WØGBJ 3, WØOVV 2.

NEBRASKA—SCM, Charles E. McNeel, WØEXP—KØTSU, SEC, returned home from the West Coast and Fair at Seattle. Your SCM has returned from a three-week vacation in New York and thanks KØWFG for taking over the SCM report for last month and the daily schedules from N.Y. to No. Platte. KØDGW, NC Morning Phone Net, reports QNI 666, QTC 96. WØEGQ reports the Novice Slow Speed Net had 21 sessions, QNI 120, QTC 17. KØJXN, NC for the Storm Net, has changed the time to 1830 CST and reports 30 sessions, QNI 432, QTC 2. WØNIK, NC of the Western Nebraska Net, reports QNI 768, QTC 509, of which 461 are WX reports, 100 per cent check-in WØAHB, KØBMQ, WAØBYK, WØDVB, WØGGP, WØRIH, WØWUV, WØHXH, NC of the Nebr. Emergency Phone Net, reports QNI 549, QTC 29. WØFQB is back on the air from Omaha. The No. Platte Hamfest Dinner, sponsored by KØWFG was held Oct. 27 in No. Platte with 46 in attendance. Good food and prizes were enjoyed by all. Traffic: WØGGP 463, KØKJP 76, WØLOD 71, WØOKO 63, KØRRL 60, KØDGW 48, WØEGQ, WØNIK 46, KØSBP 42, WØZJF 39, WØRIH 27, WØWUV 27, WAØAES 25, WØOCU 24, WAØBTK 23, WØAHB 21, KØFBD 17, KØUWK 17, KØMSS 15, WØVEA 11, WNØBAD 10, WNØBRH 10, WØLJO 10, WØCIW 9, WØBOQ 8, WØVZJ 8, KØYZP 7, KØIAL 5, WØFJU/Ø 5, WØRJA 5, WØFYR 5, KØZEO 5, WØHOP 4, WØKFY 4, KØVTD 4, WØHQE 3, WNØBIE 2, WØBKW 2, KØKTZ 2, WØNYU 1.

NEW ENGLAND DIVISION

CONNECTICUT—SCM, Henry B. Sprague, jr., W1CHR—SEC: W1EOR. RM: W1KYQ. PAM: W1YBH. V.H.F. PAM: W1FHP. See Dec. *QST* for traffic skeds. The late CN sessions has been cancelled since IRN's sessions are at 1815 and 1930 local time. K1JAD put up a half-wave wire for 160. K1SDX wants to contact any 1215 Mc. hams in southwestern Conn. and has an APX-6 going on this frequency. K1PKQ enjoyed the CD Party. K1QVX passed the 45 w.p.m. high-speed code test from W1NJM. W1LIQ passed away quietly in his sleep. His enthusiasm and interest in the activities of his fellow hams will be missed. W1s OJR, PHP and K1NNC participated in the Sept. FMT. W1BDI scored 5000-plus points in the CD Party. K1PLR says that he and K1IKE have cooked up the WAN award (Worked All Neighbors). This award goes to anyone who has made "contacts" (!) with all his neighbors and yet is on good terms with them. W1OJR nailed ZDQAM (W4BPD). Vic's DXCC total is now 275/266. W1IKB, another DXer, now has 225/216. W1WX spends more time on 1.6 and 3.5 Mc. with the sunspot cycle declining. The pressure of business has slowed up K1IRI. W1FHP is active again on the nets. K1UQQ received his General Class ticket and is interested in c.w. traffic work. W1CHR got the bugs out of his antenna tuner and is back on the air. The Meriden ARC, W1NRG, reorganized and elected W1FYG, pres.; K1QAH, vice-pres.; W1BTZ, treas.; W1WEE, secy.; W1TZH, sgt. at arms. K1TGX went up to Mass. with a twoer. The Oak Hill School ARC elected K1EIR, pres.; K1STM, vice-pres.; K1EIC, secy.; KN1CWO, treas. W1RAN writes of a pleasant visit with W1TYQ viewing slides of HZ1AB and vicinity while Vic was in the States. W1HGE says the East Hampton and Marlborough AREC gang participated in the SET with a simulated hurricane disaster. K1IVR is working at the local f.m. station. A new station is K1UQQ, Trumbull. K1QVX is a new OPS. Traffic: (Oct.) W1AW 329. K1KYQ 262. K1PQS 259. W1EFW 201. W1RZG 156. W1YBH 114. K1PPS 80. W1KUO 71. K1QVX 57. W1GVJ 56. K1LFW 55. W1BDI 53. W1FHP 51. K1DGK 46. W1LUH 44. K1MBA 37. W1CTI 35. K1SRF 34. W1QV 32. K1PUG 30. K1EIR 25. K1AQE 21. W1CUH 21. K1GGG 20. K1JAD 20. W1OBR 20. W1FXS 16. W1CHR 12. K1OEH 10. K1UQQ 10. K1OJZ 9. (Sept.) K1LFW 20.

EASTERN MASSACHUSETTS—SCM, Frank L. Baker jr., W1ALP—SEC: W1AOG. New appointments: W1FON Boston, K1IMP Milton, K1TSD Pepperell as ECs; W1HIV as OES. We are very sorry to have to report the death of W1MUD. W1EAE presented the ARRL charter to the North Shore Radio Assn. W1MB had an attack and is home for awhile. Appointments endorsed: W1FZJ, W1BB, K1IMP as OOs; W1s BB Winthrop, ISU Holbrook, QXX Arlington, MME Hull, JSM Waltham, MD Hingham, DPO Chatham, DDF Watertown, ZW Westwood, YYZ Randolph, K1s STS Sudbury, OLN Tewksbury as ECs; W1MME as OBS; W1s EAE, WU, K1OJQ as ORSs; W1s EUJ, JSM, K1MVN, K1KCG as OESs; W1EAE as RM for 80 c.w.; K1MEM and W1MME as OPSs; W1AOG as SEC. Reports were re-

(*Continued on page 124*)

measure
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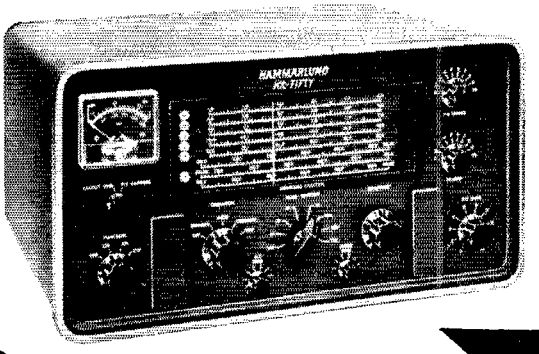
performance...



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Output Power—Two-tone SSB and CW—50 watts at 10 meters to 65 watts at 80 meters for conservatively rated input of 90 watts DC, 130 watts P.E.P. AM is 25% of SSB/CW values.

3 element Pi network variable output circuit (40 to 80 ohms).

5 position switch for internal or external VFO plus three crystal control frequencies suitable for Novice, MARS, C.A.P., etc.

Built-in antenna changeover, VOX and break-in keying.

Amateur Bands Covered—80, 40, 20, 15 and 10 meters. 160 meter band position provided for use with optional kit.

Complete passband coupler design used throughout low-level stages provides minimum 1 MC bandwidth at the following frequency ranges: 3.2 to 4.2 MC; 6.9 to 7.9 MC; 13.8 to 14.8 MC; 20.8 to 21.8 MC; 27.0 to 31.0 MC.

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...and we are sure that you will agree that despite the new price tag we have had to put on the FABULOUS HX-50, it still gives you more dollar-for-dollar value than any other transmitter in the market today! The '50 is crammed full of outstanding features to deliver the performance you have always wanted—but have never been able to get in this price range.

ONLY $449.50 AMATEUR NET

Now Available! 160 Meter Band Kit for only $11.00. Or, if you prefer, this plus feature can be wired right into the unit on special order for an additional charge. NOTE: The Hammarlund HX-50 is the only commercially manufactured SSB Amateur transmitter that presently provides 160 meter band capability.

Don't wait. See the FABULOUS '50 at your authorized Hammarlund Distributor—or send for complete technical data on the transmitter that is still "THE BEST BUY IN ITS CLASS."

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VARIABLE AIR CAPACITORS • SUPERVISORY REMOTE CONTROL SYSTEMS

ceived by W1AOG from the following ECs: W1s STX, AAU, MRQ, K1s ICJ, MBU, OLN, W1s BGW, PLJ, TZ K1s IPA, CCL, WXC, took part in the Sept. FMT. W1BGW got the WPX award. The Wellesley ARS had a "Telestar" movie. The T-9 net at W1BBF's QTH. KN1s VGG, WVI and YAE are new in Westwood. K1VHS is General Class. KN1s YNR, YSG and YXT are new in Marlboro. K1ONW is in our 80 c.w. net. W1PEX made BPL. KN1VXB is active on 2 and has a beam for 15 meters. W1BKI has a new HB-6M d.s.b. rig. W1DIY worked a KH6 on 80-meter c.w. K1CMS and group are back from a trip to Alaska and Mexico. The Neuasket ARC's new officers are K1RBD, pres.; K1TCP vice-pres.; K1LAD, secy.; K1YBT, treas. K1HCC has worked 43 states on 6. K1LAD has 27 states on 80. K1LRK is back at Tabor Academy. K1RBD has 42 states toward WAS. The *HI-MU* bulletin of the Framingham Club has been started up again with W1-DXE as editor. The club's new officers are K1CQO, pres.; K1MCL, vice-pres.; W1ZEN, treas.; K1KCG, rec. secy.; W1FY, corr. secy.; W1ZWJ, act. mgr. A Novice class course has been started. K1IRC is a new OES on 6. K1DYA is on 2 but is having TVI on 6. EM2MN had 23 sessions, 255 stations, 148 traffic. W1OFK moved again. Ex-K1GVR, in California, sends his 73 to the 2-meter gang. W1SIV and his XYL went to the Bahamas. The Yankee Radio Club now has the call W1MF, formerly held by Al Stacey, now a Silent Key. W1GHD is trustee. K1TCO, of P-Town, is on several bands. K7OTD now is living in Malden. W1RHN is going to N.U. nights. W1EPA is home again and will operate under club call K1UEA. W1EUJ is getting married. K1-WTK is building a rig for 6. WA2OKK, ex-1DWO, visited W1DBE, who is on 75-meter s.s.b. W1BB sends out quite a 160-meter *DX-Bulletin*. W5CCZ-1 is at Point Shirley. KN1YQZ is new in Winthrop. W1LES has a net certificate for our 2-meter net. K1YSC, ex-K2VJO, is going to B.U. KP4BEA has worked 200 DXCC in 11 months in KP4-Land. W1GOU worked ZD9AM. K1PNB advises that the Townsend ARS meets the 1st Mon. of each month at the Spaulding Memorial School. W1-TTD, Minuteman ARC pres.; says the club meets each month at the plant, Trans-Sonics, Inc., and conducts code and theory classes. EM75MN held 31 sessions, 291 traffic, 465 stations. The 6-Meter Cross Band Net held 20 sessions, 187 traffic, 481 stations. W1AWA and K1TSD made the BPL. Traffic: (Oct.) W1PEX 693. W1AWA 557. K1TSD 513. W1ZSS 148. W1OFK 139. W1EMG 120. W1LES 100. K1ONW 85. K1DGI 50. W1BKI 38. W1DIY 27. K1PNB 25. W1VYS 25. K1GKA 22. K1OCD 11. K1-LCQ 10. K1CCL 9. K1OJQ 9. KN1VXB 8. K1GTX 4. K1CMS 2. (Sept.) W1EMG 94. K1ONW 17. K1PNB 10. (Aug.) K1PNB 18. (July) K1PNB 4. (June) K1CMS 3.

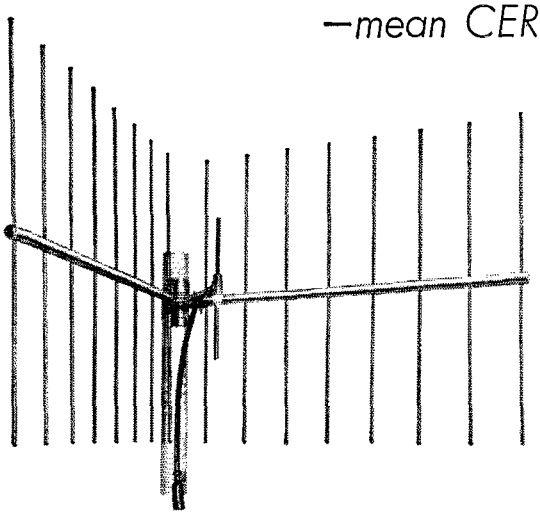
WESTERN MASSACHUSETTS—SCM, Percy O. Noble. W1BVR—SEC: W1BYH/K1APR. RM: K1IJV. PAM: K1RYT. K1PES. K1RYT. K1TLY and K1TTT are reporting into the East. Mass. Phone Net until such time as activity warrants a West. Mass. net. The following stations reported in the West. Mass. C.W. Net (3560 kc. 7 P.M. daily). W1DVW. K1IJV. W1BVR. K1-LBB. K1SSH. W1ZPB. W1MNG. W1BKG. K1PES. W1-YK. W1TQB. W1MND. W1LLN. K1LRS. W1QFJ and W1KQK (listed in order of percentage attendance). K1LRB is now a student at Western New England College in Springfield. K1LNC. EC for Gardner, reports 8 mobiles in operation during the SET. K1SSH has a new Heath Sixer and a TBS-50. From *Random Scatter* we learn that the West. Mass. Phone Net is on 3840 kc. nightly at 7:30. Please get in and give it a push! W1EFN worked two Australians, VK3HG and VK3-AKR, *on 160 meters*. Yes, this year, by cracky! W1DDW has a new Valiant II and an HQ-140. Ex-K1IZV is now K6JSB. If the *Nipmuc Smokesignal* adds many more pages it will almost be in competition with *QST!* It is a very interesting bulletin published by the Nipmuc Emergency Radio Corps, P.O. Box 342, Upton, Mass. With deep regret we report the passing of K1SPD and old-timer W1AVK. Lou had been in extremely poor health for over two years. Our sincere sympathy to the families of both. Traffic: K1IJV 189. W1BVR 84. K1LBB 59. K1LNC 53. K1SSH 48. K1PES 39. W1ZPB 36. W1DVW 27. K1TTT 5. K1TLY 2.

NEW HAMPSHIRE—SCM, Albert E. Haworth, W1-YHI—PAM: K1NXV. RM: K1BCS. GSPN meets Mon. through Fri. at 2400Z and Sun. at 1430Z on 3842 kc. CNEN meets Mon. through Sat. at 1130Z on 3842 kc. NHN (c.w.) meets Mon. through Sat. at 2330Z on 3685 kc. Endorsements: A number of appointees have received notices of expiration. Forward your certificates for endorsement and send monthly reports. With this first report I thank all those who made my election possible. I look forward to a fine association and desire all clubs and members to communicate regularly. News items and participation in League activities are urged. It would be appreciated if all radio clubs in New Hampshire would forward information as to officers, etc. The Nashua Mike and Key Club will hold its 24th annual banquet and installation of officers Jan. 19, 1963.

(Continued on page 126)

C-P COMMUNICATION ANTENNA SYSTEMS

—mean CERTIFIED PERFORMANCE!



Base Station Corner Reflector Advanced Design Antenna

(10X-Unidirectional Gain)

Cat. No. 161-509, Frequency Range 450-470 MC

Cat. No. 161-509 Corner Reflector Antenna is designed for use in the 450-470 Mc band. All reflector screen components are manufactured of high strength aluminum alloys, all mounting components are fabricated of hot-galvanized steel and all radiating components are fabricated of aluminum. The above combine maximum strength, optimum electrical performance and minimum weight for the first time in an antenna of this type.

This lightweight aluminum antenna is ideal for use in multiple corner arrays.

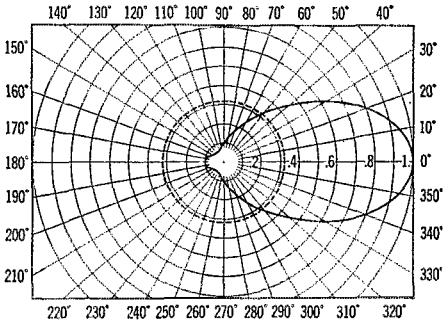
Electrical Specifications:

Nominal input impedance	50 ohms
Forward gain	10 db
Front-to-back ratio	20 db
Maximum power input	250 watts
Internal feedline	RG-8A/U
Flexible terminal extension	18" of RG-8A/U
Termination	Type N male with Neoprene housing
VSWR	1.5:1
Bandwidth	±3%
Lightning protection	Direct ground

Mechanical Specifications:

Reflector (size per side)	2' x 2'
Reflector material	High strength aluminum alloy
Radiating element material	High strength aluminum alloy
Radiating element diameter	⅜"
Rated wind velocity	100 MPH
Lateral thrust at rated wind	16 lbs.
Torsional moment on mounting pipe	16 ft. lbs.
Weight	8 lbs.

Stainless steel hardware supplied to mount antenna on 2" IPS pipe.



Horizontal field strength pattern of Corner Reflector 10X-Gain Antenna Cat. No. 161-509. A dipole pattern is shown for reference.

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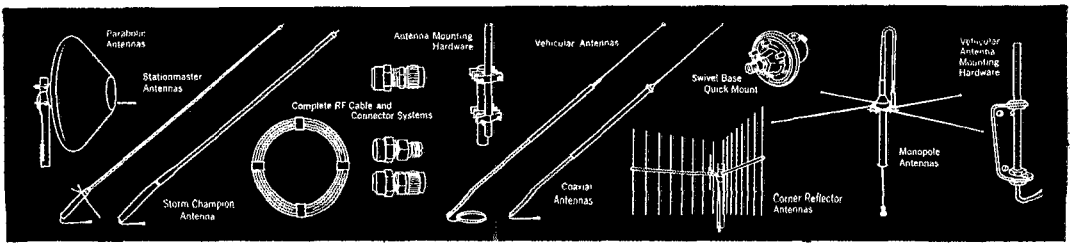

All are welcome to attend. New Hampshire's first Amateur Radio Week was proclaimed by Governor Powell for Nov. 3 through 10. Many clubs held open houses to celebrate same and the WRONE's annual meeting was held at Concord as the opening celebration. Congratulations to K1PCZ, K1JFQ, K1SLS, K1OGU and K1NZK for a fine program and for including the OMs for the first time. Traffic: W1TA 91, K1DQM 16, W1HQ 8.

RHODE ISLAND—SCM, John E. Johnson, K1AAV—SEC: W1YNE, RM: W1SMU, PAM, W1TXL. RISPN report: 32 sessions, 698 QNI, 136 traffic. Appointments: W1YNE as ORS, OPS and OO. Members of the AREC, R.I. Mobileers and the V.H.F. Society supplied communications for the R.I. State Police in search of a downed plane. The aircraft was found the next morning and survivors were taken to the hospital. This was the first emergency in which the newly created AREC group participated and the SEC was pleased with the results. W1MMX and W1TXL have been made Asst. ECs for the Newport Area. The NCRC of Newport held a Memorial Auction for the late W1ETM and the proceeds were given to his mother. The W1DDD Club of Woonsocket held its annual banquet, which was a huge success. W1YNE has received a MARS appointment and is now in operation on 4020 and 4025 kc. K1TPK has completed a new home-brew rig with 125 watts input. K1KDI has increased his power on 6 meters to 50 watts and hopes to be running 100 watts soon. K1NEF has received his Code Proficiency certificate for 25 w.p.m. Traffic: W1TXL 711, K1LYQ 158, K1NEF 128, W1YNE 109, K1TPK 43, K1PZY 38, K1DZX 34.

VERMONT—SCM, Miss Harriet Proctor, W1EIB—SEC: K1DQB. PAM: W1HRG. RM: W1KRV, K1SUO, of Chittenden is a captain on the USC and GSS *Pathfinder*. Lamoille County stations joined in an SET exercise based on comparative local coverage. W1KJG is building 2-meter arrays. K1YID assisted in setting up a meeting for amateurs in Southern Vermont. The CVARC used 2 meters to assist in reporting Barre election returns with a unit in each of six wards. W1WOD has been enjoying his rig during his convalescence. K1DQB has been preparing a location for a new QTH close to his present one. W1EOY is mobile on 10 meters. K1VNE operates a DX-60. K1KYX is a DX operator. W1ZYZ has received endorsement as OBS and W1EXZ as OES. New officers of the Middlebury Mike & Key Club are W1EIB, pres.; K1BCU, vice-pres.; K1BDA, secy.; K1BXV, treas.; K1DQB, act. mgr.; W1TFB, trustee. Traffic: K1YID 16, W1KJG 12, W1EIB 8.

NORTHWESTERN DIVISION

IDAHO—SCM, Mrs. Helen M. Maillet, W7GGV—The FARM Net meets at 0200Z on 3935 kc. M-F. The GEM State Net meets at 0300Z on 3580 kc. daily. Third Emergency Net (Magic Valley Area) meets at 1600Z on 3910 kc. Sun. FARM Net's new manager is W7FBL, NCS is W7MJZ. Gem State Net's new manager is W7EMT. *Hambone News* publication has terminated for lack of support. We thank Editor K7HLR for his efforts. In spite of notifying ECs individually of the SET, only a few reports were received. The Eagle Rock Club assisted the Bonneville Sheriff with "Goblin Patrol" with K7s NUP, KBY, QIE, CRS, and W7s DMP, DHD, and W7GRU arranging operation. The new president of the Driggs High School Club is K7UBU. W7KXJ has an RTTY receiver and is building a transmitter. FARM Net traffic: 86. Gem State Net traffic: 60. K7GTK/6 has USA-CA No. 126. Traffic: W7FBL 77, K7KBY 65, K7KXJ 53, W7LQU 22, W7GGV 19, K7HLR 15, K7OAB 13.

MONTANA—SCM, Walter R. Marten, W7KUH—SEC: W7UPR. PAM: W7YHS. RM: K7AEZ. Montana nets meet as follows: MPH, M-W-F, 3910 kc. 1800M; MSN, T-T-S, 3550 kc. 1830M; TSN, Mon. through Fri., 7230 kc. 1200M; Flathead Valley 6 Meter Net, T-F, 50.135 kc.; Harlowton Emergency Net, 1st and 3rd Sun., 3885 kc.; Missoula Area Emergency Net, each Sun. 3890 kc. 0900M. Missoula and Kalispell Areas AREC held simulated emergency tests on 6- and 75 meters. W7EWR has a new antenna pole in the back yard and is working on one for the front yard. K7MEG installed 250 feet of coax to the antenna on top of the hill. W7PRH/M, working at Yellowtail dam, is heard on mobile. KNTZE/7 moved to Great Falls from Billings and is attending blind school. K7KLE moved back to Story, Wyo., from Miles City. W7FGZ and K7PKW have new s.s.b. mobile rigs in Great Falls. K7JWC, K7PKW and K7MEG are on big game hunting trips. W7ODK made his first QSO on 6 meters. W7AYH is operating on 160 meters with a 50-watt rig. W7AHR has moved back to Rainbow Dam. W7HTB and K7JXL are on 20 meters with kw. rigs. K7DGQ is active on 2 meters. K7PKV has a triband beam on a 60-ft. tower. K7OGF/M passed through Great Falls. W7KUH left for a two-week trip to Washington, D. C., and a visit to ARRL at West

(Continued on page 128)

George Lucas, W1ZYS, "Pops" Karentz, W1YLB, and Ray Churchill, W1VBI, enjoy an infrequent eyeball QSO at "Pops'" Millis, Mass., QTH.

FIELD ENGINEERING WITH A FUTURE

Assignment: Advanced Radar, Worldwide

It is unusual for the three people pictured above to get together in the same ham shack — more often all three are on far-ranging domestic or foreign assignments supervising Advanced Capability Radar installations for our armed forces.

George Lucas, W1ZYS, is currently Raytheon's resident field engineer at Boeing, Wichita, Kansas. He has advised and instructed on new ACR alignment techniques at many major Air Force bases in the U. S.

Ray Churchill, W1VBI, specializes in high speed bombing radar aboard B-52's. He may be at Loring AFB, Maine one day, Edwards AFB, California the next.

Pops is the Field Project Supervisor of Air Force Programs for Raytheon's Electronic Services Operation. Pops served in a wide range of field engineering assignments prior to his promotion to Project Supervisor and is currently responsible for field programs requiring the services of a large group of field engineers. George Lucas and Ray Churchill are members of Pops' highly capable and fast moving field team.

It is possible you too can qualify for a Raytheon field engineering future.

Requirements include an E.E. or its equivalent in practical experience in guided missiles, fire control, radar, sonar or communications equipment.

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RAYTHEON

Hartford. Traffic: K7GHK 53, K7DCI 28, K7MEG 14, K7DCH 9, W7CCH 4, K7INJ 2.

OREGON—SCM, Everett H. France, W7AJNJ—SEC: W7WKP, RM: W7MTW. Certificate endorsements: W7ZB and K7CNZ as ORS, K7CJB as OBS, W7ADX and W7TMF as EC, K7DVK as OES, W7UQI as OES and OPS. Net reports: OSN, 3585 kc. 0230 GMT Tue.-Sat., sessions 21, total attendance 190, traffic 73. BRAT awards to W7AJN, W7BNS, W7ZFH, K7DDY and K7IWD. OAREC, 3585 kc. 0330 GMT Wed.-Thurs., sessions 8, total attendance 32, traffic 7. AREC V.H.F.: 50.550 Mc. 0400 GMT Fri., sessions 4, total attendance 82. W7RVN, Multonomah County EC, sent in an excellent report of activities of the AREC and other hams participating in the emergency during the big wind storm. K7DVK says all his antennas came through the storm intact and he is adding a tri-band beam. K7IWD claims BPL could have been made but he had power failure during the storm. K7ADI reports that she operated her station from Sat. morning to Tue. as the only operator and handled 49 messages during the storm emergency. Traffic: K7IWD 210, W7ZFH 115, K7KBK 104, W7DEM 93, W7RVN 63, K7CNZ 53, W7AJN 14, W7BVH 13, W7MAO 13, W7BNS 11.

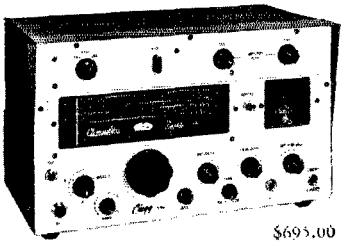
WASHINGTON—SCM, Robert B. Thurston, W7-PGY—Washington section nets are as follows: CBN, 3960 kc. at 0230Z; WARTS at 1800 PST on 3970 kc.; WSN at 1900 PST on 3535 kc.; ESN at 1700 PST on 3920 kc.; NSN at 2100 PST on 3700 kc. K7GCK is attending Foothill College near San Jose, Calif. and works some on 6 meters. At the Spokane Radio Amateurs Annual Banquet held Oct. 27 at the Longhorn the following were elected: K7BVM, pres.; K7EUA, vice-pres.; K7MFS, secy.; K7PJJ, treas.; W7NCJ, W7CEV, W7-UOJ, K7AGI and K7QVB board of trustees. The new EC for the Spokane County AREC is W7CEV. A new amateur radio club has been formed in Pacific County called the Willapa Amateur Radio Society (WARS). The new EC for the county is W7BJW. K7ASX is experimenting in the 3500-Mc. band. W7PGY turned in a top NCS performance on RN7 during October. W7AIB is a new NCS on RN7. A report from NSN shows 27 sessions, 282 QNIs and 36 QTCs with 52 members in the net. Lots of antennas went down in the big windstorm on the west side of the Cascades, with winds in excess of 100 miles in parts of the state. W7BA has completed eleven (11) years of traffic-handling without a break in the BPL column. W7GVV now is using a Ranger 2 and RME-6900. New amateurs in the Walla Walla Area are KN7UNU, K6PUN, WV6UMG. W7NSU is working on teletype gear. The Northwest YL Net meets on 3830 kc. at 0900 PST Fri. All YLs and XYLs are invited to attend. K7PBA is building a new automatic bug. W7GEO is reported moving to the Seattle Area. W7RWG joined the ranks of Silent Keys. K7AZG and K7EVE are attending college at W.S.C. W7EBU has a new SX-101A. Amateurs in the Clark County AREC under the direction of W7SAP operated thirty hours on emergency power and handled the communications for the area on five channels and three bands. The new EC of Grays Harbor, K7KJB, expresses his thanks for the cooperation received from Grays Harbor amateurs during the emergency. The Mt. Baker Radio Club of Whatcom County received high praise for outstanding and noteworthy acts following the typhoon. K7PVF and K7PVG have a new Swan rig. W7FYO is on RTTY and K7HSA and K7-DED are planning RTTY soon. K7KSF mobiled to Idaho. W7WJR, K7PVO and K7PWM are doing a good job with Richland code classes. So many outstanding deeds were accomplished by amateurs during the recent storm that space does not permit listing. The SCM and SEC congratulate all who participated. We say "well done." Traffic: W7BA 909, K7JHA 633, W7DZX 612, W7-GIP 265, W7APS 199, W7OEB 166, W7PGY 152, W7AMC 94, W7AIB 43, W7GYF 23, K7HEF 23, W7BTB 11, W7-EMX 10, W7KZ 8, K7JRE 5, W7JEY 1, K7PIY 1.

PACIFIC DIVISION

NEVADA—SCM, Leonard M. Norman, W7PBV—SEC: W7JU. Many thanks for the congratulation on my being elected as your new SCM. Your support and good wishes are appreciated. There are several ARRL appointments available. Are you willing to take one? K7-RKH is the new EC for Las Vegas. K7ICW is active on 6 and 2 meters. W7PRM, with the cooperation of the Boulder City and Las Vegas 2-meter gang, is testing with back to back yagi antennas on radar hill for positive 2-meter communications. K7TDQ and K7RKH each have a new 50-ft. antenna tower. K7JPC worked an Aeromobile over Utah while he was mobile in Las Vegas with a Twoer. The Las Vegas ARC members operated the Special Events station, W7AL, for the American Legion Convention. K7KNB made BPL for the third time. W7HJ was ill and couldn't make the SET, the first he has missed conducting in five years. W7PBV is operating s.s.b. on 75. K7RWN has a new HT-41. K7MER is /6 at

(*Continued on page 130*)

Here's Clegg's top performance line for VHF in '63...SSB...AM...and CW!



$695.00

ZEUS VHF TRANSMITTER FOR 6 AND 2 METERS

A highly efficient, AM, high power VHF transmitter for full coverage of the amateur 6 and 2 meter bands and associated Mars frequencies. Maximum TVI suppression.

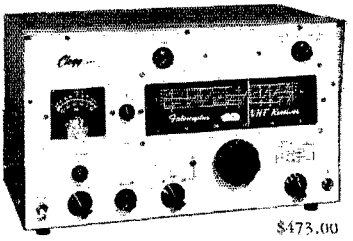
Automatic modulation control with up to 18 db of speech clipping provides magnificent audio with "talk power" greater than many kilowatt rigs.

This beautiful unit with its ultra-stable VFO is the ultimate in VHF equipment for amateur and Mars operation.

INTERCEPTOR VHF RECEIVER FOR 6 AND 2

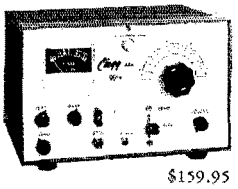
Designed for the serious operator on these bands, the INTERCEPTOR, with cabinet and panel exactly matching the famous ZEUS transmitter, offers performance features unmatched by presently available equipment for these frequencies.

For example, here is a receiver with virtually no cross modulation. Nuvistor RF stages give an extremely low noise figure and sensitivity better than .25 microvolts. Stability is ideal for exacting requirements of SSB and CW.



$473.00

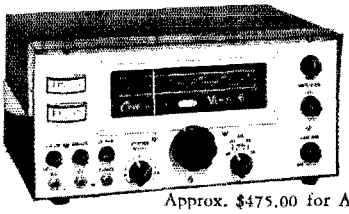
99'er TRANSCEIVER FOR 6 METERS



$159.95

This famous little transmitter-receiver is ideal for both fixed station and mobile operation. Small in size, low in cost, and tops in performance, the 99'er offers operating features unequalled in far more costly equipments. The double conversion superhet receiver provides extreme selectivity, sensitivity and freedom from images and cross modulation. The transmitter section employs an ultra-stable crystal oscillator which may also be controlled by external VFO. An efficient, fully modulated 8 watt final works into a flexible Pi network tank circuit. A large S meter also serves for transmitter tune-up procedure.

VENUS 6 METER TRANSCEIVER

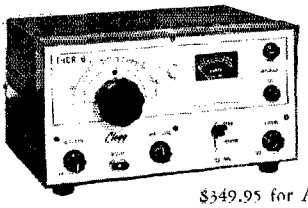


Approx. $475.00 for AC operation

Here's what you can expect: A superbly engineered crystal lattice filter, SSB transmitter of greater than 85 watts PEP input; amazing frequency stability, VFO controlled by the receivers tuneable oscillator; full power input on CW and a substantial signal on AM phone. There is also output provision to drive a KW linear final.

In the receiver section a double conversion, low noise super-het of extreme sensitivity and selectivity, with crystal lattice filter and product detector provides flawless reception of sideband, AM phone or CW. A 115V AC power supply of adequate capacity is a separately mounted unit which can be installed at any convenient distance from the transmitter.

THOR VI TRANSCEIVER FOR 6 METERS



$349.95 for AC operation

Talk about performance . . . listen to this. 60 **solid watts** on both AM and CW; high level modulation with full speech clipping to give you famous CLEGG "Talk Power"; true transceiver operation with tuneable oscillator in the receiver serving as the VFO in the transmitter; provision for keying the transmitter.

A low noise double conversion super-heterodyne receiver complete with BFO and ANL provides maximum selectivity and sensitivity with stability equal to the exacting requirements of SSB and CW; separate power supply/modulator for 115V AC operation. A fully transistorized power supply/modulator for 12V DC available.

Write for complete information

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DIVISION OF TRANSISTOR DEVICES, INC., OF CEDAR GROVE, N. J. OAkwood 7-6800

Cal-Poly. W7HJ and K7TKS have new 2-meter mobile antennas. Traffic: K7KBN 1070, K7RLX 60, W7MRN 41, W7PBV 12, K7RKH 5.

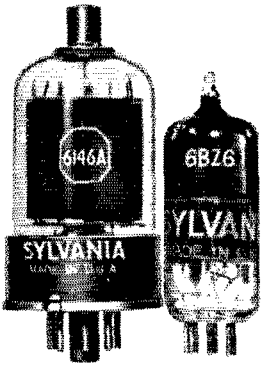
SANTA CLARA VALLEY—SCM, Jean A. Gmelin, W6ZRJ—Asst. SCM: Edward T. Turner, W6NVO. SEC: WA6EIC. RM: K7KCB. PAM: WA6EIC. From the entire section, may I express our thanks for a job well done to K6DYX for four years of outstanding service as our SCM. Major activity in the section for October was the SET, then one week later an actual emergency —flooding from a major storm. WA6EIC reports RACES groups active were San Jose, Santa Clara, Palo Alto, Santa Clara County and Sunnyvale. New ECs are K6-BDK, K6ODP and K6TCC. BPL was made by W6RSY, W6CER, WA6EIC, K6GZ and W6YPM. New officers of the SCARS are K6JJU, pres.; K6OEJ, vice-pres.; WA6-DXW, secy.; WA6GIM, treas. Over 350 attended the Greater Bay Area Hamfest in San Mateo to hear talks by W6LDD, K6TWF, W6AQR and W6HC. A new OES is WA6VBY. K6DYX is now on RTTY. W6ASH made Class I OO in the Sept. FMT, and those keeping Class I are W6CBX, W6ISQ, K6MZN, W6UJA, with WA6UAM in his first test. K6YKG has an inverted "V" and no TVI. W6AUC reported the Sketo Net now l.s.b. only. WA6TNY reports SCVSN traffic total as 57 in 17 sessions. K6MTX reports that he and W6NRM helped set up the RTTY station at the Greater Bay Area Hamfest. W6MMG holds a weekly sked with New Hampshire. K6-TWF is now on TV on 432 Mc. and demonstrated at several club meetings. Menlo Park RACES was on stand-by during the Cuban crisis, according to a report by W6DEF, and WA6LRD reports that San Jose CD still is on stand-by three times per day. Traffic: W6RSY 782, W6YPM 298, W6CER 250, WA6EIC 238, K6GZ 228, W6UW 110, W6YBV 80, W6DEF 71, W6AIT 62, K6DYX 56, W6YHM 51, W6ASH 46, K6YKG 42, W6OII 38, K6-BBF 36, W6AUC 33, K6GID 21, W6RFF 17, W6ZRJ 14, K6VQK 13, WA6UAM 3, K6MTX 2.

EAST BAY—SCM, B. W. Southwell, W6OJW—WA6-MIE made BPL. Congrats. WA6MXI is QRL rebuilding. WA6MAR is the dad of WA6MJP. WA6MJP a new OBS, is hot on the trail of his DXCC. The gang in San Pablo and Walnut Creek took part in the KO-Polio Drive. FB. WA6VAT hooked Idaho for his WAS. W7QOH 6 has been taking advantage of 28-Mc. openings. Pacific Division RTTY Bulletins are on 3610 kc. via W6RNM. W6ZF finished his shack console and is installing the rig. K6GK's two-year hitch to Malaya for the Peace Corps was cancelled. W6NBX still is plugging on NCN. WA6VAT has an FL-8 filter and says it's FB. The president of the Optimist Club sent thanks to the East Bay gang who handled traffic for the club recently. Walnut Creek AREC and RACES were activated during the flood of Oct. 13 and did an FB job. The SACEN 6-meter gang also helped out in the flood and liaisoned with ORC station W6OT. The ORC reports two more WACC applications are being processed. LARK members helped with the UNICEF Carnival. A6GSR is on RTTY. AD5GHC, AA6URG and A6GSR are check-ins on the AD6GHC/A Net. Tom Lott, of Oscar Assn., was guest speaker at the HARC Club October meeting. K6YBS is building a power supply for his Morrow Twins. K6CFY has a new Swan rig. WV6ZXU lost his vertical during the storm. W6ICR also lost most of his skywires during the storm. WA6QEJ is on s.s.b. W6NLZ is on 144-Mc. s.s.b. WV6-ZXK is attending a special missile school in El Paso. Traffic: WA6MIE 129, K6GK 105, W7QOH/6 20, W6NBX 14, W6ZF 3.

SAN FRANCISCO—SCM, Wilbur Rachman, W6-BIP—Congratulations to K6IPM, Alan, and WA6LYA, Jan, on their October wedding. Uncle Sam activated Alan into the Air Force the week following the big day. New officers of the San Francisco Radio Club took over at a recent meeting. W6JXK has many plans for getting the regular members of the club to act as guest speakers at future meetings and tell of their personal experiences at "hamming" and of their other hobbies. He thinks the personal touch with regulars speaking might draw a bigger crowd. The HAMS took an active part in the Simulated Emergency Test Oct. 6-7th. The boys monitored emergency channels, 7250 kc. in the early hours of the 6th, 3875 kc. in the late afternoon and onward, and checked into the 75-meter net also. WA6WSN, Asst. EC, was active on 6 and 2 meters. The Tamalpais Amateur Radio Club's guest speaker was Bruce "Doc" Merrill, who spoke on his adventures while aboard the SS *Monterey*. The Far West Radio Club and Humboldt Radio Club held a joint meeting. W6HC, Harry Engwicht, W6-BIP Bachman and W6KZF Bill Ray report a fine plane trip. They were met at the airport, given a royal welcome at the meeting and report a fine tour by the club members, met some swell fellows in both clubs and hope to make a return visit in the not-to-distant future. W6-KZF, our SEC, says: "Holiday greetings from your SEC. Few reports from the October storms have come in. How about you ECs keeping your SEC informed so he'll know what frequencies to monitor in future disasters?" The BAYLARC had a very enjoyable party on

(Continued on page 132)

Not a cliff-hanger in a carload...



Detergent ads always remind us of our own efforts to produce tubes that are "whiter than white and clean clear through." We exercise this care because the things uncontrolled impurities can do to an otherwise fine tube are just plain murder.

Take cathodes, for instance. The structure is nickel with a few additives. In fabricating the nickel, impurities are introduced from such oddball places as the heating crucible, the forging hammer and the hot-rolling equipment. The contaminants cause cathode-to-heater and grid-to-cathode leakage, excessive grid emission and a lack of uniformity in established characteristics. All of which is no fun in a final, a high-frequency oscillator or a TR tube.

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The answer is powder metallurgy. This is the comparatively new art of taking pure metal powder---in this case nickel---and cold-rolling it at such extreme pressures that the particles virtually fuse together. Through this process, we obtain a dense nickel strip with a mechanical strength some 25% greater than ordinary nickel strip---and free of unwanted impurities!

What does all this do for you? It offers you tubes that have virtually no end-point failures due to insulation breakdown... tubes that continue to operate over longer periods with no development of leakage paths, and no change in accepted values of grid emission. All nice things to have working for you in the middle of a contest.

We call this the "LIFE-BOOST* Cathode," and we're putting it into more and more Sylvania types as fast as we can. Notable examples are the Sylvania 6146A and 6BZ6. If you'd like a list of the power and receiving types available now, just drop a line to the Electronic Tubes Division, Sylvania Electric Products Inc., 1100 Main Street, Buffalo 9, New York.

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73 Bob Lynch K2RMN

SYLVANIA

SUBSIDIARY OF GENERAL TELEPHONE & ELECTRONICS

Oct. 27. K6RCR drove down from Santa Rosa. W6CTH was lucky winner of the "C.W. Spotting Contest." Thanks to W6FDU and W6GQA for their ARRL FMT reports. OES WA6NDZ now has a Heathkit Seneca on the air on 6 meters. He is having problems neutralizing the Seneca on 2 meters but still is working on it. W6URA transmits code practice on 51.15 and 146.64 Mc. at 2101 local time every Wed. and Sat. He starts at 4 w.p.m. and increases to 17 w.p.m. and would appreciate QSL cards in acknowledgment of transmissions. WA6UHN is starting an MCW net on 6 meters at 51.150 Mc. on Sun. at 7:30 P.M. W6GGC and W6JWF attended the AF MARS Dinner at Fresno. Traffic: K6FCT 455, WA6MDL 41, W6BIP 2, WA6NDZ 1.

SACRAMENTO VALLEY—SCM, George R. Hudson, W6BTY—Asst. SCM/SEC: Antone F. Buzdas, K6IKV. Current appointments are as follows: ECs—WA6OXK, W6LSW, WA6JTO, OBSs—W6WLI, W6AF, K6HHD, K6EIL, WA6CJU, OESs—W6GGW, W6PIV, OPSs—W6MIW, K6EIL, WA6OXK WA6PYT, W6WGO, OOs: W6WLI, WA6QWW, K6ER, K6HEZ, W6ZJW, K6EIL, WA6NAU, W6TFH, W6GDO, OASs: W6CEI, K6YZU. *Radio Amateur Mobile Society*: Looks like WA6JTO is one of the busiest hams in town, what with being prexy of RAMS, editor of *RAMS News*, and new EC for Sacramento County. *Golden Empire ARC*: This live-wire club up Chico way held a steak-bake recently with over 40 members attending and had WA6OHP and W6PML as guests. W6TSR has returned from a fine mobile trip to Canada and W6CKV and his XYL, W6YKU, have come back from mobiling to Grand Canyon Park. *McClellan MARS*: Operation "high heels" was activated recently with 36 members turning out to man the MARS station 'round the clock! Recent programs at MARS featured AF6EI and AF6AAQ as speakers. *Northhills ARC*: Exprexy WA6LWP has returned from a training session at Beale AFB and K6EJX has moved to Sacramento. We hear that K6TWE is trying to break into the auto mechanics trade! WA6TZP was a recent speaker at Northhills. *Sacramento ARC*: Prexy W6WGO has just returned from a trip to KH6-Land. WN6BWB is a new Novice member of the club. The editor of *Mike and Key*, W6MIW, has just been appointed an OPS. The Annual Club Christmas Party at Burich's Grill in Sacramento was a bang-up affair with 45 in attendance. *Sierra Foothills ARC*: K6BIJ highlighted a recent program according to a note from club secretary, K6ZWZ. Traffic: W6UUN 28, W6WGO 25, K6HEZ 22.

SAN JOAQUIN VALLEY—SCM, Ralph Saroyan, W6JPU—The annual Marsfest was held in Fresno at the Town and Country Lodge Oct. 27. Among those present were K6PPI, W6BJI, W6FKL, W6ARC, K6OGX, W6QOS, W6TZJ, W6DUD, K6PBN and WA6DRH. WA6YPF has a DX-100 transmitter. WA6DRH has an HRO-50 receiver. WA6URV is handling traffic for the boys overseas. WA6ZVY modified his Heath 6er. K6OER is handling phone traffic. The Tulare County Radio Club held an auction and picnic at Mooney Grove Park Oct. 8. K6OLN is attending the University of Redlands. WA6BTK is in the Army. K6CPQ lost his 120-ft. tower in the October windstorm. WA6GWL is building a linear amplifier for his DX-100. W6CUA has a Swan 175. K6RPL went on a vacation to Oregon and Washington. WA6FFJ is on 75-meter phone with some hum in his speech. The San Joaquin Valley Net for the month of October had 921 check-ins, traffic 59, contacts 72, QST 5, bulletins 12. The Turlock and Modesto Amateur Radio Club gave a demonstration of radio communications for c.d. officials Oct. 18. Those participating were W6ERE, W6YIN, K6SNA, K6DYM, K6RPL, K6IXA, K6ODA, WA6OWE, and WA6GJA. They hope to set up a weekly 2-meter net for c.d. purposes. The Modesto Amateur Radio Club held its first meeting Oct. 10. WA6GJA presided as president. Traffic: (Oct.) W6ADB 104, W6EFB 30, W6ARE 14, K6AXV 2. (Sept.) W6ARE 28.

ROANOKE DIVISION

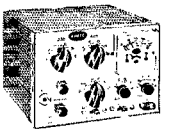
NORTH CAROLINA—SCM, N. J. Boruch, W4CH—SEC: W4MFK, RM: K4CPX, V.H.F. PAM: W4ACY. Your SCM is very pleased to announce the appointment of W4MFK as SEC, and invites all to lend Jim your full support in his new and vital role. W4FUI also accepted EC appointment for the Asheville Area. SET reports were received from W4AJT, W4COJ, WA4FMJ and W4MFK. The husband-wife team of W4EJP-W4EJQ are proud possessors of A-1 Operator certificates. Congrats, Gerry and Deane. From W4BUZ comes the story of two runaway girls and how, through ham radio, contacts of W4BUZ and W5CAC aided in their apprehension. K4MHS reports poor conditions on 144 Mc. but holds local contacts with K4YYJ on 432 Mc. WA4JCS is having difficulty receiving 50-Mc. signals up Oxford way. W4HJZ is attending night school, and W4OAB has a new HB DSC rig on 6 meters using a pair of 2E26s with good results. Thirteen listings were made by OO W4FUI, while WA4FMJ snagged 42! A Carolina Radio Monitor

(*Continued on page 134*)

AMECO LEADER in COMPACT, QUALITY HAM GEAR

COMPACT 6 THRU 80 XMTR.

Will handle 90 watts phone and CW on 6 thru 80 meters. Final 6146 operates straight-through on all bands. Size is only 5" x 7" x 7" —ideal for mobile or fixed use. Can take crystal or VFO.



Model TX-86

Model TX-86K—Kit 89.95
Model TX-86W—Wired 119.95
Model PS-3 power supply, wired 44.95
Model W612A mobile supply, wired 54.95

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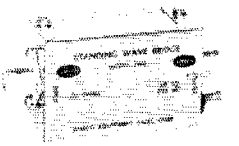
for 27, 28, 50, 144 or 220 MC. Lower noise figure Over 20 db gain.

Model PV— Uses 6CW4 Nuvistor. Improves gain and noise figure of present converter or receiver. Specify frequency.

Model PV Wired & tested **$13.95**

Model PH—Uses 6CB6 tube—for any frequency or ham band, 2 to 27 MC. Wired & tested **$13.95**

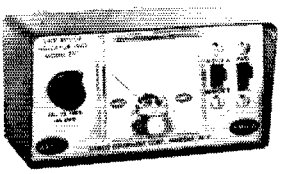
NEW SWR BRIDGE & INDICATOR



STANDING WAVE BRIDGE MODEL SWB

Model SWB accurately reads SWR from 1.8 to 225 Mc. and handles up to 1000 watts. It uses the superior type of inductive coupling and can be left in the line without insertion loss. Size 1⅝ x 2¼ x 4½.

Model SWB—wired and tested.....$9.95



BRIDGE INDICATOR UNIT MODEL BIU

Model BIU, when used with the AMECO SWB or other make of bridge will read SWR, % power and % voltage (three scales). It contains a 100 microamp D'Arsonval meter. A feature found only in this indicator is a switching circuit for reading either one of two bridges. Model BIU can be calibrated to read power up to 1 Kw.

Model BIU—wired and tested $15.95

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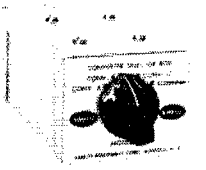

Makes it possible to switch up to three converters or the low frequency antenna to the receiver. A single switch automatically switches rf and power. May be used with AMECO converters and power supply or any other makes.

Model CSB—kit form only.....$9.95

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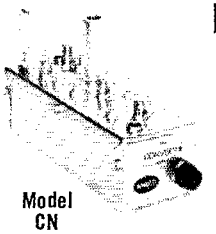

Model CN

$49.95 wired $34.95 kit

Two Nuvistor RF stages, a Nuvistor mixer and a 6J6 osc. give lowest noise figures and high gain. Ameco convertors do NOT become obsolete as their IF output is easily changed to match any receiver. All CN models (CN-50 for 6 meters, CN-144 for 2 meters and CN-220 for 1¼ meters) are available in ANY IF output. (Specify IF output in order.) Specs. Noise figure 2.5 db at 50 MC; 3.0 db at 144 MC; 4.0 db at 220 MC. Gain 45 db average, image and spurious rejection—better than—70 db. IF rejection—better than 100 db. Power required—100 to 150 V at 30 ma, 6.3 V at .84 A. See PS-1 Power supply.

CB-6

Tube-type low noise, high gain converters. IF easily changed. Specify IF.

CB-6K — 6 meter kit, 6ES8-rf Amp., 6U8-mix./osc. ..only $19.95

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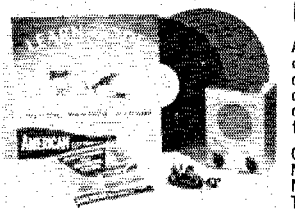

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League is now in existence, and for more information contact WA4EYA. Sincere thanks go to the Rock Hill, S.C., Radio Club for making the large group from North Carolina so very welcome at its gala hamfest. Traffic: K4CPX 151, W4EJP 127, WA4FJM 110, W4PCN 78, WA4ANH 66, W4EJQ 48, W4BDU 41, K4YCL 37, W4COJ 27, K4TPK 22, W4BAW 20, WA4DNK 15, K4QFV 13, WA4EYA 5.

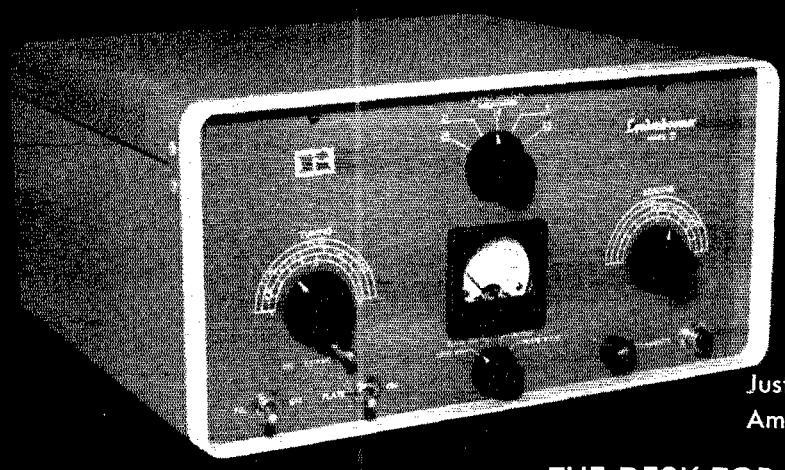
SOUTH CAROLINA—SCM, Lee F. Worthington, K4HDX—SEC: W4BCZ S.S.B. PAM: K4JOQ. A.M. PAM: K4KCO. RM: W4PED. Nets: C.W., 1900 and 2200 EST 3795 kc. S.S.B., 1900 EST 3915 kc.; A.M., 1900 EST 3930 kc. AREC S.S.B., 1900 EST 3985 kc. Wed. The ARRL Section meeting at Rock Hill on Oct. 13 was very successful with a large attendance, including the SCMs from North Carolina and Virginia and the Roanoke Division Director. Accomplishments were many, including formation of an S.S.B. PAM post, new SCN manager K4LND and formation of a state-wide newspaper under the guidance of State Radio Council. State-wide SET participation and traffic was larger than the past two reporting years combined. W4CE reports 35 counties have RACES plans approved and 838 operators enrolled. The phone nets are handling and reporting more formal traffic, which is a sign of real accomplishment by the net members and their leaders. Net traffic: c.w. 91, s.s.b. 91, a.m. 24. Traffic: K4OCU 77, K4VWL 74, W4BCZ 72, K4LND 59, W4PED 50, K4WOI 47, K4GVE 30, W4NTO 28, WA4CSO 15, W4BHR 11, K4KCO 9.

VIRGINIA—SCM, Robert L. Follmar, W4QDY—Asst. SCM: H. J. Hopkins, W4SHJ. SEC: W4VMA. RMs: W4LK, K4ITV, W4IA, W4SHJ, W4QDY. PAM: W4UFX. Interest is being showed in the new Navy MARS program. K4PXY has applied. W4PFC keeps a very busy sked with about 14 outlets. W4RHA hopes to make BPL often. K4PYV operator at W4NTR, reports on operating gap of 2 weeks. K4YDL is working traffic and DX side by side as it should be. W4PTR added 10 more feet to the tower. W4DLA blew his power supply again. The LARC is holding a fall training program for amateur aspirants with 75 in attendance. New appointments: K4YDL, W4WRG, WA4DUW, W4DVT and K4MWP. K4SGQ says he's lazy. The Va. Century Club will hold its annual meeting and banquet in Norfolk during January and it is expected that Division Director Anderson will attend. K4QIX got his HT-37 back on the air after repairs. The Va. QSO Party was a big success. A windstorm took down WA4DUW's antenna. W4TE says the SET is getting better each year. W4OOL reports a new 2-meter net going in Winchester. KH6EVG, the SCM of Hawaii, is resigning that post because of an extended absence while attending V.P.I. K4AET is holding skeds with his son at Ft. Monmouth, N.J. National Red Cross traffic for the SET was handled through W4PAY as net control with AREC members as operators, according to EC W4OP. W4ZM was gaddin about Europe during October and had eyeball QSOs with a number of hams while there. K4TZF put a push-to-talk switch on his mike and is working traffic and DX. W4WRG is working on a new t.r. switch. W4BGP has inverted "vees" for all bands 40 feet up in the center. W4KFC reports K4OKZ now is in electronics training with the Navy at T.I. K4PIK has a linear on now. W4WBC finished his Marauder and K4YZT remodeled his station. Traffic: (Oct.) W4PFC/4 826, W4DLA 323, W4NTR 270, K4PXY 267, W4RHA 236, W4DVT 228, W4WDZ 187, W4FOR 156, W4LK 151, K4FSS 136, W4QDY 115, WA4JFY 110, K4ITV 93, W4SHJ 90, K4YDL 80, W4IA 49, W4PTR 48, K4MXF 45, K4PQL 37, W4OOL 35, W4WRG 28, W4BGP 23, K4WMP 22, W4JUJ 20, W4LRN 20, K4JYL 19, W4TE 18, K4AL 16, K4JKK 12, K4YZT 12, K4PIK 10, K4TZF 10, W4ZM 8, W4BZE 7, K4DCN 7, K4JQO 7, K4AET 6, K4LTK 6, K4ORQ 6, W4OWV 6, W4WBC 6, WA4DUW 5, K8KFK/4 4, K4SGQ 4, K4BAY 3, W4KFC 3, W4MYA 3, K4QIX 1. (Sept.) W4MYA 19, (July) K4MXF 45.

WEST VIRGINIA—SCM, Donald B. Morris, W8JM—SEC: W8SSA. RM: K8HID. PAM: K8CFT. WVN Phone Net meets at 2330 on 3890; c.w. Net at 0000 on 3570 kc. Officers of the Tri-State ARC of Huntington are K8KDL, pres.; W8BDD, vice-pres.; K8OEN, secy.; and K8IYU, treas. W4BLR is now W8DUV and her OM is W8DUW. WVN (c.w.): 17 sessions, 67 stations, 33 messages. WVN (phone): 17 sessions, 492 station, 48 messages. K8BIT reports that W8CLX, W8VMP and K8BIT worked 5 continents in the October RRY Contest. New officers of the MARA at Fairmont are K8UQY, pres.; W8PZT, vice-pres.; WA8CKO, secy.; WA8CUM, treas.; W8IXG, act. mgr. W8HZA reports greatly increased activity in c.d. and RACES work, with regular drills in progress. The Blennerhassett ARC elected Dorothy Leon, K8ZDP, as its delegate to the State Radio Council. K8HID, chairman of the Centennial Committee, reports W. Va. Centennial Contest, top West Va. station receiving plaque and out-of-state winner, week at State Park and appearance at the West Va. State Convention to be held at Jackson Mill on July 6 and 7, 1963. Traffic: K8HID 50, W8DUV 45, K8ZWM 22, K8UQY 18, K8CFT 17, W8HZA 13, K8ELH 12, W8JM 5.

(*Continued on page 136*)

MONEY SAVING! SPACE SAVING! QSO SAVING!



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1. Zero-bias Eimac 3-400Z requires no screen and grid power supplies. 400 watts of plate dissipation.
2. Full legal input power on CW and SSB, 600 watts AM —80 through 10 meters.
3. 45 watts of drive for full input.
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6. 50 ohms input through wide band Ferramic transformer.
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8. Requires just one power supply—2500 to 3000 VDC at 350 MA.*
9. Circuitry supplied for controlling power supply from MARK II panel.
10. 50 C. F. M. blower and self-contained filament transformer requires 115 VAC, 60 cycles. Both front-panel fused.

*NOW AVAILABLE: Matching Power Supply for the MARK II Linear Amplifier. Supplies 3000 VDC at 350 MA Continuous. Transformer Primary for both 115 VAC and 230 VAC. Size, 12" x 14" x 8½". Weight 75 lbs. AMATEUR NET, $159.59.

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ROCKY MOUNTAIN DIVISION

COLORADO—SCM, Donald S. Middleton, WØNIT—SEC: WØSIN. PAMs/WØCXW, WØIJR and WØGNK. *RM: WØFEO. OBS: KØDCC. WØFEO again has taken* over as manager of CCW. KØDTK found it impossible to carry on. Net control stations will include WØBES, WØFEO, KØFDH, WØCWD *and* WØTVI. *Congratulations* to WØSIN on a very successful AREC S.S.B. Net. Chic reports a QNI of 681 and a QTC of 222 during a *period of one month this fall. The Colorado University* station, WØYQ, has been reactivated under the leadership of Dave Sheats. Boulder amateurs, including KØJSV, KØEND, KØMRY and WØCGQ, plan operation in the January V.H.F. Sweepstakes with a v.h.f. rig built *around the new* GE GL7894 *compartron tube.* WØTUT and WØDQN are attempting v.h.f. communications over a 21-mile mountainous path. The Pikes Peak *Beat* states that the Colorado Springs 2-Meter AREC Net on 146.25 Mc. is going strong. WØWZY is now operating 420 Mc. with a tripler tied on to a 2-meter rig. Traffic: KØDCW 99, KØZSQ 54, WØENA 33, WØCGQ 30.

UTAH—SCM, Thomas H. Miller, W7QWH—Asst. SCM: John H. Sampson, W7OCX. SEC: K7BLR. Anyone interested in a model 15 teleprinter should contact Russell R. Bateman, W7NFT, 1138 W. Girard Ave., Salt Lake City. Russ will act as agent for Utah amateurs. The supply of machines may be limited. W7OCX, W7QWH, K7MPQ, K7QGW and W7VTJ earned BRAT Awards on BUN. W7POU did quite well in the recent Frequency Measuring Test. W7WMO has moved to Price from Idaho and is expected to resume his traffic activities here in Utah. The UARC (Salt Lake) has taken on the project of helping to get a 2-meter repeater in operation. Utah State Library, Division for the Blind, could use some volunteers for recording *QST* and other technical publications. Contact W7QWH for further information. Traffic: K7NWP 478, W7OCX 41, K7KBX 14, W7QWH 1.

NEW MEXICO QSO PARTY

January 26-27, 1963

All amateurs are invited to participate in the Fourth New Mexico QSO Party, sponsored by the CHC Chapter #1, of Albuquerque. New Mexico hams are urged to work as many out-of-state stations as possible so that those interested can earn credit toward WAS, the Worked New Mexico Counties Award, the Amigos de Albuquerque Award and the USA-CA Award.

Rules: (1) *Time*: 36-hour period from 1500 GMT Saturday, January 26 to 0300 GMT Monday, Jan. 28. (2) No time limit and power restrictions. All bands can be used and contact credit with the same station on different bands will be given. (3) *Scoring*: *New Mexico stations*: 1 point per contact and multiply total by the number of states, U.S. possessions, Canadian provinces, and foreign countries worked. *Outside stations*: 3 points per New Mexico station worked and multiply total by the number of New Mexico counties worked. (4) A certificate will be awarded to the highest scoring station in each state, country, Canadian province, and U.S. possession, plus a certificate to the highest scoring station in the U.S.A. outside of New Mexico. There will be awarded to the 1st, 2nd, 3rd, and 4th highest scoring station in New Mexico a gold trimmed certificate. Special certificate for multioperator groups. (5) *Frequencies*: 3600, 3835, 7030, 7250, 14,080, 14,250, 21,050, 21,300, 28,100, 28,600, 29,000 kc., and 50.28 Mc. (6) *Exchange*: New Mexico stations send number of QSO, RS(T), and county. Others send QSO number, RS(T), and state, possession, province, or country. (7) Logs postmarked no later than Feb. 28, should be sent to CHC Chapter #1, of Albuquerque, John C. Kanode, K5UYF, 408½ Cornell Dr., SE, Albuquerque, New Mexico.

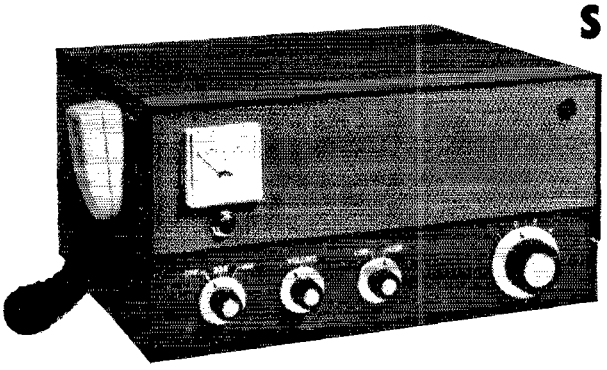
NEW MEXICO—SCM, Carl W. Franz, W5ZHN—SEC: K5QUIN. V.H.F. PAM: W5FPB. 10-Meter PAM: W5WZK. We are sorry to hear that FPB has been confined to his bed by illness and wish him a speedy recovery. K5UYF was presented with the Arne Trossman Award by Mr. Lanier, president of the ABQ Chamber of Commerce, at the monthly breakfast meeting of the Chamber. The Caravan Club provided communications

(Continued on page 138)

SSB COMMUNICATIONS

The *NEW* COMPACT *Series*

SSB TRANSCEIVER



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3 Channel $870
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The new COMPACT Series of single sideband transceivers are priced for use in applications formerly reserved for AM radiotelephone equipment. The COMPACT can be equipped for 1, 2, 3 or 4 channel operation, upper or lower sideband only—or selectible sideband. Channels can be set anywhere between 1.6 and 16 Mc. Power output is 100 watts, p.e.p. Compatible AM is standard, as is the front panel meter.

The COMPACT weighs only 34 pounds and measures 15½ x 13 x 8¼ inches, *including power supply*. Automatic level control (ALC) and receiver AGC are standard. A Collins mechanical filter is used for sideband selection. Remember, under poor signal conditions, the COMPACT has approximately the same communications range as a 700 Watt AM transmitter. Can be used to drive the RF-101 Linear Amplifier.

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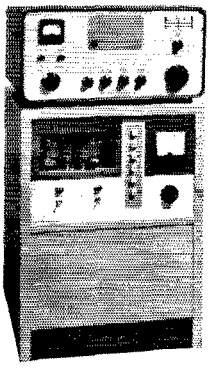
SB-6F TRANSCEIVER

RF-101 LINEAR AMPLIFIER



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for the sports car races at Fort Sumner. A new ARC is being organized in the Albuquerque Area. W5ZHN is teaching several visually-handicapped persons at ABQ Training Center. These boys are real sharp and working hard for their licenses, a club is being formed at the center for their use. Anyone having working equipment that they would like to donate, please get in touch with ZHN. From all reports it appears that the boys had a very fine time at the Ruidosa Hamfest. There is some talk of making it an annual affair. We all hope so. I would like to take this opportunity to send you all Season's Greetings. Traffic: (Oct.) K5UBW 68, K5ZWI 42, W5GB 11, K5HTT 11, K5ONE 8, W5WZK 6, K5FMF 5. (Sept.) K5FMF 6.

WYOMING—SCM, L. D. Branson, W7AMU—SEC: W7HH. The Pony Express Net meets Sun. at 0800 MST on 3920 kc.; the YO Net is a c.w. net on Mon., Wed. and Fri. at 1830 MST on 3610 kc.; Wyoming C.D. Net is on Wed. at 1900 MST on 3537 kc.; TWN Net meets daily at 2000 MST on 7060 kc.; Wyoming Emergency Net at 1230 MST every day on 3920 kc. New officers of the Sheridan Amateur Club are K7GDW, pres.; K7LZM, vice-pres.; K7LZL, secy. The Sheridan Club is 100 per cent ARRL and code classes were started Nov. 1. W7LVU has been appointed Natrona County EC. W7LKQ has resigned. K7HAW has been reappointed Official Observer III and IV. W7BXS is working on an ARRL Membership Drive. W7LVU has been appointed OO Class II. YL K7IVK is an Associate ARRL member. The Pony Express Net handled rural election returns. W7HH is doing fine SEC work. W3BNR/7 moved to Sundance, Wyo. W7DXV is back at Snug Harbor Ranch for the winter. Traffic: W7HH 196, W7AMU 85, W7AEC 38, W7DXV 32, K7IBM 24, W7GZG 18, W7LKQ 16, W7NMW 16, W7HLA 15, W7BHH 14, K7MAT 14, W7LVU 10, W7-TZK 10, W3BNR/7 8, K7HAW 5, W7YWW 2, K7IAY 1.

SOUTHEASTERN DIVISION

ALABAMA—Acting SCM, Walter W. Coleman, sr., W4CXU—SEC: W4FQQ. RM: W4USM. PAMs: K4BTO, K4KJD, K4ZTT. S.S.B.: K4KJD. New appointment: W4USM, as RM and AENB Net Manager. WA4AVM has a new HA-1 keyer. WA4GNG has a new HE454A 6-meter rig. W4DS is using a TA-33 on top of a 65-ft. tower and operates all bands 80 through 2 meters. K4SFH had a QSO with HC1FS Oct. 6. The Mobile Amateur Radio Club furnished communications for the County Board of Health in the polio distribution campaign. W4FUT was top station in the message originating contest on AENO. 6-meter net. Traffic: (Oct.) W4FQQ 179, K4WHW 91, K4DJR 88, WA4AVM 54, K4AOZ 51, K4WOP 46, K4NUW 43, W4PEX 41, K4ZTT 39, WA4BDW 33, K4BSK 31, K4-PFM 26, K4FZQ 20, K4KJD 20, W4USM 20, K4BRZ 19, K4WVD 16, WA4HCW 15, WA4CPF 14, WA4FWP 14, W4WGT 13, W4OXU 12, K4PHH 11, K4KDE 10, W4MI 10, K4WSH 10, WA4GNG 9, K4GXS 7, K4HJM 6, K4-PBY 6, W4RTQ 6, W4DS 5, K4JDA 5, K4UMD 5, K4-WSK 5, W4CIU 4, W4DGH 4, WA4EEC 2, K4TDJ 2, K4ZYO 2, K4RIL 1, W4RLG 1. (Sept.) K4WHW 46, K4FQG 35, W4VWG 18, W4CIU 4, WA4AVM 2.

EASTERN FLORIDA—SCM, Albert L. Hamel, K4-SJH—SEC: W4IYT. RM: K4KDN. RM RTTY: W4-EHU. PAMs: 40 W4SDR; 75 K4LCF; V.H.F, W4RMU; S.S.B. W4OGX. K4LCF is back with FPTN. Welcome back, Herb. We need your know-how and enthusiasm. W4TRS seems to have licked his gremlins and is back in the running again. W4BNE, our EC for Hillsboro, is doing a bang-up job in conjunction with HARS. Throw some of that energy this way, Ray. K4DAX, our busy FMTN manager, finally made it v.h.f.-wise. Congrats, Herb. How about 220 next? WA4IJH, down here for good from Pennsylvania, has shifted his excellent traffic work to this section. Congrats on the ORS, Mac. W4-EXM is now in Teheran looking for his EP2 call and will be on s.s.b. with KWM-2 gear. Wonder why most of our v.h.f.ers are afraid of that OES appointment. It doesn't cost anything and the only extra effort needed is to put down once a month the fine work you are doing all the time. How about it? Traffic: (Oct.) WA4BMC 391, W4TUB 369, K4SJH 294, K4BY 234, W4KIS 195, K4-YSN 195, WA4IJH 179, W4MIN 148, W4AKB 115, K4-RNG 109, K4KDN 93, K4AHU 80, K4COO 77, W4CWD 76, WA4DCI 74, K4NVD 74, K4YLX 72, W4EHW 64, K4ILB 58, WA4CJC 49, WA4BAW 47, K4JWM 45, WA5-GBM 42, WA4DKG 41, W4IYT 40, WN4KKW 37, K4-DAX 36, WA4DMV 36, WA4BGW 34, WN4ESS 32, W4-KCG 30, WA4FGE 29, K4AKQ 28, W4VCX 27, WA4IET 26, W4BBZ 25, W4BKC 25, K4ENW 25, WA4AME 24, K4DBT 24, K4MZR 22, W4EAT 20, W4SMK 18, K4FQP 16, W4DFZ 14, K4MTP 13, W4NDL 13, K4QQE 13, W4-BNE 12, WA4ILQ 12, WA4KGH 11, W4LMT 10, K4LVE 10, W4TRS 10, W4ERM 9, K4OSQ 8, K4ZIF 7, K4IWT 6, K4LCF 6, K4NXW 6, K4VGD 6, K4CMK 5, WA4AZZ 4, W4QVJ 4, K6SXX/4 4, W4AYD 3, WA4KZX 1, K4YIC 1. (Sept.) K4GUE 90, K4RHL 71, K4YSN 70, K4DBT 58, K4YBL 50, K4UKF 8, W4DTS 1.

(Continued on page 140)

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WESTERN FLORIDA—SCM, Frank M. Butler, Jr., W4RKH—SEC: W4MLE. PAM: W4WEB. RM: W4BVE. Panama City has been designated Area C.D. Hq. for Western Fla. K4GVV and WA4FIJ called a meeting of all ECs and ROs to plan an Area RACES Net. The primary frequency will be 29.520 kc., with drills every Thurs. at 8 P.M. CST. Alternate frequencies are 50.4 and 146.57 Mc. A vertical antenna will be used on 10 meters and all counties are asked to install a ground plane at their C.D. Hq. Tallahassee: Leon County RACES will use a frequency at the low end of 10 to link public shelters, using modified CB rigs. Defuniak Springs: K4VWE is the new Walton County EC. WA4IZS soon will be on s.s.b. with a Marauder. Panama City: WA4FIJ was installed as new prexy of the PCARC at a recent banquet. W4MLE and W4RKH were out-of-town visitors. WA4KKB and WA4KKC are new hams in town. W8BBI/4 and K4PMO are back from Navy duty in the Mediterranean. W4FIU has joined the 2-meter gang. WA4FJF received YLCC and WRONE certificates, Ft. Walton: W4BVE is a new RM, relieving K4UBR, who was transferred. Milton: K4HOX has been appointed EC for Santa Rosa County. Pensacola: The NAS Club has started new code classes. Club meetings are held every Tue. at 7 P.M. W4AXP has moved and is busy wiring up the new ham shack. Traffic: K4VFY 129, WA4FIJ 17, W4GAA 14, K4VND 14, K4DHK 2.

GEORGIA—SCM, James A. Giglio, W4LG—SEC: W4YE. PAM: W4KR. RM: W4DDY. New officers of the Georgia S.S.B. Association are W4RZL, pres.; K4AUM, vice-pres.; K4SUD, secy.-treas.; W4TJS, K4KEC, board members. Welcome back to W4LME, from temporary duty overseas with the USAF. The new "WARN" frequencies are 3550 and 7100 kc. The Augusta Radio Club is holding classes with 40 prospective hams in attendance. There are more than 40 Augusta stations now operating on 2 meters. K4BAI and K4QPL have a transceiver working FB at Mercer. Watch out for W4OMC, the Southern Technical Institute ham club station. K4BWQ reports excellent DX on 15 meters. Congratulations, Suzanne, on the 25-w.p.m. code Proficiency Award. K4MCL has a TDQ operating on 2 meters. K4ZSK has been elected a lifetime honorary member of the Atlanta Radio Club. 4RDN's new operating frequency is 7115 kc. K4WWY boasts a WAS certificate and a 30-w.p.m. code Proficiency Award. A meeting of League Officials will be held the first Sun. of each month on 3995 kc. immediately following the Ga. Cracker Mobile Net. K4KPQ puts on a magic act that is really out of this world. W4UO is the newly elected president of the "Old Timers Wireless Club." W4KL was reelected to fill all other offices. Members of this exclusive group refer to one another as "Old Goats." New appointments: K4DKY as OBS and W4OHA as OO. Traffic: K4MCL 170, W4DDY 156, K4WWY 144, W4PIM 124, W4HYW 54, W4LME 54, K4FRM 35, W4YE 24, K4YRL 15, K4NGI 14, K4ZYI 14, W4BZ 2, K4TEA 2, K4BAI 1, K4BWQ 1.

WEST INDIES—SCM, William Werner, KP4DJ—C.D. Radio Officer: KP4MC. QSL Bureau Mgr.: KP4VT, P.O. Box 1061, San Juan. San Juan Area EC KP4BCA has appointed KP4AYP as Asst. EC. The AREC Net drills the 2nd and 4th Thurs. at 2230 GMT on 28,740 kc. The El Morro ARC picnic was held at Luquillo Beach Oct. 21. The Puerto Rico Amateur Radio Club elected KP4DP, pres.; KP4SV, vice-pres.; KP4ABN, secy.; KP4AQK, treas.; KP4CH, KP4GP, KP4AKS, KP4AVB, KP4AYA, directors. KP4AYA won 2 Mosley trap verticals. KP4ASK moved to Bayamon and his XYL is now WP4BKU. KP4RD is using an HT-37 and a Thunderbolt amplified. KP4BAU, at Ramey AFB, added a Gonset GPP-L and a Knight T-150 transmitter for stand-by. KP4CGB and KP4BHR have applied for membership in the new Navy MARS. Besides being NCS of the Amateur Emergency Weather Net at 1045 GMT daily on 3820/7245 kc., KP4CGB also checks into the 20-Meter Intercontinental SB Net for West Indies traffic. VP4NC, PJ2CE and PJ3AF acted as NCS for AEWN when KP4CGB was QRL. VP2KP, VP2KJ and VP2KPA are on the Island of Anguila operating as VP2-KPA using a DX-60 and an SX-96. QSL cards should go to VP2KJ at Nevis Island with SASE. KP4CT has curtailed activities because of a heart ailment. KP4SV installed a Swan 20-meter transceiver in the car. KP4-AYB added a Warrior ahead of the Marauder he built. KP4RK bought a TO keyer. KP4CH has been on 10 meters. KP4HZ is a now a lieut. in the USCG auxiliary. KP4AZ added a Pacemaker to his s.s.b. equipment. AWH bought a used B&W 5100-B and is looking for a 51SB-B adaptor. KP4BJD writes that WP4BHY and Tech. KP4AYI are now General Class. Season's Greetings. Traffic: KP4CGB 412, KP4WT 102, KP4BAU 30, KP4BJD 13, KP4BCA 3.

CANAL ZONE—SCM, Thomas B. DeMeis, KZ5TD—At a recent CZARA meeting plans were made to increase membership. Army MARS started its new 40-meter net but plans to begin code instructions have not been progressing because most members are working shifts. KZ5-SH returned from Puerto Rico and the Air Force MARS

(Continued on page 142)

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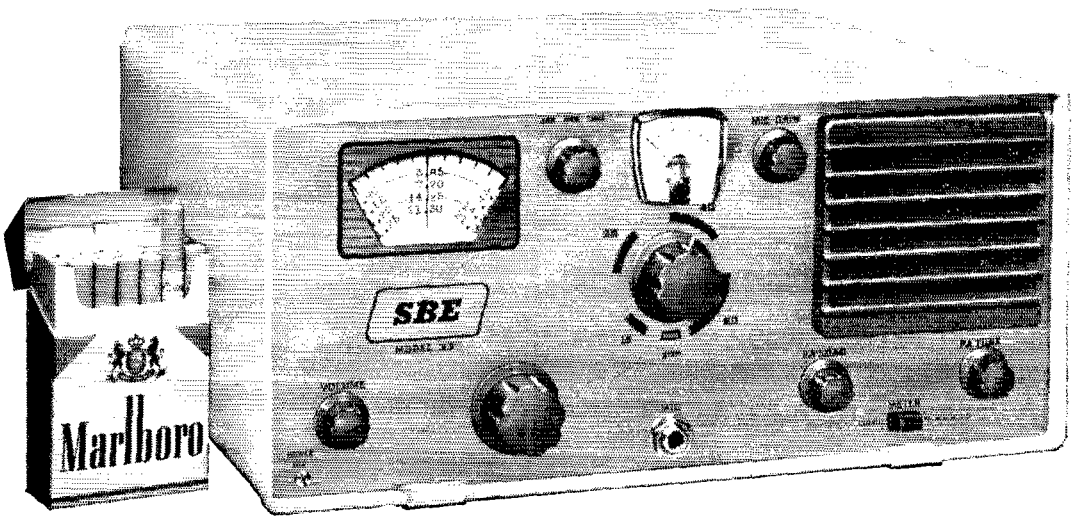

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SIZE: 5½"H, 11¾"W, 10¼"D. Weight 15# (approx.)
FREQUENCY RANGE: Band 1: 3.8-4.0 mc.
Band 2: 7.15-7.35 mc. Band 3: 14.2-14.4 mc.
Band 4: 21.25-21.45 mc.

TRANSMITTER

POWER INPUT: 135 watts P.E.P. max. (Speech waveform.)
DISTORTION PRODUCTS: Down at least 25 db.
CARRIER SUPPRESSION: —50 db.
SIDEBAND SELECTION: Upper or lower sideband selectable by panel switch.
UNWANTED SIDEBAND: —40 db.
OUTPUT IMPEDANCE: 40-100 ohms unbalanced.

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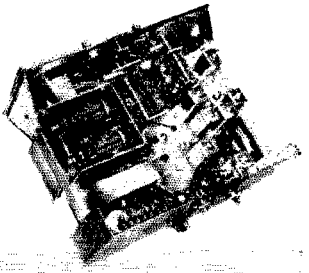
SENSITIVITY: Better than 1 uV for 10 db signal/noise ratio.
SELECTIVITY: 2.1 kc @ 6 db. 5.3 kc @ 60 db.
SPURIOUS RESPONSE: Images and I-F response down at least 40 db.
STABILITY: Less than 100 cps drift in any 30 minute period in any normal ambient temp. condition.
AUDIO OUTPUT: 2.0 watts @ 10% distortion.
TUNING RATE: 30 kc per revolution.
POWER SUPPLY: 117VAC POWER SUPPLY IS BUILT IN.
POWER CONSUMPTION: AC operation. Receive 35 watts. Transmit: 165 watts (single tone).
DC operation through vibrator or transistorized inverter.

TUBE AND SEMI-CONDUCTOR COMPLEMENT:
2—PL-500 beam power tetrodes, **PA.** 1—12DQ7 driver. 19—transistors, 13—diodes. 1—zener diode.

OPTIONS: Several options are separately available including VOX and Calibrator unit with provisions for mounting on rear of transceiver. Internal power supply provides operating power. Rear connections are brought out for linear amplifier



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Net is back in full swing again. KZ5s HX, KR and TD attended ceremonies at the Liga Panemena Radio Aficionados inaugurating new club officers. HP1RD is pres.; KZ5LO, 1st vice-pres.; KZ5RF, 2nd vice-pres.; KZ5RO, secy.; KZ5LB, treas.; KZ5IE, KZ5MH, Pete Bagdonovich and Moises Henriqus relief officers; HP1-AC, Sgt. at Arms and QSL Mgr. The LPRA also announced that beginning next year the Government will issue new radio call license plates. New radio regulations went into effect in the Republic of Panama and several countries were added to the 3rd-party traffic system. KZ5MQ is back on the air with his DX-100. KZ5OB is quietly awaiting a new transformer for the rig. KZ5JW is off the air because of transmitter troubles. Traffic: KZ5SS 146, KZ5JW 53, KZ5KR 15, KZ5TD 12. KZ5SM 3.

SOUTHWESTERN DIVISION

LOS ANGELES—SCM, Albert F. HILL, jr., W6JQB—Asst. SCM: Lyle G. Farrel, W6KGC. SEC: K6YCX. RM: W6BHG. PAMs: W6ORS, K6PZM. The following stations earned BPL for October traffic: K6EPT, W6WPF and W6GYH. Congrats, fellows! K6OZJ replaced the 11-meter band with 6 meters in his Ranger. K6CDW repainted the house! W6SRE still is travelling, down Florida way this time. K6UMV has new mike and tape equipment. W6WAW reported an excellent SET, as did W6LVQ, WA6HUO and many other ECs in the section. W6QAE had a nice vacation in Hermosillo, Mexico. WA6-OWM is the new activities chairman of the Marina Amateur Radio Club. WA6ORS received his CP-25 sticker! W6VUZ is building a new shack. WA6ORJ reports the Tri-County Amateur Radio Club meets the 2nd Tue. of each month at the Naval Reserve Armory in Pomona. K6UYK and a great number of others in the section were active in the SS. W6VOZ is now a "big star" in the local Little Theatre Production! K6JMX is recuperating in the hospital after surgery. A speedy recovery, Rod! K6TOS needs only Africa for WAC. K6GXO has a new Elmac Mobile. W6WNR changed his 829Bs to 6298s. W6MEP reports that effective Jan. 1, 1963, the K6-MYK 2-meter repeater will change frequencies to input 147.240 and 146.980 Mc. and output 145.220 Mc. Two young brothers with ham tickets are WA6WBA, 10 years old, and WA6TWA, 13 years old! Support your local section nets! On phone, the Southern California Six Net (SoCal 6) meeting at 0300 GMT daily on 50.4 Mc.; on c.w. the Southern California Net (SCN) meeting at 0300 GMT on 3600 kc. daily. Traffic: (Oct.) K6EPT 593, W6-WPF 504, K6MDD 412, W6GYH 405, W6QAE 124, WA6-WTK 106, K6YVN 93, K6OZJ 58, W6BHG 43, W6WAW 34, K6HOV 33, WA6CKR 30, WA6KAW 25, W6USY 16, K6UMV 11, WA6OWM 9, WA6HUO 7, K6SIX 5, WA6-DWP 4, W6VUZ 2. (Sept.) WA6TWS 62, K6SIX 35, K6-UMV 32, W6NKR 8, WA6AAH 6, W6SRE 2.

SAN DIEGO—SCM, Don Stansifer, W6LRU—Director W6MLZ and your SCM attended the Annual Diner of the Anaheim Club in November. W6VVA, Orange Co. EC, reports Asst. ECs as follows: W6DEY, W6-DGM, W6EMT, K6HVR, W6QAT, W6WRJ and WA6WV. They are getting very excellent publicity in local papers for their work. WA6PDE reports that he is trying to organize a ham club at Hilltop High School. The November meeting of the San Diego DX Club was held at the home of WA6SBO. WA6EYX is now the EC in Escondido. WA6BUX was home for Christmas vacation. WA6FJD had a new VW "bug." Your SCM had a nice meeting with the Newport Club in October with 56 members attending. The ARRL allows me 10 trips a year to attend club meetings. If interested in a visit, please let me know by mail or phone. K6BHM traded his s.s.b. gear for an Apache, and now operates all bands. The San Diego Chapter of the QCWA was formed recently at a meeting at the Midway Chuckwagon. More than 75 attended. All local clubs and their officers are reminded again of the San Diego Council of Amateur Radio Organizations. This group is putting on the Southwestern Division Convention next October. Full participation from all organized clubs in the area is needed. How about a New Year's resolution to see that your club is represented at each council meeting this year? Your cooperation is needed in this matter. If more information about the council is needed, contact your SCM, W6EWU or W6RCD. Let us all get behind the council and forthcoming convention and spread the work load some. Traffic: (Oct.) K6BPI 3630, W6IAB 2422, W6YDK 1628, W6-EOT 322, WA6ROF 203, K6IME 65, WA6PDE 10. (Sept.) W6YDK 1251, WA6CDD 92, WA6UUO 33.

SANTA BARBARA—SCM, William C. Shelton, K6-AAK—This section seems to lack a volunteer for the position of SEC. Several have been interviewed but none so far have had any interest in the position. With the international situation the way it is it would appear that some interest would be generated. WN6BNT has a new Ranger but is inactive because of poor grades in school. Better hustle, Steve. K6PEC faithfully reports the OAEN activities. W6YCF reports for the Tri County

(Continued on page 144)

The ideal Christmas gift for any ham

(or for his xyl!)

Season's Greetings

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K8JYP	*"Ernie" Gulden*
K8HGI	*"Carl" Wolfe*
WA8CKE	*"Bob" Brandt*
W8ENH	*"Clem" Wolford*

Net on 3820 kc., which meets at noon and also relayed the OBS sked for W6OJX, Paso Robles, 3600 kc. at 0240 GMT. Thanks, Mel. WA6TCX is very active with OO work. W6KZO is busy with a new transceiver and his troops. Hope to start visits to all clubs after the holidays as considerable interest has been shown in ARRL affiliation. Traffic: K6AAK 12, W6PEC 8, W6OUL 8, W6YCF 8.

WEST GULF DIVISION

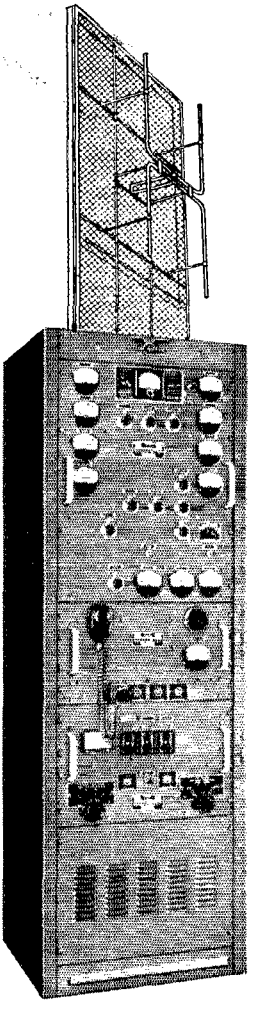
NORTHERN TEXAS—SCM, L. L. Harbin, W5BNG—The Abilene Hamfest was a great success with 250 in attendance and 131 preregistered. I met with a group of the Abilene Club members Saturday night and enjoyed a fine steak dinner at Lo Wakes Steak House. AREC and RACES problems were discussed at this time and I think some good plans were formulated. K5TRY, State RACES Communications Officer, was present and held a meeting on Civil Defense communication. I am thankful that I have a mobile set up in my car because I got lost as usual. I look forward to these West Texas meetings because there is never a dull moment. I will have a report of the Brownfield Annual Swapfest next month for you who could not attend. Many amateurs from this section attended the Oklahoma State ARRL Convention at Lake Texhoma Oct. 27-28 and I must say the V.H.F. Club of Oklahoma did a fine job. There were 216 preregistered with a total of 250 in attendance. K5QKF is now an Indian Chief. W5THI and W5YUO, working together, won the water transmitter hunt. This was something new and proved to be interesting as well as entertaining. K5BTZ presented a technical discussion on RTTY to the KC Club of Ft. Worth recently. K5ZFI became the proud papa of a baby girl Oct. 10. W5MSG reports WESCON is very interesting. K5GZC is in the hospital in Waco because of an auto accident. K5ULC reports there are 6 AREC members in Cooke County. Congratulations to K5EGO, a newlywed. Traffic: W5BKH 164, W5BNG 36, W5GY 9. K5PXV 3.

OKLAHOMA—SCM, Adrian V. Rea, W5DRZ—First, a very special thanks from all of us to the Okla-City V.H.F. Club for a very fine convention at Lake Texoma. It was the largest attendance of any of our state conventions. All enjoyed it. Because of his health and other matters K5KTW has had to resign as SEC. Bill has done a very fine job. All of us in this section express our thanks to Bill for his work. W5PNL is the new manager for OPEN, which meets at 1400 GMT Sun. on the new frequency of 3850 kc. Thanks to the ECs for a very fine showing in the SET. New officers of the Electron Benders Club are K5EYT, pres.; K5WWA, vice-pres. and librarian; K5ZCJ, secy.; W5GZD, treas.; K5OOV, trustee. At a recent meeting the club's new station was dedicated to the memory of the former holder of W5OK (the club's new call), pioneer in amateur radio around Tulsa. W5ATB was the speaker at this occasion. K5LIL has a new transistorized homebrew mobile rig. K5ACR has a new s.s.b. exciter. K5SWL has returned from the hospital. W5FFW and W5ERY are doing fine jobs as OOs. The Oklahoma Chapter of the Quarter Century Club has been organized under the leadership of W5MMH and W5KW. W5ZWT will be on Ascension Island for short time. Traffic: K5IBZ 154, W5JXM 112, K5OCX 105, W5DRZ 82, W5QMJ 73, K5AUX 62, W5JMQ 59, W5MFX 50, K5YTH 24, K5RWL 23, K5ZEP 23, K5CBG 13, W5CCK 13, K5VNJ 12, K5OOV 11, K5JOA 9, W5UYQ 8, W5MQI 6, W5FKL 5.

SOUTHERN TEXAS—SCM, Roy K. Eggiston, W5QEM—SEC: W5AIR. Congratulations to the Sun Valley Amateur Radio Club on the completion of their new club house. ON4KZ and his XYL, also YN4CWH, have been visiting in the El Paso Area. The Brazoria County Amateur Radio Club has been reactivated and the new officers are K5OON, pres.; W5CPO, vice-pres.; and K5QQI, Secy.-treas. The club has set up a 2-meter net on 147.6 Mc. K5CRO acted as NCS for the Jefferson County Polio Immunization drive. New officers of the Orange Amateur Radio Club are K5AAM, pres.; W5QEY, vice-pres.; W5THD, secy.-treas.; WA5AUZ, K5AAM, K5BJB, W5ICL, K5RTR, K5RZB and K5SUB, board of directors. The club station, W5ND, has a new 40-ft tower and triband antenna, with others located on top of the Orange Memorial Hospital. The Texas A&M College Amateur Radio Club has a new Invader. This club has approximately 30 members, all operating the club station, W5AC. Houston amateurs are setting up two complete rigs at the Harris County Chapter of the Red Cross for emergency work. One rig is on 6 meters and the other works 80 through 10. W5AIR is co-chairman of the emergency communication committee, with K5RDP and W5DSF as assistants. The Corpus Christi Amateur Radio Club has a 2-meter and 80- through 10-meter rig set up at the Nueces Chapter of the Red Cross. Traffic: W5AC 282, K4HDU 117, W5AIR 108, W5ANV 67, K5ABV 16, K5VHH 9, K5ZSC 1.

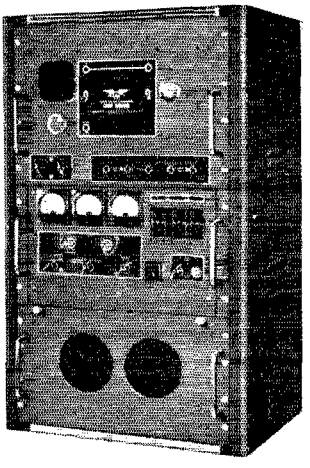
(*Continued on page 146*)

AEROCOM PRESENTS VHF AM TRANSMITTERS and RECEIVERS



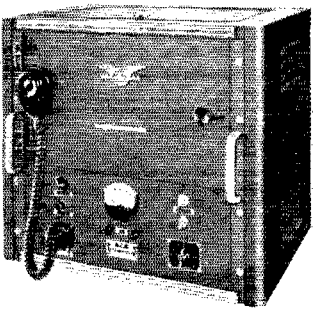
AEROCOM communications equipment is designed with both performance and reliability in mind, and is produced by experienced personnel using high-quality materials. The following features are found in all three transmitters: Single crystal controlled frequency (plus an additional frequency ½% away from main frequency): stability ± .003% or ± .001% over temperature range of 0° C to + 55° C, any humidity up to 95%; audio system incorporates high level plate modulation, with compression; forced ventilation with air filter is employed. Welded steel cabinets.

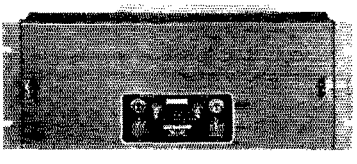
Model 10V1-A—1000 Watts output—Successfully being used in Troposcat service for communications with aircraft beyond the optical horizon. Frequency range 118-153 mc. Can be completely remote controlled by using AEROCOM's remote control equipment. All tuning from front panel by means of dials. Power requirements 210-250 V 50/60 cycles, single phase.



Model VH-200—200 Watts output in range 118-132 mc. Excellent for both point-to-point and ground-to-air communications. Press-to-talk and audio input may be remoted using single pair of telephone lines. Power requirements 105-120V 50/60 cycles. Also available for use above 132 mc; output drops gradually to 150 watts at 165 mc.

Model VH-50—50 Watts output. Frequency range 118-153 mc. Outstanding low power transmitter for ground-to-air service. With remote control provisions; main power control with front panel switch. Convection cooling for press-to-talk service—otherwise forced air cooling. Power requirements 115/230 V 50/60 cycles.





Model 85 VHF Receiver. A high performance, low noise, *single channel crystal controlled, single conversion VHF* receiver. Stability normally ± .001% (with oven crystal ± .0005%) over temperature range 0° C to + 55° C. Sensitivity ½ microvolt or better for 1 watt output with 6 db signal to noise ratio. Standard selectivity bandwidth 30 kc; other widths available. Spurious response down 90 db. Frequency range 118-154 mc. Power requirements either 115 V or 230 V 50/60 cycles. Made for standard rack panel mounting.

As in all AEROCOM products, the quality and workmanship of this VHF equipment is of the highest. All components are conservatively rated. Replacements parts are always available for all AEROCOM equipment.

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CANADIAN DIVISION

MARITIME—SCM, D. E. Weeks, WE1WB—Asst. SCMs: A. E. W. Street, VE1EK, and H. C. Hillyard, VO1CZ. New appointments include VE1OZ as EC (Saint John). Deepest sympathy is extended to the families of VE1AB and VE1DQ, who have joined the ranks of Silent Keys. Harry (AB) was a veteran broadcaster of the early twenties while Art (DQ) was Maritime Section SCM for about 25 years. Congratulations to VE1JT and his XYL on the arrival of a baby girl. VE1AFP has been awarded the CHC certificate. VE1WF recently underwent surgery with VE1AEY performing the operation. Newly elected club officers: (Halifax) VE1MM, pres.; VE1AFQ and VE1YN, vice-pres.; VE1AHR, treas.; VE1AFN, secy. (Loyalist City) VE1AAH, pres.; VE1XN, vice-pres.; VE1AJS, secy.; VE1QV, treas. Winner of the Goose Bay QSO Party was W5HCZ/VO2 with 335 points. Runners-up were VO2NA, W8UPV/VO2 and VO2DP. Winner of the VO2NA Trophy was W8UPV/VO2. New calls include VO1AP, VO1AR and VO1CK. VO1EC has a new TA32 Tribander. VO1BD has a new beam. VO2NA reports that the following new members of the GBARC will provide credits for the WAG Award: W5HCZ, K7TIH, K5DYR, W8UPV, K5HOJ, KØSZE, VO1FG, all operating portable VO2. Traffic: VE1OM 7.

NINTH ANNUAL VE1 CONTEST

Jan. 19-20 and 26-27, 1963

All VE1 amateurs are invited to participate in a contest sponsored by the New Brunswick Amateur Radio Association. The contest is divided into two sections, phone and c.w. The highest scoring contestant in each section will be awarded permanent possession of an engraved cup, the NBARA Trophy.

RULES: 1) The c.w. contest will begin at 2400 GMT Saturday, Jan. 19 and end at 2400 GMT Sunday, Jan. 20. 2) The phone contest will begin at 2400 GMT Saturday, Jan. 26 and end at 2400 GMT Sunday, Jan. 27. 3) Any and all amateur bands may be used but only c.w. to c.w., or phone to phone contacts will count. Any contestant may participate and be eligible for awards in both sections. 4) The same station may be counted but once for credit (in each section) regardless of band used. Mobile, portable, and home stations covered by the same station license constitute the same station. 5) The general call is "CQ VE1." 6) Exchange signal reports, county, province, and operator's name. Local QTH is not required. 7) Logs should show band, type emission, signal reports, county, province, time, and date. Logs not showing this information IN FULL will be disqualified. 8) Score one point for information recieved and one for information sent and confirmed. Multiply total points by the number of individual counties worked in the three provinces to determine final score. For contest purposes Sable Island will be classed as part of Halifax County. 9) Decisions of the contest committee will be final. Logs must be postmarked not later than Feb. 8 and should be in committee hands not later than Feb. 15. Forward all entries to: Contest Committee, P. O. Box 366, St. Stephen, N.B., Canada.

ONTARIO—SCM, Richard W. Roberts, VE3NG—The Metro-Toronto Two Meter Net is well under way under the control of PAM VE3DUU and controller VE3EZC. VE3AIB has retired as EC for v.h.f. in the Toronto area after fourteen years of service. The new EC for 2 meters is VE3DRF. Officials and appointees of the ARRL were in great numbers at the Toronto, Ontario Division ARRL Convention. Among those present were John Huntoon, General Manager ARRL; Alex Reid, Vice-President ARRL; Noel Eaton, Canadian Division Manager; Colin Dumbrille, Canadian Division Vice-Director; Art Aleen, Asst. Legal Council for Canada your Ontario SCM, PAM VE3CFR; SEC VE3AML; QSL Mgr. VE3QE and most of the Ontario ECs. We are sorry to have to list VE3BMX, of Sarnia, as a Silent Key. Congratulations to VE3FIQ and VE3BOC, who recently got their tickets via the St. Thomas ARC. The recent SET showed a marked increase in AREC work. Fifty new members were initiated into the Royal Order of the Wouff Hong at the Ontario Convention. WE3DSM is in the hospital with heart trouble. VE3BQL/SU is back from Egypt and will be in VE1-Land for a while. The Ontario S.S.B. Dinner in Ontario was a huge success. Send self-addressed and stamped envelopes to

(Continued on page 148)

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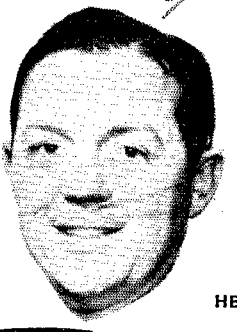

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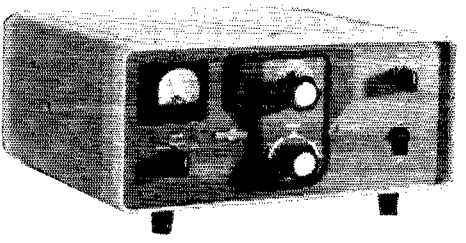

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VE3QUE, our QSL Manager, for your QSL cards. Hamilton or London may be the site and hosts of the 1963 Ontario Division Convention. Any club or group can apply to hold the convention in its city or town. Write your SCM for information. Lee, the XYL of VE3EBE presented him with a second receiver (daughter). VE3BIJ is now RTTY. Traffic: (Oct.) VE3CFR 229, VE3CYR 152, VE3NG 133, VE3DPO 126, VE3EHL 82, VE3DRF 76, VE3GI 73, VE3GP 60, VE3BSY 54, VE3RN 47, VE3UOW 35, VE3ELQ 31, VE3AM 27, VE3BAQ 27, VE3EAU 27, VE3ETM 23, VE3EZC 16, VE3DU 15, VE3BZT 12, VE3DUU 12, VE3SG 10, VE3AKQ 8, VE3BUR 7, VE3OT 7, VE3VD 5, VE3DH 2. (Sept.) VE3BUR 31, VE3FES 29, VE3SG 6.

QUEBEC—SCM, C. W. Skarstedt, VE2DR—Asst. SCM: Jean P. Achim, VE2ATL. During the SET exercises held in the Montreal Area VE2OC controlled Hq. station VE2CDM while the field organization was looked after by VE2BDV. The South Shore Group, led by VE2AEW, also held a successful exercise. In the Laurentide Park, hams controlled by VE2CDB and VE2CDC searched for a missing motorist. The operation was successful although the man was found dead. VE2ARA and VE2LU entered the ARRL FMT and both did well, with VE2LU's error only one part per million. VE2QG and VE2EC were confined to the hospital. VE2VG announced the arrival of an 8-lb jr. operator. The Annual Scout Jamboree was well sponsored by section stations with VE2s ABV, DBP, BLR, XX, YA, BV, YX, GJ and SI showing the young scouts how we operate. VE2s BE, BK, CI, VR and HI enjoyed the Toronto ARRL Convention. The MARC sponsors code and theory classes, 1015 Beaver Hall Hill, Montreal at 8 P.M. Mon. VE2s BDP, SH, BHV, BLR, BDV and NN instruct, while VE2BDV and VE2NN are organizers. VE2AJD teaches code at Trois-Rivieres. Sorry to report the passing of VE2AJR at Hull. VE2ATL reports: VE2LO retired after 46 years of service. VE2ACD is moving to California. VE2SO met his YL at the RAQI convention. VE2RJ visited Telstar installations at Andover, Me. VE2AJV succede a VE2AWR comme titulaire de VE2JC. Ex-VE2APC et VE2ATL prennent un cours de photographie 35 mm. Nous regrettons de vous annoncer la mort d'un amateur tres connu, VE2AO. Traffic: VE2DR 89, VE2CP 33, VE2AUU 28, VE2AUH 24, VE2AGQ 20, VE2BFT 19, VE2EC 18, VE2BDV 14, VE2BG 14, VE2SD 13, VE2ALE 8, VE2ANK 3, VE2BMK 1.

ALBERTA—SCM, Harry Harrold, VE6TG—SEC: VE6FS. PAM: VE6PV. RM: VE6AEN. ECs: VE6FK, VE6SS, VE6ABS. OPSs: VE6CA, VE6PV, VE6HM. OOs: VE6HM, VE6NX, VE6PL. OBS: VE6HM. ORS: VE6BR. OESs: VE6DB, VE6HO. Thanks to all who helped in the success of the test on Oct. 6 and 7, the Scout Jamboree and the patrols for the police on Halloween. The NARC elected D. M. Taylor, pres.; D. M. Mahoney, secy.; Mrs. E. Beckman, treas. The NARC will sponsor the 1964 Alberta "HAM"fest. VE6FK, Calgary, did a very good job as control for the province-wide test. VE6FS (SEC) was very pleased with Oct. operations and says thanks to all concerned. The PTN (c.s.) Net hopes that more of you c.w. fellows will check in this winter. APN still is encountering black outs. All of the Vulcan club members are League members. The CARC, Calgary, elected officers recently. Most clubs will run classes this winter, with Vulcan coming up with ten in the next three months. Traffic: VE6HM 166, VE6FK 67, VE6FS 65, VE6BR 37, VE6AEN 30, VE6AFJ 14, VE6ABS 9, VE6PV 9, VE6GN 6, VE6SS 5, VE6CA 4, VE6UH 4, VE6SU 2, VE6BL 1.

BRITISH COLUMBIA—SCM, H. E. Savage, VE7FB —Plans are being made for Old Timers Night for Feb. 1963. VE7QC is back at Merritt, also VE7AMT/7. It looks like Merritt will be back on the map. VE7BBB now has her Advanced Class ticket. Congratulations, gal. The Boy Scout Jamboree for VE7s appears to have been a terrific success judging by the large total of Boy Scouts attending. Nanaimo's newest call is VE7BLE. VE7BJV has 25 watts on 160 meters. BCEN nominations for ORS have been awarded to VE7AGF, VE7KZ and VE7BJV. The net still is looking for more members from many places in B.C. Worry not about your code speed. They will send at your speed. The B.C. Opman is being revised for net operations. The Vancouver Amateur Radio Club lost top two sections and a tower trailer last FD. Any help would be appreciated in recovering this equipment. Your SEC, VE7OM, has appointed three new Emergency Coordinators, VE7BHH, VE7AKE and VE7MX. Have you filed a Form 7 yet? Have you read the Canadian Director's News Letter for October? Ask your club secretary for it, or contact us. News to this office has hit an all-time low. So if you want to use this space let's have your letter. Traffic: VE7BDJ 228, VE7AGF 113, VE7BJF 82, VE7KZ 48, VE7AC 14, VE7DH 4, VE7AOY 2.

MANITOBA—SCM, M. S. Watson, VE4JY—New licenses issued by the D.O.T. are VE4CS, VE4LK, VE4OW, and VE4RQ; also VE4ED and VE4PB at Churchill. The ARLM has procured a supply of "Ham Ties" for

(Continued on page 150)

THE HAMS AT HARVEY SAY:

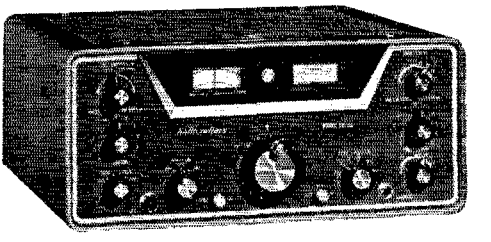
STEP UP TO *hallicrafters*

MODEL SR-150 TRANSCEIVER

Amateur Band • Fixed/Mobile

Here's top transceiver performance with full amateur band coverage — 80 through 10 meters • Receiver AF gain and RF gain controls • SSB operation — VOX or PTT; CW operation — manual or break-in • R.I.T. (Receiver Incremental Tuning) — ± 2 kc adjustment of receiver frequency independent of transmitter • Exclusive new AALC (amplified automatic level control) • 1650 kc crystal filter.

Model SR-150 ..... **$650.**



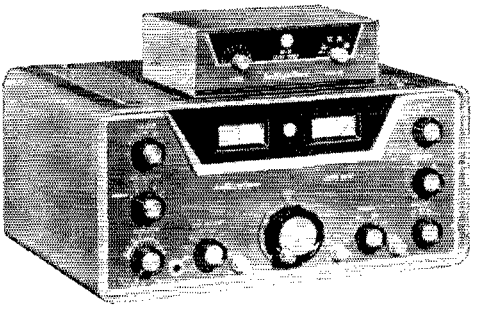
ALSO: AC or DC Power Supplies

P-150 AC Styled to match SR-150 Transceiver. Five silicon diode rectifiers. PM speaker **$99.50**

P-150 DC Five silicon diode rectifiers, four transistors **$109.50**

Complete Mobile Mount:

MR-150 Adaptable to transmission hump or floor. Easily mounted **$39.95**



MODEL SX-117 RECEIVER

A new versatile highly stable Hallicrafters communications receiver! It's a triple conversion heterodyne type with crystal-controlled high-frequency oscillator on all ranges • Crystal-controlled 1st and 3rd conversion oscillators • Selectable side bands • Constant tuning rate • Can operate on most frequencies from 3 MC to 30 MC with proper crystals; with accessory unit HA-10 (shown on receiver) can be extended downward from 3 MC to 85 KC • Selectivity variable in 3 steps from 500 to 5,000 cycles • V.F.O. can be used as crystal locked oscillator.

Model SX-117 ..... **$379.95**

Accessory HA-10 ..... **$24.95**

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Visit our new subsidiary, FEDERAL ELECTRONICS, INC., Vestal, N.Y. for all your industrial needs.

sale. The Elliot family, VE4IF, VE4GE and VE4PE are in the process of moving to the wide open spaces at Birds Hill. VE4AN has been appointed PAM, succeeding VE4RR. Glad to hear veteran VE5GO back on the Manitoba Net from Wadena. VE4SR reports a fine holiday on the west coast. On the way he made 126 contacts on 80-meter mobile. VE4BJ reports 5 continents worked on RTTY teletype. VE4GA is the new treasurer of the ARLM. It is with deep regret that we record the death of VE4WJ, for many years a devoted amateur. A new radio club has been formed in Winnipeg piloted by VE4-OL, pres.; VE4BK, vice-pres.; and VE4QL, secy., under the name of "BISON." Traffic: (Oct.) VE4FF 9, VE4FX 8, VE4KN 8, VE4QD 8, VE4LQ 3, VE4AN 2, VE4JA 2, VE4JW 2, VE4SE 2, VE4IW 1, VE4UC 1. (Sept.) VE4JA 5, VE4KN 5, VE4QD 4, VE4HF 3, VE4-UC 3, VE4AN 2, VE4GB 2, VE4MK 2, VE4SE 1.

SASKATCHEWAN—SCM, Jack Robinson, VE5BL—During the week end of Oct. 20 and 21 a number of stations throughout the province took part in the 5th Boy Scout Jamboree on the air. The Regina Club had two stations operating at Boy Scout Headquarters on 75 and 20 meters, using the special call VE5JAM. Other stations in the province had boys from various troops in their locality visit their stations and exchange greetings and information with other troops. Ex-VE3DWM is now VE5QF, located at McCord. VE5HP visited W1AW during the summer holidays. VE5IG is busy taking flying lessons. Traffic: VE5HP 79, VE5LM 27, VE5NX 8, VE5-OB 7, VE5HQ 6, VE5RE 6, VE5JU 5, VE5MS 2, VE5-HX 1, VE5IG 1.

S4 + 30 Db.

(Continued from page 29)

"Well, that's fine, Jock. Now as you know, Ramses II (1301–1234 B.C.) built six temples along the Nile. The most famous, of course, is the Colossus at Abu Simbel — we still plus 30, Jock? Break."

"You're up to 36 db. over S3 now, Jack —"

"Ah + 36 now. Very good, Jock. Now, as I was saying, there are four statues of Ramses II at the entrance to the Temple, each 67 feet high, and show the Pharoh seated . . ." QST

YL News and Views

(Continued from page 80)

Red Wagon Widows?

K2OEW, Thelma, WA2UAB, Mabel, and WA2WHE, Gretna, wonder if there are other YLs who are "Red Wagon Widows" — YLs whose OMs are firemen — who would be interested in forming a Red Wagon Widows net on 75 meters. All interested please contact one of the above YLs.

COMING EVENTS

YL-OM Contest — The fourteenth annual, conducted by the YLRL. Phone section March 2-3; C.W. section March 16-17. Complete rules next month.

Novice Roundup

(Continued from page 41)

Rules

1) *Eligibility:* The contest is open to all radio amateurs in the ARRL sections listed on page 6 of this *QST*.

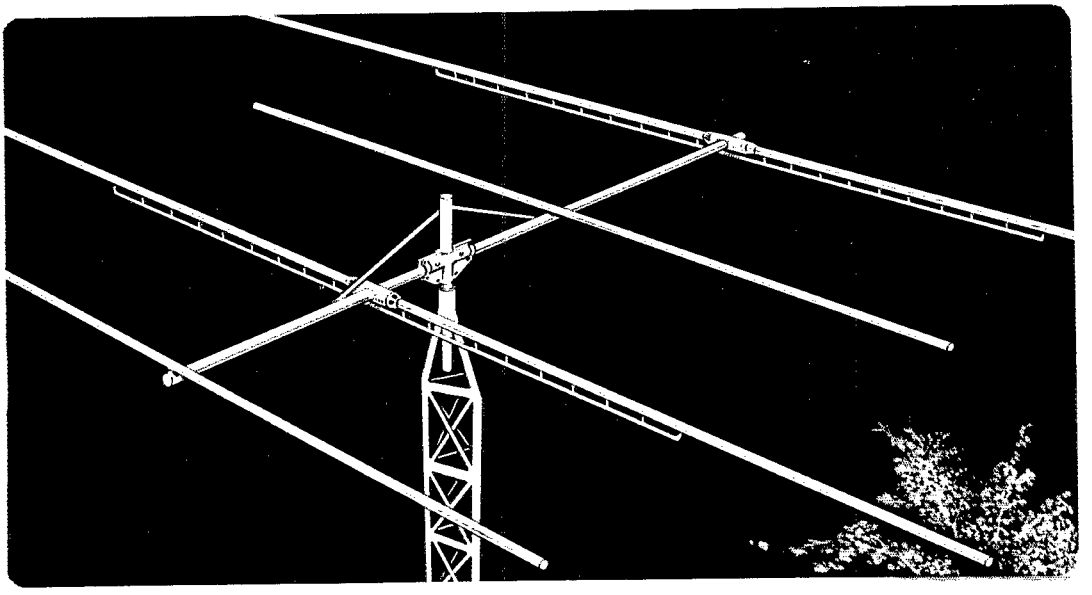
2) *Time:* All contacts must be made during the contest time indicated elsewhere in this announcement. Time may be divided as desired but must not exceed 40 hours total.

3) *QSOs:* Contacts must include certain information sent in the form as shown in the example. QSOs must take place on the 80-, 40-, 15-, or 2-meter bands. Crossband contacts are not permitted. C.w. to phone, c.w. to c.w., phone to phone, phone to c.w. contacts are permitted. Novices work any amateur stations eligible; non-Novices work only Nov-

(Continued on page 152)

NEW hy-gain DUOBANDER

for the popular 20-40 meter bands



New compact lightweight unit features Linear Decoupling Stub and Beta Match

The 20-meter and 40-meter bands are becoming more and more popular with amateurs because of more room for expansion and low sun spot activity. That's why the Hy-Gain engineering staff has designed this important new antenna. The Hy-Gain Duo-bander has three full-sized elements on 20 meters and two reduced-size elements on 40 meters. It's compact, lightweight, highly practical—and priced right.

Through the exclusive Hy-Gain development, the linear decoupling stub, the ordinarily outsize 40-meter element is reduced to about ⅔ of the normal size. This makes the Hy-Gain antenna practical, usable where others won't work out, but keeps performance standards high.

The exclusive Hy-Gain advancement of the linear decoupling stub makes two-band operation possible. You do away with inductance and capacity traps, yet the Duobander elements sections can be decoupled very efficiently. The linear loading principle, another Hy-Gain exclusive, does far better than a loading coil in reducing antenna size.

A proven Hy-Gain development—THE BETA MATCH makes possible maximum gain and low standing wave ratio into a single 52 ohm coaxial feed line. For perfect pattern symmetry, a broad band balun is an integral part of the matching system.

price $169.50

ELECTRONIC WHOLESALERS INC.

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2345 SHERMAN AVE., N.W., WASHINGTON 1, D.C. Phone HUdson 3-5200

1301 HIBISCUS BLVD., MELBOURNE, FLA. Phone PArkway 3-1441

938 BURKE ST., WINSTON-SALEM, N. C. Phone PArk 5-8711

2310 BOB WALLACE AVE., S.W., HUNTSVILLE, ALA. Phone 534-2461

ices. Valid points can be scored by contacting stations not working in the contest, upon acceptance of your number and section and receipt of a number and section.

4) *Scoring:* Each exchange counts one point. Only one point may be earned by contacting any one station, regardless of the frequency band. The total number of ARRL sections (see page 6 of this *QST*) worked during the contest is the "section multiplier." Yukon-N.W.T. (VE8) also counts as a multiplier. A fixed scoring credit may be earned by entrants who hold ARRL Code Proficiency certificates. If an entrant does not hold a CP award he can apply for credit by attaching to his Roundup report a copy of qualifying run from W6OWP, January 4 or February 7, or from WIAW, January 16 or February 21. CP credit equals the w.p.m. speed indicated on the latest certificate or sticker held by the entrant. The final score equals the "total points" plus "Code Proficiency credit" multiplied by the "section multiplier."

5) *Reporting:* Contest work must be reported as shown in the sample form. Reporting forms and a map of the United States will be sent gratis upon request. Indicate starting and ending times for each period on the air. All Roundup reports become the property of ARRL and must be postmarked not later than March 1.

6) *Awards:* A certificate award will be given to the high-est-scoring Novice in each ARRL section.

7) *Disqualifications:* Failure to comply with the contest rules or FCC regulations are grounds for disqualification. ARRL Contest Committee decisions are final. QST

Easy Match

(*Continued from page 48*)

75-ohm low-pass filter reasonably well. It should be noted that the L network gives a considerable amount of harmonic attenuation when properly adjusted, and when combined with the inherent harmonic suppression of the pi-network final, generally makes the use of a low-pass filter unnecessary unless you are located in a TV fringe area. In any event, it is important that the transmitter itself be adequately shielded and filtered.

Fig. 2 is a block diagram showing where the various components of the system should be installed. The low-pass filter and the s.w.r. meter can be eliminated, as mentioned, and of course, the use of a send-receive antenna relay is optional. If used, it should be located as indicated in the diagram.

A "bargain" cabinet,[2] about 15 inches wide by 7½ inches high by 9 inches deep, was used for the model pictured. Included were the panel and a cadmium-plated chassis. The chassis is not used. The ceramic meter switch came from the junk box, as did the capacitor scale and knob, the SO-239 coaxial connector, a ceramic feedthrough for the single-wire feeder or antenna, and an 8-32 machine bolt for the ground connection. The meter, capacitor, and coil came from a surplus store at a total cost of about $5.00. Even with new material, the cost can be moderate, considering the results that can be obtained with the very simplest forms of all-band antennas. QST

[2] Obtainable from World Radio Laboratories, Council Bluffs, Iowa.

POWERED BY TUNG-SOL

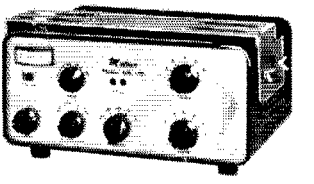
ALL THREE MODES BY WRL

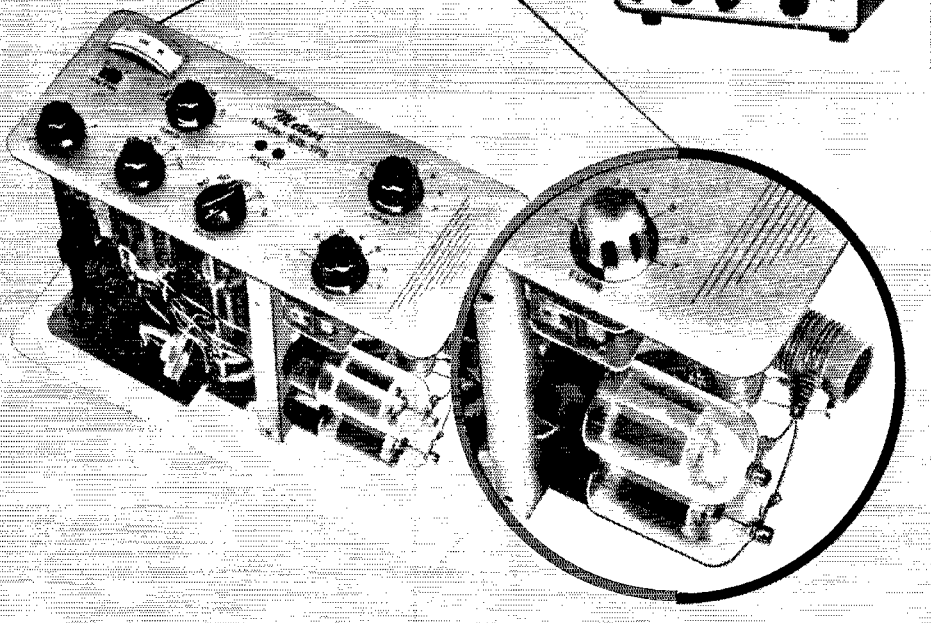
Compact and Powerful 6DQ6B Tubes

WORLD RADIO LABORATORIES, INC.
3415 West Broadway Council Bluffs, Iowa

TUNG-SOL provided the answer with the new 6DQ6B, by approving its use in transmitting service at 20 *watts plate dissipation* intermittent amateur service. Power capability of 175 watts CW for a pair of tubes on all amateur bands up to 30 MC.

Now it's the Meteor SB 175 for the novice or advanced operator; 175 watts CW, 100 watts AM, 140 watts (PEP) on SSB. Tung-Sol 6DQ6B are compact and powerful. Optional mobile bracket available.





Because of the sturdy 6DQ6B Tung-Sol Tubes and other equally rugged components, WRL offers a full year warranty on the Meteor.

Beautifully styled for "Shack Appeal." 5" high by 11 3/8" wide and 8" deep. Under 10 lbs. (less power supply). Gold iridite treated panel and chassis. Extra heavy for durability.

All amateur bands 80-10 meters with continuous coverage 3.5 9MC and 13-30 MC. Provisions for crystal or VFO control; Pi-network, one knob bandswitching; 100% modulation; efficient class "C" final operates through all bands. Wide coverage for MARS and CAP.

The 6DQ6B is a Beam-Power Pentode primarily designed for use as the horizontal-deflection amplifier in television receivers. Its high zero-bias plate current at low-plate and screen voltages makes the tube well suited for use in receivers that operate at low plate-supply voltages.

TUNG-SOL

Tung-Sol Electric Inc., Newark 4, N. J.

Novice 40-Watter

(Continued from page 35)

the power supply should be connected to the + side of the meter and the lead from the plate of the tube to the − side.

Tune-up procedure with the meter is similar to the indicator system. Tune C_3 for a "dip" in plate current or minimum plate current. The dip point is resonance. The amplifier can be loaded to a plate reading of 120 to 140 ma.

Still using a dummy load, put a 40-meter crystal in the rig and tune up on 40, using the same tuning procedure as outlined for 80. You'll have to switch S_2 to the 40-meter position, of course. Once you have the rig tuned up on 40 with the dummy load, adjust C_1 for maximum brilliance of the dummy load. This adjustment needs to be set only once and then you can forget about it.

A common trouble that Novices who operate on 80 meters are likely to encounter is the radiation of a second harmonic which falls outside the high end of 40 meters. With this transmitter, or for that matter, almost any transmitter, commercial or home-built, precautions should be taken to prevent this unwanted harmonic radiation. There are several different ways that the trouble can be eliminated, two of the popular methods is with either an antenna coupler or a filter. It is suggested that the newcomer read a recent article [1] that treats the problem and takes the necessary steps to prevent such harmonic radiation. QST

[1] McCoy, "How to Avoid Radiation of Spurious Signals," *QST*, April 1962.

The W4JWV S.S.B. Exciter

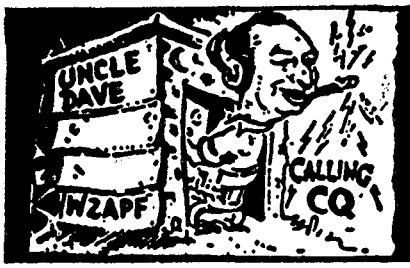
(Continued from page 28)

now the same as has been explained for 80 meters, with one exception. Because of the choice of the crystals used to mix to higher frequencies, the v.f.o. will tune in a reverse direction on the higher-frequency bands, and the sideband will be opposite to that on 80 meters; that is, the l.s.b. position for 80 meters becomes the u.s.b. position on all other bands.

For operation on a.m. phone, the exciter is tuned up as for s.s.b. Then carrier is reintroduced by unbalancing the balanced modulator until the plate-current meter reads 100. With modulation, you will be transmitting what is in effect an s.s.b. signal with carrier present. The result is a crisp, punchy a.m. signal typical of the better types of high-level modulation and of a band width comparable to s.s.b. The reason the band width remains narrow is that the a.m. signal is subject to the filtering action of the 9-Mc. crystal filter. The push-to-talk feature may be used on a.m. in the same fashion as for s.s.b.

As a final step, the dial is calibrated using a frequency meter or the station receiver, and the

(Continued on page 156)



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Radio Distributing Co. INC.

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Cable Address "Uncledave" **CALL ALBANY HE 6-8411** **NITES GR 7-5891**

SO, ALL YOU GOT FOR CHRISTMAS WERE SOME TIES AND SOME MONEY? UNCLEDAVE—AND TINY, TOO—WANT YOU TO SIT RIGHT DOWN AND WRITE A LETTER. TELL THEM WHAT YOU NEED AND IF YOU HAVE ANYTHING TO TRADE-IN, LIST IT ALSO. THEN, BEFORE YOU KNOW IT YOU WILL RECEIVE THE BEST EVER DEAL THAT YOUR CHRISTMAS MONEY CAN GIVE, AND THE YEAR OF 1963 WILL BRING YOU MANY MORE BARGAINS AND TRADES FROM W2APF.

NATIONAL RECEIVERS

NC300	$250.00
NC98	98.00
NC188	100.00
NC98	79.50

TECHNICAL MATERIEL CORP. RECEIVERS

GPR90 w/spk. Excelnt. Cond.	$295.00

HALLICRAFTERS XMTRS. AND RECEIVERS

S38D[B]	44.95
S38D	44.95
SX99	89.50
HA4	39.95
SR34AC	195.00
HT32A SSB Xmtr	495.00
HT31 Linear	195.00
HT33 Linear	395.00
SX100 Rec.	219.00
S108 Receiver	104.50
SX110 Receiver	129.50
SX111 Receiver	229.50

GONSET XMTRS—REC.—CONV.

GSB100 SSB Xmtr	325.00
Commil—2 Mtrs	175.00
2 Mtr Linear	95.00
VFO preamp	34.95
G66 with P.S.	175.00

COLLINS XMTRS. AND RECEIVERS

KWS-1	$995.00
KWM-1 with AC PS & console	725.00
32V2	250.00
75S1	425.00
75S2	625.00

JOHNSON XMTRS. AND ACC.

Mobile Xmtr	$ 69.50
Viking 1-w/VFO 122 Xmtr	175.00
Valiant Xmtr	350.00
Viking 1—Xmtr	125.00
Pacemaker SSB Xmtr	175.00
Navigator	115.00
Challenger	115.00
VFO 122	34.95

"WRL"—GLOBE XMTRS.

DSB100 DSB Xmtr	$ 74.50
VOX-10 Voice OP Relay	$ 19.50
QT-10 Anti-Trip Unit	5.95
PA-1 Power Reducer	7.95

VANTRON

300A Linear Amp	$ 75.00

BARKER AND WILLIAMSON XMTRS., ETC.

5100 AM Trans.	$250.00
51SB	150.00

HEATH XMTRS. AND ACC.

DX 20	$ 44.95

TUBES—NEW—GUARANTEED

All individually boxed except where noted in bulk.

	Reg.	Each	Dozen
6H6	$3.50	$1.05	$11.50
6SJ7	3.75	1.15	12.65
6J7	4.55	1.25	13.75
45 (Bulk pack).	2.05	.65	7.15
2A6 (Bulk pack)	3.65	1.10	12.10
6A8G	5.80	1.75	19.25
6AE6G	2.05	.65	7.15
6S8GT (Bulk pack)	2.75	.85	9.35
6C4 (Bulk pack)	1.50	.45	4.95
6J6 (Bulk pack)	2.35	.75	8.25

1962 Calendar and Schedule Pad Free with purchase of 5 Receiving Type Tubes

BEAMS—NEW AND USED (AS INDICATED)

Mosley V-27GP (CB) new	$29.95

We have more beams and verticals at very special prices—write us about your needs and we will quote.

Mosley VPA1520 (New)	$109.50
Mosley VPA1020 (New)	99.50
Mosley V144GP (2 mtr.) used	17.50
Mosley VPA20-2 (New)	39.50
Mosley TA33 (New)	84.95
Mosley V3 (New)	19.95
Mosley V3 Jr. (New)	15.95
Mosley TA32 (New)	59.95
Mosley TA32 Jr.	42.95
Mosley A320	66.95
Mosley S153	42.50
Cushcraft AGP15	11.95
Cushcraft AGP10	10.95
Cushcraft ATGP3	24.95
Cushcraft A28A	21.95

EXTRA SPECIALS

New Items—Overstock and Discontinued

COLLINS RECEIVER FILTER 35U1 (New)	$ 10.00
COPPERWELD WIRE (Nos. 12-14-16). per 100 ft.	2.85
GLASLINE—Standard per 100 ft.	3.08
per 600 ft.	17.84
Heavy Duty. per 100 ft.	5.89
per 600 ft.	34.75

HAMMARLUND RECEIVERS

HQ160	$295.00
HQ110	195.00
HQ100	145.00

DEMONSTRATORS AND DISPLAY MODELS, ONE OF A TYPE, NO TRADES ACCEPTED ON THESE SPECIALS. IF YOU DON'T SEE WHAT YOU WANT HERE—WRITE—WE PROBABLY HAVE IT.

Collins 30L-1	$450.00
Drake 2B	250.00
Hallic SX115	510.00
Hallic SX140(w)	105.00
Hallic HT40 (w)	90.00
Hallic SX111	250.00
Hallic HT32B	650.00
Johnson Invader 2000	1110.00
Johnson Ranger II (w)	320.00
RME	
DB23 Preselector	42.00
Gonset	
88-108 mc FM Tuner(12V)	49.95

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TIME PAYMENTS 18 Months to pay. Life Insurance at no extra cost

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A SUBSIDIARY OF FORT ORANGE RADIO DISTRIBUTING CO.

various panel controls are suitably marked with decals. You now should have a rig of which you can be justifiably proud, you've saved some money, and you're a full-fledged member of the s.s.b. fraternity.

Drop me a postcard and let me know how it came out! QST

Happenings of the Month

(Continued from page 67)

Tire Town Radio Club — Akron, Ohio
The Vulcan County Amateur Radio Club — Vulcan, Alberta

There being no further business, the meeting adjourned, at 12:55 A.M. November 20.

JOHN HUNTOON
Secretary

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington 25, D. C.

In the Matter of Amendment of Parts 2 and 12 of the Commission's Rules and Regulations to Remove the Power Restrictions in the Band 420–450 Mc/s in the Amateur Radio Service	DOCKET NO. 14610 RM-304

REPORT AND ORDER

By the Commission:

1. The Commission adopted a Notice of Proposed Rule Making in the above-entitled matter on April 25, 1962, which was duly published in the Federal Register on May 3, 1962 (27FR4253), looking toward the amendment of Parts 2 and 12 in order to remove the power restrictions in the 420–450 Mc/s band in the Amateur Radio Service, except in certain specified restricted geographical areas. Interested parties were invited to file comments on or before June 15, 1962, and reply comments on or before June 25, 1962.

2. Comments were received from several parties. All comments supported the Commission's proposed amendments; however, two suggestions were submitted which were given further consideration by the Commission and the interested Government agencies. Several comments proposed that the maximum authorized power in the Amateur Radio Service be permitted in the band 432.0–432.25 Mc/s in the restricted geographical areas, thereby eliminating the need for any prior coordination with the Commission and the local Military Area Frequency Coordinator. The Government agencies concerned did not concur in this proposal.

3. Other comments proposed that the northern boundary of the restricted area in California be modified to read latitude 37° 10′ North to permit the area immediately south of San Francisco to be excluded from the restricted portion of the State of California. This modification to the proposed amendments was agreed upon by the appropriate Government agencies. No reply comments were received.

4. The Commission finds that adoption of the rule amendments, as proposed and modified, would contribute to a wider and more flexible use of radio in the Amateur Radio Service.

5. The Commission, in negotiation with the appropriate Government agencies, has reached an agreement whereby the Amateur Radio Service will be authorized to use the maximum input power permitted in this service in the band 420–450 Mc/s except in certain designated geographical areas which are defined in the attached Appendix.

6. In view of the foregoing, IT IS ORDERED, pursuant to the authority contained in Sections 4 (i) and 303 (c), (f) and (r) of the Communications Act of 1934, as amended, that effective January 2, 1963, Parts 2 and 12 of the Commission's Rules are amended as set forth in the attached Appendix; and the proceedings in this Docket ARE HEREBY TERMINATED

FEDERAL COMMUNICATIONS COMMISSION
BEN F. WAPLE
Acting Secretary

(Continued on page 158)

new from hallicrafters

Modernize Your Station Now!
Liberal Trade-ins at Every...

SX-117

RADIO SHACK

SR-150 AMATEUR BAND TRANSCEIVER

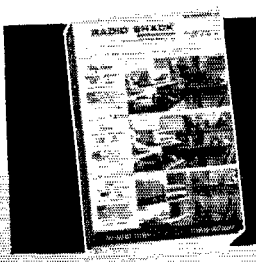
Hallicrafter's new SR-150 is a rugged, lightweight amateur band transceiver designed for maximum flexibility and convenience of operation in fixed or mobile situations. Power requirements: 12.6V at 5A; 250V at 220ma; 500V at 250 ma (transit only); 75V at 10ma. Frequency coverage: eight-band capacity, full coverage provided for 80, 40, 20 and 15 meters; 10M crystals furnished for operation on 28.5 to 29.0 Mc. Transmitter section: 2 12DQ6B output tubes. Fixed, 50Ω Pi network. Power input 150W P.E.P. SSB; 125W. Carrier and unwanted SB suppression 50db; distortion prod., 30 db. Audio: 400-2800 c.p.s. at 3db. Sensitivity better than 1 μv for 20 db. signal-to-noise ratio. 6½x15x13".

20P1105E, SR-150, Ship. wt. 17 lbs. $650.00
20P1106E, P-150AC, AC Supply with Speaker for SR-150.. 99.50
20P1107E, P-150DC, DC Power Supply for SR-150..... 109.50
20P1108E, MR-150, Complete Mobile Mount for SR-150.... 39.95

SX-117 TRIPLE CONVERSION RECEIVER

The SX-117 is a triple conversion heterodyne 12 tube receiver. Its advanced communications technology and proven, dependable design have been carefully blended to give you maximum performance under all potential enviromental conditions. It utilizes a transmitter type VFO which can be used as a crystal locked oscillator. 1st and 3rd conversion oscillators are crystal controlled. The sensitivity of this outstanding instrument is better than 1 mv. The tuning mechanism is back-lash free and operates at a constant rate. Front panel switch for selection of sidebands. The selectivity of the receiver is variable in three steps from 500 to 5000 cycles. The excellent engineering uses a product detector for SSB and CW and an envelope detector for AM. The SX-117 covers 7.0-7.5, 14.0-14.5, 21.0-21.5, 28.5-29 mc. Dimensions: 15x7⅛x13".

20P790E, SX-117, Ship. wt. 21 lbs. $379.50



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Brand new electronics shopping guide chock-a-block full with over 8,000 items . . . 3,000 illustrations . . . 284 pages! Modernize your station — ask for our top trade-in quotation on your present equipment. Take up to 24 months to pay on our Revolving Charge Plan! Send TODAY for FREE catalog!

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ADams 6-5441

NEW HAVEN, CONN.
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SPruce 7-7941

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Adopted: November 21, 1962
Released: November 23, 1962

2. Section 12.111 (b) (14) is amended to read as follows:
§12.111 Frequencies and types of emission for use of amateur stations.
(b)
(14) Within the following areas, the DC plate power input to the final stage of the transmitter shall not exceed 50 watts, unless expressly authorized by the Commission after mutual agreement, on a case-by-case basis, between the Federal Communications Commission Engineer in Charge at the applicable District Office and the Military Area Frequency Coordinator at the applicable military base:
   (i) Those portions of Texas and New Mexico bounded on the south by latitude 31° 53′ North, on the east by longitude 105° 40′ West, on the north by latitude 33° 24′ North, and on the west by longitude 106° 40′ West;
   (ii) The entire State of Florida, including the Key West area and the areas enclosed within a 200 mile radius of Patrick Air Force Base, Florida (latitude 28° 21′ North, longitude 80° 43′ West), and within a 200 mile radius of Eglin Air Force Base, Florida (latitude 30° 30′ North, longitude 86° 30′ West);
   (iii) The entire State of Arizona;
   (iv) Those portions of California and Nevada south of latitude 37° 10′ North, and the areas enclosed within a 200 mile radius of the U. S. Naval Missile Center, Point Mugu, California (latitude 34° 09′ North, longitude 119° 11′ West).
3. Section 12.131 is amended to read as follows:
§12.131 Maximum authorized power.
Except for power restrictions as set forth in §12.111, each amateur transmitter may be operated with a power input not exceeding 1 kilowatt to the plate circuit of the final amplifier stage of an amplifier-oscillator transmitter or to the plate circuit of an oscillator transmitter. An amateur transmitter operating with a power input exceeding 900 watts to the plate circuit shall provide means for accurately measuring the plate power input to the vacuum tube or tubes supplying power to the antenna.

The Templeton Case

(Continued from page 70)

It is a matter of record that Smith did turn on his field-strength meter at 8:57 P.M. At 9 o'clock the meter reading dropped from 6700 microvolts to zero and remained there for five minutes, after which time the signal again came on.

It is also known that Jerome Lindsay Barnes, ex-chief engineer of WKOO-TV, checked into the Grand Bahama Hotel, Nassau, B.W.I., on August 10, 1958. Barnes, BSEE, University of Chicago (1939), former main-stay of the local v.h.f. ham club, spent two months at the Grand Bahama Hotel and then dropped out of sight. No trace of him has since been found. The hotel maid who cleaned his suite after his disappearance came across the cover of what appeared to be a folder of some type. It was bright red and had black, bold lettering which read:

TOP SECRET

A Study of Gaussian Abstractions Leading to a Non-Detectable v.h.f. Radiation System. By J. L. Barnes, MIT Radiation Labs, June, 1948.

Single Copy — Do Not Remove From Files

Beneath the title was a short, hand-written notation in faded blue ink, "Impractical — Godfrey Smith, Assistant Secretary of War for Advanced Projects." QST

AMECO CB-6 CONVERTERS
Tube-type low-noise, high-gain converters. IF easily changed. Specify IF.

CB-6K — 6 meter kit, 6ES8-rf Amp., 6U8-mix./osc. **$19.95**

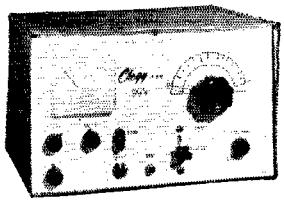
CB-6W — 6 meter wired and tested. **$27.50**

CB-2K — 2 meter kit, 6ES8 1st rf amp., 6U8-2nd rf amp/mix. 6J6 osc. **$23.95**

CB-2W — 2 meters wired and tested. **$33.95**

Model PS-1—Matching Power Supply — plugs directly into CB-6, CB-2 and all CN units.
PS-1K — Kit — **$10.50**
PS-1W — Wired — **$11.50**

CLEGG 99'er 6 METER TRANSCEIVER



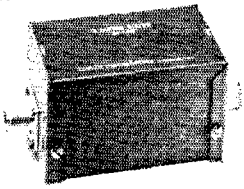
Double conversion superhet gives you extreme selectivity and freedom from images and cross modulation. Transmitter section has an ultra-stable crystal oscillator which also may be controlled by external VFO. Efficient, fully modulated 8 watt final works into flexible Pi network tank circuit. Large S meter serves for transmitter tune-up procedure.

Amateur net price $159.95.

ZEUS and INTERCEPTOR also in stock.

SUPEREX HAM HEADPHONES
Full comfort even after many enjoyable hours of continuous use. Superb comfort even for eyeglass wearers. Crisp, distortionless reproduction and high sensitivity allows you to single out that weak signal and hard to reach station. 600 ohms impedance, completely adjustable head harness. **$24.95**

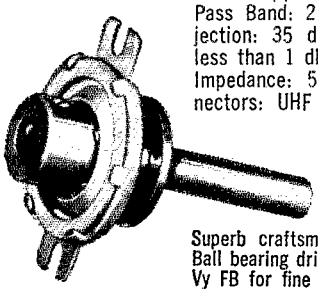
GAVIN, 2 METER, TUNABLE BAND PASS FILTER



Model BP-144 is a narrow band pass filter designed to attenuate spurious emissions generated in 2 meter xmtrs. Four tunable stages for optimum match and suppression. Pass Band: 2 mc. Center Freq: 144-148 mc. Rejection: 35 db, 5 mc from center. Insert Loss: less than 1 db. Power Rating: 190 w. plate input. Impedance: 52 ohms. Size: 4"x2¼"x2¼". Connectors: UHF coax.

BP-144 **$11.85**

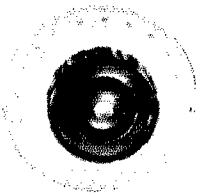
BULLSEYE BUYS AT ARROW
hand picked for hams by hams...



Shown approx. actual size.

PRECISION PLANETARY-VERNIER for exceptionally fine tuning
Superb craftsmanship by Jackson Bros. of England. Ball bearing drive, ¼" dia. Shaft 1⅛" long, 6:1 ratio. Vy FB for fine tuning. Easily adaptable to any shaft. Comparable value $5.95. **Amateur net $1.50 ea. 10 for $13.50**

PRECISION BALL DRIVE DIAL
Another superb product of Jackson Bros. of England. 4" dia. dial with 6:1 ball drive ratio. Fits standard ¼" shaft. For that velvet touch... **Amateur net $3.95**



VERSATILE MINIATURE TRANSFORMER

Same as used in W2EWL SSB Rig—March, 1956 QST. Three sets of CT windings for a combination of impedances: 600 ohms, 5200 ohms, 22000 ohms. (By using center-taps the impedances are quartered). The ideal transformer for a SSB transmitter. Other uses: interstage, transistor, high impedance choke, line to grid or plate, etc. Size only 2" h. x ¾" w. x ¾" d. New and fully shielded.

Amateur net $1.39.
3 for $3.49.
10 for $10.75

MAIL ORDERS PROMPTLY PROCESSED. SAME-DAY SHIPMENT FROM STOCK.

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525 Jericho Tpke., Mineola, N.Y. • 516 — Pioneer 6-8686
225 Main St., Norwalk, Conn. • 203 — Victor 7-5889

Added Versatility for the HBR-16

(Continued from page 40)

The receiver's sensitivity in large part is dependent upon how much time the builder is willing to spend on adjusting the L_1, L_2, and L_3 coils in the receiver's front end, the first two for proper tracking and optimum primary-secondary coupling, and the latter for optimum oscillator injection and feedback, directly related to the primary-secondary coupling. The sensitivity figures given represent the minimums for the various bands.

Image rejection of the receiver is exceptionally good, in part due to the double-conversion circuit. The high Q of the front-end coils is a contributing factor, however. The 72-db. figure represents the minimum observed on any of the various ham bands.

Conclusions

The HBR-16 as described by Ted Crosby is relatively easy to construct. Obviously, the circuitry used is complex only to the extent necessary to achieve the excellent performance for which the receiver is noted. The modifications I have made represent personal preference for features that I feel add considerably to the performance of the receiver, particularly on s.s.b. I am passing them along in the hope that other HBR-16 builders may find one or all of them useful, provided only that all such builders feel themselves reasonably qualified to tackle the job.

Confidentially, it's a swell feeling to be able to say, "The receiver here is home-brewed." QST

Southeastern Division Convention

(Continued from page 28)

the QCWA and the Historical Association of Southern Florida.

Registration for the two-day convention is $1.00, and the banquet price will be $4.75. There will be special hotel rates for convention visitors, at both the Alcazar and the Biscayne Terrace Hotels; $8.00 for a single and $10.00 for a double. Free parking is available for guests. Requests for tickets for the dinner and for hotel reservations should be sent to the Dade Radio Club, P.O. Box 104, Miami 1, Florida.

COMING A.R.R.L. CONVENTIONS

January 19–20 — Southeastern Division, Miami, Florida.
March 15–17 — Michigan State, Saginaw, Michigan
April 26–28 — New England Division, Swampscott, Mass.
June 21–23 — West Gulf Division, McAllen, Texas
July 5–7 — Rocky Mountain Division, Albuquerque, N. Mex.
October 4–6 — ARRL National, Cleveland, Ohio
October 11–13 — Southwestern Division, San Diego, Calif.

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AT MONEY-SAVING PRICES!

- Trade Your Present Gear On A Like-new Receiver or Transmitter
- Two-Week Trial
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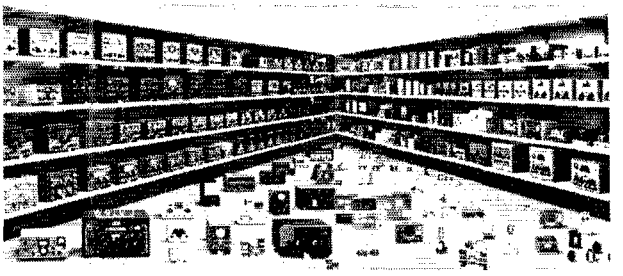

If you insist on like-new equipment — in appearance and performance — at substantial savings, write, phone or visit Trigger Electronics. Receivers, transmitters, and other ham gear are completely realigned and calibrated by service technicians trained in rigid quality control methods. Tubes, capacitors, and other components that *can* contribute to unsatisfactory performance are replaced — insuring optimum, trouble-free performance. Inventory consists of one of the most complete stocks in America of brand-name Trigger reconditioned amateur equipment. Listed below are but a few of the hundreds of items currently available:

75S1	$379.50	GSB100	319.50
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*ORDER BLANK TO: (1) trade ur present gear, (2) order above units, (3) sell ur gear for cash (ABC1234)

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Strays

Outstanding New England Amateur Radio Operator

The Federation of Eastern Massachusetts Amateur Radio Associations will present an award to an outstanding New England amateur radio operator. Only hams in the first amateur call district are eligible and should meet any one of the following qualifications.

a. Performed a meritorious public service to his community through the medium of amateur radio;

b. Made a major contribution to the science of amateur radio;

c. Helped greatly to stimulate interest in amateur radio to others;

d. Aided other radio amateurs to acquire a greater knowledge and skill in operating or building amateur radio equipment.

This honor will be presented at the New England American Radio Relay League Convention April 27 & 28, 1963 at the New Ocean House, Swampscott, Mass., and will be made in the memory of the late John R. Mansfield, W1CMN of Boston, whose spirit and comradeship despite great physical handicaps inspired the award. The award will be known as the John Mansfield Memorial Award and the recipient will receive a cash gift of $150 plus a plaque commemorating the event.

Nominations are urgently requested from the amateur fraternity and they should be complete and accurate. Information on your choice of candidate should be sent at once to the Federation of Eastern Mass. Amateur Radio Associations, c/o Mr. Eli Nannis, W1HKG, 37 Lowell St. Malden, Mass. The closing date for nominations will be March 15, 1963.

—···—

Another f.m. station carrying an amateur radio program is WHFS, 102.3 Mc., serving the Washington D.C., area. The 15-minute program, which has been on each week for over a year, is presented Sunday evenings at 5:45 P.M., with Carl Brown, W3LUL, running the show. It is transmitted in stereo (f.m. multiplex).

—···—

W9IVJ vows he told his fiancée that she would remain a YL until she earned her Novice License. Now Dorothy is "studying like mad," according to Trigger, because the scheduled big date is January 12th. For the license exam? No, for the wedding.

At the HARRISON TRADE-IN CENTER CHRISTMAS COMES IN JANUARY

No matter what equipment or model you want, it's a safe bet you'll find it here . . . and for less than you would expect to pay for such good condition gear.

Here, in the world's greatest trading center you always get more real value for your money. Here, at Harrison's, you can save with complete safety because every piece is plainly green-tagged, fully covered by our 90 day Warranty of free service in our Lab.

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You can spread payments up to 18 MONTHS, on our EASIEST TERMS.

Because we have such brisk turnover, we can give you TOP ALLOWANCE for your present gear!

We put an awful lot of great new gear under the Christmas Trees of happy Hams this year. As a result, the shelves of our Trade-in Center are overflowing with some of the nicest looking, like-new gear we've ever seen—and we want to give you the best deal you've ever seen!

Sensational savings—highest trade allowances—and of course, the Harrison Unconditional Satisfaction Guarantee!

Here are just a few examples. Come on in and look over all the other WHITE TAG "Special Buys" on display in the internationally famous Harrison Trade-in Center. (Or write for list.)

MAKE	MODEL	QUANTITY	PRICE
Hallicrafters	SX-71	4	$ 99.00
Hammarlund	HQ-129X	5	109.00
Hammarlund	HQ-140X	4	159.00
Johnson	Valiant	4	259.00
Collins	KWS-1	5	995.00
Hallicrafters	S-40B	5	49.00
National	NC-98	8	79.00
National	NC-109	5	109.00
National	NC-183D	7	179.00
National	NC-270	6	169.00
Hallicrafters	S-85	7	79.00
National	HRO-60	6	289.00

Just compare prices—positive proof that Harrison always saves you real money! But you must act quickly or others may beat you to the special WHITE TAG super-bargains. While the limited quantity of each item lasts, a $10.00 deposit will hold your choice for the easy credit terms you want, and the allowance on your present gear that will make you happy. (Or, we can ship immediately balance COD.)

In *all* ways it always pays you to visit "Ham Headquarters, USA" every time you want any brand new or like-new equipment. Here you can see more, hear more, learn more, receive more friendly assistance, and get more for your money.

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[LONG ISLAND—144-24 HILLSIDE, JAMAICA]

Silent Keys

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

W1AVK, Louis A. Richmond, Springfield, Mass.
W1CPV, Albert Savage, Pawtucket, R. I.
K1JWK, George D. Wilbur, Sharon, Conn.
W1LIG, Julian E. Greenbaum, Bridgeport, Conn.
W1MUE, James T. Miller, jr., Edgewood, R. I.
W1OPR, John F. Coolen, Pawtucket, R. I.
W1PLR, Daniel V. Bowen, North Attleboro, Mass.
K1SPD, Paul Pierce, Pittsfield, Mass.
W2ATV, William S. Winslow, Somers Point, N. J.
K2HWM, Isabelle R. Lannin, Hampton Bays, N. Y.
ex-W2KA, Charles H. Hennig, Irvington, N. J.
WA2QGB, Vincent A. Prattella, Yonkers, N. Y.
W2VT, David E. Muir, Herkimer, N. Y.
W3ACH, Harold L. Mercer, Scotland, Pa.
W3AIB, Bernard J. Mack, Baltimore, Md.
W3HCT, Harry W. Shepherd, Macungie, Pa.
W3KCB, Lillie M. Leigh, Betterton, Md.
W3LVJ, Edward Gursky, jr., Rockville, Md.
W3MPO, Robert A. Blackburn, Ingomar, Pa.
W3UJP, Charles F. Smith, jr., Pittsburgh, Pa.
W3UKF, John A. Rose, Philadelphia, Pa.
K4CSH, Albert F. Hall, Louisville, Ky.
W4GG, Robert L. Byrum, Greensboro, N. C.
K4GMA, Joshua R. Boyd, sr., Oak Ridge, Tenn.
W4JEF, Tracy I. Hite, Aiken, S. C.
K4TPZ, Thomas H. Nesbitt, Black Mountain, N. C.
W5ASV, Frank Adam, Garland, Tex.
W5MNR, John H. Harvey, Jackson, Miss.
W5WFB, Emile F. Meyer, jr., Bethesda, Md.
K6DKZ, Norman W. Abramovice, Martinez, Calif.
WA6ECN, Bob Glover, Los Angeles, Calif.
WA6GRT, Bill A. Merrell, Norwalk, Calif.
K6IV, Clarence D. Carter, Van Nuys, Calif.
W6IZ, Edmund H. Hansen, Balboa Island, Calif.
K6PVG, Robert E. Brown, West Covina, Calif.
WV6TWL, David L. Oudin, Covina, Calif.
K7LVO, Walter Casteel, Clayton, Wash.
W7VQ, Wellard E. Stevenson, Portland, Oreg.
W7YFU, Clifford R. Anderson, Anaconda, Mont.
W8BEW, William E. Shurance, Mansfield, Ohio
W8BI, George E. Bourne, Dayton, Ohio
K8BIL, Clarence E. Glick, Tiffin, Ohio
W8EYE, Robert L. Davis, Salem, Ohio
W8GXS, Leon F. Rhodes, Kalamazoo, Mich.
W8HBB, Raymond W. Lee, Detroit, Mich.
W8HZJ, Edward L. Miller, Bellaire, Ohio
W8UZ, George E. Anthony, Columbus, Ohio
K8ZGL, John P. Castiglioni, Detroit, Mich.
W9AKP, Philip R. Kennedy, Indianapolis, Ind.
W9BHD, Joseph S. Huffman, Chicago, Ill.
K9CUM, James L. Ryden, Chicago, Ill.
W9DOS, Sigmund J. Wysocki, Milwaukee, Wis.
W9GWF, Melvin E. Overholt, Casey, Ill.
W9TLP, Joshua D. Sanford, Reedsburg, Wis.
K9TUK, Frank J. Berghammer, St. Petersburg, Fla.
K9UCX, Victor W. Henning, Janesville, Wis.
WØFGR, Thomas W. Flack, St. Louis, Mo.
WØHXX, Royce Burkholder, Englewood, Colo.
KØPQO, Vertis J. Grimshaw, Omaha, Neb.
KØREW, John A. Liken, Creston, Iowa
VE1AB, Harry Holden, Glace Bay, N. S., Canada
VE1DQ, A. M. Crowell, Halifax, N. S., Canada
VE4WJ, W. J. Jefferys, Winnipeg, Man., Canada
VE7IM, Arthur E. Lowe, Victoria, B. C., Canada
ex-VE7JH, Charles Keay, Victoria, B. C., Canada
VP1EE, C. Edgarton Eves, Stann Creek, British Honduras

Strays

The North Allegheny High School ARC would like to hear from other high school radio clubs interested in forming a high school 40-meter phone net. Contact K3OLU.

A.R.R.L. QSL BUREAU

The function of the ARRL QSL Bureau system is to facilitate delivery to amateurs in the United States, its possessions, and Canada of those QSL cards which arrive from amateur stations in other parts of the world. All *you* have to do is send your QSL manager (see list below) a stamped self-addressed envelope about 4¼ by 9½ inches in size with your name and address in the usual place on the front of the envelope and your call printed in capital letters in the upper left-hand corner.

W1, K1 — G. L. DeGrenier, W1GKK, 109 Gallup St., North Adams, Mass.

W2, K2 — North Jersey DX Ass'n, P.O. Box 303, Bradley Beach, N. J.

W3, K3 — Jesse Bieberman, W3KT, P.O. Box 400, Bala-Cynwyd, Pa.

W4, K4 — Thomas M. Moss, W4HYW, Box 20644, Municipal Airport Branch, Atlanta 20, Ga.

W5, K5 — Brad A. Beard, W5ADZ, P.O. Box 25172, Houston 5, Texas.

W6, K6 — San Diego DX Club, Box 6029, San Diego 6, Calif.

W7, K7 — Salem Amateur Radio Club, P.O. Box 61, Salem, Oregon.

W8, K8 — Walter E. Musgrave, W8NGW, 1245 E. 187th St., Cleveland 10, Ohio.

W9, K9 — Ray P. Birren, W9MSG, Box 510, Elmhurst, Illinois.

WØ, KØ — Alva A. Smith, WØDMA, 238 East Main St., Caledonia, Minn.

VE1 — L. J. Fader, VE1FQ, P.O. Box 663, Halifax, N. S.

VE2 — George C. Goode, VE2YA, 188 Lakeview Avenue Point Claire, Montreal 33, Quebec.

VE3 — R. H. Buckley, VE3UW 20 Almont Road, Downsview, Ontario

VE4 — D. E. McVittie, VE4OX, 647 Academy Road, Winnipeg 9, Manitoba.

VE5 — Fred Ward, VE5OP, 899 Connaught Ave. Moose Jaw, Sask.

VE6 — W. R. Savage, VE6EO, 833 10th St., N., Lethbridge, Alta.

VE7 — H. R. Hough, VE7HR, 1291 Simon Road, Victoria, B. C.

VE8 — George T. Kondo, VE8RX, C/ Dept. of Transport, P.O. Box 339, Fort Smith, N.W.T.

VO1 — Ernest Ash, VO1AA, P.O. Box 6, St. John's, Newf.

VO2 — Douglas B. Ritcey, Dept. of Transport, Goose Bay, Labrador.

KP4 — Joseph Gonzalez, KP4YT, Box 1061, San Juan, P.R.

KH6 — John H. Oka, KH6DQ, P.O. Box 101, Aiea, Oahu, Hawaii.

KL7 — Alaska QSL Bureau, Box 6226, Airport Annex, Anchorage, Alaska.

KZ5 — Ralph E. Harvey, KZ5RV, Box 407, Balboa, C. Z.

(Cards for SWLs may be handled via Leroy Waite, 39 Hanum St., Ballston Spa, N. Y.)

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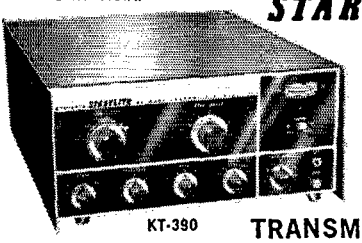

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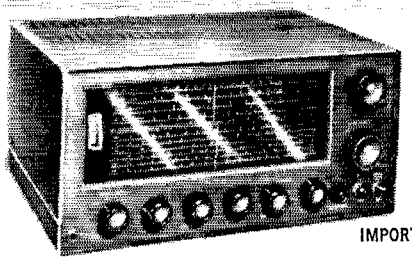

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Sensitivity is 1.0 microvolt for 10 db. Signal to Noise ratio. Selectivity is ± 0.8 KCS at —6db with Q-MULTIPLIER. TUBES: 6BA6—RF Amp, 6BE6 Mixer, 6BE6 OSC., 6AV6 Q-Multiplier—BFO, 2-6BA6 IF Amp., 6AV6 Det-AF Amp. ANL, 6AQ5-Audio output. 5Y3 Rectifier.

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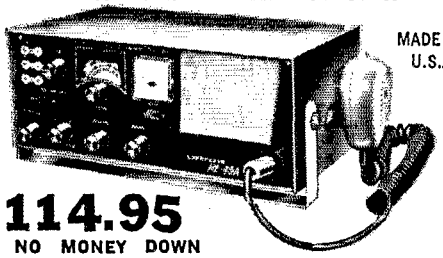

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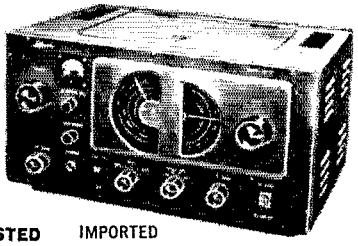

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The Communications Receiver that meets every amateur need—available in easy-to-assemble kit form. Signal to noise ratio is 10 db at 3.5 MC with 1.25 microvolt signal. Selectivity is —60 db at 10 kc, image reflection is —40 db at 3 MC. Tubes: 3—6BD6, 2—6BE6, 2—6AV6, 1—6AR5, 1—5Y3.

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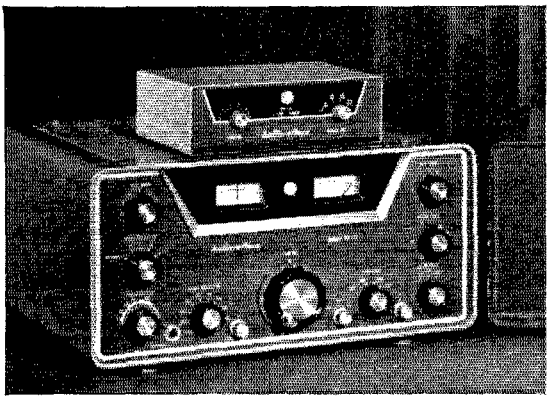

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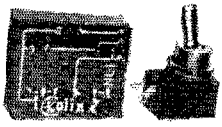

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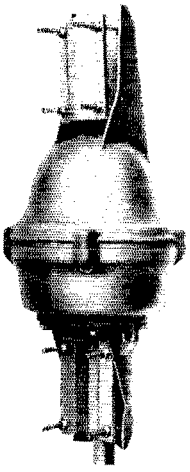
San Diego, California: "I am well pleased with the rotor to date, holds and turns stacked 40M and up beams in 50 mph winds with no difficulty."

Los Angeles, California: "I have personally installed 3 other HAM-M Rotors in the past 3 years (all of them OK) so I feel that I'm buying the best."

Houston, Texas: "Wonderful! Was using the AR-22 (the CDE TV automatic) and it did a fine job for 4 years, but put up a larger beam and needed more power."

Anchorage, Alaska: "Due to below-zero weather, it took quite a while to get up but the last couple of weeks it has proved perfect. Wish I had one years ago."



Alamo, California: "Works very well and purchased on recommendation of my friend who has been using one for 4 years and likes it quite well."

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Pluckemin, New Jersey: "The HAM-M rotates and two TR-15's tilt the 6-foot parabola for 432 and 1296 mc."

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New York, N. Y.: "This is a perfect rotor. Can't see where you can improve it."

(a sampling of mash notes received by our HAM-M)

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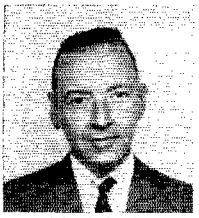


RAY MORRIS
W2QYS

LET'S FACE IT . . . We all expect top performance from our gear. When the rig and receiver are perking along just right we can enjoy our hobby to the utmost. The DX comes a little easier and all is right with the world.

BUT . . . Unfortunately there are times when the equipment will develop a few bugs. Most of us do not have the test instruments or the time to do the de-bugging, ourselves. This is where Amatronics fits into the picture.

AMATRONICS . . . Has the facilities, know-how and personnel to handle your servicing problems. We are all Hams. . . . We know the business. . . . We speak the language.

LOU ARMAGNO
WA2JBG

Authorized Warranty Station

- Hallicrafters • Globe • RME
- National Radio • Hammarlund
- Civil Defense service and maintenance
- Complete receiver alignment service
- Complete transmitter servicing facilities
- Modifications and "up-dating"

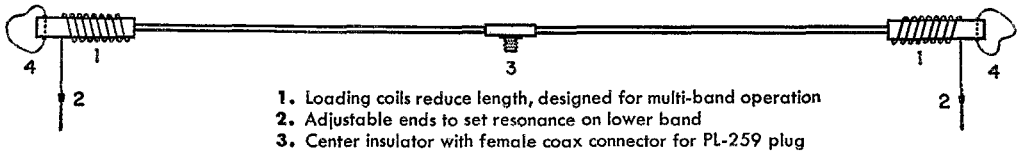
JIM O'BRIEN
K2UDP

Pick-Up and Delivery Service

- Available in the Metropolitan New York, Long Island, New Jersey area at no charge
- This service also available to the "in-warranty" customer at a very nominal fee
- When shipping equipment to us please use Railway Express, motor freight, or air freight (pre-paid)
- Please pack carefully. If in doubt about shipping contact us.

AMATRONICS INC. 91–46 Lefferts Blvd. Richmond Hill 18, New York Telephone (212) HI-1-7890

LOADED MULTI-BAND DOUBLET ANTENNAS



1. Loading coils reduce length, designed for multi-band operation
2. Adjustable ends to set resonance on lower band
3. Center insulator with female coax connector for PL-259 plug
4. Fittings to tie on rope to support antenna

RG-58/U or RG-8/U coax required for feeder

LRL-66 FOR 80-40-20-15-10, 66' long, 2 KW PEP 80-40-15.....$30.00
(1 KW P.E.P. 20-10 Where Decoupling Stubs Used)
LRL-70 FOR 80-40, 70' long, 2 KW PEP 80-40..... 30.00
LRL-125 FOR 160-80, 125' long, 2 KW PEP 160-80..... 30.00

WRITE FOR DESCRIPTIVE SHEETS. SHIPMENTS POSTPAID IN CONTINENTAL USA.

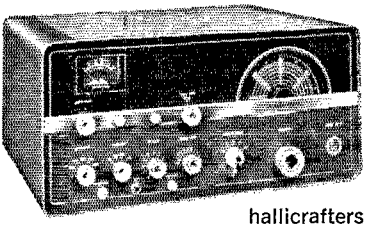
LATTIN RADIO LABORATORIES ▪ Box 44, Owensboro, Ky.

southwest's most complete ham stock

All Popular Makes Of Equipment And Accessories

TIME PAYMENTS • TRADE-INS

We handle our own financing.



hallicrafters
Model HT-37 SSB Transmitter

Call or Write
RONNIE W5ATB
BERT W5FU

Radio, Inc.
1000 S. Main LUther 7-9124
TULSA 19, OKLA.

To QST Readers:

For the third year we're happy to report that the amateur radio business is still being run by amateurs.

There is room here to list only a few of them, but wide-awake operators will recognize W1AFN, W1HRX, W1PRI, K1RNO, K2AKK, W2DCO, W2GHK, W2JXB, W2LOY, W2OSH, K2RMN, W2UVY, K3QAX, W3YXG, W3WBA, K4NMT, W6CEM, W6QKI, W6UF, K8BLL, W8CYE, W8DUS, W9AC, W9GDS, W9SFW, WA9ESM, WØEDX, WØGDJ, WØHCY, WØJRY as some of the hams responsible for the steady flow of new receivers, transmitters and components. Code courses are offered by W2OSH, W2RID, W3TDF, W6TTB.

Mobile antennas come from W1LKQ, W2VHP, W6RAL, W6TKH, K8UQV, among others: W1AWZ, W2BDS, K4KXR, W4YM, W5AJZ, W6GRW, W6ZKA. WØFQY, WØLTE are furnishing us with beams and W2BDS, K2TKN, K3JFF, W6UTB, WØAIW, WØEDX, WØFQY, WØGFQ, WØLTE, WØOJI make towers, rotators for them.

We can buy from hams all over the country. Complete stocks are carried by W1BFT, K1UGI, W2APF, W2AVA, W2DIO, W2FEU, W2IEK, W2LNI, W4ECI, W4ICE, W5ATB, W6TT, W6UOU, W7EHQ, W9ADN, W9ARA, W9BHD, W9DIA, W9IHZ, W9IVJ, W9KJF, W9ZSO, WØGFQ, WØPGI, KØUFE, to name a few.

Some of these calls appeared in *QST* advertisements during the past year — and many other calls were there, too. We counted 288 in 1962. How many can you find?

Mail us your list showing each call and the name of the company whose ad it was in. If you find 150 we'll send you an ARRL Log Book. Please arrange your list by call areas and alphabetically within each call area.

73,

ADVERTISING DEPARTMENT of ARRL
L. A. "Pete" Morrow, W1VG

DO NOT include Ham-Ads and DO NOT include calls listed in Allied Radio's December ad under "and from all the gang," and DO NOT include Hy-Gain's "5th through 30th" list in January, page 111.

HAM-ADS

(1) Advertising shall pertain to products and services which are related to amateur radio.
(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others. No Box Reply Service can be maintained in these columns nor may commercial type copy be signed solely with amateur call letters. Ham-ads signed only with a box number without identifying signature cannot be accepted.
(3) The Ham-Ad rate is 35¢ per word, except as noted in paragraph (6) below.
(4) **Remittance in full must accompany copy, since Ham-Ads are not carried on our books. No cash or contract discount or agency commission will be allowed.**
(5) Closing date for Ham Ads is the 20th of the second month preceding publication date.
(6) **A special rate of 10¢ per word will apply to advertising which, in our judgment, is obviously non-commercial in nature.** 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, takes the 10¢ rate. Address and signatures are charged for. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising so classified takes the 35¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply.
(7) **Because error is more easily avoided, it is requested copy, signature and address be printed plainly on one side of paper only. Typewritten copy preferred but handwritten signature must accompany all authorized insertions.**
(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

Having made no investigation of the advertisers in the classified columns except those obviously commercial in character, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

WANTED: Early wireless gear, books, magazines, catalogs before 1922. Send description and prices. W6GH, 1010 Monte Dr., Santa Barbara, Calif.

MOTOROLA used FM communications equipment bought and sold. W5BCO, Ralph Hicks, Box 6097, Tulsa, Okla.

WE Buy all types of tubes for cash, especially Eimac, subject to our test. Maritime International Co., 199 Front St., Hempstead, N.Y.

RECEIVERS: Repaired and aligned by competent engineers using factory standard instruments. Factory service at reasonable prices on Collins, Hallicrafters, Hammarlund, Gonset, National, Harvey-Wells. Our 26th year. 90 day guarantee. Douglas Instrument Laboratory, 176 Norfolk Ave., Boston 19, Mass.

TOROIDS: Uncased 88 Mhy, like new, Dollar each. Five/$4.00 P.P. DaPaul, 309 So. Ashton, Millbrae, Calif.

SOUTHERN California: Transmitters and receivers repaired, aligned. Bandwidth, frequency, harmonics measured. Used ham gear bought, sold, traded. Robinson Electronics, 922 W. Chapman, Orange, Calif. Tel. KEllogg 8-0500.

WANTED: Two or more 304TL tubes. Callanan, W9AU, P.O. Box 155, Barrington, Ill.

CASH For your gear! We buy, trade and sell. We stock Hammarlund, Hallicrafters, National, Johnson, RME, Hy-Gain, Mosley and many other lines of ham gear. Ask for used equipment list. H & H Electronic Supply Inc., 506-510 Kishwaukee St., Rockford, Ill.

WANTED: Military or Industrial laboratory test equipment. Electronicraft, Box 399, Mt. Kisco, N.Y.

WANT 1925 and earlier ham and broadcast gear for personal collection. W4AA, Wayne Nelson, Concord, N.C.

MICHIGAN Hams! Amateur supplies, standard brands. Store hours 0830 to 1730 Monday through Saturday. Roy J. Purchase, W8RP. Purchase Radio Supply, 327 E. Hoover St., Ann Arbor, Michigan. Tel. NOrmandy 8-8262.

CHICAGOLAND Amateurs! Factory authorized service for Hallicrafters, Hammarlund, Johnson, Gonset. Service all amateur equipment to factory standards. Heights Electronics, Inc., 1145 Halstead St., Chicago Heights, Ill. Tel. SKyline 5-4056.

HAM TV Equipment bought, sold, traded. Al Denson, W1BYX, Rockville, Conn.

KWS1, $900. W2ADD

EIMAC built 4CX1000A final (11/57 QST), the ultimate compact linear, $395; Eimac built brute power supply for above, to 6000v at 1 amp., other voltages, gud industrial or ham (parts over $1500), best offer. Compact pwr. supply in 24" cabinet, to 4000v at 1 amp, solid state, parts over $500, professional design, best offer. W1WNY, J. F. Ashton, 12 Top O'Hill Rd., Darien, Conn. 203-DAvis 5-2125.

SELL: VFO-Matic, for transceive operation with 75A receivers and 9 mc. exciters, $90. F.o.b. Lamb, 1219 Yardley Rd., Morrisville, Penna.

FOR Sale: SX-101A, $325.00 HT37, $350.00. Both for $660. K5MWU. Qtrs 1831B, Blytheville AFB Arkansas.

"FOR The operator that has everything." Samples 10¢. Call Signs, Box 933, Aurora, Ill.

QSO Record Forms on 4 x 6 file cards. New, different, $1.00 for 100. WB2BEV, George Roberts, 763 Eastern Parkway, Brooklyn 13, N.Y.

QSLS? WPE? Get greatest returns! Largest variety samples 25¢ (refunded). Religious QSL samples, 20¢. Sakkers, W8DED, Box 218, Holland, Michigan.

QSLS & SWLS, 25¢. Spicer, 4615 Rosedale, Austin 5, Tex.

QSL, SWL, cards that are different. Quality card stock. Samples 10¢. Home Print, 2416 Elmo, Hamilton, Ohio.

1½" Call QSLS (2 sides printed) 100 $2.75. Samples free. Gariepy, 2624 Kroemer, Ft. Wayne, Ind.

C. FRITZ QSLs guarantee greater returns! Samples, 25¢ deductible. Box 1684, Scottsdale, Arizona (formerly Joliet, Ill.).

QSLS. Twenty exclusive designs in 3 colors. Rush $3.85 for 100 or $6.90 for 200 and get surprise of your life. 5 days' service. Satisfaction guaranteed. Constantine Press, Bladensburg, Md.

QSL Specialists. Distinctive Samples 15¢. DRJ Studios, 2114 N. Lavergne Ave., Chicago 39, Ill.

QSLS "Brownie," W3CJI, 3110 Lehigh, Allentown, Penna. Catalog with samples, 25¢.

QSLS-SWLS. Samples 10¢. Malgo Press. Box 375 M.O., Toledo, 1, Ohio.

QSL-SWL-WPE. Finest. Since 1946. Largest assortment. Priced right. Send 10¢ for samples to: Glenn Print, 1103 Pine Heights Ave., Baltimore 29, Md.

DELUXE QSLS. Petty, W2HAZ, Box 27, Trenton, N. J. Samples, 10¢.

QSL Cards. Call-letter D-cals. Samples 10¢, or send 25¢ for extra large selection and free "Danger, High Voltage!" card. Dick, W8VXK, Rte. 4, Gladwin, Michigan.

QSLS-SWLS, 100 2-color glossy, $3.00; QSO file cards, $1.00 per 100. Samples, 10¢. Rusprint, Box 7507, Kansas City 16, Mo.

QSLS: samples 25¢ (refundable). Schuch, W6CMN, Wildcat Press, 6707 Beck Ave., North Hollywood, Calif.

QSLS, SWLS, WPE. Samples 5¢. Nicholas & Son Printery, P.O. Box 11184, Phoenix 17, Ariz.

QSLS, SWLs, XYL-OMs (sample assortment approximately 9¾¢) covering designing, planning, printing, arranging, mailing; eye-catching, comic, sedate, fantabulous, DX-attracting, prototypal, snazzy, unparagoned cards (Wow!). Rogers, KØAAB, 961 Arcade St., St. Paul 6, Minn.

CREATIVE QSL Cards. Free, new catalog and samples. Personal attention given. Wilkens Creative Printing, P.O. Box 1064-1, Atascadero, Calif.

SUPERIOR QSLS, samples 10¢. Ham Specialties. Box 823 Bellaire, Texas

DON'T Buy QSLs until you see my free samples. Bolles, W5OWC, 7701 Tisdale, Austin, Texas.

QUALITY QSLs. New designs monthly. Samples 10¢. Giant 25. Savory 172 Roosevelt, Weymouth, Mass.

PICTURE QSLs. Cards of your shack, home, etc., Made from your photograph. 1000, $14.50. Raum's 4154 Fifth St., Philadelphia 40, Penna.

QSLS, 300 for $4.35, Samples 10¢. W9SKR, "George" Vesely, Rte. #1, 100 Wilson Road, Ingleside, Ill.

QSLS-SWLS. Samples free. W4BKT Press, 123 No. Main, McKenzie, Tenn.

QSLS. Samples free, Phillips, W7HRG, 1708 Bridge St., The Dalles, Oregon.

QSLS. Samples dime. Rubber stamps: name, call and address $1.35. Harry Sims, 3227 Missouri Ave., St. Louis 18, Mo.

QSLS. Free Samples. W7IIZ Press, Box 183, Springfield, Oregon.

RUBBER Stamp, Call, address, name. Case, ink-pad: $1.00. K4ISA, Perry, Box 8080, Allandale, Fla.

ATTRACTIVE QSLS: Large variety of styles, cartoons, colors. Personal ham stationery. Samples 25¢ (deductible). Paul Levin, K2MTT, 1460 Carroll St., Brooklyn 13, N.Y.

QSLS, 3-color glossy, 100- $4.50. Rutgers VariTyping Service, 7 Fairfield Rd., Somerset, N.J.

QSLS, Kromekote 2 & 3 colors, attractive, distinctive, different. Free ball point pen with order. Samples 10¢. Agents for Call-D-Cal decals. K2VOB Press, 62 Midland Blvd., Maplewood, N.J.

RUBBER Stamps, $1.00. Call and Address. Clint's Radio, W2UDO, 32 Cumberland Ave., Verona, N. J.

QSLS. Write for samples. Blanton's, Box 7064, Akron 6, Ohio.

HUNDRED QSLS. 80¢. Samples, dime. Meininger, Jesup, Iowa.

POCKET Rubber Stamps. Your call plus name and address, $1.00. Ralph, KØUMY, Box 238, New Ulm, Minn.

RUBBER Stamps for hams, sample impressions. W9UNY, 542 No. 93rd, Milwaukee, Wis.

TOP Quality rubber stamps, your call, name, QTH, choice of handle or moulding mountings, 3 lines, $1.95; 4 lines, $2.35. Send remittance with order to WØREU, Dobson, 1312 Delaware St., Leavenworth, Kansas.

QSLS, Stamp and call brings samples. Eddie Scott, W3CSX, Fairplay, Md.

QSLS, $2.50 per 100. Free samples and catalog. Garth, Jutland, N.J.

RUBBER Stamp, 3-lines, $1.00. Travis, Box 612, Austin 63, Texas.

QSLS. Large selection styles including photos. Lowest prices. Fast service. Samples dime. Ray, K7HLR, 679 Borah, Twin Falls, Idaho.

QSLS, Regular or special. Frier Specialties, 21 Harvard, Schenectady 4, N.Y. Samples 25¢.

200 CARDS for $3 in any one color. Your sample 25¢. Arthur Greenberg, 10 Burbank, Yonkers 2, N.Y.

HEY! Sample QSLS-SWLS, etc. Dime. Bill W. Johnson, 1009 Yeadon Ave., Yeadon, Penna.

QSLS. Dime, Filmcrafters, Box 34, Martins Ferry, Ohio.

QSLS-SWLS. The kind you'll want! Highest quality; low prices. Special discounts. Samples dime refundable. Joe Harms, WA4-FJE (W2JME), 905 Fernald, Edgewater, Fla.

QSLS. $2.00 per 100 postpaid U.S. only. Glossy red and green. Free sample. Hobby Print Shop, Umatilla, Fla.

HUNDRED QSLS. 80¢. Samples, dime. Meininger, Jesup, Iowa.

SUPERIOR QSLS, Samples 10¢. Ham Specialties, Box 73, Hobbs, New Mexico (formerly of Bellaire, Texas).

BEAUTIFUL QSLS. Outstanding call letters. Samples 10¢. Gates Print Shop, 317-11th Ave., Juniata, Altoona, Penna.

RUBBER Stamps, name, call and case. Ink pad, $1.00. Perry, K4ISA, Box 8080, Allandale, Fla.

WANTED: A copy of RCA Ham Tips for May 1961. Gutman, 7526 Mountbatten Rd., Montreal 29, Que. P., Canada.

ATTENTION: Amateur radio equipment repaired, work guaranteed. L & S Electronic Technicians, Sid Levinson, WA2OQG, 393 South 3rd, Brklyn, N.Y. Tel. EV 4-7564.

KWS-1 and 75A-4. Both in mint condx. Also station control: Collins spkr in Collins spkr table type cabinet along with clock, standing wave meter and Ham-M rotor control and direction meter and operating lever. This is for the man who wants the best in the best condition. Photo on request. W8BPB, 5210 Three Mile Drive, Detroit 24, Michigan. Tel. TUxedo 4-3800 days.

FOR Sale: 6146, 6883, 3 for $5.00; RCA Monoscopes, 1698 $2.50; lab type SWR Bridge, $60; all new and guaranteed recorders, polar. $300: Rect. co-ord, $75. Brush Instr. $60. Free list. A & B Engineering, 1040 E. 45th, Brooklyn, N.Y.

SELL, Swap or buy ancient radio sets and parts, magazines. Laverty, 118 N. Wycombe, Landsdowne, Penna.

MUHL Antenna traps now available; 80 thru 15M bands can be used on 88 foot lot with recommended configuration. Amateur net, $18.00 pair. Send for literature. Muhl Engineering Co., Box 105, Greenville, Ohio.

GOING High power. Need tubes: 304TL, 833A, 810, 450TH, 750TL, etc. L. Huttner, 1890 East 5th St., Brooklyn 23, N.Y.

WILL Sell Apache for $200. Have Marauder now. K8VHD, Benton Harbor, Mich.

STORM Warning Stations. Building our 12 weather station instruments. Plans $2.00. Saco Press, Box 2513, South Bend, Ind.

WANTED: O-73/URT oscillator. Prefer one manufactured by Meridian, Inc., Stamford, Conn. State price and condition. W9TGI, 801 Glendale Rd., Glenview, Ill.

CUP-CORE Inductances, excellent for sharp or band-pass 50 to 100 Kc. I.F. or B.F.O. Very high Q. Unused, cased, adjustable; solder terminals. Type 1, 2.9 Mh., Type 17, 3.7 mh. Dollar each postpaid U.S. Circuit suggestions included. H. Woods, 2346 Clover Lane, Northfield, Ill.

WE Pay cash for used 2-way radio equipment. State model, price, quantity and condition. Communications Service, 3209 Canton, Dallas, Texas. Tel. RI 7-1852.

TUBES Wanted. All types, highest prices paid. Write or phone. Lou-Tronics, Inc., 131 Lawrence St., Brooklyn 1, N.Y. Tel. UL 5-2615.

FROM Anyone driving to Mexico will buy good mobile rig. "Revmex", Apartado 2807, Mexico City, D.F. 1.

WANTED: For personal collection: QSTs January through August 1916; ARRL Handbooks: Editions 1 and 5. W1CUT, Box1, West Hartford 7, Conn.

CHANGE X-tal frequency, including plated type. Safe method, ammonium bi-floride, containers, holders, instructions, complete, $1.00. Deluxe model, $2.00. Ham-Kits, Box 175, Cranford, N.J.

WANTED: Old wireless gear, tubes, magazines and catalogs before 1925. Amateur or ship equipment only. Please give complete information including prices. My purpose is to buy this equipment, put it in first-class shape and make it available either on a museum or demonstration basis to all amateurs who didn't live and operate during this era. W5VA, T. Frank Smith, P.O. Box 840, Corpus Christi, Texas.

ATTENTION Mobileers! Heavy-duty Leece-Neville 6 volt 100 amp. system, $50; 12 volt 50 amp system, $50; 12 volt 60 amp system, $60; 12 volt 100 amp. system, $100. Built-in silicon rectifier alternators 12 volt 60 amps, $100; 12 volt 100 amps, $125.00. Guaranteed no ex-police car units. Herbert A. Zimmerman, Jr., K2PAT, 1907 Coney Island Ave., Brooklyn 30, N.Y. Tel. DEwey 6-7388.

304TL tubes wanted. Also other xmttg and special purpose tubes. We will buy military or commercial transmitters and receivers with designations ARC, GRC, URR, 51 and MN. Air Ground Electronics Co., 64 Grand Pl., Kearny, N.J.

PROCEEDINGS Of the I.R.E. 1914 through 1949, 1923, 1928, 1931, 1932 complete. Will sell any copy or copies. Excellent price on entire lot. Mrs. Miriam Knapp, W1ZIM, 191 Beechwood Rd., West Hartford 7, Conn. Tel. 521-2055.

WANTED: All types of aircraft or ground radios. 171., 618F or S 388, 390, GRC, PRC, 51J, RVX. Especially any item made by Collins Radio, ham or commercial. Also large type tubes and test equipment in general. For fast cash action contact Ted Dames, W2KUW, 308 Hickory, Arlington, N.J.

HAM Discount House. Write us for lowest prices on ham equipment. Factory sealed cartons. Specify equipment wanted! H D H Sales Co., 327 Greenwich Ave., Stamford, Conn.

CASH promptly paid for your ham gear. Trigger, 7361 North, River Forest, Ill. PR-8616.

TOROIDS: 88 mhy. with mounting hardware. Uncased; like new. Information sheet included. $1 ea. 5/$4.00 postpaid. KCM, Box 88, Milwaukee 13, Wis.

TELEVISION Camera Kit easy to build step-by-step instructions, suitable for Ham TV, Educational, Industrial, Medical uses. Craftsmen Instrument Labs. Inc. 60-30 34th Ave., Woodside, L.I., N.Y.

FOR SALE, complete instructions, including 28-p. booklet, 4-26"x36" schematic for converting the ART/13 transmitter to AM and SSB. $2.50. Satisfaction guaranteed. Sam Appleton, K5MKI, 501 No. Maxwell St., Tulia, Texas.

NEW And used ham gear. Top trades. Norm, K9HRI at Dahn Electronic Supply, 14 Jayne St., Algonquin, Ill. Mail orders welcome.

SELL: Clean rack mount Hallicrafters HT-20 freq. 1.7-30 Mc 490 watt AM. power input, $175.00; Gonset G50 with built-in Ameco Nuvistor preamp., $225.00; Telrex 5-el. beam, $20; CD power converter 12VDC-120VAC, 175 watt, $45; all cash & carry. WA2FVD. Call office: BA 7-7870 and leave msg. F. Eykman, 149 Broadway, Rm. 1902. New York 6, N.Y.

160 through 2 combo Heath DX-100 and Viking 6N2 (factory wired), $250. Cash or certified check. Will deliver 100 mile radius of Pittsburgh. Roy Miller, Linn Drive, Belle Vernon, Penna.

QSTS wanted, earliest copies only. Have later, extras available. Sell Waters 75S-1 Q mult., new and unopened, $22; also C-E model A Slicer, $35. W2DYU, 36 New Lawn Ave., Kearny, N.J.

QUALITY Rubber stamps. Low prices. Pix Pocket 3 lines, $1.00. Sam Koury. K8TCJ, 3867 Fernleigh, Troy, Michigan.

FOR Sale: Pacemaker, $250; HQ-110, $175; NC-300, $240. All little used and in excint condx. Will ship if necessary. Dan Vermut, 83 Blackheath Road, Lido Beach, L.I., N.Y. Phone: 516-GE-2-0707.

FOR Sale: Collins 51J3 with 1.5 Kc and 3Kc mech. filters, $675; 75S1, $375.00, 200V, $675; HT33A modified to "B", $550; transistor Parameter Tester with Hewlett-Packard 400H VTVM, $375; Simpson Signal and Sweep generator, Mod 479, $250; B&K model 160 transistor leakage and Beta Tester, $55; all the above in a like-new condition. W2FUR, S. Gogel, 1096 Laux Pl., N. Bellmore, L.I., N.Y. Tel. SU 5-6876.

COMPLETE Station for sale: Apache, $230; Mohawk, $250; Mosley TA-33, $65; TR-4 rotor, $15; Vibroplex Lightning deluxe bug, $20; Heath SWR bridge, $10; all the above plus Heath spkr, Advance coax relay, JT-30 mike and 100 ft. brand new RG8/U, $550. Mobile equipment: Palco B-65A, Harvey-Wells R-9A, AC and DC power supp. and cables, Triband antenna, coax relay, all in excint condx: $300. K1JSH/2, 36-41 169th St., Flushing 58, L.I., N.Y. Phone FL-8-3575.

SELL: Excint SX-71 with R-46B spkr, 100-kc. calibrator, need money for college, $125. Robert Ball, W7GBF, 104 Parsons Ave., Endicott, N.Y.

JOHNSON Pacemaker, in mint condx, used only 10 hours, excint SSB rig. $250.00. Need college money. Wallace J. Gingerich, Goshen College, Goshen, Ind.

COLLINS 75A-3, in mint condition. Serial number 52. Fully modified. Calibrator. Homebrew product detector. 3.1 Kc filter. $300.00. W9FSV, 3233 Hill Ln., Wilmette, Ill. Tel. AL-1-9462.

FOR Sale: New BC-603 receiver with manual, $10; new BC-1335 transceiver $10; Eico 950-K R-C bridge, $12.50, Eico 147-K signal tracer, $15. John Bagwell, Somerville, Tenn.

SELL: SX-140, $75; Tecraft 2 meter transmitter and pwr. supply, $60; both in vy good condx. Will ship. WA2SZY, Tim Meaney, 136 Pemberton Ave., Plainfield, N.J.

SELL 100-V like new condx. $550; will deliver within 150 miles for gas. Over 150 miles will ship express collect. E. W. Barton, W9IOG, C.M.R. 119 East Peoria, Ill.

FOR Sale: KWM-2 with AC power supply. In mint condx. Less than a year old. Can't use in my Apt. QTH. $825. R. W. Carter, 5111 8th Rd. S., Apt. 201, Arlington 4, Va.

LATE Model G-76 transceiver, xtal calibrator (Srv. Doc. ad printed G-75 in error). Sorenson transistor AC P/S, dynamic mike, spkr. 100 ft. RG-59/U. $345.00. Transistor mobile P/S 12VDC in 500VDC outp. 250 Ma., $25. Williams, 64 Prospect Ave., Hackensack, N.J.

MUST Sell: Globe Scout xmtr: Dow-Key relay; Johnson low-pass; xtal mike; coax connectors. $75 takes all. Phibe 212 WE-3-8338. Write L. Lester, 2241 Creston Ave., Bronx 53, N.Y.

SP600JX, $450; BC779B, $100; National MBL 150, $15; 4CX-300s, $15; 4CX250s, $15; 4X150, $15; 4-250s, $15; 41-125, $7.50; 4-1000A fil. xfrmr, $15; plate transformers, 3600-0-3600, $30. Tim Petersen, KØMTY, 2333 James Ave., North, Minneapolis, Minn.

MUST Sell: RME 4350A receiver with 100 kc. calibrator; matching 4301 Sideband selector and pre-amp; matching spkr. Certified new condx, professionally aligned, works better than new. Will ship anywhere: $190 or you make an offer. Stan Loye, K7BHI, 5120 S.W. Richardson Dr., Portland 1, Oregon.

QSTS Dime each, or buck per year; 1933 through 1943, 1955 through 1960. Six years are in binders. Radio News, CQ, AIEE, 1950s, dime. IRE, 1951 to 1962. 3/$1. Cleaning out surplus gear. November ad. List, W2ZCZ, 33 Wexford, Dewitt 14, N.Y.

TRADE New Bolex 8mm turret movie camera, 3 lenses, zoom lens, filters, fitted leather case for Hallicrafters HT33B linear amp. Sell SCR522A-C shock base, $30; Heath "Twoer", $40; Homebrew 6M to 14 Mc IF, $12; new Ameco CB-6W, $22.50. Abramson, 522 S. Dearborn St., Chicago.

HAM Gear repaired. Kits assembled. Cummings Electronics, WØQPO, Cummings, Box 124, Hot Sulphur Springs, Colorado.

GONSET G-76 Serial 18301 new Jan. 62. $280; 1-1777 tube tester with MX-949AU adapter, $15; Club Saver portable partially wired, all parts, $10; Morrow 5BR-2 converter, $30; De Vry VTVM, $14; Paco 630 AF-RF generator, $20; ARC-2 Pi-network final, $25; MB-150 tuner, $10; Regency tuneable UHF converter, $10; transistor tape recorder, $12; surplus modulator with tubes including pair 807's, $12; Heath grid dipper, $8. Will ship. James W. Stuckey, W5ZJO, 10865 White Oak, Baton Rouge, La.

SELL: Hallicrafters SX-99, $110; Heath DX-40, $55; Heath VF-1, power supply, $20. All in good condx. K2ZLT, 37-19 223 St., Bayside 61, N.Y. Tel. BA 4-0159.

FOR Sale: Collins 75A-4 like new condition with 0.5-0.8-1.5-2-3.1 Kc. mechanical filters, recently factory overhauled, serial number 4202 (erroneously printed as serial number 442 in QST for December). This is still the best receiver made. $595. Complete. Prefer local pick-up but will ship. Frazier, 12 Golden Isle Drive, Mount Dora, Fla.

SELLING Out. Hickok VTVM, 'scope, oscillator, tube checker, Sams, Riders, 100's new tubes. Royal standard mill; Sparx 905 tracer, Webster wire-recorder, new Thordarson amplifier, FM, no cabinet, B&H 16 mm camera, new Packard Bell radio phono, 0-10 DC amp, Triplett, 0-100 new microamp, Seco VT tester, TV's, others Appreciate stamp. Want or will swap for inexpensive KWM-1, also S53A, 3KP4, VW camper. W6NOB, Clarence, 1753½ N. Western Ave., Hollywood, HO 2-3024. (Sta. to Sta. pls.)

HAM Shack 10 ft. x 20 ft, equipped with two SCR-522's, S-102, S-106, three whip antennas, signal tracer, signal generator, tube tester, grid dipper, VOM, and many spare parts complete with junk box. QTH changed therefore house included on same lot 105' x 145'. W7NLR, 111B Henry Circle, Ft. Huachuca, Ariz.

SELL: New Drake 2B, w/cal., like new, DX-100, both $400. WA6MWA, 2214 Lester St., Bakersfield, Calif.

COLLINS KW-1 Serial No. 150, factory converted for SSB, also FSK RTTY optional. Set new spare tubes, instruction books, excint condx, $1995.00. Lester Benson, K4HWF, Box 2832, Pompano Beach, Fla.

SELL: Apache and SB-10, $250. W8QBR, 2036 25th St., Detroit, Mich.

2 KW power supply with 872s, 3000 @ 750 mils, $95; Johnson Matchbox 275 watt with SWR meter like new, $55. E. Shafer, 3479 Kersdale Rd., Cleveland 24, Ohio.

WANTED: ARC-2 transceiver. Sell or trade: BC610 plate transformer 2000 or 2500 VDC 700 Ma. William Wesslund, WØDNW, 2801 Wright Ave., North Platte, Nebr.

HT-30, $175; Clegg 99'er, $85; HC-10, $75. All in perf. condx. Taylor, K2ITP, 201 Leeds, Haverford College, Haverford, Penna.

VIKING II, VFO, mike, $150. Pick up deal only, sry. W9YVZ., 1401 Willow, Western Springs, Ill.

HT32A like brand new. Sell for best reasonable offer. Willard, Box 73, Mead, Nebr.

COMPLETE Station: 75A-4, 3 Kc., Vernier knob, #1460, $460; 3RV-3, $300, L. E. Springer, Oakridge Rd., Auburn, N.Y.

SELL: Ranger II, in mint condx, $250; Hammarlund HQ-110C, gnd condx, $140. Bob Slater, K9ZGT, 1515 Scott Ave., Winnetka, Ill.

KWM-2, serial #433, 516F-2, AC supply, 312B3 spkr. SM-1 mike, in mint condx. Factory manuals and original cartons, $995. K7NFB, Pat Lynch, 6326 Joshua Tree Lane, Scottsdale, Ariz.

TRADE Factory wired Valiant for mobile rig complete. State make, model and price. Cash deal possible without trade. K2BUF, 418 Second Ave., Albany, N.Y.

VIKING Navigator transmitter, factory built, excellent; Globe 300 watt grounded grid amplifier, factory built, excellent; Johnson electronic TR switch, excellent. Quality equipment, used very little. Total factory price: $351.75. First check over $175 gets all shipped collect, insured. B. Kane, 85 S. Main, Pittsford, N.Y.

KWM2 AC and DC pwr. supplies. Late number, $950; Johnson 125 watt Challenger, $75; Johnson KW Matchbox, $65; Gonset 101 linear, $240.00; BC-779 rcvr, $65; Heath SB-10, $75; ARC-5 rcvr, $3; ARC-5 xmtrs, $5; 60 ft. crank-up tower, new, $75. Ridings, 2903 Yearling, Lakewood, Calif.

FOR Sale: Johnson GN2 Thunderbolt, like new condx, in carton, $360; 20A and BC458 VFO, perf., $135; Gonset III 6M, $135; 51J3, needs alignment and dial cord, PTO OK, $490. K1PYI, Tobe Deutschmann Jr., 2020 Washington St., Canton, Mass.

SELL Like new: Heathkit mobile twins, never installed, Comanche, $88; Cheyenne $78; Hammarlund Super-Pro SP400X, $100; Globe Chief 90 w/mod., $40; DX100, $115; Super 6 conv., $25; Morrow Converter 5BR, $25. Instructions. 100THs, 75Ts, 808s. F.o.b. L. A. trade? W6NFV, 24023 Bessemer, Woodland Hills, Calif.

75A4 serial No. 2687, 800 and 3100 CPS filters. First check for $450.00 picks it up. WA2OQE, 1307 Beverbrook Dr., Haddonfield, N.J. Phone HA 8-1815.

SELL 500 new radio-TV tubes. Best offer or trade Collins recvr, or camp trailer. Also prop-pitch motor, $15. BC-1031-B Panodapter, $75. W8WBG, 313-427-5127.

304-TL. Six. Never used. Best offer any number. KH6BXU, 3770 Lurline Drive, Honolulu 16, Hawaii.

CLEVELAND Area, will trade HT-32 for Leslie speaker for Hammond. K8DYW, CH 7-6364.

WANTED: Collins 51-J-4, General Radio 1106-A, 1107-A and 1103-A equipment. Write Robert Seibert, 3423 Humbolt Ave., North, Minneapolis 12, Minn.

SELL Or Trade: Heathkit Cheyenne and Comanche with both mobile and fixed station power supplies. One year old. Best offer over $200 or will trade for good used SSB receiver. K9UQP, 1705 Northwood Ct., Valparaiso, Ind.

TRADE: Sony model 101 tape recorder in new condition for 10A SSB exciter. Ken Akin, K3DNO, 7413 Oak Lane, Chevy Chase 15, Md.

SELL Or trade: Hammarlund HQ180C, noise silencer and spkr., $359.50; Collins transmitter 32V2, 2300 series, $299.50; both are in excint condx. Or will trade receiver and transmitter towards Collins S/Line. Dealers invited. All letters will be answered. Send complete information, condx, price, etc. in your first letter. Ed Lubowicki, 18 Lee St., Apt. 6A, Nixon, N.J.

CUSTOM Building ham gear, VHF specialists. Converters, power supplies, etc., Free quotes. Frontier Electronics, Orr 1, Minnesota. WØHPS, Everett Hoard, WØPYC, Frankie Hoard.

FOR Sale: Knight C-11 transceiver, $40. Kerry Bramham, K4EDN, Rte. #1, Canton, Ga.

CLEANING Out: Lots of parts and equipment. Send stamp for list. WA2EHD, 260 W. Hudson Ave., Englewood, N.J.

WANTED: Collins 51-3 4, R-388, R-390A, R-391, 75A-4, SP-600, teletype, Kleinschmidt, facsimile and test equipment. Cash, or trade for new amateur equipment. Write: Tom, WIAFN, Alltronics-Howard Co., Box 19, Boston 1, Mass. Tel. Richmond 2-0048.

HAM BUERGERS. Used equipment, money-back guarantee: B&W 51SB, $174.95; Central Electronics 10B and VFO, $149.95; Gonset 6 meter linear, $90; 2 meter Gooney Box 1 with VFO, $149.95, Comm. II 2-meter, $139.95; G28, $144.95 Hallicrafters FPM200 $1375; SR34, $264.95; S20R, $59.95; S40, $79.95; S107, $74.95; Heath DX40, $54.95, DX-20, $34.95; DX35, $49.95; Johnson Pacemaker, $339.95; KW Matchbox with SWR Bridge, $119.95; 6 and 2 Xmitter, $119.95; RME DB23A, $31.95; National NC300, $244.95; NC98, $79.95, NC183D, $239.95; NC303, $369.95; Phasemaster II with VFO, $264.95. Trades. Write for free list. Ham Buergers, Wyncote, Pa. CA 4-1740.

BUILD: Any construction article appearing in Handbooks, CQ, QST or 73. High quality parts and workmanship. Satisfaction guaranteed. Write for a bid: Servotronic Instruments, Inc., Melose, W5JFJ, and Stamps, K5OOR, Box 12441, Houston 17, Texas.

HQ-170-C in mint condx, 1 year old, little use: $250; Viking I factory wired TVI suppressed, with Johnson VFO, $120; Elmac PMR6A rec (6v), $65.00; Johnson Matchbox, $35. Will ship prepaid. Edwin Wheeler, K4ADD, 2260 N W No. River Drive, Miami, Florida, 69-1-2341.

COLLINS 75A4, B, C, filters, matching speaker, $475; B&W 5100B and 51SB-B, $300; B&W L1000A, $275; Package deal $950 cash, carry. Ask DX stations about quality of sig from this rig. Al Reiss, W2BN, 320 East 52nd St., New York 22, N. Y. Tel. P-15-5544.

WANTED: Telrex five element 20 meter beam; 60-85 ft. tower; Telrex rotator: 75S-3, 32S-3, 312B-4 30S-1; 604 microphones, 516F-2. For sale: cash or trade toward above: KWS-1, 75A4, D-104, 302C wattmeter. Will sell only complete package, $1625. Miller, 88 Stonewall, Fairfield, Conn.

FOR Sale: National HRO-50T (3 coils), $150; NC-188, $99.95; NC-300, $180; NC-400, $500; Heath Apache, $200; Johnson Viking I, $75; Viking II, $125; Pacemaker, $275; Valiant, $275; B&W 5100, $225; 51-SB, $125; 5100 with 51SB, $325; Elmac A-54, $50 AF-67, $100; PM-7, $100. Grice Electronics, Inc., 300 E. Wright St., Pensacola, Fla.

6 Meter SSB-AM-CW linear amp. 175 watts PEP or 125 watts AM, CW. Brand new. (needs only 3 watts drive) $52. Box 32, Dudley, Mass.

SELL-Swap: New Roberts four-track deck. Two Nortronics amplifiers. All like new. $160. (originally $325). Foy Guin, Russellville, Ala.

FOR Sale: Heath Apache, Seneca, SB-10, OM-3 'scope. Two meter converter and F/W Valiant. K9QAN.

MERCURY Wetted 276F relays. Octal base. Fast, dependable keying, switching. $2.75. Meters 1 Ma/DC, 3½" round, precision quality, $2.75. Postpaid U.S.A. W7RJA, Box 293, Rawlins, Wyoming.

HT-32B, like new condx for $500. Drake 2B and 2BQ for $250. Frank Smith, K2RSP, 31-80 36 St., Long Island City 6, N.Y.

FOR Sale: 1-TCS-12 complete with 12VDC supply, manual, remote control and cables, $120.00; 2-URC-4 transceivers w/pwr. cords, $40 pr; 1-BC-745 pogostick w/pwr., $20; 1, new, 833A, $15; 1 HRO rcvr w/coils, power, manual as is, $25; 1 W2EWL SSB exciter 80-20m less power, 9 Mc. xtal and phase shift, $20; 1 homebrew SSB exciter 80-40-20 100 watt with built in VFO, VoX, low volt power, pair 6146, $120. Rod Hogg, KØEQH, 715 N. Sheridan, Minneapolis, Kansas.

VIKING Kilowat Ped. Lots of extras. $750. K4AOZ.

RECONDITIONED Components for sale. Stereo, Mono. Write for listing. Your trade-ins accepted toward new components. Marrt Electronics, 690 Central Ave., Cedarhurst, N.Y.

WANTED: Assembled Heath Tower. WN2DSL, 2842 West 25th St., Brooklyn, N.Y.

WANTED: Calibration book for LM frequency meter No. 392. Have book No. 167. W6OII.

MUST Sell: DX-40, $30; Heath VFO, $12; S-38C, $36. Heavy brass key, $5, JT-30 mike, $10 and tubes of all sorts. VT4C, $15, etc. 250 watt gun. James B. Lawson, WA4JTT, 606 Normandy St., Cary, N.C.

GLOBE King 500B, in excint condx, $375.00. Will ship. W9WDD, RR No. 1, Box 525, East Alton, Ill. Tel. CLinton 4-0234.

FOR Sale: SX-99, best offer and I will ship PP. W2ROU/5, 607 B. Foch, Bryan, Texas.

SELL: Eldico SSB 100F, $375; L-1001A with matching B&W power supply, extra transformer, $270; VFO-Matic for transceive operation with 9 Mc. exciter, $90. All perfect F.o.b. Lamb, 1219 Yardley Road, Morrisville, Penna.

COMPLETE Station: 300 watts, Globe Champion 300A, HQ-110, Hornet 3B1, Triband beam, orig. over $800. First $350 cash takes all. No shipping, sry! K4KEK, 105 Elliot Circle, Oak Ridge, Tenn.

MAKE Offer Two RCA 5820 image orthicons and one 1850A iconoscope. WA2UNN.

SELL: 75A3 with speaker, serial 1504, in top condx, $325.00. K9CUT, 335 South 22nd St., La Crosse, Wis.

HEATH Marauder, SSB-xmitter, professionally assembled, Hammarlund HQ-180C, like new condx Johnson Matchbox w. SWR meter. W2BAA, 22-12-128 St., College Point 56, N.Y.

ANTENNA Coupler, identical to 1959 ARRL Handbook design, page 353, but for KW capacity and with built-in SWR bridge and meter. $43.50. Don Maxwell, W8FQS, 1525(E) Bridge Road, Charleston 4, West Virginia.

COMPLETE Antenna system E-Z Way 3 section heavy-duty, Galvenized tower, Ham-M rotor, ground post, Hy-Gain 402-B and TH-4 beams. Remote relays and all cables. Installed only 4 months. $500 cash and carry! Michael Myster, WA2UNE, 295 Grand Ave., Lindenhurst, N.Y. TU 8-8598.

SELL: Perfect GSB-100 $325; SX-111, $185; P&H linear, 800 w. PEP with 837s, $125; Taubin, W2GCW, 144-44, 41st Ave., Flushing, L.I., N.Y.

SELL: HQ-170C with Damppchaser, in top condx, $255; local area deal, Frank Stolpen, W2HZQ, 2132 E. 13th St., Brooklyn 29, N.Y. Tel. DE 9-8175.

SELL: DX-35, $35.00. WA2QPX, 50 James St., Westwood, N.J.

KNIGHT R100 receiver, covers 550 Kc-30 Mc. bandspread dial for 80-40-20-15-10 M. Contains Q-multiplier for extremely sharp selectivity. With 100 kc. xtal calibrator, S-meter, outside speaker. In excint condx, $100. Power supply, mounted 8¾ x 19" panel, 300v. at 200 ma., 6.3v. at 4 a. Includes extra transformer, 6.3 v. at 2.7 a., 90 115v. at 60 ma., 6.3 v. at 13 a., 1500 v. insulation. Has 3" panel voltmeter, $35. Tuning condenser, dual 180 mmfd., .220 spacing, $7.50; four 8 mfd. 600 volt oil condensers, meta; case, $4.00 each. 3-speed Webster record changer, has diamond 33 monaural stylus, matching base, $25. Cannot ship, sry! W2HTD, 86 Brook, Red Bank, N.J.

A-1 Reconditioned equipment. On approval. Trades. Terms. Hallicrafters S-107, $69.00; S-85, $79; SX-99, $99; SX-100, $179; SX-11, $149; SX-101A, $229; Hammarlund HQ-100, $119; HQ-110, $169; HQ-170, $259; Valiant, $279; NC-300, $199; Collins 75S-1, $379; 32S-1, $499; National, Gonset, Elmac, Heath, Johnson, RME, many others. Write us for lists. Henry Radio Co., Butler, Mo.

FOR Sale: Johnson Viking kilowatt with righthand desk. Price includes 2 spare 810s, 2 kw. 50 Ω transmatch, Johnson KW low-pass, 110VAC Dow-Key coaxial ant. relay and 40 watt audio driver. All in perf. optg. condx. Ready to go. $750. Wm Brown, K6EVB, 7737 Fair Ave., Sun Valley, Calif.

75A-4 with 2 and 5 Kc filters. Best offer received by January 15, 1962. Over $535. Merry Christmas! W4ZRH, C. R. Commander, P.O. Box 905, Charleston, S.C.

500B Globe King, 60 hours optg. time. Best offer above $290. W3MBB, RD 4, Box 259, Altoona, Penna.

SELL: Heath Apache xmtr and Mohawk rcvr, both like new condx. Will ship. $425.00. Roy Kraft, WØAEJ, 114 Catalina, NAS Lemoore, California.

SELL: Hallicrafters S-38E1 isolation transformer; S-meter, Heath HD-11O multiplier, $80 complete. David Keebler, West Lake Rd., Skaneateles, N.Y.

SELL: 80-10 meter vertical with 500 ft. of RG 58/U coaxial cable, $35; factory boxed. Hallicrafters S-120 Ham/SWL rcvr, $50; brand new. Crystal microphone with 25 ft. of cable, $5. WA2VRK, Michael Bender, 61 Millrock Road, New Paltz, N.Y.

WANTED: Elmac AF-68 or Gonset G77. State price. Local purchase only. Bob Aberle, 1 Rudolph Dr., Carle Place, N. Y.

KWS-1. Gud opertg. condx. Will sell to best offer over $700. D. Anderson, Box 437, Hiawatha, Iowa.

GONSET G-50, new this year. $215.00. K8YWS, Dave G. Steffens, 656 Cascade Rd., Cincinnati 40, Ohio.

SELL: Viking Challenger w/PTT; model 122 VFO; NC155, TA33 Jr., AR22, both w/cable. Contact K1RFE.

KWM-1 with AC power supply, both are in excint condx. $425.00 cash and carry. S. Ross, W9ISY, BE 7-1082, 1844 N. Ruthertord, Chicago 35, Ill.

HAVE: 1 Kw 3000v. 110/220V power supply kit, reasonable; homebrew 4-250A 3.5-30 Mc. Linear, UTC S-74 pwr. xfrmr. Want gud BC-221 or equivalent. W2PZI, 48 So. Lake St., Hamburg, N.Y.

75A-4 Collins receiver Ser. No. 2343, in excint condx. Will ship in factory carton F.o.b. New Orleans, $425.00. Check or m.o. required. R. E. Neumann, W5KHX, 75 Thrasher St., New Orleans 24, La.

APACHE, wired professional engineer, $200. Boecher, Woodedge Dr., Huntington, N.Y.

TRANSMITTER, 300W., 80-20, S-100 Mark II, $325 (plus extras). K1NJH, 390 Roosevelt Dr., Seymour, Conn.

ALUMINUM For every ham need. Write to Dick's, 62 Cherry Ave., Tiffin, Ohio, for list of tubing, angle, channel, castings, plain and perforated sheet, and complete beam kits.

SELL: Courier amplifier, $150; HQ-150 rcvr, $150. Prefer pick-up deal. K8CKW.

WANTED: One DX-35 operating manual. Alvin W. Latta, K8DHJ, 1809 Clark Ave., S.W. Canton 6, Ohio.

MOSLEY CM-1 receiver, used less than 10 hours, in new condx, $155. P&H VFO-matci, in gud condx. Make an offer. Hy-Gain 3-el. 10M beam. K4TCK, 689 Beth Lane, Lexington, Ky.

TROPICAL Three bedroom home in Florida: two baths, double garage, central air conditioning, sewers, three minutes to beaches. With forty-foot tower and cubical quad. Price $17,900. Phone St. Petersburg, 391-1009. W4SDC.

DRAKE 1-A w/xtal calibrator. In excint condx. $150.00. Richard Uhl, 4906 Northcrest Dr., Ft. Wayne, Ind.

KWM-2, PM-2 portable supply, CC-2 carrying case. Hardly used. Mint condition. $1000. W9HOM/Ø, 8334 Graybirch Drive, St. Louis 34, Missouri.

WANTED: HRO-60 coils AC and AD. Must be operative and include dial scale. K7MLU, Myron Perry, 1975 W. 6000 S., Roy, Utah, TA 5-4896.

FOR Sale: Gonset G-77, power supply, cables, excint condx, $145; Elmac AF-67 in gud condx, $75; Elmac PMR-6, 6 and 12 volt pwr. supply, gud, $60. F.o.b. Augusta, Kansas. WØIPM, 1911 Ohio.

FOR Sale: Globe Scout deluxe and model V-10 Globe VFO deluxe, less than 6 mos. old. Perfect condx and no scratches: $150. Richard Hennis, K5YBB, 3912 Cedar St., North Little Rock, Arkansas.

COLLINS 30L1 linear amplifier Drake Q multiplier with spkr, both brand new, and Paco 5" 'scope, excint condx, no scratches, all three for $475.00. Collins 32S1 with AC pwr. supply and built-in spkr, 75S1 with factory noise blanker, both 2 years old, but perfect condx, no scratches. The pair, $945.00. Whole works for $1395. Dr. Nelson Murray, W4MBM. Phone EV 9-2297, Jacksonville, Fla.

MILLEN Grid dipper with probe, 46704 and 46702 coils, $50; DI-104 mike with telescoping stand, $12.50; B&W 425 low-pass, $10; Heath WA-P2 preamp, $10; Wingard FM booster-coupler, new, $10; trequ. standard, inquire, $25. Eldico ant. tuner w/coils 160, 80, 20 $15. Eldico line filters, $6. New surplus 813, $8; T-R switch, $8. General GLC-B stereo headset, $20. Pair unused 40 ft. surplus telescoping poles, $15; F.o.b. All other items prepaid. Oliver Nash, R #6, Midland, Michigan.

FOR Sale: HQ-140XA, Q-Mult., spkr, Model 14 typing reperf needs some work on it), Model 14 TD CV-57/URA6 FS converter, PE-103 ready to mount. All the above with manuals and/or schematic. S. J. Goch, K2IVB, 1062 Virginia Ave., Bronx, N.Y. Tel. UN 3-2215.

DX-100B, HQ-110C, 12V Super Six conv. All in excint condx. Best offer. KØQCU, 407 W. 26th, Kearney, Nebr.

202 COUNTRIES worked with my HQ-129X. Now tor sale with xtal/cal., $115.00. BC-221 with original calibration book, $65. Meissner VFO, $15. Larry Pace, K2IXP, 2740 Cropsey Ave., Brooklyn, N.Y.

KWM2, and AC pwr. supply, like new condx, no trades! N. Title, W6AYJ, 342 N. Orlando Ave., L.A. 48, Cal. WE 6-5449.

KNIGHT 50 watt transmitter, key, mike, Johnson modulator, $46.00; Knight DXer transistor radio, $10; new 4D32 for Collins $8.00 each; BC348 original AC supply, $6.00; Knight R-100 receiver, $74; DX-40 real gud, $49.95. Parts 1900 supply 525 Ma., $20. Gifford 698th Radar Sqdn Thomasville, Ala.

TO Settle Estate: Gonset G76 transceiver model 3338, serial 1209; Gonset power supply G76AC model 3349, Serial 1015; multi Elmac AF68 transciter serial 10171; multi-Elmac pwr. supply No. 678; numerous accessory items. Best offer. Write Harvey J. Lambert, Atty. Box 131, Ada, Oklahoma.

75A-3 with reduction know and calibrator, DX-100, SB-10 with separate pwr. supply, all cables. All units were in console. Builder holds Amateur Extra and First Class commercial licenses. Best offer over $500. K2ODT, Dick Lodwig, 1060 Carukin St., Franklin Square, L.I., N.Y. Tel. FL 2-0567.

DETROIT Distributor offers big savings for cash deals on new amateur equipment. Write for prices from Collins down. Volume purchasing permits ale at old prices while inventory lasts on Hallicrafters HT37, $450; HT33B, $795; SX101A, $369; SX-111, $229; Collins 75S3, $620; Clegg 99er, $139.00; Zeus, $595. Gonset GSB201 $399.50. Twenty demonstrators with new warranty available. Radio Supply and Engineering Co., RSE Ham Shack, W8VSK, 90 Selden, Detroit 1, Mich.

SWAP latest HQ170C plus cash for Marauder and, or Mohawk unassembled. K9QGS.

SELL: Hallicrafters S-38C. In excint condx, $35.00. John Cook, 3105 Mt. Vernon, Bakersfield, Calif.

SELL: Lampkin 205A modulation indicator with quad scale. Like new condx, $250. Russ Stewart, Yellow Springs, Ohio.

SHIPPING Prepaid: Globe King 400A, $137.00, NC183-D, $160; Globe 755 VFO, $32.00, Johnson 122 VFO, $21.00; Harvey-Wells TBS5OD, 115V/PS and VFO, $38. W9JVF, 1849 E. 49th St., Indianapolis 5, Ind.

SELL: TV camera, weighs 5 lbs., 110 Vac transmits actual RF channels 2-7 connect to antenna on any TV $295; Eldico SSB 1000F 80-10 linear amplifier $350.00, Collins 310C-2, $45.00. Transformer 5000 VCT 350 Ma., $35.00. Will consider trade for SSB exciter or 75A4. Prefer pick-up deal. Bert Simon W2UUN, Oak Ridge, N.J. Call after 7 PM Tel. OXbow 7-4246.

DELUXE Rubber stamp, call in king-size type, name, address, $2.00. Compact stamp, $1.00. Frey, Box 296, Schwenksville, Penna.

WANTED: Commercial or surplus Airborne, Ground, Transmitters, Receivers, Testsets, 618S, 18S, 17L, 51R, ARN14, GRC, PRC, ARC27, ARC33, ARC34, others. Ritco, Box 156, Annandale, Va.

75S-3 for sale. Purchased from Collins June 1962. In perf. condx, $530 in original carton, with instruction book, cash & carry. Frank A. Hayes, Red Hill Rd., Middletown, N.J.

SELL: Gonset G-76 with model 3350 transistor supply with mounting brackets, and AC supply, factory re-aligned recently, $410. WA6KUM, Brian Ziak, 1075 E. 8th St., Chico, Calif.

HEATH Seneca, $135.00. W5ELF, Rte. 3, Box 125-A, Hot Springs, Ark.

SELL: HQ-145C, $195; Apache, $200. WA2ZVJ, 2115 East 27th St., Brooklyn, N.Y.

FOR Sale: Gonset Triband converter, in vy gud condx; Dumont 3" oscillograph 'scope, like new condx; Gonset G66B mobile receiver, with 3-way pwr. pack, in like new condx; Riders Service manuals, TV Vol. I; Radio, abridged, Vol. 1-5, 3, 7, 9, 11, 13. All in like-new condx. Wanted: gud communications receiver. All the above items will go to best offer, cash or otherwise. Bartinoski, Box 66, Essex Junction, Vt.

COLLINS 75S1 receiver; Superior check-writer (swap?); Drake 1000 low-pass filter; transistor desk clock. Any reasonable offer. Locascio, 8420 51 Ave., Elmhurst, L.I., N.Y.

ADVENTURER, like-new condx: $45. WA9CEQ, 833 So. Shore Drive, Madison, Wis.

I Have a good "clean" Gonset G-63 receiver, complete with manual for sale for $150. It is in a "like-new" mechanical and electrical condx and does not have a scratch on it! Full specs of rcvr in March 1960 QST. I will answer all inquiries. James H. Demler, WØDSU, 318 Garfield Ave., Hastings, Nebraska.

VIKING Challenger, $85; VFO, $29; S-85, $89; Heath Q-Multi., $8, RME Pre-Selector, $20; all in gud condx. KØIPI, 4919 Walker, Lincoln, Nebr.

COLLINS 75S-1 for sale, with 500CPS filter and BFO xtal. Like new condx, $390.00. Ray, WA2PJV, 112 Surrey Dr., Wayne, N.J.

HAPPY New Year and the best of everything for 1963 from WOCVU. My 50th Year on the air.

TRADE BC-348R AC receiver and Eddystone 840 AC-DC Receiver for a pair of walkie-talkies, or an electric train set of equal value. Tel. 3-8983. Erik Karlsson, 112 St. Mark's Ave., Brooklyn 17, N.Y.

DSB-100, excint, manual, $69. K8JRC, 15808 Oceana, Allen Park, Michigan.

RANGER, in excint condx, $160.00. W2TZI, 467 Apple Orchard Lane, Webster, N.Y. Tel. OS 1-5872.

ATTENTION! Swap equipment, components with other hams! Many interesting offers in "Equipment Exchange"! Sample copy free! Write: Brand, Sycamore, Ill.

NC-300, xtal calibrator, 6N2 converter $230. Roy Norby, K2CQG, 2514 Crompond Road, Yorktown Heights, N.Y.

HT-17 $22.50; HT-18 $45; Globe Chief 90 unused, $47.50; screen mod. $10.00; C-E model A-SSB slicer, $35.00. Nat. NC98-TS, $5.00. W. S. Cox, Rt. 1, Box 547, E. Brunswick, N.J.

FOR Sale: 6 Meter Gonset VHF power amplifier, mod. 3065. Like new condx, used only 4 hours, $100. E. J. Middleton, 320 W. Franklin Street, Morrisville, Penna. W3GFQ.

FOR Sale: Johnson Thunderbolt linear amplifier, 2000 watts P.E.P. Used only 5 hours, like new condx. $275.00. Will deliver within 75 mile radius of Los Angeles. Miller, W6EMN, 5842 Oliva Ave., Lakewood, Calif. Phone ME 3-7706.

MOBILE Rig: Elmac AF-68, PMR-8, M-1070 supply manuals, DK relay, LP filter, S-meter, RG-8/U coax; Astatic 331 ceramic mike, chest mounting with neck strap. All angle-iron frame mounted for hump installation. In excint condx. Firm $335.00 F.o.b. Levittown, Penna. Tom Allen, K3BUL, 15 Quill Road.

CABINETS: Polystyrene, tan—table type, approximately 10 x 5¾ x 3, excellent for VFO, test equipment, meters, etc. Large quantity. $1.50 each P.P. Peak Plastics Co., Box 189, Yonkers, N.Y.

SELL: Heath 6 meter "Shawnee" transceiver. Like new condx, in perf. optg. condx. Well wired, aligned, and calibrated. With all cables and instructions. $220. K3OBU, 2803 Duncan Rd., Wilmington 8, Del.

SELL: Johnson Viking Courier Linear amplifier, 500 watts, 5 mos. old. Cost $295. Price $220. Ellis A. West, Jr., K5FUT, 5416 Vicksburg St., New Orleans 24, La.

COMPLETE Station: HT-37, Heathkit Mohawk, both perfect, Electro-Voice 630 mike, Heath SWR bridge, Dow Key relay, coax ant.switch AR-22 rotator, Hy-Gain Tribander, 10 ft. tower and roof mount, coax, all for $750. Plus free plenty home-built gear and parts capable of 1 kw SSB or 500 c.w. plus AM modulator, VFO, 6146 exciter, etc. Dick Goldberg, W2PGF, Elm Place, Armonk, N.Y.

COLLINS Owners work AM! S/Line, KWM-1-2! No drilling! No soldering! No chassis removal! Instant switching! Easy installation! Wired kit, $5.00. Kit Draft, Harlan, Ky.

SELL: KW xmtr, 4-400A final 304TH modulator, Viking Ranger, 75A-4 with spkr, misc. accessories, R. Linder, 3 Maud Graham Circle, Burlington, Mass. Tel. 272-3058.

PERFECT HQ-150 for best offer or trade toward 75A4 or S/Line. Also excellent B&W-5100 with B&W-51SB with B&W Matchmaster. Perfect RME-23DB Preselector, $25; F/W Eico model 425 scope $30; new replacement meter for Model V-7A VTVM, $7. Housecleaning list for SASE. K8WSR, 125 Carmel Ave., Galion, Ohio.

SEND Your want lists for old radio magazines and QSTs. Mrs. Conrad Beardsley, 119 Wythburn Rd., So. Portland 7, Me.

YOUR HEATHKIT Conelrad Alarm gathering dust? Convert it to a useful versatile Photoelectric Control Unit. Kit with instructions, $4.95. A. Melechinsky W1YAE/2, 16 Northwood Ave., Glen Rock, N.J.

AUTOMOBILE AC/DC generator 2300 watts 115v, $149.50; KWS-1, 75A4 and noise blanker, $1250; new factory-wired SB-10, $89; Tapetone TC-220 converter, $39; photocopy set, $15 (swap?) transistor stereo-preamp, $29.50; stereoamp, $15; stereo record-player, $24.50, audio sig-gen., $17; RCA transceiver $45; Johnson 6N2 converter, $45; 220 and 432 Mc. linear amplifiers, Bendix 4X250 220 xmtr $25; Heath color generator, $55; pair 4-400A, $40, trap traveler, $34; transistor pwr. supply, $20; Lakeshore Tonemaster, $7; tubes, meters, list sell/trade. Want SSB mobile. W4API, 1420 South Randolph, Arlington 4, Va.

FOR Sale: 75A3 with 3 Kc. filter, calibrator, spkr, $350; GSB 100, $275, both excint. K1MID, Hillsboro, N.H. Phone 478-3152 (Code 603).

WANTED: Commercial, medium power, ham transmitter in good condx. Will trade 5J3, new cabinet, recently aligned. Also other gear. K1ZEX, 91 Johnson Rd., Falmouth, Me.

RICH at W9JS still looking for Bacon B&D plectrum banjo, and Ludwig banjo-uke. Cash or swap ham parts.

JOHNSON C. B. Messenger with beacon antenna, $100; Heath 6M Shawnee in mint condx, $240; 6M Halo, $10; AR22 plus indicator, $20; prefer local deal. WA2OHN.

COLLINS KWM-2, S.N. 11621, 516F-2 AC supply with built-in speaker. Used 10 months, never mobile. Excellent condx. $925.00. Al Rothschadl, 1223 Ninth St., Watertown, Wisconsin. W9WAQ.

RME 4350A receiver, immaculate, described Sept. 1958 QST, $160; RME VHF-11 receiver for 2, 6 and 10; includes 2M cascode preamp; FB for Technician or Novice. $60. Ship anywhere. WA6QIC, 1849 Middleton Ave., Los Altos, Calif.

GONSET Tri-band conv., $15; 500 w. 6M final, $35; H.P. aud. osc. 200 IR, $45; T'scope, $20; 9" RCA 'scope, $35; Variac 3A, $6; SA, $8. K2JSO, 2043E 52nd St., Brooklyn, N.Y.

WANTED: NC-98 or 88. Will trade 100 wt. modulator with power supply, BC654-A and pwr. converter, plus about $150 of gud parts. Send self-addressed envelope for list. K7RRF, 1921 Azalea, Grants Pass, Ore.

MILITARY Model 15 Teletype. New, $100. Sry, no shipping. W9UE.

SELL: Factory built Eico 720, in excint condx, $70. WN9EBT, 504 W. Aldine, Chicago 13, Ill.

COLLINS Transmitter, 32V2, in excint condx, asking $200. W2QBC, 30 Edgar Ave., Buffalo 7, N.Y.

SALE: Viking Challenger with push-to-talk. In excint condx, $90. Prepaid. WA6CNT, 1749 Lucerne, Stockton 3, Calif.

SX-43, $60; Eico 723, in excint condx, $55; Vignali, 29-08 31st Ave., L.I.C. 6, N.Y. Tel. RA 1-4518.

32V3, $260; HQ170C, $240. Both for $450. Guaranteed perfect operation and appearance. W4PLM.

FOR Sale: Brand new Model 14TD 60 wpm, sync. motor, $60. Non-typing reperf., $60. K5CHF, 867 Berkinshire, Dallas 18, Texas.

SELL: DX-20, Hallicrafters S-107, QF-1. Guaranteed good. Sell all for $115.00. Steve Buholz, Box 77, Brookings, S.D.

WANTED For cash, unmodified, clean 32S1 and 516F2, also 30S1 final. W9EWB, Walt Kohlhagen, 818 Oakley, Elgin, Ill.

WANTED: 24-hour clock model TD-2400; also, Eico code oscillator, Mod. 706. For sale: Ameco code oscillator, $10. R. L. Wildman, 469—9th, Phillipsburg, Kansas.

COLLINS 75A4 with 2.1 and 3.1 filters, $550.00; KWS-1 has castor equipped base for power cabinet, $875.00. Together, $1350.00. Picture available. Dick Whitney, W2UMI, Mexico, N.Y.

COLLINS KWM-1 Serial 1032 with matching power supply, in excint condx, $495.00. Will deliver within 100 miles. National NC-125, $80. Art Rieders, K1UGK, 225 Kelton St., Boston 34, Mass. Tel. 566-5880.

TV Camera, RCA TV-eye with complete control per article Nov. 1962 QST, $325.00; BC614 speech amplifier, $45. Sell; BC610 by sections; power supply, modulator, etc. W8BKH, 102 East Schaaf Rd., Cleveland 31, Ohio.

SELL: Morrow mobile 5BRF converter and fixed tuned rcvr, in excint condx, $80; two 50 ft. tubular plywood masts in 10 ft. sections. Navy type 40S1, with erection equipment, block & tackle, anchors, base plate, pre-cut cable guys, instructions; one new mast, one used 6 mos, both for $80. Components of Navy transmitter TCN-1: 2-18 Mc suppressor modulated transmitter, with 4-837, 2-803 output, nine 2" meters, filament supply, used 6 mos, $80; also 0.3-2 mc. CW xmtr with 3-837, 2-803 outp., seven 2" meters fil. supply, new, $40. All have service manuals. W9HVK, 530 Meadow Dr. East, Wilmette, Ill.

SELLING out account of health retiring from ham radio after fifty years. (Gov't call book 1915-9VP) factory name equipment good as new condition mostly fifty percent discount from national advertised prices. Collins KW-1 transmitter $1925.00, Collins KWS-1 $925.00, Collins 30-S1 linear $875.00, Collins 312-B4 $97.50, Central Electronics MM-2 scope and adapt $95.00, Heath Seneca six and two meters factory wired $105.00, RTTY teletype model 28 ASR factory demonstrator $1400.00. Model 19 complete table, filters, rect. $450.00, Electrocom 250-FSC three filters $275.00, May 1961 issue RTTY magazine for picture. All inquiries answered. Benson-WØZB-K4HWF-Box 2832, Pompano Beach, Florida.

YEAR-End close-out sale! Brand new store demonstrators, limited supply Hammarlund HQ-145X, list $279.00, sale $219.00; HQ-170 C, list $369.00, sale $290.00; HQ-180C list $439.00, sale $345.00; Gonset GBS-201 linear amplifier list $419.95, sale $345.00; Sonar citizens band model E transceiver list $179.50, sale $129.50. Limited supply. No trades! Bill Slep Co., P.O. Box 178, Ellenton, Fla., Tel. 722-1843.

SELL F/W Ranger, $165.00 This is a good one with three spare 6146s; Johnson TR switch, $15; pair new 4-125s, $25; pair new GE 813s, $25; HVDL coils 10-20-40 meters and shielded links at half net price. W5UX, 154 Country Lane, San Antonio 9, Texas.

NORTH Jersey area: Hallicrafters SX-99, perf. condx, you'll agree! $70 cash and carry. WV2VYW, 425 Hillside Place, So. Orange, N.J.

WANTED: Two junker BC-221, no xtals, tubes or cal. bk. Write: K7MAT.

SELL: Collins 32V3, spare 4D32 tube, Astatic D-104 mike, low-pass filter, ant. rotator. W5UBY, Parker W. Scott, 8820 Graywood Dr., Dallas 31, Texas.

SELL: SX-115, 200-V, HT-41, separately or as a package deal. New condx! Surplus to my need. Best offer! Eliot Young, M.D., W1JUP 66 Cypress Rd., Milton, Mass.

NC Rcvr. Perf. condx. Need money. Sell for $500. K1AJC, 41 Almy, Providence, R. I.

TRADE: Sig. gen. Superior 650-A Dumont 3" scope, model 164-E for gud FM tuner. K2ZRU, 684 South Washington Ave., New Market, N.J.

COLLINS 75S1, $375; B&W L-1000-A w/tubes, $200; Tecraft xmtr, 220 Mc, $40; Health Twoer less mic., $40. Frank Wakefield, Franklin, Ky.

GLOBE Chief 90, needs xfrmr, $20; SG modulator for same, $8; Knight VFO, $20; Variac 3 amp., $8; transceiver 160, 80 meters AM, 100 watts, $50. Include postage pls. W2QND, 176 Winding Way, Little Silver, N.J.

WANTED: Early Hallicrafters receivers for personal collection. Please state condx and your best price. H. Hoagland, 3036 So. Robertson Blvd., Los Angeles 34, Calif.

WANTED: SW3-58AC with coils for 10, 20, 40 and 80 with or without power supply (National eqpt.) State price. W2GDE, Monterosso, 4156 Harriet Rd., Bethpage, L.I., N.Y.

VIKING 500, like new, Dandy rig, but hasn't been used since KWM-2 moved in. Make offer. K7NHO, 2727-132nd St., Bothell, Wash.

TOROID RTTY Kit: Mark-Space discriminator and bandpass filters. Inclues 4-88 Mhy and 1-44 Mhy uncasel, like new condx. toroids: information sheet, mounting hardware and six mylar capacitors. $5.00 ppd. Toroids: specify 88 or 44, less capacitors, $1.00 each. 5/$4.00. ppd. KCM Products, Box 88, Milwaukee 13, Wis.

"HOSS TRADER" Ed Moory, can sell cheaper "because we operate in a small town, with low overhead. Telephone for lowest cash quotes on most brands of ham equipment. Demonstrator equipment and used gear in warranty: Swan transceiver, $239; 75A-4, $479; KWM-2, $789; 2-B, $219; Ham-M rotor, $75; TH-4 beam display model, $77; 200-V, $689; 30L-1, $389.00; HRO-50-T with slicer, $229; new Gonset GSB-201, $319; new HQ-180-C, $359; Demon. Loudenboomer amplifier, $229; new Globe Chief Deluxe, $59.50; Johnson Pacemaker, $189; SX-115, $379; HT-37, $359. Terms, cash. Ed Moory Wholesale Radio, Box 506, DeWitt, Arkansas. Phone WHitney 6-2820.

CRYSTALS Airmailed: SSB, MARS, Commercial, CD, Novice, CAP, Ne. etc. Custom-finished FT-243, .01% any kilocycle 3500 to 8600 $1.49, (10 or more FT-243, same frequency, 99¢). 1707 to 20,000 kilocycles $1.95. Above 10 megacycles are overtones. Fundamentals 10 to 13.5 megacycles $2.95. Add 50¢ each for .005% Add 65¢ each for BC-6/u hermetics. QST crystal kits (FT-243): "SSB Package," five mixer, $9.95, seven matched filter (FT-241-A), $9.95. "DCS-500." "IMP," "Phasing", $9.59 set. Write regarding your crystal needs. Air-mailing 10¢ crystal, surface, 5¢. Crystals since 1933. C-W Crystals, Box 2065-Q, El Monte, Calif.

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5100 Transmitter	$199.00
Clegg	
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Collins	
KWS-1 Transmitter	950.00
KWS-1 (RF Unit Only)	675.00
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32V-2 Transmitter	225.00
Drake	
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Champ 300 Transmitter	219.00
Champ 300A Transmitter	259.00
King 500C Transmitter	395.00
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Six-Meter Linear Amplifier	79.00
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HT-33 Linear Amplifier	299.00
S-95 Receiver	49.00
S-107 Receiver	74.50
SX-110 Receiver	129.00
SX-140 Receiver	99.00
Hammarlund	
HC-10 Converter	89.00
HQ-100 Receiver	139.00
HQ-129X Receiver	129.00
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Johnson Viking	
"6N2" Transmitter	89.00
Ranger I Transmitter	189.00
Challenger Transmitter	89.00
Valiant I Transmitter	299.00
Knight	
R-55 Receiver	49.00
R-100 Receiver	79.00
C-11 Citizens Band Transceiver	19.00
C-27 Citizens Band Transceiver	49.95
T-60 Transmitter	49.00
T-50 Transmitter	29.00
"Span Master" Receiver	12.50
Lincoln	
L-2000A Citizens Band Transceiver	39.00
Multi-Elmac	
AF-67 Transmitter	99.00
PMR-6 Receiver	59.00
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PMR-8 Receiver	142.50
National	
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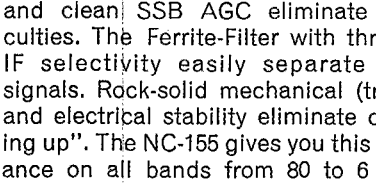

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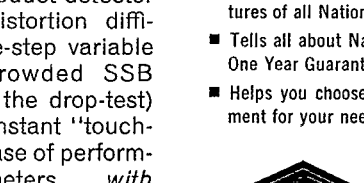

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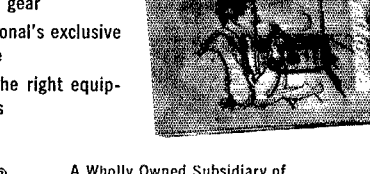

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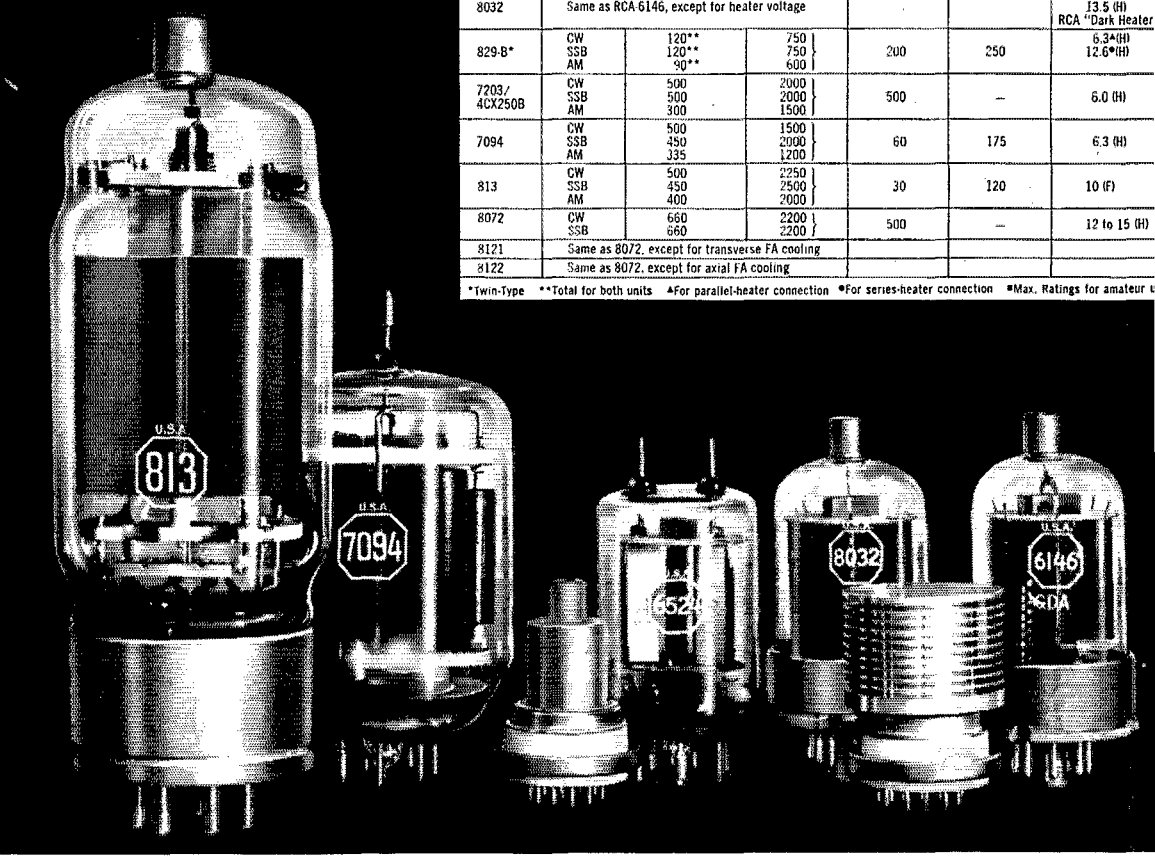
8077/ 7054	CW	9.9	300	40	—	12 to 15 (H)
5763	CW AM	17 15	350 300	50	—	6.0 (H)
6417	Same as RCA-5763, except for heater voltage					12.6 (H)
7905	CW AM	18 15	300 250	175	—	6.3 (F) quick-heating
7551	CW AM	24 17.5	300 250	175	—	12 to 15 (H)
7558	Same as RCA-7551, except for heater voltage					6.3 (H)
2E26	CW SSB AM	40 37.5 27	600 500 500	125	175	6.3 (H)•
2E24	Same as RCA-2E26, but has quick heating filament					6.3 (F)
6893	Same as RCA-2E26, except for heater voltage					12.6 (H)
832-A*	CW AM	50** 36**	750 600	200	250	6.3▲(H) 12.6•(H)
807	CW SSB AM	75 90 60	750 750 600	60	125	6.3 (H)
6524*	CW SSB AM	85** 85** 55**	600 600 500	100	470	6.3 (H)
6850*	Same as RCA-6524, except for heater voltage					12.6 (H)
4604	CW	90	750	60	175	6.3 (F) quick-heating
6146	CW SSB AM	90 85 67.5	750 750 600	60	175	6.3 (H)
6883	Same as RCA-6146, except for heater voltage					12.6 (H)
8032	Same as RCA-6146, except for heater voltage					13.5 (H) RCA "Dark Heater
829-B*	CW SSB AM	120** 120** 90**	750 750 600	200	250	6.3▲(H) 12.6•(H)
7203/ 4CX250B	CW SSB AM	500 500 300	2000 2000 1500	500	—	6.0 (H)
7094	CW SSB AM	500 450 335	1500 2000 1200	60	175	6.3 (H)
813	CW SSB AM	500 450 400	2250 2500 2000	30	120	10 (F)
8072	CW SSB	660 660	2200 2200	500	—	12 to 15 (H)
8121	Same as 8072, except for transverse FA cooling					
8122	Same as 8072, except for axial FA cooling					

*Twin-Type **Total for both units ▲For parallel-heater connection •For series-heater connection ■Max. Ratings for amateur u



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