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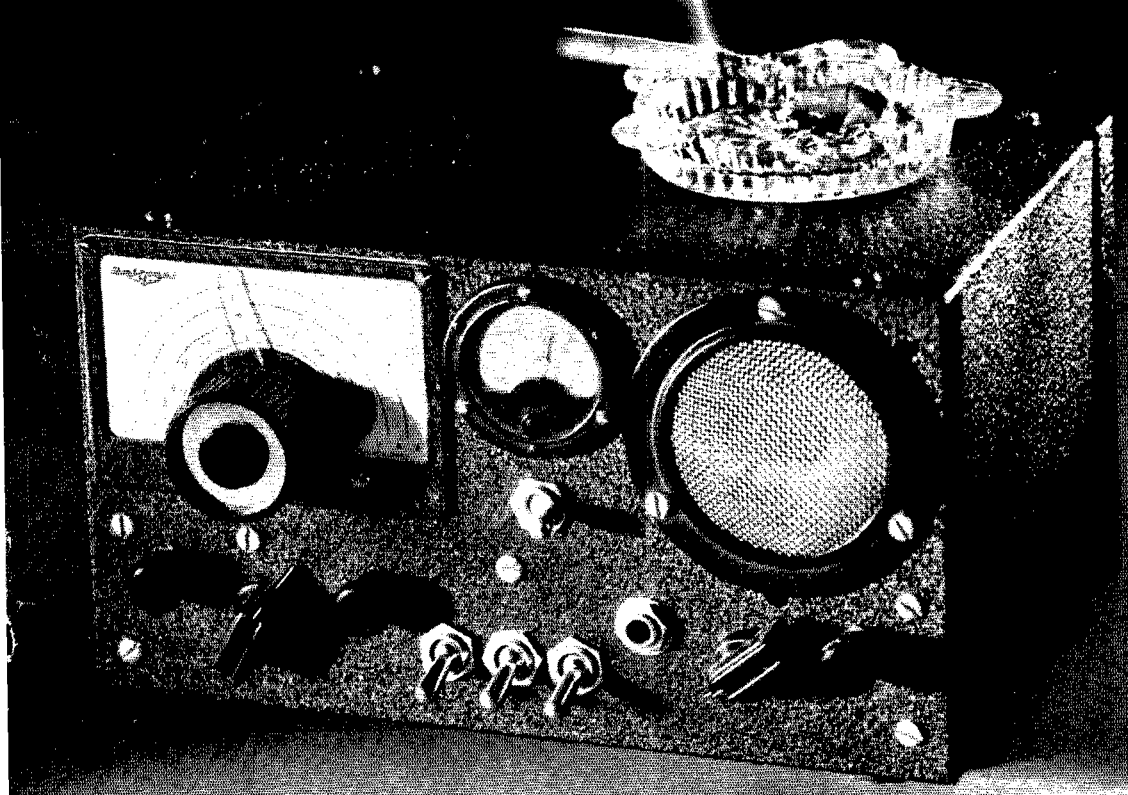

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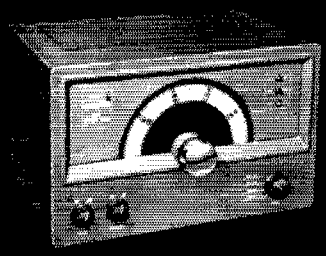

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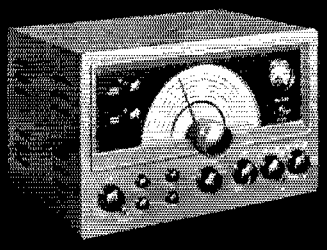
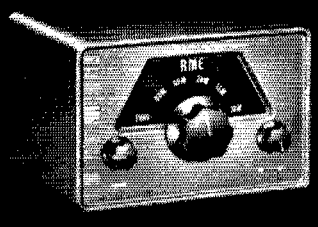
VHF pioneers designed and built this versatile VHF Converter. It will extend the range of any communications receiver through the 6, 2 and 1¼ meter bands. All bands are tuned with equal ease since the 50mc tuner does the tuning for the higher bands in the same way it tunes the 50mc band. Sensitivity ½ microvolt with very low noise figure. Built-in power supply. Simple to install and requires no circuit modification to select either VHF or standard communication ranges. Designed and manufactured to the requirements of costly astronomy receivers.

Experience the finest VHF reception, ever!...**$239.00** Amateur Net.



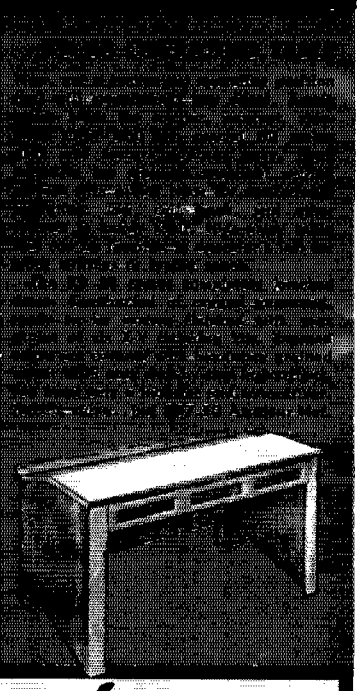
CHECK ANY RECEIVER, THEN CHECK THE RME 4350A.

It has everything you want and need. Study and compare these features usually found in only high-priced receivers. Efficiency concentrated for ham bands only. IF curve is 2.8 kc wide without crystal, down to 100 cycles with crystal. Sensitivity one microvolt with low noise figure. Dual conversion for image rejection of at least 54 DB. Six-pound cast panel with heavy gauge steel chassis and cabinet gives maximum stability. 100 kc crystal calibrator. Single dual speed dial for easy tuning. Engineered for maximum performance on SSB, CW and Phone. Ideal for contests and DX under all receiving conditions. FCDA Item R-16. **$249.00**. . Amateur Net. Model 4302 Matching Speaker **$17.50** Amateur Net.



RME DB23 PRESELECTOR...

improves the performance of any receiver. Three 6J6 twin triodes are used as neutralized push-pull stages in a unique combination of selective and wide band RF amplifiers. You get a minimum gain of 20 db throughout all ham bands from 3.5 to 30 mc, and signal-to-noise improvement can be as much as 7.5 db over that of the receiver alone. Input circuits are accurately matched to any standard type antenna. Operation is simple; merely set band selector and adjust peaking control for maximum signal...**$49.50** Amateur Net.



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the Big Signal...

this one puts out "rocking chair copy" without half trying!

HT-33A
linear amplifier

There's more than one reason why the HT-33A was designed to be *rated conservatively at the maximum legal input. Talk-power* was part of it—enough to provide output to the antenna that guarantees you one of the really big signals on the band. But way beyond that was a need for *reserve-power* . . . to insure the effortless operation that means so much to efficiency and component life. Your distributor is ready to give you a convincing demonstration.

Available with convenient terms from your radio parts distributor.

Make reservations now for annual SSB dinner, New York City, March 24th

FEATURES

- **Maximum legal input.**
- **Certified for FCDA matching funds.**
- **Third and fifth order distortion products down in excess of 30 db.**
- **Passive grid circuit. 50 to 75 ohms input.**
- **Built-in r.f. output meter to simplify tune up.**
- **Complete coverage of 80 thru 10 meter amateur bands.**
- **Pi-network for maximum harmonic suppression.**
- **Variable output loading.**
- **All important circuits metered.**
- **Circuit breaker assures protection of power supply.**
- **Perfect match to HT-32 in size, appearance, and drive requirements.**
- **Tubes: (1) PL-172 high power pentode; (2) 3B28 rectifiers; (4) OA2 screen regulators.**
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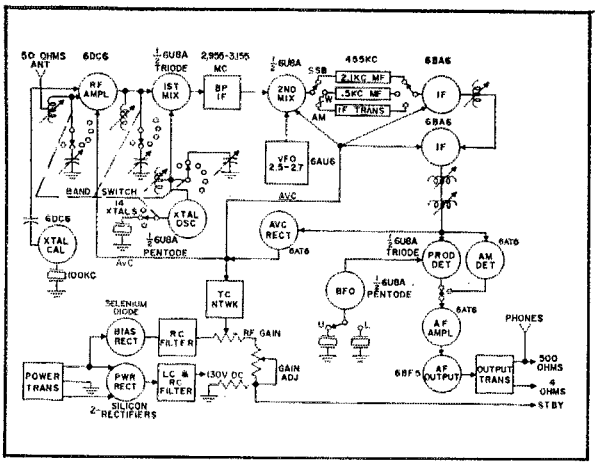
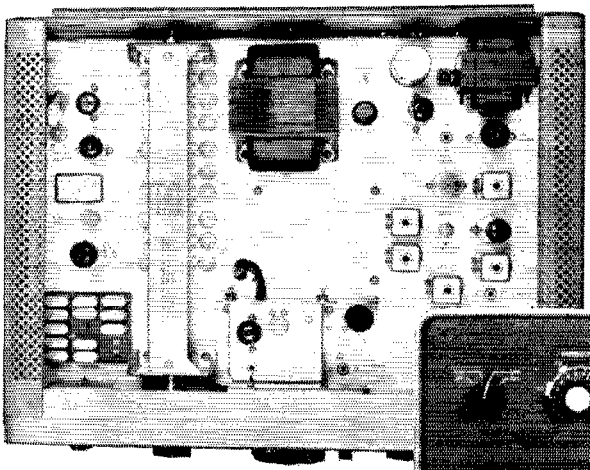
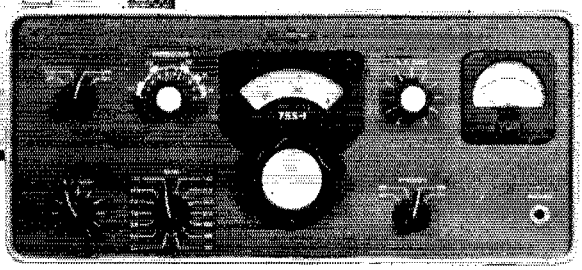


Units of the new S/Line (First of a Series)

Circuits include new design low noise mixers for improved S/N ratio, HF crystal oscillator and low frequency VFO for maximum frequency stability, and Mechanical Filters for optimum selectivity.



Major components are arranged in an orderly manner with attention given to heat dissipation, a major requirement for high reliability. Note the pleasing appearance and simplified front panel arrangement.



Collins 75S-1 Receiver

Surpassing in Performance . . . Simplified in Operation

New criteria of performance, compactness and operational simplicity have been achieved in the new Collins S/Line Receiver — the 75S-1. The highly accurate linear dial, coupled with extremely stable circuits, provides maximum ease in tuning in the frequency you want for keeping a sked or checking into a net. A bonus feature of the S/Line enables the 75S-1 to control the frequency of its companion 32S-1 Transmitter, putting the transmitter right on the received signal frequency without zero beating.

Other new highlights of the 75S-1 design include AVC with a very flat characteristic for optimum SSB performance; 150 volts on vacuum tube plates for reduced heat dissipation and increased reliability; silicon power rectifiers; control of three degrees of selectivity — 2.1 or optional 0.5 kc with Mechanical Filters, or 4.0 kc conventional IF transformers for AM.

Time-proven features of its Collins predecessors incorporated in the new receiver include dual conversion with a crystal controlled first injection oscillator; bandpass first IF; RF amplifier with low cross modulation products; stable, permeability-tuned VFO, product detector for SSB, and diode detector for AM.

The 75S-1 offers reception of SSB, CW or AM signals on all amateur bands between 3.5 and 29.7 mc, with coverage of any frequency in the 3.5 to 30 mc range, except 5.0 to 6.5 mc, possible by substituting crystals.

See the 75S-1 and other units of the S/Line — 32S-1 Transmitter, 30S-1 1 kw (Average Plate Input) Linear Amplifier and accessories — on display by your Collins distributor.

COLLINS

QST

FEBRUARY 1959

VOLUME XLIII • NUMBER 2

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OFFICES

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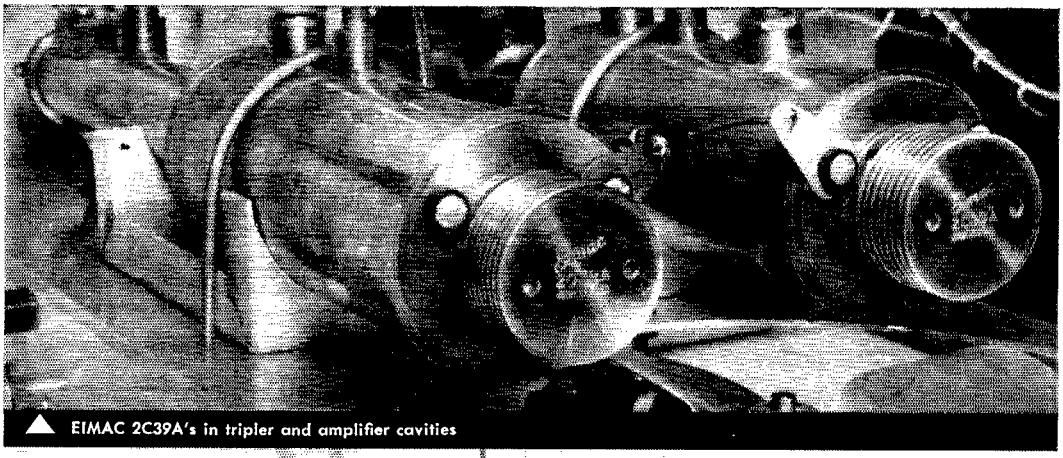

▲ EIMAC 2C39A's in tripler and amplifier cavities

Four Eimac Tubes Help K6AXN/6 and W6MMU/6 Set New Amateur Microwave DX Record

On September 21, 1958, Mike Krivohlavek, K6AXN/6 and Donald K. Goshay, W6MMU/6 set a new DX record on the 1215 to 1300-megacycle band with a two-hour contact over a 270-mile path. Two-way CW contact was established at 8:00 a.m. between Mt. Diablo near Oakland, California and Mt. Pinos near Bakersfield, California and maintained until 10:00 a.m.

As in many amateur radio firsts, Eimac tubes played an important part. K6AXN/6 used an Eimac 4X150A to triple from 144 to 432 megacycles, and an Eimac 2C39A to triple from 432 to 1296 megacycles. Another Eimac 2C39A was used as a straight-through amplifier, with an input of 600 volts at 80 ma and an output power of 16 watts. W6MMU/6 also used an Eimac 2C39A tripler, without further amplification, delivering an output power of 6 watts.

Whether breaking records, exploring new bands, or just enjoying solid QSO's, there's a member of the Eimac transmitting tube family for the discriminating amateur radio operator. For information, write to our Amateur Service Department.

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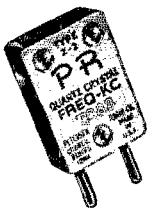

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Third overtone oscillator. Low drift. High activity. Can be keyed in most circuits. Fine for doubling to 10 and 11 meters or "straight through" 20 meter operation; ±500 cycles.....$3.95 Net

24 to 27 Mc., PR Type Z-9A

Third overtone; multiplies into either 2-meter or 6-meter band; hermetically sealed; calibrated 24 to 27 mc., ±3 kc.; .050" pins.

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50 to 54 Mc., PR Type Z-9A

Fifth overtone; for operating directly in 6-meter band; hermetically sealed; calibrated 50 to 54 mc., ±15 kc.; .050" pins.

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Commercial Crystals available from 100 Kc. to 70 Mc. Prices on request.

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3023.5 Kc., .005%.....$3.45 Net

Type Z-1, MARS and CAP

Official assigned transmitter frequencies in the range.
Calibrated to .005%. 1600 to 10000 Kc. $3.45 Net

Type Z-6A FREQUENCY STANDARD

To determine band-edge. To keep the VFO and receiver properly calibrated.

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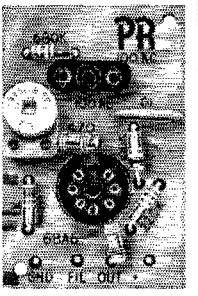
Has many uses—

- As 100 Kc. Marker
- As 1000 Kc. Marker for Check Points up to 54 Mc.
- As Foundation Circuit for Low Frequency SSB Crystals



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Suitable for converters, experimental, etc. Same holder dimensions as Type Z-2.

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Reports Invited. All amateurs, especially League members, are invited to report station activities on the first of each month (for preceding month) direct to the SCM, the administrative ARRL official elected by members in each Section. Radio club reports are also desired by SCMs for inclusion in *QST*. **ARRL Field Organization station appointments** are available in the areas shown to qualified League members holding Canadian or FCC amateur license, General or Conditional Class or above. These include ORS, OES, OPS, OO and OBS. SCMs also desire applications for SEC, EC, RM and PAM where vacancies exist. OES appointment is available to Novices and Technicians.

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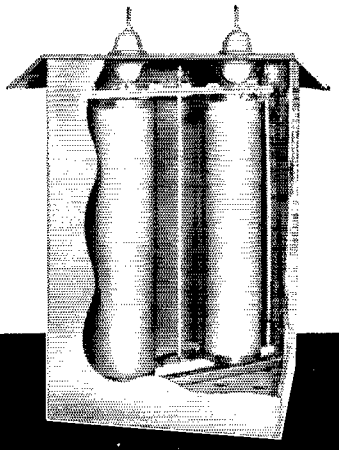

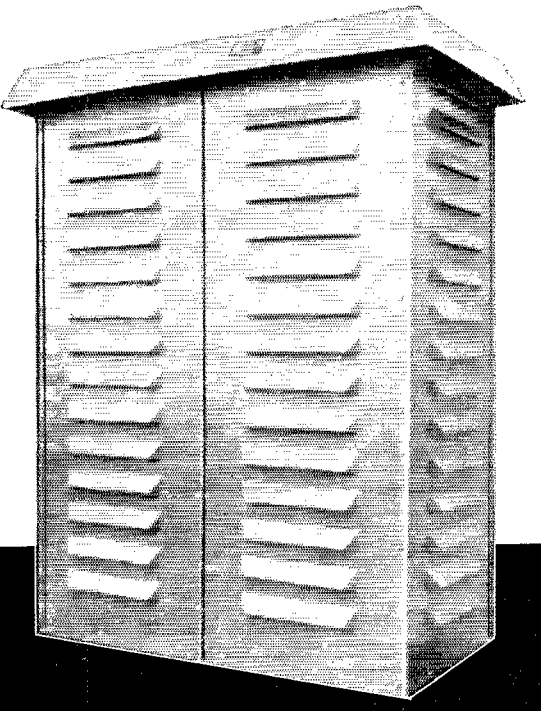

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DC TO 30 MC

The TMC Transmitting Dissipators and Dummy Loads, Models TER are a new engineering approach to the problem of providing a flat. resistive termination capable of dissipating RF energy. Housed in reinforced fiberglass plastic cases for pole or frame mounting, the TER series provides for minimum insulation and maintenance expense with maximum protection from the elements. All units are teflon insulated and silicon sprayed. The assembly is completely free of ferrous materials, and all vents are screened for maximum protection.

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TER-500 (600)	500 watts	600 ohms	DA-199/U
TER-3500 (600)	3500 watts	600 ohms	DA-200/U
TER-5000 (600)	5000 watts	600 ohms	DA-201/U
TER-5000 (50)	5000 watts	50 ohms	DA-209/U
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THE AMERICAN RADIO RELAY LEAGUE, *INC.*,

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

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

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

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

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

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Vice-Director: Charles O. Badgett W3LVF
725 Garden Road, Glenside, Pa.

Central Division

JOHN G. DOYLE W9GPI
4331 N. Wildwood Ave., Milwaukee 11, Wis.

Vice-Director: Philip E. Haller W9HPG
6000 S. Tripp Ave., Chicago 29, Ill.

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ALFRED M. GOWAN . . . . . WØPHR
1012 South Willow Ave., Sioux Falls, S. D.

Vice-Director: Charles G. Compton . . . . . WØBUO
1011 Fairmount Ave., St. Paul 5, Minn.

Delta Division

VICTOR CANFIELD W5BSR
Box 965, Lake Charles, La.

Vice-Director: Sanford B. DeHart W4RRV
227 S. Purdue Ave., Oak Ridge, Tenn.

Great Lakes Division

JOHN H. BRABB W8SPF
708 Ford Bldg., Detroit 26, Mich.

Vice-Director: Dana E. Cartwright W8UPB
2979 Observatory Ave., Cincinnati 8, Ohio

Hudson Division

MORTON B. KAHN W2KR
22 Birch Hill Rd., Great Neck, N. Y.

Vice-Director: Lloyd H. Manamon W2VQR
709 Seventh Ave., Asbury Park, N. J.

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ROBERT W. DENNISTON . . . . . WØNWX
Box 631, Newton, Iowa

Vice-Director: Sumner H. Foster . . . . . WØGQ
2315 Linden Dr., S.E., Cedar Rapids, Iowa

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MILTON E. CHAFFEE W1EFW
53 Homesdale Ave., Southington, Conn.

Vice-Director: Carmine A. Polo W1SJO
17 Park St., West Haven 16, Conn.

Northwestern Division

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837 Park Hill Drive, Billings, Mont.

Vice-Director: Harold W. Johnston W7PN
2727 Belvidere Ave., Seattle 6, Wash.

Pacific Division

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770 Chapman, San Jose 26, Calif.

Vice-Director: Ronald G. Martin W6ZF
4212 Berrendo Drive, Sacramento 25, Calif.

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428 Maple Lane, Danville, Va.

Vice-Director: Joseph F. Abernethy W4AKC
768 Colonial Drive, Rock Hill, S. C.

Rocky Mountain Division

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740 Lafayette St., Denver 18, Colo.

Vice-Director: John H. Sampson, Jr. W7OCX
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717 Anderson Way, San Gabriel, Calif.

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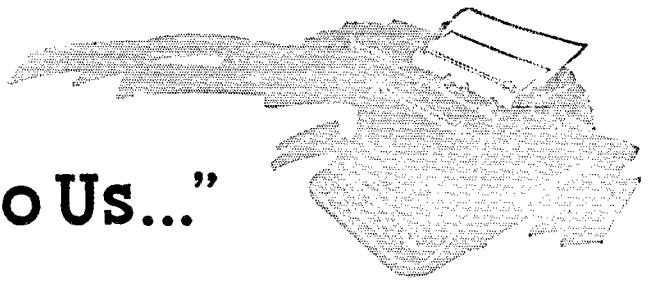
1175 Longhill Way, Monterey Park, Calif.

West Gulf Division

GRADY A. PAYNE W5ETA
5103 Linden St., Bellaire, Texas

Vice-Director: Robert D. Reed W5KY
4339 S. Peoria, Tulsa 5, Okla.



"It Seems to Us..."

Join 'Em Up!

In Geneva, Switzerland, there will convene this August — for the first time in twelve years — another international radio conference. At this meeting the nations of the world will revise the Atlantic City (1947) radio regulations, including the assignment of frequencies to various services. As in the case of every previous international radio conference dealing with our short-wave bands in the past thirty years, your League will have representatives present for the duration of the Conference, acting as advisers to the official U. S. Government delegation.

For some two years now, under the guidance of the Department of State, our domestic radio interests — government, military, and civilian — have periodically met in Washington to study and recommend what should be the official U. S. viewpoint toward possible changes in the regulations. Again, ARRL has had representatives present at every such group meeting dealing with amateur matters or possibly affecting the amateur service.

A spokesman for the amateur is essential in these matters. Obviously, it would be impractical for thousands of individual amateurs to appear, each with his own views. That is one of the reasons we have a League — to collect and record the accomplishments of the Amateur Radio Service in the public interest, convenience, and necessity — and to lay that record before regulatory authorities who have the power to decree the status of our future existence.

Such representation costs money — sizable hunks of money when it involves attendance at an international conference for a duration of perhaps several months. Again, this is one of the reasons we have a League — to finance activities necessary for the continued existence and health of our hobby. The job must be done — for amateur radio exists only so long as we can maintain our frequency bands — and the League is doing it on behalf of all amateurs, League members or not.

Several amateur organizations in other areas of the world, similarly aware of the need for international representations, have plans to send advisers with their government delegations to Geneva. For some of the smaller societies, this is quite a financial problem. European amateur societies have banded together and for several years now have been contributing to a fund to handle the expense of representation. The Wireless Institute of Australia has inaugurated a "war chest," soliciting a minimum of 1 pound (half of a year's dues) per VK ham — and are getting help also from ZLs — to cover anticipated expenses.

It seems to us that we here are fortunate; we do not have to assess members or solicit from amateurs generally. Our League structure contemplates and provides for such activities. But mark well one point: you *members of the League* are the active supporters of representation for the amateur service. Every amateur who is not a League member is getting a free ride. Mull this over — and next time you run across a ham pal who does not belong to ARRL, give him a sales pitch. For the moment, never mind the fact that he will receive a *QST* subscription with his membership. If League members received no more tangible return from their dues than organized representation before national and international regulatory authorities, we think it is still the best investment they can make. So, start a private membership campaign of your own — kick a few shins, discuss the subject at your club meetings, and let's see if we can't substantially broaden the portion of the amateur body which is actively supporting the carrying of our torch. QST

COMING A.R.R.L. CONVENTIONS

May 2–3 — Oregon State, Roseburg
June 19–21 — ARRL National Convention, Galveston, Texas
August 15–16 — Pacific Division, Honolulu, Hawaii
September 5–6 — New England Division, Hartford, Conn.

NOVICE ROUNDUP REMINDER

Event: Eighth Annual ARRL Novice Roundup! Starts: January 31, 1959, 6:00 P.M. Local Time. Ends: February 15, 1959, 9:00 P.M. Local Time.

Yessir, this one we know will be an all-time record-breaker! Complete information, including a sample log form, may be found in the January issue of *QST* (p. 77). Don't miss this one. It'll be a real battle!

Get off those cards, radiograms or letters for ARRL's convenient log forms. They're mighty handy and will save you much time in readying your final tabulation. Good luck!

Strays

For some years the State of Michigan has had a law requiring the issuance of a state police permit for the installation in a motor vehicle of any equipment capable of receiving police radio transmissions. An amendment to the law now excludes amateurs (other than Novice or Technician classes) from the requirement for the permit. — *W8GFH.*

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The National Bureau of Standards Laboratories in Boulder, Colo., has several GS-5 to GS-13 openings. The work is in research and development on top national standards and measurements at frequencies to 1000 Mc. A theoretical background and experience commensurate with individual grades is essential. Those interested should address their inquiries directly to Boulder.

— • • • —

Early risers who don't dash to the shack to listen for new ones may be interested in tuning in NBC-TV's "Continental Classroom" which is appearing every morning at 6:30 local time. The course is entitled "Physics for the Atomic Age," and radio amateurs will find much of interest in the course. The course has been functioning since last October, but brief synopses of all the lessons of the first semester, including textbook references and problems, are available for 50¢ from Continental Classroom, Box 321, Oneonta, N. Y. Similar synopses became available in January for the lessons of the second semester. Entire scripts of individual programs are available for 50¢ from the same address.

— • • • —

Stolen from W0MMM was an Elmac transmitter model AF-67, serial number 5955. This unit was taken from his car on Dec. 8. Let him know if you see anything of this rig.

— • • • —

W2PS was recently (Sept. 17) interviewed on Jack Paar's "Tonight" show concerning his experiences as a radio and TV repairman, and wonders how many *QST* readers saw him.

— • • • —

K4LSI and K4LIS are mother and son!

— • • • —

The Boston section of IRE is sponsoring a transistor lecture series on six consecutive Wednesday evenings commencing April 1, to be held in John Hancock Hall. Registration is $10.00, or $7.00 for IRE members. Write to Boston Section, IRE, 73 Tremont St., Boston.

25th ARRL International DX Competition

Phone: Feb. 6–8, March 6–8;
C.W.: Feb. 20–22, March 20–22

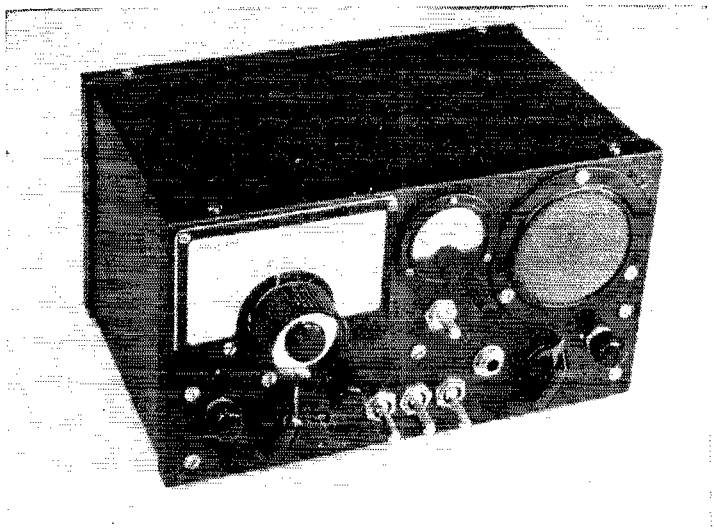
It won't be long now! Whatever your locale, you're urged to get your feet wet on both phone and c.w. Each of the four 48-hour contest periods starts on Friday at 7 P.M. EST and ends on Sunday at 7 P.M. EST on the dates shown.

Certificates will be issued to the highest-scoring c.w. and phone operator in each country and each continental U. S. A. and Canadian ARRL Section. And there will be special certificates for club leaders and multioperator stations and a cocobolo gavel to the top club entry.

The DX will be shooting to trade contest data with as many W/K/VE/VO stations as possible. U. S. and Canadian amateurs will transmit RS and RST reports plus states or provinces, while the returns from overseas will be five- and six-figure numerals indicating signal reports and powers input.

Free contest forms, though not required by the rules, are now available from the ARRL Communications Dept. When requesting them, please advise whether you expect to enter the c.w. section, the phone section, or both.

Be selective and go after only new countries for DXCC, if you wish. But if you expect to earn the award in your ARRL Section, you'd better chase all comers. Scan the rules in last month's *QST*. Don't miss the banner DX activity of the year!



Except for an antenna, this amateur-band receiver is complete as you see it—everything, including power supply, in one small cabinet. It makes no compromises with sensitivity or selectivity; both are what you would expect from a first-rate communications receiver using vacuum tubes.

All-Transistor Communications Receiver

High Performance in a Miniature Package

BY H. F. PRIEBE, JR.,* W2TGP

This isn't a "let's see if it can be done" unit — transistors are no longer that experimental — but is a practical ham-band receiver capable of competing with the better tube sets. Single-sideband selectivity (thanks to including a mechanical filter in the low-frequency i.f.), double conversion, a.v.c. and noise limiter. Seventeen transistors, plus a few semiconductor diodes, make it possible to house the whole works, including power supply and speaker, in a 5 × 6 × 9 box.

THE ever-increasing popularity of the transistor has resulted in its utilization in a wide variety of electronic equipment. No doubt more and more electronic gear will make use of the transistor as time goes on. Continuing development has improved transistor performance to the point where transistorized equipment is actually easier to construct than its tube counterpart. Even the time saved in wiring is worth mentioning: No heaters, screen grids or suppressor grids to connect; for example, a pentode tube has seven leads that must be wired in the circuit while the transistor that replaces it has only three.

This "easier to construct" assertion certainly would not be true if it were necessary to neutralize the r.f. and i.f. stages. And up until a short while ago most of the available transistors used in r.f. circuits required neutralization. However, this is no longer the case, since transistors with very low collector capacitances are readily available.

Two types of transistors that are used in this receiver have been most gratifying to work with — the i.f. transistors, General Electric 2N169A N-P-N rate-grown junction types; and the r.f. transistors, RCA 2N384 P-N-P drift types. Circuit analysis shows that with transistors having collector capacitances of approximately 2 $\mu\mu$f. or less, neutralization in typical receiver circuits is not necessary, and the transistors mentioned above were chosen for this reason. Surprising as it may be, these units are relatively inexpensive — approximately $2.00 each for the 2N169A, and a little more than $6.00 for the 2N384.

In the recent past, all sorts of worthwhile

* 192 Mills St., Morristown, N. J.

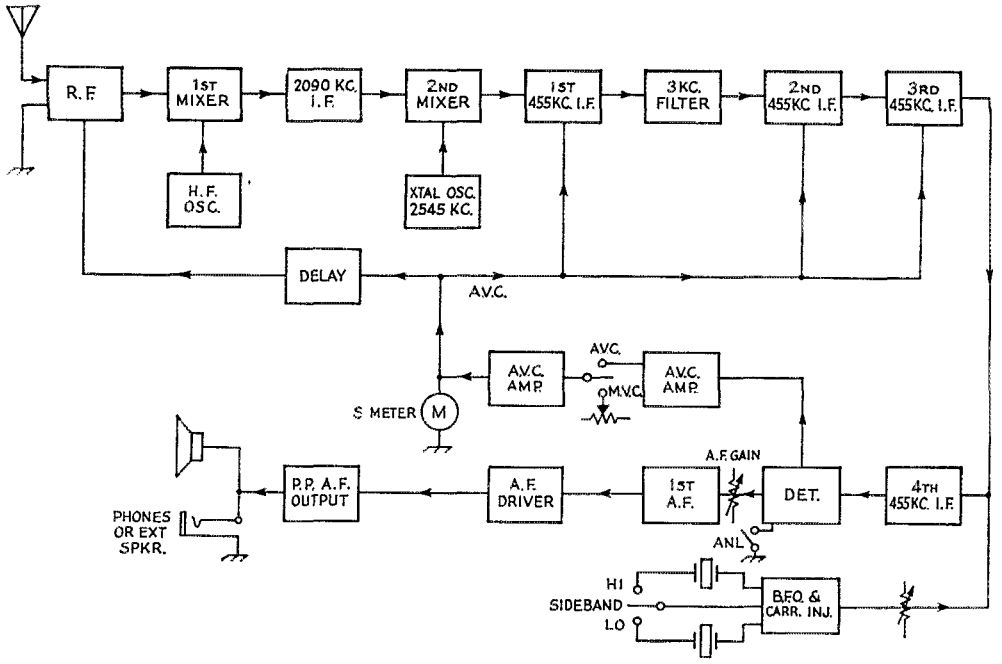


Fig. 1—Block diagram of the transistor communications receiver.

electronic devices have been constructed with various experimental transistors available to only a few individuals. But the receiver described here is not in that category, because all the components — transistors, transformers and the rest — are readily obtainable from good electronic parts distributors.

The availability of transistor circuit information has been quite complete. Therefore this article will only be concerned with application of transistors to this receiver. For information regarding transistor circuit properties, the *ARRL Handbook* and articles in previous issues of *QST* are suggested.[1]

If one reads just the characteristics and performance data listed in Table I, it might be difficult to visualize that the entire receiver, with built-in speaker and self-contained batteries, is contained in a 5 × 6 × 9-inch cabinet.

Of course, the transistor has made this possible. However, one should not overlook the mechanical filter that plays an important part in the receiver's selectivity and its single-sideband operation. Miniature components also have made the task somewhat easier. But the principal credit still goes to the little semi-conductor devices.

Over-All Circuit Features

The block diagram of the receiver, shown in Fig. 1, does not differ greatly from block diagrams of tube receivers. However, the methods of interrelating the control functions have optimized performance and operating convenience.

Delayed a.v.c. is applied to the r.f. stage to insure the best signal-to-noise ratio on weak signals. The delayed action is also in operation when m.v.c. is used. (The word "delay" is used to mean a threshold in control voltage and not a time delay.) The signal-strength meter is operated from the same circuits as the a.v.c.-m.v.c.; consequently, for the same level of audio output the signal strength of c.w. stations can be read directly on the S meter. The same is true for single-sideband signals when a constant level of modulation is assumed.

Table I

Receiver Characteristics

Band	*Tuning Range*	*Sensitivity**
80	3.5 to 4 Mc.	0.2
40	7 to 7.3 Mc.	0.2
20	14 to 14.4 Mc.	0.3
15	21 to 21.5 Mc.	0.4
10	28 to 29.7 Mc.	0.5

* Microvolts r.f. input for 50 mw. a.f. output with 30 per cent modulated signal.

A.V.C.: Audio rise less than 3 db. for inputs from 1 to 100,000 μv.

Audio: Output 0.5 watt with a 3-μv. signal 30 per cent modulated.

[1] Priebe, "Transistor Operating Characteristics," *QST*, February, 1957.
Priebe, "Checking Transistors," *QST*, April, 1958.

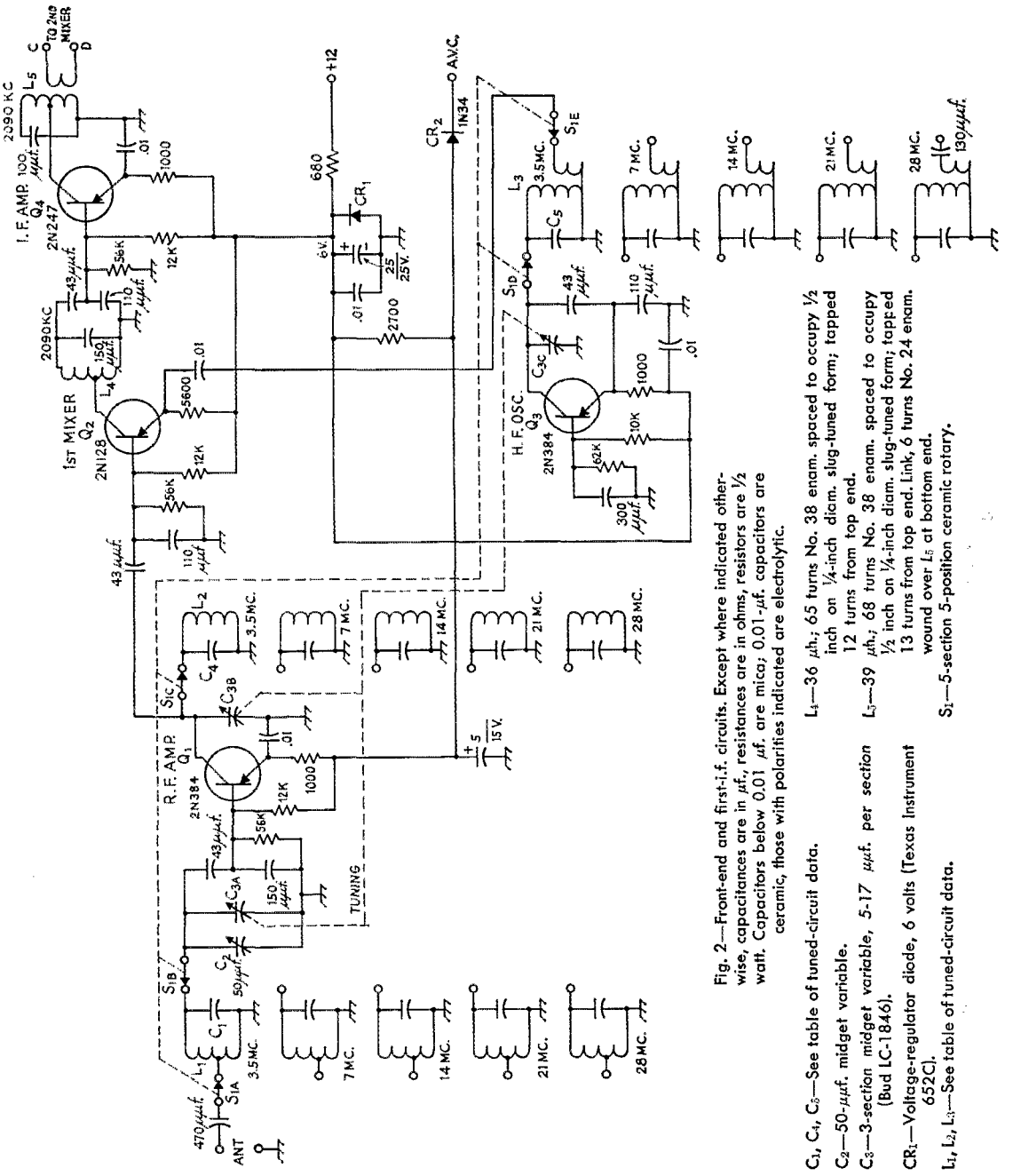


Fig. 2—Front-end and first-i.f. circuits. Except where indicated otherwise, capacitances are in μf., resistances are in ohms, resistors are ½ watt. Capacitors below 0.01 μf. are mica; 0.01-μf. capacitors are ceramic, those with polarities indicated are electrolytic.

C_1, C_4, C_5—See table of tuned-circuit data.

C_2—50-μμf. midget variable.

C_3—3-section midget variable, 5-17 μμf. per section (Bud LC-1846).

CR_1—Voltage-regulator diode, 6 volts (Texas Instrument 652C).

L_1, L_2, L_3—See table of tuned-circuit data.

L_4—36 μh.; 65 turns No. 38 enam. spaced to occupy ½ inch on ¼-inch diam. slug-tuned form; tapped 12 turns from top end.

L_5—39 μh.; 68 turns No. 38 enam. spaced to occupy ½ inch on ¼-inch diam. slug-tuned form; tapped 13 turns from top end. Link, 6 turns No. 24 enam. wound over L_5 at bottom end.

S_1—5-section 5-position ceramic rotary.

A single-stage of 2090 kc. first-i.f. amplification is employed, not so much for the gain as to provide isolation between the first and second mixer-oscillators.

A total of four second-i.f. stages is operated at 455 kc. A little more gain than that provided by one i.f. stage is needed to offset the loss through the band-pass filter. The selectivity of the i.f. section, with the inexpensive i.f. coils used, is not adequate without the filter. However, for some applications other than single sideband the i.f. selectivity without the filter might be adequate.

A conventional diode detector and automatic noise limiter circuit is used. The detector is followed by three audio-frequency stages. The audio output stage uses a pair of 2N188As in push-pull with a peak output of 0.5 watt.

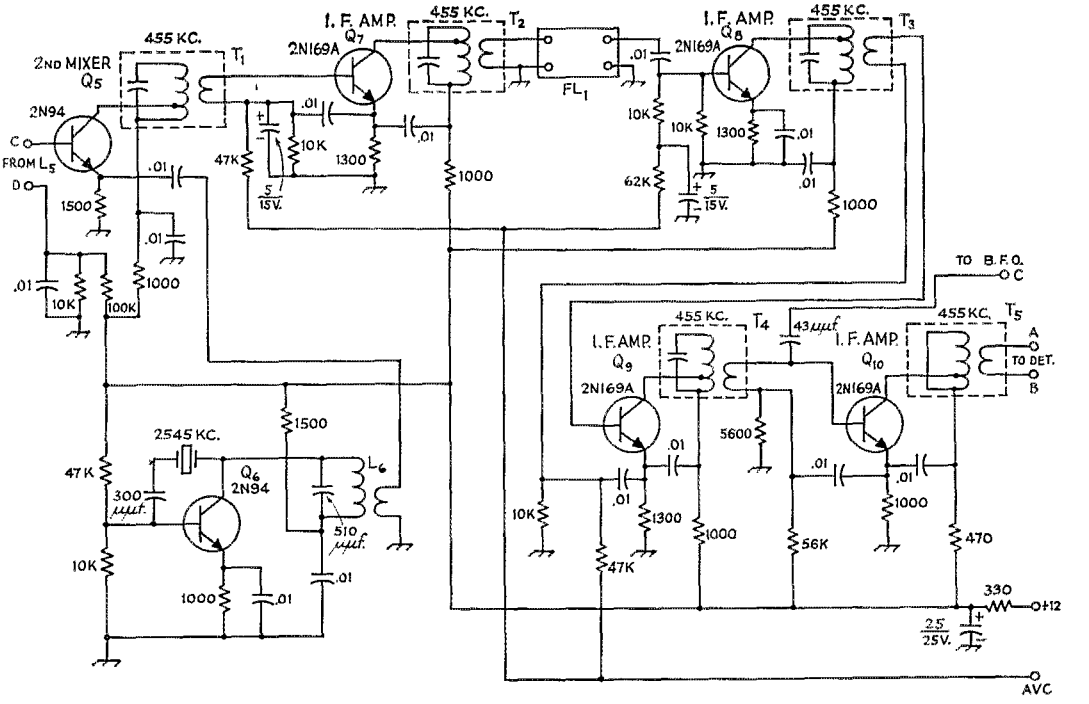


Fig. 3—Second conversion and 455-kc. i.f. circuits. Except where indicated otherwise, capacitances are in μf., resistances are in ohms, resistors are ½ watt. Capacitors below 0.01 μf. are mica; 0.01-μf. capacitors are ceramic; those with polarities indicated are electrolytic. Terminals connect to those with corresponding designations in Figs. 2 and 4.

FL_1—Mechanical filter, 3-kc. bandwidth (Collins F455A-3).

L_6—9.3 μh.; 38 turns No. 32 enam. spaced to occupy ½ inch on ¼-inch diam. slug-tuned form. Link, 5 turns hook-up wire wound over L_6 at bottom end.

T_1-T_5, inc.—Transistor 455-kc. interstage, 25,000 to 600 ohms (Lafayette MS-268).

The complete schematic diagram of the dual-conversion receiver is shown in Figs. 2, 3, and 4. Fig. 2 includes the r.f., mixer, h.f. oscillator and the first i.f. Fig. 3 is the circuit of the second mixer, conversion oscillator and 455-kc. i.f. stages. The third section, Fig. 4, includes the noise limiter, detector, a.v.c. amplifier, b.f.o. and carrier oscillator, and the audio frequency stages.

R.F., Mixer and H.F. Oscillator

The design of the "front end" or main tuning circuits was carried out with the object of keeping the number of adjustments and circuit elements to a minimum while covering the major amateur bands. A standard three-gang tuning capacitor having the required change in capacitance (12 μμf.) was chosen and values for the various coils and shunt capacitors determined.

An earlier receiver of this type had used ceramic trimmers across the individual coils, which resulted in the front-end assembly's occupying approximately three-fourths of the entire receiver. Since the receiver covers only a relatively narrow band of frequencies and is hand calibrated, there is no need for precise control or adjustment of circuit capacitances, so good-quality fixed capacitors are used with a worthwhile saving in space. The r.f. chassis now occupies less than half of the total space and the components are not excessively crowded.

Table II
Tuned-Circuit Data

	R.F. and 1st Mixer		Oscillator	
Band	L_1, L_2*	C_1, C_4	L_3	C_5
80	40.3 μh. 80 turns No. 38 Tap at 7 turns	Not used	10.75 μh. 48 turns No. 32 Tickler, 8 turns	22 μμf.
40	3.44 μh. 24 turns No. 28 Tap at 5 turns	91 μμf.	1.43 μh. 15 turns No. 28 Tickler, 8 turns	160 μμf.
20	0.61 μh. 11 turns No. 28 Tap at 2 turns	160 μμf.	0.39 μh. 8 turns No. 28 Tickler, 3 turns	200 μμf.
15	0.23 μh. 6 turns No. 28 Tap at 1 turn	200 μμf.	0.15 μh. 5 turns No. 28 Tickler, 2 turns	260 μμf.
10	0.30 μh. 7 turns No. 28 Tap at 1 turn	51 μμf.	0.24 μh. 6 turns No. 28 Tickler, 2 turns	62 μμf.

* L_2 same as L_1 except not tapped. Taps on L_1 measured from ground end.

All coils wound with enameled wire on ¼-inch diam. slug-tuned forms, spaced to occupy ½ inch. Ticklers on L_3 wound over ground end with same wire size.

The L and C values for each tuned circuit were selected so the desired band would occupy most of the main tuning dial's 180 degrees. The resulting values are listed in Table II. The number of sections in the band switch has been kept to a minimum by employing a capacitor type of resonant-circuit tapping for impedance matching. This method of tuning results in a slight reduction in available gain from the r.f. circuits, but it is felt to be a worthwhile exchange for the easier construction and adjustment.

The h.f. oscillator is operated on the high-frequency side of the received signal. By keeping the oscillator on the same side of the received signal for all of the bands covered, the same position of the sideband switch will hold for all bands. If the oscillator were operated on the low-frequency side of the received signal on some of the higher frequency bands, the position of the sideband switch corresponding to the lower sideband on the lower bands would become the switch position for the upper sideband when the receiver was operated on the higher bands.

Since the h.f. oscillator is operated 2090 kc. above the received signal a corresponding first i.f. output frequency of 2090 kc. results.

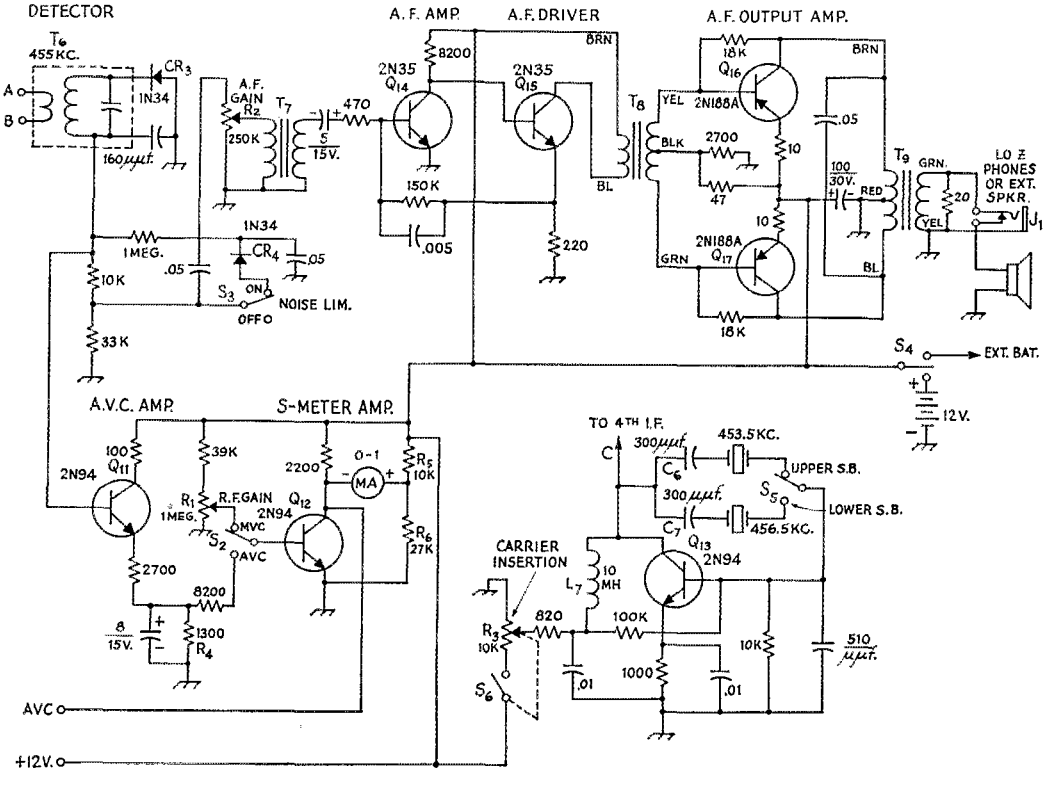
First I.F.

The first i.f. stage (2090 kc.) separates the two oscillator-mixers. That is, it isolates the oscillator-mixer in the r.f. section from the one used to produce the 455-kc. intermediate frequency. An earlier design used a low-pass filter to provide this isolation, but its requirements were rather stringent and therefore not easily reproducible.

The gain of the 2090-kc. i.f. stage is relatively unimportant but the isolation is well worth while. In spite of the fact that the receiver can distinguish a signal of a tenth of a microvolt, the antenna can be disconnected and the receiver

Fig. 4—Detector, b.f.o., a.v.c. and audio circuits. Except where indicated otherwise, capacitances are in μf., resistances are in ohms, resistors are ½ watt. Capacitors below 0.01 μf. are mica; 0.01-μf. capacitors are ceramic; those with polarities indicated are electrolytic.

C_6, C_7—See text.
J_1—Closed-circuit phone jack.
L_7—R.f. choke, 10 mh.
R_1—1-megohm control, linear taper.
R_2—0.25-megohm control, audio taper.
R_3—10,000-ohm control, linear taper.
R_4, R_5, R_6—See text.
S_2, S_3, S_5—S.p.d.t. toggle.
S_4—S.p.d.t. toggle with center off position.
S_6—S.p.s.t. toggle mounted on R_3.
T_6—Same as T_1.
T_7—Interstage audio, 25,000 to 500 ohms (U.T.C. SSO-3).
T_8—Transistor audio driver for p.p. amp., 2000 ohms to 2000 ohms c.t. (Thordarson TR-1).
T_9—Transistor p.p. Class B output (400 ohms) to voice coil (Thordarson TR-22).



tuned over its entire range with no trace of spurious signals. When the low-pass filter was used some weak spurious signals were heard but for many cases the filter could be considered adequate.

455-Kc. I.F.

The low-frequency i.f. is quite conventional. No particular attention was paid to the selectivity of the i.f. transformers since the Collins filter provides the desired selectivity characteristic. The output i.f. is link-coupled to the detector transformer. The link facilitates construction and testing and provides an easy way of matching impedances.

Second Detector and Audio System

The second detector is operated at a relatively high impedance for transistor circuits, but it was designed so it would work with the popular diode noise limiter. Audio amplification consists of two Class A stages followed by a stage of push-pull Class B output. The power output, 0.5 watt, is more than sufficient for the self-contained speaker. The 20-ohm resistor across the output transformer provides a load for the amplifier when headphones are used.

Automatic Gain Control

The normal range of received signals, so far as amplitude is concerned, is quite extensive. At one extreme the weak signals are limited only by noise conditions, and at the other the maximum amplitude in close proximity to a transmitter can exceed several volts. The most frequently encountered range of signals is from noise level to about a tenth of a volt (100,000 microvolts). To be effective, then, the a.v.c. should start operating at a few microvolts and remain in control of the receiver's r.f. gain at all signal levels up to 100,000 microvolts. The operating conditions of transistors in typical circuits make the a.v.c. problem more difficult than with tubes.

As shown in Fig. 4, a two-stage d.c. amplifier is used for a.v.c. and as a driver for the signal-strength meter. Delayed a.v.c. is applied to the r.f. stage in the form of a variable-voltage collector supply. This gives more effective operation on strong signals than would be possible with only emitter current variation as used on the other controlled stages.

Construction

The receiver is contained in a standard 5 × 6 × 9 inch metal cabinet. A framework of lightweight aluminum is made to accommodate three flat-sheet aluminum chassis. One chassis comprises the tuning unit or front end, and has the r.f., first mixer and oscillator stages. The second chassis accommodates the second mixer, oscillator, the 455-kc. i.f. and the mechanical filter. The third chassis includes the diode detector and audio circuits.

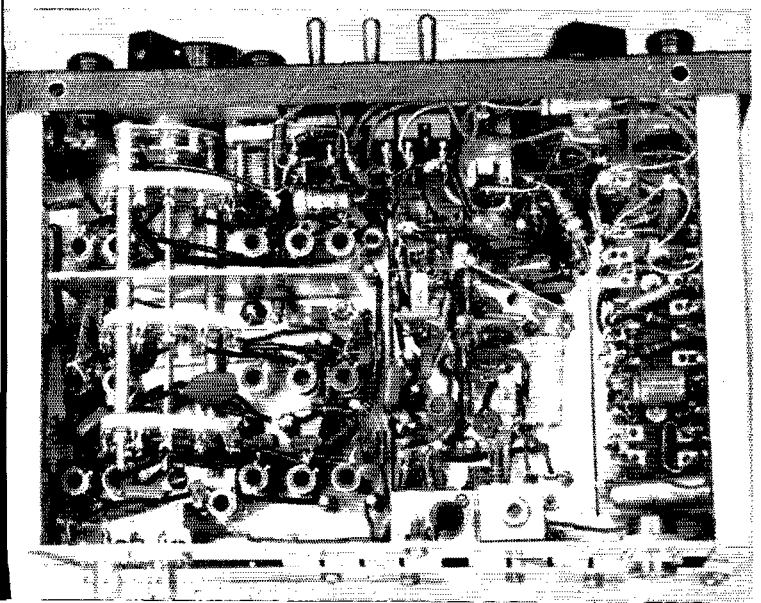
The speaker, main tuning dial, signal-strength meter, and various controls are mounted on the panel-frame assembly. The frame around the speaker grill was made from an old metal meter case.

The four units — the three chassis and panel-frame assembly — are wired individually for ease in construction. The arrangement of circuits and components is such that a minimum of wiring is used between units. During testing and alignment of the receiver the various units can be operated without completely assembling the receiver.

Front Panel Controls

The band-selector switch, S_1, is located below the main tuning control, the r.f. gain control, R_1, is just to its left, and the antenna trimmer, C_2, is to its right. The three switches at bottom center are, from left to right, a.v.c.-m.v.c. (S_2), upper or lower sideband (S_5), and a.n.l. (S_3). The control beneath the speaker is the carrier insertion level, R_3, and its on-off switch, S_6. The control

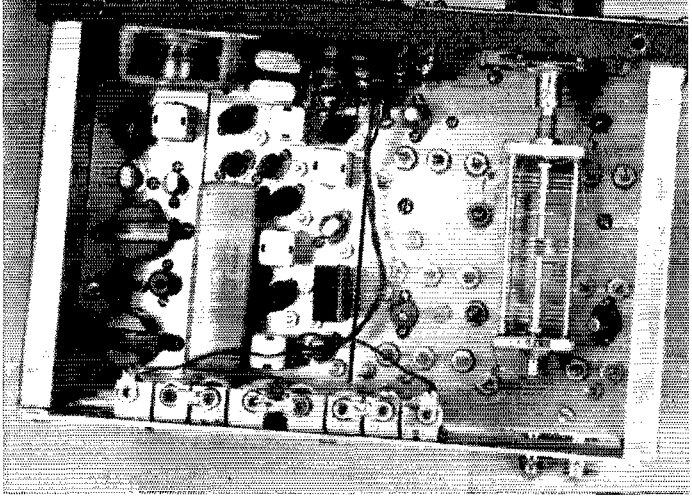
The r.f. section is at the left, i.f. in center, and audio at the right in this view under the chassis. The small variable capacitor on the panel alongside the band switch is the antenna-circuit trimmer. The 28-Mc. coils are at the left, with the bands progressing to the right to 3.5 Mc.



In the i.f. section (middle chassis plate) the small bracket at the bottom in this view holds the 2090-kc. i.f. transistor. L_5 is concealed by the part of the bracket to the right of the transistor. L_4 is the coil just to the left of and below the 40-meter oscillator coil (third from the right in the h.f. oscillator row). The coil above the 2N247 i.f. is L_6, the 2545-kc. crystal oscillator tank.

A phenolic lug strip has most of the audio circuit components mounted on it, as shown at the right. This strip is mounted about an inch above the audio chassis and conceals the transistor sockets.

The two coaxial sockets at the left (antenna input) are wired in parallel. Only one is actually necessary. The connector at the right is for an external battery.



This plan view of the receiver shows the three flat-plate chassis on which the various sections are constructed. The r.f. circuits are on the right-hand chassis, with the coils for the five bands arranged in rows adjacent to the capacitor sections which tune them. The r.f. amplifier is nearest the panel, the mixer is in the center, and the h.f. oscillator is toward the rear edge. The transistors, almost end-on in this picture, are mounted in miniature sockets.

The center section has the first i.f. amplifier, second mixer with its crystal-controlled oscillator, the 455-kc. i.f. string (including the mechanical filter), the a.v.c. amplifier and the b.f.o. The progression in this section is from the rear toward the panel. Audio circuits are on the narrow plate at the left, with the Class B output stage toward the rear.

Penlight cells for power supply are mounted in clips on supporting frame at the rear.

in the extreme right corner is the a.f. gain. The three-position toggle switch located directly under the signal-strength meter is the on-off switch S_4; the center position is battery off, the right side connects the receiver to the internal 12-volt battery and the other position connects the receiver's power lead to a connector for external battery or power supply.

Supply Voltage

The normal no-signal current drain from a 12-volt supply is 30 ma. The 12-volt supply was chosen because most automobiles have 12-volt electrical systems. The receiver works well with as little as 6 volts and as high a voltage as the transistor's ratings will permit. However, there is no advantage to the higher voltage. The self-contained batteries (eight penlite cells) are mounted on the inside of the back cover.

Circuit Adjustments

Alignment of the receiver is straightforward. However, to obtain maximum performance from simple circuits some of the values of the circuit components might require adjustment. The gain of the two-stage a.v.c. amplifier depends on the beta of the transistors; therefore, resistor R_4 should be adjusted by comparing the audio outputs from a given signal when S_2 is switched back and forth. This adjustment is performed by first tuning in a station with S_2 on m.v.c. and adjusting the r.f. gain for maximum undistorted audio output. Then on throwing S_2 to a.v.c. the S-meter reading should stay the same; if not, adjust R_4 until it does.

The resistors in the S-meter circuit are chosen to give full meter deflection on the strongest signals likely to be encountered. However, by proper choice of R_5 and R_6 the circuit can accommodate different meter movements and different signal-strength indications.

Since a single oscillator stage is used for the two carrier frequencies (453.5 kc. and 456.5 kc.) differences in the activities of the two crystals will result in a different amplitude of carrier injection voltage being fed to the detector for a given setting of the injection control. If this occurs, the values of capacitors C_6 and C_7 can be changed to make the voltage outputs equal for the two conditions.

Reception of A.M. Signals

Adjustment of the receiver for regular a.m. reception is the same as with any receiver employing 3-kc. selectivity. The main tuning control can be positioned to tune in either sideband or it can be set with the carrier at the midpoint of the selectivity curve.

When the carrier is centered, the sideband frequencies are limited to less than 1500 cycles. The amplitude of the audio frequencies in this range (0 to 1500 cycles) at the detector output will vary as the receiver is tuned across a signal; if this audio voltage is represented as e when only one sideband is received, it becomes $2e$ when both sidebands fall in the pass band.

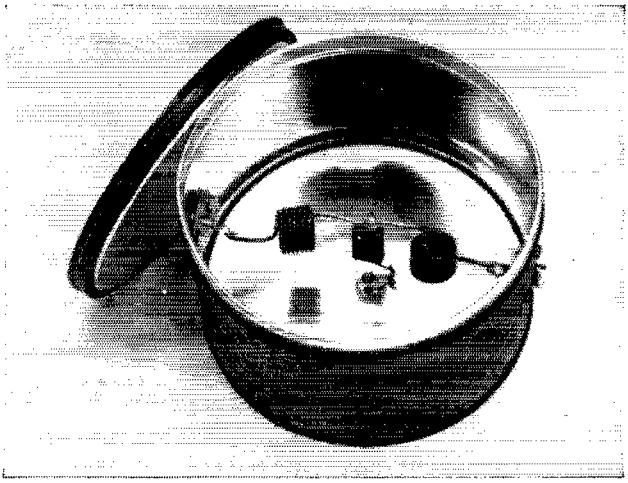
Reception of Single-Sideband Signals

Single-sideband signals are detected by inserting a carrier of proper frequency into the diode detector along with the received signal. A convenient method for tuning in s.s.b. signals is to tune for maximum excursion in S-meter deflections and then increase the strength of the inserted carrier until the S meter wiggles only slightly on voice peaks. If signal is not intelligible, throw the sideband switch to the other position. Some slight retouching of the main tuning control may be necessary to bring the received signal into the natural voice range.

Reception of C.W. Signals

The controls used for single-sideband reception are also used for c.w. Several advantages are obtained by so doing. The carrier insertion control is used for beat-frequency insertion, which allows the level to be set at the optimum value for, for example, limiting action on c.w. signals. When the b.f.o. injection is set at the value that just gives maximum audio output the S meter reads signal strength. Since the a.v.c. amplifier remains in the circuit (if so desired) a certain degree of automatic adjustment of r.f. gain is achieved.

(Continued on page 138)



A coffee can is used to house the filter. This type of can makes an excellent shielding enclosure. Phono jacks are mounted on opposite sides of the can and the two coils and the capacitor are mounted inside.

Note that the coils are mounted so that their axes are at right angles to minimize coupling between them. A single ground lug is mounted at the bottom center of the can for the ground connection of C_1.

Solving Your TVI Problem

Some Suggestions for the Novice

BY LEWIS G. McCOY,* W1ICP

Interference to television reception by amateur transmitters may be divided into distinct categories, each one requiring a different treatment. This discussion of the causes and cures includes details of a simple low-pass filter.

Soon after getting into amateur radio, the newcomer will discover that a subject of general interest is something called "TVI." You won't find TVI defined in Webster's dictionary. But if it were, the definition might go something like this: "TVI — Garbling of received television signals by interference from undesired signals." These undesired signals have many different sources such as electrical devices with sparking contacts, industrial heating equipment, diathermy, short-wave stations, and many others. But there are only two types of TVI of direct concern to the amateur. First is the type of interference that is caused by spurious signals emanating from his transmitter at the same frequency as that of the television signal. The second type of interference is caused by the legitimate transmitter signal at the operating frequency.

The first is distinctly the amateur's responsibility, since regulations require that the radiated energy from a transmitter be confined to the authorized operating frequency. The second type of interference is a result of deficiencies in the television receiver itself. While it is therefore not a direct responsibility of the amateur, it is not a problem that he can entirely ignore.

* Tech. Asst., *QST*.

Interference From Spurious Signals

Let's tack a definition on spurious signals so you'll know what they are. Spurious signals resulting from operation of your transmitter are *any* signals other than your fundamental, the fundamental being the signal you are using for communication. Spurious signals fall into two general categories, harmonics and parasitics. Let's take harmonics first and see how they can cause trouble.

The generation of a signal at a desired operating frequency is invariably accompanied by the generation of other lesser signals at multiples of the fundamental frequency. These multiples are called "harmonics," and when they are radiated they are classed as "spurious" signals. If these spurious signals happen to fall in a TV channel, they may ruin the reception of an otherwise perfect picture. How bad the interference to the TV picture or sound may be will depend on the comparative strengths of the harmonic and the TV signals. If the TV signal is strong enough, it is possible to have a harmonic in the channel without causing TVI.

In the normal course of events, it would be unusual for a ham to cause TVI by harmonics from an 80-meter transmitter. As you go lower in frequency, the harmonics falling in the TV region decrease in strength. Thinking in terms of the Novice power limit of 75 watts input, it is unlikely that an 80-meter rig could cause TVI except in extremely weak TV-signal areas. On

the other hand, one must be on guard against harmonics from a 40-meter rig and definitely expect them in 15-meter operation.

Before discussing methods of eliminating harmonic interference, we must also consider the problem of parasitic signals that can be radiated and cause TVI. You can expect to have harmonics but parasitics are "odd-ball" signals that may be present when the transmitter is operated. They occur when some stage in a transmitter oscillates at some frequency which may be far removed from the operating frequency — often in the region assigned to television. Such signals are not harmonics of the operating frequency; they are usually generated directly at the interfering frequency. A point that should not be forgotten is that factory-built rigs and kits are just as likely to have parasitics (and harmonics) as homebuilt transmitters. Methods of detecting and eliminating parasitics are given in the *Radio Amateur's Handbook* and won't be treated in detail here. The important thing to remember is that parasitics can cause TVI.

There is nothing very complicated about curing harmonic radiation. In fact, only a minimum amount of work and expense is required to insure a "clean" transmitter. The first step is to close up the transmitter so that any signals leaving the rig can escape via only one route. This route should be through a coax line to the antenna or antenna coupler.

By closing up the transmitter we are referring to a completely shielding enclosure. Although your transmitter may be housed in a metal cabinet it doesn't necessarily mean that it is shielded. Incomplete shielding is seldom better than no shielding at all, and even factory-assembled rigs may require additional work if they are to be considered r.f. "tight." For example, some transmitters have panels with painted surfaces on the sides that fit into the cabinet, or the panel lip on the cabinet may be painted. In order to obtain good shielding, the paint must be removed so that the panel and cabinet are joined by clean metal-to-metal contacts. Screws holding the panel to the cabinet should be not more than three inches apart. Any spacing of screws greater than this may permit the harmonic energy to leak out. Harmonic energy will escape more easily through a slit-type opening than through a circular or square opening of equivalent area. If the transmitter has a hinged lid, the paint should be removed from around the edge where it joins the cabinet, and as with the panel, the lid should be screwed down. The same shielding techniques should be applied to the rear of the cabinet or any areas where there are large openings.

Ventilation holes in the cabinet should not exceed ¼-inch in diameter. If they are larger than this the harmonic energy will tend to leak out. You can use perforated metal for covering large ventilation holes; the Reynolds "Do-It-Yourself" type of aluminum is excellent for the purpose. Once the rig is completely shielded you can be reasonably sure that the r.f. will be confined to escape routes provided by wires emerging from the enclosure. Techniques for filtering power and key leads are described in the *BCI-TVI* chapter of the *Handbook*.

Low-Pass Filters

This leaves us with only one more problem — that of preventing the harmonics from reaching the antenna through the feed line. The answer is to install a low-pass filter at the transmitter output. A low-pass filter is simply an "electrical gate" that permits your fundamental to reach the antenna but which stops harmonics. The filter is a coil-capacitor combination that is designed to attenuate any signal above a certain "cut-off" frequency. Any signals higher in frequency than the cut-off frequency are attenuated, while the signals below the cut-off frequency are permitted to pass through the filter.

The filter is a simple device and the one described here can be built in an hour or so. Details are shown in Fig. 1 and in the photograph. Parts for the filter should cost about one dollar or less. The cut-off frequency for this filter is slightly higher than the 21-Mc. band, permitting 3.5, 7.0, and 21-Mc. signals to reach the antenna but attenuating harmonics above 21 Mc.

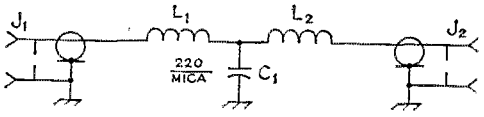
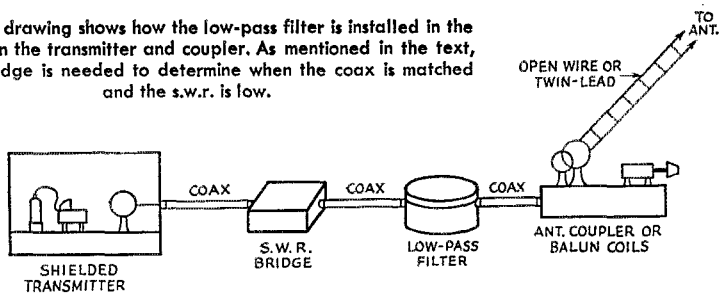


Fig. 1—Circuit diagram of the low-pass filter. The coils L_1 and L_2 are wound with No. 16 solid enameled wire. Each coil is 7 turns ½-inch diameter and ½-inch long. A ½-inch diameter drill shank or dowel rod can be used as a winding form. Leave an inch or so of lead length at the coil ends for connecting to J_1 and J_2 (phono jacks), and don't forget to scrape the enamel from the ends of the leads before soldering. A 220-$\mu\mu$f. mica capacitor, ± 5 percent tolerance, should be used for C_1. The filter should be used with RG-58/U, RG-59/U, RG-8/U or RG-11/U coax. Of the two cables, RG-58/U and RG-59/U are less expensive and easier to handle.

For the filter to do a good job it must be shielded and properly installed on the transmitter. We want the r.f. to flow through the circuit, not around it. The customary method is to use a short length of coax line between the transmitter and the filter. The feedline terminals on the transmitter and filter must be of the coax type to maintain shielding and prevent harmonics from getting on the outside of the coax. If harmonics manage to get on the outside of the line they can bypass the filter and reach the antenna and be radiated. That is why the filter must be connected to the rig with coax line and coax fittings.

Fig. 2 shows how the filter should be used with antenna couplers or balun coils. In many instances amateurs use antennas fed directly with coax line, without benefit of a coupler. In this type of installation the filter should be installed close to the transmitter. The standing-wave ratio on the coax line should be low, say 2 to 1 or less, otherwise there is a danger of component break-

Fig. 2—This drawing shows how the low-pass filter is installed in the line between the transmitter and coupler. As mentioned in the text, an s.w.r. bridge is needed to determine when the coax is matched and the s.w.r. is low.



down in the filter due to excessive voltages. An s.w.r. bridge such as the Monimatch [1] can be used to determine when the line is flat (terminated in its characteristic impedance).

Fundamental Overloading

If you have followed the steps outlined above you should have a transmitter that is free of harmonic radiation. However, you may still cause interference on the neighbor's TV set (or your own) due to "fundamental overloading." This type of interference, though caused by your fundamental signal, is not your fault nor obligation. However, you should be in a position to know what it is, how it is caused, and the cure.

Briefly, here is what happens. Assuming you have a clean transmitter with no harmonics being radiated, you still have your fundamental signal going out. Receiver circuits that have sufficient selectivity to reject an adjacent-channel signal if it is of reasonable strength may not be selective enough to reject a very strong signal, even though its frequency may be far removed from the frequency to which the circuits are tuned. If the television antenna is close enough to your transmitting antenna, the signal from your transmitter picked up by the TV antenna may be so strong, even though you are operating on a frequency widely separated from the TV channel, that the input circuits of the TV receiver will not reject it. If the signal is strong enough, one or more tubes in the TV receiver may overload. This overloading is usually accompanied by the generation of spurious signals which are then fed to other stages in the receiver, and TVI results. If the TV set had better selectivity it could discriminate against your fundamental and prevent it from reaching the r.f. tube.

The way to improve the selectivity of the TV set so that it accepts only TV signals is by means of a *high-pass* filter. A high-pass filter is just the opposite of the low-pass unit described earlier. In this case we design a filter that will pass only signals *higher* than its cut-off frequency while attenuating lower-order signals. Usually the cut-off frequency is about 40 Mc. although there are special units available with a cut-off just below Channel 2. Any of the hams who operate on 50 Mc. and have Channel 2 to deal with make good use of such filters. When high-pass filters are installed on the tuner of a TV set they usually clean up the fundamental-overload problem. The filters should be installed *at the tuner* and *not* on the back of the set. This is done to prevent any signal pickup on the lead from the TV antenna terminals to the tuner.

A good way of finding out when your own station is clean is to have a filter installed on your own TV set and be able to operate the rig without causing interference to your own set.

As we said earlier, cleaning up your neighbor's TV set is not your obligation. However, it will usually help to maintain good relations if you explain the problem to your neighbor and invite him over to see your set and demonstrate that it is clean when operating your rig. You might also point out that a high-pass filter will help reduce other types of interference. Never be discourteous, even if the TV viewer is (and many of them can be quite difficult to deal with!). Don't, under any circumstances, make remarks over the air about the neighbor or his set, he may be able to copy everything you say and you may find it difficult to keep things on a cooperative basis.

Many areas of the country have TVI committees — groups sponsored by local amateurs. These committees are equipped to handle TVI complaints and are trained to do the job. If you have complaints, contact your local committee and ask for help. If you don't know of any local groups, write the nearest FCC office, since they maintain a list of committees in each area. If there is no committee nearby to service the complaint, then you will have to handle it it yourself. This means that you must show the set owner how his set is at fault and why the installation of a high-pass filter is required. In many instances the set manufacturer will furnish a high-pass filter at no charge. The local serviceman or distributor may not know about this policy, so you may have to persuade the set owner to write to the manufacturer.

As we mentioned earlier, study the BCI-TVI chapter of the *Handbook*. Also, your ARRL Headquarters has printed material available that is yours for the asking. This includes sample letters to TV set owners, explaining fundamental overloading and the use of a high-pass filter, sample publicity releases, information on forming TVI committees, and other information.

Maybe you'll never have to worry about TVI, but if you do, don't forget there is plenty of help available for the asking. QST—

[1] McCoy, "Monimatch Mark II," *QST*, February 1957 or the current edition of *The Radio Amateur's Handbook*.

A 500-Watt Package

Self-Contained Unit for Five Bands

BY DONALD MIX,* W1TS

By taking advantage of the short duty cycle of c.w. and s.s.b. operation, it has been possible to find space on a standard-size chassis for self-contained power supplies in a half-kw. rig. The safe limit on a.m. is about 250 watts. A differential keying system and remote-tuning v.f.o. are included.

The transmitter shown in the photographs is a 500-watt c.w. transmitter, completely self-contained except for an external remote v.f.o. tuning box. Provision is made for introducing s.s.b. input at the grid of the driver stage. While plate modulation can be applied to the final amplifier in the usual manner, ratings of the plate power supply limit the safe input to about 250 watts.

The circuit is shown in Fig. 1. Switch S_2 permits either v.f.o. or crystal-controlled operation using a 6AH6 oscillator. Either 80- or 40-meter crystals may be used. C_6 is a crystal feed-back control. The v.f.o. circuit is in the 80-meter band and S_1 selects either of two frequency ranges — 3.5 to 4 Mc. for complete coverage of all bands, and 3.5 to 3.6 Mc. for greater bandspread over the low-frequency ends of the wider bands. The plate circuit of the oscillator is on 80 meters for all output bands except 10 meters where it is non-resonant.

A 6CL6 buffer separates the oscillator and the first keyed stage. This stage doubles to 20 meters for 20- and 10-meter output and triples to 15 meters. The driver is a 2E26 which doubles to 10 meters and works straight through on all other bands. This stage is neutralized and a potentiometer in its screen circuit serves as an excitation control.

The final is a 7094, also neutralized, with a pi-network output circuit using a B & W 851 band-switching inductor unit.

A differential break-in keying system using a 12AU7 is included. Both the final amplifier and driver are keyed by the grid-block method. Chirps are prevented by the keying system which automatically switches the oscillator on ahead of the amplifiers and off after the amplifiers. The differential is adjusted by R_1. Clicks are suppressed by envelope-shaping circuits which include C_7, C_{11} and the associated grid-leak resistances.

Metering

A meter-switching system provides for monitoring 6CL6 plate current, driver grid or plate current, and final-amplifier grid, screen or plate current. The 1000-ohm resistor in series with the meter M_1 makes it possible to use standard resistance values for the shunts R_2, R_3, R_5, R_6, R_8 and R_4. The 100-ohm shunts give a full-scale reading of 50 ma., the 51-ohm shunts a full-scale reading of 100 ma., and the 10-ohm resistor in the negative high-voltage lead provides a 500-ma. scale.

Power Supply

Space, restricted by the size of a standard

* Assistant Technical Editor, *QST*.

A 500-watt transmitter. Power supplies and a differential keyer are included. It operates with the external v.f.o. tuner shown in following photographs. Controls along the bottom, from left to right, are for low-voltage power, v.f.o./crystals/s.s.b. switch, driver tank switch, driver tank capacitor, final loading, v.f.o. set switch, and high-voltage. Above, from left to right, are controls for excitation, final tank switch, final tank capacitor and meter switch. The band-switch pointer is made by cutting down the metal skirt of a dial similar to the one to the right. All dials are Johnson.

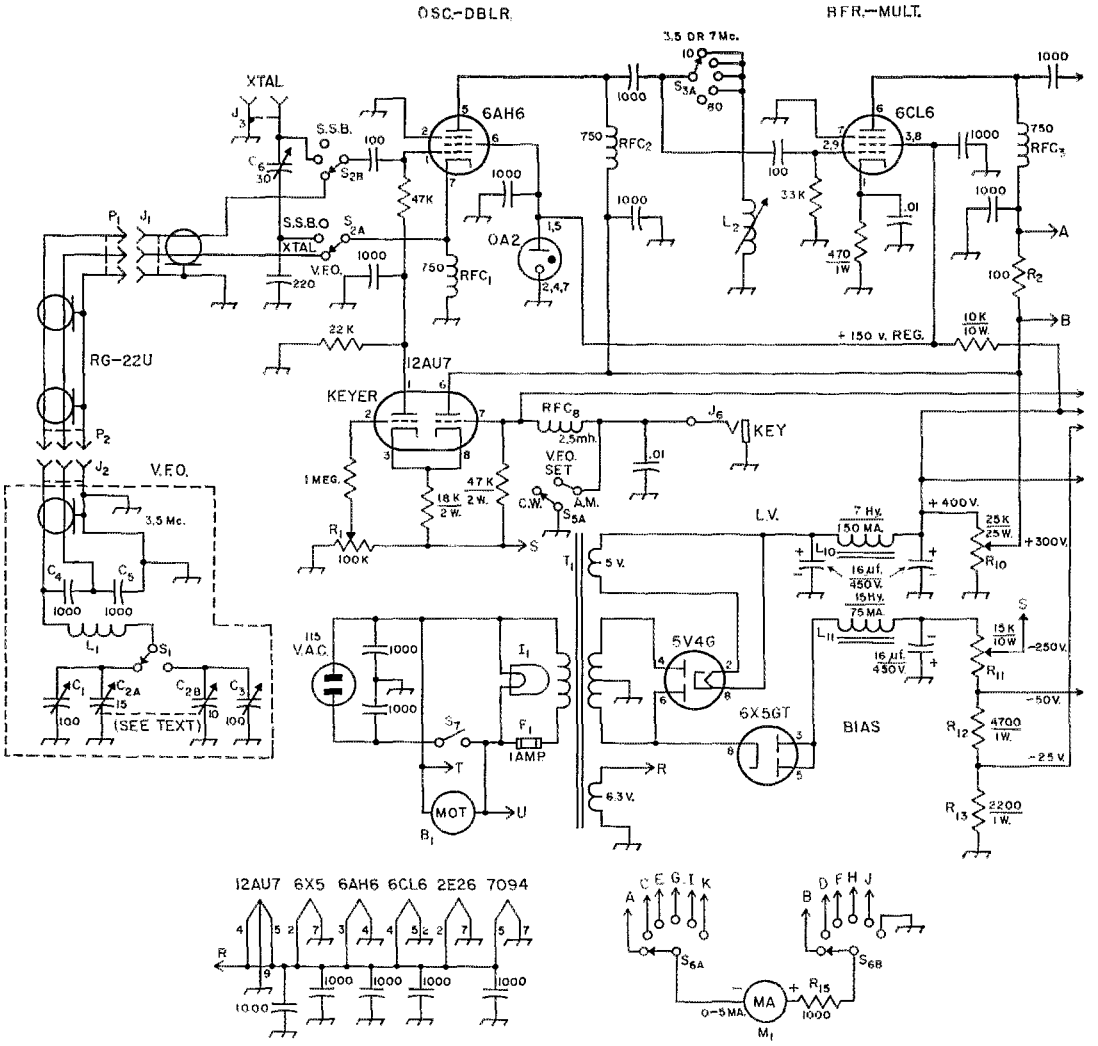
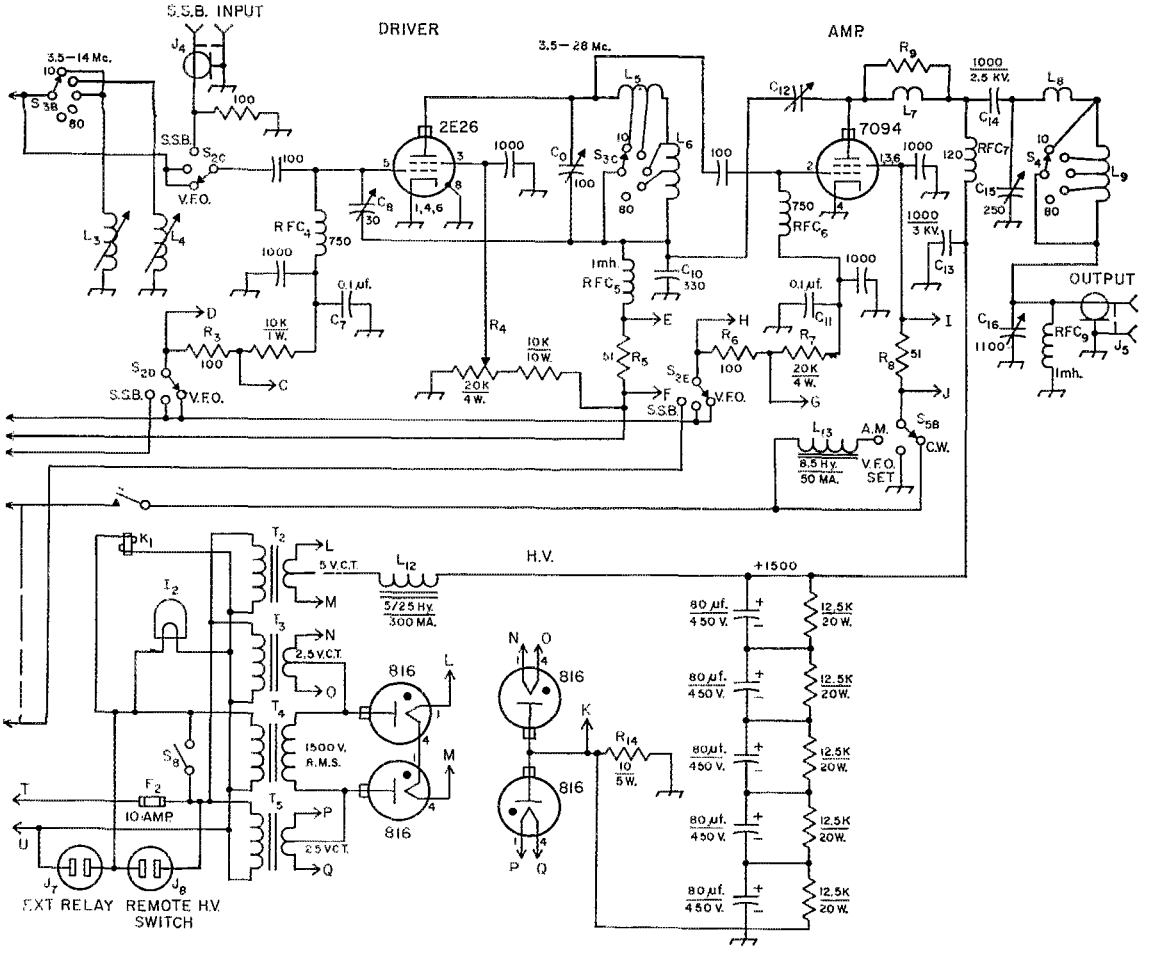


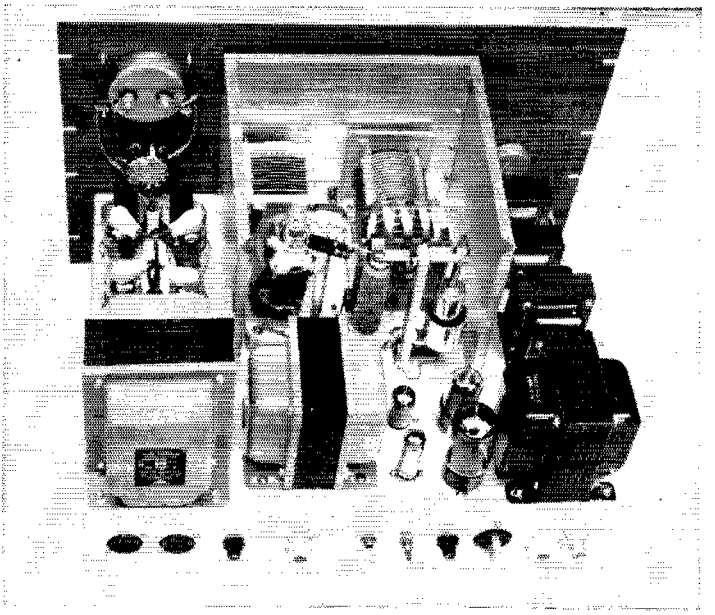
Fig. 1—Circuit of the 500-watt self-contained transmitter. Except as indicated, capacitances less than 0.001 µf. are in µµf. Fixed capacitors of capacitance greater than 100 µµf. should be disk ceramic, except as noted below. Fixed capacitors of 100 µµf. and 220 µµf. should be mica. Capacitors marked with polarity are electrolytic. Resistors not otherwise marked are ½ watt.

B_1—Blower (Allied 72P715).
C_1, C_3—100-µµf. air trimmer (Hammarlund APC-100-B).
C_2—Midget dual variable, 25 µµf. per section (Johnson 167-51 altered as described in the text).
C_4, C_5—0.001-µf. silver mica.
C_6—30-µµf. mica trimmer.
C_7, C_{11}—0.1-µf. paper (keyer shaping).
C_8—30-µµf. miniature variable (Johnson 160-130).
C_9—100-µµf. midget variable (Johnson 167-11).
C_{10}—330-µµf. mica.
C_{12}—10-µµf. neutralizing capacitor (Johnson 159-125).
C_{13}—0.001-µf. 3000-volt disk ceramic.
C_{14}—0.001-µf. 7500-volt ceramic (CRL 858S).
C_{15}—244-µµf. 2000-volt variable (Johnson 154-1).
C_{16}—Triple-gang broadcast variable, 365 µµf. or more per section, sections connected in parallel.
F_1, F_2—Type 3AG.
I_1, I_2—One-inch 115-volt panel lamp (Dialco C-432, C-431).
J_1, J_2—Chassis connector for RG-22/U (Amphenol 83-22R, UG-103/U).
J_3—Crystal socket (Millen 33102).
J_4, J_5—Coaxial receptacle (SO-239).
J_6—Key jack, open circuit.
J_7, J_8—Chassis-mounting a.c. receptacle (Amphenol 61-F1).
K_1—S.p.s.t. 115-volt a.c. relay (Advance GHA/1C/-115VA or similar).
L_1—35 µh.—32 turns No. 18, 2 inches diameter, 2 inches long (Airdux 1616).
L_2—Approx. 10 µh.—65 turns No. 26 enam., on ⅜-inch iron-slug form (Waters CSA-1011-3).
L_3—Approx. 2 µh.—16 turns No. 26 enam., close-wound at center of form similar to L_2.
L_4—Approx. 1 µh.—13 turns No. 26 enam., ½ inch long at center of form similar to L_2.
L_5—16 turns No. 20, ¾ inch diameter, 1 inch long, tapped at 10 turns and 13 turns from L_6 end (Airdux 616).
L_6—40 turns No. 16, 1¼ inches diameter, 2½ inches long, tapped at mid point (Airdux 1016).
L_7—3 turns No. 14, ½ inch diameter, ¾ inch long.
L_8—4 turns ⅜ × 1/16-inch copper strip, 1⅜ inches diameter, 2½ inches long (part of B&W 851 coil unit).



L_9—4¾ turns No. 8, 2½ inches diameter, 1¾ inches long, tapped at 1¾ turns from L_8 end, plus 9½ turns No. 12, 2½ inches diameter, 1½ inches long, tapped at 6 turns from output end (part of B&W 851 coil unit).
L_{10}—7-hy. 150-ma. filter choke (Stancor C-1710).
L_{11}—15-hy. 75-ma. filter choke (Stancor C-1002).
L_{12}—5/25-hy. 300-ma. swinging filter choke (Triad C-33A).
L_{13}—8.5-hy. 50-ma. filter choke (Stancor C1279).
M_1—Shielded 0-5-ma. d.c. milliammeter, 3½-inch rectangular (Phaostron).
P_1, P_2—Plug for RG-22/U cable (Amphenol 83-22SP).
R_1—0.1 meoghm potentiometer.
R_2, R_3, R_6—100 ohms, 5%.
R_4—20,000-ohm 4-watt potentiometer (Mallory M20-MPK).
R_5, R_8—51 ohms, 1 watt, 5%.
R_7—Two 10,000-ohm 2-watt resistors in series.
R_9—Three 100-ohm 1-watt noninductive resistors in parallel.
R_{10}—25,000 ohms, 25 watts with slider.
R_{11}—15,000 ohms, 25 watts, with slider.
R_{12}—4700 ohms, 1 watt.
R_{13}—2200 ohms, 1 watt.
R_{14}—10 ohms (Five 51-ohm 1-watt 1% resistors in parallel).
R_{15}—1000 ohms ½ watt 5%.
RFC_1, RFC_2, RFC_3, RFC_4, RFC_6—750-μh. r.f. choke (National R-33).
RFC_5, RFC_9—1-mh r.f. choke (National R-100).
RFC_7—120-μf. r.f. choke (Raypar RL-101).
RFC_8—2.5-mh. r.f. choke (National R-100).
S_1—Single-pole ceramic rotary switch (Centralab 2000, 2 of 12 positions used).
S_2—5-pole 5-position ceramic rotary switch (Centralab PA-300 index, PA-5 wafers, S_{2A} and S_{2B} are on one wafer, S_{2C}, S_{2D} and S_{2E} on second wafer).
S_3—3-pole 5-position ceramic rotary switch (Centralab PA-301 index, wafers PA-0, 5 positions used).
S_4—Part of B&W 851 coil unit.
S_5—2-pole 2-position ceramic rotary switch (Centralab 2003, two positions used).
S_6—2-pole 6-position ceramic rotary switch (Centralab 2003).
S_7, S_8—S.p.s.t. toggle switch.
T_1—Power transformer: 750 v.a.c., c.t., 150 ma.; 5 volts 3 amps.; 6.3 volts, 4.7 amps. (Thordarson 24R06).
T_2—Filament transformer: 5 volts, c.t., 3 amps. (Triad F-7X).
T_3, T_5—Filament transformer: 2.5 volts, c.t., 3 amps. (Triad F-1X).
T_4—Plate transformer: 1780 volts, c.t., 310 ma., center tap not used (Triad P-14A).

chassis and cabinet, made it necessary to design the power supply primarily for the short duty cycle of c.w. or s.s.b. operation. The plate transformer in the high-voltage supply uses a transformer designed for a conventional full-wave rectifier circuit with an ICAS d.c. output rating of 300 ma. at 750 volts. A bridge rectifier is used with this transformer so that an output voltage



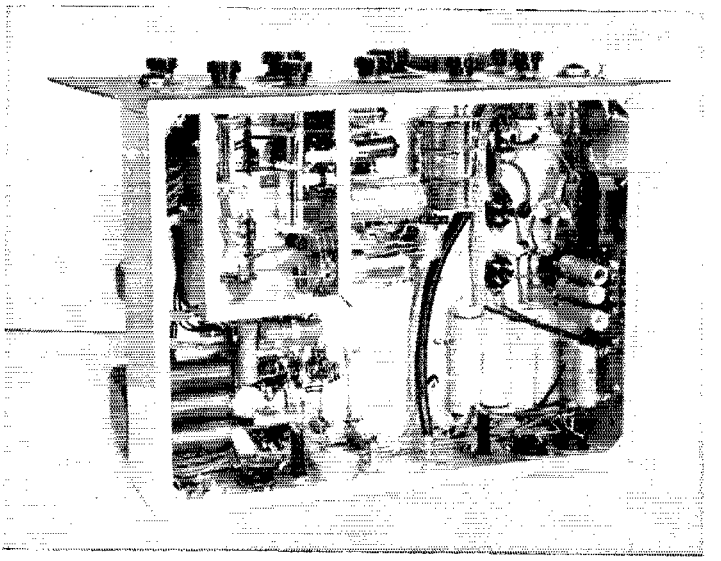
The only shielding required on top of the chassis is the amplifier enclosure shown. A perforated cover for the enclosure is not shown. The text discusses other details.

of 1500 is obtained. The short duty cycle of c.w. or s.s.b. operation makes it possible to draw up to the rated maximum of the 7094 (330 ma.) through a choke-input filter without a prohibitive rise in transformer temperature. For economy, electrolytic capacitors in series, with equalizing resistors, are used in the filter.

The low-voltage supply has two rectifiers. A full-wave rectifier with a capacitive-input filter provides 400 volts for the plate of the driver and the screen of the final amplifier. A tap on a voltage divider across 400 volts provides 300 volts for the plates of the oscillator, buffer and keyer tubes. Screen voltage for the 6AH6 and 6CL6 is regulated at 150 volts by an 0A2. A half-wave rectifier with a choke-input filter supplies 250 volts of bias for the keyer and fixed bias for the 2E26 and 7094 when they are operating as Class AB_1 linear amplifiers. The 6.3-volt filament winding on T_1 supplies all filaments.

Control Circuits

S_7 is the main power switch. It turns on the low-voltage, filament and bias supplies. Until it has been closed, the high-voltage supply cannot be turned on. In addition to turning on the high-voltage supply, S_8 operates the relay K_1 which applies screen voltage to the final amplifier. Thus, to protect the screen, screen voltage cannot be applied without applying plate voltage simultaneously. J_8 is in parallel with S_8 so that the high-voltage supply can be controlled remotely



The exciter is assembled using a standard aluminum box as the foundation. The perforated cover has been removed. The bottom of the chassis should also have a perforated metal cover.

from an external switch. Also, in parallel with the primary of the high-voltage transformer is another jack, J_7, which permits control of an antenna relay or other device by S_8 if desired.

The "v.f.o. set" switch S_5 simultaneously turns on the exciter and grounds the screen of the final amplifier. It is not necessary to turn off the high voltage while setting the v.f.o. to frequency.

S_2 has three positions. One is for crystal control, the second for v.f.o. operation, and the third position is for operating the last two stages of the transmitter as linear amplifiers with an external s.s.b. exciter. In addition to shifting the input of the driver stage from the buffer amplifier to an s.s.b. input connector, fixed bias is provided for AB_1 operation of both stages.

Construction

The transmitter is assembled on a 17 × 13 × 4-inch aluminum chassis with a 19 × 12¼-inch panel. Except for the final amplifier, the top of the chassis is devoted to power-supply components. The exciter is built as a separate unit mounted underneath. The amplifier enclosure measures 8½ inches wide, 8¼ inches deep and 7½ inches high. The three permanent sides shown in the rear view can be bent up from a single sheet of solid aluminum stock. The top and back (not shown) are made from a single piece of Reynolds perforated sheet aluminum. The box is centered on the chassis, flush with the front edge.

To provide ventilation for the final-amplifier tube, the tube socket is mounted on ¾-inch ceramic cones over a large hole cut in the chassis and covered with a patch of perforated sheet. The tank capacitor C_{15} is mounted on metal spacers to bring its shaft level up to that of the switch on the B & W inductor which is mounted directly on the chassis. The two shafts are spaced 4 inches and symmetrically in respect to the panel center line.

The neutralizing capacitor and the plate r.f. choke are placed to the rear of the coil unit. The parasitic suppressor composed of L_7 and R_9 is suspended between the top of the choke and the plate cap of the tube.

The high-voltage transformer is mounted in the rear right-hand corner of the chassis with the four 816 rectifiers and the two 2.5-volt rectifier filament transformers in front of it. The 5-volt transformer T_2 is on the opposite side of the chassis, close to the panel, followed toward the rear by the bias and low-voltage filter chokes and the low-voltage transformer.

Across the rear of the chassis, between the two transformers are the high-voltage filter choke, keyer and VR tubes, and bias and low-voltage rectifiers.

Exciter

Turning to the under side of the chassis, a 4 × 5 × 6-inch aluminum box is used as the foundation for the exciter. The driver tank capacitor is mounted central on the chassis with the center of the capacitor approximately 3 inches back from the front edge of the chassis. The capacitor specified has an insulated mounting. If an uninsulated capacitor is substituted, an insulating mounting must be provided. The shafts of S_2 and S_3 are spaced 2½ inches and centered on the front end of the box. On the side of the box toward the tuning capacitor, the oscillator tube, the buffer tube, the low-frequency section (L_6) of the driver tank coil, and the 2E26 are lined up so as to clear the tank capacitor nd its shaft. The latter is fitted with an insulated coupling and a panel-bearing unit. The slug-tuned coils are mounted in holes near the bottom edge of the box. Neutralizing capacitor C_8 is mounted at the rear end of the box, close to the 2E26 socket. The high-frequency section (L_5) of the tank coil is suspended between the outer end of the low-frequency section and the plate cap of the 2E26. Coil-tap leads run through small feed-through points or grommeted clearance holes in the side of the box.

The final-stage loading capacitor C_{16} is placed so that its shaft is symmetrical with the shaft of S_3, and S_5 is spaced from it to balance S_2 at the other end of the panel.

The ventilating fan is mounted against the right-hand wall of the chassis. The high-voltage bleeder resistors are also mounted at this end, supported on insulating strips. The five high-voltage filter capacitors are held in place in the right rear corner by a strap. In the opposite rear corner are the capacitors in the low-voltage and bias filters.

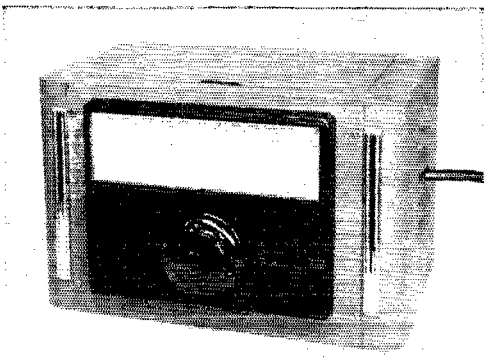
Along the rear wall of the chassis, from left to right as viewed from the front, are the s.s.b. input connector, the v.f.o. tuner connector, a.c. power connector, low-voltage fuse, bias potentiometer in the keyer circuit, key jack, coaxial output connector, high-voltage fuse, and receptacles for external high-voltage control and antenna relay. All power wiring is done with shielded wire. The 1000-$\mu\mu$f. heater bypass capacitors shown in Fig. 1 should be connected one at each ungrounded filament terminal of all tubes except the 6X5 rectifier.

On the panel, the meter switch is placed below the meter, symmetrical with the excitation control at the opposite end.

The V.F.O. Tuner

The v.f.o. tuner is assembled in a 5 × 6 ×9-inch aluminum box (Premier AC-596). The dual tuning capacitor C_2 has 7 plates, 4 rotor and 3 stationary, in each section. In the front section, which is used to cover the entire 80-meter band, the two rotor plates nearest the front should be removed. This leaves two rotor plates and two active stator plates, the front stator plate being inactive. In the rear section, the front stator plate and the last two rotor plates are removed. This leaves one rotor plate riding between two stators.

The capacitor is mounted on a bracket fastened against the bottom of the box, although it could be mounted from the front cover with spacers to clear the hub of the Millen 10035 dial. The shaft of the capacitor should be central on the front cover. The coil is suspended between a pair of



The remote v.f.o. tuning unit is housed in a standard metal cabinet. The cable at the right plugs into the main chassis.

2½-inch ceramic pillars (Millen 31002). It is placed immediately to the rear of the tuning capacitor. The two air trimmers, C_1 and C_3, are mounted on the top side of the box with their shafts protruding so that they can be adjusted from the top. The bandspread switch is mounted in one end of the box and the cable connector at the other end.

The leads of the two bridging capacitors, C_4 and C_5, are soldered directly to the terminals of the connector and to a grounding lug.

The unit is housed in a standard cabinet (Bud C-1781) having an 8 × 10-inch panel. The dial should be fastened to the panel, making sure that the hub of the dial lines up accurately with the shaft of the tuning capacitor. Then the box is inserted in the cabinet through the front opening. The switch shaft goes out through a hole drilled in the side of the cabinet, and the cable goes through a hole in the opposite end to the cable connector. After the box is inside the cabinet, the dial hub can be fastened to the capacitor shaft and the panel moved into place. The dial should be set to read zero at maximum capacitance of the tuning capacitor. The box should be supported on spacers. Four 2-inch cone insulators were used in this case.

Adjustment

With all tubes except the rectifiers out of their sockets, the power supplies should be checked first to be sure that they are functioning properly. The voltage output of the low-voltage supply should be in excess of 400 volts, the biasing voltage 300 or more and the high voltage above 1500. The slider on the low-voltage bleeder should be set at approximately three quarters of the way from ground. The slider on the bias-supply bleeder should be set for a reading of −250 volts to ground.

Plug in the oscillator and buffer tubes and an 80-meter crystal if one is available; otherwise connect the v.f.o. tuner. With the low-voltage supply turned on, the 0A2 should glow. When the key is closed, the 0A2 should dim but stay ignited. If it does not, the value of the 10K VR resistor should be reduced.

The v.f.o. can now be adjusted to frequency. Set C_2 at maximum capacitance. Set S_1 to the 80-meter position. Adjust the 80-meter trimmer C_1 until a signal is heard at 3500 kc. on a calibrated receiver. Then set the receiver to 4000 kc. and tune the v.f.o. until the signal is heard. If the signal is not close to 100 on the dial, carefully bend the rear rotor plate of the 80-meter section of C_2 outward a little at a time to get the desired bandspread. Each time this adjustment is made, the trimmer should be reset to bring 3500 kc. at zero on the dial. When this adjustment is complete, the dial can be calibrated against the receiver at intermediate points.

The same procedure should be followed in adjusting for the other v.f.o. range, aiming for 3600 kc. (or above if desired) at 100 on the dial. The rear stator plate can be bent for fine adjustment.

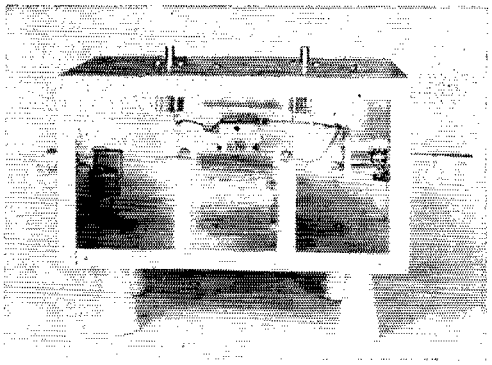
The 2E26 should now be plugged in and the excitation control R_4 set at the ground end (zero screen voltage). S_2 should be set in the v.f.o. position. With low voltage on and the key closed, a reading of grid current to the 5763 should be obtained with the band switch in the 80-meter position. With the switch in the 40-meter position, the slug of L_2 should be adjusted for maximum grid current to the 2E26. With the band switch in the 20-meter position, L_3 should be adjusted for maximum grid current, and then the slug of L_4 should be adjusted for maximum grid current with the band switch in the 15-meter position.

Now insert the 7094 in its socket. Turn the band switch to the 15-meter position. Advance the excitation control to about three-quarters of maximum. Tune the driver tank circuit to resonance as indicated by maximum grid current to the final amplifier. Switch the meter to read driver grid current. There will probably be a pronounced change in grid current as the plate tank circuit is tuned through resonance. Adjust the neutralizing capacitor C_8 *using an insulated screwdriver*. As the neutralizing capacitor is adjusted, the change in grid current should become less. When the change has been reduced to a small percentage, tune the driver tank circuit accurately to resonance as indicated by minimum plate current. Now switch the meter back to read grid current. Detune the plate circuit very slightly both above and below the exact resonant point, observing if the grid current increases with an increase or decrease in tank-circuit capacitance. If the grid-current increase occurs with an increase in capacitance, the capacitance of the neutralizing capacitor should be increased slightly. If the grid current increases with a decrease in tank capacitance, the neutralizing capacitance should be reduced. The neutralizing capacitor should be carefully adjusted to the point where there is no change in grid current either side of resonance, or where the grid current decreases on both sides of resonance. This adjustment should be satisfactory for all other bands. After neutralization is completed, the driver tank circuit can be tuned for the other bands, always adjusting for maximum grid current to the final amplifier. Any excess of grid current can be re-

duced by adjustment of the excitation control.

Testing of the final amplifier requires a load applied to the output connector. Two 150-watt lamps connected in parallel should serve the purpose. Turning on the high voltage will also apply screen voltage through the relay K_1. With both band switches set to 10 meters, and C_{16} set at about half capacitance, quickly tune the output circuit to resonance as indicated by the plate-current dip. The load lamp should show an indication of output. Switch the meter to read grid current and reduce the fluctuation in grid current as C_{15} is tuned through resonance as described for the driver. *Use an insulated screwdriver with extreme caution*, since the neutralizing capacitor is at full supply voltage to ground. When the fluctuation in grid current has been reduced to a minimum, observe the plate current at resonance. If it is above the rated maximum value, increase C_{16} and retune to resonance, or decrease C_{16} if the plate current at resonance is below the rated value. When the loading has been adjusted to normal, the last fine adjustment of neutralization, as described for the driver, should be made.

With the final adjusted and the entire transmitter operating, make a final check on the voltage at the tap on the low-voltage supply, adjusting the slider if necessary to bring the voltage to 300 with the key closed. Be sure to turn off *all* voltages each time an adjustment is made. Next, check the voltage from the arm of R_4 to ground



Interior of the v.f.o. tuning box showing the mounting of the coil and other components.

with the control turned to maximum (toward the fixed resistor) and the key closed. If the voltage differs from 200 appreciably, adjust the value of the fixed resistor, decreasing the value if the voltage is too low, or increasing it if the voltage is too high.

The last adjustment is in the keyer. Adjust the potentiometer R_1 to the point where the oscillator cannot be heard between dots and dashes at normal keying speed.

Tuning the final amplifier with an antenna connected in place of the lamp load will be similar, although the settings of C_{15} and C_{16} may be different. QST

A.R.R.L. QSL BUREAU

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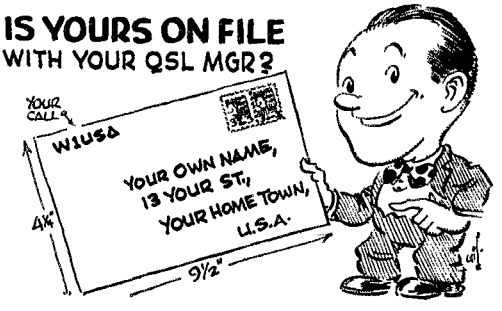
KL7 — KL7CP, 310-10th Ave., Anchorage, Alaska.
KZ5 — Catherine How, KZ5KA, Box 407, Balboa, C. Z.



New Thresholds in V.H.F. and U.H.F. Reception

Circuit Theory and Diode Details

BY ROSS BATEMAN,* W4AO AND WALTER F. BAIN,** W4LTU

BEFORE getting into the thick of this month's installment it might be well to briefly review what has gone before in order to be sure what we're about. December *QST* showed something of the potential of new devices for v.h.f. and u.h.f. reception. January *QST* [1] discussed these devices with the emphasis on the reactance amplifier. It was shown that the important item in its operation is a voltage-tunable capacitor. It was also shown that under conditions of back-bias a semiconductor diode exhibits such a characteristic and should therefore be usable in this application. Now let us briefly rehash the basic circuitry in which this diode is to be used.

A Brief Refresher

Fig. 1 shows a simplified circuit which may be used for either frequency conversion or straight-through amplification. In this figure, tank 1 serves as an input tank to which a signal at a frequency f_s is applied. When used as a frequency converter, tank 2 is tuned to the output frequency f_o, which may be either higher than (up-converter) or lower than (down-converter) the signal frequency. The pump tank has only the job of providing an efficient means for exciting the diode capacitor at a pump frequency f_p. The diode capacitor is represented in Fig. 1 by the strange-looking symbol. Pump and pump-frequency are nothing more than new-fangled terms for a local oscillator and its output frequency. The pump performs a function similar to that of a high-frequency oscillator in an ordinary superheterodyne receiver.

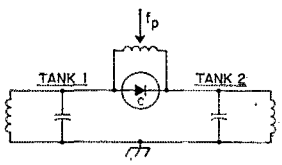


Fig. 1—Basic two-tank circuit.

When the circuit of Fig. 1 is employed as an up-converter, with the output frequency f_o higher than f_p (tank 2 tuned to $f_o = f_p + f_s$), a stable power gain equal to $\frac{f_o}{f_s}$ may be realized with ideal diodes and lossless circuits. If the output tank is tuned to $f_p - f_s$, the gain relationship is $-\frac{f_o}{f_s}$. The negative sign implies that regeneration is involved and, depending on operating conditions, very high gains may be achieved.

When used as a down-converter, the output frequency is always lower than the signal frequency. For the case where the signal frequency is higher than the pump frequency, the gain is ideally $\frac{f_o}{f_s}$ and since f_o is smaller than f_s, we have a stable attenuator. Thus, if $\frac{f_o}{f_s}$ is made small very high values of attenuation may be realized. Who knows, maybe someone can find a use for such a device. On the other hand, when f_s is lower than f_p, the gain is ideally $\frac{f_o}{f_s}$. Here also, f_o is smaller than f_s and the ratio $\frac{f_o}{f_s}$ is less than unity. However, the actual gain for this arrangement, as in the case of the regenerative up-converter, may, in fact, be large if the device is adjusted to be highly regenerative.

It will be noted that for the regenerative arrangements f_p is always the highest frequency in the system and is equal to $f_s + f_o$. In the regenerative condition the signal in tank 1 is amplified by the regenerative action and the device may be used as a straight-through amplifier merely by taking the output from tank 1 instead of from tank 2. The difference frequency $f_p - f_s$ must, however, still appear in tank 2. The terms "idler" and "idler frequency" have become standard nomenclature for tank 2 and its frequency since they apparently have no purpose in life except that they must exist.

Two-Tank Amplifier

A mild skirmish with the noise figure equations for the two-tank amplifier will be helpful in illustrating what's involved in designing and adjusting the devices for low noise figure. Fig. 2 shows a block diagram of the device and illustrates a way in which it might be used. The electrical circuit showing the principal elements which determine noise figure performance is given in Figure 3.

R_1 is the shunt resistance representing the losses directly associated with tank 1, including losses in the semi-conductor capacitor (the shunt resistances representing the load and the antenna are not included).

R_a is the shunt resistance across tank 1 representing the antenna (or generator) resistance as

* 5720 El Nido Road, McLean, Virginia.
** Route 1, Box 27M, Springfield, Virginia.

[1] Bateman and Bain, "New Thresholds in VHF and UHF Reception — Devices and Diodes," *QST*, Jan. 1959.

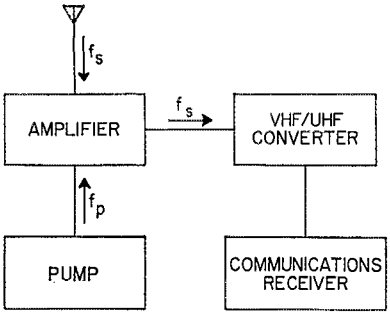


Fig. 2—A receiving system employing the two-tank amplifier.

transformed by the tuned circuit.

The theoretical noise figure of the two-tank amplifier has been developed in some detail by Heffner and Wade [2]. For our purpose it may be represented to a good approximation by the relation:

$$F = 1 + \frac{R_a}{R_1} + \frac{R_a}{R}\frac{f_s}{f_i}.$$

The first term (unity) represents the thermal noise generated by an antenna (or signal generator) whose source resistance is at room temperature. The second term is the contribution added by the thermal noise associated with R_1. The third term represents the thermal noise generated at the idler frequency in tank 2. This noise appears in tank 1 which serves as both an input and an output tank for the device. In this last term, the factor R is a shunt negative resistance determined by the operating conditions. If the device is giving a low noise figure with good gain, R will have a value only slightly greater than R_a and the ratio $\frac{R_a}{R}$ can be omitted without much loss in accuracy. The equation then simplifies further to:

$$F = 1 + \frac{R_a}{R_1} + \frac{f_s}{f_i}.$$

What does the equation tell us, having in mind our goal of having F as close to unity as possible? Since the first term represents noise which originates in the generator, we can't do anything about it. The remaining two terms when added together are a measure of the *excess noise* generated by the amplifier. Each of these terms should be kept as small as possible in order to keep their sum to a minimum. To minimize the second term we should couple the antenna tightly so that R_a is much less than R_1. The third term may be made small by using an idler frequency much higher than the signal frequency. This means a still higher pump frequency, since $f_p = f_s + f_i$.

Fig. 4 shows how the noise figure varies with pump frequency and different values of the ratio $\frac{R_a}{R_1}$. The curve labeled $\frac{R_a}{R_1} = 0$ represents the best that can be accomplished. This is an idealized case in which R_1 is considered to be infinitely large. This curve illustrates the importance of having a high pump frequency. For example, if a pump frequency equal to five times the signal frequency is used, the contribution from idler noise will be 0.25. The noise figure will be 1.25 (approximately 1 db.). In any practical circuit, however, the contribution from $\frac{R_a}{R_1}$ will add to the 0.25 idler contribution with the result that the noise figure will be greater than 1.25. Thus, if you are straining for a one-db. noise figure ($F = 1.26$) it would be more practical to use a pump frequency in the range of 7 to 10 times the signal frequency. The contribution from idler noise will then be in the range of 0.11 to 0.17. This would allow some room to maneuver in with respect to the contribution from $\frac{R_a}{R_1}$ which can then be in the range of 0.09 to 0.15 depending on the ratio $\frac{f_s}{f_i}$ used.

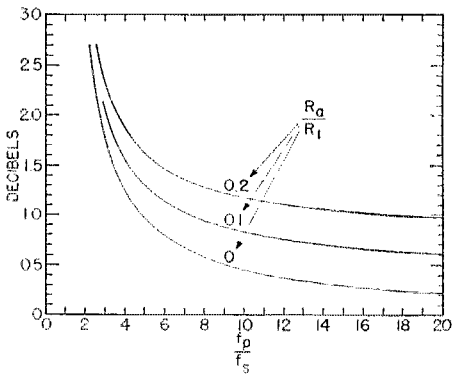


Fig. 4—Noise figure of the two-tank amplifier as a function of frequency and antenna loading.

Someone may be wondering about the noise associated with the load and whether it is amplified along with the signal by the regenerative action of the circuit. This matter is of some academic interest and is discussed in Appendix A.

Although the noise figure equation gives good directions on how to proceed, it does not tell the complete story. Nothing has been said so far as to how much capacitance variation is required from the diode capacitor and its pump. The required capacitance variation, ΔC, may be

[2] H. Heffner and G. Wade, "Gain, Bandwidth, and Noise Characteristics of the Variable Parameter Amplifier" *Journal of Applied Physics*, Vol. 29, No. 9, Sept. 1958.

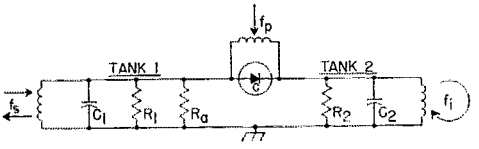


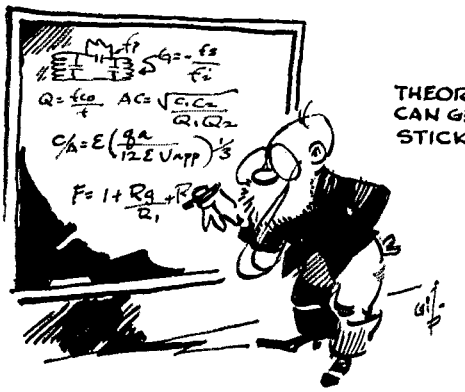
Fig. 3—Electrical circuit of the two-tank amplifier.

estimated from the relation

$$\Delta C = \sqrt{\frac{C_1 C_2}{Q_{T1} Q_{T2}}}$$

Here, Q_{T1} and Q_{T2} are the loaded Q's of tank 1 and tank 2 respectively. The loaded Q of tank 1 depends on R_a and R_1, together with the effect of the actual load which for the two-tank amplifier will usually be a conventional v.h.f. or u.h.f. converter. In Fig. 3, R_1 and R_2 are shunt resistances representing the losses (excluding the effects of R_a and the load imposed on tank 1 by the converter) associated with tanks 1 and 2. For tank 1 the resistances R_1 may be considered to be the parallel combination of a shunt resistance R_{C1} resulting from the circuit losses of the tank itself and a shunt R_{D1} representing the losses in the semiconductor capacitor at the signal frequency. A corresponding situation exists for tank 2. Note that only R_1 enters directly into the noise figure equation but that both R_1 and R_2 are involved in Q_{T1} and Q_{T2}.

The noise figure equation becomes complicated and somewhat sticky if the equation for the required capacitance variation is built directly into



it. R_1, C_1, C_2, ΔC and Q_{T2} are all interrelated in a complex fashion which will be left as an exercise for the mathematically inclined. The end result, however, indicates that in order to minimize the noise figure of a practical device the following conditions are desirable:

a. High idler and pump frequencies relative to the signal frequency, **b.** High-Q tanks, **c.** High Q in the semiconductor capacitor, **d.** A high available ΔC in the diode capacitor, and **e.** Small C_1 and C_2.

Other means for minimizing noise figure of the two-tank amplifier are available in addition to the suggestions given by the simplified equation. These are discussed in Appendix B as their application to amateur practice will probably be somewhat restricted.

The Up-Converter

The theoretical noise figure of the up-converter has been developed by Leenov.[3] The same general considerations such as high pump frequency and high-Q circuits and diodes that lead to low noise performance of the two-tank amplifier are also applicable to the up-converter. For this reason, the noise figure equation will not be given, although it is quite similar to that for the two-tank amplifier when translated into the same general form. The nonregenerative up-converter is attractive since it is stable and in practice will probably not require frequent retuning nearly as often as its regenerative cousins. Fig. 5 shows

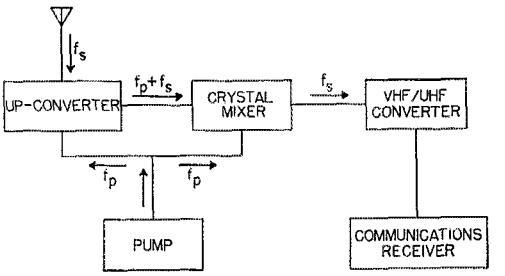


Fig. 5—A receiving system employing an up-converter and crystal mixer.

a practical configuration involving an up-converter and a crystal mixer in which the output appears at the signal frequency. This combination of up-converter and crystal mixer therefore performs the same function as a straight-through amplifier. It has the desirable feature of permitting a self-controlled oscillator to be used for the pump without introducing frequency instability in the output. The configuration has one disadvantage in that the overall noise figure will be somewhat greater than that which can be obtained from a two-tank amplifier using the same diode and pump frequency. Fig. 6 gives the minimum noise figure which can be obtained from an up-converter followed by a crystal mixer with a noise figure of 4.8 db. The value of 4.8 db. is about as good as one can do with a conventional crystal mixer using currently available diodes designed for this purpose. Fig. 6 is based on the assumption that the thermal noise generated in the signal tank (tank 1) has been made negligible by extremely heavy antenna loading and is there-

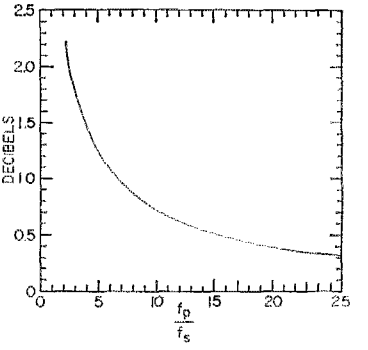


Fig. 6—Minimum noise figure of the up-converter/crystal mixer configuration.

[3] D. Leenov, "Gain and Noise Figure of a Variable Capacitance Up-Converter," *Bell System Technical Journal*, Vol. 37, July, 1958.

fore an idealized case. The noise figure performance of the up-converter/crystal-mixer configuration as represented in Fig. 6 is therefore directly comparable with the idealized noise-figure performance of the two-tank amplifier as shown in the curve labeled $\frac{R_a}{R_1} = 0$ of Fig. 4.

The Down Converter

The regenerative down-converter arrangement illustrated in the block diagram of Fig. 7 is quite attractive from the point of view of the number of major components required for a complete receiving system. The noise figure equation is similar but not identical to that for the two-tank amplifier. In a simplified form it is given by the relation:

$$F = 1 + \frac{R_a}{R_1} + \frac{R_L}{R_2}\frac{f_s}{f_o}$$

In this equation R_L is the shunt resistance representing the losses introduced at the output frequency f_o by the load. Typically, the load will be a communications receiver, as in Fig. 7.

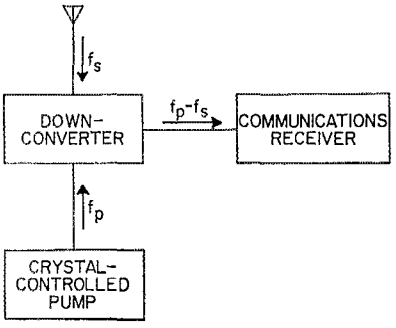


Fig. 7—A receiving system employing a down-converter.

Inspection of the noise figure equation shows the principal difficulty in obtaining low-noise performance in the down-converter. Since f_o is smaller than f_s the ratio $\frac{f_s}{f_o}$ may be quite large, as, for example, in a 144-Mc. down-converter working into a 14-Mc. communications receiver. In order to compensate for large values of $\frac{f_s}{f_o}$ it will be necessary to have extremely tight coupling between the load and the output tank. Existing diodes may not have sufficiently high values of ΔC and Q to give adequate regenerative gain with the heavy loading required for low-noise performance at low output frequencies. A further disadvantage of the down-converters is that very high regeneration will be required to give useful gains. When $\frac{f_o}{f_s}$ is small a narrow bandwidth will result and the device will tend to have very poor gain stability. For these reasons down-converters with a high ratio of $\frac{f_o}{f_s}$ will probably be tricky to adjust and maintain.

Diode Considerations

It has been shown that a back-biased semiconductor diode can provide the voltage-tunable capacitance that is necessary for the operation of reactance devices. Is the capacitive component the only one existing in such a diode? Unfortunately, no. There is some leakage across the dielectric which appears as a high shunting resistance. There is also some resistance in the mass of the material outside the depletion region which appears as a low series resistance. This series or spreading resistance is not the d.c. resistance determined simply by E/I in the forward direction. It is the dynamic or a.c. resistance in the forward direction, and is equal to the slope of the E/I curve after it has straightened out to be nearly linear. R_s is typically 0.25 to 2.5 ohms. Fig. 8 shows the equivalent circuit of the diode con-

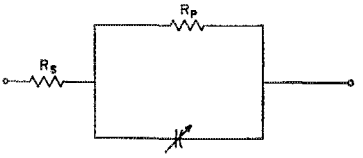


Fig. 8—Equivalent circuit of a semiconductor diode.

sidering these three components, the small series resistance R_s, the large shunting or back resistance R_p, and the voltage sensitive capacitance, C. (R_p should not be confused with the R_{D1} mentioned earlier. R_{D1} is the shunt *equivalent* of the actual diode loss. R_p is of importance only at the lower frequencies.)

It is evident that resistive components are undesirable if the diode is to be used as the active element in a reactance amplifier. Resistance not only inhibits the gain of the device, but provides a source of noise. (Remember that a pure reactance cannot generate noise.) Therefore, in order to evaluate the usefulness of a diode for amplifier purposes, it is desirable to have a simple figure of merit based on these three characteristics. Such a factor turns out to be none other than "Q," the same as used for evaluating ordinary coils and capacitors which have reactive and resistive components.

Fig. 9 shows qualitative curves of the behavior of diode Q versus frequency for both germanium and silicon types. It will be noted that at the lower frequencies Q is dropping as it is limited by shunt resistance, hence the poor showing there by germanium, well known to be inferior to silicon in back resistance.

At the higher frequencies, Q is largely limited by series, or forward resistance, and germanium does not make such a poor showing. For all practical amateur applications at the higher frequencies, the limiting factor will be series resistance and the quantitative expression for Q takes on quite a simple form:

$$Q = \frac{X}{R_s} \text{ or } Q = \frac{1}{2\pi f R_s C}$$

From this, it can be seen why Q drops off linearly

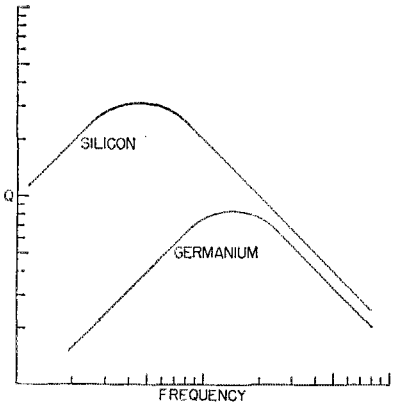


Fig. 9—Q *vs* frequency for representative silicon and germanium diodes.

with frequency in the higher frequency region of Fig. 9. This leads one to expect poorer performance from a given diode as the frequency increases. (Shades of tubes and transit-time!) This is indeed the case and it is possible to define a cutoff frequency for a given diode as that frequency at which Q has dropped to unity, i. e., the resistive component is equal to the reactive. These cutoff frequencies typically fall high in the microwave region.

Maximizing Diode Q

In order to maximize Q in a given diode, it is necessary to operate with as high a reactance as possible. This implies a low capacitance which in turn requires a high back bias. The limit to the amount of back bias that may be used is the peak inverse voltage (p.i.v.) of the diode. Beyond this value, avalanche breakdown may take place, the diode will begin conducting in the reverse direction, and a new shunting resistance will appear across the diode, deteriorating the Q. The behavior of the Q-versus-frequency curve for various levels of back bias is shown in Fig. 10 for a diode of 100-volt p.i.v. Note that in the high frequency region the Q increases with bias until the p.i.v. is reached and breakdown occurs. The Q then rapidly deteriorates, beginning at the low frequency end, due to the above-mentioned shunting resistance. It would appear then that

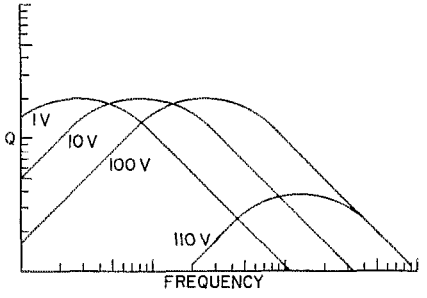


Fig. 10—Typical Q variation with frequency and bias for a diode having a peak inverse of 100 volts.

for high-frequency operation we desire to operate as close to the p.i.v. as possible.

In what manner does the capacitance vary with the applied back-bias voltage? This is dependent on the junction structure employed. Where there is a sharp boundary between the p-type and the n-type material, the step or alloy junction shown in Fig. 11, the capacitance varies inversely as the square root of the bias. For what is known as a diffuse junction, see also Fig. 11,

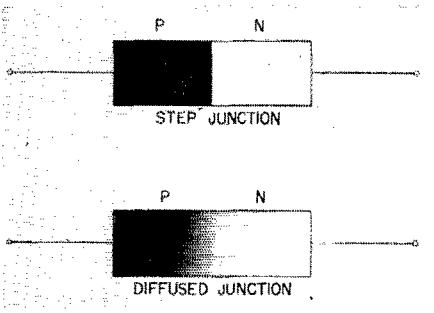


Fig. 11—Step junction and diffuse junction diodes.

there is no sharp boundary between the materials, and capacitance is found to vary more nearly as the inverse cube root of the bias. Fig. 12 shows the variation of capacitance with bias voltage for a typical step-junction diode with a 50-volt p.i.v. The curve follows the expected $V^{-\frac{1}{2}}$ law quite closely except in the region below 1 volt. The cause of the flattening of the curve in this region is the presence of a small constant "built-in" voltage in addition to the applied bias. This is

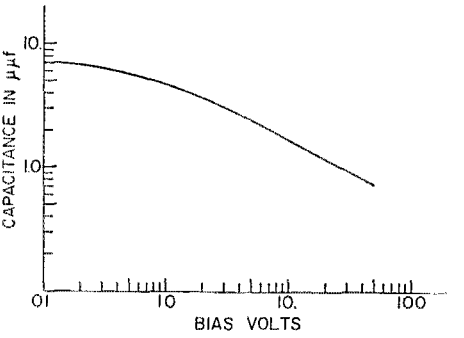


Fig. 12—Diode capacitance variation with back-bias voltage for a step-junction diode having a peak inverse of 50 volts.

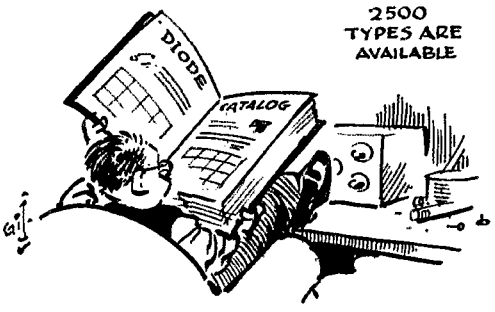
the contact potential existing between the two dissimilar substances, the p-type and n-type material. Its magnitude is about 0.7 v. and it sets the practical upper limit on the diode capacitance. The $V^{-\frac{1}{2}}$ law proves to be quite accurate when this effect is included. Another effect that may be observed in practical cases is an apparent flattening of the curve at the low capacitance end. This is due simply to the fixed static capacitance of the diode cartridge and may be considered to

set the lower limit of available capacitance for cases not limited by p.i.v. Its value ranges from 0.1 $\mu\mu$f. for sub-miniature glass diodes to 0.4 $\mu\mu$f. for the microwave ceramic structure.

It has been seen that Q represents a rough figure of merit by which diodes may be evaluated. It has also been seen that diodes may be classed in four different groups, germanium or silicon, each in either a step-junction or a diffused-junction configuration. Let us briefly consider the comparison of these four types on the basis of their theoretical Q's. An excellent discussion of diode Q is given by Spector [4], which indicates that in general silicon should prove superior to germanium, and that diffused structures should have an edge over step junctions. It is also indicated as a result of this theory that low p.i.v. diodes should be preferable. Experimental results concerning these considerations will be discussed shortly. It might be mentioned at this time that no improvement in overall Q is to be expected by either series or parallel operation of diodes.

Practical Diode Results

Evaluating presently available diodes for use in reactance devices is a fertile field indeed. The latest tabulation shows a total of over 2500 different semiconductor diode types. It has of course



not been possible to test even a significant portion of this total and a certain amount of educated (?) guessing has been involved in selecting types to measure. For this reason the data contained here are not intended to be all inclusive but rather to serve as an indication of what directions might prove fruitful for future work.

A word or two might be in order about the methods of measurement involved in the determination of Q. Two methods have been used. The first is to use the diode in question to resonate a tuned circuit whose resonant impedance may be determined. This resonant impedance is then compared with that observed when an air capacitor of known Q is used in the same circuit. The second method is by use of a standard Q-meter, with the diode resonating a tuned circuit of known Q. When using this method, care must be taken to see that the r.f. voltage developed by the Q-meter is not sufficient to swing the operating point of the diode. Frequencies at which Q measurements have been made include 30, 50, 100, and 200 Mc., with the majority being made at 50 and 200 Mc.

Table I

Recommended Diodes

Type	Q max at 200 Mc.	P.I.V.	C at ½ P.I.V.	Manufacturer
1N663...	40–63	100v.	2.0 $\mu\mu$f	Pacific Semicond.
1N252...	51	20v.	0.5 $\mu\mu$f	Transitron
S266G...	55	8v.	0.5 $\mu\mu$f	Transitron
DR303...	112–122	75v.	0.25 $\mu\mu$f	Radio Receptor
1N660...	31–59	100v.	2.0 $\mu\mu$f	Texas Instr.
PS705...	34–56	200v.	1.4 $\mu\mu$f	Pacific Semicond.
MA460A.	115	9v.	2.0 $\mu\mu$f	Microwave Assoc.
1N308...	82	8v.	0.3 $\mu\mu$f	Raytheon

Results of Q measurements of most interest are summarized in Table I. Values of Q_{max}, p.i.v. and C are given for those diodes which appear satisfactory for low-noise v.h.f. and u.h.f. use. The Q given is for the maximum bias condition, with the spread in Q being given where available. The value of diode capacitance is a typical value that might be expected at ½ p.i.v. (½ p.i.v. might be considered the nominal operating bias if the maximum pump voltage is to be used to swing from zero volts to full p.i.v.) The manufacturer of each diode type is also given. The retail price of these diodes is $6.00 or less, with the exception of the MA-460A which currently sells for about $50.00. The 1N663 and the 1N660 are available from supply houses such as Allied Radio. It might be noted that the MA-460 series, designed specifically for voltage-tunable reactance use, should soon be available in improved versions such as the MA-460E with Q's of 300 at 200 mc.

Appendix C gives a list of marginal and submarginal diode types tested. The 1N21 and 1N23 series are conspicuous by their absence from any of the lists. Small but measurable Q's could be determined for these diodes but with no tunability. Point-contact silicon diodes do not appear suitable for reactance use.

Theory and Results

Now let us consider briefly the overall results of the measurement program in the light of what was predicted theoretically. The diffused structures have indeed shown a superiority over the step junctions as to Q. However, it is possible that the greater tuning ratio of the step junction may partially offset this in practical use. The superiority of silicon over germanium has not been clearcut. The usefulness of silicon has been fully established but the situation for germanium has not yet been fully resolved because of the measurement difficulties resulting from the extremely small junction capacitances.

The theoretical prediction that low p.i.v. diodes would prove superior has not been verified. In fact, the indication has been that the high p.i.v. units have a slight advantage. This may

[4] C. J. Spector, "A Design Theory for the High Frequency p-n Junction Variable Capacitor," paper presented at the 1958 Electron Devices Meeting, PGED-IRE, Washington, D. C., Oct. 30–31, 1958.

result from the fact that the theoretical predictions assume comparison of a low p.i.v. diode designed to be a low p.i.v. diode, with a high p.i.v. unit designed to be high p.i.v. In the practical case of mass-produced diodes, junction design may well be aimed toward optimizing high p.i.v. characteristics, with those units failing to meet the spec being marketed as low p.i.v. That is, the low p.i.v. diodes are imperfect high p.i.v. design rather than optimum low p.i.v. design.

It is of interest to compare the measured values of Q with those computed on the basis of measured spreading resistance and reactance. The realized Q has been found to fall considerably short of the calculated values particularly for germanium and alloyed-silicon units. Diffused silicon junction units designed for fast recovery time show somewhat better agreement but still indicate that existing theory is not complete.

In outlining in general the diode characteristics that appear to correlate with high Q for use in reactance devices, it appears that the fast-recovery silicon diffused computer diodes, and extremely high forward conductances diodes of all types, hold the most promise. The higher p.i.v. units appear somewhat preferable. One precaution in considering high conductance units: rectifier types, even diffused, seem to have poor Q even though their forward conductance may be phenomenal. Their forward characteristic is due principly to a large junction area, a process equivalent to paralleling diodes, which is known not to increase the Q.

Diode Q and Noise Figure

It might be of interest at this time to attempt to determine what noise figures may be expected using a diode of given Q. Noise figure, however, is indirectly dependent on the ratio of tunable to fixed capacitance $\frac{\Delta C}{C}$ as well as being directly dependent on diode Q. Thus a fully rigorous figure of merit for diodes should include the effects of both Q and $\frac{\Delta C}{C}$.

Fortunately the range of variation in $\frac{\Delta C}{C}$ between diodes is not nearly so large as the range of Q's encountered; in fact, for diodes of interest it differs by not more than 2:1. Therefore, it appears that we may solve the noise figure equations using a mean value of $\frac{\Delta C}{C}$ to determine a required Q, and state that practical Q's will vary about this value over a 2:1 range. This allows us to include the effects of $\frac{\Delta C}{C}$ without having to solve for each individual diode.

Table II, then, gives the range of Q, as measured at 200 Mc., that appears necessary on the above basis to obtain the noise figure given. Note that the required Q ranges given are at 200 Mc. so they may be compared directly with the measured values given in Table I. In considering the values in Table II it might be noted that the low p.i.v. diodes and the germanium units would tend to require Q values at the high end of the range. For the high p.i.v. diodes the lower values of Q would be expected to be satisfactory.

Table II

Required Diode Q, at 200 Mc.

	n.f. = 1 db. $\frac{f_p}{f_s} = 9$	n.f. = 2 db. $\frac{f_p}{f_s} = 4$	n.f. = 3 db. $\frac{f_p}{f_s} = 3$
144 Mc.	18– 36	7.5– 15	4.5– 9
220 Mc.	27.5– 55	11.5– 23	6.9–13.8
432 Mc.	54–108	22.5– 45	13.5–27
1300 Mc.	162–216	67.5–135	40.5–81

The noise figures of Table II are theoretical and are based on certain assumptions, such as equal noise contribution from the idler tank and the diode, zero signal-tank loss, and a specified ratio of pump to signal frequency. Hams have been in this business long enough to know that theory is good only so long as it agrees with the results. How well these numbers agree will be determined in the next year or so as these devices are put to use. With the best available diodes noise figures of 1 db. appear attainable up to 432 Mc., and 2 db. at 1300 Mc.

A discussion of experimental results and hardware details is planned for a future article. In the meantime there are no good reasons why a stock of the hotter diodes should not be laid in and experimental work begun.

Appendix A

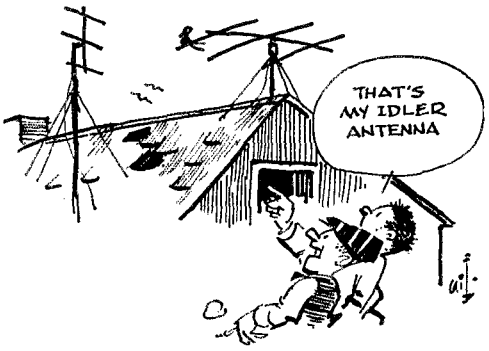
Thermal and excess noise generated by the load affects the overall noise performance in a rather tricky way. Although the noise figure equation is correct, it tells us only how to minimize the noise figure of the two-tank amplifier. It says nothing about the coupling between the two-tank amplifier and the converter. As an indication of the difficulties which may arise, the noise figure of the receiving system will be greater than that of the converter alone, if the converter is matched to the generator impedance and connected in parallel with the generator. Low receiving system noise figure will be obtained when the load is lightly coupled to the two-tank amplifier. This, however, results in a higher gain requirement, narrower bandwidth and poorer gain stability of the device.

These problems can be avoided by using an esoteric device called a circulator. Circulators have a unique property of permitting power to flow in only one direction between certain pairs of terminals. By properly connecting a circulator in a receiving system, the noise generated by the load can be made harmless by dissipating it in a resistive termination. Unfortunately, these devices are available only for frequencies above 1000 Mc. and have not yet appeared on the surplus market.

Another approach involves the use of two of the two-tank amplifiers connected in a receiving system in such a way that the load noise is cancelled out. If the reader is interested in pursuing this matter further, the technique is described by S. H. Autler, in connection with a similar problem involving masers, in the Correspondence Section of the *Proceedings of the I. R. E.* for November, 1958.

Appendix B

Thermal noise generated in the tanks and in the diode is directly proportional to their absolute temperature in degrees Kelvin. Noise figure might be reduced by immersing and keeping these components in a bath of liquid air or liquid



nitrogen. This technique could be quite effective, but how you do this is your problem.

A second way to reduce noise figure is to terminate the idler tank in a separate directive antenna pointing at a cold spot in the sky. The region in the general direction of Polaris (the North Pole Star) is relatively quiet, permits a fixed antenna, and appears suitable for the purpose. This method is not without its drawbacks. Idler frequency signals received by the idler antenna will be converted to signal frequency and appear in the output as interference. Also, the FCC has not yet seen fit to allocate "idler dumping" frequencies in which no transmissions may be made!

Appendix C

Measurements indicate that the following diode types are either not useful or of marginal value for use in v.h.f. reactance devices. They are listed so that further testing or experimentation will not be required to establish their merits for this application. All of these types did, however, exhibit variable reactance and might be useful at lower frequencies.

Not Usable at V.H.F.		*Usable but Marginal*
S10G	1N645	DR670
1N482B	1N91	1N283
1N484A	1N674	1N270
SG213	TI600	1N279
1N461A	TI601	S131
HC7001	TI604	1N659
V27	TI610	1N661
1N1252	1N145	1N643
CK851	1N34	PS700
	TI9G	PS703

Strays

The annual radio contest for Boy Scouts sponsored by *Boys' Life* and ARRL will be held during the last two weeks in February. There will be a Hamboree for on-the-air contacts between hams who are in scouting, and there will be a short-wave listening contest for those scouts who are not yet licensed. The list of 200 prizes runs the gamut from receivers to QSL cards. Only those who are in scouting and who have not reached their 19th birthday by March 1, 1959, are eligible. For further details and complete rules, see the December issue of *Boys' Life*.

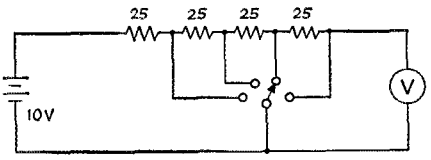
—•••—

W3HPO says that when working with antenna problems he often gets his ohms, impedance and resistance mixed up. Therefore, he suggests two new terms — Zohms and Rohms. (Sometimes life gets so complicated.)

Quist Quiz

Charles Carnahan, ex-W6OJE of El Monte, Calif., spotted this one in an employee applicant test for an electronics firm:

With the switch at the position shown, what is the voltmeter reading?



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You undoubtedly found that last month's Quist Quiz has two sets of answers. They are $R_2 = 0.125$, $R_3 = 0.5$ and $I = 4$, and $R_2 = 32$, $R_3 = 8$ and $I = 0.25$.

● QUIST QUIZ CORRESPONDENCE

Transportation Problem Resolved?

2820 Albemarle Street, N.W.,
Washington 8, D. C.

Quist Quiz Editor, *QST*:

I have gazed long and fondly into my single crystal (yttrium-iron-garnet) sphere hoping to find solace there. Alas, to my everlasting sorrow I am led to believe that you are about to publish an incorrect answer to the December Quist Quiz, submitted by friend Sam Goldish. My crystal sphere tells me that Sam wanted his 6-meter man to construct a cubic container one yard on each edge and place the 1.7 yard antenna therein, as a body diagonal.

The trouble here is in the wording of the ban by the baggage man. He said, ". . . whose greatest dimension does not exceed one yard." Now on some railroads the 1-yard cube would be accepted. But don't try this one out on the Miltown and Tranquility R.R. on which I am chief baggage master. We would consider the body diagonal of the cube as the greatest dimension in one direction. Then, when the traffic gets pretty bad, as at Christmas time, we may even take the circumference (4 yards) or a circumference including two face diagonals (about 4.8+ yards) or even revert to a ruling similar to that of the U. S. Post Office and measure length and girth. Then we would find Sam's convenient package measured about 6.55 yards. So the 1-yard cube is definitely out.

There remain two solutions: one practical and one depending on the sensibilities of the railroad officials. The latter, place the confounded antenna in a coffin (the 6-meter man can even ride with it, if he is quiet and does not start the baggage men ghost-dancing) and apply for special permission to send this long-departed relative in the baggage car. Even the M & T R.R. would make this exception. The other and perhaps more practical solution, especially for tall men, is to place a curved wooden top on the antenna and claim that it is the latest model in crutches. (And thank your lucky stars it wasn't a 10-meter or lower-frequency vertical.)

Now it is your problem; which solution would you use? I will stay tuned in to find out.

— *Robert D. Hatcher, W8RIL*

A Simple Electronic Key

Better Code With Less Effort

BY ROY G. FOSTER,* KØHLC

IN THESE progressive times we have a.m., s.s.b., RTTY, TV and other great improvements in radio communications, but we still have c.w., thank goodness! Although in just tuning across one of the crowded amateur bands, one would wonder if the art of radiotelegraphy has not, in many instances, been lost.

What can one do to improve his fist? Well, he might obtain a tape perforator and use tape in all his QSOs. But there is a much simpler and more economical means for the average ham to obtain tape-like perfection of his code — the automatic, self-completing electronic key. Many readers will no doubt stop here. However, if you will go a bit farther and look at the diagram in Fig. 1, you will find that a good electronic key does not have to be extremely expensive or complicated.[1]

It is true that a good many of the electronic keys proposed for amateur construction are quite complicated, while others that are relatively simple leave much to be desired in the way of operating ease and flexibility.

Just what are the fundamental requirements of a good electronic key?

1) Dots and dashes must be self-completing and the key lever must be necessary only to start a dot or dash — the electronic key should then complete the character and make the required space as well.

2) It should be impossible to make a dot following a dash (or a dash following a dot) without first completing the dot (or dash) and the correct space between. Releasing the key lever in the middle of a dot or dash should not affect the length of that character.

3) The speed control should be continuously variable from about 5 to 50 words per minute.

4) The key switch circuit should be adaptable for use with a slightly modified semiautomatic bug or a simple home-made key lever.

5) Provisions should be made for an adjustable dot-to-dash ratio. Slight deviations from the accepted ratio of one to three sometimes allows easier sending.

6) Weight of keying (dot-to-space ratio) should also be variable to meet the requirements of different transmitters and keying techniques. Here again, the accepted ratio of one to one may not suit the requirements of all operators.

7) The circuit should be mechanically and electrically stable. Ordinary variations in line voltage should have little or no effect on the performance of the circuit. Adjustments should not require critical attention.

8) There should be no interaction between the three controls: speed, dot-dash ratio and weight of keying. Changing any one of these should not affect any other.

9) And last, but by far not the least, the circuit should be simple, using the minimum of easily obtained standard components.

I would like to present an electronic key that will meet all of these requirements. The only one of these requirements that leaves anything to be desired is number 8. When the speed is changed there is a slight change in the dot-to-dash ratio. However, this change is quite small and is entirely unnoticeable unless an extremely wide change of speed is made. Within the usual limits of 10 to 25 w.p.m., there will be no difficulty.

The Circuit

As shown in the schematic, Fig. 1, the circuit requires only one tube, a triode-connected 6AQ5. This tube is normally biased beyond cutoff by the drop across the 5000-ohm cathode potentiometer. Relays K_1 and K_2 are not energized in this condition.

Upon application of the supply voltage, both C_1 and C_2 charge to its value, about 150 volts. When the key lever is pushed to the dot position, C_1 discharges very quickly through the 470-ohm resistor. At the same time the grid of the 6AQ5 is driven positive by the current flow through R_1, R_4 and R_5. This causes the tube to conduct heavily and energizes both K_1 and K_2. When K_1 is energized, the discharge path for C_1 is open and it is permitted to charge to the supply voltage again. This charging current flowing through R_4 and R_5 keeps the grid positive and the relays energized after K_1 has opened and B+ has been removed from the resistors in the grid circuit. When C_1 becomes recharged, the grid is no longer positive and K_1 is de-energized and the discharge path for C_1 is again closed. If the key lever is still in the dot position when K_1 is de-energized, the cycle will repeat. When the key lever is in the dash position the operation is similar except it takes longer for C_2 to charge because of its higher capacitance. Now both dots and dashes are automatic with the key lever locked out until the character and space have been completed.

R_1 and R_2R_3 provide adequate isolation between C_1 and C_2. Complete isolation would require another tube and is quite unnecessary. R_5 varies the charging time for both C_1 and C_2 and thus controls the sending speed of the key. Relay K_2 is shunted with an adjustable resistor. This allows K_2 to become de-energized at a higher plate current than K_1. By adjustment of the 500K weight control, K_2 can be made to

* 9 Rambler Road, Hutchinson, Kansas.

[1] Geppert, "A Single-Tube Electronic Key," *Radio & Television News*, October, 1950.

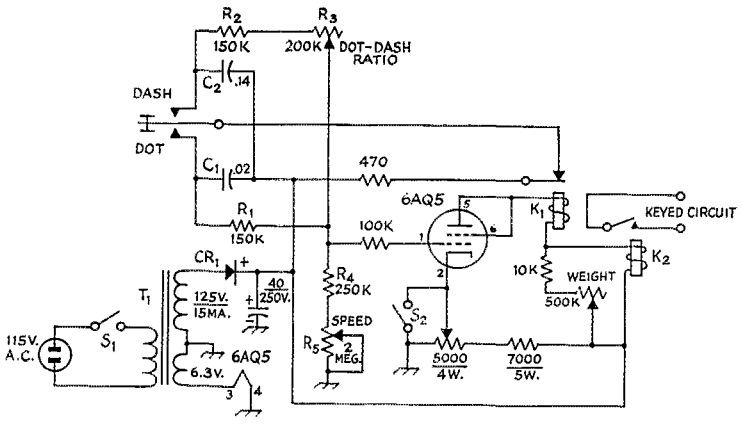

Fig. 1 — Circuit diagram of the electronic key. All capacitances are in μf., all resistances are in ohms, all resistors are ½ watt unless otherwise indicated.

CR_1—65-ma. selenium rectifier (Federal 1002A or equiv.).
K_1, K_2—9000-ohm plate-circuit relay (Sigma 11F-9000-G/SIL or equivalent).
S_1, S_2—S.p.s.t. toggle.
T_1—125-volt 15-ma. ½-wave secondary and 6.3-volt 0.6-amp heater winding (Stancor PS-8415).

open at any time during the charging time of C_1. This controls the weight of keying.

S_2 is a normally open switch or push button; when operated it causes K_2 to close so that the transmitter can be tuned.

Adjustment

After the key is wired and B+ applied, the following procedure should be used for initial tune up. A code oscillator connected to the contacts of K_2 will be very helpful at this stage. If everything is working properly, both relays should operate when the key lever is pushed to either the dot or dash position. Adjust R_5 for a speed of about 8 to 10 words per minute. The weight control should be turned so that all its resistance is out of the circuit. Now, while listening to the key through the audio oscillator, adjust R_3 for the proper ratio. This should be a one-to-three ratio, and a little patience will give just the right sound. Now advance the weight control for proper weight of keying. Its final adjustment should be made while keying the actual transmitter under normal load and listening to the signal on the station receiver. The keying circuits in some transmitters tend to change the weight of keying. The 5000-ohm cathode potentiometer should be adjusted for about +35 volts or so on the cathode of the 6AQ5. Then while listening very closely to the dots (keying the code oscillator) make very small adjustments of the cathode control in the direction that tends to slow down the speed of the key, until all the dots at any specific speed are the same length. If this adjustment is not correct the first dot of a series of dots may be shorter than the following. There is some interaction between controls during tune-up, so all adjustments should be touched up again.

The author's model was built into the case of a Mon-Key. The entire circuit, along with the power supply, was included on the chassis, thus making a very compact arrangement. The only controls that need to be accessible are S_1, S_2 and R_5, the speed control. All the others may be under cover and made screwdriver-adjustable.

An ordinary semiautomatic bug may be easily modified for the key lever. Remove the weights from the bug lever, adjust the dot contacts for positive closure without vibration, and remove the jumper between the dot and dash posts. The modified bug is then connected to the proper points on the electronic key with a three-conductor cable.[2]

Relays

And now a few words about the relays used in the circuit. I used an 8000-ohm, Terado Micro relay for K_1 and an Advance 10,000-ohm, plate-circuit relay for K_2. These relays were used because they were available at the time. Other relays have been used, and as long as they are sensitive and fast acting they seem to operate very well. The Sigma 11F-9000-G/SIL plate circuit relays will work at both K_1 and K_2. These relays are quite small and relatively inexpensive, and they should be used if cost is to be kept at a minimum. Many of the relays on the surplus market will give good service.

After using this key for about two years and listening to the comments about it on the air, I can think of only two improvements that might be incorporated into it. One is the elimination of at least one relay, and the other is the addition of a dot anticipator. However, these complicate the circuit and defeat the purpose of a simple inexpensive electronic key. After all, the Ultramatic has all these features and many more!

If one is accustomed to a hand key it should take only a few minutes to get the "feel" of this electronic key because it does almost all of the work, except spelling. If the operator has been using a semiautomatic bug, it may take a bit longer for him to realize that those dashes are

(Continued on page 138)

[2] If you don't have a bug key to convert for the lever, ideas on lever construction can be found on page 36 of February, 1955, *QST*; page 35 of April, 1955, *QST*; and on page 48 of February, 1957, *QST*. — *Ed.*

VR-Tube Receiver Muting

Smooth Break-In Operation for the C.W. Man

BY LESTER W. KRUTE,* W3OFU

Smooth c.w. break-in operation with a single antenna requires the use of a good keying system, an electronic transmit-receive antenna switch, and an adjustable receiver muting system. In this article W3OFU describes a combination that works well for him and should be applicable to any station with blocked-grid keying. And he also proves that good old "cut-n-try" isn't dead!

For several years the *Handbook* has included a differential keying system using a VR tube and a 6J5. However, neither the *Handbook* nor the original article [1] mentions anything about receiver muting or protection when using this keying circuit. The *Handbook* shows a receiver protection and muting circuit using a relay, but I asked myself, "Why not do it electronically without relays?"

The system I've worked out does just that. Used along with the t.r. switch described by W3LYP,[2] my muter gives me full c.w. break-in without clicks or thumps. I monitor my sending on the receiver with a comfortable signal, adjustable downward from S9+ to a meek S5 or less. If I choose, I can set my own signal level so it is weaker than the station I'm working.

I could make this short and merely describe the circuit of the final product, but *QST* editorialized recently about the need for more do-it-yourself cut-and-try spirit. That's exactly what was involved here, since my technical electronic education was a correspondence course in radio and TV that I took just for the fun of it. Perhaps you will find my efforts at design of some interest, so let's start at the beginning. . . .

Desiring a versatile rig, last year I built the two-control job described by W3KMA,[3] using the bandbox multiplier of W1TS[4]. I substituted a 6146 for the 2E26 output tube so I could have reasonable power until I could afford a good amplifier. Next, I added a remote-tuned v.f.o., also described in *QST*[5] and the *Handbook*. Not satisfied with cathode keying, I installed the VR system with the variations mentioned by W5DWX.[6] These variations permit me to use a 6C4 instead of the 6J5 and to ground the plate directly. The system works fine, and I get many compliments on the quality of my keying.

One Monimatch and a t.r. switch later, I decided I wanted to install a good method of receiver silencing. Not caring for noisy relays, I spent many hours poring through available literature. Stumped! There was nothing on electronic receiver muting geared to the VR-tube keying idea. Plenty of other ideas, but to adopt them I'd have to scrap the keying system I liked so well.

Analyzing the set-up, I had a negative voltage that was being used to good advantage to grid block my oscillator and amplifier. Why couldn't it be used also to grid block another tube employed to develop a negative voltage for muting purposes? Seemed elementary enough, but how to do it?

The problem resolved itself into two parts:

* 3912 Adams Drive, Silver Spring, Md.

[1] Goodman, "VR Break-In Keying," *QST*, Feb., 1954.

[2] Arvonio, "An Electronic Transmitter-Receiver Antenna Switch," *QST*, Oct., 1957.

[3] Herring, "A Two-Control Multiband Transmitting Unit," *QST*, Dec., 1953.

[4] Mix, "The 'Bandbox' — A Single-Control Frequency Multiplier," *QST*, April, 1952.

[5] Mix, "Simple Remote Tuning for the VFO," *QST*, Jan., 1953.

[6] "A *QST-Handbook* Rig," *QST*, Sept., 1956.

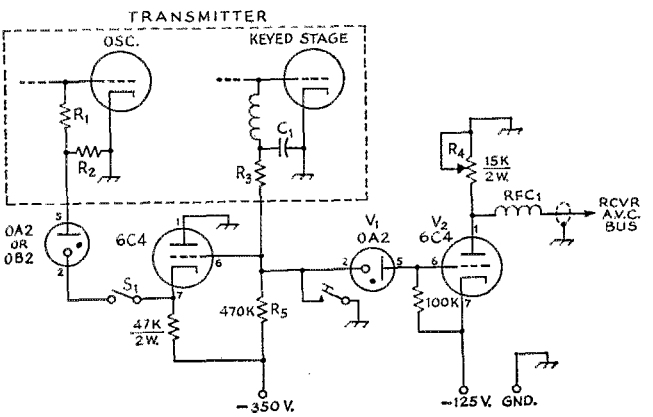

Fig. 1—Circuit diagram of the VR-tube differential keying circuit and the receiver muter (V_1V_2). Resistances are ½ watt unless otherwise indicated.
C_1—Grid-block keying capacitor.
R_1—Oscillator grid leak.
R_2—10,000 to 20,000 ohms, depending upon oscillator tube.
R_3—Keyed stage grid leak.
R_4—Key-down receiver gain control.
R_5—Part of grid-block keying circuit; value may differ with value of R_3.
RFC_1—R.f. choke, 40 μh. to 2.5 mh.
S_1—V.f.o. spotting switch.

(1) how to develop the required biasing voltage, and (2) how to trigger it properly. The answer to (1) was basic enough: use the voltage drop developed across a plate resistor with one end grounded. The whole thing could be accomplished with a tube, a small power supply, and a few resistors — except that I didn't know what values to use for the resistors.

Here's where cut-and-try took over. With the aid of a few potentiometers in an experimental layout, I was able to develop the proper relationship between the resistance values. Using a 150-volt source, I had no trouble juggling the values to develop a voltage drop of up to 50 volts across the plate resistor. By using a potentiometer instead of a fixed resistor, I could vary this voltage drop at will. A higher voltage could be developed by changing values or increasing the source voltage, but I saw no need to do so. I had all I needed.

Next, I had to figure out how to employ the negative voltage already available in the VR keying system, use it to grid block the bias tube, and key it along with the transmitter. I tried it the hard way first, by digging into the rig and running out some experimental leads. Here's where I ran into trouble. The v.f.o. wouldn't oscillate when I took the grid blocking voltage from between the oscillator and the VR keyer tube. Taking it from the power supply side of the VR tube worked after a fashion, but gave me an uncomfortable "tail" on break. No amount of juggling circuit constants relieved this condition much.

Almost ready to give up, I decided to make one more attempt, using a simple approach. I took my cut-off voltage direct from across the key, which is in the grid circuit of the keyer tube instead of the cathode. It worked! Perfect keying, with no connections inside the rig! (At least it's perfect as far as my ears are concerned, and that's what counts.)

Operation of the muter is simple. With key up, the VR tube (V_1) conducts, biasing off V_2. With key down, the VR tube stops conducting and permits V_2 to draw current, developing a voltage drop across the plate potentiometer. The muting voltage is varied by increasing or decreasing the resistance of the plate resistor.

How to apply the muting voltage may vary somewhat with different receivers. Mine is an RME 4350A, and the modification is simple. I merely opened up the connection to the ground ends of the a.v.c. (grid) resistors for the r.f. and first i.f. tubes and applied the negative voltage to the grids of these tubes through these resistors. The shield on the coax between receiver and muter completes the circuit to chassis. I use RCA phono plugs and jacks for my connections. To run the muting voltage in to the receiver, temporarily I am using one of the jacks provided at the back of the receiver for the s.s.b. adapter, by removing the original connection. Since this method necessitates inactivating the a.v.c. system (which isn't in use on c.w. anyway), I intend eventually to install a regular closed-circuit phone jack.

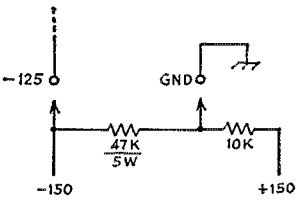

Fig. 2—If the necessary —125 volts is not available from a heavy voltage divider across the —350-volt power supply, it can be obtained from an additional 150-volt supply as shown above.

My transmitter at present runs only 50 watts input. Perhaps with higher power it might be necessary to mute an audio stage also. If so, this should be easy to accomplish. Or it may be necessary to shield and bypass the receiver to reduce direct pick-up, along the lines described recently for the HQ-129X.[7] Incidentally, I use a conventional r.f. choke and capacitor spark filter at the key; that could make a difference in how smoothly and click-free the muter works. The r.f. choke in series with the muting lead to the receiver helps in this respect. I used an Ohmite Z-14 which I had on hand. A regular 2.5-mh. should do as well.

My silencer is built on the back part of a 5 × 9½ × 3-inch chassis, the front half being used for the t.r. switch. Parts layout is not critical. For convenience, I mounted R_4 on a small panel in front above the t.r. tuning control, and to avoid r.f. pick-up ran the connection to the potentiometer through a length of shielded wire. I didn't have space in this small chassis for the muter power supply, so I used a separate 150-volt supply I had on hand with a 47K-10K voltage divider as shown in Fig. 2.

In some instances where VR-tube differential keying is already in use, the addition of V_1 and V_2 for receiver muting may have a slight effect on the shaping of the keying. It should only be necessary to juggle the values of C_1 and R_5 to restore the shaping to the desired characteristic.

QST

[7] Geiser, "Filtering and Shielding the Station Receiver," *QST*, Aug., 1958.

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What source those nervous
clicks and clacks
that punctuate the evening air?
All's revealed! The dreadful sight's
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And who's the wretch our shuddering
eyes behold?
A c.w. man! A binary boob!
And worst of all
This article's meant for him.

— thp

The C. W. Man's Friend

An All-Purpose Keying Unit

BY T. H. PUCKETT,* W5JXM

THIS is a description of a precision general-purpose keying and control device to provide flexible break-in control of a complete station. It uses small, standard, inexpensive relays as the actual control elements, since no other arrangement allows as much flexibility with equivalent electrical performance.

What It Is

The input is the usual telegraph key. The outputs are two sets of relay contacts, arranged to operate in a controlled sequence. One circuit, which will be referred to as the oscillator circuit (V_1 and V_{2A} in Fig. 1), controls the transmitter oscillator, the receiver break-in gain control, the antenna switch or relay, the final amplifier bias (for noise suppression purposes), etc., as used in any particular station. The other circuit, which will be referred to as the amplifier circuit (V_{2B}), controls the keyed amplifier, the monitoring oscillator, etc., as used. The actual outputs are sets of relay contacts to be used as desired in performing the operations listed above. Up to three single-pole-double-throw contacts may be used in the oscillator circuit, and either one or two s.p.d.t. contacts may be used in the amplifier circuit, one relay being required for each s.p.d.t. contact.

The sequential operation is as follows: on "make" (when the key is closed) K_1 picks up immediately, but K_2 pickup is delayed for a time proportional to the value of C_2. This allows the oscillator clicks and chirps to get over with, the receiver to get turned off, etc., all before the keyed amplifier controlled by K_2 passes any signal. On "break" (when the key is opened) K_2 drops out almost immediately, but K_1 is held up for a time proportional to the value of C_1 to allow the keyed amplifier to cut off cleanly the transmitter output before the oscillator is turned off and the receiver turned back on.

Necessary Adjustments

Because a range of negative voltage, E_k, and component variations were allowed for, there are three adjustments that must be made when the keyer is initially put into operation. For best performance these adjustments should be checked occasionally to allow for gradual drift in component values as the unit ages.

The first adjustment to be made is the 250,000-ohm potentiometer, R_1, that adjusts the level of the input control signal. It should be set to give the two voltage levels indicated in Fig. 2. A high-input-impedance voltmeter should be used for this measurement, preferably a v.t.v.m. or 20,000-ohms-per-volt multimeter. If things are working normally there will be a little extra voltage swing available. Adjust the pot so that the excess swing is about the same in each direction.

The next adjustment is the relay resistors R_2 and R_3. Adjust each so that 12 volts, or a little over, appears across the relay coils when the key is closed. Typical values for these resistors are: one relay, 8200 ohms: two relays, 2200 ohms; three relays, 1000 ohms.

* Box 2155, Norman, Oklahoma

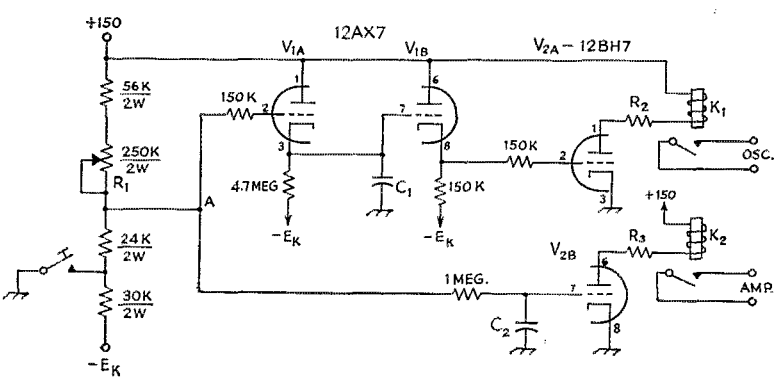


Fig. 1—Circuit diagram of the break-in keying unit. Unless otherwise indicated, resistors are ½ watt. The 24K and 30K resistors are 5-percent tolerance. See text for values and adjustment of C_1, C_2, R_1, R_2 and R_3. Two or three relays can be used in parallel at K_1; two relays can be used in parallel at K_2. K_1, K_2—12-volt 1350-ohm s.p.d.t. relay (Potter & Brumfield RS5D).

The final adjustments are the delays controlled by C_2 and C_1. The amplifier keying should first be adjusted[1] as desired, with the keyer functioning only to drive K_2. This may be done conveniently by grounding pin 2 of V_{2A} to hold the oscillator on, and temporarily removing C_2 from the circuit so there is no delay. After the keying circuit connected to the contacts of K_2 has been adjusted satisfactorily, restore the keyer to its original condition. Now gradually increase the value of C_2 until the output signal of the transmitter on make sounds just as it did when the keyer was not functioning. Because of the inherent time delays in the relays, it may be found that C_2 can be omitted entirely.

After C_2 has been adjusted, adjust C_1 to the minimum possible value that does not clip the transmitter output signal on break. For most transmitters both C_2 and C_1 will probably end up within a factor of ten of 0.01 μf. The use of decade capacitors is very convenient in making these adjustments.

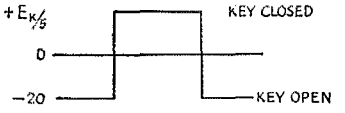


Fig. 2—Voltages to chassis at point "A" (Fig. 1) for proper operation of the keying unit.

Technical Discussion

The keyer may be operated with any negative voltage supply, E_k, from 60 to 150 volts. The current required will range from 2.5 ma. at 60 volts to 6 ma. at 150 volts. The 150 volt positive supply current can be calculated from the following equation: $5 + 9N$ (N = number of relays) ma. Thus if two relays are used at K_1 and one relay is used at K_2, the total positive current will be about 32 ma. These supplies should be reasonably well regulated, preferably by VR tubes. If this is a problem, V_2 may be supplied by a source of somewhat poorer regulation, leaving only 5 ma. at + 150 volts that must be well regulated.

The decision to use relays as the primary control elements was due to their flexibility. Practically any kind of control circuit can be made to work from relay contacts, so their use allowed the keyer to be designed with practically no thought as to the circuits to be controlled and their voltage and current requirements. Anyone who has tried to replace a relay with a vacuum tube, particularly when the final use of the circuit is unknown, will appreciate the convenience involved. The relays are all 12-volt s.p.d.t. Potter and Brumfield type RS5D, with 1350-ohm d.c. coils; they cost $2.70 each. They are quite adequate at speeds up to about 30 w.p.m., allowing a breaking station to be heard through a string of 25 w.p.m. dits. For higher speeds it is suggested that Stevens-Arnold Millisec relays be used, which cost around three times as much.

The K_2 circuit is practically a straight relay control circuit. The 1-megohm resistor limits the grid current of V_{2B} and in conjunction with C_2 creates the delay in the pickup of K_2 on make. There is also a slight delay in the drop out of K_2, but it is not long enough to be significant.

The K_1 control circuitry is a little more subtle. V_{1A} is used as a driver for the break storage capacitor C_1, and V_{1B} as a cathode-follower driver for V_{2A}. The capacitor charges through V_{1A} in less than a millisecond after the key is closed, but when the key is opened V_{1A} is cut off and the capacitor must discharge through the 4.7-megohm resistor, giving an appreciable delay before V_{2A} is cut off and K_1 opens. There may be a little delay on make as a result of the closure time of K_1, but probably not more than 10 milliseconds, and it is automatically allowed for in the adjustment of C_2.

If the key spark causes an objectionable amount of r.f. noise in the form of clicks when the key is opened or closed, correction measures should be limited to placing an r.f. choke in series with the key as close to the key contacts as possible. The shunt capacitors of the usual click suppression circuit might slow up the waveforms too much.

[1] For a discussion of keying adjustments, keying circuits, and receiver control, see the keying section of the current *Radio Amateur's Handbook*.

Silent Keys

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

W1CDX, John W. Singleton, Portsmouth, N. H.
W1LAD, Clinton C. Brown, Needham, Mass.
W1PWI, Benjamin H. Biays, Yarmouth Port, Mass.
K2BUW, John J. Oskay, New Brunswick, N. J.
W2FAY, Francis J. Hinz, Beach Haven Crest, N. J.
W2NUI, John McGrath, Bayonne, N. J.
W2SFD, Philip A. Sussdorff, Port Kent, N. Y.
W3FUS, Russell D. Anders, Norristown, Pa.
W3GBI, Clarence L. McGee, Norfolk, Va.
W4CMV, Frederick G. Calvert, Arlington, Va.
W4GMH, Raymond L. Norman, Birmingham, Ala.
K4JCN, Joseph C. Rhodes, Washington, Ga.
W4TIK, Graves Taylor, Tryon, N. C.
K5GZQ, John L. Robinson, Altus, Okla.
W5PCO, Dale F. Aldrich, El Paso, Texas
W6AY, James F. Brown, Los Altos, Calif.
K6DJL, Elliott Lasky, Los Angeles, Calif.
KN6KMP, John S. Hunter, Newport Beach, Calif.
KW6FAA, Steve Paris, San Francisco, Calif.
W6KGO, Alfred W. Boberg, Mountain View, Calif.
W7SF, George E. Johnson, Aurora, Oreg.
W8GCU, George R. McCotter, Lawrence, Mich.
W8IAY, Alfred C. Breth, Chillicothe, Ohio
W8OQO, Dale R. Hetzman, Alma, Mich.
W9NBY, Fred J. Hoffman, Chicago, Ill.
KN9OKU, Lawrence A. Schmidt, Salem, Wis.
W9PLG, William H. Combs, Terre Haute, Ind.
W9VGI, Walter P. Hardin, Liberty, Ill.
W9ZHB, E. F. Grabill, Zearing, Ill.
W0CBT, William C. Caldwell, Humboldt, Kans.
W0KTH, George A. Bell, Bethany, Mo.
W0PMQ, Arthur O. Flankey, St. Vincent, Minn.
HB9S, Adolph Anderegg, Grenchen, Switzerland
VE5GD, Gordon C. Drake, Regina, Sask.
VP9Y, Jim A. Amos, Pembroke, Bermuda
ZS5U, H. J. Buckley, Margate, Union of S. Africa

• Recent Equipment —

The Hammarlund HQ-170 Receiver

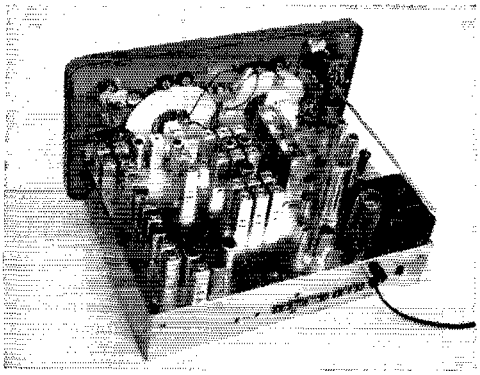
AT FIRST glance the HQ-170 appears to be the HQ-110 receiver[1] with a built-in HC-10 converter.[2] It isn't exactly, but if it were it would point up the fact that a lot of hams missed the boat in not adding the HC-10 to their older receivers. Making a single package out of the two brings home the fact that here is a new philosophy in ham-band reception, something that has been staring us in the face for some time without being spelled out.

It has been mentioned many times that a slow tuning rate is desirable in a receiver that is very selective or is being used to tune in a single-sideband signal. However, it has always seemed advantageous to be able to get to any given part of a band in a hurry, and these two opposed objectives have been a stumbling block for designers. One recent approach has been the two-speed dial drive.[3]

The HQ-170 uses another approach, one of those "Why-didn't-I-think-of-that?"-type inventions. The normal two-knob receiver is well known to all; one knob is used to set to the general frequency area (band set) and the other knob tunes the amateur band in that area (bandspread). In a typical receiver the bandspread dial may just cover the amateur band or a little more.

The HQ-170 receiver is a ham-bands only receiver, 160 through 6 meters. In the past this would have been a one-knob receiver. The HQ-170 is a two-knob job. The main tuning knob drives the directly-calibrated scales, and most operators sitting down to the receiver will use just this knob, because it controls the receiver in the traditional manner. However, another knob, marked

[1] *QST*, August, 1958, page 46.
[2] *QST*, August, 1957, page 38.
[3] *QST*, September, 1958, page 44.

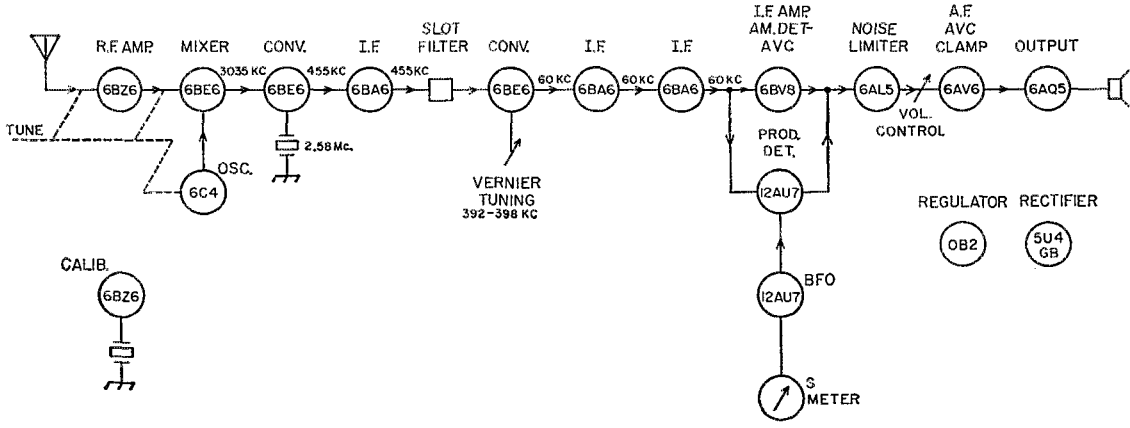


The HQ-170 is a ham-bands-only triple conversion receiver. The two dial scales turn together; one has 180-degree rotation and the other has 270. The long rod from the panel to the transformer is not for reinforcement; it projects out the back of the case and is used for setting the panel clock.

"Vernier Tuning" tunes just *3 kc.* either side of the frequency determined by the main tuning! This we consider the bandspread dial of the HQ-170, and band spread it is. The tuning rate is *2 kc. per revolution*, and you don't hardly ever find tuning much slower than that! It means that a sideband signal can be handled with ease and dispatch by even the most impatient operator.

Before we get into the details of the receiver, we might mention that the 6-meter band on the 170 is no mere manufacturer's gesture, designed to let the operator listen to an occasional loud local signal. The 6-meter range in our sample HQ-170 dug down and brought up the weak ones in a manner that even had perfectionist W1HDQ nodding his head in approbation.

Fig. 1—Block diagram of the HQ-170 receiver.



Heterodyne reception on 6 meters yielded d.c. signals and made the reception of c.w. and s.s.b. on 50 Mc. a cinch.

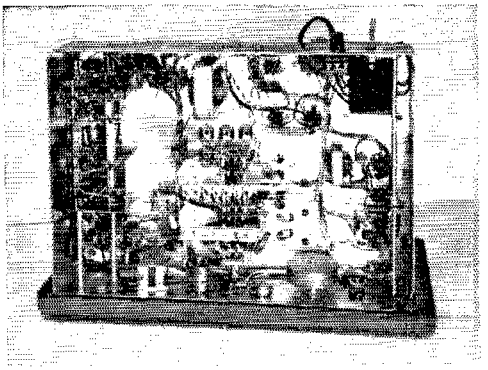
Referring to the block diagram in Fig. 1, the HQ-170 is a triple-conversion receiver with a tunable front end. The i.f. out of the 6BE6 mixer is 3035 kc., except on the 160- and 80-meter ranges where it is 455 kc. and the 6BE6 converter following becomes an amplifier at 455 kc. The signal is given a boost in a 6BA6 i.f. amplifier and then, if desired, an undesired carrier or heterodyne can be nulled out by means of a "bifilar T trap" or slot filter. This handles like the rejection notch of a *Q* multiplier; the circuit was described earlier.[2] Following the 455-kc. i.f., the signal is heterodyned to 60 kc. in a 6BE6 converter with a *tunable* oscillator. This tunable oscillator has a panel control marked "Vernier Tuning," and its range is limited to 6 kc. This is the control referred to earlier, the one we consider the band-spread dial in this new philosophy of reception. The panel control turns a variable capacitor through a planetary reduction drive.

Following the conversion to 60 kc. the signal is passed through a couple of 6BA6 i.f. amplifier stages where quite a bit of selectivity is applied, and this portion will be discussed in more detail a little later. The triode portion of a 6BV8 then feeds the signal to a diode detector when a panel switch is on "A.M." and to a 12AU7 product detector when the panel switch is on "C.W. S.S.B." Whether another panel switch has the a.v.c. on or off, an a.v.c. rectifier is always operative and the S meter works. We have been told that one user of the HQ-170 didn't like the fact that there is no way to turn off the S meter, but we found it interesting to have a meter kicking on all signals, even with the a.v.c. off.

Following the detector a double diode noise limiter is available for reducing the effects of ignition noise during both A.M. and heterodyne reception; this circuit has a panel control for setting the threshold of clipping. Two stages of audio amplification follow the limiter, and the Hammarlund "auto-response-circuit[4] is again used to restrict the audio frequency range on weak signals and extend it on strong ones.

A 100-kc. crystal oscillator, using a 6BZ6 tube and a printed circuit, is included for checking the dial calibration, and a panel control sets the hair-line index on the dials. Since the receiver cannot tune to WWV for checking the 100-kc. oscillator, one has to rely on the factory adjustment or an auxiliary receiver. A 5U4-GB rectifier and a 0B2 regulator round out the tube complement; regulated voltage is used on the screen grids of the r.f. amplifier, mixer, 455-kc. i.f. amplifier and first converter and on the high-frequency oscillator and the S-meter amplifier.

One thing you notice when you tune the HQ-170 is that backing off on the r.f. gain control doesn't make the set go dead as quickly as it does on many receivers. In other words, with the gain control backed off some you can twist the antenna trimmer and still get it to peak up the noise. (Try that on *some* highly-touted receivers!) This can be attributed to the (long-overdue!) first commercial use of multiple controls of different characteristics. In the 170 the gain control knob actually turns two controls. One of these is in the cathode circuit of the 6BZ6 r.f. stage and its taper is such that for the first 20 per cent or so of rotation it changes the bias very slightly on the r.f. stage. In other words, the r.f. stage runs "wide open" in this region. The other control is in the cathode circuit of the 455-kc. i.f. amplifier, and it changes the bias "faster" on this stage. The net result is a desirable type of operation in which the r.f. stage is the noise-determining factor over a wide range of gain-control setting. Other applications of this general principle (the HBR-14 of W6TC, and the Heath Mohawk) involved separate controls.



All of the inductors for the front-end tuning are mounted above the chassis except those for the 6-meter range, which are mounted on the band switch. The many switch sections at the left are used in the 60-kc. circuitry.

The a.v.c. in the 170 is applied to the r.f. amplifier, the 455-kc. amplifier, the second converter and the first 60-kc. amplifier. A panel switch selects one of three time constants (slow, medium, fast) or turns off the a.v.c. Incidentally, some operators will perhaps wonder what is happening to the receiver when it occasionally goes dead (or nearly so) in the slow or medium condition. This will happen when a sudden noise peak of high amplitude loads up the a.v.c. system momentarily. It is the cross all long-time-constant a.v.c. systems must bear (at least all those we have seen). The a.v.c. in the 170 will work with the b.f.o. on or off, and you will probably find yourself experimenting with the longer time constants on c.w. and sideband, reserving the fast time constant a.v.c. for a.m. reception. The diode portion of the 6AV6 (audio amplifier) is used as a clamp that prevents the application of a.v.c. voltage to the r.f. and 455-kc. i.f. stages until a sizable a.v.c. voltage has developed. As a consequence, the same effect is obtained with a.v.c. as with manual gain, in that the front end gain of the receiver is maintained until the signals are fairly strong. Fig. 2 shows a simplified version of the a.v.c. clamp circuit.

[4] "The HQ-100 Receiver," *QST*, January, 1957.

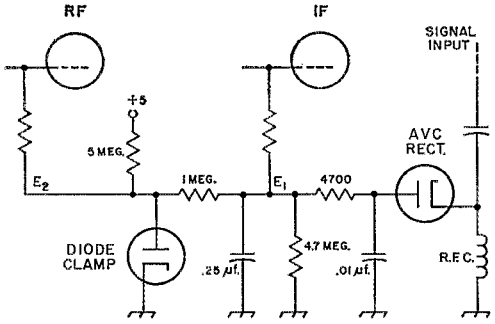


Fig. 2—Simplified diagram of the a.v.c. clamp circuit. The diode clamp has low resistance when conducting, and this fact prevents E_2 from ever becoming a significant + voltage; practically all of the voltage drop from +5 to ground will be across the 5-megohm resistor. When the a.v.c. voltage E_1 becomes more negative than −1 volt it will start to bring E_2 negative, but E_2 will never be as negative as E_1. For example, when $E_1 = -7$, $E_2 = -5$; when $E_1 = -13$, $E_2 = -10$, etc.

In the practical circuit, the a.v.c. time constant is modified by switching in different resistance values across the 4.7-megohm load resistor.

While a "wise guy" can twist the controls of the HQ-170 and bring in signals, a little time spent in learning the significance of some of the controls and where they should be set will really pay off. The selectivity switch, the sideband selector switch and the b.f.o. pitch control are all tied together in a sense, and we will resort to a sketch or two to demonstrate this interrelation. Incidentally, the selectivity switch is marked ".5, 1, 2 and 3," indicating the nominal bandwidth in kc. The sideband selector switch is marked "UPPER, LOWER, AND BOTH," and now we get to the tricky part. Forgetting the .5-kc. position for the moment, switching the sideband selector switch to BOTH *doubles* the indicated bandwidth of the receiver. In other words, if the selectivity switch is set at 3 kc., you have a 3-kc. bandwidth when the sideband selector switch is at Upper or Lower, and a 6-kc. bandwidth when it is switched to Both. Confused? Well, don't be, because it is a very neat trick and something you should understand thoroughly if you are going to get the most out of your 170. The principle is illustrated in Fig. 3.

In Fig. 3 the frequency marked "0" is, of course, the nominal i.f. of 60 kc. It should be obvious that for single sideband reception the b.f.o. should be set to this frequency if the sideband-selector switch is to do its job properly. The receiver is set up at the factory so that this b.f.o. setting is obtained when the pitch control pointer is vertical, a real convenience for the operator who is always wondering how to set the b.f.o. for s.s.b. reception.

When the selectivity switch is in the ".5" position (too sharp for anything but c.w.), the mid frequency of the i.f. is 60 kc., and the b.f.o. has to be set off to one side for single-signal c.w. reception.

The various degrees of selectivity are obtained by switching in capacitors that change the coupling and tuning of the six tuned circuits used in the 60-kc. i.f.

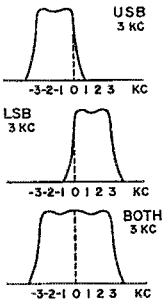


Fig. 3—The sideband selector switch in the HQ-170 shifts the tuning of the second i.f. to one side or the other of the nominal i.f. (dashed line). When the sideband selector switch is set at BOTH the bandwidth of the i.f. is doubled, to include the two sidebands. For proper use of the sideband selector switch the b.f.o. should be set to the nominal i.f.

Mechanical

Physically the HQ-170 resembles the other receivers in the line in many respects, with the familiar styling right down to the perforated metal case. It has two dial windows and at a distance one might think these scales were independent, but such is not the case. One dial, fastened to the capacitor shaft, turns 180 degrees for 5½ revolutions of the tuning knob. This dial scale carries the calibrations for the 3.5–4.0, 14.0–14.4, 7.0–7.3 and 1.8–2.0-Mc. ranges. The other dial scale turns 270 degrees at the same time, and it carries the 50–54, 28–30, 21.0–21.6-Mc. bands and a 0–100 arbitrary scale for logging. The time-tested rim drive is used, with a heavy flywheel on the tuning knob shaft.

Much of the clean look above and below the chassis of the 170 can be attributed to the use of separate shield cans for the front-end inductances and the use of preformed cables and printed circuits. — *B. G.*

Transcon TNS

THE TRANSCON TNS is a noise limiter and squelch system designed to be used with the car broadcast receiver. In Fig. 1 when there is only noise at the second detector, the voltage at Y will be low and the voltages on the grids of V_1 and V_4 will be close to ground potential. If R_2 is set to a value lower than R_1, the voltage at the plate of V_4 will be more positive than the voltage

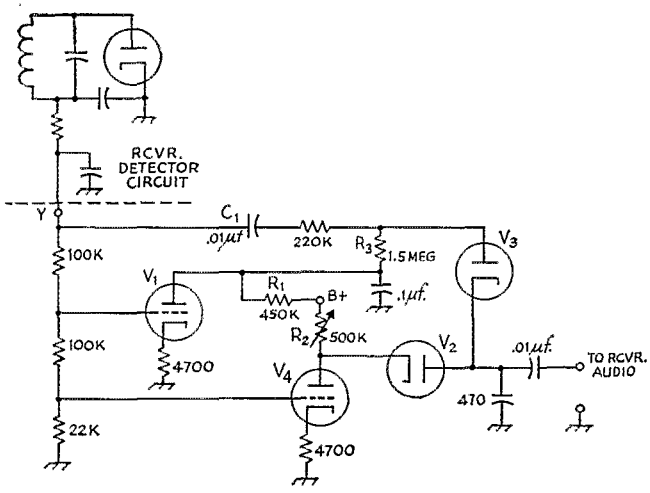


Fig. 1—Circuit of the Transcon TNS. Unless otherwise indicated, capacitances are in μμf., resistances are in ohms, resistors are ½ watt. V_1-V_4 is a 12AX7 and V_2-V_3 is a 6AL5.

at the plate of V_1. As a result, no current can flow around the loop from the plate of V_1 through R_3 and V_3 and V_2. With V_2 nonconductive, any slight noise amplified by V_4 can not be passed on through to the receiver audio.

When a carrier is rectified by the receiver detector, the voltage at Y becomes negative, and the grid of V_1 is always more negative than the grid of V_4. Consequently, V_4 passes more current than V_1 and the plate of V_4 is less positive than the plate of V_1. Under these circumstances V_2 conducts and audio amplified by V_4 passes through to the receiver audio.

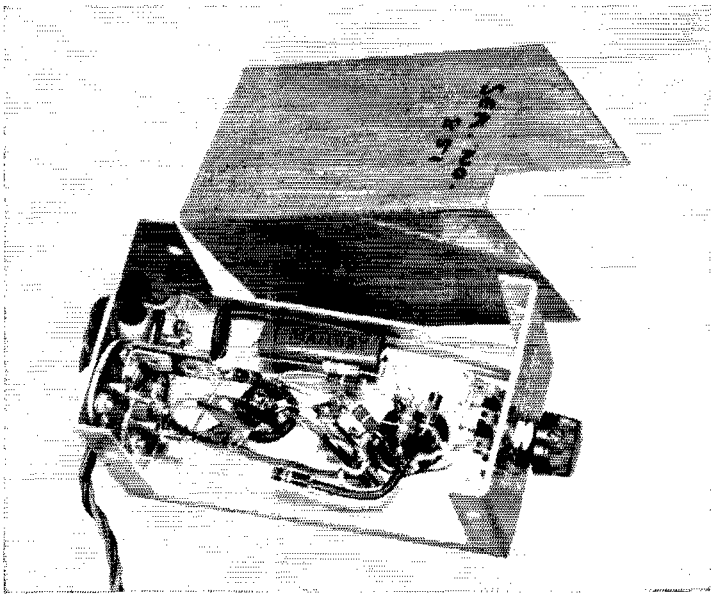
Noise peaks are transmitted via C_1 as negative-going pulses to the plate of V_3. During their existence the condition of transmission through V_2 (V_3 plate more positive than V_2 cathode) no longer exists and no signal is transmitted to the receiver audio.

When using the unit, the squelch control R_2 is advanced until all normal background noise just disappears. When a carrier appears at the detector, the squelch will automatically trigger, and the audio component of the signal will be heard. When the carrier disappears the circuit will function to cut off the audio.

Both the noise limiter and squelch circuit are turned on when heater and plate voltage are applied to the unit through the power cable. There is no switch on the TNS and, therefore, provision for turning the unit on and off has to be made outside the unit.

Instructions included with the unit show methods of connecting it to most of the detector circuits commonly used in automobile radios.

The TNS is available in both factory-wired and kit form. Creative Electronics Corp., Stamford, Conn., manufactures it. —*E. L. C.*



The TNS is constructed in a 2¼ X 2¼ X 4-inch box. The control at the right adjusts the squelch action. Power for the unit is supplied by the twisted cable running in at the left. Other connections from the TNS to the receiver are made via three phono jacks mounted on the end of the box.

Hula-Hoop Helical Halo

BY E. LAIRD CAMPBELL,* W1CUT

THE RECENT hula-hoop fad produced quite a few discarded "hoops" along with quite a few comments such as, "There must be something *else* they can be used for!" Naturally the ham instinct made me try to think of an application for these plastic rings in amateur radio. The result, a ten-meter antenna, is shown in the photograph.

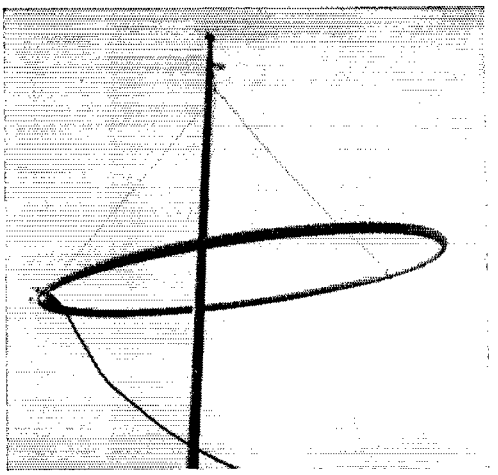
The hoop is about 3 feet in diameter; the tubing is ¾ inch in diameter. The pitch of the helix is about ¾ inch and about 16 feet of wire are used in each leg. A diagram of the hoop is shown in Fig. 1.

The hoop antenna was constructed in about 15 minutes. I didn't measure the wire — just rolled a spool of No. 24 cotton-covered copper wire around the plastic tube, feeding the wire out as needed. After the entire loop was wound the wire was cut so as to produce two equal helical legs. I grid-dipped the antenna and found several good dips; one fell in the ten-meter band so I decided to try this band first. A series capacitor was connected at the feed point, the transmitter hooked up and the capacitor tuned until my s.w.r. bridge indicated a decent match.

Mounting the antenna seemed to be a bit of a problem at first but was solved by merely tying four strings at equal distances around the hoop and suspending the strings from the top of a wooden pole. The coax transmission line was taped to the pole and helped to steady the hoop.

After this preliminary test in the workshop, I mounted the antenna up about 50 feet, found that the match was still satisfactory, and tried my luck on 10 meters. Besides working the local gang,

* Technical Assistant, *QST*.



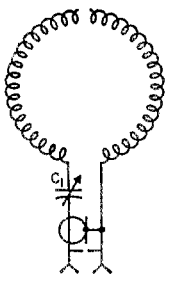


Fig. 1—Diagram of the hoop antenna. Details are given in the text.
C_1—35 $\mu\mu$f. variable capacitor (once the optimum value is found a fixed mica capacitor may be substituted).

I also made several out-of-state contacts. W9HHJ and WØIQU both reported the signal S9 plus. I carried on a 15-minute ragchew with both stations without any difficulty.

This antenna won't out-perform a beam but it will clear out those old used hoops in the back yard. Who knows, maybe we'll soon see a stacked hula hoop helical halo! QST

Strays

Here are the various MARS technical net schedules for February.

First Army MARS

(Wednesday evenings 2100 EST, 4030 kc. upper sideband)

Feb. 4 — Observation of Radio Signals Transmitted From Earth Satellites.
Feb. 11 — Vehicular Noise Problems in Mobile Communications Systems.
Feb. 18 — Experience With Video Tape Recording.
Feb. 25 — Mobile SSB Communications.

AF-MARS Eastern

(Sundays 1400 EST, 3295, 7540 and 15,715 kc.)

Feb. 1 — Electronics in Medicine.
Feb. 8 — Future Atomic Powered Generator Stations.
Feb. 15 — Electronic Seeing With Low Level Illumination.
Feb. 22 — Modern Quality Control Principles.

AF-MARS Western

(Sundays 1400 PST, 3295, 7832.5 and 143,460 kc.)

Feb. 1 — Technical Writing in the Electronic Field — Part I.
Feb. 8 — Technical Writing in the Electronic Field — Part II.
Feb. 15 — Weapons Systems Electronics.
Feb. 22 — Space Flight Problems.

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I1BAF, up on a 9500-foot mountain for a v.h.f. contest, discovered that he had forgotten loudspeaker and earphones. Not being one to give up easily, he connected the receiver output to his automobile horn, and says it worked fine. He does admit, however, that the result wasn't exactly hi-fi!

Two-Band Conversion for 10-Meter Beams

Simple Alteration for 15 Meters

BY L. E. BUMP,* W0ANY/VO1

An easy and inexpensive method of extending the usefulness of a 10-meter beam to the 15-meter band.

If you have a 2- or 3-element 10-meter beam, the chances are good that you can convert it to a 2-band affair for 10 and 15 meters very easily and at small cost. If your present antenna has a 12-foot boom or longer, all you need is to add traps and short extensions to the ends of each element, and shorten the elements a little.

The traps, sketched in Fig. 1, are easily constructed in one evening from scrap aluminum tubing that you may have lying in your junk box. The polystyrene tubing is available from Allied Radio in Chicago and probably from most other radio supply houses. The sizes of tubing you will need will depend on the size of tubing at the ends of your present elements. If it is ½ inch o.d., the dimensions shown in the sketch will fit. In any event, the same principle will apply.

First cut to a length of 6 inches 6 pieces of aluminum tubing that will fit over the ends of your elements. Then cut to 3-inch lengths 6 pieces of polystyrene tubing that will fit inside the aluminum pieces. Next, cut to 6-inch lengths 6 pieces of aluminum tubing that will fit inside the poly tubing. These pieces of tubing will form the trap capacitor.

Before assembling them, cut a 1-inch saw slot in one end of each of the aluminum pieces, and near the opposite end of each piece, drill small holes approximately as shown in the sketch. Do not drill the poly tubing.

Insert the poly tubing into the larger aluminum tubing to a depth of 2½ inches, and then insert the smaller aluminum tubing into the poly tubing to a depth of 2¾ inches. This will give you a capacitance of about 35 $\mu\mu$f.

Now hold the assembly over a low flame until the poly bubbles out of the holes in the aluminum tubing. When the poly has cooled, this will lock the pieces together so the capacitor won't fall apart.

The coils have 5 turns of No. 8 or No. 10 copper wire, 1½ inches inside diameter. The coil is fastened across the capacitor by means of clamps. Using a grid-dip meter, the length of the coil should be adjusted so that the trap resonates at 28.8 Mc. Be sure to do the job on a wood bench because any metal within a foot or so of the trap will alter its resonance point.

It will be necessary to shorten your original 10-meter elements when the traps are added. The length of the driven element between outer ends of the trap coils should be 14 ft. 2 inches, and the over-all length, including the 21-Mc. extensions (of ½-inch aluminum tubing) should be 19 ft. 6 inches. Similar lengths for the reflector should be 14 ft. 10 inches and 20 ft. 10 inches, while those for the director should be 13 ft. 2 inches and 18 ft. 10 inches.

I have been feeding the beam with RG-8/U. As a measure toward keeping r.f. off the outside of the coax, the coax line is wound into a coil of 12 turns 8 inches in diameter, close to the feed point. The coil is taped to the boom. My measurements show an s.w.r. of 1.8 on 10 meters and 1.5 on 10 meters, with little change over the entire range of either band. I run 100 watts and have worked 10 states and the Canal Zone on RTTY on 21,090 kc. from Newfoundland, with S9 reports from California. In the *CQ* DX contest for 1956. I had the second highest score for Canada on 10 meters, although the beam was only 35 feet off the ground.

I also found that, with the length of coax I happened to be using, I could load the transmitter on 20 meters. Several East Coast stations gave me S9 reports. I didn't measure the s.w.r.!

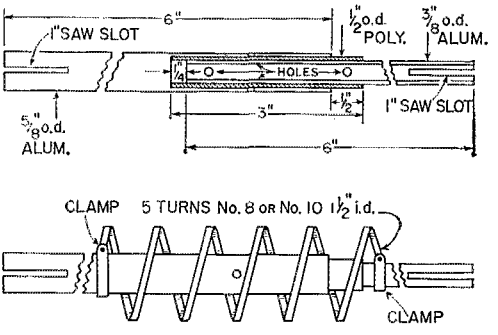


Fig. 1—Sketch showing construction of trap capacitor and method of mounting coil.

* 1515 Third Ave. S., Fargo, North Dakota.

FEEDBACK

In the Novice 50-Watter described in December *QST* the 0–200-ma. milliameter was omitted from the circuit diagram. The lead between the bottom of RFC_2 and J_1 should be opened and the meter inserted at this point. This makes it possible to read the cathode current of the 6146.

Hints and Kinks For the Experimenter

MODIFYING THE HEATH VX-1 FOR C.W. BREAK-IN

After obtaining a Heath VX-1 voice-controlled break-in unit, I looked about for a way to modify the unit for c.w. break-in. I studied the circuit, tried various methods, and finally arrived at the following changes.

The only additional components needed are an s.p.s.t. toggle switch and a 0.1-μf. capacitor. Remove the ground end of the 100,000-ohm grid resistor on Pin 7 of the 12AX7 speech amplifier tube and connect it to one side of the toggle switch. Ground the other side of the switch as

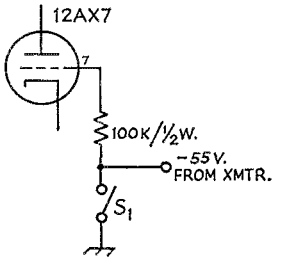


Fig. 1—Insertion of switch S_1 allows the VX-1 to be used for c.w. break-in.

shown in Fig. 1. Now connect the 0.1-μf capacitor in parallel with the 0.1-μf. capacitor that is already connected to the 7.5-megohm time-

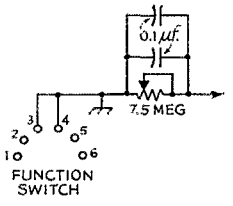


Fig. 2—Diagram showing the additional 0.1-μf. capacitor connected across the 7.5 megohm time-delay control.

delay control. See Fig. 2. Consult pictorial diagram No. 4 on page 16 of the instruction manual for aid in finding the above components.

If more time delay is wanted, add more capacity in parallel with the capacitor across the 7.5-megohm time-delay control.

The above change will work on a transmitter using grid-block keying or on one that makes use of a blocking bias for keying. The bias can be obtained from a battery that is keyed by a relay. My transmitter uses —55 volts bias to key the oscillator. With the toggle switch open and the function switch on vox, it is ready for c.w. break-in. With a little practice, the most pleasant setting can be found. When keying begins, the relay in the vox will close and stay closed until keying is discontinued, then the relay will open after a short delay.

The unit's function can easily be switched to phone operation, of course, by throwing the toggle switch to the other position.

— *Paul G. Marsha, K4AVU*

HOMEMADE TERMINAL STRIP

Every constructor is familiar with the terminal strip, and has probably used the masonite/machine screw variety for mounting components and small subassemblies. Although machine screws are satisfactory for solder terminals, terminals made of medium-gauge copper wire are economical, quickly soldered, and easily trimmed to size. Lugs of this type can be easily fabricated with long-nose pliers as shown in Fig. 3. The

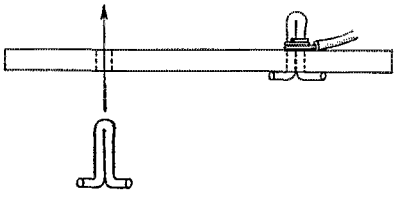


Fig. 3—Sketch showing details of the homemade terminal board.

terminal should fit snugly into its hole with the lead soldered flush with the board. If the lug is loose after this connection has been made, its legs can be spread by pressure with pliers at the top and under side.

— *Joe A. Rolf, K5JOK*

5-BAND MOBILE ANTENNA

Here is a center-loaded mobile antenna that will work on 5 bands and there's no need to get out of the car for switching or adjustment when changing bands. I used a Master All Band Coil, but any type with the correct number of turns may be used. The antenna could be called a multiple-loaded antenna since the proper LC sections resonate the antenna for whatever band is being used.

The diagram of the antenna is shown in Fig. 4. The capacitors should be mica or ceramic and must have a voltage rating high enough for whatever power is being run. Solder the four capacitors in series and connect the 40-$\mu\mu$f. capacitor to the bottom end of the coil, using a lead of about 6 inches. Now tune the mobile receiver to 10 me-

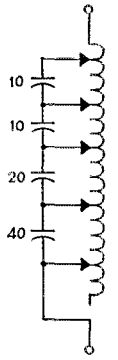


Fig. 4—Circuit of the multiple-loaded mobile antenna. The capacitors are in $\mu\mu f$.

ters and slide the top end of the top 10-$\mu\mu f$. capacitor along the coil until the signals peak. Do the same on 15 meters with the next 10-$\mu\mu f$. capacitor and so on down the bands until the last tap is peaked for 75 meters. A little readjustment of all the taps may be needed after the first run, due to some interaction between the connections. Solder the connections and the antenna is ready for use.

— *Rev. Francis A. Peterson, W7RKI*

OUTBOARD B.F.O.

THE circuit shown in Fig. 5 is a simple 455 kc. b.f.o. which is easy to build and adjust. Most of the parts can be found in the junk box but if components do have to be purchased they can be obtained with no great damage to the billfold.

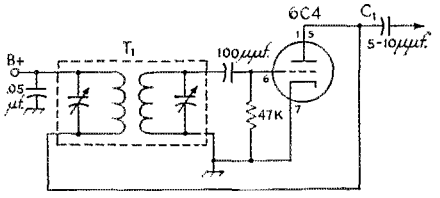


Fig. 5—Circuit of the b.f.o. Transformer T_1 is a 455 kc. i.f. transformer.

The circuit is a basic one and almost any triode may be used. The two coils and their capacitors are the two sections of a common 455 kc. i.f. transformer. If the b.f.o. is mounted near the receiver detector circuit no additional coupling may be required. However, the diagram shows a coupling capacitor C_1 which may be connected to the detector diode plate if additional coupling is required.

— *James Lewis, K4SAM*

IMPROVISED R.F. SNIFFER

CONVENTIONAL vacuum tube voltmeters can be used for antenna coupling and tuning adjustments simply by switching to the a.c. voltage range and plugging a loop of wire into the a.c. input jacks. The loop acts as an r.f. pick-up and the induced r.f. is rectified by the diode in the a.c. circuit. — *Frank D. Wilmer*

VIKING RANGER V.F.O. ZERO BUTTON

THE circuit shown in Fig. 6 was developed to permit zeroing the Viking Ranger v.f.o. without operating any switches after the transmitter is tuned up. Normally, in order to zero beat a received station, the OPERATE switch has to be turned from C.W. to STANDBY and the key pressed. This requires two switch operations each time the v.f.o. is tuned to the frequency of the received station. During a contest this might require hundreds of switch operations.

The zero button S_1 keys the v.f.o. independently

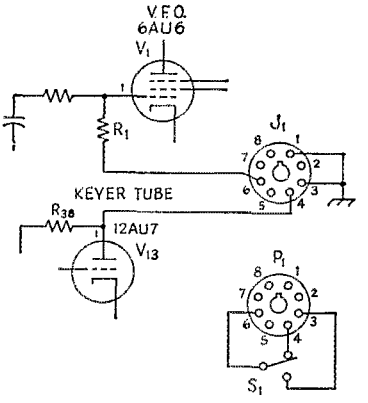


Fig. 6—Diagram showing the v.f.o. zero addition to the Viking Ranger.

J_1—Existing octal socket.
P_1—8 prong octal plug (Amphenol PM8-11).
S_1—S.p.d.t. push button switch (General Cement 1340).

of the rest of the transmitter. The level of the "v.f.o. only" signal in the receiver is adequate on 80 and 40 meters and reduced somewhat on 20 meters but still usable.

Unused pins on the existing octal socket J_1 (the one provided for plugging in crystals) are used to bring out the oscillator grid connections without the need for drilling any holes and destroying the resale value of the transmitter. An Amphenol octal type plug, P_1, is connected to the push button zero switch by a short length of cable and is mounted at the operating position. To restore the transmitter to its original circuitry, merely connect pins 4 and 6 of the crystal socket together. — *Lewis E. Elicker, Jr., W3ADE*

TAPPING CLOSE-WOUND COILS

PUTTING a tap on a Miniductor coil whose turns are spaced rather closely together can pose somewhat of a problem. For example, a No. 20 wire will not pass between the turns of a coil of No. 24 wire wound 32 turns per inch. A solution is to flatten the end of the wire used for making the tap. This can be done by putting the wire on a hard flat surface and pounding it flat with a hammer. The wire can easily be flattened to a thickness of a few thousandths of an inch so that it can be wrapped around a coil without shorting

adjacent turns. The wire can be annealed to its original pliability by momentarily heating it red hot over a flame and allowing it to cool slowly. After cleaning the wire with steel wool it can be soldered in place easily; small strips of aluminum foil alongside the tap will keep the solder from running to adjacent turns.

— *Leo B. Weiner, W3LOS*

HANDY ADJUSTMENT TOOL

THOSE who have transmitters built in a one-piece cabinet know that internal adjustments sometimes can be made only by pulling the transmitter completely out of the cabinet. My Johnson Valiant transmitter has a control on the time-sequence circuit and in order to adjust this control the transmitter must be removed from its cabinet.

To overcome the above problem, I use a length of wire bent into a small right angle as shown in Fig. 7. The wire is small enough to go through

Fig. 7—K4AVU's tool for adjusting hard to get-at slotted controls.

the perforated holes in the cabinet and fits into the slot on the end of the control. The wire is used to adjust the control to the desired position. One caution: be sure the high voltage is turned off whenever the adjustment is being made!

— *Paul G. Marsha, K4AVU*

STATION CONTROL CIRCUIT

A NOVEL method of switching line and plate voltages is shown in Fig. 8. Two momentary contact switches, S_1 S_2, are used, one being of the normally open type, the other a normally closed type. The relay is of the d.p.s.t. variety. One pair of contacts is used as holding contacts, while the other pair is used to break the circuit. This

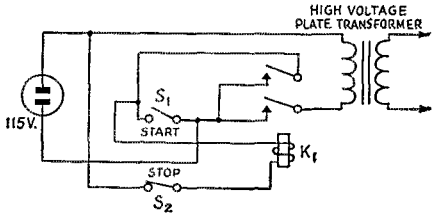


Fig. 8—Diagram of the control circuit.
S_1—S.p.s.t. normally open switch.
S_2—S.p.s.t. normally closed switch.
K_1—D.p.s.t. relay normally open.

method is often used in commercial broadcast equipment, and is especially useful for remote control applications. The switches can be color coded to show their functions; red and green seem to be appropriate colors for start-stop and on-off.

— *Earl A. Carron, Jr., W1WRW*

ACCURATE ZERO BEATING

BECAUSE the audio frequency response of most receivers drops rapidly below a few hundred cycles per second, it is not possible to zero beat two signals exactly by listening to their audio beat note on a receiver's speaker or earphones. A more accurate indication of zero beat can be obtained by measuring either the receiver's a.v.c. voltage or its second detector output voltage with a vacuum tube voltmeter. When the difference in frequency between the two signals is only a few cycles per second, the voltmeter needle will fluctuate with the beat signal. The fluctuations become slower as the frequency difference becomes smaller and a large dip is obtained when the frequencies are exactly equal. However, this dip is extremely sharp and it sometimes requires a steady hand to zero beat the two signals exactly.

— *D. F. Zawada, K8EMS*

EMERGENCY MODULATOR

AFTER many enjoyable hours using my 80- and 40-meter c.w. rig I decided to try my luck on phone. I didn't have a modulator so I tried to think of an inexpensive way to convert to phone operation. I had an old television power transformer and an old phonograph audio amplifier with a microphone preamplifier stage. These parts connected as shown in Fig. 9 made up my new modulator.

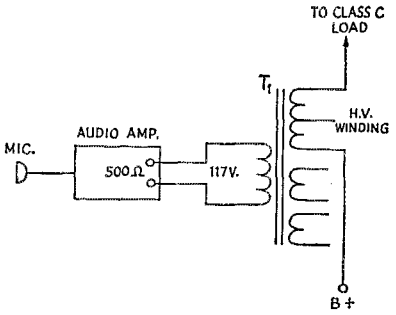


Fig. 9—Circuit showing a modulator using a power transformer modulation transformer.
T_1—Power transformer.

Only a few connections are required for the modification and it is an easy job to shift back to c.w. Reports on the voice quality are excellent and many successful phone contacts have been made.

— *David T. Saussier, jr., W3MILE*

HINT CONCERNING THE KWM-1

USERS of the KWM-1 may sometimes have some difficulty when tuning the receiver due to an apparent electrical instability in the tuning

(Continued on page 148)

DX—Dream

BY DON O'CONNOR,* W9QQU

IT WAS 3 A.M. The XYL was beside me in the shack, as always, pouring me another cup of coffee, and setting out a freshly toasted sandwich. We were taking a break from another night of frenzied DX activity. The receiver gain was turned down but I could hear three strong signals on the frequency.

"W9QQU, W9QQU de ZK1AK pse"

"W9QQU de AC4NC bk"

"W9QQU de HE9LAC ar"

I stretched back in the chair with my feet on the operating table, took another puff on my post coffee cigarette and mused "Some of these guys are awfully persistent, aren't they, honey?" — "Whaddaya say, shall we work 'em or turn off the rig and go to bed?"

"If you work 'em they'll be expecting QSL cards and I've already made out 265 tonight."

It had been a good night. I had racked up that many stations toward my WAC, which, as any fool knows, means Worked All Cities. I had a comfortable score of 29,252 with only another thousand to go. That WAC certificate would look good on the wall of the shack with all the others and right behind the WAS (Worked All Satellites).

I cast an appraising glance at the XYL. In her new sack dress, she looked more and more like Brigitte Bardot. She had made the dress herself — from a sack. After all, giving me half of her household allowance each week toward the new transmitter and directional antenna farm hadn't been easy. But she had insisted on it and was happy now that we had a first class installation. After all, it isn't every amateur that has a rotatable stacked rhombic on each band.

She interrupted my reverie. "The post office delivered five more sacks of QSL cards from the Bureau, today, while you were at work. You know, we've almost completely covered two of the walls already." It had been her idea to rent the abandoned Eagle's Ballroom just for a place to post our QSL's.

Suddenly a weak but persistent signal could be heard under the other 20-meter c.w. stations. My wife made it out as FB8ARL. That was the one we had heard about on TV news earlier in the evening. A cruise ship had gone aground on an uninhabited island halfway between the Antarctic Circle and the Kerguelen islands. Among the passengers were the members of the ARRL DX committee. While waiting for rescue, they had authorized amateur equipment to be set up on shore with the call FB8ARL — a new country, the island Shavnlotion. Evidently they had just completed the installation and were ready for their first contact. They were calling W9QQU, naturally.

It had been that way for three years now — ever since the *QST* article on "Hidden Meanings of Awkward Calls" had pointed out that "9QQU" in Gaelic pig latin means "Good DX".

I snapped on the plate switch and rapped out on the bug "Pse QRX, OM, you're QRMing a W6."

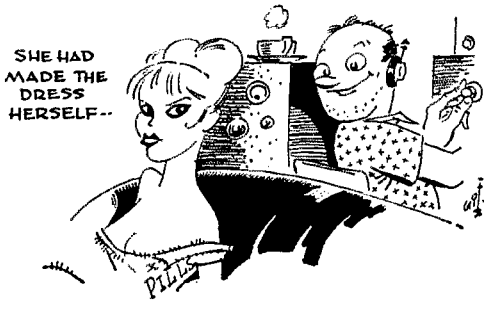
"Don! Don! — wake up! It's three o'clock in the morning!"

I raised one eyelid and, through bloodshot eyes, saw the curler clad head of the XYL leaning over me, not looking much like BB.

"If you're going to sleep, then for Heaven's sake come on to bed — a grown man, sitting up all night listening to a lot of mouse squeaks."

It was a cruel, cold dawning. QST

* 543 N. 93rd Street, Milwaukee 13, Wisconsin



25 Years Ago this month

February 1934

. . . George Grammer, W1DF, modernized a three-tube transmitter, putting in a meter panel, a '47 crystal oscillator, and a new tank circuit with a split-stator capacitor.

. . . Arthur Collins, W9CXX (now WØCXX), described a universal antenna coupling system for modern transmitters.

. . . Fred Schnell, W9UZ (now W4CF), presented some notes on the adjustment of bugs and the improvement of sending.

. . . The Sixth International DX Competition was announced, to take place during the nine days of March 10–18.

. . . H. A. Robinson, W3LW, commenced a two-part series on the operation of r.f. power amplifiers.

. . . Temple V. Ehmsen, W7VS, gave some dope on taming a phone transmitter.

. . . G. F. Lampkin, W8ALK (now W4DRB), presented constructional details on an oscillator-multivibrator bandsetter.

Portable ZS9

BY ARTHUR LEWIN,* ZS6AQQ

I SUPPOSE that this Saturday night was the same as most Saturday nights round 1730 GMT. W4IYC and 9G1CF were on 21,410. The only difference was that the ragchew turned to DXpeditions. One of the only ZS countries which had not shown up on sideband was ZS9. It was now my turn to natter. I did. Bechuanaland Protectorate was not far from my QTH and I would organise an expedition. When? Well, the first public holiday was three weeks away. . . .

Francistown is the chief town of Bechuanaland. Of this fact I was certain. Nothing else! For the rest of it was remote as Timbuktu is to most of the chaps reading this story. There are two operators in this territory that I knew. Jock, ZS9A and his son Norman, ZS9P. I had worked them with great excitement in the distant past when everything beyond a twenty-mile radius was rare DX. A little research through some travel magazines showed that there was a.c. power in this town, and that this was the only town with a.c. in the Protectorate. The road map showed that the nearest border was 120 miles away on a beautifully cemented road. Then we looked for Francistown. One way to get there was via the latter road plus some four hundred miles thru the sandy bush, or you could travel well on the way to the Game Reserves on the northern borders of the Union and then swing west towards Serowe, the domain of the Seretse Khama, and then on to Francistown. A good deal more civilization was thrown in on this route and the likelihood of having to drag a petrol tanker with you was a lot more remote.

The next day I phoned the Automobile Association for road maps and a few hours later the local manager came to see me. The roads in the Protectorate were good at this time of the year but one should beware of elephants and of the sand banks in the road. If you hit these at high speed you would feel the scenery instead of seeing it!

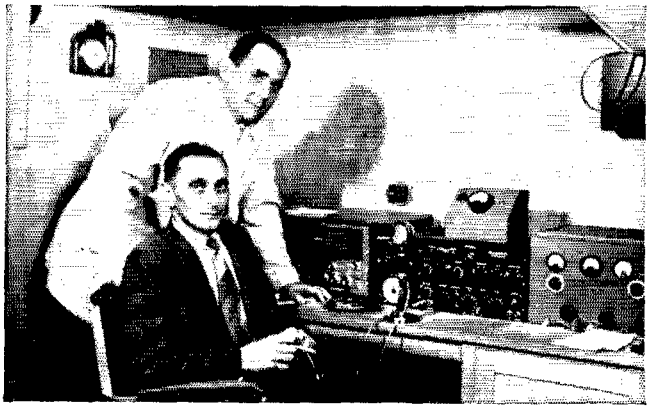
What equipment to use was the next consideration. ZS1FD had sent me a pair of 4-125 tubes. He reckoned that they were better than 807s. This would be as good a time to check up as any. We would use the simple G2MA clamper circuit built about one of the 4-125 bottles. The driver would be the old stalwart, a 10B. We had an SX-101 to serve as a hearing aid.

The next thing was to find some guy to do all the work while I acted executive! My first thoughts turned to Ben, ZS6ARC. He never gets tired, needs less sleep than a camel needs water and is besides a fitter and turner, motor mechanic, beam erector, and above all one of the nicest, kindest chaps a bloke could wish to spend a week end with. I went to see him and suggested the plan to him. He agreed but suggested that we find a portable source of a.c. and take that across the border instead of going to Francistown.

I set about trying to find that needle in a haystack called portable a.c. power. Eventually one friend said that he would organize a 1½ kw. supply. I should come and see him in three days.

We now set about building the amplifier and power supplies. Things went well until we came to the test out. It appeared that in order to prevent the solder from melting at the base some form of cooling was necessary. (The manufacturers suggest this, but who reads their instructions anyway?) So we took an old gram turntable motor, some aluminum plate, a dandy polish tin, and an old torch and made a blower which runs a darnside quieter than the surplus job I have just acquired. We plonked this on to the tube base and the solder started to behave more gentlemanly. We switched the power on and the final plate current jet-propelled itself across the meter almost as fast as we switched off. Brilliant deduction after 15 hours of shallow thought showed the surplus choke to be as resonant as a mating bee. We replaced with a 2.5 mh. Things were smooth

*32 Latham Road, Irene Park, Klerksdorp. Tvl. South Africa



ZS6ARC (seated) with author ZS6AQQ.

till this choke fizzed like a faulty firecracker. Another one did the trick. The following night we had a QSO with W4IYC. At the start things were not too good but once the audio levels had been determined 5-8's and 5-9's began to appear. We were all set for 15 and 20. Least, so we thought!

Then we drove out to see the portable power. It had now been completed. What a magnificent sight awaited us. The world's largest hydroelectric scheme had nothing on this baby. It weighed just short of a ton. Francistown had triumphed. It was ordained that we visit OM Jock and Norman. But instead of 100 miles of cement road we were to have 1100 miles of everything both natural and manmade.

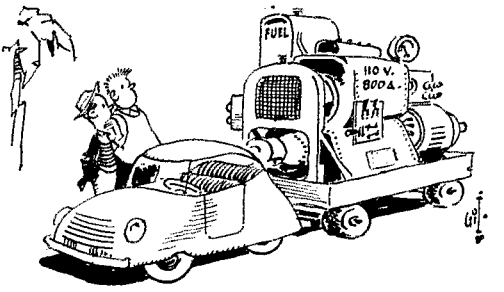
A cablegram to ZS9. A QSO. They would be overjoyed to have us. But watch for elephants between Serowe and Francistown. They were in the town the week before.

With three days to go we were about to start work on a ground plane for twenty and a two-element beam for fifteen when Norm, ZS6ATA, came in and offered us his Mosley Trapmaster. There are only about five or six of these in the country and Norm had not yet got his atop his tower. If you were aware of the transportational hazards associated with trip you would no doubt appreciate the magnanimity of this offer. Not too reluctantly we accepted. The beam was brought over, assembled, tested out at twenty feet. It gave my home-constructed Christmas tree such a go that one of the elements is still drooping!

On Thursday night we packed the car. The equipment was strapped down to the back seat on foam rubber. When completed the car looked more like an ice sleigh than the Jet it was called. ZS6ATA was running the station inside telling the world about the expedition while we sweated with ropes and dural tubing. We finished packing at midnight. We needed sleep and there was still a morning's work ahead before we could get cracking.

We left Klerksdorp at 3 P.M. on Friday and made our way to Potgietersrust. Passing through the various towns must have evoked some terrific thoughts in the minds of pedestrians judging by their physiognomic stupor. In P-prust we filled a four-gallon drum with the juice of transportation while we filled the petrol tank to capacity. Unless you want to suffer the headaches that we did on the upward trip then I suggest that you check to see that the garage attendants seal the petrol drums properly. We were almost anaesthetised before realising what the cause was. From this town we made our way northwest on the last piece of tarmac. Darkness was upon us when some forty miles later we took off from the tarmac and landed on the gravel with a soul-shattering jolt. The surface of the road for the next hundred miles was as corrugated as a turbulent sea. A high speed was essential if the equipment was not to be subjected to the treatment received by many a character in the days of the old fashioned dental drill.

Martinsdrift lies on the border of the Union

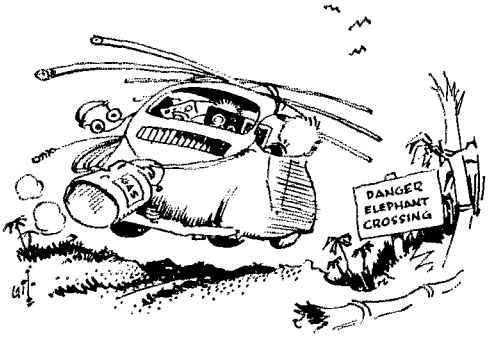


and the Bechuanaland Protectorate. It is at this point that we crossed the mighty Limpopo River (dry as a bone) and came into contact with the soft velvety sand roads. The roads are made by dragging a branchy tree behind a tractor so that the sand can be displaced to the sides of the road where it forms an ominous embankment. Ben had been this far once before and he was sure that there was a hotel and petrol some three miles away across the border. Sure enough we saw the sign indicating petrol ahead and then the hotel loomed up. It was in darkness. We stopped and got out. The silence and eeriness of that place was frightening. I doubt if ever I have experienced anything so quiet and still. We walked down to the main buildings and found the place absolutely deserted. The rooms were devoid of any furniture and all signs of habitation were gone. There was only one thing to do and we did it fast!

We drove on into the night, becoming more and more aware of the falling needle on the petrol gauge. Then at about midnight a light suddenly loomed up in the distance. The roads are straight as a die for miles on end. We deduced that this must be an oncoming car. But then the light vanished. What now? We drove on and on becoming more and more perturbed. At last the most welcome sign in the wilderness. *Your Last Chance for Petrol.* There was the car we had seen having the spirit of motion pumped into its veins. We filled up and were told that we were on the right road and that we were about 100 miles from Palapye. Again we were warned of the sand banks.

We forged on a lot happier and Ben found the necessity for Scotch a little less pressing. We found Palapye. It was like a native kraal with dozens of little paths leading in and out of it. Very disconcerting, until we managed to wake a native who was asleep by his fire and find out which path to take. Soon we were bypassing Serowe and well on the way to Francistown. There was to be a sign 'Welcome to Francistown' which jokingly we had been told to ignore! We were under the impression that the distance from Serowe to Francistown was 35 miles. In fact it was 105 miles! What a long and tiring stretch that turned out to be. We were on the lookout for the elephants but the Scotch and dexidrene made us a little less worried than we would have been. The trees along side the road were broken and rather large droppings were to be seen but

the world's largest beast had decided to leave us in peace. Maybe they were as tired as we were! At 3:15 A.M. we almost passed through Francistown without knowing it.



Jock and Norman were on the veranda waiting for us as we climbed from the dust wagon. They gave us hot coffee and then some hot coffee. We set about unpacking the gear which was almost lost in the dust and got cracking on the installation. Jock had just about cleaned up his whole shack to make room for us and it did not take us long before the s.s.b. equipment was functioning. We went outside at 5:30 to help Ben and Norm pull up the beam which they had assembled by torchlight. With a jimpole, sweat and blood we pulled the antenna up to 28 feet. Not very high, but at that time of the morning quite a formidable feat.

After more coffee we switched on and allowed the rig to heat up. At 6:45 A.M. we called W4IYC and pronto W6BAC replied giving us 5-9. Then W4IYC broke in. We were 15 minutes earlier than pre-arranged. By the time the band packed and we were called to breakfast we had logged some 15 contacts.

We hit the hay at 0700 GMT. The beds were soft and downy. Sleep came easily.

At 1000 GMT we started again and made a few contacts before the screen current went berserk. We could not load. Immediately we reasoned that something had gone wrong with the antenna so we set about pulling it down for examination. Two hours later we had it back, convinced that there was nothing wrong with it in the first place. Still no loading. Still no QSO. A few hours later after more brilliant deduction we decided that there must be a short in the feedline. But there was no short. But the feedline did not start at the coax connector. There lay the trouble. The coax connecting the link to the coax connector had melted. The temperature in the shack was 102°! The 4-125 was not the coolest of birds and so I cannot blame the coax for melting. We replaced it with a piece of open wire and called. The frequency let out a yell. It guzzed. Enthusiastically we returned to the challenge. But the screen resistor exploded. This happens when the screen draws too heavily in the G2MA circuit. We had anticipated it. The next one did the same thing after a few minutes. The only resistor of the correct value was a ten watter. We needed at least fifty watts. What now? The plate voltage was decreased to 600 volts and the ten watter placed. We left the amplifier out of the case, mounted the chassis on match boxes and placed the fan into its belly. Everything would be cool now. We had a few more cans of beer to cool us down. We tuned 15. We tuned 20. The band was motherless dead! The time — midnight. Up again at 6 A.M. A few calls between then and 8:30 A.M. Then the band packed up again. To hell with expeditions!

After the tour of the 'city' we had tea with another ham who was minus a.c. since the area had not yet been supplied although the house was fully wired and the cables connected to the mains. Frustrating was the word used by Peter Broome!

Before lunch we again tuned the band and only Empty, ZS6KD, was on talking to a local. I want it to go on record that on this occasion Empty responded to 'break-break!'

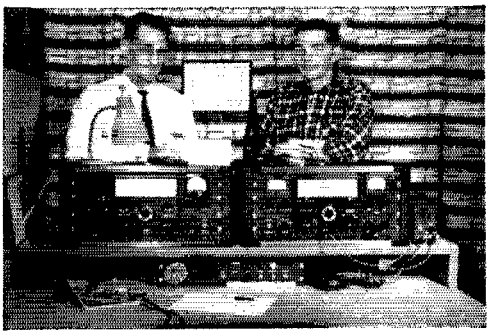
After lunch on Sunday we called CQ. Pandemonium broke loose. We had contact after contact. Hour after hour. When things dulled up a bit VK6MK, Vic, said "Shall I rustle them up a bit, Art?" He did. The calls thundered in. The score was 200 worked by supper time.

At 1815 we called on 15. The frequency let out a strangulated gurgle. We never let up for one minute until 2015. We were now aware what had happened to Jimmy when he was VQ9. That would not happen here. We refused to go back to stations on our own frequency and informed that we were listening 3 kc. up or 3 kc. down. A few of the boys were accurate enough to be three up or down, but the majority were not. Some were up ten, others down seven. So it went and we logged some 200 contacts in under two hours. It was a glorious experience.

At 2005 we started to pack up. By midnight we had bidden our wonderful hosts and hostess a fond farewell. We hit the trail for home. 35 miles from Francistown we also hit a boulder in the road at 60 m.p.h. Where that rock came from in the sandy wastes of Bechuanaland still remains a mystery to me. (Meteoric shower, Ben said.) After that the slightest dip caused a machine-gun like rattle on the floor of the car. We had to stop and look, even if it was in the elephant country. We loaded the Brownie revolver (a lot of use it would have been anyway!), got out and inspected. Ben reported that one of the body cross members had been bent and that the universal was rat-tat-tatting against the overloaded body whenever the springs gave a bit. What was needed was a stout piece of fencing wire, said Ben. We had spare plugs, points, condensers, coils, tubes and tires, but a stout piece of wire? Who would have thought of that. All the cables, feedlines and so on that we had with us were as useful as the blown screen resistors. Miserable as blazes we got in and drove at a snail's pace. There were no fences, no farmers, no nothing. Only sand and bush. The half jack of Scotch was out and another dexidrene was down the hatch. (Ben has a weak heart . . . and that's true, too!)

(Continued on page 146)

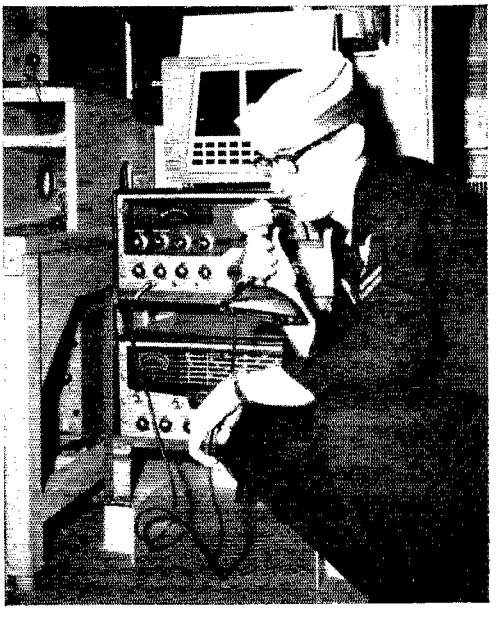
Strays



Pictured above is the father and son team of W3CWW and W3CXV. Their station is completely home-built and consists of a 20-tube, double-conversion superhet and a phone/c.w. transmitter with a 6146 in the final.

The U. S. Navy recently authorized operation of a ham station on board the *USS Ranger* (CVA-61) while she was on detached duty on a good will cruise from Atlantic to Pacific around the Horn. Above, in an order not disclosed by the Navy, are six of the hams on the *Ranger* at the time: KH6BWX, W8PBR, W1WSM, K4GHY, W4HLX, and WØUJI. Not present when the photo was taken were W1YUT and W4IDN.

The *USCG Spar* recently returned from a 4-month stay in the Arctic during the course of which W1WIN (shown above) operated his ham station on board to help the crew keep in touch with the home front.



One of the Navy's icebreakers in the Antarctic, the *USS Staten Island,* has been authorized to have an amateur station aboard, using the call of Electronics Technician W9HJM. Shown above is W9HJM himself, trying out the gear furnished through the courtesy of Hallicrafters and C&G Radio Supply of Tacoma, Wash. Four other men on board the icebreaker have taken their ham exams, so look for plenty of activity from W9HJM in the Antarctic.

W2ZC has a sure cure for inquisitive sightseers and picnickers who turn the controls in his remote antenna-tuning doghouse. It's a sign that reads, "Danger — 110,000 Millivolts. Trespassers Subject to Ohm's Law."

—...—

W2TPV says he has been getting out good with only a Heathkit v.f.o. tied to the antenna.

Cherchez la Femme . . .

In September the Montreal Radio Amateur Club ran its annual hamfest, during the course of which they pulled off one of the neatest hidden transmitter hunts that we've heard about in a long time. Here's the way it went.

Registration of mobiles for the hunt was made in the usual way, with no hint of what was to transpire later. VE2AUU/mobile was the "hidden transmitter," and the fact that he was poorly hidden was intentional. He was instructed to stay "hidden" until four mobiles had found him, at which time all the other mobiles were told by radio that the hunt was over and that they were to return to the hamfest site. Upon their return they and everyone else (except the four who had "found" VE2AUU) were told that the real hunt would now get underway, with the hunters being the first four that had arrived at VE2AUU's site.

The gimmick was that VE2NR (a real and very pretty YL) and Eric Lloyd were to stroll up and down the street in the vicinity of the hamfest headquarters. Eric was dressed up as a girl, and so all any casual observer spotted was a couple of good-looking blondes stolling aimlessly around. However, the hunters heard a masculine voice transmitting, because Eric carried a ½-watt battery-powered transmitter in the handbag with an antenna wire sewed in the hem of his skirt and the mike taped to his wrist.

The hunters soon arrived in the area, but spent an hour looking behind bushes, in houses, under benches, and so on and so on before VE3UY with a portable field strength meter finally had the courage to walk right up to the blonde and ask "her" to speak to him. The discrepancy between the voice and the costume had the boys going for quite a while! QST

The Montreal gang did quite a job of make-up on these two "girls." At the left is Mary Reidy, VE2NR. To the right is Eric Lloyd, whose deep voice completely fooled the hidden-transmitter hunters who were looking for a male operator. The low-powered transmitter was hidden in the handbag, the antenna was sewn in the skirt.

. . . Just Strollin' Along

But all the ingenuity isn't in Montreal. Down in Santa Barbara the AREC was kept guessing for a while because K6DXW hid his transmitter in a baby stroller. Battery-powered, with about three watts input to a 6AQ5 final modulated by another 6AQ5, and with a Gonset G-66 receiver and a ground-plane antenna, he kept the hunters confused for quite a spell. K6UEC finally was successful in running down this unusual mobile. QST

Left, K6DXW and his "mobile." For the transmitter hunt he had the equipment a bit better disguised than this!

Danger — Blasting — Turn Off Two-Way Radios!

EVER been driving along the highway and noticed a sign like this one? The reason for the warning is that radio frequency energy from an operating transmitter is strong enough in some cases to induce current in electric blasting caps and cause them to explode. The danger of accidental firing increases as the leads in the electrical circuit of the caps approach a half wavelength or longer at the transmitted frequency. Since a current as small as 150 ma. is sufficient to fire an average cap, complete safety requires that the transmitter be turned off when near a blasting site. The table shown in Fig. 1 shows the minimum safe distance that should be maintained between electric blasting caps and an operating radio transmitter.

It is relatively safe to carry caps in vehicles containing an operating radio transmitter so long as the caps are in their original containers; the metal car body is a good shield against the r.f. energy. However, as an extra precaution it would be a good idea to carry the caps in a closed felt-lined metal box.

Transmitter power watts	Minimum distance feet
5 — 25	100
25 — 50	150
50 — 100	220
100 — 250	350
250 — 500	450
500 — 1000	650

Fig. 1 — Table showing the minimum distance that should be maintained between an electric blasting cap and a radio transmitter.

It might be well to note that there is no danger that radio frequency energy will fire primers such as those used in the primer pocket of cartridge cases. Those primers are quite insensitive to anything except a direct blow or extremely high temperatures. — *E. L. C.* QST

Strays

When you hear a ROAR on the bands these days, don't be frightened — it's a Rotarian of Amateur Radio. W9JKC is compiling a list of Rotarians who are also amateurs and is trying to establish a phone net for Rotarians. He suggests noon CST, Saturdays and Sundays, on the following frequencies: 3960, 7235, 14,270, 21,400 and 28,600 kc., either a.m. or s.s.b.

—•••—

From the School of Medicine at the University of Washington, Seattle (via W7USO), comes a warning on the hazards of microwave radiation. Microwaves produce localized heating in matter, and this effect can cause damage to certain human organs where normal heat control is poor and blood circulation is low. The organs most likely to be affected are the eyes. Wavelengths of 10 cm. or longer are more likely to cause damage than those of less than 10 cm., because they penetrate more deeply. It is particularly important not to expose appreciable portions of the body (100 sq. cm. or more) to microwaves in the range 30 cm. (1000 Mc.) to 10 cm. (3000 Mc.). Do not make detailed visual examination of any microwave radiator, reflector, waveguide opening, waveguide horn, or magnetron during a period of transmission.

—•••—

Congratulations to *QST* author G. Franklin Montgomery, W3FQB, who has been appointed chief of the electronic instrumentation section at the National Bureau of Standards. At the Bureau he has been associated with research programs on ionospherics forward scatter and meteor-burst communication. In recent months he has been investigating the application of transistors to electrical measuring instruments. One of his better-known *QST* articles was "Corkey — a Tubeless Automatic Key."

—•••—

We have a rather interesting letter from a fellow who says that because he is past the half-century mark his days are probably numbered. However, the only thing that bothers him about the future is that after he is gone from this vale of tears his name and call will be listed under "Silent Keys." And this bothers him because he is strictly a phone man.

Field Day on the Green

An Unusual Activity in Rugged Country

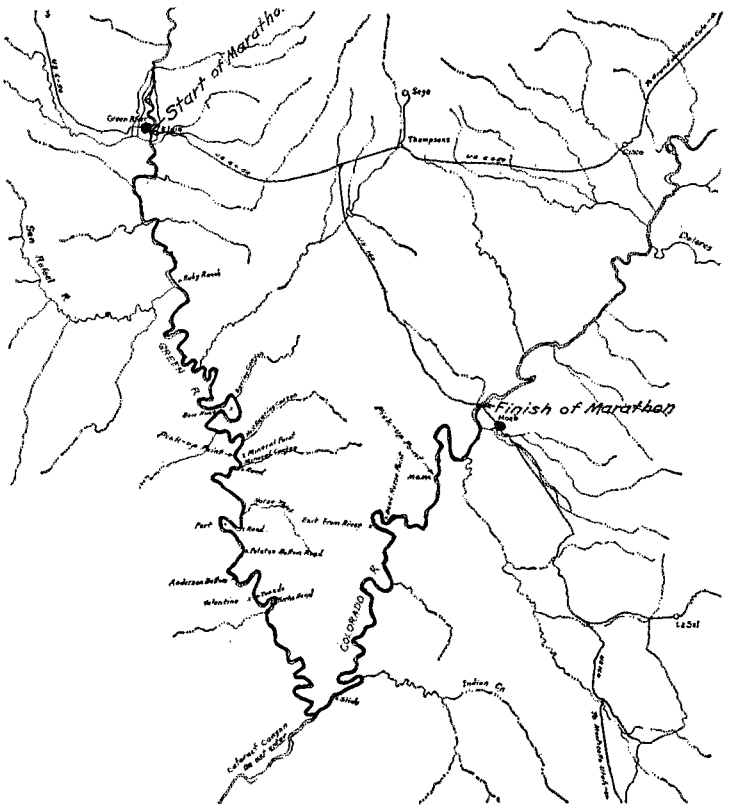
BY CECIL L. HEBREW, JR.,* WØQEL

The net control station (WØRRZ/Ø) used the back end of a station wagon, looking out over the river at the starting line. Operators shown are KØJMG and WØQEL as they watch the boats go by.

IT WASN'T exactly a "Field Day" in the ARRL sense; but it was an outdoor communications experience that had all the aspects of FD except the score, plus a few others — and those are what we want to tell you about.

During February, the Chambers of Commerce of Green River and Moab, Utah, contacted our club — the Western Slope Radio Club of Grand Junction, Colo. — to request that we provide communications for the Canyon Country River Marathon, an annual speed boat race held the third Sunday in June on the Green and Colorado Rivers. The objectives were two-fold: (1) to provide spectators along the route with a running account of the boats as they progressed, and (2) to dispatch aid quickly in the event of a mishap or emergency. The race, down the Green from Green River to the Colorado and then up the Colorado to Moab, covered a total distance of 196 miles, much of it through sheer canyon walls, although the distance from Green River to Moab by road is only fifty miles. It was a challenge, and we accepted it.

*1630 Hall Ave., Grand Junction, Colo.



Problems

First, the long distance involved would require many stations in order to provide adequate coverage. Second, the two river banks are inaccessible, except at a few points, to automobiles. Third, the canyon walls would make radio coverage difficult if the operator was to be close enough to read the boat numbers. Fourth, since the area is mostly uninhabited, power would have to be supplied by generators or batteries. So a Field Day it was, but unlike the average FD we couldn't pick any location we wanted, and we had to maintain communication with specific points.

Preparations

Preparation was under the supervision of two committees, the Activities Committee and the Communications Committee. The former, chairmanned by WØFKY, planned the location of stations, ways and means of getting the

equipment and operators to the locations, and the method of operation. The latter, under WØIQV, set to work modifying some surplus equipment, purchased by the civil defense agency.

The plan was to set up nine stations along the race route (see map). Four of these were to be in pick-up boats and one in an aircraft. Dependence on mobile stations was ruled out because of the length of time of the operation (supposedly all day); fixed stations with portable generators were to be set up, although most were to be backed up with mobile rigs. The pick-up boats would be stationed along the river in various areas to aid any racers in distress, and the aircraft would circle the area for spotting purposes. All stations were to be put on location Saturday, June 14, and operators would camp out overnight so they would be ready to roll early the next morning. The net control was to be located at Green River and operate as WØRRZ, the club call. Frequency picked for the operation was 3890 kc.

Since there was no road into Anderson Bottom, WØIQV and WØUVY were flown in, along with their equipment, on Saturday afternoon, landing on an old Forestry Department landing strip. WØVCB had his equipment in a jeep with four-wheel drive, which is what it took to get to the slide area, along with a full day's travel time. Many stations, set up Saturday as planned, were checked in that evening. Everybody (well, almost everybody) went to bed early in order to be ready to go at 0500 the next morning.

Great Day for the Race

At 0430 Sunday, after a session of trying to get relays to operate on 90 volts (that's all we had!), contacts with some of the other stations were started. Most of the operators were up and around, except those who had been carried away by the mosquitoes. WØIQV asked for a new spark plug and a quart of oil, which were flown in to him. WØZJO, at the finish point in Moab, reported generator trouble and general confusion. But our problems were only beginning.

The race started right on time, at 0630, and WØDGA, who had one of the strongest signals in pre-race tests, could not be contacted. This required relaying of boat numbers by outside stations, but there were plenty available for this. (Isn't this ham fraternity the greatest?) Then two of the boat transmitters refused to work. The station in the aircraft worked fine on the ground, but in the air WØGSF said it was so bouncy that he couldn't tune it up, so contact could be made only when the aircraft was directly overhead. Two other transmitters went out because of voltage variations from the small generators (from 120 to 180 volts), and mobile operation was required. WØZJO finally got set up with a generator that would conk out every so often; this, along with a noise level of 7 db., made it very difficult to contact him at the finish line.

But all was not lost, despite this operation of "Murphy's Law." A total of 57 boats entered the race, but naturally not all finished. They were started in ten heats, with as many as 18 boats in one heat. All types, sanctioned and not sanctioned, participated. Some had engine trouble, some ran aground on sand bars, some ran out of gas. The amateurs had their hands full with messages concerning these mishaps, in addition to regular spotting functions. Several boats were spotted by the aircraft, beached along the bank, and help was sent to them. A typical message read: "Will drift to Mineral Point. Send someone to pick me up there."

The winning boat made it in four hours and thirty-five minutes, but some of the slower boats were still coming across the finish line at 1600. Many problems were met and some solved on the spot. However, there is room for a lot of improvement, so "wait until next year."

This account wouldn't be complete without a list of the amateurs who took part in this venture. Here they are: *WØs* PXZ VCX GSF VCB QEL DGA PCB FKY GNK UVY QWW GDC IQV ZJO, *KØs* JTE JMG, KNØQTV. QST

Right: WØIQV and WØUVY set up this station at "Anderson Bottom." Since there is no road, they had to be flown into (and out of) this location.

Below: WØQEL/m is drawn up alongside the control station, in case the latter should break down. After the start, most cars and boat trailers repaired to the finish line.

The Art and Practice of Delivering Messages

Some Hints on the End Object of All Message Handling

BY DAVID B. FELL,* W3TN

WHOEVER has made final delivery of radio messages will remember the joy and satisfaction he derived from this phase of traffic work. Have you known these pleasures? Have you ever notified a mother that her son is homeward-bound from Korea? A grandmother that she has first grandson, born early this morning? A young lady that her sweetheart sends reassurance of his love from his military outpost in Greenland?

If you have enjoyed these satisfactions you may even have had letters, just as I have, from especially grateful recipients. Now the surprising thing is that they thank *you* or *me*, when usually all we did was to bring in the message by short relay from forty or a hundred miles away. Still we are lavished with thanks. So let us in all humility accept those thanks on behalf of the whole chain of hams who carried the message through rough conditions, a chain in which you or I were but the short end-link. And let us accept those thanks on behalf of the whole network of sections, regions, areas and transcontinental nets that make these deliveries possible.

When we contemplate the amount of work on the part of a number of stations that has already gone into bringing a message to your station and mine for delivery, it is only fair to expect that we will finish the job as effectively as we are able.

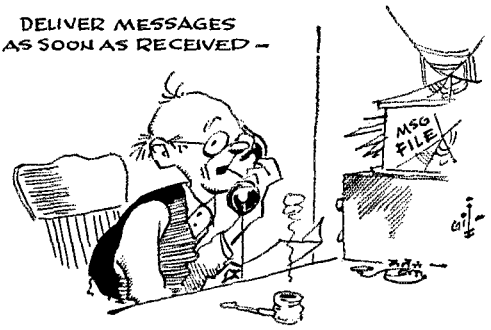
* 7818 Stratford Road, Bethesda, Md.

The suggestions that follow are aimed at just that: more perfect deliveries. Just as when a housewife has painstakingly prepared an excellent dinner it is an outrage to serve it in a tin dish mixed like a cold, unappetizing stew; so when the rest of the chain — originator and relayers alike — have all done their parts well it is an outrage to spoil the delivery with a drab, lukewarm performance.

So then, to make more perfect deliveries, how shall we proceed? There are, I suggest, three distinct steps: (1) pre-delivery checking, i.e., preparation for the delivery; (2) the telephone delivery; (3) the written delivery or confirmation.

First, the pre-delivery checking. You read over the message you are about to deliver and make note of any passages possibly garbled. You consult your telephone directory either to find the phone number or to verify the correctness of the number given in the message. If no listing is found and none is given in the message address, here is a chance to enlist the help of the phone company's Information operator. Simply by telling Information my mission I have found her most helpful. She tells you there is no such street address; she tells you there is no such town as *South* Pleasant, Pa., with a Kimmel exchange, but there is a *Mount* Pleasant, Pa., with a Kimball exchange. From her you learn the number to be called is a university dormitory, a hospital, a rooming house, or an apartment hotel with a private branch exchange, thus presaging more trouble getting through to our party. There is an immense amount of help we can get from Information just for the asking. We may also check our *Call Books*, in case of doubt, to verify that the town and call letters of the station of origin match. To those of you whose copying skill is much better than mine, such checking may be wasted time. But I find it worthwhile. The more I know in advance what I'm likely to encounter when I place the phone call, the better delivery I can make.

Second, and most important, is the phone delivery itself. Here and now is our great moment. Remember, we are going to make an impression, either favorable or unfavorable. There is no happy medium. We are about to telephone an utter stranger; we are about to intrude upon the privacy of the home of someone who has, perhaps, too often suffered the annoyance of tele-



phone solicitations of fund-raisers, canvassers, TV-viewer survey pollsters. We are about to deliver a "telegram," a thing which raises the image of nothing but dreadful tidings to folks of earlier generations.

What our recipient cannot yet know is that we are about to bring her good news — greetings, safe arrivals and so forth. She doesn't yet know the *wonder* of all this ARRL traffic system: that we didn't just happen to pick up this message directly from Maine or California, wonderful though that would be, but it was relayed in; that hundreds of us banded together and engaged in this work for the sheer *love* of it. We are indeed Amateurs, i.e., lovers of our craft. So let us launch into this cheerfully, enthusiastically, and, at the same time, with all the considerateness and good manners that we can muster. The text itself (its urgency or routineness), the addressee (his or her probable youth or maturity), and whatever else our pre-checking has told us will guide us.

Very well, then, how to proceed? There is no single best way and you will develop your own. This way works for me. I speak slowly:

"Mrs. Smith? My name is David Fell. I am an amateur radio operator in Bethesda and I have a radio message for you from Hawaii, signed Moose." Note that in these brief words we get directly to our business; and, by announcing Who, What and Where From, we do our best to put our recipient at ease and to dispell the cautious reserve which it is normal to expect.

Right here I keep the recipient in suspense long enough to do some "post-checking" before I deliver the text. Thus: "Do I have the name correctly, Mrs. John P. Smith at 4807 Wishful Vista? The signature, Moose, do I have that correct?" Yes, we learn, that is the nickname of a favorite nephew. All right then, "This message was originated in Honolulu on March 22, and here is the text," and we read it to her, accepting from her fill-ins or corrections for any parts that appear garbled to you, but which are quite intelligible to her. Thus, by careful inquiry from Mrs. Smith, we correct our file copy and are enabled to confirm to her a "smooth" message, freed from the simple mistakes that have cropped up during transmission and reception. One purpose of these verifications is for possible use in our third step: confirmations.

Third, the written message or confirmation. When shall we make mail deliveries? Here are four kinds of occasions: (1) obviously, when there is no phone listing in the local directory; (2) for delivery to outlying towns where the cost to telephone would be excessive; (3) to other towns in our ARRL Section when the text of the message indicates that to hold it hoping to find a radio outlet within the next 24 or 48 hours would defeat the purpose of the message and render it useless; (4) for confirming telephone deliveries.

Our first task is to complete the delivery. Shall we quit just because telephone Information tells us there is no phone listing and no such address? Not yet. There is further checking we

can do: road maps, atlases, street and city directories, inquiries to the post office and fire department. Let us make every reasonable effort to get the message through. I have on occasion enclosed the message with its own stamped envelope in a letter to the postmaster in an outlying town requesting his help to complete or correct the address. It worked. Remember, a service message back to the originating station regarding undeliverability is at best a poor substitute for actual delivery, when, by a little more effort, we could have finished the job.

Now deliveries in writing require, if anything, more exactness than phone deliveries. For here, written mistakes and omissions reveal more glaringly the errors that have accumulated along the way. We must not tamper with the text of a message but we can query parts not clear. And we ought, I think, make every correction we can in our written confirmation delivery. Thus, a message to Mr. Scofield from his friend Bill should be addressed to Mr. Scofield, not to a Mr. *Suffield* even though that is certainly what we copied. Likewise, when the recipient has a newer street address, new telephone number, new and higher rank or title, use the correct information and show the older, incorrect stuff parenthetically, if at all.

For written messages I use the ARRL message blank and I type the message as neatly as I can. Postcards or plain paper written in longhand will do. But a little glamor or "gift wrapping," will help make a more pleasing impression.

Contrary to the practice of most traffic men, I regularly mail written confirmations of telephone deliveries.

Here are some benefits and values of all written deliveries and confirmations:

1. The written message or confirmation gives station of origin, town of origin and date of filing; name, station, address and telephone of the delivering station. How often have you received a commercial telegram delivered by telephone and then wondered afterward exactly when or where it originated? How often has another member of your household accepted a message for you and failed to grasp certain vital information? You, the delivering station, are not even sure they got your name and phone number to be able to call back for verifications!

(Continued on page 144)

Maritime Mobile Privileges Expanded
C.W. Bands on Six and Two
RACES Expansion Proposed

C.W. BANDS ON 6 AND 2

At press time last month we received word FCC had acted on Docket 12485, which grew out of an ARRL proposal that 100 kc. be set aside at the low end of the 50 and 144 Mc. bands for c.w. only. In its Report and Order, the Commission established c.w.-only segments, effective January 10, but placed them at 50.9–51.0 and 147.9–148 Mc. We present the text of the FCC action at the end of this department.

Flash! At ARRL request, FCC (on Jan. 9) delayed the effective date of the above order and set March 10 as a final date for the League's (or others') possible filing of petitions for rehearing.

W1DF ELECTED FELLOW, IRE

We know that George Grammer, Technical Director of the League and Technical Editor of *QST*, needs no introduction to our readers. Therefore, and contrary to established policy among public speakers, we're not going to give him one. We just want you all to know that George has been elected a Fellow of the Institute of Radio Engineers, an honor we feel he thoroughly deserves. The citation mentions his

W1DF

work over the years in the general field of technical literature, and specifically his contributions to the development of single sideband in its present forms.

CALL PLATES FOR N.Y.

After several futile efforts, hams in New York, led by W2AAO and the Albany Amateur Radio Association, apparently have won their battle for automobile license plates bearing their amateur call signs. New York is thus the 41st state to grant this special recognition.

Governor Harriman made the announcement himself by ham radio through the facilities of W2APF. He told the members of the New York State Emergency Net that Commissioner Kelly would meet soon with amateurs to work out the details of procedures for issuance of the plates, effective in 1960. The Governor also had some nice things to say about amateurs in general and New York hams in particular:

"My purpose in speaking to you today is to express, on behalf of the people of the State of New York, our deep appreciation for the humane and often heroic services you have performed in the past and to tell you how very much we are dependent on you to be on the job at anytime, and particularly if a civil defense emergency should ever occur."

W1TS 25th

At the risk of making the old timers feel still older, we want to report that the Sleepless Wonder of 1TS, the man behind the key at 1923's WNP, the operator who had your call in the "Calls Heard" column of *QST* if you so much as sent a one-by-one on the air, has now been on the League staff for a quarter-century. Donald H. Mix, who still etches the call W1TS on the Kennelly-Heaviside layer "regular and frequent", first came to the League in 1933 to operate the Technical Information Service. The shine was hardly off his nameplate when he began turning out the copy on transmitters which has made his name a household word among hams.

W1TS

In 1939 Don moved up to Assistant Technical Editor. During the war he kept the show running at 38 LaSalle, serving as acting Technical Editor from 1943 to 1945. In recent years Don is better known among our *QST* authors perhaps than among the readers; he spends a good part of his time checking articles written by others and putting them into *QST* style.

But long before he came on the staff Don had become famous as the operator of WNP—"Wireless North Pole". When MacMillan was

fitting out the *Bowdoin* for his 1923 Arctic Expedition to Greenland, he made provision to take ham radio along — perhaps the first DXpedition. Zenith contributed the equipment, and the ARRL Board of Directors was asked to furnish an operator: Don was its choice. During the long winter, when the schooner was frozen in the ice at Etah Harbor, WNP kept the *Bowdoin* in touch with civilization. After the expedition, Don spent the next ten years in the research laboratories of a number of outstanding organizations including Burgess and Press Wireless. A ham continuously since 1920, Don's current interest is in chasing DX, with 250 watts available on 80 through 10 meters; at press time the score is 199/192.

MORE RACES FREQUENCIES PROPOSED

Responsive to a petition by the U. S. Civil Defense Amateur Radio Alliance, the Federal Communications Commission has proposed to make certain additional frequencies within the amateur bands available for the use of the Radio Amateur Civil Emergency Service. As will be seen from the list of frequencies in the notice published at the end of this department, most of the proposed channels are centered around ARRL national calling and emergency frequencies. Additionally, two frequencies are to be designated for liaison with military units.

FCC EXPANDS MARITIME MOBILE PRIVILEGES

FCC has now made final its proposals in Docket 12307 (see *QST* for March, 1958, page 60) to permit maritime mobile amateur stations to operate on any band from 7 to 148 Mc. when on the high seas in Region II (roughly, North and South America and adjoining waters; see footnote 2 for an exact description). The new rules become effective January 30, 1959. The text of the Commission's Report and Order is published below:

In the Matter of Amendment of Section 12.91 of Part 12, Amateur Radio Service, to make additional amateur frequency bands available for amateur operations outside the continental limits of the United States, its territories, or possessions.	Docket No. 12307

REPORT AND ORDER

By the Commission:

1. The Commission issued a Notice of Proposed Rule Making in the above-captioned proceeding on February 3, 1958, wherein it was proposed to amend Section 12.91,[1] of the Commission's rules so as to make available all amateur frequency bands between 7 Mc. and 148 Mc. for use by amateurs operating within Region 2,[2] except when within the jurisdiction of a foreign government. All interested persons were afforded ample opportunity to file original and reply comments in support of or in opposition to the proposal.

2. The purpose of the proposed amendments is to place

(*Continued on page 148*)

[1,2] See footnotes at bottom of page 148.

George K. Rollins, W3GA

It is with great regret that we report the passing of George K. Rollins, W3GA, on December 17, 1958. "Red," as he was universally known, had served as Chief, Public Safety and Amateur Division of the Federal Communications Commission, since that post was established in July, 1950. For the two years previous he had been Chief of the Radio Operator and Amateur Division of the Commission's Engineering Department.

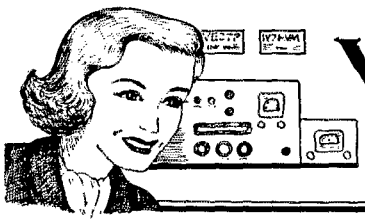
Born February 2, 1905, in Minneapolis, and raised in Springfield, Mass., Red Rollins became interested in amateur radio at age fourteen. His first station license was issued in 1922 with the call 1CHO. This was followed with 8HW, W8JO, W9GR, W4EJP and W3GA as he went off to school at Michigan State College, and then to work for the Radio Division of the Department of Commerce at Grand Island, Nebraska, in 1929. The next stop was at Atlanta, Georgia, where Red was responsible for the operation and maintenance of the Marietta Monitoring Station.

W3GA

In 1937 Red left Government service, and went into business for himself as a partner in the firm of Holey and Rollins, consulting engineers to broadcasters. He returned to the FCC in the Hearing Section of the Broadcasting Division in 1939, and left these duties a year later to supervise the construction and installation of the Laurel, Md., monitoring station. Not long after, Red became Chief, Aviation Section of the Safety and Special Services Division. Toward the end of 1942, he went into Naval aviation, reaching the rank of Lieutenant Commander by the time he was discharged in 1946. He returned to the Aviation Section of FCC, and served there until moving to the Radio Operator and Amateur Division.

Red was active on the bands 80 through 10 meters, and on v.h.f. as a member of the Montgomery County RACES net. His other hobbies include bass fishing and photography.

W3GA will be deeply missed, both on the air and in his official capacity.



YL NEWS AND VIEWS

CONDUCTED BY ELEANOR WILSON,* W1QON

YLRL ANNIVERSARY PARTY RESULTS

ANOTHER YLRL Anniversary Party record broken! In nineteen years of YLRL contesting a new participation record has been set each year. Last November 550 YLs participated in the AP phone contest (166 logs submitted) and 161 YLs participated in the c.w. section (70 logs submitted) — making the total turnout of YLs the largest ever for the popular annual Party. All forty-nine states plus three Canadian districts and fifteen different countries were represented.

Varying opinions of the revised rules for the contest were received by Vice President Kay Anderson, W4BLR. Here are Kay's summarizing remarks:

"Comments were about equally divided for and against the new 24-hour time limit. Suggestions ranged from one who wanted a week-long contest with a limit of 36 hours operating time out of the week, to one who would like a 12-hour blitz contest, with no resting time.

"Some would like the c.w. section first and the phone section second. Many, many YLs wondered about California being divided into sections. Others would like the contest on a week end. A few say 'Let's keep the rules somewhat permanent, so winners will be competing under the same rules and conditions as previous winners. Only in that way will the awards have any meaning.'

"It takes more than one letter or one complaint from a group to get a particular feature changed or ruled out. It takes lots of pressure from all the sections. The vice president has to know that it is the will of the majority before the rules can be changed. If you have not voiced an opinion and would like to, then by all means write to our new vice president, Gladys Eastman, W6DXI. She will be writing the rules for the Twentieth Party and will want to please the majority.

"Thanks to all who sent in logs, comments, and helpful suggestions. Congratulations to the winners!"

Highest scoring phone contestant in the AP was Katherine Johnson, W4SGD, who gathered her 11,180 points on 10, 15, 20, 40, and 75 meters. Although Katherine has been a high scorer in other YLRL contests, winning this one was a surprise, for she says that she just relaxed and operated for the fun of it all. Katherine is custodian of the popular YL Century Certificate.

Top phone scorer Katherine Johnson, W4SGD, and top c.w. scorer Mary Schultz, K6OWQ, each received a gold cup. Certificates were awarded to second and third place phone winners Harriett Woehst, K5BJU, and Doris Anderson, K5BNQ, and second and third place c.w. winners Joyce

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

Top c.w. AP winner Mary Schultz, K6OWQ, of Temple City, California, is strictly a c.w. operator, athough on RTTY at times. For this year's contest Mary switched from high to low power and concluded that there was considerable satisfaction winning with reduced power (under 100 watts). The XYL of W6CG, Mary is DXCC, with 130 countries confirmed.

TOP SCORERS

C.W.

First — K6OWQ	3376
Second — K9IKL	3195
Third — K2JYZ	2434

Phone

First — W4SGD	11,180
Second — K5BJU	10,962
Third — K5BNQ	10,750

CLUB ENTRIES

Floridora YLs	4,241
Gulf Area YLARKs	4,144
Los Angeles YLRC	4,014
Portland Roses	3,231
San Diego YLRC	3,099
Ladies Amateur Radio Klub	1,398
Washington Area YLARC	690

Polley, KØIKL, and Illian Byrne, K2JYZ. A novice certificate was given to KN5SPD, the only one of fifteen participating novices who submitted a log. A gavel was awarded to the Floridora YLs for the highest club score of seven competing clubs.

SCORES

Only the station and the total score is listed below. Complete score information, including number of contacts made, sections worked, and power multiplier, if used, will appear in the YLRL publication *YL Harmonics*.

C.W.

K1ADY....195
K2JYZ....2434
K2ZQG....1855
K2CUQ....760
K2ZLN....123
W3TSC....2280
W3UTR/3...775
K4HXB....2018
W4RLG....1813
W4KZT....1656
W4SGD....1250
W4BIL....998
W4GAN....784
K4TFL....638
K4SAF....431
W4WPD....88
W5EGD....2080
K5LIU....2015
K5HTO....1696
K5PFF....325
K5BJU....252
K6OWQ....3376
W6PCA....2351
K6KLN....2120
K6ZCR....1523
W6UHA....1457
K6ENK....1248
K6BUS....1014
W6WSV....936
W6WDL....866
W6AAX....630
K6HOI....135
W6GGX....60
W6WRT....46
W7PUV....1565
W7PTX....1486
K7BQI/7...1242
W7HXE....1170
W7WHV....1094
W7FDE....100
K7ADI....70
W8HWX...2025
W8WQE....1140
W8RIR....971
W9MLE....1824
W9USR....1281
K9BWJ....1219
K9AVK....225
K91WR....15
KØIKL....3195
KØLYV....2175
KØGIC....1890
KØEDH....1156
KA2HA....124
KH6BTX....792
KL7YG....1530
KL7ALZ....863
VE3DKY...1392
VE3AJR...1200
VE5DZ....1674
VE6YW....356
VE7ADR....689

Novice Award Winner:

KN5SPD....213

Phone

W1ZEN....8125
W1CEW....7534
K1DGZ....6426
W1ICV....5050
W1YPT/1..4305
K1ADY....195
K2JYZ....10,183
W2EWO....5311
K2ZQG....3700
W2OWL....878
K2TXM....800
W2EEO....743
K2CUQ....553
W2VMQ....96
K2ZLN....70
W3URU....9555
W3TNP....7260
W3APT/4..6462
W3GEN....5558
W3GTC....1380
W3UTR/3...775
W3RXJ....473
W4SGD...11,180
W4CWV....7131
W4KYI....7076
K4KKR....6498
K4IFF....6469
W4BIL....4973
W4KZT....4024
K4RNS....3760
K4CZP....3720
W4VCB/3..3183
W4WPD....2393
W4UF....1914
K4BKT....1581
K4EUG....1093
W4RLG....608
K5BJU....10,962
K5RNQ...10,750
K5HTO....9570
W5DRI....8125
W5EGD....7830
W5SPU....6738
W5ERH....6081
W5JCY....5328
K5PIO....5273
K5LIU....4408
K5GYZ....2880
W5WUX...2558
K5PFF....2361
W5YSJ....1984
K5IHF....924
W5ZPD....897
K5MIZ....601
K5JGC....30
W6QGX....9753
W6GGX....9685
K6EXV....7706
W6WRT....7073
K6OAI....7056
K6KCI....6192
W6JZA....5700
W6AAX....5334
W6WDL....4703
K6JPY....4485
K6KLN....4363
K6ANG....4400

In Houston, Texas, K5BJU, Harriett Woehst, persevered hard and long enough to capture second place AP phone honors. Harriett was first president of the new Gulf Area YLARKlub organized early in 1958.

W6UMA...3696
K6OQD....3500
K6HHD...2975
W6CEE...2835
W6VSL....2380
K6JCL....2010
WA6AOE..1581
W6DXI....1512
K6PWH...1380
K6QPG....1035
K6ENK....940
K6HOI....820
K6UHI....266
W7RVM....8343
W7TGG...5248
W7DRU...4700
W7QKU...4025
W7QME...3294
K7BQI/7...3168
W7HHH....2975
W7CSQ....2720
W7DIC....2306
W7FDE....1781
K7CPB....1000
W7WHV....892
W7CPV....326
K7ADI....300
W7NJS....260
K7AJB....210
W8RZN....5751
W8WUB...4770
W8IIUX....4095
W8VRH....2846
W8EIR....1392
W8DNF....368
W9RIJ....7763
K9CQF....6611
W9GME....6270
W9YWH...2368
W9VNG....1823
K9IVG....1500
W9LDK....850
W9UXL....743
K9LYG....360
K9CMZ....6
KØLYV....8528
KØACC....8288
WØTYB....6950
KØGIC....5738
KØIGU....4056
KØHEU....3943
KØGRG....3613
KØIKL....3290
KØDHA....2772
WØERR....2480
WØZWL....2228
KØLQS....1528
KØATT....990
KØJUW....798
KØEDH....100
G2YL....2288
G8LY....360
KA2HA....360
KA2HA....1210
KH6CKO...3608
KH6BGE...2988
KL7BHE...8100
KL7BLL...1950
KP4APX...2325
KX6CM....3924
OH5SM....3230
VE3AJR....1657
VE3DGV....808
VE6YW....607
VE7ADR...4331
VP1OLY...2250
ZS6APG....563

Stations submitting logs for confirmation only: C.W. — W1s KYT, UVV; W4PPQ, W6QYL/4, W7GUQ, KH6AUJ, VE3DDA. Phone — W3s MDJ, NNS, UKE; W4s BLR, PPQ, K4s MQN, RBU; K5ALF, W5sDRA, ECF, RZJ; K6JZA, W6QYL/4, K6ZCR; K7BED, W7s GRC, GUG; KØBTV/M; JA1AEQ, KH6AUJ, KL7ALZ, VE6MP, OE5YL.

TENTH ANNUAL YL-OM CONTEST

Last year some 1500 OMs and 300 YLs participated in this YLRL sponsored contest. We're almost willing to bet that these record-breaking figures will be surpassed this year. Interest in YL certificates of all kinds is soaring, and the YL-OM contest offers the year's golden opportunity to contact literally hundreds of YLs in two gay week ends. And the attraction is mutual, to be sure, for what gal wouldn't be interested in talking personally to a few hundred men herself? So, gals, and guys, observe the rules and get set!

Eligibility: All licensed OM, YL and XYL operators throughout the world are invited to participate.
Operation: All bands may be used. Cross-band operation is not permitted.
Procedure: OMs call "CQ-YL". YLs call "CQ-OM".
Exchange: QSO number, RS or RST report, name of state, U. S. Possession, VE district or country.
Scoring: (a) Phone and c.w. contests will be scored as separate contests. (b) One point is earned for each station worked, YL to OM or OM to YL. A station may be contacted no more than once in each contest for credit. (c) Multiply the number of QSOs by the number of different states, U. S. Possessions, VE districts and countries worked. Maryland and the District of Columbia count as one state. (d) Contestants running 150 watts input or less at all times may multiply the result of item (c) by 1.25 (low power multiplier).
Logs: Copies of all phone and c.w. logs, showing claimed score, must be postmarked not later than March 31, or they will be disqualified. Please file separate logs for each mode of operation. Send logs directly to YLRL Vice-President Gladys Eastman, W6DXI, 735 Glen Avenue, Glendale 6, California.
Awards: YL — First Place Phone — Cup
First Place C.W. — Cup
OM — First Place Phone — Cup
First Place C.W — Cup
The winner of the phone cup is also eligible for the c.w. cup. Certificates will be awarded to high-place phone and c.w. winners in each district, U. S. Possession and country.

PHONE Contest —

Starts: Saturday, Feb. 28, 1959, 1:00 P.M. EST
Ends: Sunday, March 1, 1959, 12 Midnight EST

C.W. Contest —

Starts: Saturday, March 14, 1959, 1:00 P.M. EST
Ends: Sunday, March 15, 1959, 12 midnight EST

1959 Air Race

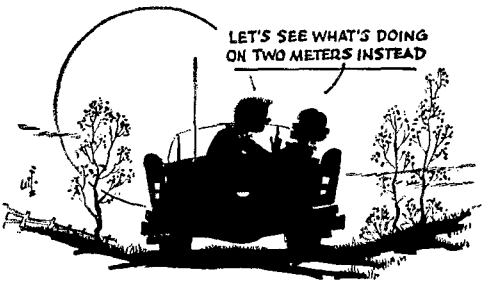
The 1959 All-Woman Transcontinental Air Race will start at Lawrence Municipal Airport, Lawrence, Mass., on July 4 and will terminate at Felts Field, Spokane, Washington on July 8. The race route will take the women pilots via Binghamton, N. Y.; Youngstown, Ohio; Kokomo, Ind.; West Chicago, Ill.; Rochester, Minn.; Fargo, No. Dakota; Bismark, No. Dakota; Miles City, Mont.; Helena, Mont.; and into Spokane, Washington. Kokomo, Fargo, and Helena will be "must" stops for all aircraft. Mrs. Betty Gillies, W6QPI, of San Diego will again serve as Chairman of the AWTAR Board. Watch this column for information later concerning an amateur network, which is expected to be set up again to assist the flyers in this famous annual derby.

YLRL Affiliated Club Certificate

In accordance with the new YLRL constitution, effective Jan. 1, 1959, those YL clubs with fifty per cent of their members belonging to YLRL are eligible for national YLRL club affiliation. Previously seventy-five per cent of the membership of a club had to belong to YLRL in order to become an affiliated club. Interested clubs should apply for an affiliation certificate to Secretary Connie Hauck, 794 Glencagles Ave., Pomona, California. To date affiliated clubs are the Chicago YLRL, Hoosier Amateur Woman's Klub, San Diego YLRC, Washington Area YLRC, Gulf Area YLARK, Los Angeles YLRC, New York City YLRL, and the Floridora YLC.

KH6 YL Certificate

The KH6 YL Amateur Radio Club announces a new



award, the KH6 YL Certificate, to be issued for confirmed contacts with seven club members. Contacts must date after June 1, 1958, and may not be made during net time. Send QSLs and stamped self-addressed envelope to Elsie Wright, 733 Murray Drive, Honolulu 18, Hawaii. Present members of the KH6 YLARC include KH6s AFC, AFL, AFN, AUJ, BGE, BTX, CBT, CIB, and CKO.

Clothesline Net Certificate

The Loaded Clothes Line YL Net, which meets at 9:00 A.M. MST, Mondays on 7235 kcs., offers a certificate to any YL or OM who works ten of some thirty-six members in off-net contacts. Confirming QSLs should be sent to K5GYZ, Lucille Miller, 215 East Frazier, Roswell, New Mexico. Include return postage. Contacts valid beginning Jan. 1, 1959. (No question about it — clever gals are they who can load both their clothes lines and their rigs by nine on blue Monday mornings!)

Six Meter Certificate

Twelve YLs in the Pittsburgh, Pa., area who get together every Tuesday at 9:00 P.M. EST on 50.4 Mc. offer a certificate to amateurs who contact and QSL any seven of the group. Known as the Petticoat Operators of Six, the net officers are president K3AZZ, secretary W3UTU, treasurer K3DYQ, and manager W3ERK. The goal of the group, according to W3ERK, is to get more women interested and active in amateur radio and "to be able to help if and when the time comes that we are needed. Most of the YLs are available 24 hours a day, and in our small group we have three mobile units that can be manned at a moment's notice by efficient operators."

Keeping Up With The Girls

Clubs:
TYLRUN — Custodian of the net's YL-OM Certificate,
(*Continued on page 140*)

XYLs all and proud enough to wear placards advertising the fact. Occasion for the mass declaration was a "Ham Fiesta" at W6UNU, Harold Peterson's QTH in Coronado, California. Members of the G.G. Breakfast Club net, which meets at 6:00 A.M. daily on 3940 kc., brought their XYLs to the gathering, which paralleled a similar get-together ten years ago. The XYLs are the wives of W6s CID, DQN, GBP, GUG, GVT, HQL, IZ, LI, MJB, PQT, QNK, SQC, TZC, UNU, VU, and K6s AZW and BWS.

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

Whereas:

It's that time of the year again, mates — the 25th ARRL International DX Competition's general sessions are only a log page or two away. The full announcement in last month's *QST* states the case for the prosecution. If necessary, subpoena the XYL with that proclamation to secure the needed mittimus for cellar, attic or closet, wherever the shack may be. Gather your own evidence — Exhibits AC4, BV1, CR8, etc. — remembering, of course, that DX hogs will be in contempt. The ultimate verdict is invariably favorable.

Old Sol, as usual, will hand down appellate decisions while CRPL, our chief counsel, attempts to gauge the temper of the court. *This* won't be easy. There still are things 'twixt heaven and earth as yet undreamed of, or at least unfathomed by, our philosophy. How's that? Well, scan this testimony sworn to by witness W1BIH, a conservative DX scholar from Connecticut:

> Last September 6th, a Saturday evening, I acted on a hunch, turned on my receiver at 0245 GMT, and immediately heard CEØAC calling CQ on 14,095 kc. I called him but he came back to a K2. After he signed I called him again. This time he came back to "W2BIV?". I called once more and he again promptly answered W2BIV?, asking for a repeat of the call. Finally he gave up and answered a W9. I decided something must be wrong, so I checked the transmitter tuning and found I had been operating the final off resonance with my ten-meter beam switched in by mistake. I tuned up properly with the twenty-meter beam pointed 30 degrees west of south. After hearing the CEØ now coming in about three Ss stronger I found he was going QRT.
>
> Along with others I called him for a while and then heard W5LW working him a few kc. higher, the CEØ on phone. Then he disappeared again; but I kept at it, together with other hopefuls. In five minutes the rest apparently gave up chase. But, in hopes of coaxing him back on, I kept calling CEØAC off and on for another fifteen minutes or so, carefully tuning between calls. Then I concluded that the project was hopeless, checked my clock, and wrote in the log, "QRT at 0340."
>
> However, I kept listening around the general area of 14,095 kc., presently noting a weak signal calling CEØAC. Curious, I put the crystal of my NC-300 at its sharpest and peaked this calling station to perfect readability. I then clearly heard: "CEØAC CEØAC DE W1BIH W1BIH W1BIH K." The clock read exactly 0345. Without touching the receiver dial I turned on my v.f.o. and found it peaking perfectly at that receiver setting. I briefly called CEØAC again but heard no more.
>
> If my own signals came back to me five minutes later — maybe more — where did they come from? At a speed of 186,000 m.p.s., the traveled distance figures to approximately 56,000,000 miles.

Teasy, eh? Clean-cut observations of such singular echo phenomena are rare enough,[1] particularly where the interval is a matter of minutes. Even *amicus curiae* F. E. Terman swings somewhat speculative on this subject with a brief filed in his *Radio Engineers' Handbook:*

> . . . Echo signals having a time delay of several seconds have been reported a number of times, and there are authentic cases of echoes having a time lag of several minutes. The cause of such echoes has not definitely been established, but theoretical work indicates that retardation up to ten seconds could be accounted for by low group-velocity propagation in the upper part of the ionosphere. Signals of greater retardation could be accounted for only by waves that have traveled great distances in the empty space outside the earth's atmosphere, and that then by a fortuitous combination of circumstances are finally reflected back to earth by ionized regions either within the influences of the earth's magnetic field or in the vicinity of the sun.

What unusual propagation incidents will *you* encounter in the 1959 ARRL DX Test? Probably nothing to match W1BIH's adventure, but there's not much cut and dried about the long-haul game. You're in for some signal surprises or we'll be mighty surprised.

What:

This year's ARRL DX classic promises to be a truly multiband affair. Our 3.5-Mc. range has surged to long-

[1] W1NJM points out that W1DX (then W1JPE) recorded similar "creepy, spooky-sounding" retardations in "How's DX?" all of twenty years ago (p. 52, January 1938 *QST*). This recounted a 10- or 15-second job on 28 Mc. with W6DUC transmitting and W6ADP observing.

*4822 West Berteau Avenue, Chicago 41, Ill.

These USAF lads normally are scattered throughout the Ryukyus, so the camera recorded a red-letter occasion when (l. to r.) KR6s HP, GI, LP, DO and BP assembled for a transcoffee round table at the latter's station in 1958. Got 'em all worked?

skip life in recent weeks, 7 Mc. likewise. Ten and 15 meters retain their high DX momentum while King Twenty holds its own with ease. Yes, the slots are hot — those grooves are *way* out! Here follow healthy samplings, band by band, of the stuff you'll be stalking in the pending big show. DX items reported active by "How's" operatives near and afar. . . .

40 **c.w.** arched into orbit after seasonal launching difficulties. W2SQT reports, "After fighting a losing battle against the 3-element kilowatt boys on 20 meters I fired up the 813 250-watter on 7 Mc. In just five nights I worked 21 stations in 14 countries on four continents, all between 7010 and 7040 kc." Don had competition from W1ECH, W2HMJ, K2UBW, W3CMN, K3BWI, K4s RJM RWH, K5s JVF JZP, W6KG, K6QHC, W7DJU, W8YGR, K8DHJ, W9PDH and CO2US whose dispatches to Jeeves & Co. mention QSOs with **DU7SV, EA9AG, HAs** 2MF 5BC 5KFR, **HC1HM, JAIs** AEW AYZ AZR BBT BC BCO BLN BLY BNK BRK BRL BRN BSM BXA BYT CBZ CDJ CID CJF DY EF GC HG IU NM PS YN, **JA2s** AAQ FG LC RL UW, **JA3s** AAW ACT mm ADT AOG CV SJ TY XY, **JAs** 5BI 6ADO 6MIO 6PR 7JU 7NS 8AO 8EO 8FO 8GS 8GU 9DA 0IL 0IY (most of these bagged by W7DJU), **KA0KZ** (7028) 1500 GMT, **KJ6BX, KM6BK, KP6AN, KR6s** AK BF (20) 11, **KV4BO, SL3AG, TT2s** PZ WD, **UA0s** GF KFG (25) 14, **UB5WF, UF6KAF, UQ2AB, VK9XK, VPs** 4RL (21), **7BT, VS6BJ** (33) 16, **WP4AKB, XEs** 1UU 2UA 3BL, **YO8KAN, YUs** in number and **ZK1BS** . . . . . CO2US and K5JZP scared up **HK1XMX, HR3HH, VP5s** DX RA, **XEs** 1VA 2MX and YN1JG on 40 phone . . . . . KN5OGU made the long Novice hop to **KL7AIZ.**

80 **c.w.,** as we were saying, is gaining ground. W1s ECH YIS, K6QHC, W8FEM, W9s ADO and MAK stirred up **CE3AG, CN8JX, EAs** 1AB 4GA 8BF, **FA8BG** (1), **FO8AK,** Gs aplenty, **JAs** 1BWA 2JW 3UT, **KL7DG, KP6AN, KR6SZ, KX6AF, UA0KAF, VKs** 2AKF 6UF, **VP7BT, XE1HH, ZK1BS, ZLs** 3QX and 4OD . . . . . K5JZP flushed CO2CM on 75 phone one night.

10 **c.w.,** on the opposite end of our normal DX spectrum, will be a hotbed of multipliers, a nest of the coming Test's best. W1s ECH (115/88 worked confirmed), EQ YIS, K1s CBR CCA CDN CJV DIW (33), W2HMJ, K2s MDL TBU UPD UYG, K3AMH 4 (95/67), K4s DFU JKU, W6KG, W8NOH, W9MAK, K9ISP, KØJPL (60 40), CO2US and I1ER give us the pitch on **CM2US, CN8s** GF (60) 16, LM, **CO2GR, CR6CK** (110), **CXs** 2CO 3BH, **DM3KML, DU7SV** (100) 20, **EAs 8BF** 9AP, **EL1D, F2CB,** F9QV **FC** (105) 16, **FAs** 8JO 9UO, **FB8XX, FF8AJ** (53) 12, **FG7XF** (30) 18, **GD3UB** (70), **HA5DH, HB1UC, IT1s** AA PA who go for Italy only, **JAs** 1AFF 1AS 1BKV 1VX 2AB 2YT 3AA 3AB 3DY 3GM 3IS 7AD (50) 21, **KA2s** EB RB (120), **KG1FO, KM6BL** (120) 21, **KR6s** AK BF, **LZ1s** AH KSP (100) 15, **OQ5IG, PJ2CJ,** SPs galore, **SVØs** WP (30) 16, WR (100) 16-17, **UAs** 1DZ (135) 16, 2KAW 4IF (90), ØGF (80) a real all-band man, **UB5s** FG KAB (8) 14, WF, **UC2s** AA KAB, **UQ2s** AB AN AS, **UR2s** AO BU (200) 18, **VE8NM, VPs 7BT** 9DO 9Y, **VQs** 2RD 18-19, 4FK 5EK (75) 17, **VRs** 2DG 23, "5AA" (88) 17, **YO3WL, YS1O, ZC4s** IK IP (130), LL, **ZD7SE** (15) 20, **ZE1JV** (110) and **4X4KK.**

10 **phone's** trajectory remains at apogee and W1ECH, K1s CBR CCA CDN, W2JGF, K2MDL, W3QIR, K3AMH 4, W4YQB (125/119), W5s ERY HNS, W8NOH, W9JFT, WØZVM (105/88), KØJPL and CO2US excerpt from their collective logs such trophies as **CEØZG** (465), **CNs** 2AX 8HA 8IG, **CRs** 4AD 6CA (400), **7AP, CT3AF** (200) 15, CXs a-plenty, **DU1VVS, EA8AH, EL1D, GD3ENK, HA8WS** (650), **HC1VA, HE9LAC, HIs** 7LS (400), 8GA, **HL9s** KS (440), KT, **HR3MW,** I1AIM, **M1, IS1ZDT** (820), **JAs** 4AF 4AH 6AK, **KAs** 2BE 2HA 2RB 8RA 9MF ØIJ ØIK (100) of 1wo Jima, **KGs** 1DT 4AY, **KJ6BV** (1150), **KM6s** BD BI BK, **KR6s** DO GP LP, **KX6s** AF CM, rare **LUs** 5XE 8UC, **LX1DE, LZ1AM, YL QE2YL, OQ5s** CV FH FV, **PJ2s** CA CE, **PZ1AP, SVØs** WS WT (100), **UAs** 1AB (200), 3EG, **UB5s** FG SB (220), UW (200), **UR2BU, VE3EGD/SU** on Gaza Strip, **VK9CP, VPs** 1RL 5ER (400), **6TR 7NA** 8DS 8DW (550), 22 9DO, **VQs** 2RB (276) 13, 2SB 3PBD 5EK 5GJ, **VR6AC** (540), **VS9AO, VU2CQ, XE3AF, YS1GA, ZB1USA** (400), **ZC4JB, ZDs** 1FG (350), **7SA** (450), **8JP, ZE1JV, ZP5EC, 4X4s** AB FV GB HK, **5As** 1FF 4TT, **9G1s** AA BV CW (419) 13 and **9K2AP.**

15 **phone** is equally affable. W6*ZZ**, K1s CCA CDN CJV, K2s MDL YLD* (91 on sideband), K3s BQB* BWI, K4s DRO PHY, K8CFU, KØs JPJ JPL (60 40) and CO2US — asterisks representing s.s.b. effort — chorus their approval of **AP2AB** 11-12, **CEØZC*, CNs** 8HZ 8JC 9JC, **CO3IGY, CRs** 4AD 6AG, **EL2G, FA8JK, FM7WU, FQ8AJ FS7RT*, HCs** 1RY 5MT, **HE9LAC, HH5RL, HI8GA, HP1GP, HR2DK, HZ1AB*, IT1CDS, JZØPB, KA2LL, KG1FO, KR6s** CP* RB, **KX6AF, M1B, MP4BBW*,** OA1A, OE1DH, **OQ5JS, PI1RRS** just Holland, **PJ2MC*, PYØNA, SL7BS** of the SM military, **SP9NH, SVØs** WE* of Rhodes, WT of Crete, **TFs** 2WCS 5WDD*, **TGs** 7JD 9TS, **UB5UW, UQ2AN, UR2AO, VKØKT** now closed, **VPs** 1OLY **2AB 2DA** 2GAB 2GT 2SI* 2SL 3VN 4MM 5DM* 5MC of Turks, 8DG 8DK (190), 9AK 9BY, **VQs** 2IV 4AC 4AQ, **VU2s** CQ NR, W3AIJ/**VO1*, XEØNHD, YVs** 3CB 5ADP 5AED, **ZB1DC, ZD1EO, ZS3D, 4X4s** FF FV HK IO, **5As** 1FF 2TA 5TF and **9G1CF*.**

15 **c.w.'s** DX population appears to be at an all-time high. Taking full advantage of this happenstance, W1YIS, K1s CBR CCA CDN CJV (126/95), W2HMJ, K2s MDL UBW, W3CMN (61/42), K3s BIW BQB, W4s EGE YOK, K4s DRO LAY PHY RJM, W5KNE/5, W6s JQB KG, W7s DJU QNI, K7ABV (85/48), W8s NOH YGR, K8IITI, W9MAK, K9s GDQ (45/26), ISP, KØs JPJ PFF, I1ER and VE3EIL stashed away such numbers as **CNs 2AY 8EC 8JX 8MK, CO2s** MS WD, **CRs** 5AR 3-4, **6CS 7IZ** 22, **CTs** 1ID 1IQ 1JL 2AI (5) 21, CXs 1FB 2BT 2CO 3BH, **DU7SV** 22, **EAs** 6AM (36) 19-20, 8BF (2) 0, 9AP (30) 0, **ELs** 1K (95) 23-1, 1X (10), 2A 2O 0-2, F9QV **FC, FB8CJ, GD4VH, HAs** 5KDQ ØKHB, IT1GO, **JAs** 1AAW 1TD 3, 5AI 7AD 1, **KA2s** BE (62) 2, KB KS (42), RB 1-2, **KC4USA** (56) 1-2, **KG1s** CK (45) 20, EG, **KM6BL** 0-3, **KR6AK, KX6CW** 2, **LZ1s** AH BB (61) 17, **OA4s** BP (90), FA, **OHØNC** of the Alands, **OQ5s** IG HC, **OR4VN** 23 of Belgium's antarctic effort, **OX3KW, PJ2MI, PYØNE, SPs** 1KAA 6NF 6WM 9JA (66) 19, **SVØs** WAE (21) 12, WP WY, **TFs** 3MB (90) 19, 3MG 5TP 5WDD, **UAs** 1KAQ 1OD 3AN 4IF 4KCE 4KED 6KOB **9CL** 9KCA (50) 10, 9KQA ØCN ØGF 2, ØKDA 14, ØOM, **UB5s** EF KIA 16, UG UW WF, **UC2s** AA (50) 19, CB, UN1AE (96) 19, UO5AA, **UQ2s** AB AE mm AN BA KBA, **UR2KAE, VK9XK, VPs** 2LO 4LA (44) 0, 6AH 6GC 7BT 17, 8CR 9EN, **VQs** 2GW (85) 19, 4FK 4FM 4RF, **VR2s** DA (40) 13, DG, **VS9s** AS AT, **VU2JA** (35) 1, **XE1AAI, XW8AH, XZ2TH** (74) 17, **YOs** 2BU 3RI 3VU, YV5DE, **ZCs** 4AM 6AA, **ZD1s** FG GM, **ZD2GWS, ZEs** 1JN (63) 20, 1JV 2JC 3JO 5JE, **ZK1BS** (30) 3, **ZPs** 5JP 9AY, **4X4s** DR and HK.

15 **Novice** xenophiles trend toward the long haul more heavily. WV2BWS, KNs 1IMP 5PYX 6RMJ 9PRW 9PSX ØPFF (now "N"-less) and ØRKF are delighted with **CR6CK, DU7SV, EAs 8BF** 9AP, **EI4A, EL2X, HA8WS, IT1CDS, JAs** 5AI ØFR (not 1wo), **KC4USB, KR6BF, KX6CW,** OA4FM, O1Is and OKs in quantity, **PYØNA,** UA4KAA, **UD6KAK,** VKs en mass, VQ4FK, **VS6DK, WL7s** CIW CNJ CRL, **WP4APB, WW6CW** (that's Wake, men), **ZD2NWW** and sundry ZLs. "In my opinion a Novice does not need a super antenna to work DX," declares WV2BWS. "My DX is contacted while running my DX-20 into a long-wire at the great height of eight (8) feet above ground."

20 **phone** interested K1CCA, W2HMJ, K3BQB*, W6*ZZ**, K6SHJ, W8YIN*, CO2US, VEs 1PQ* (81 on sideband) and 3EIL because of **CEs 7AY* ØZG*** (300) 1, **CN2DD, CR9AH** (305) 12, **CX2AY*** (305) 2, **DU6IV, FS7RT*** (310) 0, **HC1HM, HKs** 3RR* (297) 1, **ØAI** of San Andres, **HL9KT, HP1LO*** (300) 2, **HR4WH*** (305) 2, 1wo's **KAØIJ, KG1DT*** on T-3's icy flat, **KR6QW*** (310) 11, **KX6CM** (240) 7, **OAs** 4IY* 5H*, **OY7ML*** (300) 12, **PYØNA*** (305) 23, **SVØWE*** (320) 4 of Rhodes,

TI2EV*, **UA3EG*** (320) 16, **VK9BW** 8, **VPs 5CB*** 5DM (310) 0, **9EP**, **VQs 3ES*** (310) 20, **5EK 5FS*** (300) 19, **VS6AZ*** (305) 16, **XW8AM**, **XZ2SY*** (310) 23, **5A2TZ***, **9G1CB**, **9K2s** AM and AT, the stars signifying s.s.b. transmittals.

20 c.w. suffered several sinking spells as the new year dawned but the band certainly is entitled to a vagary now and then to help its followers appreciate propagational prosperity. We're getting spoiled! This month's 14-Mc. reports come from W1s ECH (115/88), EQ UQP YIS (112), K1s CBR CCA CDN, W2s HMJ JBL, K2s AYC (83/49), GJS TBU UPD UYG, WA2CCC, K3BQB, W4ZSH, K4s DFU DRO (171/154), RJM, W5HNS, W6s JQB KG, K6SHJ, W7s DJU QNI, W8s KX YGR YIN, K8ETO, W9s MAK (102/63), UBI, K9ISP, K9JPL, CO2US, I1ER, VEs 1PQ and 3EIL (62/31). Mentioned in their communiqués are **BV1USB**, **CM2US**, **CN8s** AF BK (10) 4, JX, **CRs 5AR** (8) 21, **6AI 7CI 7IZ** (104) 3, **CT2s** AI (90) 2, BO (20) 1, **CXs** 2AM 2BT 2CO 5CO 6AD 7CK, **DMs** 2AHE 3KSJ, **DU1DR** (7) 21, **EAs 6AW 8BK** (15), **8CP 9AP**, **EL1X**, **ET2KY**, **FAs** 3WW 8SB 8TT 9UO (14) 12, **FF8AJ** (90) 1–6, **FK8AS** (80) 1, **FO8s** AC (88) 7, AU (68), **FQ8s** AP HA (30), **FS7RT** (20), **FY7YI** (76), **GCs** 2FMV 3HFE (17) 1, **HAs** 5AM 9IIN (40) 6, HB1UE/**f1** (80) 6 on Liechtenstein tour, **HI8BE**, **HKs** 4JC (35) 2, 5SG, **HP1s** AO BR, **HS1C** (25) **7–11,23**, **HZ1AB**, **IT1s** AGA (15) 2, PDN TAI, **JAs** 1VX 1YY 4JQ 6AP 7AD 8AA (12), 9AA, K2ILQ/**KG6**, **KAs** 2BE 2CB 2KS 2RB 8KW, **KCs 4**USG (45) aboard USS *Glacier* down south, **4USK** (50) 8, **6JC** (16), "KG3USA" 0, **KJ6BV**, **KM6BL**, **KR6s** CG QW RY SS, **KV4s** AA (82) 21–23, BO, **KX6CW** (110), LU0MT(23) 3, **LX1DE** (25) 21, **LZ1s** AF AH, **MP4DAA** (5, 46) 13–14, **OA4FA**, **OD5LX**, **OH0NC** (70) 23–4, **OQ5IG** (52) 16, **OX3s** RH (1) 3, UD, **OYs** 1R (15), 7ML (21) 1, 8LW (23) 6, 8RJ (90) 6, **PI1VKL** of the Netherlands, **PJs** 2ME (27) of Sint Maarten isle, 3AB, RAEM (90) 6 of Moscow, **SLs** 3AG (70), 5AB (22) 3 of the Swedish forces, WASM's desirable **SM2AQQ**, **SV0s** WE (320) 4, WP WR (10), **TFs** 2WDR 2WDS 3AB 3PI 5TP, **TI2s** WD WR (5), a YL at **UA1-KFA**, **UA2s** AA KAW, **UA9s** AK (30) 8, CR DR (41) 8, KCC (22), KJF OM (78) 4, SC VB (87) 5, **UA0s** KAR of Dickson isle, KFG KIA KJA (35) 5, KOA (87) 5, KUA, a hatful of UB5s, **UC2s** AX DM KAB KAR (28) 16, **UF6s** AP FB KPA (34) 16, **UH8s** AA KAA (10) 6, **UI8s** AK KAA (35) 4, **UJ8KAA**, **UL7s** GQ HB (35) 5, JA (60) 16, **UM8s** DX (80) 4, KAA, **UN1s** AEK AH (15) 15, **UO5PK**, **UP2AT**, **UQ2AN**, **UR2s** AO BU KAE (33) 17, **VE8MX**, **VPs** 2GL 2SK (55–85) 3, 4LQ (75), 6PJ 6RG 7BT 7NA 8CY 9DP 9L 9Y, **VQs** 2JN 3CF 4EV (64) 4, 4FK (58) 18, **VRs** 2DG 2DK 6AC, **VSs 6EE** (97) 13, 9AQ (55) 3, 9MA of the Maldives, **VU2s** AJ (55) 2–3, BK BL CK (37) 17, RM, **YOs** 2CD 3RI 8CF, **YV5s** FH GO (2) 3, **ZC4s** BN (35), IP, **ZDs** 2CKH (102) 21, 2GUP (50) 16, 2GWS (30) 0, **6NJ** (81) 17, 7SA, **ZEs** IJN 2JS (40) 4, **ZK2AD** (40, 80) 17, **ZS9s** M (13) 5–6, N 6, **4X4s** FN GY II JU and **9K2AJ**.

160 c.w.'s fall-winter season got off on the left foot, according to W1BB's commentary. **VPs 7BT** and **9EP** were the substance of early week-end sessions attended by W1s BB ERX PPN SMU VDB WLZ WQC WY, W2IKII, W3RGQ, W5SOT, W6KIP, K6HXT, W8s FHE GYS KFY/5 MAX, W9s CZT DKT KRT YZG, W0s GBV YFS and VE2AIZ on our side. European signals, usually prevalent during Octobers and Novembers on 160, still hadn't peeped through by mid-December. Adversity is the promulgator of the college try, though, and much of the season lies ahead. This month's designated 160-Meter Transatlantic and World-Wide Tests week ends fall on the 8th and 15th, the concluding formal sessions of the 1958–'59 affair (full data in December *QST*). Chins up!

Where:

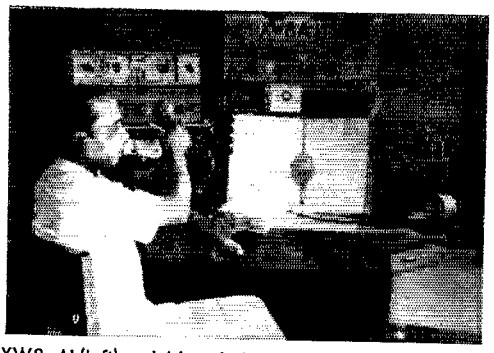
Oceania — "I will be operating from Macquarie Island as VK0CC from about January to December, 1959, using c.w., a.m. and s.s.b.," informs VK4CC. "VK4FJ has been kind enough to offer his services as my QSL manager; hence prompt QSL is ensured. Cards received via the bureaus will be replied to via bureaus, cards accompanied by IRCs will be answered by direct mail, all QSLs will be issued on a card-for-card basis only, and all received cards must clearly indicate the time of QSO in GMT to facilitate rapid log check." . . . . . PA0MOT, ex-PK1XZ-PK2XG-PK6XG-PK6XZ, has his European and Indonesian records with him at the New Jersey address which follows. Full QSO particulars will secure deserved QSLs by return mail . . . . . "I've almost made DXCC by letters received from people wanting skeds with my OM, KW6CQ," pens XYL K6QPG, "though Britton's been listed in the last two issues of the *Call Book*. He operates phone and c.w. on 10, 15 and 20 meters and should be contacted direct by mail to Wake for schedule purposes." . . . . . W3GJY advises that, "S.a.s.e. are required for speedy returns concerning my QSL managership for FO8AU and ZK1AK."

Africa — From CN8JC via W1TUW comes word of a new bureau address for Yanks in Morocco: USAFE QSL Service, APO 118, Box 80, New York, N. Y. They hold a stack of yellowing QSLs for ex-CN8s, by the way. Old Morocco ham hands should write the agency giving dates of operation, former CN8 suffixes and present mailing addresses . . . . . "VQ2RB has asked me to handle distribution of his QSLs for all W/K/VE stations," writes K6VKX. "Each morning we keep schedules which supply me with log information. Ralph's signals are quite good here and we have missed only one morning in the past six weeks." . . . . . "Would appreciate your informing the DX fraternity that ex-CN8FD-5A5TK now is back in North America — near Fairbanks, Alaska — and anyone still shy my deserved Africa QSLs should contact me." This comes from W6VQB/KL7 who really leaped from the frying pan into the icebox . . . . . VQ5EK reiterates via W8KX that he receives cards *only* via Box 391 or Box 1803, Kampala. Verily, once an erroneous QTH starts making the rounds of the DX 'vine it's almost impossible to eradicate . . . . . Bureaucratic false economy in call-sign suffixes rears its ridiculous head again. ET2TO-CN8JE writes: "I am very surprised to find my Moroccan call, CN8JE, still widely listed under another name and address. I feel that the call was reissued to me without sufficient time delay." Depending on a former licensee's *m.o.*, more or less grief is bound to result from deals like this.

Asia — XZ2SY writes W9DSO: "Due to my operating hours I haven't much time to QSL individually or direct. QSL cards to various QSL managers or bureaus are sent within 48 hours of QSOs and each card is made out at time of QSO" . . . . . WG1DXC reports that W4ANE's QSL effort on behalf of AP5HQ was delayed for lack of pertinent data from the Pakistan party . . . . . OK1JX, via W1s BDI WPO and W8KML, reports resumption of his QSL labors on behalf of JT1s AA and YL. The JT1s closed down in late '58 but Jan doubtless will be busy with their confirmation affairs for months to come. "Nearly spoiled my other office work due to this QSL business, but all is okay now. I look forward to being able to rebuild my rig, erect a super minibeam and become active again. It wasn't good for me to go on the air while handling JT1 QSLs as there were immediately too many boys calling me just to remind me of their expected M.P.R. cards. It's good to be just an ordinary ham again!"

Europe — After eighteen isolated months at Murchison Bay, SM8AQT/LA/p returned from Svalbard to Stockholm and SM5AQT late in 1958. Charlie took care of the stacks of QSLs sent direct to his home station but cards still dribble in via bureaus. "Just wait; you *will* get your card," assures SM5KV, erstwhile SM8AQT/LA/p QSL manager, observing with chagrin that only thirty per cent of all cards received bear unambiguous GMT. There's something peculiarly insular about the great number of Americans who apparently believe that all the world's clocks are set to U. S. local time . . . . . Ex-CN8IU, changing his overseas address as indicated in the following, expects to try his hand at European DXpeditionary work in 1959 — 3A2, PX and what have you — pointing out that his K4UZO home QTH also will remain usable. "Anyone who had a QSO with CN8IU and received no card

Fletcher's Ice Island, also known as T-3, has been the scene of arctic ham activity off and on since old KF3AA broke the ice in 1952. Here's W7YJP who signed the installation's current call, KG1DT, during much of 1958. W1ECH reports the station workable almost daily in December around 28.7 Mc. Ice islands count nil for DXCC scores but KG1DT's QSLs are prized collectors' items nevertheless. T-3 is roughly 300 miles northwest of Prince Patrick Island, soon due to pass well north of Point Barrow.
(Photo via W9NZZ)



XW8s Al (left) and AJ traded local Vientiane QRM late last year, each outfitted with 807s finals. Agastin prefers long-wire radiators, Roger doublets. Amateurs in the Laos capital must cope with a.c. mains which swing unpredictably between 80 and 140 volts. *(Photo via W7PHO)*

should let me know via either address. I might mention also there are quite a few QSLs *I* haven't received." . . . . . "A lot of people seek TF5WDW QSLs and they may apply for them at my KØQME address. I departed Iceland unexpectedly about two months early and should be back on the air from Biloxi, Miss., in the near future." . . . . . "Will be active on DX bands almost every day and I'll certainly QSL 100 per cent," avers the new DL4IJ (K7CJX). Take care not to confuse Bill with one N. Dunkel, former holder of the call — *darn* these snap reissuances . . . . . Keeping track of Swedish QTH-switchers is a cinch because there is no suffix duplication in the seven SM call areas. As W6KG observes, ex-SM4BPJ easily became SM5BPJ. By the same token the address of any legitimate shipboard or portable SM8 is easily established by seeking out the homeland suffix — there is only one — among said Sweden call areas . . . . . Observation by EI6X of Co. Limerick: "EI stations are apparently not too plentiful going into W/K-land. The requests I receive for QSLs would stagger you. Some 200 per month is not an uncommon number for me to send out." . . . . . W6SAI writes from the back yard of Princess Grace: "All QSOs with 3A2AF since 1951 and prior to November, 1958, are invalid. It seems that 3A2 continues as a favorite pirate prefix."

Hereabouts — W2CTN now handles world-wide QSL disseminations for CR9AH, FK8AT, JZØHA, KW6CU, OX3RH, VKs 2AYY/LH 2FR 9BW, VQ3CF, VR2s DA DK, XZ2TH, ZD2DCP and 9G1BQ — and Jack still is heard on 20 c.w.! Self-addressed stamped envelopes are requisite, of course. W2CTN's ZD2DCP log dates from December 1, 1958, and his KW6CU services commence with November 25, 1958, QSOs . . . . . Note that Brazil is back in the *Call Book*, a development bound to ease the pressures on this "How's" segment . . . . . W3BIW and others call attention to K4SXO's QSL managership on behalf of VP2SL. The usual s.a.s.e. requirement holds . . . . . "I have taken over the W/K/VE QSL chores of VP6RG," informs W1EQ. "He finds himself swamped and very much in disfavor with the gang. Commencing with contacts made on November 1, 1958, stations wanting QSLs from VP6RG can send me self-addressed stamped envelopes for prompt replies." . . . . . OVARA points out that uncanceled foreign postage is quite available at some philatelic supply houses and may earn authentic QSLs from rare ones when other means fail . . . . . K1CDN finds that Dominica's VP2DA answers cards promptly on receipt of IRCs . . . . . "CEØZG requests self-addressed envelopes but no coupons or cash," relays W3QIR . . . . . Regarding his Outgoing DX QSL Bureau Service, W9RKP pens, "In three years of operation this bureau has forwarded 50,000 QSLs to foreign QSL bureaus. Results have been very gratifying and many users of this service claim better QSL returns than when they QSL direct. Any DXer in the U. S. and possessions is welcome to use the Outgoing QSL Bureau Service. A self-addressed stamped envelope will bring details to those interested." . . . . . The following specific QSL hints come your way through the time and trouble of W1s ECH RB TS TUW ZDP, KIs CCA CDN CJV, W2s GT HMJ JBL, K2UYG, WA2CCC, W3s BIW QIR, W4s REZ YOK, K4DRO, K5JVF, W6KG, K6SHJ, W7s DJU QNI, W8NOH, K8CFU, W9s DSO MAK, K9JIN, WØZVM, VE3s ADV EIL, SM5KV, British Two-Call Club, International Short Wave League, Japan DX Radio Club, Northern California DX Club, Newark News Radio Club, Ohio Valley Amateur Radio Association, West Gulf DX Club and Willamette Valley DX Club:

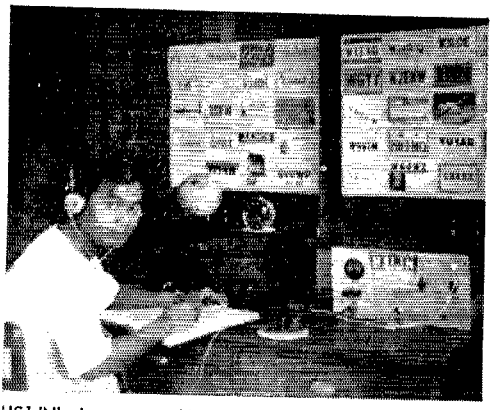
CE3SF (via RCC)
CEØZG (via CE2AA)
ex-CN8EE, L. Brune, Lann-Bihoue, Lorent (Morbihan) France
ex-CN8FD-5A5TK (see W6VQB/KL7)
ex-CN8IU, T/Sgt. A. Pittman (K4UZO), 604th AC&W Sqdn., APO 207, New York, N. Y.
CN8JE (see ET2TO and preceding text)
CR4AD, H. da S. Sousa Brito, P.O. Box 16, Praia, Cape Verde Islands
CR4AV (via CR4AI)
CR5AR, Ramalho, % PTT, Box 21, Sao Thome Island, P.W.A.
ex-CR9AF (to CT1ID)
DL2YU, D. Willoughby, No. 3 Higher Education Centre, BFPO 30, United Kingdom
DL4IJ, W. Brister (K7CJX), C. C. 10th Ord. Bn., APO 189, New York, N. Y.
DL7AH, H. Lilienthal, Birkenfeld/Nahe, Maiwiese, USAF B.O.Q., Germany
EAAD95, C. Urdazpal, Transmisiones, Ceuta, Sp. Morocco
EL2O (via SSA)
ET2TO, H. T. Orr, 172 N.E. Logan Pkwy., Minneapolis 21, Minn.
ex-F7ER, S/Sgt. A. Kemmesies, K2JCS/4, Co. C, 317th USASA Bn., Ft. Bragg, N. C.
FF8AL, B. Delpierre, Ave. d'Alfortville 44, Choisy-le-Roi (Seine), France
FF8AU, M. Grivaud, B.P. 7045, Dakar, F.W.A.
FM7WT, A. Meunier, Chemin des Maluettes 8, Bourges (Cher), France
ex-FN8AD (to AC4AX)
FO8AU (via W3GJY)
FY7YC, R. Martinon, Rue Belliard 81, Paris 18, France
FY7YF (via W2FXA)
HA5KDQ, Radio Club of Budapest, Rokoczy Ter No. 2, Budapest, Hungary
HC1VA, A. Vasquez, Box 2978, Quito, Ecuador
HI8CJY, C. Willett, Central Romana, D.R.
KA2CB, (M. Sgt. Clayton E. Benjamin, 56th WEA Recon. Sqdn., APO 328, San Francisco, Calif.
KC4USK (to W3ZYB)
KG1EG, U. S. Coast Guard Loran Stn., APO 23, New York, N. Y.
KR6CA, Sgt. J. Hammond, USA Sig. Gp., APO 331, San Francisco, Calif.
ex-KR6MJ, M. Jones, K2RTX/1, 155 Farm Ln., Portsmouth, N. H.
KW6CU (via W2CTN)
LUØMT, O. Felici, Rivadavia, Mendoza, Argentina
OY8RJ, Ployeensgoeta No. 5, Torshavn, Faeroes Islands
ex-PAØMOT, W. Willemse, 116 Scotland Rd., So. Orange, N. J.
PY2BOM, M. Jacinto, Box 22, Sao Paulo, Brazil
PY3APJ, H.T.L. de Medeiros, Box 67, Canoas, Brazil
ex-SM8AQT I.A.p (to SM5AQT)
SVØWAD, U. S. Consulate General, Salonika, Greece
TF5WDD, APO 81, New York, N. Y.
ex-TF5WDW (to KØQME)
TG9TS, P. Sulsona, % U. S. Embassy, Guatemala City, Guatemala.
UB5KAB, P.O. Box 27, Stalino, Ukrainian S.S.R.
VE8MG, P.O. Box 2330, Edmonton, Alta., Canada
VKØCC (via VK4FJ)
VP1RA, P.O. Box 2511, Belize, British Honduras
ex-VP2LU (see VP5FP)
VP2SL, B. Dellimore, P.O. Box 80, Kingstown, St. Vincent (or via K4SXO)
VP4RL, 75 Broadway, San Fernando, Trinidad
VP5ER, MCB7, FPO, New York, N. Y.
VP5FP (via W1TBS)
VP5MC (via W4NBN)
VP6RG (via W1EQ)

ex-VP8CR (to G3HTF)
VP8DK (via RSGB)
VP9BY, J. Sayer, P.O. Box 360, Hamilton, Bermuda
VP9L (via W2YTH)
VQ2MS, J. Shea, Box 36, Luansha, No. Rhodesia
VQ2RB, R. Barlow, K195, Mufulira, No. Rhodesia (W/K/VEs via K6VKX)
VR2DG (via VR2AS)
VS9AT, W. Bell, 419B AMQ, RAF, Khormaksar, Aden
VU2CD, Maj. K. Gillon, % Mgr., Lloyds Bank Ltd., Hornby Rd., Bombay, India
W6VQB/KL7, D. Thompson, % Mrs. M. S. Brown, 55 S. Lake Ave., Albany, N. Y.
W7CKY/KL7, Box 71, Nome, Alaska
W7JJM/VO1, S. Leluan, jr., 640th AC&W Sqdn., APO 864, New York, N. Y.
XE1AAI, R. Ibarra, Apartado Postal 32030, Tlalpan, D.F., Mexico
XE1EPO, P.O. Box 1980, Mexico City, D.F., Mexico
XE2PAE (to XE2AM)
ex-XW8AH, S. Wagoner, jr., W8UTQ, 16541 Comstock Rd., Route 2, Grand Haven, Mich.
XW8AM (via W2JXH)
ex-YI3AA, B. Dare, 3 Westminster St., Alvaston, Derby, England
YO2BU, C. Dan, P.O. Box 80, Timisoara, Roumania
YU1KG, R. Karakasevic, Zlotna Greda 11, Novi Sad, Yugoslavia
YV3CB, J. Belen Diaz, P.O. Box 165, Barquisimeto, Venezuela
ZA1AA, Box 127, Tirana, Albania
ZC4GT (via RSGB)
ZD2DCP (via W2CTN)
ZD7SE, % Post Office, St. Helena
ZK1AK (via W3GJY)
ZS6KO, F. Ingalson, 54 Govt. Village, P.O. Ficus, Tvl., So. Africa
ex-ZS6YW (to VQ2RB)
3A2AF, W. Orr (W6SAI), Chambre 39, Hotel le Siecle, Ave. de la Gare, Pt. de Monaco (via France) — or via W6TNS
3A2CK (to G2DMV)
5A5TO, Box 638, Tripoli, Libya
9M2MA (to VS1HU)

Whence:

Europe — WALT (Worked All London Town) is an interesting certification now available world wide, sponsored by the Grafton Radio Society (G3AFT), an RSGB affiliate. This one should serve as an excellent incentive for the working of Gs (even G3s!); it's based on the confirmation of QSOs with Londoners in at least 65 of the great town's 118 postal districts, all contacts dating after January 1, 1958. London postal districts are numbered E. 1 through 18, N.W. 1 through 11, W. 1 through 14, N. 1 through 22, S.W. 1 through 20, S.E. 1 through 27, E.C. 1 through 4, and W.C. 1 through 2. "Contacts with mobile, portable and alternate-address stations will be accepted provided each confirmation bear the postal district number from which the contact was made." Endorsements for c.w.-only, phone-only, individual bands and for additional confirmations will be available. Check with the Awards Mgr., Graf on Radio Society, Montem School, Hornsey Rd., Holloway, London N. 7, England, for full details. This announcement comes courtesy G2CJN, GRS secretary . . . . . SM5KV has been signing SL2CL in the Swedish military but hopes to be back home at 15 and 20 meters by the time you scan this . . . . . OK1JX opines, in a letter to W8KML, "I prefer to chew the rag with good operators and good friends rather than fight queues of hopping-mad DX men. My main interest lies in technical things." . . . . . Ex-F7ER now works 40 c.w. with a Knight exhaler at Fort Bragg but expects to expand his scope of operations shortly . . . . . DL4WA (W4UWA) and XYL K4JNI report arrival of baby Mark Douglas in Frankfurt. Al's contributions have helped us round out these DX digests for many a year . . . . . As TF5WDW at Keflavik International Airport KØQME rolled up some 800 QSOs on 15 meters over a two-month siege. "Anyone desiring contact with Iceland can tune above 21.4 Mc. and find a number of TFs on single sideband. A few are TF2s WCY WDC WDE WDP WDR, TF5s WDK and WDO. TF2WCS departed in December, I in November. TF2WDR likes 20 c.w. at times" . . . . . After a nine-month hamming halt DL2YU momentarily expects a new activation. "I was posted back to Germany last July, received my license and old call in November, got my shipment of gear from England which I found badly damaged, and now await a new transmitter. I've been erecting skywires in anticipation. I'm also hoping to arrange a two-week hamming holiday in San Marino come September and will forward full particulars when everything is tied up. In the meantime sincere regards to my many on-the-air friends. Any who may be visiting Germany in the next three years can be sure of a welcome at the DL2YU shack." . . . . . HB1SR was a Swiss portable activated by HB9s FE RJ and s.w.l. HE9ESV at Lovens, Fribourg canton, in early November. Twenty-five watts to an 807, a Morrow converter and a cube quad caused quite a stir on 28-Mc. phone, particularly among Helvetia-22 aspirants . . . . . K7CJX becomes DL4IJ with serious 10-through-80-meter operational intentions and hopes to form a ham club in his area . . . . . W3CMN recently chatted personally with visitor OH2TK, editor of the official SRAL organ in Helsinki, at the W3DYT hamshack, learning of Finland's current amateur license structure. Novitiates are Class C licensees until they accumulate 200 c.w. QSOs, maximum power 50 watts; then Class B with full privileges at the same power; and finally Class A with 150-watt and v.h.f. authorization . . . . . W7AMM-DL4YK, formerly DL4OV and W3UYH, reports that his tentative San Marino DX-cursion is running afoul of red tape. On the brighter side Eber hears that U. S. MARS operation soon may be permitted in Spain . . . . . EI6X, at 140/120 on the DX ladder, finds winter 10- and 15-meter conditions somewhat erratic. "This spring I'll extend my quad to accommodate 20 meters and then you guys had better watch out for my 1625s!" . . . . . W9SKR finds OK1LM hunting Ark., Nev. and Utah to finish WAS endeavors with a 150-watt 813 on 14 and 21 Mc. . . . . That British Columbian at Oxford, VE7ABE, is being worked by W9MAK and others as G3NBE on 14-Mc. c.w. . . . . From W6SAI, now signing 3A2AF near the Monte Carlo: "I'm active on 14, 21 and 28 Mc., s.s.b. and c.w., with an HT-32 and SX-101 plus assorted ground-planes and dipoles. I'll be here for about six months and that should take the heat off 3A2-land for a short time. Most interesting to compare condi-

Seventh "DXCC²" and No. 1 claim from our seventh call area is filed by W7ENW (see p. 59, April 1957 QST) on the heels of last month's HB9J and W5KC enrollment. W7ENW's achievement is made possible by CE3DZ, CM2SW, CN8EJ, CP5EK, CRs 6AI 7LU, CTs 1JS 2BO, CX6AD, DL7AH, DU7SV, EAs 1BC 8BC 9AP 9DF, EI5F, F9MS, FA8DA, FE8AB, FG7XA, FQ8AP, FR7ZA, FS7RT, G3DOG, GC2FZC, GI4RY, GM6MD, GW4CX, HA4SA, HB9X, HC1FG, HI8BE, HZ1AB, I1KN, IS1AHK, JA7AD, K2OLS, KH6LF, KL7PJ, KR6AC, KS4AI, KV4AA, LA3DB, LU7AZ, LX1AS, MI3ZJ, MP4QAL, NY4CM, OA4AK, OD5LX, OE5CA, OH2RY, OK1FF, ON4AU, OQ5QF, OX3MG, OY7ML, OZ2LX, PAØRC, PJ2s AA ME, PK4DA, PY4AO, SM4WI, SP8CK, ST2AR, SV1RX, TA3AA, TF3EA, VKs 3KX ØAB, VO6U, VPs 5BH 5DC 7NM, VQs 2GW 3HJP 8AD, VR3B, VSs 1HU 6AE, VU2MD, XZ2TH, YI2AM, YN4CB, YO2BU, YS1O, YU3AC, YV5AE, ZC5AL, ZDs 2DCP 6BX, ZE1JI, ZK2AA, ZL1MR, ZSs 2X 3K 7C, 4S7WP, 4X4RE and 9S4AX. Anyone else out there among the readership with QSLs from ARRL Century Club members in 100 or more DXCC countries?



HS1JN's homespun 40-watt sender and S-40 receiver function faithfully on 20 c.w. in Bangkok where the OM is an officer in the Royal Thai Navy's research lab. After warming up on a fast WAC, HS1JN now aims for WAS and DXCC honors. *(Photo via W1TUW)*

tions here with those in Sixland: The W1/K4-W9/K9 'blanket' has been replaced by UB5-UM8-VU-4X4 QRM which makes working 'rare stuff' like W7-K7 and KH6 rather difficult. It all depends on the point of view!" . . . . . Continental releases from JDXRC, BTCC and WGDXC: Bona-fide ZA1s KB and KC QSL reliably, work mostly 7 Mc. with slow c.w. and rarely try 20. . . . In conjunction with his DJ0AA, 3A2CK operations this year G2DMV hopes to make QSO stops in France, Italy, Yugoslavia, Austria and Switzerland. . . . OK1MB will maintain skeds with OK2s HZ and ZH who accompany the Odyssean Czech geographic expedition scheduled to hit such areas as AC4 C C9 JY PK TA ZC5, Nepal and Yemen. The five-year enterprise kicks off next month with two KWM-1s in tow.

Oceania — From VK6CC (VK4CC): "Once my Macquarie operational routine has been established I will endeavor to allot specific days for working DX stations and other days for working only VK stations. (I will not QSL stations who break in on my VK contacts.) By this arrangement it is hoped that the needs of all will be adequately satisfied, especially those who require Macquarie s.s.b. QSOs." . . . . . PA0MIOT, ex-PKs 1XZ 2XG 6XG 6XZ, came to the States in October of last year and now permanently resides in Jersey. He hopes to attain American ham status in due time. "I used to chat with Stateside rag-chewers quite a bit with my 150-watt 807s rig, assisted by a battered old BC-348 that found its way to PA0MIOT from a surplus B-17 in Dutch New Guinea. What was left of the plane wasn't worth much but the receiver was still in top shape and only a few tropical creatures had managed to get into it." . . . . . A British s.w.l. reports reception of the third harmonic of "ZC3RF" to W1WPO of the ARRL DXCC desk. Rum! . . . . . The Wallis Islands project of FK8AS was finally consummated in mid-November. W7PHO reports an approximate total of 300 FW8AS QSOs over the two-day stand. Unenthusiastic local authorities almost terminated Achille's enterprise before it began . . . . . VK3CX, who views radiotelephony with opprobrium, denies intentions of a Lord Howe onslaught but reports friend VK3ARX game for more L.H. fame . . . . . W6KG identifies VK6DL as ex-VR3B. Dean may become a VK9 this year . . . . . ZL3DA (ZL3DX) worked 44 countries and 46 States from the Chathams last autumn — spring down his way — and the first of his 1060 QSOs went to ZL3ID, Ws 5DA 4IYC 5BGP 9NDA 5KBU, TG9AD, TI2RC, Ws 5BZT 4TM 4NL and 9QLH in that order . . . . . Oceania notions via SCDXC, OVARA and WGDXC: Five Kwajelein KX6 QSLs for QSOs dating after October 1, 1958, will qualify you for the Killer Clam certification issued by the Amateur Radio Club of Kwajelein. About eight possibilities are active; check with KX6AF & Co. for details. . . . ZL3VB aims for daily c.w. activity from Waitangi on the low end of 20 around 0700 GMT. He's the Chathams postmaster. . . . ZC3s are said to be practicing up on a new VK9X prefix this season.

South America — Activity by CE0s ZF and ZG warmed up the Juan Fernandez subject prior to RCC's DXpeditionary assault featuring CE3AG as CE0ZA, CE3s DY GI and IIL as CE0ZB. W3QIR reports CE0ZG workable around 2130 GMT near 28,465 kc. . . . . VP8s recently raised by W9WHM, mostly on 15 phone, include CC CQ CR DG DH DI DL and DN in Antarctica, AQ DS and DW in the Falklands, DT on South Orkney and BJ of South Georgia . . . . . W6KG finds W6LGH enjoying the DX end as CE3AS. Lloyd also hears that W3ZYB comes home from KC4USK next month . . . . . W1EQ has word that HK5CR, prominent Colombian c.w. protagonist, lost both arms in a commercial high-voltage mishap some months ago.

Asia — XZ2SY writes W9DSO: "I started using s.s.b. last November first and have been working an average of sixty stations per day on a.m. and s.s.b. I could work more if there were less QRM. QSOs are unnecessarily delayed by stations calling me on the frequencies of stations I am working before I can properly sign off with them. Difficulty also is caused by the many stations who call me on the frequency of *each* station with whom I have just completed QSO. Quite unnecessary trouble results, too, from improper phonetics. For instance, 'November' is a poor choice for the letter 'N' because two other months end in 'ember'. And there is little logic in using phonetic words likely to be unknown at the other end. I am active on 14, 21 and 28 Mc. depending on conditions. When on a.m. I can change to s.s.b. on request. I am active daily between 1330 and 1730 GMT with additional Sunday periods at 0100-0300 and my usual frequencies are (a.m.) 14,178, 21,200 and 28,390 kc.; (s.s.b.) 14,312, 21,400 and 28,620 kc." . . . . . KL7PI has XW8AI closed down for operations elsewhere. The grapevine also reports W3ZA once more on the move after an XW8AM flurry. The latter call may be used by other ops . . . . . W2ZGB identifies MP1BCN as our old rover friend, Lee Grant (pic on p. 67, November 1958 *QST*) . . . . . YU1KG reports ex-YU1JQ now businessing in Istanbul with British Shell. Little possibility of Turkey ticketing at this time, however . . . . . W2HMJ has the date of QRT for JT1s AA and YL as last November 29th — pirates take note . . . . . "If there are any U. S. hams in India or in any countries close to India I would be happy to meet them," writes VU2CD. Drop the Major a line if you're going his way for a stay, eh? . . . . . KA2KM's Ranger already has collected WAS wherewithal in Tokyo. W1TS finds Ken audible on 14,070-kc. c.w., 14,125- and 28,240-kc. phone . . . . . From W0DEI we learn that VU2JA seeks QSOs with Colorado, the Dakotas and Nebraska to complete his you-know-what. He likes to surprise QRP W, K/VEs around 1600 GMT on 28,050-kc. c.w. . . . . The British Two-Call Club has G3LJU off to Singapore with adequate shack furnishings while 9M2MA-VS1HU goes back to G3JFF . . . . . JDXRC understands that the new Japanese party at Showa base, Antarctica, formerly workable as JA1JG, prepares for Tokyo departure with intentions of using a 7J1 or 8J1 prefix this year.

Africa — Local Libyan color is supplied by 5A1FF (K4GTZ): "I am located 350 miles south of Tripoli in the Sahara and operating conditions are always strictly 'field day' with portable generator, etc. I use 10, 15 and 20 phone from 1730-2100 GMT daily, also 20 and 15 sideband when my v.f.o. is working. Gear includes a Valiant, a 10B, NC-183D and a four-band trap vertical. I'm engaged in geophysical oil explorations and our high temperature for the summer of '58 was 119° with plenty of wind and sand at all times." . . . . . VQ5EK, in lines to W8KX, lists neighbor VQ5s AU DM GF and GJ as the most active Uganda DXers along with himself. VQ5GF likes to work the States on 50 Mc. when conditions allow. VQ5EK uses a homemade v.f.o.-807-813 150-watt arrangement modulated by 807s, an HRO receiver and miniature beam. He's hearing W, Ks on 7-Mc. phone but broadcast QRM precludes serious DX work on forty from Kampala . . . . . "CR4AD seeks Vermont and Nevada on the low end of our 10-meter phone band," notes K1CDN . . . . . ZS9s M and N, OM and XYL, were worked consecutively by W2HMJ on 20's low edge . . . . . Writing from a stop in Northern Ireland, ET2TO looks forward to resuming DX activities in Asmara next month after a few weeks of CN8JE work . . . . . W3QIR finds CR6CA in hot pursuit of Del., Ky., Mont., Nev., S. Dak., Utah, Vt. and Wyo. from 1700 to 2000 GMT, transmitting phone between 28,400 and 28,500 kc., receiving in the 28,500-28,800-kc. range . . . . . VQ2RB, in QSO with W8NOH, claims employment at one of the world's largest copper mines. Stacked rhomboids, anyone? . . . . . CN2DD tells W8YIN he's heading for a Voice of America assignment in Germany, probably Munich . . . . . One OK4QK, in QSO with W6KG on 20 c.w., claimed to be operating in the Indian Ocean near Socotra "QSL via CAY." . . . . . EL1K is about due for a four-month leave according to K4LAY . . . . . WGDXC confirms that ET2US staffers intend another ET2US/ET3 s.s.b. and c.w. outburst next month.

Hereabouts — W6OJW gives advance word on the Radio Society of Bermuda DX Contest slated for late April and early May week ends to help celebrate an important Bermudan tercentenary. "The grand winner will receive free air passage . . . to Bermuda for two including an all-expenses-paid one-week stay at a leading VP9 hotel." (How to get the XYL on your side in a contest!) W, K, VEs can win certifications of merit in this one so we'll bring it up again in a month or so when detailed announcement will be more timely . . . . . "An award in

(Continued on page 142)

CONDUCTED BY EDWARD P. TILTON,* W1HDQ

If our news coverage is a bit thin this month, blame it on a three-week trip through the southeastern part of the country during December. Though such junkets may make it hard to compile a balanced column of news for a month or so, they give us opportunities to gain perspective that is helpful in many other ways.

This round included visits with radio clubs in Virginia, the Carolinas, Georgia, Florida, Alabama and Tennessee. Some of the areas covered were new to us, and our most recent previous visits to any of them were made more than 2½ years ago. It was mighty revealing to see what has happened in v.h.f. circles in the interim. Even as recently as the spring of 1955, v.h.f. activity was not easy to locate anywhere in the South. There was a low state of 6-meter interest everywhere, and nowhere was it lower than below the Mason-Dixon Line. The 144-Mc. band was picking up converts gradually; there were a few really good stations scattered around the South, but widespread general activity was unknown.

This time around we found at least a few stations on 6 and 2 in just about every community we visited. In North Carolina they were talking in terms of statewide coverage for c.d. and other emergency purposes on 144 Mc. South Carolina, once a v.h.f. holdout, now has good representation on both 6 and 2, as have all other southern states. In southern Florida we reported into the Gold Coast 6-Meter Net and found ourselves in the midst of a lively session with scores of stations participating. Their roster of active 50-Mc. stations in and around Miami lists close to 100 calls.

Florida v.h.f. men were convinced, not so long ago, that their major population centers were too far apart for good inter-city v.h.f. coverage, but no more. Following the Gold Coast Net session, at the station of K4GKL and K4GKM, better known to v.h.f. operators as W8BFQ and W8WJC, we did a bit of visiting. While at W4EHV we had a nice QSO with W4GJO, Sarasota. This 175-mile hop, we learned, is now considered routine in the Sunshine State.

In city after city we were able to raise 50-Mc. stations with our low-powered mobile, even in the daytime, something all but unheard of a few years ago. Usually this meant a string of QSOs; obviously, there were lots of 6-meter stations in most southern cities. Miami, St. Petersburg, Birmingham, Atlanta, Chattanooga — all along the line we found the same heartening response.

This growth in v.h.f. interest, which we believe to be fairly typical of the country as a whole, is compounded of many factors. The Novice and Technician classes of license have helped, cer-

1	WØZJB	17	WØOGW	33	WØPFP	49	WØFKY
2	WØBJV	18	W7ERA	34	W6BJI	50	W8LPD
3	WØCJS	19	W3OJU	35	W2MEU	51	WØZTW
4	W5AJG	20	W6TMI	36	W1CLS	52	W6GCG
5	W9ZHL	21	K6EDX	37	W6PUZ	53	W2RGV
6	W9OCA	22	W5SFW	38	W7ILL	54	W1DEI
7	W6OB	23	WØORE	39	WØDDX	55	W1HOY
8	WØINI	24	W9ALU	40	WØDO	56	W6ANN
9	W1HDQ	25	W8CMS	41	K9DXT	57	W1SUZ
10	W5MJD	26	WØMVG	42	W6ABN	58	W1AEP
11	W2IDZ	27	WØCNM	43	W6BAZ	59	W5LFH
12	W7LLL	28	W1VNH	44	VE3AET	60	W6NLZ
13	WØDZM	29	WØOLY	45	W9JFP	61	W7MAH
14	WØHVW	30	W7HEA	46	WØQIN	62	W8ESZ
15	WØWKB	31	KØGQG	47	WØWWN		
16	WØSMJ	32	W7FFE	48	K9ETD		

W1FOS	48	W4FLW	46	W7ACD	48	WØDGE	47
W1LSN	47	K4JMF	46	W7DYD	47	WØEDM	47
W1CGY	46	W4EQR	46	W7INX	47	KØAKJ	47
W1RFU	45	W4LNG	45	W7RT	47	WØIBL	46
W1LGE	45	W4RFR	45	W7JPA	46	WØJOL	46
W1FZ	45	W4ZBQ	45	K7AMW	45	WØJHS	46
W1ELP	44	W4GJO	45	W7CAM	45	WØOFZ	46
W1KHL	44	W4FNR	44	W7BOC	45	WØYZV	46
W1IKO	44	W4AKX	44	W7GRA	42	WØQVZ	45
W1CLH	44	W4MS	44	W7JRG	41	WØWNU	45
W1TAM	42	K4DNG	44	W7MKW	40	KØDXS	44
		W4HHK	43	W7UFB	39	KØGKR	43
W2BYM	48	K4GYZ	43			WØBTG	43
K2ITP	47	K4AGM	40	W8SSD	47	WØPKD	43
W2FHJ	47	K4KYL	40	W8HXT	47	K6CLJ	41
K2CBA	47			W8WPD	47		
K2ITQ	46	W5VY	48	W8HJR	47	VE7CN	45
W2SHV	45	W5LFQ	47	W8RFW	47	KL7AUV	44
K2HPN	44	W5ONS	46	W8NOH	47	VE1EF	42
K2YWH	43	W5VV	45	W8SVU	47	VE7AQQ	40
K2AXQ	43	W5EXZ	45	W8SQU	46	VE3AIB	39
W2EIF	43	W5FSC	45	W8OJN	46	VE2AOM	38
K2VIX	42	W5BXA	45	K8CIC	46	KH6UK	37
K2LTW	42	W5KTD	44	K8ACC	46	EI2W	37
W2ORA	40	W5FXN	44	W8NQD	46	VE3BHQ	36
		W5ML	44	W8UZ	45	VE3OJ	34
W3TIF	47	K5ABW	42	W8INQ	43	VE3DER	33
W3KKN	45	W5HEZ	42	K8BDT	43	VE1PQ	32
W3KMV	45	W5JME	42	W8EVH	42	VE4HS	31
W3RUE	45	W5CVW	42			XE1GE	30
W3MXW	44	W5VVW	42	W9AAG	48	SM7ZN	29
W3BGI	44			W9BRN	48	PZ1AE	28
W3OTC	42	W6UXN	48	W9ZHB	48	VE1WL	28
W3FPH	42	W6WNN	48	W9QUV	48	CO2ZX	27
W3NKM	42	W6IWS	48	W9RQM	47	ZE2JV	26
W3HCK	42	W6ANN	48	W9MHP	47	LU9MA	26
W3ZYK	42	K6JCA	47	W9DSP	46	ZS3G	26
W3LFC	41	K6GTG	47	W9EPT	46	VE1ZR	25
		K6HYY	47	W9JCI	45	SM6ANR	24
W4KKU	48	K6RNQ	47	W9UIA	45	SM6BTT	23
K4DJO	47	W6JKN	46	K9EID	45	CO6WW	21
W4UMF	47	K6KXR	46	W9SWH	44	LA9T	21
W4AZC	47	W6AJF	45	K9GFQ	43	SM5CHH	20
W4UCH	47	W6CAN	44	W9KLR	43	LA7Y	20
W4EQM	47	W6NTT	43	W9IMG	42	VQ2PL	18
W4IKK	46	W6BWG	43			JA1AUH	16
W4ZZ	46	K6UJL	43	WØAEH	47	JA8BU	14
W4CPZ	46	K6ZEH	41	WØNFM	47	ZE2JV	12
W4FBH	46	K6ERG	40	KØDTA	47	JA1AAT	12
				KØJJA	47		

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

tainly. The current boom in 6-meter DX, due to the red-hot solar cycle we're passing through, has brought newcomers and old-timers alike to the 50-Mc. band in droves. The 144-Mc. contacts made almost the length of the Atlantic Seaboard by W4RMU and W4TKE last fall have lighted a fire under the 2-meter band. But most of all, we feel, is the realization, at long last, that the world above 50 Mc. is far more than a line-of-sight world. Amateurs everywhere are coming to appreciate something of the true potential of our v.h.f. bands for work far beyond the horizon, not just "when the band is open," but all year around.

This is particularly helpful in the South, where operation on our lowest frequencies is a noisy business many months in the year. In every southern state we find a growing appreciation of the usefulness of 6 and 2 for a lot of the work formerly done on 80 or 75, both for emergency communication and just plain hamming. This is all to the good, for our numbers are increasing rapidly. There will have to be a move toward higher frequencies, if for no other reason than that there is no place left to grow in.

There are other and better reasons for making better use of the bands from 50 Mc. up. They are high-priority territory, much in demand for all sorts of commercial and military purposes. If we are to hold them for generations of hams yet to come, we should lose no opportunity to show that we are worthy of them. The growth in the v.h.f. population we've just observed in the South, and the increased awareness on the part of hundreds of hams we visited of the value of the portion of the spectrum in which they are working, are good omens. We shall not soon forget the hospitality and enthusiasm we found at every hand in this swing down through the Southland.

50-Mc. DX News

To hear the talk on 6 one would think that hundreds of 50-Mc. operators had made WAC on this band. We're talking about how many have actually earned the IARU award, not how many have merely worked all continents. (There is a difference — getting the award requires QSL proof!) Our records to date show that only 15 50-Mc. WACs have been issued. W6BAZ W6BJI W9DSP K6GDI (first operator to *work* all continents on 6) WØQIN W9HGE W0SMJ WØOGW W6FZA WØCNM WØIBL W8ESZ WØIC and WØZJB, more or less in that order, have been issued the WAC certificates with 50-Mc. endorsement. It is of interest to note that more than half of these people also have 50-Mc. WAS.

Business in 50-Mc. WAS certificates has been booming as never before, with 10 new holders of the award listed this month, bringing the total of 50-Mc. WAS holders to 62. In the WAC department we still lack representatives from W1, 2, 3, 4, 5 and 7. Only W4 remains out of the WAS listings, and this may not be for long. W4KKU, Miami, Fla., has worked all 48, but doesn't yet have the QSLs to prove it. There is a beautiful hand-lettered certificate (the last one to be so awarded) waiting for the first 50-Mc. W4 who can produce the necessary proof.

Time and again we've reported rare DX going begging on 6, largely because many U.S. operators don't listen carefully. If you listen only to signals that are 40 over 9 on phone you miss the best stuff. Classic example: Operating KR6AF, Okinawa, W5SWV heard a K2, several WØs, W7s in Oregon, Washington and Nevada, and California stations by the hundreds, but was able to raise only W7RT. The Americans were working Japan at the time. The JAs were not audible on Okinawa. Daily lists the following KR6s a active on 50 Mc.: AF AK MD DS GE FB JR QM OT. All but the first three are mobile, on 50.2 Mc. KR6AF was on 50.125 c.w. when worked by W7RT Dec. 2. This was his first stateside QSO.

K6ZEH, Porterville, Cal., heard KR6AF Dec. 2. Norma says that the openings to Japan this year have been far beyond anything experienced previously. JAs have been heard almost every day, sometimes for as long as 4 hours. On Dec. 2, K6ZEH worked JA4LG, who was running only 2 watts input to a 6AQ5! She has worked all JA districts, and may be the first YL to achieve this.

W6BJI, Fresno, also has all JA districts. Gib heard them all on a single day, Dec. 2, when the JAs were in until 1810 PST, well after dark. W7RT is another applicant for WAJD. John worked over 140 different JAs between Nov. 8 and Dec. 19.

What may have been the first 50-Mc. crossband QSO between this country and Italy was made Nov. 27 by W4DWY, Arlington, Va., and IIBRT, Turino, Italy. IIBRT was on 29.198 Mc.

Some choice calls are listed as worked by ZS6s in the Johannesburg area. We cannot tell from the report we have which of the stations were worked crossband and which were two-way on 50 Mc., but we believe that all except F9BG and 4X4IX were two-way on 6. Here's the list, for Americans to drool over: F9BG HB9BZ HB9QQ VQ5GF VQ4EV VQ4AA 4X4IX.

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

Activity and DX interest on 144 Mc. are reaching new highs in Europe. With nearly every country now showing up on 2, the countries lists of many of the better stations are very impressive. Good tropospheric openings may bring up to a dozen countries into range in a single evening, and many inter-country "firsts" have been made recently. One of these, reported by LA9T, V.H.F. Manager of NRRL, is a contact between LA8MC and SP6CT in a widespread tropospheric opening of Oct. 28 and 29. Stations in Belgium, Holland, Germany, Poland, Denmark, and England were worked from Norway during this period. The German 1GY station, DLØIGY, was heard continuously for 22½ hours.

The night of Dec. 4, and into the morning of the 5th, brought some fine aurora signals. Logged by LA4VC and LA9T on 144 Mc. were SM5BDQ, SM4BIU, SM6BTT and DL1FF.

There was widespread aurora in this country the night of Dec. 4, though we do not have anything like complete coverage on it in our reports currently on hand. Running close to deadline, we won't have time for a trip out to the PRP office to study the reports for the first half of December. W4FJ, Richmond, Va., says that he worked W1REZ, W9ZIH, W9WOK, W9LF and W8GNN, between 1930 and 2140 EST. Many other W1, 2, 3 and 8 signals were heard.

For quite some time W2ORI, Lockport, N. Y., had lacked only Georgia in all states east of the Mississippi. This condition was corrected by a Geminids QSO with W4LNG, Atlanta, Dec. 13, putting John into a three-way tie with W2CXY and W2NLY at the top of the heap of all eastern 2-meter operators, with 37 states apiece. W2ORI also kept Geminids skeds with WØIC and W7JRG, but without results.

W7JRG, Billings, Mont., added state No. 9 on 144 Mc. Dec. 13, working WØQDH, Salina, Kan., between 2200 and 2346 MST. We were one behind on W2NLY's states record for a while. Jim worked WØEMS, Omaha, Neb., for No. 37 during the Orionids. No skeds were kept during the Geminids at W2NLY. Instead, Jim tried calling CQ during the second thirty seconds of each minute. This was followed by careful scanning of the panadaptor during the 30-second listening period. On two different days Jim copied his call and parts of other station calls, so obviously the quick CQ method was close to paying off. One sequence ran "_ _E WØ_ _ _ _2NLY DE WØ_ _ _", and another time Jim heard his call repeated three times in a row. The latter indicates that a contact might have been made had the caller sent each call only once each time.

W2NLY points out that this approach is useful only if all participants agree on timing. With eastern stations transmitting during the second 30 seconds and listening during the first, there is substantially no QRM problem, and kilowatt stations in adjacent blocks can play the game

without mutual interference.

Some interesting 144-Mc. DX is being provided for New Mexico v.h.f. men by W5JVO, operating from a 9450-foot elevation at Sunspot, about 17 miles below Alamogordo and Clouderoft. This is a 175-mile hop to the Albuquerque area, but W5FPB reports that most of the stations in and near Albuquerque make it, even with low power. W5FAG has been keeping schedules with Alamogordo and El Paso stations, 160 and 220 miles, respectively. With his high power on c.w. he has been getting through, and has heard W5SEP in Alamogordo, but no two-way work had been done at the time of W5FPB's report.

What are the chances of a beginner having fun on 6? K3CPA, Washington, D. C., thinks they're good, and he cites his record to prove it. Ed first went on the air Nov. 13, with a 50-watt rig. As of Dec. 10 he had worked 105 stations, of which 17 were in his own call area. W4s totalled 30. California stations head this list with 36. He also worked 17 sevens and 4 zeros. This was done within the framework of an average working schedule, so his contacts were made during evenings, week ends, and an occasional lunch hour.

WØWRT, Omaha, has been dividing his time between 50 and 144 Mc. He reports that there is somewhat more doing on 50 Mc., due to the current DX interest, but there are about 10 stations active on 144 Mc. in and around the city. He and WØEMS wonder why they never hear anything from the Dakotas on 144 Mc. They'd be glad to cooperate with interested parties to the north in bringing about more interstate 2-meter work.

"How does the range on 220 Mc. compare with that on 144?" This question was asked during almost every meeting we had on our recent swing through the Southeast. One thing is sure: many people are thinking and talking 220 these days. W4RMU, Jacksonville, W4GJO, Sarasota, W4TKE, Gainesville, W4LNG and W4FWH, Atlanta, W4IKK, Chattanooga. These are just a few of the well-known v.h.f. men of the South whoare getting set to work on 220.

We have to admit that we have no sure answer to their question, but we feel sure that just about anything (except possibly meteor scatter) that is currently being done on 144 can be done on 220 about as well. The higher band may even be the better under favorable tropospheric conditions. Too few regular schedules have been kept on 220 to permit much in the way of comparisons, but the record of W9EQC, Aurora, Ill., and others looks encouraging. Dick has been keeping nightly schedules with W8SVI, Fairborn, Ohio, for many months. Many of these contacts have been on voice, and c.w. work is always possible, despite the 300-mile distance. W8GHX, Tipp City, has also been worked many times under normal conditions. W9EQC's schedules include W8PT, Benton Harbor, Mich., at 1930 CST and W8SVI at 2000. Dick runs 125 watts. His beam is 28 half waves in phase, 95 feet in the air. He is a co-holder of the 220-Mc. record, 740 miles, with W2DWJ. Other stations on 220 regularly within a 50-mile radius of Chicago include W9s EFE BOD ROS JCS JEC OVL SKN VVH JFP and K9s DOE HNO HIH and ILH.

The first Arizona-California 220-Mc. contact was made Dec. 18, by K6GTG, Arlington, Calif., and W7LEE, Parker, Ariz. This is a 240-mile mountainous path that has been worked with marginal signals for some years on 144 Mc. W7LEE was running 800 watts input. K6GTG developed amplifier trouble and was running only 35 watts input for the first test. Signal reports were S7 for W7LEE and S3 for K6GTG. Night and morning schedules since have produced signals up to S9. Antennas are 44-element arrays at both ends. Polarization was vertical, but horizontal will be used after Jan. 15.

OES Notes

W1EXZ, Danville, Vt. — Using direct frequency control on 50 Mc. with Kalitron oscillator. Info on oscillator found in *RSGB Bulletin* for September, 1958. Recently had 5-way QSO with K1CXX, Auburn, K1GPJ, Lewiston, W1QIG, Standish, and W1GKJ, Old Orchard. All these stations are in Maine, 100 miles or more distant and on opposite side of the White Mountains of northern New Hampshire.

W1HDQ, Canton, Conn. — Presently using 30-inch base-loaded whip for 50-Mc. mobile. Seems as good as full quarter-wave whip in reception of DX, and is better for DX work than halos of various kinds. Halos give much-improved range in local work, however, where matching polarization is important. Principal feature of the 30-inch whip is that it is well-nigh invisible, being made of piano wire.

W1LGE, Windsor Locks, Conn. — Many tests with 5-over-5 tied in parallel with a 4-over-4 show no gain over the latter array alone. The 5-over-5 is fixed NE, and was constructed as a possible aid in working European DX. It is the higher of the two, but is only ½-wave spaced, whereas the 4-over-4 is 1-wave spaced.

W1UHE, N. Tiverton, R. I. — Experimenting with parametric amplifier on 432 Mc. Results thus far, using 1N21C

(*Continued on page 140*)

2-METER STANDINGS

Figures are states, U.S. call areas, and mileage to most distant station worked.

W1REZ	29	8	1175	W5CVW	11	5	1180
W1AZK	24	7	1205	W5NDE	11	5	625
W1KCS	23	7	1150	W5VY	10	3	1200
W1RFU	23	7	1120	W5SWY	10	3	600
W1AJR	23	7	1130	W5ONS	9	3	950
W1HDQ	20	6	1020	W5FEK	8	2	560
W1MMN	20	6	900				
W1IZY	19	6	875	W6NLZ	12	5	2540
W1AFO	17	6	920	W6WSQ	12	5	1390
W1ZJQ	17	6	860	W6DNG	9	5	1040
K1CRQ	17	6	800	W6AJF	6	3	800
W1CLH	17	5	450	W6ZL	5	3	1400
K1ABR	16	6	810	W6MMU	3	2	950
W1PHR	16	6	780				
W1BCN	16	5	650	W7VMP	15	5	1280
W1KHL	16	5	570	W7JRG	9	4	1040
				W7LHL	4	2	1050
W2NLY	37	8	1390	W7JIP	4	2	900
W2CXY	37	8	1360	W7JU	4	2	353
W2ORI	37	8	1250				
K2GQI	30	8	1200	W8KAY	38	8	1020
W2AZL	29	8	1050	W8WXV	35	8	1200
W2BLV	27	8	1020	W8LVF	33	8	1060
K2IEJ	25	7	1060	W8PT	33	8	985
W2AMJ	25	6	960	W8RMH	22	8	910
W2DWJ	23	6	860	W8SVI	30	8	1080
K2HOD	23	7	950	W8SFG	30	8	1000
W2PAU	23	6	753	W8LPD	29	8	850
W2SMX	22	6	940	W8EHW	28	8	860
K2CEH	21	8	910	W8WRN	28	8	680
W2LWI	21	6	700	W8BAX	27	8	960
W2RXG	20	6	700	W8DX	26	8	720
W2UTH	19	7	880	W8ILC	25	8	800
W2RGV	19	6	720	W8JWV	25	8	940
W2WZR	18	7	1040	W8GFN	23	8	540
W2ESK	18	5	850	W8NOH	21	8	975
K2RLG	17	6	980	W8LCY	21	7	610
				W8BLN	21	7	610
W3RUE	30	8	975	W8GTK	18	7	550
W3GKP	29	8	1020				
W3KCA	28	8	1110	W9KLR	40	9	1160
W3TDF	28	8	915	W9WOR	40	9	1150
W3SQA	26	7	700	W9QAB	33	9	1075
W3FPH	22	8	1000	W9AAG	32	8	1050
W3NKM	20	7	730	W9REM	31	8	850
W3LNA	20	7	720	W9ZIH	30	8	830
W3LZD	20	7	650	W9LVC	27	8	950
				W9EQC	26	8	820
W4HJQ	38	8	1150	W9ZHL	25	8	700
W4HHK	35	9	1280	W9BPV	25	7	1030
W4IXI	34	8	950	K9AQP	24	7	900
W4AO	30	8	1120	W9PBP	23	8	820
W4MKJ	38	8	850	W9LF	22	7	825
W4UMF	28	8	1110	W9KPS	22	7	690
W4VLA	26	8	1000	W9PMN	19	6	800
W4EQM	25	8	1040	W9ALU	18	7	800
W4WNH	24	8	850	W9JLY	17	8	790
W4JCJ	23	6	725	W9LEE	16	6	780
K4EUS	23	6	765	W9DDG	16	6	700
W4VVE	21	6	720	W9DSP	15	6	720
W4IKZ	20	6	720				
W4OLK	20	6	720	W9SMJ	29	9	1075
W4AIB	19	7	840	K9EMQ	29	7	1110
W4CPZ	18	6	650	W9IHD	27	7	890
W4TLV	18	7	1000	WØBFB	27	8	1060
W4RFR	18	7	820	WØGUD	25	7	1065
W4MDA	17	6	650	WØRUF	23	7	900
K4YUX	16	8	830	WØINI	21	6	830
W4CLY	15	5	720	WØUOP	21	7	900
W4LNG	13	5	800	WØTGC	21	7	875
W4RMU	13	6	920	WØZJB	18	7	1180
W4KCQ	10	4	860	WØRYG	17	6	925
W4GIS	9	2	335	WØIFS	16	6	1100
				WØJHS	13	5	700
W5RCI	33	9	1215	WØIC	12	6	1240
W5DFU	25	9	1300	VE3DIR	28	8	1100
W5LPG	25	7	1000	VE3ATB	26	8	910
W5AJG	23	8	1360	VE3BQN	19	7	790
W5KTD	22	8	1200	VE3AQQ	17	7	800
W5JWL	21	7	1150	VE3DER	16	7	820
W5PZ	16	8	1300	VE2AOK	13	5	550
W5VKH	15	5	720	VE3BPB	14	6	715
W5ML	15	5	700	VE7FJ	2	1	365
W5FSC	12	5	1390				
W5HEZ	12	5	1250	KH6UK	1	2	2540

Correspondence From Members-

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

USE THAT MARKER!

503 North Arden Blvd.
Los Angeles 4, Calif.

Editor, *QST:*

Recently, a DX QSO of mine was ruined by a W-ham (may all his fuses blow), who was operating outside of the American phone band. But, he is not alone in enjoying this QRM-free bonanza; there are throngs of other W stations whose religious trust in their v.f.o. dials is exceeded only by their puerile lack of common sense.

Since so many Ws can nest themselves, undisturbed, in the DX bands, I am forced to conclude that the FCC is undisturbed, so long as the ham's frequency is not lower than d.c. nor higher than ultraviolet.

Should someone, somewhere become concerned about this problem, I would suggest a firm regulation, that none be permitted to use a v.f.o., unless his station is equipped with either a 100 kc. xtal marker, or, at least, a single band-edge xtal for each band of operation.

— *Mark Holzman, W6VUR*

271 Midland Avenue
River Edge, New Jersey

Editor, *QST*

When will some hams wake up to the fact that the FCC makes rules to be obeyed, and not to be ignored? We must all realize that the vast majority of the regulations are for our own benefit. The violation that most agitates me is the flagrant out-of-the-band operation that some persist in. These fellows must possess the mentality to realize that the edge of the band means that operation is not permitted beyond that point by an amateur radio station. The band limits for all types of emissions are certainly available to every amateur, so ignorance can never be claimed!

Apparently our out-of-the-band operators never consider the harm they do by breaking this regulation. They sully the reputation of amateur radio in general, and themselves in particular . . .

It is clearly time for the amateurs at large to cure this problem. Take the initiative and stop pampering those locals known to habitate the ether outside of the legal limits. Let's stop listening to their snickering accounts of their "fun." If they find themselves unliked and unwanted by the amateur fraternity, they will likely take the hint and obey the law. Let's do something about this problem, and do it quickly!

— *Art Samuelson, K2PIM*

HELP A LID

3607 NE Liberty
Portland 11, Oregon

Editor, *QST:*

As a lid who holds a Novice and Technician ticket, I would like to offer a solution to those who are so critical of these license classes. We need a "help a lid" club — amateurs willing to help lids like myself to learn the correct procedures and skills necessary for becoming a good operator. Hard as we try, these are things that cannot completely be learned from books; it takes practice and lots of it. Not just getting on the air, but supervised practice.

The past few months I've been making a survey of both good and bad operators alike. One main point stood out in almost all cases. *The good operators had qualified outside help, the poor ones didn't.* If every good operator took just one lid under his wing and followed through to help them become good operators the results would be tremendous.

Whatever your motive may be for helping the lids, the first step is to get hot and start. Remember *the lid you save may be yourself.*

— *Jack L. Wilson, KN7DDH/K7DDH*

CQ CLASS A

221 Edgewood Ave.
New Castle, Pa.

Editor, *QST:*

The other day I had just finished a contact and decided to go down to 75 meters to do a little snooping. Man, those generals should complain about the novices. There was a W2 calling "CQ CQ non-phonetic. Class A operators, no Texas Rangers," etc. When a fellow came back to him and the "Class A operator" who was calling the CQ turned him down when the guy used phonetics in his call, I almost cussed the receiver off the table! The worst part of it was the "Class A operator" told him to call a Class E operator instead of him. Boy, does that make me mad! The next time I hear that guy on I am going to see that he gets a pretty sour letter. A guy like this shouldn't have the privilege of being on the air.

— *Guy B. Young, K3DKO*

INFILTRATION

2006 Swansea Road
Baltimore 14, Maryland

Editor, *QST*

I stopped subscribing to *QST* several years ago when the gear described began to look too professional. I see by glancing through the latest issue that things have not changed, and have gotten even worse, if anything. I am beginning to wonder if the wealthy leisure class is infiltrating our ranks. If so, I'll bow out quietly. If not, where are the articles by the boys who are still doing pioneer work with 6AK5s, 829Bs, and scrap aluminum, simply because they can't afford 6BX7s, 4CX1000s, and new aluminum prices?

— *Joel L. Ekstrom, W1UGX/3*

A PROPHECY

Box 10365, Caparra Hgts.
San Juan, Puerto Rico

Editor, *QST*

I was rambling through some old *QST* magazines and came across an interesting prophecy on page 31 of the June, 1940 *QST:* "Some day, we imagine, some amateur will build a station with a control panel having one switch to select the band he wants and one dial to tune the band — for both transmitter and receiver." Ham radio has certainly come a long way since this prediction. I am wondering what prediction you would care to venture at this time for the next fifteen years of ham radio?

— *Robert R. Renfro, jr., KP4AMU*

FROM OUTER SPACE?

421 Belvedere Street
La Jolla, California

Editor, *QST:*

I'd like to see a notice in *QST* telling some of the hams that there is such a thing as a WV. Eight or nine times I've had Novices come back calling W4BAJ. When I answer back I'll pound out my call at least four times at 5 to 7 w.p.m. (This is quite slow compared to the speed which I'm usually sending.)

When I turn it back you know what call comes back to me. On the next transmission I spell my call out phonetically but some won't give in. W4BAJ will probably be receiving some unidentified QSLs which I would like on my call.

— *John Barr, WV6AJB*

RST

Springs RFD Box 67
East Hampton, N. Y.

Editor, *QST:*

In *QST* for November, K6RIP comments on our RST system of reporting and states instances of a a.c. signal that was reported by many hams as T9 and he wanted to call the DX station to report that his signal was 573. Good for him!

For many years now I have considered writing ye Ed. about this very subject and to suggest a new, revised system of reporting signals. I hesitated because I know it is against human nature to want to change a thing such as our beloved RST system. However, it seems like the time has come, and I submit the following:

R-1 Unreadable
R-2 Readable with considerable difficulty
R-3 Perfectly readable
S-1 Faint, barely perceptible
S-2 Fair signals
S-3 Strong signals
T-1 Extremely rough or a.c. note; suggest you close down and investigate (or, you have an illegal note).
T-2 Fair note, some a.c. or chirp
T-3 Pure d.c. note.

Regarding the R — after all, what else is there to tell him? Either you can read him or you can't (or with difficulty) and I think he'd be glad to know. As far as S goes, why should there be other figures (for example a figure for extremely strong signals?) As far as T-1 goes, if someone heard my signal in such a condition I should be most happy to have him tell me so.

Do you think we could bat this around a bit before letting it die? At the present time, an RST 599X is a *standard* signal, even though it may actually be 347! However, who among us would ever expect to get a 347 signal these days (I'll bet it would lead to suicide!).

Comments, anyone?

— *Don Miller, W2MQB*

UNDERSTAND THE LANGUAGE

1 Vista Drive
Great Neck, New York

Editor, *QST:*

We always see Generals complaining about Novice signal reports. If these Generals but knew that the Novice system of RST reporting is dissimilar to that of everyone else, maybe they wouldn't squawk so much. With three full months of Novice experience behind me I shall try to translate some typical reports.

299 — Who knows how to give signal reports?
358 — I didn't like your report.
477 — My receiver drifts.
489 — This is the second time I've worked you.
539 — My "S" meter is out of adjustment.
555 — 5 is the only number I can send with this bug.
579 — We are on 15 meters.
589 — We just changed to 80 meters.
599 — You are my best DX — or, You and I have the same rig.

Keep this list on your shack wall at all times, Mr. General, and see if it doesn't give you a clearer picture of what is going on in the Novice bands.

— *Robert Salzman, WV2BWC, WA2BWC*

LISTEN FIRST!

3719 Wilshire Blvd.
Los Angeles 5, Calif.

Editor, *QST*

From an elevation of 750 feet on the side of the Palos Verdes Hills, the window of my shack looks out 35 miles across Santa Monica Bay to the Malibu Mountains. Last night these mountains were a seething mass of flames. Listening in on the 2- and 75-meter bands, I could hear the RACES nets relaying vital messages to the fire crews and the Sheriff's patrol cars. One message had to do with a helicopter taking burned men to the hospital. It was grim business, and nearly every message had to do with an emergency. It was very frustrating when time and time again a CQ call would come through on the frequency. Over and over again the control stations would plead for a clear channel. The interfering stations were not malicious, just careless. Emergencies do not advertise themselves in advance, so it is *always* necessary to listen in on a frequency before putting the carrier on. That's just common decency and courtesy.

— *Gabe Little, K6MVT*

OUT OF ADJUSTMENT

2075 Harvard St.
Palo Alto, California

Editor, *QST*

It seems that faith in machinery and electronic equipment has gone too far. Recently, I was asked to repair a GSB-1 single sideband adapter. The complaint was that no adjustment of the controls would make some signals comprehensible. Rigorous checking showed that the instrument was in perfect condition. The owner, however, insisted that it was still out of order, and demonstrated that several signals could not be made into clear English by an adjustment. After some work with the device, it turned out that one of the offending stations was speaking Spanish, which the owner did not recognize; another was transmitting in Cantonese, which was equally unrecognizable to the owner.

Perhaps word needs to get around that there are languages other than English, and that no electronic device yet devised will produce instantaneous translations of verbal copy. It is possible that we will have something like this soon, but as of now, no commercial device will make clear English speech out of transmissions in any other language.

— *Ronald L. Ives*

WASTED QSLs

Davenport, Iowa

Editor, *QST*

1. The writer works in the Davenport, Iowa, post office and attempts to deliver all QSL cards not properly addressed. There are times when the mountainous task becomes extremely frustrating. I now have cards from 37 states (including Delaware) in my undeliverable collection.

2. I consider the following as the prime example of wasted effort:

YL CHASER AND CLIK ARTIST, BUD
Davenport, Iowa

This card, mailed from Idaho, is "the most." Since we have quite a few YL chasers and numerous clik artists in our fraternity, can any one of you chaps give me the answer? No wonder I am aged prematurely! Seriously, fellows, please develop the habit of addressing your cards with a complete address. Most of this trouble is in the fact that you "roger" for an address when you are not sure it is correct and then blithely waste your money. You will get the same results by depositing your QSL in the sewer, boys.

3. I therefore respectfully suggest that all clubs place the following placard in their club:

	Example
Call of station	(Amateur Radio Station KØAGJ)
Operator	(David Davis, opr)
Address	(3322 W. 17th St.)
City, State	(Davenport, Iowa)

That last name is the most important item in the address. All cards showing last names have been successfully delivered. Last but not least, *Call Books* are never up to date, in a roving population such as ours. Please remember post cards are never forwarded unless the addressee guarantees forwarding postage, and never returned; unless the mailer guarantees return postage. The next time you don't receive an answer to your card, don't blame the contact; how can he reply if he never received your card?

— *David Davis, KØAGJ*

MEMBERSHIP CHANGES OF ADDRESS

Four week's notice is required to effect change of address. When notifying, please give old as well as new address. Advise promptly so that you will receive every issue of *QST* without interruption.

Operating News

F. E. HANDY, W1BDI, Communications Mgr.
GEORGE HART, W1NJM, Natl. Emerg. Coordinator
ROBERT L. WHITE, W1WPO, DXCC Awards
PHIL SIMMONS, W1ZDP, Asst. Comm. Mgr., C.W.
LILLIAN M. SALTER, W1ZJE, Administrative Aide
RONALD GANN, W1FGF, Club Training Aids
ELLEN WHITE, W1YYM, Asst. Comm. Mgr., Phone

Worked-All-States Certifications. Alaska's statehood, accomplished by Presidential proclamation, became effective January 3, 1959. Submissions for worked *all* states now require inclusion of an Alaskan confirmation, this representing a QSO accomplished *on or after* that date. See September *QST*, page 78, for a detailed discussion concerning Alaska and WAS. (If you made a 48-state WAS before January 3 you have until July 4 to get your WAS cards in to ARRL.)

Novice Roundup. Dedicated to the interest of the Novice in testing his station on the air and building his coverage and operating ability, the annual ARRL operating activity known as the Roundup calls for a list of your QSOs made between January 31 and February 15. The "NR" starts at six P.M. local time. One and all are invited. See the full announcement of the activity on page 77, January *QST*. Here's an activity that calls for you to put in *just a little time each day.* The general call is CQ NR. It's a chance for all amateurs to welcome newcomers into ARRL activities. The "NR" always finds some interested old-timers working near, but outside, the Novice sub-bands to give them contacts, in addition to those made by Novices with each other.

Novice participants and others merely make a list of the QSOs and ARRL sections with which two-way contacts by amateur radio have been made. Just send in a copy of your log, computing the score in the form suggested in the *QST* announcement. You new-timers will be surprised and pleased at your score and progress. This is something of a refresher for senior amateurs, a special chance to make some new acquaintances and to exercise patience and kindness. It gives many an old hand a thrill to send in the list of WN/KN amateurs worked in this annual opportunity, after exchanging signal reports with the new men. Such scores are not in competition with the section winner's certificates that go to leading Novices.

No physical endurance test is required since a whole half-month is available to make up the list worked and try for all the ARRL sections in the U.S.A. and Canada that may be found listed on page 6 of this *QST*. You can use that page for a convenient check-off list for the sections as you work them! Incidentally you will be on your way for the Worked-All-States award as a by-product of your activity.

Who Calls First? *Midwest Relay*, published by WØUOL, brings up the point that when stations are sent to a frequency to clear traffic there needs to be an understood practice as to which should call first to establish contact on the given frequency. It all depends. WØUOL quotes from *Clixs* as follows: "If the station with traffic calls first then the other can indicate his readiness to copy on his first transmission. *If QRM is rough, the fellow that is to copy a message should have priority in choosing the exact spot.* On the other hand the difference in signal strength may be such that the man with traffic could be copied on any frequency but the receiving station will have to be just where the man with the traffic wishes or he can't read any request for repeats or the "R" (QSL). If one station is inept in zero beating, then it may be best for the latter's operator to call first, so both stations will end up on the same frequency."

Let's look at recurrent scheduled contacts too. Where stations have a schedule, which one will call first likewise may be made a definite procedure; otherwise a period of poor conditions can result in both operators wasting considerable time in calling each other simultaneously to no avail. Two OTs who worked out this problem over the air reasoned that *the station customarily heard best* should call first for a pre-determined number of minutes. The operators then alternate, calling each other in a known time sequence. This permits the operator whose turn is second to zero his frequency *exactly* to that of the calling station so there is maximum chance of his being heard. It is incumbent on the station making the first call to look over the band carefully to pick the spot most free of QRM. Advance indication of the order of frequencies he is likely to use is necessary so everything goes off smoothly, of course.

Slow-Speed Nets. Slow code speed or modest code and procedure ability should *not* keep you out of traffic work. Every outstanding operator had to build up his prestige and proficiency by actual on the air work. Such net operation can be most enjoyable. The know-how and pleasure in exchanging intelligence through messages with amateurs beyond those we normally work directly is the heritage of every American amateur. You never know when a flood or hurricane or other type of disaster will challenge your ability to be an accomplished communicator. Since you will want to be able to rise to such a challenge in the field of possible public service work, we think that by all means you will want to review sections II-V-VI-VII of our *Operating an Amateur Radio Station* booklet (sent ARRL members

on request) and join in some group traffic activity.

The foremost section leaders across the country are ready to organize low-speed nets, where these are not already functioning, if enough of their individual active amateurs will drop a line, indicating interest in such section nets. We're pleased to mention at this point quite a number of slow-speed traffic nets that are now working in different sections. All amateurs in those parts of the nation who would like to get into traffic work are invited to report into these nets (QNI). The registration of nets was not quite complete for the new season as this list was made up. Be sure to drop a line to your SCM for slow-speed net information or to express your interest if a group can be organized, if your area is not covered herein.

Coun. Training Net (CTN)	Sun	3640	0800	EMT	W1RFJ
Empire Slow Speed Net	Daily	3590	1800	EST	K2QJL
Georgia Novice Net	Tu-Th-Sat	7157	1700	EST	K4HMS
Lakeland (NY) Slow Speed Net (LSS)	Daily	3701	1600	EST	K2UTV
Minn. Jr. Net (MJN)	M-W-F	3690	1700	CST	KØDIA
Nebr. Slow Speed Net (NSS)	Daily	3750	1700	CST	WØMAO
NJ Slow Speed Net (NJSS)	M thru Fri	3748	1830	EST	K2ZHK
Northwest Slow-Speed Net (NSN)	M thru Sat	3700	2100	PST	W7IEU
Novice Emergency Net (NEN)	Sun	3715	1615	EST	W4SSB
Novice Hurricane Net (NHN)	Sun	3725	0730	EST	W4UHF
Ohio Slow Speed Net (OSN)	M thru Sat	3580	1830	EST	K8DDG
Okla. Slow Speed Net (SSZ)	M thru Sat	3682½	2130	CST	W5JXM
Sundown Novice Net (SNN)	Sat-Sun	7152	1800	CST	KØKMZ
Virginia Slow Net (VSN)	M thru Fri	3680	1830	EST	W4LW
Wisc. Slow Speed Net (WSSN)	M thru Fri	3620	1830	CST	W9SAA
Ky. Slow Net	M thru Sat	3600	1700	CST	
W. Mass. Novice Net (WMNN)	Tu-Th-Sat	3744	1830	EST	

What any net lacks in speed it can make up for by high efficiency and good procedure. Accuracy and reliability are the prime aims in accepting and handling any message at any time. The rate of sending on either a phone or a c.w. net must always be adjusted to the capability for writing-down words accurately. Good spacing and a steady speed, avoiding the necessity for asking for fills, and reasonable rate of sending, never fails to accomplish the greatest amount of transferred intelligence between operators in the very minimum of time. Good net procedure and order make for net efficiency; operator judgment is even more important than intrinsic code speed. We shall welcome all reports on the organization of slow-speed traffic nets, and will be happy to furnish forms for Net Registration of such groups.

ARRL's 25th Annual DX Competition. Among many tasks completed in December was the annual mailing of promotional invitations to other national societies and some of the rare DX, to get into the 25th ARRL DX Competition. DXers everywhere will follow the contest dates and timetables for this annual highlight. Two-way international amateur work is concentrated on those designated February–March dates. There are really two separate contests. Full rules appear in January *QST*. The phone section scores include all contacts in the February 6–8 and March 6–8 periods; the c.w. section similarly may include all successful DX exchanges February 20–22 and March 20–22. Many overseas amateurs will be looking for new states in the contest to advance their WAS standings. Luck and DX! — *F.E.H.*

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for November traffic:

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
W2KEB	369	1626	1268	263	3526
W7BA	13	1406	1370	34	2823
WØSCA	21	903	901	1	1826
W7PGY	32	785	744	38	1599
WØBDR	76	730	618	5	1429
WØBLI	6	585	580	4	1175
WØLGG	50	566	536	14	1166
W8UPH	16	550	521	27	1114
W6GYH	225	437	410	27	1099
W9NZZ	223	395	1	394	1013
WØIA	34	488	486	5	1013
WØPZO	3	494	474	17	988
K6HLR	23	489	427	45	984
W5RCF	48	452	434	18	952
WØOHJ	8	459	452	8	927
WØLCX	33	414	394	17	858
K4QES	454	191	170	16	831
K2SIL	28	393	387	13	821
W9DO	16	372	101	287	776
K4SJH	63	363	317	27	770
W6EOT	5	367	308	38	718
K6YBV	36	343	312	16	707
W9VAY	7	372	310	13	702
WØCPI	4	349	319	30	702
KØIDV	21	321	312	12	666
W9ZYK	13	315	276	51	655
K1BCS	215	223	190	12	640
W1UEQ	36	378	151	57	622
W6YDK	31	293	284	9	617
W5CEZ	25	290	270	12	597
K1CIF	128	240	225	0	593
W7ZB	26	276	259	17	578
WØKQD	78	256	228	11	573
K2QBW	122	225	143	81	571
K4JKK	8	277	253	19	557
K6GK	246	125	174	0	545
W4RLG	20	272	231	20	543
WØGXQ	172	210	199	22	543
W3CUL/4	145	197	181	9	532
W9CXY	10	257	253	4	524
KØKBD	15	254	251	3	523
W1EMG	5	264	219	34	522
K2QHR	5	257	244	8	514
W3UE	14	260	232	5	511
K2GWN	1	268	238	2	509
KØGYA	101	201	199	2	503
K1AQB	9	246	245	1	501
Late Reports:					
W4PFC (Oct.)	47	326	319	36	728
W4SRK (Oct.)	19	303	295	42	659
K4UBR (Oct.)	42	284	283	7	616
W4GXR (Oct.)	20	285	233	36	574

More-Than-One-Operator Stations

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
K5WSP	431	752	730	44	1957
K6MCA	28	620	613	7	1268
K4WCZ	181	238	151	11	581
KG1DT	219	191	50	120	580
Late Report:					
K6MCA (Oct.)	19	951	912	39	1921

BPL for 100 or more *originations-plus-deliveries*

W3WBJ	281	K2YBC	145	K8CSG/KL1	109
W1AWA	244	KØONK	136	W3BUD	107
K6GZ	220	K4ASU	133	W2RUF	105
KØBLJ	194	W1QJA	131	W8WXO	105
W3CVE	184	W6ZJB	122	W2VDT	101
KØARF	176	K1DIO	115	K6OSO	101
K9GDQ	175	K4LEM	115	W9TT	101
K8CNB	160	K2ZHK	114	KØORK	101
K2AOQ	158	K4FZL	111	Late Report:	
K4QER	150	K4PIA	109	K6GZ (Oct.)	365

More-Than-One-Operator Stations

W1AW 125

BPL medallions (see Aug. 1954 *QST*, p. 64) have been awarded to the following amateurs since last month's listing: W1NJM, W1ZME, K2OOK, K4KZP, K4QIX, K9GDQ, WØUOI.

The BPL is open to all amateurs in the United States, Canada, Cuba, and U. S. possessions who report to their SCM a message total of 500 or more or 100 or more originations plus deliveries for any calendar month. All messages must be handled on amateur frequencies within 48 hours of receipt, in standard ARRL form.

One thing that seems to be missing from the pages of *QST* and literature made available to ECs and AREC members, judging from the tenor of correspondence we have received sporadically over the past few months, is some specific information on how to keep up interest in the local AREC organization and some suggestions for activities which might accomplish this. We ran something on this some years ago (May '54, p. 78). Since then as before then we have been making suggestions by implication right along in *QST*.

In May '54 we suggested a number of activities, including picnics, banquets, dances, regular net drills, the Field Day, the Simulated Emergency Test, in-person meetings with speakers, participation in civic functions, prizes or other inducements to attend drills, a "production line" for equipment needed, hidden-transmitter hunts, press and radio-TV publicity, and intra-member competitions. In addition to all that, we suggest you read the rest of this column with open eyes and open mind each month. Why? Because it contains innumerable other ideas for you to ponder and possibly apply to your own group.

For example, in December *QST* one AREC group provided communication for a boat race, another for a trout-catching derby, another assisted police with Labor Day traffic. Each year a number of AREC groups offer their services to police departments to prevent vandalism on Hallowe'en. Also in December *QST* are accounts of RACES activities under the RACES subhead. Similar activities are described each month in whatever space is left over after account of actual emergency operation.

So read, brother, read! Don t gloss over these items as being about someone else's activities and therefore of no interest to you. They aren't printed just for the glorification of the group they are about. They are printed for you, and *you* and YOU! In many cases, the circumstances may not apply to you, but in some of them you will find that you, too, can take part in such an activity. Sure, we can suggest that you help your police department with Hallowe'en patrols, that you investigate upcoming public events for possible use of your facilities, that you organize RACES and tie in closely with your c.d. — and, from time to time, we have done so. But all this other material we put into this column is intended to be suggestive as well. Read it, digest it, ponder it — then act on it!

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On November 18 and November 25 the North Dakota Emergency Net was called into session to handle telephone and railroad company traffic during severe blizzards and snow storms. An emergency station was set up at Carrington, N. Dak., manned by KØGRM to furnish a link for telephone traffic to Jamestown. The net, operating on 3845 kc., was in session 24 hours, with *KØs* PZN GRM JLW ATK, *WØs* PHC YCL and EXO taking NCS chores. Letters of appreciation were received from the Great Northern Railway and the Northwest Bell Telephone Company. Other hams who took part in the traffic handling: *WØs* DPT HNV SRH UMX ECX GNS DOW IRN HVA OIG ORJ WIQ OEL OOD RRJ GZD DBI DMK CPS ZZK KTZ LUP MQA PMZ GII DM PQW KRC HDD WFO IHM BIH QNY FPW, *KØs* GGI OUD PLY DHB IQJ ADI CBE HLT KJR MBG EBD ABC ESO KAG DWX HOZ MHC BIT GWP HCZ, VE4LJ and VE4RF. — *KØJLW, SEC North Dakota.*

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Members of the Keep Minnesota Green Net (3810 kc.) did a magnificent job on November 19 when a severe storm battered Lake Superior's north shore, disrupting both power and telephone lines. WØBMD was first on the air, but could not get through. KØDID at Grand Marais was first with the news of the trouble in Northern Minnesota, relaying to Minneapolis via KØMAH, but he soon had the help, support and participation of the KMG Net. WØTWG at Bemidji was NCS, with *WØs* TUS OJG and OJK assisting when conditions made relaying rough. Through this hookup a news dispatch was relayed to WØMMG who telephoned it immediately to the AP-UPI wire services and radio station WCCO. But this was only the beginning. WØIRD at Duluth received information for the Coast Guard relative to damage at Grand Marais. KØDID was able to transmit school-closing information via KØMAH and WØKCP who relayed it to WØHRY in Duluth and it was transmitted on the 2200 news broadcast over KDAL-TV. Information regarding timber damage, civil defense and personal emergencies was also handled by the net until about midnight, when the need for emergency communication subsided. The Executive Secretary of Minnesota's "Keep Minnesota Green" Committee expressed the sentiments of many served when he said: "KMG salutes the unselfish volunteer work of our short wave amateurs." Other amateurs active during the emergency operation, as reported by SEC WØTUS, included: *KØs* LWK GVS, *WØs* NNG GII VPO MQA. Many of these are ECs for their respective AREC groups in the Minnesota organization.

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The Huntington (W. Va.) Weather Net was alerted on November 23 to provide communications for forest fire fighting in Harveytown, near Huntington. EC W8FUM was alerted by K8GOM at 1930 on six meters, and K8HRO was designated net control station, assisted by W8FNI. Mobiles K8CYW and K8GOM were dispatched to the fire scene and communications were set up at once. Meanwhile, the net alerted the fire warden, Civil Air Patrol, civil defense and the Conservation Corps. K8HRO reports the following additional participants: *K8s* JTX DWU GWU EYG BEL IYU, *W8s* GLB KNC, K4VEZ.

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On his way home from Boston, K1ELI on Nov. 27 came upon a car on fire near Fall River, Mass. With his 6-meter mobile rig he contacted W1GGD, who notified the police at Lincoln, R. I., who in turn notified Massachusetts State and Fall River police. The latter responded in about five minutes. This was the first time that K1ELI has ever used his rig for such a purpose, so you never know. Be ready.

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The South Texas Emergency Net CW was alerted during Hurricane Ella, on September 5–6. The frequency was monitored until 0300, with progress of the storm being relayed until all danger was over. This is standard procedure for STEN-CW when any storm is in progress in Southern Texas.

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Members of the Erie County, N. Y., AREC-RACES organization assisted in "Operation Collect 1958" on October 14, sponsored by the Community Chest drive in Kenmore, N. Y. All operation was conducted on 145.41 Mc. Eight stations were reported to have participated by W. N. Y. SEC W2PPY.

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The Monroe County, Ind., AREC organization took part in the local United Fund Campaign drive on October 22. A control station was set up at the newspaper office, headquarters for the drive, within ten minutes after members of the Bloomington Amateur Radio Club arrived for that purpose,

During Hallowe'en, the 6 Meter Mobile Association of Western New York (all AREC members) assisted Kenmore and Tonawanda auxiliary police in patrolling the area, from 1800 until midnight. Mobiles operated on 50.55 Mc. This group snapshot at the control center shows (back, standing) *K2s* BNO KKA AWU (front, standing) QJJ ZZE (seated) AWW and VAW.

These four young fellows put on an amateur radio display at the Bloomsburg (Pa.) Fair in September, operating the rig ten hours per day on 160 thru 6 meters. The equipment, consisting of 412 feet of antennas, 300 feet of lead-in and $2,000 worth of gear, was all furnished and installed by the boys. Left to right are W3s EPL (EC), GZC, EPJ and ATB.

while mobiles scattered to strategic locations to be able to pick up phoned-in pledges quickly. Control station used a ground plane antenna on 147.3 Mc. installed 20 feet above the top of the newspaper office building.

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Cuyahoga County (Ohio) AREC's "Project 45" was participation in the 1958 fund drive for Muscular Dystrophy. Twelve mobiles took part, a control station was established at dystrophy headquarters and a c.d. station was activated at central police headquarters. Many communiques were handled, dispatching the mobiles and otherwise handling fund drive activities. The National Guard rode "shot gun" for the group, since large amounts of money were often picked up and delivered. Eighteen AREC members took part. — *W8AEU, EC Cuyahoga County, Ohio.*

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Twenty-four SECs reported October activities representing 8468 AREC members, an increase in both counts for the same month last year. One new section made its appearance, North Dakota. Other sections reported: Minn., W. N. Y., San Joaquin Valley, N. C., N. Mex., Santa Barbara, NYC-LI, Ga., Colo., E. Fla., Nevada, E. Bay, S. Texas, W. Va., Ala., Wash., Wis., R. I., Santa Clara Valley, E. Pa., Ont., Mich., Maritimes.

RACES News

OCDM has announced that 14,000 copies of the USCDARA's RACES Operators Manual (SOP) have been distributed and that requests for 2,000 more are now on hand. Since they are completely out of copies at this writing, a new, slightly revised, printing is being made, and by the time you read this it should be available. It will come down to OCDM regional offices and thence to state civil defense offices, from which it can be obtained for RACES groups. The best way is to have your local radio officer or c.d. director request copies from the state office, in whatever quantity is required.

This procedural manual, although devised by the United States Civil Defense Amateur Radio Alliance for use by its member states, has the official OCDM stamp of approval and is printed by the Government Printing Office. It is used extensively throughout the United States and possessions.

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In a successful c.d. evacuation in Georgia, 540 pupils were convoyed from Peach County school to reception centers in Dooly County. Six RACES mobiles and 3 fixed stations were on the job to provide communications. The operation was directed by the Unadilla c.d. director and was monitored by Region 3 OCDM headquarters.

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Dixon, Calif., conducted an unusual c.d. evacuation on Dec. 6-7 which received national publicity. The evacuation started in Esparto and wound up in Chico. Amateurs maintained communications during the convoying of hundreds of vehicles over the route. Radio contact commenced at 0800 when the first section left Esparto and was secured at 1435 after the last section arrived at Chico. Stations were manned at c.d. headquarters at Chico, at the fairgrounds dispersal point in Chico, at the starting point in Esparto and at Dixon. Two stations, one at Stockton and one at Sacramento, served as relays when caravans could not make contact direct to Chico. In addition, there were fourteen 75-meter mobiles traveling with the various caravans, and an undisclosed number of 2 and 6 meter mobiles. Eighty-meter c.w. was also used in the operation. This was a big operation in which 590 people took part and 164 cars were involved. — *WGOJW, SCM East Bay Section.*

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The Seneca Radio Club of Tiffin, Ohio, was active during the December 5-7 week end during a c.d. alert. Setting up operations about noon on Friday in the c.d. room in City Hall basement, everything was in smooth operation when sealed orders were opened at 1900. W8WAB operated club station W8ID handling messages to W8GJL in Tiffin on two meters; these were then relayed to Cleveland and Akron on 75 meter s.s.b. and telephoned to Chagrin Falls state c.d. Area 5 station, with which radio contact could not be made. Three mobiles also assisted in the Tiffin alert. W8ID was again on the air the following day and this time direct contact was made with W8EIL at Chagrin Falls on 160 meters. On Sunday two mobiles did convoy duty from Fostoria to Tiffin, with W8ID again acting as home station.

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North Carolina RACES organizers and operators received a fine tribute from Governor Hodges on December 7. The governor pointed out that preparations for emergency communication in the state have been particularly effective, and the state c.d. director noted that the state's survival plan could not be carried out without RACES. "No group of people," he said, "is more important to the survival of this state." Fifty counties in North Carolina are now covered by the RACES network.

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Maine News: Acting SCM W1QJA reports that state c.d. headquarters has a mobile unit equipped for communications on all state RACES frequencies plus a link to state police headquarters. York County and Casco also have mobile units and Penobscot County is installing equipment for all frequencies and will be ready soon. The City of Gardiner now has a Collins transmitter and HRO receiver with supplementary high frequency gear.

TRAFFIC TOPICS

The other day we were called upon to go through our file of Traffic Net Bulletins — purpose, to reduce the file to a reasonable size to save much-needed filing space in the ARRL-CD filing cabinets. It took us longer than it should have, because we kept stopping to read the various bulletins. Of course we had already read them when they came in, but it's a subject we never tire of.

We think the average amateur — even the average traffic handler — would be surprised to see the number of such bulletins that are received here and the extensiveness of some of them. Some of them are on a subscription basis, but none of them is commercial — that is, the subscription price is to cover (some of) the cost of producing them. Most of them are supported by net members or by the editor himself. We think it is appropriate that we mention a few of the more notable traffic bulletins that cross our desk and to suggest to all concerned that in order to get the full amateur traffic picture you ought to have access to one or another of the traffic bulletins which covers activities in your neck of the woods, to supplement the traffic reading we are able to give you in *QST*.

Probably the most outstanding (of course, it's a matter of opinion) is Vic Gish's (W7FIX) *Pacific Area Net News*. Vic has been publishing this for a number of years, and it is easy to see that an enormous amount of work goes into it. The October issue, for example, contains 29 printed pages on 17 sheets, including a well-written editorial, net reports, rosters, comments from individuals and a supplement which contains rosters of four nets, a TCC flow chart, a summary of Sixth Army MARS Nets, a picture of W6PLG at his operating position, and copies of recent MARS and ARRL bulletins. Besides covering the Pacific Area, PANN also

includes reports and comments from amateur traffic men and nets all over the country.

Another outstanding traffic bulletin is WØUOL's *Midwest Relay*. This is an outgrowth of Mert Meade's (WØKXL-NIY, deceased) *Midwest Clixs*, and deals mostly with traffic matters in the midwestern area. The September issue of this effort contained 15 pages on 8 sheets and makes good reading for any traffic man.

There is no eastern counterpart to these two fine bulletins. The one that comes closest to it is W2GWN's *Watch Words*, the bulletin of the Traffic Hounds Morning Watch, a net of savvy operators that hangs out on 40 meters in the early morning. This is an outgrowth of W4IA's Morning Watch Bulletin which Ev himself edited until government duty called him to foreign climes.

But there are many more bulletins in our files. Just in browsing through them we come across surprisingly sumptuous bulletins of local and regional nets such as the Mission Trail Net *Blazer* (W6KZF), the Oklahoma CW Traffic Net Bulletin (W5JXM), Eastern Penna. *News and Views* (W3PDJ), W4QDY's UTL Bulletin, *The Virginia Ham* (W4KX), the KYN/KPN Bulletin (Ky.), W9KQB's *WIN News* and *The Oregon Netter*. Have we omitted anyone? Oh, no doubt, and we'll hear about it. Many SCMs, RMs and PAMs, not to mention SECs and ECs, get out bulletins to their participants to enhance net participation and performance. Some, like *Florida Skip*, are not entirely devoted to nets, but take other amateur activities into account as well. Others are on a more specialized theme.

Well, we don't intend to slight anyone. The point we are trying to make is that putting out a bulletin is the thing to do. It isn't easy, and you have to find someone willing to do most of the work, but it cannot fail to bind more closely together the members of a net that is already successful, or to bring added participation and success to a net whose fortunes are ebbing. The biggest secret is to find an editor who can grind out an interesting line of patter. Such amateurs aren't available just everywhere, and so some of the bulletins are just dry statistics of interest only to those who are statistical-minded. Even this is better than no bulletin at all.

We are for more, bigger and more interesting net bulletins. If your net doesn't already have one, give some consideration to getting one started. It makes a good supplement to net information in this column and in your SCM's monthly report. It frees you from some of the editorial shibboleths we have to observe in *QST*. And in your own net bulletin you can rant and rave all you want about FCC, ARRL, OCDM or anything else. Your net bulletin is your castle. And when you do get one started, don't forget to put us on your mailing list. We frequently use them for ideas to be developed in *QST*, sometime quote from them directly, and we are always interested, even if we don t often get around to saying so.

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Net Reports. Early Bird Transcon Net reports 30 sessions, 843 messages. Hudson Traffic Net reports 26 sessions, 219 check-ins, 393 messages. Transcontinental Phone Net reports: 1st Call Area, 1439; 2nd Call Area, 1460; 4th, 5th, 9th and 0th Call Areas, 376; total, 3275. North Texas-Oklahoma Net reports 30 sessions, 971 check-ins, 291 messages. Interstate Side Band net reports 30 sessions, 1860 check-ins, 912 messages. The 7290 traffic net reports 38 sessions, 490 messages, 1286 check-ins.

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National Traffic System. The net directory that just came out has 114 nets registered as being a part of NTS. Of these, 39 meet daily, 34 meet six days per week, 19 meet five days per week and 22 meet less than five days per week. Of the latter, a majority can be discounted as being one-day-per-week nets which don't really add much to the system's daily coverage.

There are still some sections that are not represented on NTS by a participating net, while some sections have several nets which make the connection. Those which appear to have no NTS net are Miss., La., South Texas, New Mexico, Arizona, Montana, Idaho, Nevada, Utah, Alberta, Sask., Manitoba, Hawaii, Alaska, West Indies, Canal Zone and, of course, Yukon.

Of the 39 nets which meet daily, 30 are section nets. This is a surprisingly large percentage. Although it is not a majority, we note that eight of the nets at regional and area level constitute a clear majority of such nets. Therefore, we have suggested that NTS be put officially on a daily basis starting as early in 1959 as this is feasible. This does not mean that all nets will henceforth be required (we just don't *use* that word) to meet every day, but that daily operation will become the rule rather than the exception and that those which do not do so will be considered substandard rather than standard NTS nets. Actually, there is no reason why nets should not be able to meet on Saturdays and Sundays as on any other night of the week, and we predict that such operation will bring in many stations (such as those operated by students) who can operate *only* those times. And that's one of the things NTS is for — to bring in the traffic man who cannot be active more than once or twice per week.

November reports:

Net	Sessions	Traffic	Rate	Average	Representation (%)
EAN	24	1204	.931	50.2	95.2
CAN	30	1182	.863	39.4	98.9
PAN	30	1327	.741	44.2	98.9
1RN	30	567	.414	18.9	91.0[1]
2RN	60	628	.395	10.5	95.3
3RN	40	441	.372	11.0	78.3
4RN	47	759	.365	16.2	63.5
RN5	50	621	.354	12.4	92.0
RN6	60	1049	.366	17.5	96.7
RN7	35	421	.283	12.0	30.4
9RN	55	1094	.546	19.8	72.3
TEN	90	1283	.621	14.2	67.2

A.R.R.L. ACTIVITIES CALENDAR

Jan. 24–25: CD Party (phone)
Jan. 31–Feb. 15: Novice Roundup
Feb. 4: CP Qualifying Run — W6OWP
Feb. 6–8: DX Competition (phone)
Feb. 13: Frequency Measuring Test
Feb. 19: CP Qualifying Run — W1AW
Feb. 20–22: DX Competition (c.w.)
Mar. 5: CP Qualifying Run — W6OWP
Mar. 6–8: DX Competition (phone)
Mar. 19: CP Qualifying Run — W1AW
Mar. 20–22: DX Competition (c.w.)
Apr. 1: CP Qualifying Run — W6OWP
Apr. 11–12: CD Party (c.w.)
Apr. 18–19: CD Party (phone)
Apr. 20: CP Qualifying Run — W1AW
May 7: CP Qualifying Run — W6OWP
May 19: CP Qualifying Run — W1AW
June 3: CP Qualifying Run — W6OWP
June 13–14: V.H.F. QSO Party
June 17: CP Qualifying Run — W1AW
June 27–28: Field Day

OTHER ACTIVITIES

The following lists date, name, sponsor, and page reference of *QST* issue in which more details appear.

Jan. 24–25: VE1 Contest, New Brunswick Amateur Radio Assn. (p. 152, last month).

Feb. 1–16: Pittsburgh QSO Party, Golden Triangle ARC (p. 98, this issue).

Feb. 13–14: Anniversary RTTY Contest, RTTY Society of Southern California (p. 84, this issue).

Feb. 14–15: Delaware QSO Party, Delaware ARC (p. 86, this issue).

Feb. 28–Mar. 1: YL-OM Phone Contest, YLRL (p. 65, this issue).

Mar. 13–15: QCWA QSO Party, QCWA Northwest Chapter (next month).

Mar. 14–15: YL-OM C.W. Contest, YLRL (p. 65, this issue).

ECN	19	62	.196	3.2	73.7[1]
TWN	20	239	.256	12.0	64.0[1]
Sections[2]	973	8057	....	8.3	....
TCC Eastern	92[3]	275			
TCC Central	60[3]	1039			
TCC Pacific	100[3]	1148			
Summary	1573	21396	EAN	12.0	CAN/PAN
Record	1439	15097	...	12.6	100.0

[1] Regional net representation based on one session per day. Others are based on two or more daily sessions.

[2] Section nets reporting: 1LN (1LL.), CN & CPN (Conn.); TLCN (Iowa); SCN (Calif.); SMN (Md.); S. Dak 40 phone, S. Dak. 75 phone & S. Dak. CW; WSSN & WIN (Wis.); AENP Morning, AENB & AENT (Ala.); WSN (Wash.); SCN (S. C.); NJN (N. J.); QKS (Kans.); KSN, KPN, MKPN & KYN (Ky.); GN, FMTN & FN (Fla.); N. W. Fla.; WVN (W. Va.); VN (Va.); MJN, MSPN Noon, MSPN Evening & MSN (Min.); QMN (Mich.); CWXN, HNN & Colo. Emerg. Phone (Colo.).

[3] TCC Functions reported, not counted as net sessions.

We are pleased to be able to report that effective Dec. 1, the recently-organized Twelfth Regional Net went on a daily basis. This makes nine of our fifteen regional-area nets operating daily. No doubt others will be coming up to full schedule as time goes on. For TWN in particular it is quite an accomplishment after its so-recent a start. Our compliments to the gang in this new mountain-state region, and may their accomplishments be permanent ones to show others in areas of much greater population density what can be done with a little determination.

W3UE is still having his troubles getting Pennsylvania into the 3RN act, but the net is being bolstered by activities of a new RM in E. Pa. and return of W3PZW to MDD. A 4RN certificate has been awarded to K4UBR. K6HLR sends us a copy of the December RN6 Bulletin and also suggestion for a NCS-ing form for regional nets. Not many comments this month. The net managers seldom say anything unless it is to complain, so this, we think, is good.

Transcontinental Corps. Things are going well, generally speaking. We have some holes developing in the Eastern Area as one former stalwart finds it necessary to drop his schedule and another to curtail his. The present chart shows five functional vacancies in TCC-Eastern, and this will soon increase to eight (out of 28) unless W3WG can find someone to fill them. Central Area functions are all filled, with all schedules being kept and reported. Two functions were not reported in Pacific Area, but most of the schedules are being kept successfully.

October reports:

Area	*Functions*	*% Successful*	*Traffic*	*Out-of-Net Traffic*
Eastern	92	95.7	2169	275
Central	60	93.3	1897	1037
Pacific	100	98.0	2241	1148
Summary	252	96.0	6307	2460

The TCC roster: Eastern Area (W3WG, Dir.) — *W1s* AW EMG NJM TUW, *W2s* HDW VDT, K2SIL, *W3s* COK LXU WG, K4KNP, W9DO. Central Area (WØBDR, Dir.) — W9CXY, *Wøs* LCX SCA BDR LGG. Pacific Area (W6BPT, Dir.) — W5DWB, *W6s* ADB PLG BPT EOT VZT UTV HC ELQ ZRJ YHM, *K6s* DYX ORT EWY HLR GES GID, *W7s* VIU GMC ZB, WØKQD.

ELECTION NOTICE

(To all ARRL members residing in the Sections listed below.)

You are hereby notified that an election for Section Communications Manager is about to be held in your respective Section. The notice supersedes previous notices.

Nominating petitions are solicited. The signatures of five or more ARRL full members of the Section concerned, in good standing, are *required* on each petition. No member shall sign more than one petition.

Each candidate for Section Communications Manager must have been a licensed amateur for at least two years and similarly a full member of the League for at least one continuous year immediately prior to his nomination.

Petitions must be in West Hartford, Conn., on or before noon on the closing dates specified. In cases where no valid nominating petitions were received in response to previous notices, the closing dates are set ahead to the dates given herewith. The complete name, address, and station call of the candidate should be included with the petition. It is advisable that eight or ten full-member signatures be obtained, since on checking names against Headquarters files, with no time to return invalid petitions for additions, a petition may be found invalid by reason of expiring memberships, individual signers uncertain or ignorant of their membership status, etc.

The following nomination form is suggested. (Signers will please add city and street addresses to facilitate checking membership.)

Communications Manager, ARRL. [place and date]
38 La Salle Road, West Hartford, Conn.

We, the undersigned full members of the.....
.....ARRL Section of the.....
Division, hereby nominate.....
as candidate the Section Communications Manager for this Section for the next two-year term of office.

Elections will take place immediately after the closing dates specified for receipt of nominating petitions. The ballots mailed from Headquarters to full members will list in alphabetical sequence the names of all eligible candidates.

You are urged to take the initiative and file nominating petitions immediately. This is your opportunity to put the man of your choice in office.

— *F. E. Handy, Communications Manager*

Section	*Closing Date*	*SCM*	*Present Term Ends*
Yukon*	Feb. 10, 1959	W. R. Williamson	Mar. 17, 1949
West Indies	Feb. 10, 1959	William Werner	Aug. 10, 1958
Idaho	Feb. 10, 1959	Rev. F. A. Peterson	Oct. 10, 1958
Colorado	Feb. 10, 1959	B. E. Spoonemore	Feb. 11, 1959
Michigan	Feb. 10, 1959	Thomas G. Mitchell	Feb. 17, 1959
Hawaii	Feb. 10, 1959	Samuel H. Lewbel	Apr. 10, 1959
Nebraska	Feb. 10, 1959	Charles E. McNeel	Apr. 15, 1959
Los Angeles	Feb. 10, 1959	Albert F. Hill, jr.	Apr. 18, 1959
Wisconsin	Mar. 10, 1959	George Woida	May 12, 1959
Connecticut	Mar. 10, 1959	Victor L. Crawford	May 23, 1959
Oregon	Mar. 10, 1959	Hubert R. McNally	May 28, 1959
Mississippi	Mar. 10, 1959	J. A. Houston, sr.	May 29, 1959
Saskatchewan*	Apr. 10, 1959	Lionel O'Byrne	June 10, 1959
Eastern Pennsylvania	Apr. 10, 1959	Richard B. Mesirov	June 15, 1959
Iowa	Apr. 10, 1959	Russell B. Marquis	June 16, 1959
South Dakota	Apr. 10, 1959	Les Price	July 2, 1959
New York City & Long Island	May 11, 1959	Harry J. Dannals	July 31, 1959

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

ELECTION RESULTS

Valid petitions nominating a single candidate as Section Manager were filed by members in the following Sections, completing their election in accordance with regular League policy, each term of office starting on the date given.

Minnesota	Lydia S. Johnson, WØKJZ	Feb. 17, 1959
Missouri	C. O. Gosch, WØBUL	Mar. 1, 1959

W1AW OPERATING NOTE

The full W1AW operating schedule appeared on page 89 of November 1958 *QST* and on page 94 of last month's issue. Refer to those for details if you wish to work or visit the Headquarters station or copy the bulletins.

CODE PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW will be made on Feb. 19 at 2130 Eastern Standard Time. Identical texts will be sent simultaneously by automatic transmitters on 3555, 7080, 14,100, 21,075, 28,080, 50,900 and 145,600 kc. The next qualifying run from W6OWP only will be transmitted on Feb. 4 at 2100 PST on 3590 and 7128 kc.

Any person can apply. Neither ARRL membership nor an amateur license is required. Send copies of all qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 10 through 35 w.p.m., you will receive a certificate.

If your initial qualification is for a speed below 35 w.p.m. you may try later for endorsement stickers.

Code-practice transmissions are made from W1AW each evening at 2130 EST. Approximately 10 minutes' practice is given at each speed. Reference to texts used on several of the transmissions are given below. These make it possible to check your copy. For practice purposes, the order of words in each line of *QST* text sometimes is reversed. To improve your fist, hook up your own key and audio oscillator and attempt to send in step with W1AW.

Date	Subject of Practice Text from December *QST*
Feb. 3:	*The "Simplex Super" Receiver*, p. 11
Feb. 9:	. . . *1958 Field Day*, p. 46
Feb. 12:	*Yasme II to Aves Island*, p. 72
Feb. 16:	*Originating Message Traffic*, p. 76
Feb. 18:	*From Pole to Pole on 40 Watts*, p. 78
Feb. 26:	*Highball to Eyeball*, p. 210
Feb. 27:	*What Is a DXer?*, p. 220

FREQUENCY MEASURING TEST FEBRUARY 13

ARRL invites every amateur to try his hand at frequency measuring when W1AW transmits signals for this purpose starting at 9:30 P.M. EST (6:30 P.M. PST) Friday, February 13. The signals will consist of dashes interspersed with station identification. These will follow a general message sent to help listeners to locate the signals before the measurement transmission starts. The approximate frequencies used will be 3530, 7096 and 14,134 kc. About 4½ minutes will be allowed for measuring each frequency, with long dashes for measurement starting about 9:36 P.M. It is suggested that frequencies be measured *in the order listed*. Transmissions will be found within 5 or 10 kc. of the suggested frequencies.

At 12:30 A.M. EST, February 14 (9:30 P.M. PST, February 13), W1AW will transmit a second series of signals for the Frequency Measuring Test. Approximate frequencies will be 3567, 7093 and 14,336 kc.

Individual reports on results will be sent to all amateurs who take part and submit entries. When the average accuracy reported shows error of less than 71.43 parts per million, or falls between 71.43 and 357.15 parts per million, participants will become eligible for appointment by SCMs as Class I or Class II OOs respectively.

This ARRL Frequency Measuring Test will be used to aid qualification of ARRL members as Class I and Class II observers. Present observers not demonstrating the requisite average accuracy will be reclassified appropriately until they demonstrate the above-stated minimum required accuracy. Class I and Class II OOs must participate in at least two FMTs each year to hold appointments. SCMs (see listing, page 6) invite applications for Class III and IV observer posts, good receiving equipment being the main requirement. All observers must make use of cooperative notices, reporting activity monthly through SCMs, to warrant continued holding of appointment.

Any amateur may submit measurements on one or all frequencies listed above. No entry consisting of a single measurement will be eligible for *QST* listing of top results. Listing will be based on over-all *average* accuracy, as compared with readings made by a professional lab.

RTTY CONTEST NOTES

The RTTY Society of Southern California announces sponsorship of the *6th Anniversary RTTY SS Contest*. This is to start at 6:00 P.M. EST February 13 and end at midnight EST February 14. Stations will exchange message preambles consisting of message number, originating station's call, check or RST report of two or three numbers, ARRL Section of originator, local time (0000–2400 preferred), date, and band used. Score one point for a message sent and receipted for entirely by RTTY, and one point for a message received and acknowledged by RTTY. For final score, multiply the total message points by the number worked in different ARRL Sections. (Refer to page 6 of this *QST* for listing.) Two stations may make additional exchanges on different bands for added contact points, but the section multiplier does not increase when the same section is reworked on another band. Each foreign country counted by ARRL for DXCC credit is treated also as a new section for RTTY multiplier credit. Logs showing the full tabulation of preamble-exchanges and claimed score should be mailed to Merrill L. Swan, W6AEE, 372 Warren Way, Arcadia, California.

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For March 13 through 15, WØBP gives us advance word of the *3rd Annual Narrow-Shift RTTY Party*. Purpose is to advance RTTY technique by a peaceful operating session of those who can "tinker." If you work RTTY get in this if possible; it's informal, no special starting or ending time. Name your own hours starting Friday afternoon. A QSO-list of those contacts you made abandoning 850-cycle f.s.k. shift and using n.f.s.k. of 300 cycles or less should be sent to the organizers, so results can be reported. In this one a shift of 170 cycles is *preferred*. Reception using a regular TT converter to "straddle" the center of the usual tuning range is possible. However, for *maximum* benefits using real narrow shift, you should build or adjust the receiving setup to work in this narrower frequency range, putting the improved selectivity to work for you. Less bandwidth should mean less interference, and closer to the same fades on mark and space; the test is dedicated to the ability to minimize interference successfully in our shared bands.

HIGH CLAIMED SCORES *1958 A.R.R.L. SWEEPSTAKES*

While you SSers breathlessly await the official results of last November's contest, we present an assortment of the highest tallies which includes all valid c.w. entries above 160,000 and phones over 100,000 points. Figures after each call are *claimed* score, number of QSOs, and different sections worked in that order. The power level is indicated by letters; A is 150 watts or less, B higher.

C. W.

W4KFC	237,158-1303-73-A	W3TMZ/3	183,060-1017-72-A
W3JNQ	223,563-1225-73-A	W3AEL	182,880-1016-72-A
W3BES	223,471-1225-73-A	W1BIH	180,036- 990-73-A
K4LPW	219,000-1200-73-A	WØTKX	179,630-1012-71-A
W3EIS	217,540-1192-73-A	W1EOB	178,558-1223-73-B
W9VXO	212,040-1178-72-A	W9IRH	177,210- 988-72-A
WØYCR	209,328-1153-73-A	W2ZSM	176,750-1010-70-A
W3GAU	206,773-1146-73-A	W4CXA	176,400- 981-72-A
W3GHM	205,130-1124-73-A	W4RQR	175,612- 967-73-A
W3ALB	201,480-1104-73-A	K4GEZ	174,652- 965-73-A
W5YDC	200,750-1100-73-A	W4PNK	174,150- 970-72-A
W8LQA	198,560-1088-73-A	W8OYI	172,767- 973-71-A
W9RQM	198,540-1104-72-A	W1TYQ	172,530- 978-71-A
W3FYS[1]	194,362-1065-73-A	W1AW[2]	171,110-1205-71-B
W1FEA	193,770-1084-72-A	W6TT	169,560- 932-72-A
K6SXA	193,632-1061-73-A	W3CPS	169,543- 960-73-A
WØPHR	193,550-1106-70-A	W3VAN	168,265-1153-73-B
K9CAN	191,260-1048-73-A	W7YGN	167,353- 933-73-A
K5DGI	188,887-1035-72-A	W3MSR	166,824-1160-72-B
W7KEV	188,860-1071-71-A	W2AYJ	166,440- 912-73-A
W1JYH	186,150-1275-73-B	W8SDJ[1]	166,258- 911-73-A
W2SSC	185,602-1017-73-A	W4JAT	166,075- 911-73-A
W3KLA	184,598-1010-73-A	W9DYG	163,976- 902-73-A
W2DMJ	184,500-1025-72-A	K6CEF	160,105- 903-71-A
W9LVR/9	183,230-1004-73-A	W7HMQ	160,020- 889-72-A

PHONE

K6EVR	220,314-1012-73-A	K5EDM	115,815- 559-70-A
W6PQW	188,595- 960-66-A	W5INL	113,715- 546-70-A
K5MDX	179,690- 821-73-A	W7OVA	112,992- 589-64-A
W6LNW	174,528- 809-72-A	W9DUB	112,895- 471-73-A
W5DQK	170,542- 779-73-A	W5IWL	108,216- 503-72-A
W7BSW	142,445- 655-73-A	W3ECR	107,967- 493-73-A
K9ALP	142,350- 650-73-A	WØPRZ	107,529- 738-73-B
W7ZCA	138,600- 660-70-A	K2BHP	106,122- 515-69-A
K4SXO	137,642- 640-73-A	W7UWT	106,088- 516-69-A
W8AJW	134,136- 625-72-A	W8VOW/8	105,735- 506-70-A
WØCYT	132,057- 603-73-A	K6ERV	105,570- 521-68-A
KØRNZ	126,931- 652-67-A	K6OOW	103,838- 535-65-A
W5MYI	126,735- 605-70-A	W1KBN[1]	103,248- 722-72-B
W5KC	123,916- 617-67-A	W7IKK	103,194- 546-63-A
W7WDM	123,690- 604-70-A	K6CHE	102,900- 492-70-A
K6DDO	123,480- 588-70-A	K8KLI	102,168- 475-72-A
W1EKO	122,040- 574-72-A	KØHEM	100,601- 503-67-A
W4FGH	120,360- 590-68-A	W7DTB	100,232- 748-67-B
K9ATZ	116,070- 530-73-A		

[1] Multiple-operator station. [2] W1WPR, opr.

QST will carry a full report on the 25th Sweepstakes when the checking is completed. Patience, please.

TRAINING AIDS NOTE

Only affiliated clubs are eligible to obtain ARRL Training Aids. We certainly wish we could grant all requests, but for the present this is too wide a field to embrace. At this writing there are over 1,000 active clubs affiliated with the League and they're really keeping the TA desk humming!

If your group is a bona fide amateur radio club desiring to use the material mentioned here, there is but one course of action open to you: apply for affiliation! It is a simple matter to accomplish. Complete information is available on request from the Communications Department.

Summary of Available Material: From time to time we have listed additions to available material in *QST*. We will continue to do this. However, a complete and up-to-date copy of available aids in mimeo form is yours for the asking. Meanwhile, let's summarize what is available:

38 film titles (16 mm. only)
14 film strips (35 mm.)
3 *slide collections*
2 tape-talks on v.h.f.
1 tape-talk by Dr. Lee De Forest *
12 quizzes with answers and discussion
List of up-to-date material, some with reviews

The above material, of course, has to be scheduled in turn to take care of the current heavy demand.

Charges? The club pays only for handling and shipping of the material. Rules for use of Training Aids are available upon request, and *must* be carefully read and adhered to by all affiliated clubs.

* Dr. De Forest recounts many of his early experiences in radio and thanks amateurs for their thoughtfulness on remembering his birthday (p. 10, last December *QST*).

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CONTEST CORRECTIONS: 1958 DX Competition (last October *QST*) — K2DQB's call, 25,876 points N.N.J. c.w., was mistakenly shown as K2DOB. The Georgia Section heading was dropped from the c.w. tabulation; W4BFR, 64,170 points, should have been indicated as Georgia winner and the nine K4/W4 calls that follow are also Georgia, not Western Florida entries. (2) June V.H.F. Party Summary (last October *QST*) — The nine-operator entry of K9GAJ/9, 840 points, 10 multiplier, 84 QSOs on 50 Mc. should have appeared in the Wisconsin listing. (3) 1958 Field Day Results (December, 1958, *QST*) — Score data on W3LDV/3 of Anthracite Wireless Association was correct but should have appeared in the one- rather than the seven-transmitter Class A tabulation. Omitted was the Class 1A score of WØFFN/Ø, nonclub group, 218 contacts, B power, 6 participants, 1458 points.

DX CENTURY CLUB AWARDS

HONOR ROLL

W1FH.....290	W8HGW....282	ZL1HY....280
W6AM.....288	W3JNN....282	W2HUQ....280
ZL2GX....287	W2AGW....282	W6DQZ....280
KV4AA....286	W6SNG....281	W6CUQ....280
W3GHD....286	W2BXA....281	W9RBI....280
PY2CK....284	W3KT.....281	W8DMD....280
W8BRA....283	G3AAM....280	W1ME.....279
W8JIN....283	G2PL.....280	W6MX.....279
W5ASG....283		W5ADZ....279

Radiotelephone

PY2CK....284	ZS6BW....275	W9RBI....269
W8GZ.....278	W3JNN....271	W8HGW....267
W1FH.....277	W8BF.....270	CN8MM....264
VQ4ERR...276	ZL1HY....269	W8KML....264

From November 1, to December 1, 1958 DXCC certificates and endorsements based on postwar contacts with 100-or-more countries have been issued by the ARRL Communications Department to the amateurs listed below.

NEW MEMBERS

WØGUS....212	VE7KJ.....109	G3FST.....102
W3ELZ.....177	K9BCK.....107	W2AHL.....101
W2BTA.....142	DL2YU.....107	W38FC.....101
OH3FS.....141	GC2CNC....106	W4HBK.....101
W6BIF.....139	SM5BVF....106	W7IWH.....101
PAØCE.....137	CN8FD.....105	K9CJK.....101
W5FJE.....126	K2UBA.....104	PJ2ME.....101
OA7I.....124	W7MCK.....104	W2UNS.....100
W3MYL.....123	4X4GY.....104	K2ZAU.....100
VE3DR.....120	W1RST.....103	W6BIZ.....100
W1DGT.....115	W2MNR.....103	K6SHJ.....100
W3CA.....114	W4UQ.....103	W7PJK.....100
EA4GA.....113	K6CTV.....103	W8OHV.....100
OZ7BZ.....113	W8UQP.....103	W7KOF.....100
W8TQY.....112	DL3DD.....103	W8FIT.....100
OZ1JW.....112	PI1RRS....103	SM7BPO....100
SV1AA.....110	W1UGW.....102	ZS8I.....100
	K5KBH.....102	

Radiotelephone

W3WGH....120	W3LEZ.....102	G3MCN....101
EI3R.....118	W1HGA.....101	JA1ACB....101
K9ATZ.....117	W3BNU.....101	K2EAD.....100
PY7YT.....111	W8OUH.....101	W9VRV.....100
K2MGE.....110	W8ZNO.....101	KØGUM.....100
K1DRN.....107	W9CVU.....101	DL4MN.....100
	G3AG.....101	

ENDORSEMENTS

W2LPE....273	W2CYS.....240	G8KS.....217
W9KOK....273	W5UX.....240	W2AEB.....213
W2WZ.....270	W8AFR.....240	W3RNQ.....212
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must be addressed to Canadian Director Alex Kew

• All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

ATLANTIC DIVISION

EASTERN PENNSYLVANIA—SCM, Richard B. Mesirov, W3JNQ—The SCM has been laboring under optical difficulties; expected improvement in conditions should permit your reports to be combined for full activities information in *QST* next month.

MARYLAND—DELAWARE—DISTRICT OF COLUMBIA—SCM, Louis T. Croneberger, W3UCR—Asst. SCM for Delaware: Ray de Courcelle, 3DQZ. SEC: YYB. New appointments: PQ as RM; KLA, ZAQ and K3CBQ as OOs. Section Nets: MDD, 3650 kc. M-S 1915; MEPN 3820 kc. M-W-F 1800, SS 1300; DelEN, 3905 kc. Sat. 1830; Maryland Six-Meter Emergency Net, 50.25 Mc. Wed. 2100. Paul Himelright showed his 16-mm. movies of a 1956 hunting trip north of Anchorage, Alaska, at the Nov. 7 meeting of the WMRC. W6QYL, Martha, won a "Ten-Meter Vertical Antenna Kit," which consisted of a large box with a number of empty beer cans and a new soldering iron. The WMRC hidden transmitter hunt held Nov. 16 was won by 4ZLN, CMX, with K8BKZ as co-pilot, was the runner-up. The RCARA meeting of Nov. 14 had OBR as the guest speaker and Nate spoke on "Some of the Special Circuits Utilized in His Work at NIH." The Greenbelt ARC's new officers are FDI, pres.; FRK, vice-pres.; IWJ, secy.; and FUO, treas. MEPN elected JNX as director and reelected NNM as NCM. JNX has taken over as the *Auto Call* reporter for the net and TUX has been appointed secretary. The NCVHF Society has joined the many clubs using *Auto Call* as its bulletin. The NCVHFs adopted the calling frequency of 50.55 Mc. for the D. C. Area. The club also changed its net frequency from 50.4 to 51.9 Mc. The net will continue to meet Tue. at 2000. The new WAYLARC officers are CDQ, pres.; RXJ, vice-pres.; UTR, secy.; and UXU, treas. PGB keeps skeds weekly with OA4AGI. Scotty has a new 75S-1 on the way. WU completed his WAZ with HS1C, while TMZ completed his by working XW8AI. Both are waiting to see who gets his QSL first. GNQ has dessert h.f. s.s.b. for 6-meter A.M. K3EFF is looking forward to leaving the USAF after 20 years of military service. ZAR/DL4ACN was home for Thanksgiving visiting his dad, K3BYR. LJV is the proud owner of a new Apache. ECZ/MM, on the *Santa Monica*, was in Baltimore and visited with ZCK and K3CNY before sailing again. WMX is active again on 10 meters using a DX-100. DTY has just finished rebuilding his 500-watt all-band transmitter. K3GDB is on 6 meters with a Communicator III. JDF is on 50 Mc. with 50 watts, 220 Mc. with 25 watts and 432 Mc. with 50 watts to a coaxial tank 4X150. QLG skeds ex-RRT in Denver, Colo. every Sun. at 1100 on 10 meters. PGA, AARC station, is on every Wed. evening on 2 meters with a Communicator. UE. BUD, CVE and K3WBJ made BPL for the second month running. Word is that Baltimore soon may be represented again on the MDD with KLA taking a try at traffic. TN had a nice write-up on traffic in Dec. *QST*. Dave (TN) reports that HC and EEB have been representing Delaware lately on the MDD. CQX reports an increase of activity on 6 meters in the Hagerstown Area. KØROD, ex-MIUK (former chief operator at PQT, NAS Patuxent) is now active at NAS, Olathe, Kan. PZW/KB6BJ is back home in the D. C. Area. KG6AGX is now living in Rockville, Md. LJV scored tops in the Sept. F.M.T. with an average measurement of 3.2 p.p.m. and MSR was second at 18.9 p.p.m. DOV and SLS are now getting settled in their Westport, Conn., home. NJT has been heard working the West Coast and VE7AQQ on 6 meters. KAV, formerly of Cumberland and Baltimore, is working on the same ships as UCR at Portsmouth, Va. Activity reports are due the fifth of the month. V.h.f. traffic men: Support your section nets. Traffic: (Nov.) W3UE 511, K3WBJ 323, W3BUD 229, CVE 186, PQ 147, TN 128, COK 88, CN 32, EEB 10, KA 6, CQX 3, BKE 2. (Oct.) W3NNM 102.

SOUTHERN NEW JERSEY—SCM, Herbert C. Brooks, K2BG—SEC: W2YRW. RMs: W2BZJ, W2HDW, W2-YRW and W2ZI. Appointment this month: W2KFC, Haddonfield, as Official Observer. With regret I report the passing of W2VQC. NJN handled 386 in November. K2OOK was top traffic-handler for November. K2EFA, Cumberland Co. EC, is affiliated with TCPN, NJN, NJFN, 2RN, EAN, Interstate S.S.B. Net and MARS. W2YRW, K2MBT and K2DEI/K3DDT have daily skeds with Cape Christian, Baffin Island. K2SOL, Sewell, has a new beam on 10 meters. W2ZI soon will be on the air from his new QTH. Gibbstown has a new Novice, WV2-CVW. K2JJC, Pitman, hopes to have a new rig on the air soon. The Burlington County Radio Club elected the following for '59: K2GX, pres.; W2GOK, vice-pres.; W2UA, treas; and K2IJC, secy. The South Jersey Radio Association's new officers are W2JAV, pres.; K2MBT, vice-pres.; K2KCI, secy.; and K2BG, treas. K2BZK has moved to Somerdale. K2UQD's new QTH is Haddonfield. Delaware Twp. C.D. Headquarters was the center of activities during recent Operation "Post Attack." Fifty

(Continued on page 98)

FOURTH DELAWARE QSO PARTY

February 14 and 15

The Delaware Amateur Radio Club of Wilmington announces its 4th Delaware QSO Party and invites all amateurs to participate. Delaware hams are urged to work as many out-of-state stations as possible, so that those interested can earn credit toward WAS and the W-DEL certificate. Here are the details:

(1) Time: 30-hour period from 6 P.M. EST Saturday February 14 to midnight EST Sunday, February 15.

(2) No time limit and no power restrictions.

(3) Scoring: *Delaware stations:* 1 point per contact and multiply total by the number of states, U. S. Possessions, Canadian provinces and foreign countries worked during the contest period. *Outside stations:* 5 points for each Delaware station worked and multiply total by the number of counties in Delaware worked during the contest period.

(4) Credit for contests with the same station on another band will be given.

(5) A certificate will be awarded to the highest-scoring station in each state, U. S. Possession, Canadian Province and foreign country (with 3 or more contacts) and to the highest-scoring station in each Delaware county. In addition, a W-DEL certificate will be sent to any station working all 3 Delaware counties. Party logs showing required data will be accepted in lieu of QSLs.

(6) Watch 3530, 3700, 3905, 7030, 7150, 7275, 14,100, 14,250, 21,100, 21,400, 28,100 and 29,520, and 50 and 144 Mc. for contest stations.

(7) General Call: "CQ DEL." Delaware c.w. stations should identify themselves by signing *de DEL (call) K*. Phones say, "Delaware calling."

(8) Contact information required: Delaware stations send number of QSO, RST or RS and county (New Castle, Kent or Sussex). All others send number of QSO, RST or RS report, and state, possession, province, or country.

(9) Logs and scores must be postmarked not later than March 1, 1959 and should be sent to the Delaware Amateur Radio Club, c/o Gordon R. Rugg, W3TXY, 611 W. 27th St., Wilmington 2, Delaware.

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.

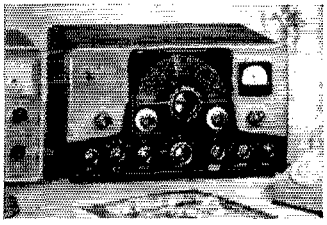
Bear in mind — we have no way of knowing what you want — unless you tell us. So, from here on out think of this as your page, with the facilities of our entire company at your disposal.

Bud Hallgren Jr. W. J. Hallgren W9AC for **hallicrafters**

XYL OR OM... THEY'LL ALL TELL YOU...

Viking transmitters

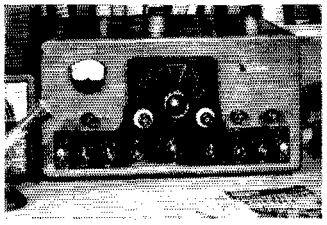
Yes, dollar-for-dollar and feature-for-feature you'll get more of everything in a Viking transmitter... that's why Viking transmitters outsell all others! Write for your free Viking Amateur Catalog and you'll soon see why your best transmitter buy is a Viking!



"RANGER" TRANSMITTER/EXCITER

This popular, superbly engineered transmitter also serves as an RF/audio exciter for high power equipment. 75 watts CW or 65 watts phone input. Built-in VFO or crystal control—instant bandswitching 160 through 10. 6146 final amplifier—wide range pi-network output. Timed sequence keying. TVI suppressed. With tubes, less crystals.

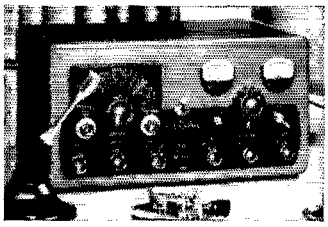
Cat. No.	Amateur Net
240-161-1..Kit	$229.50
240-161-2..Wired and tested..	$329.50



"VALIANT" TRANSMITTER

Here's effective power, wide flexibility, and many unique operating features combined in a compact desk-top transmitter! 275 watts input CW and SSB (P.E.P. with auxiliary SSB exciter) and 200 watts phone. Bandswitching 160 through 10. Built-in VFO or crystal control. Final amplifier utilizes three 6146 tubes in parallel—wide range pi-network output. With tubes, less crystals.

Cat. No.	Amateur Net
240-104-1..Kit	$349.50
240-104-2..Wired and tested..	$439.50



"FIVE HUNDRED" TRANSMITTER

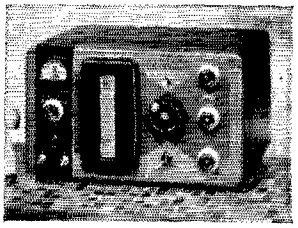
More than one-half kilowatt of power and operating convenience! 600 watts CW input . . . 500 watts phone and SSB (P.E.P. with auxiliary SSB exciter)—instant bandswitching 80 through 10 meters! All exciter stages ganged to VFO tuning. High gain push-to-talk audio system. Highly stable, built-in VFO or crystal control. Wide range pi-network output. Low level audio clipping—effectively TVI suppressed. With tubes, less crystals.

Cat. No.	Amateur Net
240-500-1..Kit	$749.50
240-500-2..Wired	$949.50

E. F. JOHNSON COMPANY

2802 SECOND AVENUE S.W.

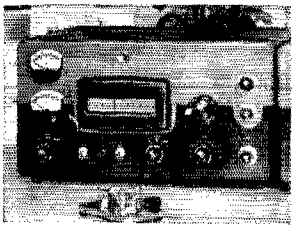
outsell all others!



"COURIER" AMPLIFIER

This power-packed Class B linear amplifier is rated 500 watts P.E.P. input with aux. SSB exciter—500 watts CW and 200 watts AM! Continuous coverage 3.5 to 30 mcs. May be driven by the Viking "Ranger", "Pacemaker" or other unit of comparable output. Drive requirements: 5 to 35 watts. Employs two 811A triodes in parallel —wide range pi-network. TVI suppressed. With tubes.

Cat. No.	Amateur Net
240-352-1..Kit	$244.50
240-352-2..Wired	$289.50



"THUNDERBOLT" AMPLIFIER

Here's real power and peak performance in a compact desk-top amplifier. Rated 2000 watts P.E.P.* input SSB; 1000 watts CW; 800 watts AM linear! Continuous coverage 3.5 to 30 mcs.—instant band-switching. May be driven by the "Ranger", "Pacemaker" or other unit of comparable output. Two 4-400A tetrodes in parallel, bridge neutralized. Wide range pi-network output. With tubes.

Cat. No.	Amateur Net
240-353-1..Kit	$524.50
240-353-2..Wired	$589.50

"KILOWATT" AMPLIFIER

Here's the most exciting unit you've ever seen... the unit that puts the whole world at your fingertips! Brilliantly designed and engineered, the Viking "Kilowatt" is *the only power amplifier available which will deliver full 2000 watts SSB** input and 1000 watts CW and AM! Continuous coverage 3.5 to 30 mc. Excitation requirements: 30 watts RF and 10 watts audio for AM; 10 watts peak for SSB.

Cat. No. 240-1000..Wired and tested.....$1595.00 Amateur Net

Cat. No. 251-101-1..Matching top, back and pedestal..FOB Corry, Pa. $132.00 Amateur Net

**The FCC permits a maximum of one kilowatt average power input for the amateur service. In SSB operation under normal conditions this results in peak envelope power inputs of 2000 watts or more depending upon individual voice characteristics.*

"PACEMAKER" TRANSMITTER/EXCITER

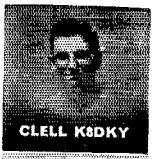
An outstanding power bargain when used as a transmitter or exciter! 90 watts SSB P.E.P. and CW input... 35 watts AM. Highly stable built-in VFO. Instant band-switching 80, 40, 20, 15 and 10 meters. VOX and anti-trip circuits. Wide range pi-network output. Effectively TVI suppressed. With tubes and crystals.

Cat. No. 240-301-2..Wired .....$495.00 Amateur Net

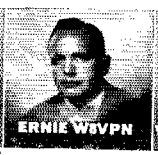
Viking

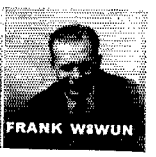
FIRST CHOICE AMONG THE NATION'S AMATEURS

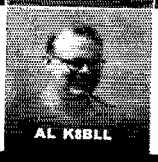
WASECA, MINNESOTA



All of these licensed radio amateurs make important contributions to the Heath line of fine ham kits. In a sense, they are your personal representatives within the company, because their design ideas and performance preferences reflect not only their own "on-the-air" experiences, but those of the amateur fraternity with which they are in constant contact. With this kind of representation in Benton Harbor, you can continue to rely on high-performance Heathkit amateur radio equipment designed by hams, for hams!







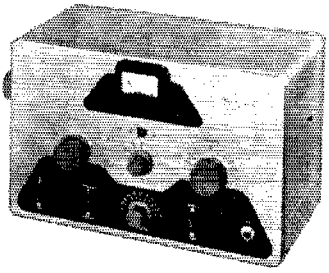
HEATH *hams work to bring you*

ROGER MACE (W8MWZ)
SENIOR HAM ENGINEER
HEATH COMPANY

HEATHKIT 50-WATT CW TRANSMITTER KIT

MODEL DX-20

$35.95



If high efficiency at low cost in a CW transmitter interests you, you should be using a DX-20! It employs a single 6DQ6A tube in the final Amplifier stage for plate power input of 50 watts. The oscillator stage is a 6CL6, and the rectifier is a 5U4GB. Single-knob band-switching is featured to cover 80, 40, 20, 15, 11 and 10 meters, and a pi network output circuit matches antenna impedances between 50 and 1000 ohms to reduce harmonic output. Designed for the novice as well as the advanced class CW operator. The transmitter is actually fun to build, even for a beginner, with complete step-by-step instructions and pictorial diagrams. All the parts are top-quality and well rated for their application. "Potted" transformers, copper-plated chassis, and ceramic switch insulation are typical. Mechanical and electrical construction is such that TVI problems are minimized. If you desire a good clean CW signal, this is the transmitter for you! Shpg. Wt. 19 lbs.

HEATHKIT "APACHE" HAM TRANSMITTER KIT

- Newly Designed VFO—Provision For S.S.B. Adapter
- Modern Styling—Rotating Slide Rule Dial

MODEL TX-1 **$229.50** *Shipped motor freight unless otherwise specified. $50.00 deposit required on C.O.D. orders.*

Fresh out of the Heath Company laboratories, the brand-new "Apache" model TX-1 Ham Transmitter features modern styling and is designed as a handsome companion to the also-new Heathkit "Mohawk" receiver. The "Apache" is a high quality transmitter operating with 150 watt phone input and 180 watt CW input. In addition to CW and phone operation, the "Apache" features built-in switch selected circuitry providing for single-sideband transmission through the use of a plug-in external single-sideband adapter. These Heathkit adapters will be available in the near future. A compact, stable and completely redesigned VFO provides low drift frequency control necessary for single-sideband transmission. An easy-to-read slide rule type illuminated rotating VFO dial with vernier tuning provides ample bandspread and precise frequency setting. Simple band-switching control allows flip-of-the-wrist selection of the amateur bands on 80, 40, 20, 15 and 10 meters (11 M with crystal control). The "Apache" features adjustable low level speech clipping and a low distortion modulator stage employing two of the new 6CA7/EL-34 tubes in push-pull class AB operation. Time sequence keying is provided for "chirpless" break-in CW operation. The final amplifier is completely enclosed in a perforated aluminum shielding for greater TVI protection and transmitter stability. Cabinet comes completely preassembled with top hatch for convenient access without taking chassis out of cabinet. Die-cast aluminum knobs and front panel escutcheons add to the attractive styling of the transmitter. Pi network output coupling matches antenna impedances between 50 and 72 ohms. Incorporates all the refinements necessary with many "plus" features for effective and dependable communications. Shpg. Wt. 115 lbs.

...top quality at lowest prices!

HEATHKIT "MOHAWK" HAM RECEIVER KIT

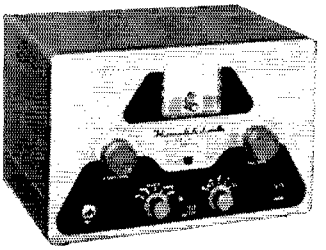
- All Critical Circuits Prewired and Aligned
- Crystal Controlled Oscillators for Drift-Free Reception

MODEL RX-1 **$274.95** *Shipped motor freight unless otherwise specified. $50.00 deposit required on C.O.D. orders.*

Outstanding results can be expected with the new "Mohawk" receiver which is designed to combine all the necessary functions required in a high quality communications receiver. A perfect companion for the Heathkit "Apache" transmitter, the "Mohawk" features the same wide-band slide rule type vernier tuning and covers all of the amateur bands from 160 through 10 meters on seven bands with an extra band calibrated to cover 6 and 2 meters using a converter. External receiver powered, accommodations are available for these converters which will be available in Heathkits soon. The "Mohawk" is specially designed for single-sideband reception with crystal controlled oscillators for upper and lower sideband selection. A completely preassembled, wired and aligned front end assures ease of assembly. All critical wiring is done for you insuring top performance. This 15-tube receiver features double conversion with IF's at 1682 kc and 50 kc. Five selectivity positions from 5 kc to 500 CPS. A bridged T-notch filter is employed for maximum heterodyne rejection. Complete accuracy is obtained with the use of a built-in 100 kc crystal calibrator and the set features 10 db signal-to-noise ratio at less than 1 microvolt input. S-meter and many other fine features built-in for top-notch signal reception. Shpg. Wt. 90 lbs.

HEATH COMPANY A Subsidiary of Daystrom, Inc. BENTON HARBOR 9, MICH.

HEATHKIT PHONE & CW TRANSMITTER KIT



MODEL DX-40 **$64.95**

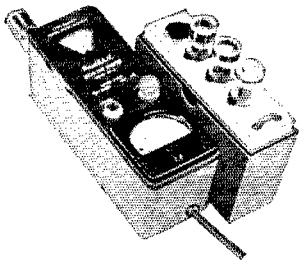
The DX-40 incorporates the same high quality and stability as the DX-100, but is a lower powered rig for crystal operation, or for use with an external VFO. Plate power input is 75 watts on CW, permitting the novice to utilize maximum power. An efficient, control-carrier modulator for phone operation peaks up to 60-watts, so that the rig has tremendous appeal to the general class operator also. Single-knob switching covers 80, 40, 20, 15, 11 and 10 meters. Pi network output coupling makes for easy antenna loading, and pi network interstage coupling between the buffer and final amplifier improves stability and attenuates harmonics. A line filter is incorporated for power line isolation. The efficient oscillator and buffer circuits provide adequate drive to the 6146 final amplifier from 80 to 10 meters, even with an 80-meter crystal. A drive control adjustment is provided, and the function switch incorporates an extra "tune" position so that the buffer stage can be pretuned before the final is switched on. A switch selects any of three crystals, or a jack for external VFO. High quality D'Arsonval meter for tuning. Shpg. Wt. 26 lbs.

HEATHKIT DX-100 PHONE & CW TRANSMITTER KIT

MODEL DX-100 **$189.50** Shipped motor freight unless otherwise specified. $50.00 deposit required on C.O.D. orders.

You get more for your transmitter dollar when you decide on a DX-100 for your ham shack! Recognized as a leader in its power class, the DX-100 offers such features as a built-in VFO, built-in modulator, TVI suppression, pi network output coupling to match a variety of antenna impedances from 50 to 600 ohms, pi network interstage coupling, and high quality materials throughout. Copper plated 16-gauge steel chassis, ceramic switch contacts, etc., are typical of the kind of parts you get, in assembling this fine rig. The DX-100 covers 160, 80, 40, 20, 15, 11 and 10 meters with a single bandswitch, and with VFO or crystal operation on all bands. RF output is in excess of 100 watts on phone and 120 watts on CW, with a pair of 6146 tubes in parallel for the final amplifier, modulated by a pair of 1625 tubes in parallel. VFO tuning dial and panel meter are both illuminated for easy reading, even under subdued lighting conditions. Attractive front panel and case styling is completely functional, for operating convenience. Designed exclusively for easy step-by-step assembly. No other transmitter in this power class combines high quality and real economy so effectively. Here is a transmitter that you will be proud to own. Time payments are available! Shpg. Wt. 107 lbs.

more fine ham gear from the pioneer



HEATHKIT GRID DIP METER KIT

A Grid Dip Meter is basically an RF Oscillator used to determine the frequency of other Oscillators, or tuned circuits. Numerous other applications such as pretuning, neutralization, locating parasitics, correcting TVI, adjusting antennas, designing new coils, etc. Features continuous frequency coverage from 2 MC to 250 MC, with a complete set of prewound coils, and a 500 ua panel meter. Has sensitivity control and a phone jack for listening to the "Zero-Beat". It will also double as an absorption-type wave meter. Shpg. Wt. 4 lbs.

MODEL GD-1B **$21.95**

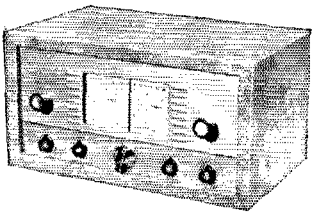
Low frequency coil kit: two extra plug-in coils extend frequency coverage down to 350 KC.
Shpg. Wt. 1 lb. No. 341-A $3.00

HEATH COMPANY A Subsidiary of Daystrom, Inc. BENTON HARBOR 9, MICHIGAN

HEATHKIT ALL-BAND COMMUNICATIONS-TYPE RECEIVER KIT

Ideal for the short wave listener or beginning amateur, this Receiver covers 550 KC through 30 MC in four bands. It provides good sensitivity and selectivity, combined with fine image rejection. Amateur bands are clearly marked on the illuminated dial scale. Features transformer type—power supply—electrical band spread—antenna trimmer—separate RF and AF gain controls—noise limiter—internal 5½" speaker—head phone jack and AGC. Has built-in BFO for CW reception. An accessory power socket is also provided for connecting the Heathkit model QF-1 Q Multiplier. Will supply 250 VDC at 15 ma and 12.6 VAC at 300 ma. Shpg. Wt. 12 lbs.
Cabinet: Fabric covered cabinet with aluminum panel as shown part 91-15A. Shpg. Wt. 5 lbs. **$4.95**

MODEL AR-3
$29.95

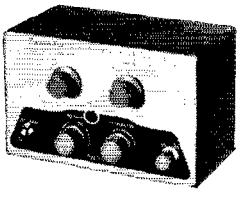


ALL-BAND RECEIVER

HEATHKIT ELECTRONIC VOICE CONTROL KIT

Here is a new and exciting kit that will add greatly to your enjoyment in the ham shack. Allows you to switch from Receiver to Transmitter merely by talking into your microphone. Lets you operate "break-in" with an ordinary AM transmitter. A terminal strip is provided for Receiver and speaker connections and also for a 117 volt antenna relay. Unit is adjustable to all conditions by sensitivity and gain controls provided. Easy to build with complete instructions provided. Requires no transmitter or Receiver alterations to operate. Shpg. Wt. 5 lbs.

MODEL VX-1
$23.95

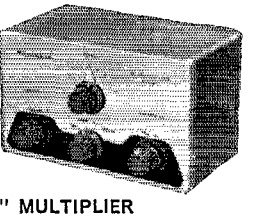


ELECTRONIC VOICE CONTROL

HEATHKIT "Q" MULTIPLIER KIT

This fine Q Multiplier is a worthwhile addition to any communications, or Broadcast Receiver. It provides additional selectivity for separating signals, or will reject one signal and eliminate a hetrodyne. Functions with any AM Receiver having an IF frequency between 450 and 460 KC that is not AC-DC type. Operates from your Receiver power supply, and requires only 6.3 VAC at 300 ma (or 12.6 VAC at 150 ma), and 150 to 250 VDC at 2 ma. Simple to connect with cable and plugs supplied. Effective Q of approximately 4000 for sharp "peak" or "null". A tremendous help on crowded phone or CW bands. Shpg. Wt. 3 lbs.

MODEL QF-1
$9.95



"Q" MULTIPLIER

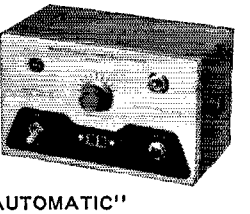
NOTE: $10.65 WHEN ORDERED WITH AR-3 BECAUSE OF EXCISE TAX.

...in do-it-yourself electronics!

HEATHKIT "AUTOMATIC" CONELRAD ALARM KIT

Designed to give instant warning whenever a monitored station goes off the air, the CA-1 automatically cuts the AC power to your transmitter, and lights a red indicator. Works with any radio receiver; AC-DC—transformer operated—battery powered, so long as the receiver has AVC. A manual "reset" button is provided to reactivate the transmitter. Incorporates a heavy-duty 6-ampere relay, a thyratron tube, and its own built-in power supply. A neon lamp shows that the alarm is working. Simple to install and connect with complete instructions provided for assembly and operation. Shpg. Wt. 4 lbs.

MODEL CA-1
$13.95



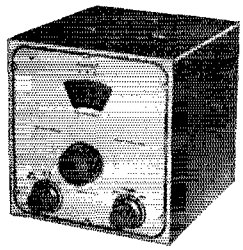
"AUTOMATIC" CONELRAD ALARM

HEATHKIT VARIABLE FREQUENCY OSCILLATOR KIT

Enjoy the convenience and flexibility of VFO operation by obtaining this fine variable frequency oscillator. It covers 160-80-40-20-15-11 and 10 meters with three basic oscillator frequencies. Better than 10 volt average RF output on fundamentals. Requires 250 volts DC at 15 to 20 ma, and 6.3 VAC at 0.45 a, available on most transmitters. It features voltage regulation for frequency stability, and has illuminated frequency dial. VFO operation allows you to move out from under interference and select the portion of the band you want to use without having to be tied down to only 2 or 3 frequencies through the use of crystals. "Zero in" on the other fellows signal and return his CQ on his own frequency! Shpg. Wt. 7 lbs.

MODEL VF-1

$19.50



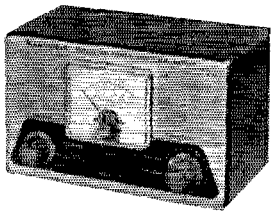
VARIABLE FREQUENCY OSCILLATOR

HEATHKIT REFLECTED POWER METER KIT

A necessity in every well equipped ham shack, the model AM-2 lets you check the match of the antenna transmission system, by measuring the forward and reflected power or standing wave ratio. Handles up to one kilowatt of energy on all bands from 160 to 2 meters, and may be left in the antenna system feed line at all times. Input and output impedances for 50 or 75 ohm lines. No external power required for operation. Meter indicates percentage forward and reflected power, and standing wave ratio from 1:1 to 6:1. Shpg. Wt. 3 lbs.

MODEL AM-2

$15.95



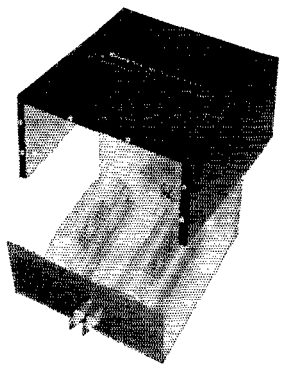
REFLECTED POWER METER

HEATHKIT BALUN COIL KIT

This convenient transmitter accessory has the capability of matching unbalanced coax lines, used on most modern transmitters, to balanced lines of either 75 or 300 ohms impedance. Design of the bifilar wound Balun Coils will enable transmitters with unbalanced output to operate into balanced transmission line, such as used with dipoles, folded dipoles or any balanced antenna system. Can be used with transmitters and Receivers without adjustment over the frequency range of 80 through 10 meters. Will handle power inputs up to 200 watts. Shpg. Wt. 4 lbs.

MODEL B-1

$8.95



BALUN COIL

save ½ or more . . . with HEATHKITS

FREE 1958 Catalog

Send for this Free informative catalog listing our entire line of kits, with complete schematics and specifications.

☐ **Rush Free 1958 catalog.**

HEATH COMPANY

BENTON HARBOR 9, MICH. a subsidiary of Daystrom, Inc.

name _____

address _____

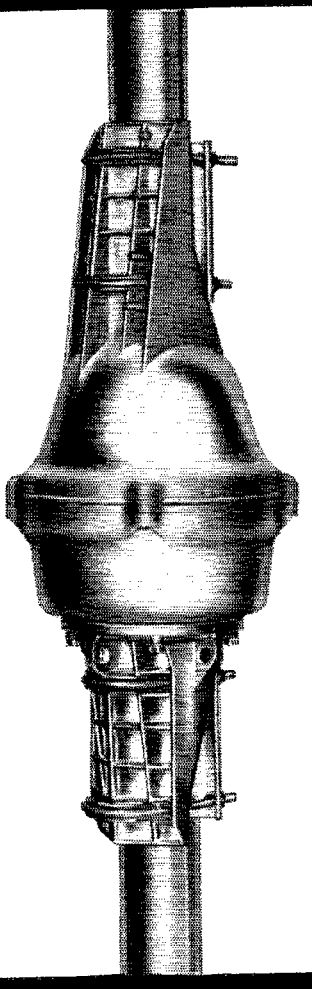
city & state _____

QUAN.	ITEM	MODEL NO.	PRICE

$_____enclosed. Parcel post, include postage—express orders are sent shipping charges collect. All prices quoted are Net F.O.B. Benton Harbor, Mich. and apply to Continental U.S. and Possessions only. All prices and specifications subject to change without notice.

"HAM-M" BY CDR

America's most popular ham antenna rotor



Preferred because:

EXTRA HEAVY-DUTY

Holds heaviest commercial arrays — ice-proof, wind-proof, moisture-proof!

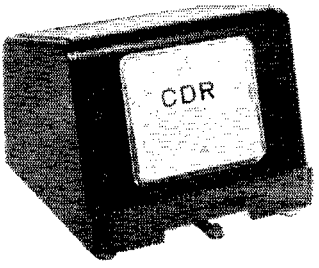
WON'T DRIFT

Provides 3500 in.-lb. resistance to lateral thrust.

EASIEST TO INSTALL

It's complete! Mounts on shaft or flat on plate in 30-minutes.

CONTROL CABINET: Pin-point calibrated in 5° units. Needle operates without activating rotor. Built for 8-wire cable.



ROTOR MECHANISM streamlined to resist moisture, "ice-lock." Actually stronger than your antenna itself. 98 ball bearings for smooth action. Positive brake ends drift.

YOU CAN'T AFFORD LESS! WHY PAY MORE? In only a few months the new CDR "Ham-M" Rotor has become the "pet" of hams from Coast to Coast. Costs less than rotors that won't give you any better performance, won't hold heavier antennae, won't give you any more resistance to the elements. It's the complete rotational system—no extras to buy. At your distributor's: only $119.50!

EXCLUSIVE OFFER: CDR "CALL-LETTERS" JEWELRY FREE! Handsome rhodium-finish tie-bar and key chain, both with your call-letters engraved FREE with your purchase of the "HAM-M". Both bear amateur radio emblem. Just *examine* the "HAM-M" and get both for only $3.60 (tax included) a $7.20 value for half price. See your CDR distributor for details.

CDR

HAM ANTENNA ROTOR

Cornell-Dubilier Electric Corp., South Plainfield, N. J.

The Radiart Corporation, Indianapolis, Ind.

GOTHAM ON ANTENNAS • • • • • • • SOME QUESTIONS AND ANSWERS

As one of the oldest antenna manufacturers consistently advertising in *QST*, we think it is a good idea to sum up our activities, comment on the antenna industry, and answer questions that arise year after year.

We have seen scores of antenna manufacturers come along with new designs, run an ad or two, perhaps linger longer, then disappear. Almost always the pattern ran: A new super antenna that could be made for pennies was advertised at fantastically high prices, accompanied by fantastic blurbs for its performance. A few antennas would be sold, and the manufacturer would sadly discover that only antennas that had stood the test of time could sell in sufficient quantities to cover all costs. As a result of these scores of failures, 'orphan' antennas still pop up plaintively in 'Used Equipment' bargain columns.

From the moment Gotham made its first antenna, there has always been continued acceptance of Gotham antennas as the standard of the amateur radio field. We are very proud of the fact that every one of our beams is a full half-wave in element size, justifying the hams' faith in our basic design.

To sum up our present plans, Gotham will continue to manufacture fifty ham antennas at low, low prices. Our only new venture for the foreseeable future is a new low-cost marine radio-telephone antenna, which will bring an added measure of safety to mariners, due to a new efficient design. Literature is available.

And now to answer some questions: Why is the Gotham price so very low? Doesn't the low price mean a lack of quality? Answer: The Gotham price is low because we sell in quantities and make only a fair profit on each antenna. We do not add on a tremendous overhead and engineering charge. As for quality, we have always used the best materials, and every antenna is doubly inspected before shipment. Thousands of Gotham antennas are in use the world over.

Why are all Gotham beams of the Yagi type, all metal, and grounded at the center? Answer: To get the maximum strength for the minimum weight, to get maximum efficiency, and to avoid the use of wood, tuning stubs, traps, or other substitute devices, all of which are undesirable and unnecessary. In addition, grounded beams are lightning-proof and protect your home.

How do Gotham beams gain compare with higher priced antennas? Answer: No beam, regardless of price, can give more gain, for a given boom size, than a Gotham beam. Obviously, the more elements, the more gain. Our gain figures are published in our literature, and are available, free, on request.

What matching systems are available in Gotham beams? Answer: We use both the Gamma match for 52 and 72 ohm coaxial feed, and the T match for 300 ohm feed. These are tried and true matching systems, proven by thousands of hams, and extremely simple. No electronic equipment or measuring devices are needed. Everything is furnished.

How difficult is it to put a Gotham beam together? Answer: It's easy, and it takes only a few moments. No special tools are required for assembly and installation. Full, simple instructions are given, and all machining and cutting is done at the factory. Thousands of novices have successfully assembled and installed our antennas.

What is the difference between the Standard and the DeLuxe beams? Answer: The Standard beams in the 6, 10, and 15 meter bands used 5/8" and 3/4" tubing elements; the DeLuxe models for these bands use 7/8" and 1" tubing. In the 20 meter beams, the Standard beams have a single boom, while the DeLuxe beams use twin booms. All 20 meter beams use full 12 foot booms. In the 20 meter beams and in the Twobanders and Tribanders, only 7/8" and 1" tubing are used.

Is the Gotham aluminum tubing corrosion-proof? Is is strong? Answer: Yes, our aluminum has an 'aluminized' finish, both on the inside and outside surfaces, and is corrosion-proof. As for strength, our 6063T832 alloy has a yield strength of 40,000 lbs sq. in.

Is it advantageous to use a Gotham Twobander or Tribander beam? Answer: Hundreds of these beams are in daily use. They are compromise beams, but by having each element a full half-wave, their gain figures are more than reasonably good. Of course a single three element beam on a single band will outperform a Tribander on that band, but the Tribander permits beam operation on three bands.

Are Gotham beams complete? Answer: Yes, we furnish everything — all tubing, fittings, castings where required, instructions — nothing extra to buy. We do not price an antenna piecemeal.

Do any Gotham antennas require guying? Answer: No. Our antennas have been designed to be self-supporting, due to the combination of tremendous strength and light weight. Whereas thin-walled or trapped verticals must be guyed, our 23 foot vertical antenna has come through hurricane winds without damage.

Do the Gotham verticals perform well on all bands? Answer: Yes, thousands of ham users attest to their efficiency on all bands from 6 to 160 meters. Reports of tremendous DX on low power are common.

Are mounts supplied with the vertical antenna? Answer: Yes, four mounting straps for side mounting are furnished with each vertical.

Are radials needed with a Gotham vertical? Answer: No, except in a few rare locations. 99% of the installations are done without radials.

Must a vertical antenna be mounted at any particular height? Answer: No, any convenient height will do. The higher, the better.

How do you change bands on a Gotham vertical? Answer: For 20, 15, 10, and 6 meters, the loading coil is not used. For 40, 80, and 160 meters, the proper portion of the loading coil is used.

Do you need a separate loading coil for each band? Answer: No, a V160 loading coil will cover 160, 80, 40, 20, 15, 10 and 6; a V80 loading coil will cover 80, 40, 20, 15, 10, and 6; a V40 loading coil will cover 40, 20, 15, 10, and 6 meters.

How much power can be used with a Gotham vertical? Answer: Anything up to the legal limit.

Is much space required for installing a vertical? Answer: No, only a few square inches are needed.

Can you give details on the loading coil used in the Gotham verticals? Answer: Yes, it is made for us by Barker and Williamson. It is 3" in diameter and exceptionally rugged. No other loading coil in the antenna industry has a higher Q.

Which do you recommend buying, a vertical or a beam? Answer: A beam is always preferable for use on any particular band. The beam cuts down QRM and amplifies the transmitted and received signal. The vertical has the advantages of small space, low cost, no rotator required, and multi-band coverage.

Why does Gotham make so many different antennas? Answer: To meet the needs of hams everywhere for a wide variety of antennas, on all bands.

What antennas are best for a novice? Answer: The V80 vertical and the S153N beam are the most popular choices.

Why should a ham buy a Gotham antenna? Answer: The tremendous progress of the amateur radio art makes it imperative that hams graduate from the antiquated antennas of years past to a modern antenna system. We will be glad to send, free of charge, our technical literature on our 50 antennas, or you can order for immediate shipment.

73,
GOTHAM

IN APPRECIATION • • • •

10% PRICE SLASH!

TAKE 10% OFF WHEN ORDERING

Airmail Order Today — We Ship Tomorrow

GOTHAM Dept. QST

1805 PURDY AVE., MIAMI BEACH, FLA.

Enclosed find check or money-order for:

TWO BANDER BEAMS

A full half-wave element is used on each band. No coils, traps, baluns, or stubs are used. No calculations or machining required. Everything comes ready for easy assembly and use. *Proven Gotham Value!*

6–10 TWO BANDER.....	☐	$29.95
10–15 TWO BANDER.....	☐	34.95
10–20 TWO BANDER.....	☐	36.95
15–20 TWO BANDER.....	☐	38.95

TRIBANDER

Do not confuse these full-size Tribander beams with so-called midgets. The Tribander has individually fed (52 or 72 ohm coax) elements and is not frequency sensitive, nor does it have baluns, coils, traps, or other devices intended to take the place of aluminum tubing. The way to work multi-band and get gain is to use a Gotham Tribander Beam.

☐ 6-10-15 $39.95 ☐ 10-15-20 $49.95

2 METER BEAMS

Gotham makes only two different two meter beams, a six-element job and a twelve-element job. They are both Yagi beams, with all the elements in line on a twelve foot boom.

☐ Deluxe 6-Element 9.95 ☐ 12-El 16.95

6 METER BEAMS

New records are being made every day with Gotham six-meter beams. Give your rig a chance to show what it can do, with a Gotham six-meter beam.

☐ Std. 3-El Gamma match	12.95	☐ T match	14.95
☐ Deluxe 3-El Gamma match	21.95	☐ T match	24.95
☐ Std. 4-El Gamma match	16.95	☐ T match	19.95
☐ Deluxe 4-El Gamma match	25.95	☐ T match	28.95

10 METER BEAMS

Ten meter addicts claim that ten meters can't be beaten for all-around performance. Plenty of DX and skip contacts when the band is open, and 30–50 miles consistent ground wave when the band is shut down. Thousands of Gotham ten meter beams have been perking for years, working wonders for their owners, and attesting to the superior design and value of a Gotham beam.

☐ Std. 2-El Gamma match	11.95	☐ T match	14.95
☐ Deluxe 2-El Gamma match	18.95	☐ T match	21.95
☐ Std. 3-El Gamma match	16.95	☐ T match	18.95
☐ Deluxe 3-El Gamma match	22.95	☐ T match	25.95
☐ Std. 4-El Gamma match	21.95	☐ T match	24.95
☐ Deluxe 4-El Gamma match	27.95	☐ T match	30.95

New! Ruggedized Hi-Gain 6, 10, 15 METER BEAMS

Each has a TWIN boom, extra heavy beam mount castings, extra hardware and everything needed. Guaranteed high gain, simple installation and all-weather resistant. For 52, 72 or 300 ohm transmission line. Specify which transmission line you will use.

☐ Beam #R6 (6 Meters, 4-El)....$38.95
☐ Beam #R10 (10 Meters, 4-El).. 40.95
☐ Beam #R15 (15 Meters, 3-El).. 49.95

15 METER BEAMS

Fifteen meters is the "sleeper" band. Don't be surprised if you put out a quick, quiet CQ and get a contact half-way around the world. Working the world with low power is a common occurrence on fifteen meters when you have a Gotham beam.

15 METER BEAMS

☐ Std. 2-El Gamma match	19.95	☐ T match	22.95
☐ Deluxe 2-El Gamma match	29.95	☐ T match	32.95
☐ Std. 3-El Gamma match	26.95	☐ T match	29.95
☐ Deluxe 3-El Gamma match	36.95	☐ T match	39.95

20 METER BEAMS

A beam is a necessity on twenty meters, to battle the QRM and to give your signal the added punch it needs to over-ride the high power boys. Hundreds and hundreds of twenty meter beams, working year after year, prove that there is no better value than a Gotham twenty meter beam.

☐ Std. 2-El Gamma match	21.95	☐ T match	24.95
☐ Deluxe 2-El Gamma match	31.95	☐ T match	34.95
☐ Std. 3-El Gamma match	34.95	☐ T match	37.95
☐ Deluxe 3-El Gamma match	46.95	☐ T match	49.95

(Note: Gamma-match beams use 52 or 72 ohm coax. T-match beams use 300 ohm line.)

ALL-BAND VERTICAL ANTENNAS

You could work the whole world, and get fantastic reports, with a Gotham vertical and only 55 watts, like VP1SD.

You could work tremendous skip and DX, and be surprised at the way your Gotham vertical brings them in, as R. E. C. of Washington, D. C., found out.

You could have a simple, easy-to-install-and-operate vertical antenna, and switch from band to band, as thousands of Gotham customers have done.

☐ **V40 vertical for 40, 20, 15, 10, 6 meters. $14.95**

☐ **V80 vertical for 80, 75, 40, 20, 15, 10, 6 meters.....$16.95**

☐ **V160 vertical for 160, 80, 75, 40, 20, 15, 10, 6 meters.....$18.95**

HOW TO ORDER. Send check or money order directly to Gotham or visit your local distributor. Immediate shipment by Railway Express, charges collect. Foreign orders accepted.

Name.....

Address.....

City.....Zone.....State.....

Station Activities

(Continued from page 86)

messages were handled during the drill. W2RG was at the County Control Center. W2ESX is SJRA's V.H.F. Sweepstakes chairman. K2MBD, Camden Co. EC, is busily engaged in coordinating RACES and AREC equipment and personnel. W2ZC recently moved to Princeton. W2BZJ is heard regularly on NJN, 2RN and EAN. No reports were received from Atlantic or Cape May Counties. Traffic: K2OOK 250, W2HDW 128, K2EFA 120, K2MBT 86, W2BZJ 67, K2JGU 59, K2SOL 14.

WESTERN NEW YORK—SCM, Charles T. Hansen, K2HUK—SEC: W2PPY. RMs: W2RUF and W2ZRC. PAMs: W2PVI and W2LXE (v.h.f.). NYS c.w. meets on 3615 kc. at 1800, ESS on 3590 kc. at 1800, NYSPTEN on 3925 kc. at 1800, NYS C.D. on 3509.5 and 3993 kc. Sun. at 0900, TCPN 2nd call area on 3970 kc. at 1900, LSN on 3970 kc. at 1900. K2EE wishes to announce that the Erie County Emergency Net meets Sun. on 3915 kc. at 1230. I wish to thank all those who participated in the statewide 2- and 6-meter tests for NYS C.D. The State Radio Officer W2GBO, W2OZR and W2JNM also wish to convey their thanks. W2GBX is now editing the RAWNY *Bulletin*. Congratulations to the following BPLers: K2AOQ, K2GWN, K2QHR, W2RUF and K2SIL. Appointments: K2DOZ as OPS, W2ATC as OO, W2ATC as OBS. Endorsements: W2ZRC as RM, W2ZRC and K2DG as ORSs. K2RIR worked 35 W6s on 6 meters. W2NNN worked 7 counties on 6 meters, including some in Africa and Europe. The SWNYVHFA Net is on Mon. at 2100 on 50.1 Mc. W2EJO is NCS. K2UZJ made 62,000 points in the SS. W2SSC reports well over 100,000 in the same contest. K2CUQ received the A-1 Operator Award. W2EMW worked 73 sections in the SS on 14 Mc. for the second year in a row. K2RIT has RCC and the Rochester TVI committee. K2RAA is on s.s.b. The Oswego ARA elected K2IOE, pres.; K2MLG, vice-pres.; W2JQK, secy.; and K2VFJ, treas. at its 10th annual meeting, reports W2ZHU. K2QPC reports working Virginia on 6-meter Aurora. K2EQB has a station lineup consisting of a Globe Scout 65, NC-109 and V-46 vertical antenna. K2KYT is NCS of the traffic net in Erie Co. on Mon. at 51 Mc. at 2130. K2MWS has a 32V-3 and a three-element Hy-Gain beam on 10 meters. The Niagara Frontier DX Assn. announces its world-wide DX "Man of the Month" Award with a yearly grand prize. K2FG is committee chairman. The North County RC meets the 2nd Tue. of each month at 7 Cherry St., Potsdam, at 1930. W2IDM is pres.; K2SAC, secy.-treas. K2QAE gave a talk at a recent meeting on his amateur radio experiences in Germany and England. K2IXB reports the following new stations on 6 meters in the Rochester Area: W2DOD, K2RHS, K2RGW, WA2CGN, WA2BKV and K2LNF. W2SWF writes that he now has the call DL4EI and sends regards to the NYS Net gang. The RARA had its c.d. aims outlined at a big meeting. Speakers were W2KIO, W2ZS and W2RUJ. K2KIJ and W2YIY do a consistent good job on the Corning ARA rag *QRM*. W2TXB got a DXCC 230 sticker. Traffic: (Nov.) K2SIL 821, K2QHR 514, K2GWN 509, K2RYH 387, W2RUF 304, K2AOQ 253, K2MES 189, W2PVI 166, K2RTN 139, K2IYP 108, W2TPV 96, W2RUT 91, 2JBX 84, W2COB 56, W2PGA 51, W2OE 46, K2TQC 43, W2ATC 41, K2EQB 40, W2GSJ 39, W2FEB 37, K2UZJ 33, K2GQU 32, K2EE 30, K2RWV 30, W2RQF 25, K2QDT 23, W2ZDL 23, K2OBU 20, K2BCL 16, K2HUK 16, K2JPN 16, K2BBJ 15, W2PMB 12, K2RIT 10, K2MWS 6, W2BLO 4, K2RIR 4, W2ZHU 3, K2CUQ 1, K2KYT 1. (Oct.) W2ZHU 10, K2DG 9.

WESTERN PENNSYLVANIA—SCM, Anthony J. Mrockka, W3UHN—SEC: OMA. RMs: GJY, GEG and NUG. PAMs: AER and TOC. The WPA Traffic Net meets Mon. through Fri. at 1900 EST on 3585 kc. A new appointee is LMM as OO. EPM reports working W6s and KH6s on 6 meters. WFR has been mobiling in VE2-, W2- and W8-Land. K3AJB needs only Asia for WAC. K3KPE passed his General Class exam. The Western Penna. DX Society meets the first Thurs. of each month at the WQED transmitter site in Oakland. DXers are welcome. W3s PHH, ELM and WRC are putting on a radio merit badge course for Boy Scouts. Assisting on code are JLM and K3CNP. K3ABN has a new 10-meter beam. LXU lost his vertical in a storm. The Willimantic Conn. Junior Chamber of Commerce has presented a W-Conn (Worked All Connecticut) Award to BQA. KBZ earned the Worked All El Paso certificate. LSS has a new HQ-110. The new radio club just formed in the Monongahela Valley is the Monessen ARC. Meetings are held every other Fri. at Monessen Civic Center. Officers are OEZ, pres.; K3AFZ, vice-pres.; K3AOD, secy.; B. Rilli, treas.; MTJ, IWD and RWA, trustees. Mr. R. Wight was guest speaker at ATA's December meeting and his subject was "The Space Age." The Steel City RC reports through *Kilo Watt Harmonics* that the club will be 20 years old in 1959; GEN received her WAZ award and is the eighth YL to receive such an award; UHM has a new Mosley Tribander beam. OKU is working s.s.b. on 10 meters. The Etna RC reports via *Oscillator* that the Kingfish Net meets Mon. and Thurs. at 1100 EST and every Tue. and Wed. at 1700 EST on 7275 kc. The Western Penna. Mobileers elected the following new officers: AEU, pres.; PUX, vice-pres.; ZUW, secy.; VVA, treas.; NBF, n.c. coordinator; RSB, FSF, WSV and VEK, trustees. Up Erie way: BFB spent some time in New York City visiting the Voice of America building. MS is keeping a daily sked on 10-meter mobile with Scotland. Washington County ARC reports that GYZ was laid up with a broken leg; HWU has a new certificate, "Worked Ten Grandmas Award"; YDG has a Communicator III; UEJ and his XYL celebrated their silver wedding anniversary; K3DXV is on 6 meters with a Wacon rig; UEN is on 40-meter mobile. K3AGF is doing a nice job representing Pittsburgh on the WPA Traffic Net. TOC has his rig in the shop for repairs. The November meeting of QCWA, Pittsburgh branch, was W3GJY Night. FIP is working 160 meters regularly. Traffic: W3LXU 320, KUN 101. K3AGF 73, W3EPM 56, GJY 52, UHN 49, LSS 22, WRE 5, K3ABN 4, W3PDY 4, K3AJB 1.

PITTSBURGH QSO PARTY

February 1-16

All amateurs are eligible to take part in a contest sponsored by Golden Triangle Amateur Radio Club in honor of Pittsburgh's bicentennial anniversary.

Rules: (1) The party runs from 7 P.M. February 1 through 4:00 A.M. February 16, times Central Standard. (2) All emissions and bands may be used, but separate entries must be filed for c.w. and phone. (3) The general call will be CQ Greater Pittsburgh or CQ GP. (4) The exchange will be NR, RST and Pittsburgh "section," latter consisting of letter indicators like BV, CN, COR, CFT, SQH, UT, etc. Ask any Pittsburgh amateur for list. (5) Logs must show date, time, calls, numbers, RSTs, Pittsburgh section, power, and "zone" (distance from Pittsburgh). (6) To score, count 2 points per QSO (one point if incomplete), and multiply QSO points by number of Pittsburgh sections worked. Multiply this total by 1.5 if input from 150 watts to 51 watts, or by 2 if input 50 watts or under. (7) Awards will be given to the winner, phone and c.w. separate, in these five categories: zone one, Greater Pittsburgh; zone two, 1000-mile radius; zone three, 2000-mile radius; zone four, 3000-mile radius; zone five, over 3000 miles from Pittsburgh. (8) Send logs to GTARC c/o YM&WHA, 315 S. Bellfield Ave., Pittsburgh 13, Penna.

CENTRAL DIVISION

ILLINOIS—SCM, Edmond A. Metzger, W9PRN—Asst. SCM: Grace V. Ryden, 9GME. SEC: HOA. RM: PCQ. PAM: RYU. EC Cook County: HPG. Section net: ILN, 3515 kc. Mon. through Sat. at 1900 CST. HPG, the present EC of Cook County, was elected Vice-Director of the Central Division in the recent ARRL election. The Hamfesters (Chicago) visited the Edison Company State Line Power Station at its latest meeting. The members also were privileged to have the Heath Co. engineers demonstrate their Apache and Mohawk gear to the gang. TZN has his operating time curtailed because of doctor's orders. FDL is back on 20 meters and is sporting a remodeled beam. SKR has succeeded in obtaining his Worked All Canada certificate. K9ANI and K9IEB participated in the Scout amateurs demonstration set-up at White Plains State Park and attracted quite a large audience. The ILN handled 275 messages in 19 sessions, according to PCQ, and CSW reports that the North Central Phone Net handled a traffic count of 338 in 25 sessions. K9ISP, JJN, TZN, QBJ, K9PBI, NN, HPG, K9CDQ, FKC, FDL, FLQ, K9HCP, LGH, K9MJC, QGL and REC scored high in the recent ARRL Frequency Measuring Test. The Chicago RACES is inaugurating theory and code instruction classes at the U. S. Coast Guard Auxiliary's Communication Center. STR reports that the new time of the Nite Owl Net is Thurs. at 2200. NPN is moving his QTH to South Carolina. LCA, MOU and FTT were elected as officers for the coming year of the Chicagoland Mobile Radio Club. K9HEA is back operating after a tonsillectomy (on c.w., I presume). ERU has a new

(Continued on page 100)

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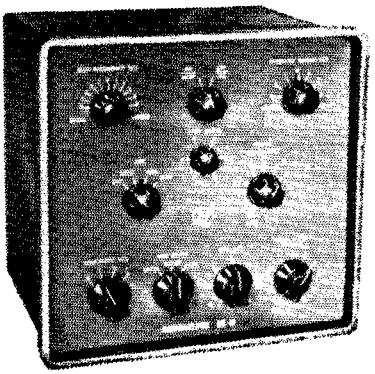

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tower which supports 10-15-20-meter beams. The West Suburban YMCA Amateur Radio Council is now affiliated with the League. IOG, UNB and K9DYD were elected as the new officers of the Peoria Area Amateur Radio Assn. IBI is the latest convert to use an SWR bridge. JGW is the proud father of a baby girl, Sandra Lee. EU purchased an HT-32 for s.s.b. and used it in the recent Sweepstakes. The Starved Rock Radio Club celebrated its silver anniversary with a banquet on Oct. 30. UOR/5 is working as a lab technician for G.E. at St. Petersburg, Fla. YJF has completed the wiring of his Heath sideband generator, and hopes to get it on the air after modification of his DX-100. SXL is back on 6 meters and would appreciate hearing from the gang. New calls heard were K9PUE, KN9LAJ, K9PUJ, and KN9-LAQ. New appointees: LZN as EC; K9JBK, K9GSG, K9EED, NLF, K9CIL and LZN as OOs; LZN and K9CIL as OPSs. From the many reports heard, the Dec. 7 c.d. affair sponsored by the various c.d. organizations had an FB turnout with many of the radio clubs manning communications equipment. A new 6-meter c.w. net is being formed and K9GVD will act as new control. Contact him for further details. Traffic: W9DO 776, K9GDQ 303, MHW 219, W9IDA 158, K9ISP 141, W9FAW 73, SXL 64, K9GVD 41, GSR 38, W9RYL 34, K9LXK 26, W9CSW 20, K9JIN 19, W9SKR 10, PRN 6, K9ERH 5, BIV 4, W9JJN 3, YYG 2.

INDIANA—SCM, Arthur G. Evans, W9TQC—Asst. SCM: Seth Lew Baker, 9NTA. SEC: SNQ. PAMs: BKJ, KOY, SWD and UXK. RMs: DGA, TT and VAY. Net schedules: IFN (A.M.) 0800 daily and 1800 M-F on 3910 kc.; ISN (s.s.b.) 1830 daily on 3920 kc.; QIN 1900 daily and RFN 0700 Sun. on 3656 kc. QWI has been appointed OPS and PPD is a new OO. The Clark County ARC elected K9DZR, pres.; K9GGC, vice-pres.; IRT, secy.; K9IAL, treas. The ladies of HAWK elected RTH, pres.; K9IXD, vice-pres.; K9ILK, secy.; and LYU, treas. The Fayette County RC elected K9LTD, pres.; K9IJB, vice-pres.; and K9DZK, secy.-treas. The HAMS elected EDE pres.; K9IUH, vice-pres.; K9LVQ, secy.; Mr. Duncan, treas.; URR, act. chairman and RSN, F.D. chairman. K9KBW has a new beam for 15 meters and has made WAS. K9GFQ rebuilt with 200 watts on 6 meters. NTA is off to North Carolina for 3 or 4 months. RE is rebuilding and is on with d.s.b. at present. BHW is building a rig for 432 Mc. with a 2C39-A final. EJW is building a unitized rig for 6 meters. K9CFG worked KH6UK on 6 meters. The Terre Haute Garfield High School ARC put on a radio demonstration for the PTA with a base station on 50.7 Mc. and two walkie-talkies. MJJ has been appointed manager for the East Central Ind. Six-Meter Net, which meets at 2100 Mon.-Sat. on 50.4 Mc. Traffic for the month was 19. VAY reports 323 messages handled on QIN. The IFN traffic count was 275, as reported by SWD. KOY reports ISB traffic as 101. TT reports RFN traffic as 87. K9GLL reports that the IMO Six-Meter Net handled a total of 63 messages. SNQ is hard at work filling some of the holes in the counties where we have no ECs. Four stations made BPL—NZZ, TT, VAY and ZYK. Traffic: (Nov.) W9NZZ 1013, VAY 702, ZYK 655, JOZ 492, TT 277, TQC 113, SWD 109, SVL 100, K9AYI 84, W9RTH 83, EHZ 80, K9GBB 79, W9ETM 69, K9IXD 68, W9JBQ 67, BDG 54, SNQ 48, GJS 47, MJJ 45, BKJ 41, FJR 36, EGV 31, BUQ 28, K9BSU 27, EEK 26, W9LYU 23, K9IHG 22, W9QYQ 22, WRK 21, GFA 20, QWI 20, K9-JKK 18, W9VNV 17, YYX 17, IMU 13, DOK 11, K9-BNL 10, PPB 9, W9DGA 8, QR 8, BDP 7, EJW 7, K9KBW 7, W9NTR 7, K9EDG 6, GFQ 6, W9HUF 6, K9CFG 5, W9MHP 5, OK 5, WAU 5, CC 4, K9DWK 4, GSV 4, W9TG 4, UQP 4, VQP 4, ENU 3, NH 3. (Oct.) W9QWI 24, K9EEK 18, W9OCC 8, K9GLU 4, NBK 4.

WISCONSIN—SCM, George Woida, W9KQB—SEC: YQH. RMs: K9AEQ, K9ELT and SAA. PAM: NRP. Two new PAMs to cover the activities on the v.h.f. bands have been appointed—GFL for the northern part and K9IQO for the southern part of the section. Other new appointees: IKY, PJT and KQB as OOs. The BEN had its best DX QNI on Nov. 30 when VK2AJ checked in to NCS ZSO at 2005. Q4. CXY now has WAC with a JA contact. WTN, the new 51.1-Mc. traffic net being managed by K9IQO, operates each Mon. at 2000 CST with 35 stations on the roster. An interesting monthly bulletin is edited by K9IQO, with DQS as his reporter. Add SGN of Richland Center to the list of stamp-collecting hams. PJT has WAC on 10-meter phone. Superior lists among its hams K9IGF, city manager; JAL, health officer and coroner; and TIV, sheriff's deputy. Thirty new Novices resulted from the Superior Club's radio classes with UXZ, GDD, ONI, K9BCE and K9IGF as instructors. JNY has a new 75A-4 and a Valiant. SAA is keeping the WSSN at high activity and using a new HT-32. KQD and K9CJK have DXCC, giving the MRAC 19 DXCC members. K9ENB has a new beam and YZG a new HQ-140. DYG is resting with a DX total of 216/201 and handling traffic on the WIN and 9RN. NLA, operator for the State Patrol c.w. station, works the NTS nets with his Lysco rig at 25 watts. K9ESN has WAS and is relief operator at Stevens Point RACES station. K9ALP also has WAC, YL and WWCNY awards. The Milw. School of Eng. Club now is on RTTY. VZK is on 420 Mc. and is going to 1215 Mc. HAJ is on s.s.b. with a Pacemaker. K9EBO worked Japan on 6 meters. VCH has a rotatable folded dipole for 10 meters. CCO is active on five traffic nets. Let's "Talk Wisconsin." Get details from the SCM. Traffic: W9CXY 524, DYG 193, SAA 107, K9GDF 105, W9KQB 94, CCO 91, K9ELT 58, W9VHP 37, NRP 36, K9AEQ 34, W9IKY 34, MWQ 26, VIK 19, NIJ 18, WJH 16, CBE 13, K9LMX 12, W9SIZ 12, K9-JVW 11, CEF 9, ESN 9, GSC 9, W9GFL 7, K9IQO 7, ALP 4.

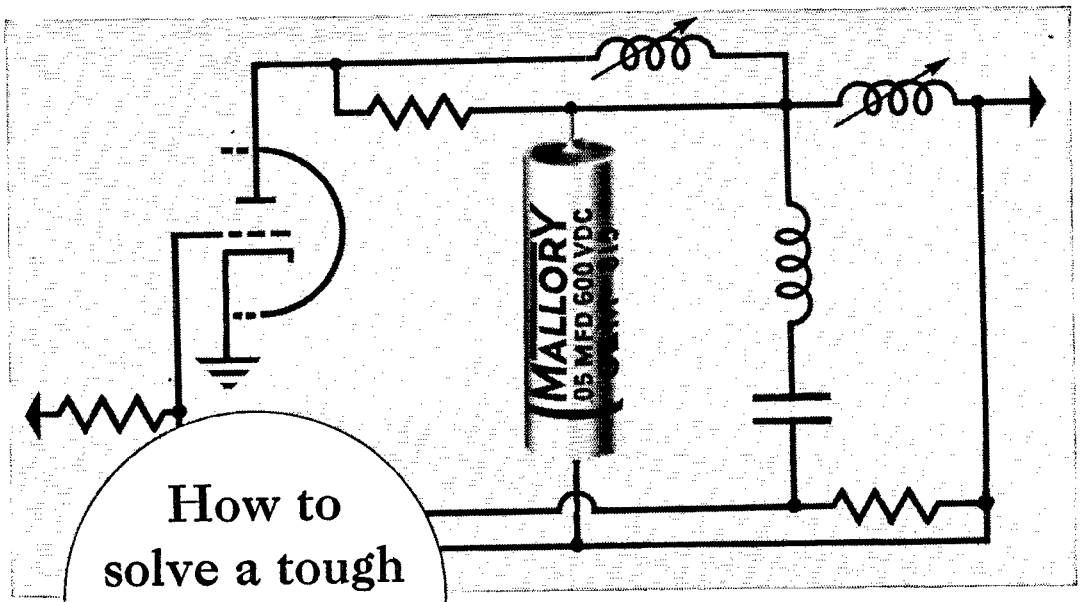
DAKOTA DIVISION

NORTH DAKOTA—SCM, Harold Wengel, WØHVA—SEC: KØJLW. PAM: YCL. The North Dakota 75-Meter Phone Net reports 25 sessions with a total number of check-ins as 604. The highest number per session was 34, lowest 8, average 24.16. The North Dakota C.W. Net needs more members. It meets at 1830 CST every Mon., Wed. and Fri. on 3670 kc. KØATK has been keeping fairly regular skeds twice a week with his brother in lower Michigan on 40-meter c.w. We wish to thank all those who took part in the emergency nets during the November storms. Traffic: WØYCL 27, KØJLW 26, ADI 25, WØEXO 22, IHM 17, IRN 15, KØATK 14, KJR 13, GRM 9, WØQNY 9, KØHLT 7, MHB 6, WØCAQ 5, KØGGL 5, JLU 3, WØBHF 2, GQD 2.

SOUTH DAKOTA—SCM, Les Price, WØFLP—Asst. SCM: Gerald F. Lee, ØYKY. SCM assistants: FKE and NEO. SECs: YOB and GDE. PAM: SCT. RM: GWS. The S.D. C.W. Net, which meets Mon.-Wed.-Fri. at 7 P.M. CST on 3645 kc., reports 12 sessions, KØBMQ 4, KØDYR 5, SCT 3; QNI 75, high 8, low 5, average 6:25; traffic 10, high 3, average 83; 1 informal. The S.D. 75-Meter Phone Net, which meets daily at 6:30 P.M. CST and 9:30 A.M. CST on 3770 kc., reports 35 sessions, KØBQR 2, GWA 4, KØDUR 3, EXX 2, YVF 4 and SCT 20; QNI 1002, high 43, low 10, average 28.62; traffic 77, high 6, low 0, average 212; informals 105, high 8, low 0, average 3.085. The S.D. 40-Meter Phone Net, which meets Mon. through Sat. on 7225 kc. at 12:15 P.M. CST, reports 24 sessions, KØLXF 18, NNX 1, SCT 5; QNI 416, high 23, low 11, average 17.3; traffic 93, high 10, low 0, average 3.875; informals 57, high 6, low 1, average 2.375. The S.S.B. S.D. Phone Net reports 30 sessions, QNI 546, high 28, low 16; QTC 31, high 4, low 0. NEO and FKE are NCSs. The S.D. WX Net, ZWL as NCS, reports 24 sessions, QNI 333, high 22, low 9, average 14; QTC 351, high 21, low 10, average 14. EXX and GWA obtained 50-ft triangular self-supporting towers. EXX has his up with a Hy-Gain two-element Triband beam. GWA built a new shop. NIW and his XYL have a new son born Nov. 17. KØDIH returned from Japan and is stationed at Miles City, Mont. OKX and family mobiled west into Canada, down the coast, and returned via New Mexico, Kansas, etc. He had daily schedules with EXX and GWA. KØBMQ has a Viking I. KØDUR got the homebuilt receiver of his portable station working OK. KØDZG/Ø, formerly of Nebraska, now is in Mitchell. TQE is General Class and is on the 40-Meter Net from Avon. The RCARC met at the home of FLP on Nov. 21 and the home of YKY on Dec. 6. Traffic: (Nov.) WØSCT 339, KØARF 176, WØZWL 165, KØBMQ 123, WØNEO 62, DVB 43, KØAIE 27, BQR 23, WØCTZ 21, VQC 19, KØBYV 16, DHA 15, WØFLP 11, ZLB 10, KØLXF 9, WØTKO 8, KØDUR 7, WØYVF 6, FJZ 5, KØEWJ 4, KLR 4, WØOFP 4, KØPMM 4, IAW 2, LXH 2, MHF 2, RQY 2, WØNNX 1. (Sept.) KØBMO 64, WØDVB 40. FJZ 29, KØLXF 22, WØNNX 20, KØOMP 15, WØZLB 12, BQS 6, BYV 6, KØKLR 4.

MINNESOTA—SCM, Robert M. Nelson, WØKLG—Asst. SCM: Bob Schoening, ØTKX. SEC: TUS. RM: KØGCN. PAMs: QVR and TCK. The Forrest Bryant Award, given annually to an outstanding amateur radio operator in Minnesota for conspicuous service to our hobby, was won by BUO for the year 1957. This award is presented by the Minneapolis Radio Club. The North Shore Area was the hardest hit by the State's first winter storm. At Grand Marais amateur radio was the only means of communication for several hours. KØDID was the first station to get back on the air and he handled several emergency messages, with KMG Net providing most of the traffic outlets. Thirty-five persons have completed the recent code and theory class given by the St. Paul Radio Club. The next class will begin about Feb. 1. The new officers of the Minneapolis Radio Club are SFU, pres.; DQL, vice-pres.; KØBIT, treas.; GLU, secy.; and BSI, SSM, and VLZ, directors. DJH has moved to Winona. KØCUO and TBX are now at Le Seuer. TRH is operating /1 while with the Navy at

(Continued on page 102)



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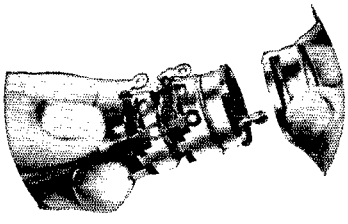

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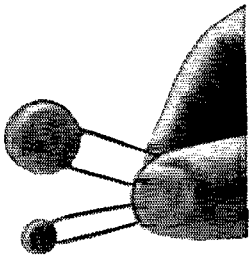

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Middletown, R. I. KØMTW and KØOIW have dropped the "N" from their calls. KØDHY has completed wiring a new Heathkit Mohawk receiver. KØALL has worked 81 countries on 10 meters. KØIDV got these awards this month: W.A.S., CP-25 and Traffikers Club 2500. He also made his goal of 100,000 points in the Sweepstakes. As of this month OPX has been a ham for 20 years! WMA's lineup now includes a Collins 75S-1 receiver and 32S-1 transmitter. KØKLY and TOF have new beams. BBY and PBY have installed 2-meter mobiles in their cars. Newly-appointed ECs include GII for Marshall, Pennington, Polk and Red Lake Counties; KØIYL for Itasca County; KØIZD for Nobles County; and VRY for Fillmore County. Traffic: KØIDV 666, WØKJZ 325, KØORK 175, KYK 138, GVS 72, WØPET 69, KLG 62, UMX 60, KØMIJ 59, D1D 51, GCN 41, WØOJK 34, KØEPT 29, WØOJG 22, KØMGT 21, WØOPX 21, FGP 20, EMZ 19, RQJ 18, WCD 18, KØIZD 16, WØKFN 16, TCK 16, DQL 15, KØQBA 15, WØBUO 14, KØMNY 14, WØQVR 14, LST 13, KØHJC 10, WØALW 9, KØAEE 8, WØQVQ 7, HEN 5, VBD 5, KØJCG 3, WØYAC 2.

DELTA DIVISION

ARKANSAS—SCM, Ulmon M. Goings, W5ZZY—SEC: K5CIR. PAM: DYL. RM: SZJ. K5LNN has up a new quad antenna on 20 meters and operated in the Sweepstakes with a score of 82,500 points. He recently received his WAC and WAS certificates. VQD and FPD have gone RTTY and are having plenty of fun. 6 meters is picking up in the northeast part of the State. We hear of several new stations in Blytheville, Osceola and Jonesboro. The club at Pine Bluff is getting a complete remodeling and paint job on the club house and will be able to take care of larger crowds with a nicer atmosphere since re-doing the place. The Blytheville Air Force Base amateurs were hosts to the hams of Mississippi County recently. Everyone had a nice time and plans were laid out for civil defense nets. We are having a lot of trouble getting enough news to fill this column and would appreciate it if more of the fellows would report. Traffic: K5IPS 115, W5BYJ 75, SZJ 58, DAG 13, ZZY 6.

LOUISIANA—SCM, Thomas J. Morgavi, W5FMO—The Baton Rouge ARC has a project of the instruction and examination of prospective amateurs at Carville with six patients at present studying code and theory. The program is under the direction of WG, DMA, IOF and KYC. Present officers of the New Orleans ARC are NLK, pres.; QQK, vice-pres.; MXQ, rec. secy.; QPS, treas.; BZ, corr. secy.; GXO, act. mgr. CEZ made BPL for the third time. K5FJH, L.S.U. Air Force ROTC MARS station, has been activated with a BC-610 and an SX-100. K5IKY is officer in charge and members include K5DGI, K5ELP, K5GEZ, DOQ and JFB. K5GPB is /5 at Southern U. K5DMA installed a Hy-Gain Monobander on 10 meters. KTD has just finished his parametric amplifier for 144 Mc. and has a gain of 19 db, and a noise figure of 1 db. CYF is in the process of building an 813 final with a 211 modulator. MXQ wants more fellows to report into LAN. K5MXO is busy participating in c.d. and MARS phone and c.w. nets. At a recent meeting held by the Ouachita ARC at Monroe, the club heard 1BDI, Communications Manager, address the group via long distance lines and loudspeaker. NUH is sparkplugging the Early Bird Net on 7235 kc. at 0600-0730 daily. A certificate of merit has been printed for issuance to regular members. CEW, PAM for Louisiana, is looking for prospective OPS. Traffic: W5CEZ 597, MXQ 239, K5DMA 14, MMP 11, W5EA 10.

MISSISSIPPI—SCM, J. Adrian Houston, sr., W5EHH—The Cleveland Amateur Radio Club elected K5EEC, pres.; K5DLN, vice-pres.; K5HYO, secy.-treas.; K5-RFW, act. mgr. K5DLN and K5DPP head the TVI Committee. The Cleveland Club has made application for a club call. The Jackson Amateur Radio Club members recently elected new officers for '59 as follows: AFE, pres.; K5KCH, vice-pres.; YCT, secy.; K5IWS, corr. secy. K5BTK/5 set up a station in the physics lab at the Annual High School Day. There were lots of visitors on hand and he handled many messages. K5DPP is working 2 and 6 meters quite a bit lately. UXJ and ZNY expect to join the 2-meter group soon. K5LEA is spending much time on 10 meters lately. Indianola has a new ham—K5TFV. Traffic: K5HAR 35, W5JHS 28, RIM 26, NRU 25, K5AUR 17, IHQ 17, W5VME 14, K5GRV 6, MFY 6, SQS 5.

TENNESSEE—SCM, R. W. Ingraham, W4UIO—SEC: RRV. RM: NHT. PAMs: UOT, PAH, VQE and ZZ. TDZ and K4LTA report SS Contest activity. DTI reports activity in three Tennessee nets—c.w., phone and s.s.b. K4LLB hopes to be on RTTY soon. Congratulations to K4VOP on the new General Class ticket and to K4EDB, new EC for Oak Ridge 5RCF reports fun on double sideband with a converted ARC-5 unit. Thanks to PVD for the OO report. K4KYL for the OES report

(Continued on page 104)

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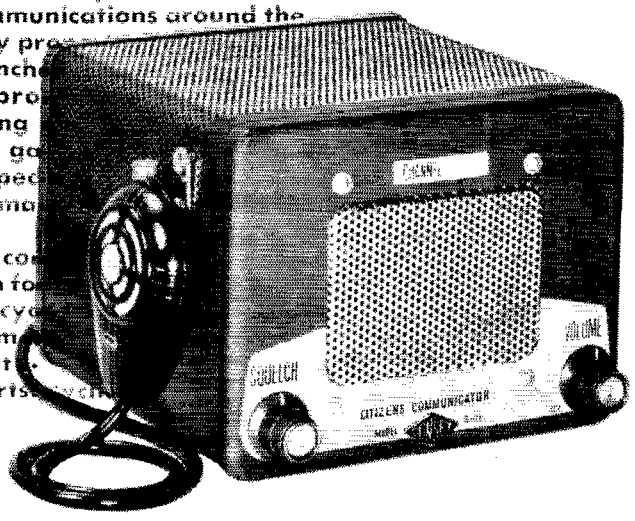

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and PAH, VQE, NHT, K4JNK and K4CFE for net reports. Honorable mention goes to the following C.W. Net attendance leaders: W5RCF, VJ, ATW, EET, NHT and K4EJN. Congratulations to W5RCF on making BPL. K4TRY has a roster of Obion County amateurs available from him for a four-cent stamp. Traffic: (Nov.) W5RCF 952, W4NHT 89, UIO 72, K4NJK 56, W4IGW 55, VJ 51,* K4LLB 49, W4UVL 33, PFP 27, CXY 18, DTI 18, PAH 15, TDZ 12, K4LTA 9, W4PYD 8, K4OUK 7, W4TZB 7, VQE 7, K4KYL 4. (Oct.) W4PQP 52, PFP 17.

GREAT LAKES DIVISION

KENTUCKY—SCM, Robert A. Thomason, W4SUD—Asst. SCM: William C. Alcock, 4CDA. SEC: BAZ. RM: K4AIS. PAMs: GTC and K4MMW. V.H.F. PAM: K4LOA. S.S.B. PAMs: NGN and K4HBF. BAZ was appointed SEC in December. JB has plans for expanding the AREC and emergency communication preparedness in this section. Your support is solicited. Thanks to JSH for his good work during the past two years. Start getting ready for a big section QSO party to be held in February. Top scorer will walk off with a nice prize. Details will be in the *Kentucky Ether Clippings*. The Greater Louisville Hamfest Assn. is making plans for a big hamfest this year. Officers are HOJ, IMW, MFI and K9EQR. K4JGN sends his greetings from school in South Carolina. KKW, K4BUB and OCN are active OOs. Traffic: K4OAH 276, AIS 244, CSH 151, W4ZDB 144, K4SBL 114, W4SUD 99, BAZ 93, GTC 84, K4LHQ 72, MMW 53, W4OGY 33, NGN 31, K4KIN 29, KIS 25, W4KKG 23, K4PNA 23, W4SZB 23, K4QHZ 22, W4ELG 18, K4HKB 18, W4HOJ 18, SZL 16, K4SBZ 14, W4TUV 14, CDA 13, K4HOE 11, W4YYI 11, K4KYZ 7, HBF 5, QCQ 5, EMR 4, LOA 2.

MICHIGAN—SCM, Thomas G. Mitchell, W8RAE—SEC: 8YAN. RMs: DAP, FWQ and OCC. WXO made BPL for November. OSG is the new EC for Otsego County. Ex-DLZ is now K7GNA at Route 1, Box 135-A Ocean Park, Wash. Our SEC lived up to the tradition of the AREC while mobiling between Battle Creek and Marshall in QSO with K8BUV. They were discussing the hazardous road conditions when Don came upon a truck accident that had just happened. BUV relayed the report to the local sheriff and Don continued on his way, after assuring BUV that there was no injury at the scene. K8ACC had a thirteen-minute QSO with Japan on 6 meters. Is this a first for our section? K8GJD is a new RCC member and has recruited five new members. How long since some of you older members have taken the time to qualify others? SLV has two daughters with licenses. Thirteen-year-old Nancy is K8JXX and Sally, twelve, is KN8JXY. We were represented in the September F.M.T. by the following stations with scores of good standing: K8GFR, BWS, AYY, K8CXI, HPR, SWF and W8VYG. Congrats to all. The Pictured Rocks Radio Club of Munising is now an ARRL affiliated club. There seemed to be a better representation of Michigan stations in the 1959 Sweepstakes Contest, but the mail was quite devoid of comments. Perhaps each of you are waiting for the results to be published before

COSMOS CALKINS MEMORIAL AWARD

The Central Michigan Amateur Radio Club is sponsoring an annual award to give recognition to that Michigan amateur who is deemed to have made the most outstanding contribution to amateur radio in Michigan. Nominations for the 1958 award must be submitted to W8FSZ not later than Feb. 28, 1959, and must be submitted and signed by either the officers of a club or a group of three Michigan amateurs. Full details concerning the services rendered by the nominee should be included in the nominating letter.

"crowing." The St. Clair Valley ARC members were guests of a U. S. Army Nike Base for their November club meeting and they were very impressed with a movie and tour of the base. The Fourth V.H.F. Conference of Western Michigan was attended by more than one hundred persons who enjoyed the afternoon and evening programs. It is gratifying to witness the growth of interest and activity in v.h.f. Quite a portion of our traffic is being handled via v.h.f. circuits these days. February is DX month with the first sessions on two week ends. Good luck to all. Traffic: (Nov.) W8OCC 258, K8NAW 193, W8FWQ 117, FX 113, WXO 112, YAN 110, RTN 70, ILP 69, K8AEM 58, W8NOH 51, JKX 46, TBP 34, K8GJD 30, W8DSE 26,K8IYN 24, W8SCW 23, 1UJ 22, HKT 16, RAE 15, AUD 14, K8ABW 7, W8EGI 4. (Oct.) W8IZS 8. (Sept.) W8TBP 4.

OHIO—SCM, Wilson E. Weckel, W8AL—Asst. SCM: J. C. Erickson, 8DAE. SEC: UPB. RMs: DAE and VTP.

(Continued on page 106)

PAMs: HPP, HUX and HZJ. The Knox County C.D. Net meets every Thurs. at 1830 on 3875 kc. GAC has a new Apache. K8AJF has a new 4X150-A on 2 meters. K8BPX has a new Triband beam. KN8LYR was in the hospital. New appointments are WEG, WNJ and K8-HGD as ECs, GKB as OPS and K8IKB as OO. The Ohio Phone Net needs outlets in Cincinnati and Cleveland. K8s HSI, HXC, HYY, JGU and JYP received their General Class tickets. NPE/M, K8s BYQ/M, ECF, HCX/M, HYY, LLX/M and MDW/M helped patrol and furnish communications during Halloween. Columbus ARA's *Carascope* informs us the 1959 officers are THX, pres.; K8IXY, vice-pres.; VOW, treas.; GKQ, secy.; and BCK, RTF and DWP, trustees; K8EIX spoke on transistor applications; APC will operate his Code School of the Air on Thurs. on 3540 kc. between 1945 and 2030; BKO is back from Lebanon, EYE spent two weeks in the hospital; HLITA was a visitor; VOW has a new Valiant and K8CZK has a new Triband beam; HQ-170 and kw. are ready to go. PXX, SSD, SSF, WGB, WRH, K8s BZX, CPY, DBC, EPW, HNR, HVM, JZF, KTB and MNK met and elected 1955 T-CAN officers as follows: PXX, net mgr.; K8KTB, asst. net mgr. and K8MNK, treas. The net meets Thurs. at 1900 on 50.76 Mc. and welcomes all stations to enter and handle traffic. IF sends in a newspaper clipping that states there are over 1400 amateurs in Miami Valley; the Dayton ARA has more than 250 members and the FCC proclaims that Dayton leads the nation in radio ham activity. Putting in my two cents, I would say Dayton would be the logical site for the next Great Lakes Division Convention because of the way the gang has operated the famous Dayton Hamvention with six years experience. Mark your calendar to keep Apr. 11 and 12 open to get into the 1959 Ohio QSO Party. Again I plead that stations in all the 88 counties get into this party either on phone or c.w. or both. Complete details will be given later. The Ohio Valley ARA won the 1958 Field Day Cup to be presented by the Ohio Council of Amateur Radio Clubs. Toledo's *Shack Gossip* names TDV, now KL7FBD, as its "Ham of the Month" and says K8MDD is in the hospital; K8KHC has a Viking Ranger and an SX-101; the stork brought EBR a baby girl; TTM moved to Florida; ATB was elected 8th district chairman for the YLRL; EPO and his XYL, IAA, are living in Arizona. It was FRD who won the W-Coun Award and not FDR. My mistake. UPH made BPL in November. IBX received the ADXC and WASM Awards. KGA has a new beam. K8AAG has a new 10-meter beam. ADC has a new Apache. The Cuyahoga County AREC helped in the Muscular Dystrophy Fund Drive with AEU, BNR, BPN, BUQ, DEV, GAT, ITR, LHX, LJI, MNO, NZI, PVC, UZJ, VFU, ZEP, K8s AAC, ABA and IZL taking part. BFP is out of the hospital. Canton ARC's 1959 officers are K8EML, pres.; K8HED, vice-pres.; and AL, secy.-treas., with IKM, MZV, OYV and TTJ as directors. K8KSB received his General Class license and is the son of EQN. Tusco RC's 1959 officers are K8JSZ, pres; JHJ, vice-pres.; SBM, secy.; LVW, act. mgr.; WFE, GAC and STR, directors. GUP has a new Viking 500. The CACARC's 1959 officers are K8AAG, pres.; AJW, vice-pres.; K8JHZ, secy.; LHX, treas. Massillon ARC heard John Lytle, astronautics engineer with Goodyear Aircraft Corp., speak on "Unconventional Electric Generators and their Application to Spacecraft Electrical Loads." Traffic: (Nov.) W8UPH 1114, K8BPX 359, W8-DAE 235, QLJ 135, OPU 84, AL 75, HXB 67, PMJ 57, K8DHJ 51, W8IBX 41, LT 39, YGR 34, WE 23, K8ETK 22, W8LZE 18, QIE 14, STR 14, ZAU 14, IFX 13, K8DTZ 12, W8HZJ 11, K8JIX 11, BYQ 10, W8QCU 10, K8EKG 7, HDO 7, W8LMB 6, BEW 4, EEQ 4, K8AJF 1. (Oct.) K8BPX 441, W8IFX 6.

HUDSON DIVISION

EASTERN NEW YORK—SCM, George W. Tracy, W2EFU—SEC: W2KGC. RM: W2PHX. PAMs: W2IJG and W2NOC. Section nets: NYS on 3615 kc. at 1900, NYSPTEN on 3925 kc. at 1800, 1PN on 3980 kc. at 1530, ESS on 3590 kc. at 1800, ENY (emerg.) on 29,490 and 145.35 Mc. Fri. at 2100, MHT (Novice) on 3716 kc. Sat at 1300. K2CRB is using a converted DX-20 on 6 meters and offers to help others convert theirs. K2YJL soon will be on 160 meters with 20 watts. Among the new rigs, K2KUA just finished a new DX-100B. Frank is interested in both DX and traffic. K2YTK reports DX 33/15, but wait until he gets up that new beam. Code and theory for all classes of operator are conducted by the RPI Club, W2SZ. The club's kw. rigs command a lot of respect on all bands. Rig difficulties slowed down K2-PRB during the SS. The Peekskill Communications Club meets every other Tue. at 2000 at Drum Hill Jr. H.S. The Lakeland H.S. Club, K2OKZ, is back on the air. Antarctica contacts featured the Nov. 28 Albany Club meeting. New Pelham e.d. members are W2TFB, W2WOH, K2ZAU KN2QBD and WV2BMC. They hope to activate RACES soon. WA2AFN passed the General Class exam. Hallo-

(Continued on page 108)

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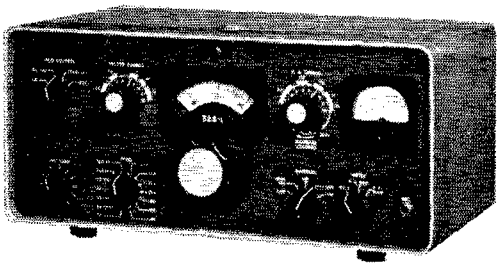

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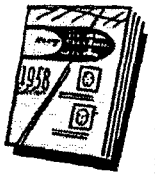

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ween police assistance with two fixed and six mobiles in Kingston and Saugerties included K2YCQ, K2YIF, W2YOK, W2SIF, K2YRY, K2BCU, W2PGE and K2YFA. The Ulster Co. Mike and Key held a successful auction on Nov. 6. A new triband cubical quad works FB at K2YFI. Movies of foreign hams by W2APF featured the Schenectady Club's Nov. meeting. Your SCM was very pleased with the stack of mail waiting during his California trip Nov. 9 to Dec. 4. Thanks for the information. Traffic: K2UTV 214, K2YZI 184, K2UYK 87, W2ATA 60, K2LKI 57, K2QJL 47, W2SZ 20, W2FVP 15, K2CKG 14, K2GKK/2 7, K2KUA 6, W2EFU 5, WV2AKK 4, K2YJL 2, K2YTK 1.

NEW YORK CITY AND LONG ISLAND—SCM, Harry J. Dannals, W2TUK—SEC: W2ADO. RM: W2VDT. PAM: W2UGF. V.H.F. PAM: K2EQH. Section nets: NLI, 3630 kc. nightly at 1930 EST and Sat. and Sun. at 1915 EST. NYC-LIPN, 3908 kc. Mon. through Sat. from 1730 to 1830 EST. NYC-LI AREC, 3908 kc. Sun. at 1730 EST. V.H.F. Traffic Net, 145.8 Mc. Tue. through Sun. at 2000 EST. Please note the RM and PAM changes above. W2WFL and W2OBW, the former managers, wish to thank all who participate in our section net activities and ask support for the new managers. In turn, the section owes thanks to Chris and Bill for their fine work in the past years. The V.H.F. Net now operates every night except Mon. The net handled 308 messages during November. BPL cards were earned by W2KEB, K2QBW and W2VDT, the latter on originations plus deliveries. Congratulations to W2KR, the new Hudson Division Director. To those who supported your SCM for this post, many thanks for your votes. To our retiring Director, W2OBU, our thanks for his devoted service to our section, division and League. K2QBW moved to Manhattan and continues as New York City's prime traffic outlet. K2LVS is using a new Harvey-Wells R-9A receiver. A new HQ-170 is in use at W2EC. K2UYG received the WAC, WASM and WBE awards. High winds caused the loss of the 50-ft tower and six-element 50-Mc. beam at K2VIX. K2VBL is on 6-meter mobile. K2OEG hunted for North Dakota, his 48th state, in the SS, but to no avail. K2VDR now has 38 states on 50 Mc. and added a new NC-303, Filter King converters for 6 and 2 meters and a VFO-62. K2MIDL is using an SX-100 and has installed a Heath SB-10 for s.s.b. K2RLI received his WAS and added a 10A. W2DYC is attending Emory University in Atlanta, Ga. K2RHH and K2MUB aimed for a 40-hour marathon QSO, but lasted only 35½ hours. K2SVY added a four element 50-Mc. Telrex beam and heard Italy on that band. K2TPU received his RCC certificate. K2VNS's sister is WV2CSP. K2TSW received the W-Conn Award for phone. K2MIG and K2OFD dropped the "N." It is with deep regret that your SCM reports W2GYL as joining Silent Keys. W2OTC and K2GNC journeyed to Vermont to put that state on the SS map. The Levittown ARC is celebrating its tenth anniversary. K2LGL has a new 20-meter beam. The list of Frog Hollow RC officers in the last column should be corrected to show K2SEN as secy. New officers of the NYRC are W2RGP, pres.; W2YAY, vice-pres.; W2ATT, secy.; and W2OWL, treas. The New York University Radio Club, W2DSC, has revived the college net which meets at 1600 Fri. on 3895 kc. Other college stations are welcome! W2TOX is trustee for W2CLE, the Stuyvesant HSRC station. All appointees are requested to check renewal dates of their appointments. Traffic: W2KEB 3526, K2QBW 271, W2VDT 474, K2VCO 197, W2DUS 87, K2HVY 82, K2MYS 69, K2SFS 53, W2DSC 36, W2EW 32, W2JBQ 24, K2IRS 23, W2GP 22, K2MIG 20, K2LVS 16, W2TOX 14, K2BH 12, K2QZS 12, K2RJO 9, W2EC 8, W2PF 8, W2IVS 6, K2YQK 6, K2GB 5, W2IIU 5, K2MEM 4, K2PHF 4, K2UYG 4, K2VIX 4, K2VBL 3, K2AED 2, W2MDM 2, K2OEG 2, W2TUK 2, K2VDR 2.

NORTHERN NEW JERSEY—SCM, Edward Hart, jr., W2ZVW—SEC: W2IIN. PAM: K2KVR. RMs: W2RXL and W2ADE. New Jersey Net (NJN) meets on 3695 kc. at 1900 daily. The New Jersey Slow Speed Net (NJSS) meets on 3748 kc. at 1830 Mon. through Fri. The New Jersey Phone Net meets on 3900 kc. at 1800 Mon. through Sat., Sun. at 0900. New officers of the Rahway H.S. Radio Club are K2QNI, pres.; K2ZSQ, vice-pres.; W2IYN, secy.-treas. W2CVW made 400 contacts in the SS. K2UKQ and ZHK are new ORSs. W2LRO needs 25 hours a day to get his work done. K2YBC and ZHK made BPL. W2EWZ worked 65 sections in the SS with 65 watts. K2VAB made some improvements in his rig and still had time to be the most consistent reporter in NJN with a total of 28 QNI out of 30 sessions. W2BVE has formed a radio club at Rutgers, and hopes to be on the air from there soon. The Belleville Net meets Sun. at 0930 on 147.24 Mc. W2JYW now is equipped for all-band operation. W2GVU built a crystal-filter s.s.b. exciter. K2PIM is QRL with school but finds time to send in OO reports. K2GIF has an auto-tune exciter in operation. W2RXL and W2ZVW attended the hamfest in Jersey City, along with Director W2OBU and SEC W2-

(Continued on page 110)

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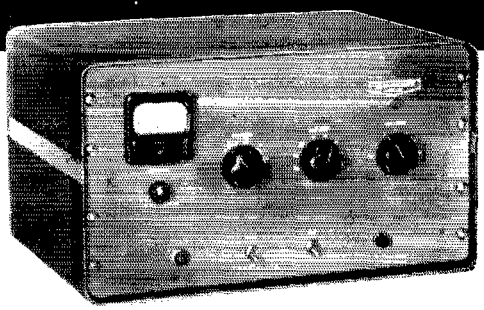
GSB-101

SSB LINEAR AMPLIFIER



GSB-100 Transmitter

POWER INPUT...140 watts P.E.P. sufficient for use as a complete transmitter, more than enough as an exciter.

SSB WITH SELECTABLE SIDEBANDS: AM, PM or C.W. Keying characteristics are excellent.

TRANSMITS BOTH SIDEBANDS WHEN ON AM.

EXCLUSIVE FILTER PHASING SYSTEM ...contributes materially to SSB quality. Unwanted sideband suppression 45 db. Uses quartz crystal CARRIER - ELIMINATION filter to suppress carrier by more than 60 db, avoids need for adjustments on carrier balance and sideband suppression.

FREQUENCY CONTROL by fixed, quartz crystal and exceptionally stable VFO. Complete band coverage with 5 kc calibration and interpolation to better than 1 kc. Precision gear ratio dial drive.

EXCELLENT VOICE OPERATED CONTROL SYSTEM (VOX). Biasing voltage available for cutoff of external linear amplifier when receiving.

COVERS 80-40-20-15-10 METERS. Flexible pi network output, quick band change. All operating controls on front panel.

BUILT IN, HEAVY - DUTY AC POWER SUPPLY.

Model #3233... 479.50

GSB-101 Linear Amplifier

POWER INPUT: 1200 watts P.E.P.* Grounded grid principle is utilized, does not waste drive power by swamping exciter...drive appears in output of final.

DRIVING POWER REQUIRED: 70 to 80 watts, readily supplied by GSB-100 or similar SSB transmitter in 100 watt class.

COVERS 80-40-20-15-10 meters.

FULL BANDSWITCHING OPERATION.

PI NETWORK OUTPUT. Flexible, easily loaded.

COMPLETE: Built-in power and bias supplies. Built-in antenna relay, 4—811A tubes and 2—866A rectifiers. Ready to operate.

Same size cabinet and general appearance as GSB-100 transmitter.

Model #3262... 439.50

*** In s.s.b. operation under normal conditions the peak envelope power input is approximately twice the average d.c. power input as measured by the plate milliammeter and voltmeter.**

GONSET

GONSET DIVISION OF YOUNG SPRING & WIRE CORPORATION
801 SOUTH MAIN STREET, BURBANK, CALIF

IIN. The NJ6 Net meets at 2300 on 51 Mc. with K2VNL as mgr. NJN handled 386 messages with a total attendance of 484 in 30 sessions. W2NIY has been spending time in OO work. K2ZSQ is holding Novice instruction classes at 7 P.M. on Tue. at Rahway. K2KGH and K2KGJ are trying to work Antarctica on 6 meters, and have had some slight success. K2VNL and K2VNK have a red-hot 6-meter v.f.o. home-brew with one tube. K2LEO finds DX easier on the high end on 6 meters. W2ADE is trying to form a net for traffic-handling on 2 meters, with connection to NJN via his station. My thanks to all who report each month. Traffic: (Nov.) K2YRC 279, K2VAB 242, W2ZVW 153, K2ZHK 134, W2OPB 123, W2MLW 121, W2RXL 117, W2EWZ 109, K2GIF 60, W2KFR 49, W2EBG 44, K2MFF 29, W2BRC 25, W2OXL 23, W2CVW 20, K2UKQ 10, W2BVE 9, K2VNL 8, W2CJX 6. (Oct.) K2VVL 38.

MIDWEST DIVISION

IOWA—SCM, Russell B. Marquis, WØBDR—The Des Moines Club assisted with mobiles in operation "Cans for Kids," a collection of food to give to a children's home for Thanksgiving. NWX is active on 6 meters and reports having heard Europe and Oceania. LCX is using a new Apache and automatic tape c.w. KØIJD is also using an Apache. SLC is sporting a new 75A-4. KØCLS is using a new vertical on 40 meters. BLJ made his first BPL. The Central Iowa V.H.F. and U.H.F. Club of Des Moines reelected the same officers for another year: ZTW, pres.; KØHTF, secy.; and QHB, treas. KØIGU and CNM received EC appointments. LCX and BLH renewed their ORS and NGS renewed his OPS appointments. CK and FRH are Silent Keys. AEH is spending the winter in Arizona. BTX is visiting Virginia and points south. KØRZO is the newest member of the TLCN. BDR visited the Story County AREC and the Des Moines U.H.F. Club. KØDVW has a new home-brew transmitter. NTB is back on the air after an extended visit in California. Traffic: (Nov.) WØSCA 1826, BDR 1429, LGG 1166, PZO 988, LCX 858, GXQ 543, KØBLJ 468, MMZ 184, IQB 168, WØBLH 104, KØCLS 91, WØSLC 57, QVA 38, VWF 38, LJW 36, KØAUU 26, EXN 23, WØNGS 22, KØGXP 17, GOQ 15, KNØQKF 15, WØUTD 15, UHO 12, KØGOT 11, WØUTX 11, LSF 10, KØJGM 9, WØCOD 8, KØGEY 8, WØHI 8, BQJ 7, KØIHC 6, KNØQWM 6, WØYDV 6, ADB 4, KØDPT 4, HBD 4, HFQ 4, KAQ 4, LKE 4, WØNYX 4, CYL 3, NWX 3, PKQ 3, PTL 3, KØBRE 2, WØFDM 2, KØLYV 2, KBX 1, WØRQA 1. (Oct.) WØBLH 95, BTX 18, KØINR 15.

KANSAS—SCM, Raymand E. Baker, WØFNS—SEC: IFR. RM: QGG. PAM: LEW, V.H.F. PAM: ZJB. New appointments: KØEMF and ETX as OESs. LIX and ETX as OBSs (ETV on 2 meters). KØHVD and KØKMZ as ORSs. ORB and KØGYA as OPSs. Endorsements: FDJ, TOL and RJF as ORSs. MXG as OBS. Class I OO stations: QGG, TRG and GUU. The KVR Club, Topeka, started code classes Nov. 18 for 9 weeks. The ACAR Club, Wichita, finished its Novice class and is starting a General class. The McPherson Club is starting a code class; also the Salina Club is conducting code classes. Salina, Hutchinson and McPherson are going strong on 2 meters. OTN has been working aeronautical mobile on 6 meters giving out new contacts. Nets: QKS at 1830 daily on 3610 kc., QGG mgr. KPN on Mon., Wed. and Fri. at 0645, Sun. at 0800 on 3920 kc., LEW, mgr. CKPN on Sat. at 0730 on 3930 kc., KØAWO, mgr. STN on daily at 1730 on 7145 kc., KØKMZ mgr. KØJID has moved to Freeport and is very active on the nets. BLI, OHL and KØGYA made BPL. The Section Meeting at McPherson was, we think, a success. Information on the meeting has been covered by *Club News* very fully for those not in attendance. Traffic. (Nov.) WØBLI 1175, OHJ 827, KØGYA 503, WØTOL 466, FNS 317, QGG 170, IFR 91, SAF 82, KØBXF 63, WØUOL 46, SYZ 41, KØIRL 40, WØUTO 40, VUI 34, KØHVD 32, BIX 30, KMZ 30, WØABJ 27, KØEQY 27, WØIRE 25, TTG 24, LEW 22, ORB 15, KØEFL 13, WØFDJ 13, WIZ 8, ASY 7, BBO 5, FHT 5, KØJID 3. (Oct.) KØMMZ 39.

MISSOURI—SCM, James W. Hoover, WØGEP—Net reports: Missouri Emergency Net, 3885 kc. Mon., Wed., and Fri. at 6 P.M.; 15 sessions, QNI 491, QTC 139; NCS, VPQ 7, OMM 4, OHC 4. Missouri Net, 3580 kc. Mon. through Sat. at 7 A.M. and 7 P.M.; 49 sessions, QNI 254, QTC 205; NCS, OUD 26, ONK 10, ARO 4, GBJ 3, RTW 3, KBD 1, KIK 1, PME 1. The Metropolitan St. Louis Civil Defense Net meets Mon. on 50.55 Mc. at 8 P.M. and Tue. on 29.640 kc. at 8 P.M. The Bandhoppers Radio Club, St. Louis County, led the Ø district in the Field Day club classification. A corporation is being formed to hold the 1959 Midwest Division Convention in St. Louis. Committee chairmen will be announced. OUD was visited by her brother, ex-IGW. KØONK is now a member of Air Force MARS. Six-meter DX recently worked by Missouri stations include VE7AQQ, KH6CTC, KH6UK, SM6BTT and ZE3G. The Kansas City TVI Committee has received a letter of commendation from

(Continued on page 112)

The New ELENCO COMMANDER

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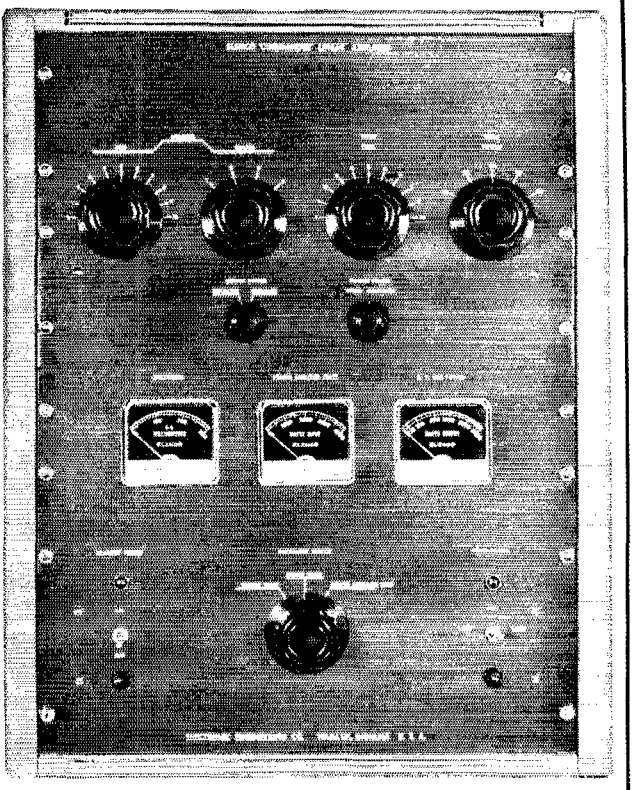
NOW AVAILABLE



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- ▶ 6000 Volt power Supply for high efficiency and easy drive.
- ▶ High-low Power Switch for tuning and quick power change.
- ▶ Grounded Grid circuit. No wasted exciter power.
- ▶ Double interlocked for absolute safety.
- ▶ Continuous frequency coverage 3 to 30 Mc.
- ▶ Forward and Reflected power circuits built in. Output meter calibrated in watts, 0-3000.
- ▶ Plate input meter calibrated directly in watts, 0-4000.
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the FCC. KØKBD is using a Viking II and SX-100. ARO has a new Courier. GEP has a new 20-A exciter and HC-10 converter. KØHHG staged an emergency drill with 21 stations active. KØLRG has a new Ranger. JHY has advanced to radioman second class. KØJPH has a new Globe Scout and Johnson v.f.o. GEP was pleased to have BUL for a short visit. Traffic: (Nov.) WØCPI 702. KØKBD 523, ONK 290, WØBVL 198, OUD 117, ARO 102, VPQ 93, KØHHG 81, WØKIK 64, WFF 53, KØLWX 51, WØRTW 50, EEE 47, KØLGZ 46, WØOVV 28, GBJ 24, KA 19, KØLRG 13, WØBUL 11, KØIHY 11, IFM 10, WØGEI' 8, KØOJC 7, WØEPI 5. (Oct.) WØECE 4.

NEBRASKA—SCM, Charles E. McNeel, WØEXP—The Nebraska 75-Meter Emergency Phone Net, reported by MAO, had QNI 497, QTC 61 and the roll call on Dec. 1 was 33 stations. The Nebraska Slow-Speed Net reports QNI 147, QTC 57 with 6 stations on roll call Dec. 1. MAO's new bulletin schedules are 4 P.M. CST on 7080 kc. Tue. and Thurs. and 4:30 P.M. CST on 3570 kc. Sat. and Sun. ZWG reports QNI 223, QTC 94 for the Nebraska C.W. Net. The Nebraska Morning Phone Net on 3980 kc. at 0730 CST, reported by KØHUA, had QNI 659, QTC 191. Those reporting 100 per cent for November were SCT, VZJ, ZJF and YFR; also KØGZD in Grand Island has been added to the roll call. The Western Nebraska Net, reported by NIK, had QNI 547, QTC 50. This net operates on 3850 kc. daily. KØEVY has a new 5100 transmitter with the 5ISB on the air. Traffic: (Nov.) KØDGW 246, WØMAO 155, KØIJW 110, WØZJF 106, ZWG 72, KØKUA 60, BDF 55, WØNIK 44, ZOU 40, FTQ 35, VZJ 34, EGQ 30, WØKDW 21, BOQ 21, KØHKI 21, OKO 16, LJO 13, UOV 12, UJK 11, VEA 11, KØBRS 8, CBV 8, WØOCU 8, KØDFO 6, WØAGF 4, KØELQ 4, KJP 4, LXS 4, ELU 3, WØHOP 3, KLB 2, KØKOK 1, WØQKR 1. (Sept.) KØDGW 126.

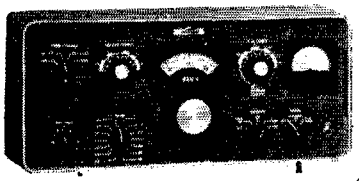
NEW ENGLAND DIVISION

CONNECTICUT—SCM, Victor L. Crawford, W1TYQ—SEC: EOR. RM: KYQ. H.F. PAM: YBH. V.H.F. PAM: FHP. Traffic Nets: CPN, Mon.-Sat. 1800, Sun. 1000 on 3880 kc.; CN, Mon.-Sun. 1800 and 2130 on 3640 kc.; CVN, Mon., Wed. and Fri. 2030 on 145.98 Mc.; CTN, Sun. 0900 on 3640 kc. K1AQB and AW made BPL. The Southington RA has moved its club house to the C.D. Communications room. FVV has a new QTH. YBH reports CPN handled 317 messages during 30 sessions. Average daily attendance was 27 stations. High QNI goes to K1CRQ, TVU, YBH, 30; K1BEN and FHP, 28; DAV and VQH, 26; VIY, 25. Section Net certificates were awarded to K1AQE, HAT, KLK, MDB and YBI for their activity on CPN. The Connecticut QSO Party was won by FEA and KLK, while K1DDY came up with the top v.h.f. score. The Willimantic ARC recently elected GFM, CQO, HNA and MHF. KYQ advises that CN handled 483 messages, including 75 on the second session, during 30 sessions. Average attendance was 12.9 stations. High QNI goes to OBR, RFJ and K1DHU. W1AW is busy answering 450 QSLs after the SS. The Stamford High School ARC received the call K1IZK and will be on the air with a DX-100B, an SX-100 and a triband beam. Officers are MDO, pres.; K1CJV, secy.; and CDM, treas. The CQ RC had 57 attend its Tue. night meetings on 146.7 Mc. K1EJS has a new Apache. Twenty ham friends attended a farewell party for VWP at YNR's Nov. 30. VWP is overseas bound as a field engineer. FHP reports CVN handled 38 messages during 12 sessions with an average attendance of 9 stations. QNI honors go to FHP, 12; K1BML and K1BMM, 11; K1AQE, 10; K1DDY, 9. DXE has a new NC-303. K1GTZ has a new NC-300. KN1IWQ is a new Novice in Meriden. HJG is on 2 meters from Terryville. CWF has a 6N2. PHT, AMJ and JZA are planning 220-Mc. operation. KLK received the 2-meter V.H.F. CC Award. KN1IWM has a new 2-meter beam. KN1IIG is a new Novice in Bloomfield. New appointments: K1DHU as ORS, K1ACC as OPS, K1CKZ as OO. Appointments renewed: PRT, EJH and NLM as ECs; EFW and NLM as ORSs; EFW as OO; FYF as OPS. Reports received: OES from K1CKZ, YOL, HQM, LGE, FVV; OO from K1CKZ, MBX, K1BEB. Traffic: (Nov.) K1AQB 501, BEN 412, W1EFW 379, AW 373, YBH 359, KYQ 346, NJM 301, TYQ 188, ULY 146, QJM 142, FHP 101, BDI 67, OBR 67, FYF 62, KLK 55, K1DHU 54, ACC 40, CRQ 38, JAD 33, W1VIY 31, DHP 22, RFJ 22, ZUQ 17, HYF 15, CUH 14, KAM 12, K1DDY 9, W1EBW 8, EJH 8, K1CAK 6, W1JZA 6, K1BML 4, W1HAT 4, YBI 4, K1BFJ 3, BMM 3, HMU 3. (Oct.) W1FYF 508.

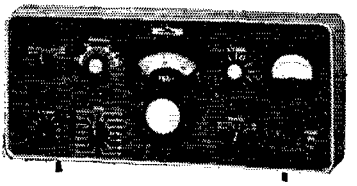
MAINE—Acting SCM, Charles F. Lander, W1QJA—SEC: QJA. PAM: VYA. V.H.F. PAM: JMN. RM: EFR. Traffic nets: The Sea Gull Net meets on 3940 kc. Mon.-Sat. at 1700, the Pine Tree Net on 3596 kc. Mon.-Fri. at 1900, the Barnyard Net on 3960 kc. Mon.-Sat. at 0800, the Maine C.D. Net at 1100-1200 Sun. on 3993 kc. New appointments include K1AKO as OBS and LER as OO.

(Continued on page 114)

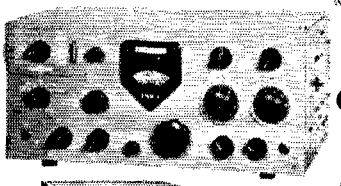
Have YOU tried out the new



Collins S line?



and the KWM-1



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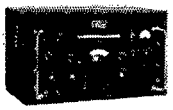
fine



51J-4

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Both LER and PNM made accurate frequency measurements in the last tests. From GPY comes a recommendation that stations with traffic going out of the State take it to the Pine Tree Net, which will tend to give the Sea Gull Net more time to handle incoming traffic. W2TQ and K2DRY are now W1TQ and K1IZO in Hancock. K1IDQ is a new ham in Ellsworth Falls. All appointees are urged to please send in monthly reports at the end of the month. Let's start the New Year off by refraining from calling into the nets until a call-up occurs, thereby helping VYA, your PAM, to keep his New Year's resolutions. We all regret the passing of John Singleton, a faithful member of the Barn Yard Net and ham fraternity. BKU has over 10 tons of surplus equipment of all sorts. John says the prices are lower than a snake's tail and first come-first served is the watchword. K1BWB is now in Rockport. It is indeed gratifying to note the observance of FCC regulations by stations calling into our nets. Many of the fellows are working DX with the frequent openings of the 6-meter band. Also the 2-meter addicts report excellent coverage. Hope all the gang reads "Operating News" in *QST*. There has been some very informative and convincing dope in this and other articles in the "fine print" sections. Traffic: W1QJA 210, GPY 142, CEV 117, EFR 55, FV 54, UDD 34, K1DPM 26, BXI 23, BDQ 10, BAY 9, W1BX 9, KBE 9, K1DWQ 6, AIF 2, EBG 2.

EASTERN MASSACHUSETTS—SCM, Frank L. Baker, jr., W1ALP—New appointments: WXC and K1GRP as OBSs, UOP and PSS as OOs, K1BYL as ORS, K1AII as OES. Appointments endorsed: VRK Swampscott, IPA for Boston Red Cross, ZNG Wakefield, YYZ Randolph, ADR Winchester, BB Winthrop, EGZ Harwich, NX Bourne, INC Melrose, AWO Wenham, LN Danvers, as ECs; EMG, DWO, K1BUF and MEG as ORS; WK, BB and JNV as OOs; IPA, ETH and MD as OPSs; ALP, LMU, UIR and K1BUF as OBSs; LMU and CTW as OESs; UE as RM for 80-meter c.w. The Eastern Mass. 2-Meter Net meets Mon. through Fri. on 145.5 Mc. at 1945. Sorry to have to announce the death of LAD. ALP attended a c.d. meeting at BB's LZP is on 6 meters. IDV and ZGW are on 10 meters. Heard on 2 meters: KN7CDS/1 Cambridge, 6KAH/1 mobile, KNs GQZ, HGW, ISR, ICJ, IEB, JHB, SVU, MSW, UMC, LVW, GMN and DA. K1ACL has a TBS-50C. NTK says that the Mass. Phone Net was one year old on Jan. 15. K1DEY says he won the top award for the Va. Free For All Contest. A Worked All Conn. Award for the Va. Free For All Contest. A Worked All Conn. Award was given to HOO. Area 1 Radio Comm. met at Sector 1-D. AUQ is busy at work. The Brainfree Club met. LGO plays football for Melrose. K1CEH has a DX-40. The South Shore Club met at UXW's QTH. WN1JAJ is a new call in Weymouth. K1ACJ has a Minibeam for 10-15 meters. NF received a card from the Central Radio Club, Moscow, and one from the USSR Government. IGY. K1BUR has a 65-ft. tower and Tri-Beam. K1BBU has an HQ-170. ZXG has an Apache. EMG made BPL again. K1DIO is busy with servicemen's traffic. KYC is president of the Acton-Boxboro Regional High School Club. NJL has an HQ-140X and worked DL1YU on 40 meters. KBN has a 44-element 220-Mc. beam and crystal converter. RCQ was busy in the SS and DX. AKN has a sked with his son K8MZD on 20-meter c.w. EUJ has a 417A crystal converter on 220 Mc. GEF got Idaho for No. 48. EUJ says 6-meter DX is very good. KN1IWE, Fall River, has a Globe Scout and an SX-99. KN1IWY/1, at Chelsea Naval Hospital, is OES. The following took part in the Sept. F.M.T.: PLJ, AYG, BW, SMO, SAD, WPG, TZ and GDJ. AAT was auctioneer at the Yankee Radio Club. BL is getting set up at his new QTH in Sudbury. K1HTK spoke and showed slides about his trip to KL7-Land near the Dew Line. DF, from ARRL, spoke at the North Shore Club. The QRA had a talk on Antennas by Bill Swanson, of Mendon. K1IDB and IIS are operating K1USA at Fort Devens and have had OBS, OO, OPS and ORS appointments endorsed. The Framingham Club had a mobile night, with QVK on 10 and FY on 6 meters. IOO has an SX-101. THO says he is feeling a bit better after having the bug. More calls on 6 meters: K1s AFU, AHQ, AJV, AQE, AQF, BYA, CFA, CLU, CRG, DTJ, DVM, DZV, GHG, W1s, AU, DXN, HIC, OMN, QVK, UNU and WZO. FVD is going to Phoenix, Ariz., for a few months. IHC has been doing some research work on u.h.f. propagation. GYZ and AKY are mobile on 10 meters. Traffic: (Nov.) W1EMG 522, AWA 298, K1DGI 158, DIO 154, WIEAE 131, KYC 68, K1BYL 55, W1UKO 46, NJL 41, UIR 30, KBN 25, LGO 23, LMZ 20, RCQ 20, K1CMS 18, W1TY 16, MIX 12, ATX 10, K1GRP 8, W1AUQ 7, AHP 6, AKN 6, DIY 6, UE 6, MER 5, K1DGG 4, EGN 4, W1WU 4, K1AII 2, W1DTB 2, EUJ 2, GEK 2, SMO 1. (Oct.) W1ZEN 23, AOG 9. (Sept.) W1KBN 37.

WESTERN MASSACHUSETTS—SCM, John F. Lindholm, W1DGL—Asst. SCM: Richard J. Kulagher, IKGJ. SEC: BYH. RM: BVR. PAM: MNG. The West

(Continued on page 116)

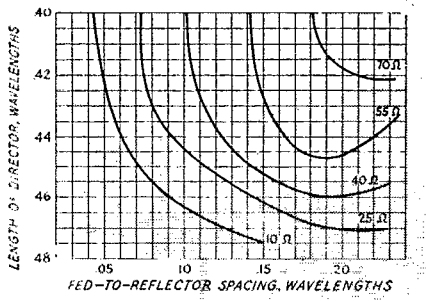
On the Hy-gain Beam . . .

Feeding and Matching the Parasitic Array

ONE OF A SERIES

Input Impedance

The radiation resistance as measured at the center of the driven element of a 3-element array can vary over a fairly wide range since it is a function of the spacing and tuning of the parasitic elements. There are, however, certain fairly well-defined trends. (1) The resistance tends to reach a minimum at the parasitic-element tuning condition that gives maximum gain, becoming larger as the element is detuned in either direction — that is, made longer or shorter. (2) The resistance tends to be lower the closer the spacing between the parasitic and driven elements. Values of the order of 10 ohms are typical with a 3-element beam having 0.1 wave length director spacing, when the director length is adjusted for maximum gain. This can be raised considerably — to 50 ohms or more — by sufficient change in director length, at a sacrifice of gain. The minimum value of resistance increases with increased director spacing, and is of the order of 30 ohms at a spacing of 0.25 wave length.



Resonant resistance of fed dipole in a 3-element parasitic antenna, over-all length 0.3 wave length.

The above paragraph and chart reprinted exactly as it appears in Chapter 4 page 159 of the eighth edition of the ARRL Antenna Book discloses certain known and well confirmed facts of great importance when considering the proper feeding and matching of a three element parasitic array. The principals apply equally to single band or multi band arrays. This evidence may be restated in the form of the following conclusions.

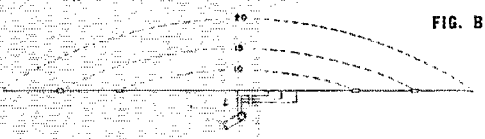
1. The radiation resistance as measured at the center of the driven element of a three element array can vary between approximately 10 and 70 ohms depending upon the spacing and tuning (length) of the parasitic elements.
2. The resistance tends to reach a **minimum** at the the parasitic tuning condition that gives **maximum gain.**
3. A typical three element beam having .1 to .15 wave length director spacing (most commercially manufactured arrays have approximately this spacing) will have a radiation of approximately 10-15 ohms when the director length is adjusted for maximum gain.
4. This can be raised considerably - to 50 ohms or **more - by sufficient change** or detuning in the director length, AT A SACRIFICE OF GAIN.
5. Increasing the element spacing will also raise the radiation resistance but beyond a certain point it also reduces gain. (See figure 450 page 158 chapter 4 ARRL Antenna Book. Which all means simply this - it is easy to split the dipole of a parasitic array and feed it directly with a 52 ohm line. **When this is done, however, the only way possible to effect a match between the antenna and the 52 ohm coaxial cable is to detune the parasitic reflector and/or director from the point of maximum forward gain. This is certainly a stiff penalty to pay for simplicity.**

We at Hy-Gain feel that it is the function of an antenna system to develop gain and front to back ratio. Its ability to do so should not be compromised to facilitate matching. It is for this reason that Hy-Gain's engineers developed the commercial version of the very popular Gamma Match System for use on both the monobander and full sized tribander series of Hy-Gain antennas. In the Gamma Matching System the driven element is grounded at the center directly to the boom. This eliminates splitting and insulating the dipole which usually weakeans it mechanically. The Gamma Match is a shunt feeding device whose impedance transforming abiliaties are a function of the point at which it is attached along the dipole, and the ratio of the diameters and spacing between the driven element and the gamma rod. (See Figure A). By adjusting the tap position along the dipole the radiation resistance of any three element array can be transformed easily into 52 ohms for maximum energy transfer into the commonly used RG8U 52 ohm coaxial cable. In addition to transforming the impedance, the Gamma Rod introduces a small amount of inductive reactance due to its length. This reactance can be tuned out by inserting, in series, a capacitor as shown in figure A.

FIG. A

The gamma match actually makes possible a perfect 1:1 SWR (which means maximum transfer of energy between the line and the antenna) at **no compromise in element tuning to facilitate matching.**

FIG. B



Carrying the application of the Gamma Match one step further, Hy-Gain's engineers designed the triaxial gamma match system shown in figure B as used on the full sized Hy-Gain trap tribander antennas. In this instance, three Gamma Rods with their associated reactance cancelling, coaxially formed, capacitors are fed in parallel by a single 52 ohm transmission line. Each gamma rod is set at a point along a dipole which makes possible the proper transformation of impedances and matches the coaxial transmission line on each band. Each capacitor is tuned so as to cancel the inductive reactance of the individual 10, 15 and 20 meter gamma rods. There is very little inter action since each gamma rod and capacitor combination is effectively a series resonant circuit. Series resonant circuits are very low impedance at their resonant frequency (thus allowing R. F. energy on that frequency to pass). They offer a very high impedance, however, to the passage of RF energy of all other frequencies.

Both the single band and three band Hy-Gain Gamma Match Systems are factory pretuned with exact dimensions which will result in a very low SWR. Although factory precalibrated, they are also adjustable to compensate for variations which may be encountered at each installation site. This is a very important feature since height above ground and the proximity of surrounding objects often change the characteristics of an antenna.

VY 73

Andrew A. Andros, WØLTE
President
Hy-Gain Antenna Products Co.

Mass. C.W. Net meets on 3560 kc. at 1900 EST Mon. through Sat. The Mass. Phone Net meets daily on 3870 kc. at 1800 EST. Attention West Mass. Novices: The West Mass. Novice and Slow-Speed Net meets Tue., Thurs. and Sat. on 3744 kc. at 1830 EST. New appointments go to KGJ as Asst. SCM, BYH as SEC, ZPB as ORS, and QKC as OPS. Congratulations, fellows. Endorsements were as follows: BKG and RLQ as OOs; AMI, DVW, HRV, JAH, LLN, WEF and ZUU as ORSs; DGL, JAH and UKR as OPSs; BKG, HRV, JAH and LLN as ECs; STR and PHU as OESs. BKG got a nice write-up on ham radio in the local newspaper. BKG also maintains skeds with Antarctica and Greenland on 20-meter s.s.b; he can handle traffic for those areas. DGT is working on an interpolation frequency meter. ZPB recently modified his rig and is working on two ARC-5s for break-in. BVR and DVW did a fine job in putting out an explanatory bulletin for the Novice Net. The BCRA continues to put out its fine publication, *Random Scatter*. New Novices are KN1IKD and ILP from Fitchburg and KN1ISW from Fiskdale. BKG gave a fine talk on TVI again at the BCRA. Our new SEC, BYH, is now active on 6 meters with 40 watts. AFN, one of the nation's outstanding authorities on RTTY, demonstrated RTTY to the Montachusett Club of Fitchburg. A vote of thanks goes to HRV for his fine service to the section as SCM. Your new SCM looks forward eagerly to a term of continued progress. Traffic: W1UEQ 622, KGJ 173, K1CAU 149, W1DZV 143, BYR 93, DGL 87, ZUU 83, AGM 20, ZPB 19, MNG 18, BYH 1.

NEW HAMPSHIRE—SCM, Robert H. Wright, W1RMH—SEC: BXU. RMs: COC and K1BCS. PAM: HQ. V.H.F./PAM: TA. The GSPN meets at 1900 Mon. through Fri. and at 0900 Sun. on 3842 kc. The NHN meets nightly at 1845 on 3685 kc. It is my sad duty to report the passing of CDX, of Portsmouth. John was very active in amateur affairs and his contributions to net activity in the State will not be forgotten. The NHN would like more stations to check in for traffic. Welcome to KN1JCO the XYL of MDP. MDP is working at Evans Radio. AIJ reports FB results on 15 meters using a 40-meter dipole. BYS says the new G-77A mobile transmitter is doing a nice job. Dana worked CN8HU from downtown Concord. Congratulations to EFW on his reelection as ARRL New England Division Director. The new officers of the Turkey River Amateur Radio Club are RMH, pres.; TTU, vice-pres.; KN1DZF, secy.-treas. Appointments: HQ as PAM. Endorsements: HKA and K1BCS as ORSs. Anyone interested in ARRL appointments, please contact me. Traffic: K1BCS 640, CTF 593, W1FUA 112, MTX 63, HKA 57, HQ 22, YHI 19, AIJ 10, K1BHD 9, AHE 8.

RHODE ISLAND—SCM, Mrs. June R. Burkett, W1VXC—SEC: PAZ. PAMs: KCS and YRC. RMs: BBN and BTV. Appointments endorsed: UHE as OES and CMH as ORS. WTR and K1AFJ are now alternate NCSs for the Johnny Cake Net. On Nov. 14 the BVARC elected AUT, pres.; IHW, vice-pres.; K1EJH, rec. secy.; K1EHV, corr. secy.; ZEZ, treas.; KN1DNC, act. mgr. MNC is instructor of the new code and theory classes started by the Cranston Radio Assn. Assisting him are POP, AFO, ABR, EGH, EGD and YVW. The CRA also has started a club net which meets at 8 P.M. on 29.510 Mc. with ZPG head of the mobile truck. A Windom has been installed on the roof of the club headquarters. We're glad to welcome ØTRH/1, who is living in Middletown while stationed in R. I. with the Navy. He is active on 10 meters and "hails" from St. Paul, Minn. YRC reports that the Providence Area stations finally have found the RISPN and that the representation is good! Thank you. UHE is building a new 220-Mc. amplifier. Many of the reports coming in contain very little information about current activities, etc. Your traffic and appointee reports are greatly appreciated each month, but tack on a little bit of news, please! Traffic: W1CMH 118, YRC 113, YAP 112, VBR 59, LSP 30, BBN 25, WED 8.

VERMONT—SCM, Mrs. Ann L. Chandler, W1OAK—SEC: EIB, RM: K1BGC. PAM: ZYZ. V.H.F. PAMs: FMK and TBG. Traffic nets: VTN, Mon.-Sat. at 1830 on 3520 kc.; VTPN, Sun. at 0900 on 3855 kc.; GMN, Mon.-Sat. at 1700 on 3860 kc.; RACES at 1000 on 3993 kc. Sun. and at 1900 Thurs. on 3501.5 kc. AD and EIB have been appointed to work with RACES officials to discuss and plan a better network in the State. During noon hours at Bryant's in Springfield, UJN/1 is in operation. WLH/1, in Colchester, is on 50 Mc. EXZ built a Kalitron oscillator for direct operation on 50 Mc. as a v.f.o. WVV is operating Amherst College's club station, JRA. OAK contacted KH6UK on 50 Mc. Traffic: W1OAK 157, ZEW 118, ELJ 20, EIB 19, TXY 12, K1BOL 8, KJG 6, KN1GCX 2.

NORTHWESTERN DIVISION

ALASKA—SCM, Eugene N. Berato, KL7DZ—The

(Continued on page 118)

Anchorage Amateur Radio Club elected AUV, pres.; PJ, vice-pres.; CCP, secy.; BES, treas.; MF, three-year trustee. MF is the proud recipient of A-1 Operator, WPX-C.W. and FOC certificates. AZU's new QTH is now Juneau. CSQ is on the air with a new Valiant and an SX-101 on 20 and 80 meters. Some bootlegging is going on with BVC's call. TL's new QTH is now C.A.A., Summitt. BEC reports all TVI problems in the Nome Area have been cleaned up. ALA is vacationing in W6-Land. The QTH of CDP is desired. Anyone knowing it, please drop your SCM a card. CRE will be mobile down the Alaska Highway during March. Traffic: KG1DT 580, KL7BMZ 51, MF 17, CRE 3.

IDAHO—SCM, Rev. Francis A. Peterson, W7RKI—RACES and ARRL members are increasing. Keep up the good work. Idaho is getting good coverage, too, on the C.D. Net. The police are appreciating the help of the amateurs in communications. JHY reports that the FARM Net handled 91 pieces of traffic in November. The ECs report much new activity and organization. 1959 should be a big year for the Idaho hams—with your help. Applications for various appointments or suggestions should go to the SCM. K7DUX gave a talk to the Pocatello Club about microwaves. New high school hams are sprouting up all over. The high school station, ZPD at St. Anthony, is being reactivated, too. The holiday traffic was quite heavy, especially in college areas. Our service to the public will help keep them favorable to the hams. How about each one getting a new ARRL member in 1959? Traffic: W7VQC 45.

MONTANA—SCM, Vernon L. Phillips, W7NPV/WXI—SEC: KUH. PAM: EOI. RM: KGJ. The Montana Phone Net meets M-W-F at 1730 on 3910 kc. OOG died from a heart attack while elk hunting. JRG became the first W7 to work all continents on 6 meters and earned the world's 12th 6-Meter WAC certificate. NBB earned DXCC. DRN got married. KN7ECD and ZPT have a new baby girl. KJX and MM were in automobile accidents. FIP shot himself in the leg. YIO and ZUQ moved from Black Eagle to Fort Shaw. ZOV moved from Havre to Great Falls. New calls: KN7ECF in Dillon, KN7EMU in Columbia Falls, KN7GOS and KN7GOT in Bozeman, K7CFA in Great Falls, K7DGQ and K7BMA in Billings, K7DCH in Kalispell and K7DZP in Fairfield. SFK and YHS have each worked all eight KC4s. New officers of the Electric City Radio Club are YLZ, pres.; ODK, vice-pres.; K7BYB, secy.-treas.; DSS, GCS, CRD, TLA and VLZ, directors. Traffic: K7EWZ 71, W7SFK 30, DEO 26, YHS 16, K7BVO 14, BYC 10, DVZ 8, W7YUB 6, BKB 5, NPV 5, CQC 4, IDK 4, TGM 4, ZUK 4, K7CTI 3, W7YQZ 3.

OREGON—SCM, Hubert R. McNally, W7JDX—The present lineup of appointments in this section is as follows: SEC: UQI. RM: AJN. PAMs: NJS, VPH and RGS. ECs: HHH, ADX, AIH, RCL, ZQM, ZQB, TMF, PPG, SO, BLM, VIL, KL, TUW, UQI, AWI, UZU, GWB, SNA and RXJ. OPSs: GNJ, RCL, QYS, ATQ, TMF, FY, HDN, BLN, NJS, JCJ, ZQM, FTA, KEN, DEM, UIU, RHX, CUW, ENU and AIH. ORSs: OMO, YUY, LT, BVH, AJN, ZFH, YKT, GAJ, ZB and BDU. OBSs: YG, AJN and KEN. OESs: VPH, GWB, GLZ and K7AUV. OOs: PQJ, WNV and K7AUV. This is a swell lineup of the gang but we can always use a few more, especially in the ORS, OES and OO spots. Your SCM is always ready to send out application forms to anyone expressing an interest in any appointment. ZB really is making a record for himself and is filling the shoes of APF in traffic totals. PQJ got on record with a perfect score in the last Frequency Measuring Test. Fine work, Fred. We sure regret to announce the death of George Johnson, SF, the old-timer of Aurora, Ore. He was always an active voice in and on OEN and surely will be greatly missed by all his friends. Traffic: W7ZB 578.

WASHINGTON—SCM, Robert B. Thurston, W7PGY—The Valley Amateur Radio Club (VARC), Puyallup, was very pleased with '58 Field Day results, having finished sixteenth in the nation. HMQ made a good showing in the Sweepstakes. HRC transmits Official Bulletins on 2-meter RTTY, 147.0 Mc. AMC is planning a 500-watt c.w. rig only. QLH is collecting parts for a 2-meter converter. FTR is back from Oklahoma. MCU is located at the Loran transmitting station, Point Granville, Wash. OIV and OEB renovated TV antennas for 144 Mc. The TVI Committee for the Spokane Area consists of W7s ZNN, ZIC, ULL, HCF, JGV and K7CTS. WØKUK is a newcomer to the Spokane Area. The Wenatchee c.d. drills are being conducted twice monthly on 2 meters, supervised by OVE. K7APJ has a new Viking II. DZX is overhauling antennas. EQU has a new 10-meter beam and rotator in operation with FB reports. UOJ is on the air with a kw. s.s.b. rig. ULL gave a very interesting live demonstration of RTTY at the Nov. 18 meeting of the Spokane Club. HOD and FBI have new WRL 300-watt transmitters. HXE received her first QSLs and they are very clever, too. AIB has a new tower and Hy-Gain Tribander in operation. W7s

(Continued on page 120)

ANNOUNCEMENT!

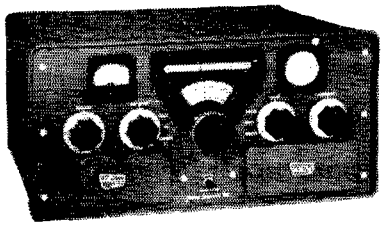
We are pleased to advise that Central Electronics, Inc. has become a wholly-owned subsidiary of Zenith Radio Corporation.

The acquisition by Zenith materially strengthens Central Electronics' position in its field of amateur, commercial and military electronics, and will enable it to expand its operations substantially.

Wesley R. Schum who founded Central Electronics in 1950 will continue as Vice-President and the balance of the personnel will remain as before.

In the future you can expect the same satisfaction, service and leadership in creative engineering that we have delivered in the past.

Central Electronics' fine quality equipment is a natural addition to the Zenith family of high quality products.



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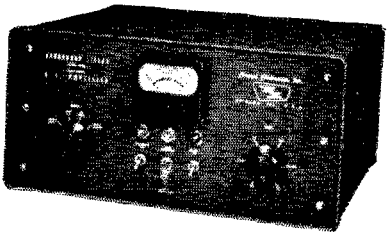

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NO TUNING CONTROLS — CE BROADBAND Couplers in HIGH EFFECIENCY CLASS AB² using single 813. Easily driven to 600 Watts PEP Input 160 thru 10 by a 20A or 100V. Built-In HEAVY DUTY POWER SUPPLY — 45 MFD PAPER Capacitor. Meter reads WATTS INPUT, GRID DRIVE, RF AMPS, and SWR. *Completely shielded* — TVI suppressed — parasitic free. REMEMBER there is LESS than ONE S UNIT difference between the 600L and a 2 KW PEP job. .....PRICE $495.00

THESE MULTIPHASE EXCITERS PIONEERED AMATEUR SSB

MODEL 20A

MODEL 10B — 10 watts PEP. Plug-in coils 160 thru 10 meters. Perfect voice control on SSB—DSB—AM and PM — CW breakin. *Carrier and calibrate level controls.* 40 DB suppression.

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MODEL 20A—20 watts PEP. Bandswitched 160 thru 10 meters. SSB—DSB—AM—PM and CW. Magic eye monitors carrier null and peak modulation. Ideal for driving AB1, AB², and most Class B linears.

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MODEL 10B

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AAJ, DBW, GVV and WQD assisted in an antenna-raising party for Hap. DPW is using a B&W 5100. KN-7GIY is a new station in the Prosser Area. FQD is working 40-meter c.w. ZSH is going to KL7-Land for four months. The Skagit County banquet has been postponed until February. The VARC is planning code classes for 1959 in cooperation with the Puyallup and Auburn high schools. RGL transmits Official Bulletins Mon., Wed. and Fri. at 1830 PST on 3700 kc. MHL is fighting oscillations in the TBS-50. BSW is moving to a new QTH. PUA/7 is working 2 meters. BA reports a big traffic total. PHO is working 75-meter phone. Washington appointees are urged to check the expiration dates on their certificates. JPH moved to a new QTH in Seattle. QPR has been appointed EC for Seattle and King County AREC. UWT renewed his EC appointment. EVU and LTK are new OOs. KN7GDO is in the process of moving to W6-Land. Traffic: (Nov.) W7BA 2823, PGY 1599, QLH 428, DZX 387, KZ 251, APS 191, EHH 49, AMC 44, LVB 34, LFA 32, DPW 22, AIB 15, IEU 14, YFO 10, EVW 9, UWT 9, CZY 7, HUT 6, GHM 4, JEY 2. (Oct.) W7NWP 23, GVV 3.

PACIFIC DIVISION

NEVADA—SCM, Charles A. Rhines, W7VIU—New SNARC officers are PWE, pres.; AFN, secy.; BJY, treas. The club's acmievement certificate No. 65 went to PBS and No. 66 to KOI. YLO, HJ and JU are very active in RACES. PC and K7DEG have new QTHs. The NARA still holds weekly transmitter hunts. K2YEB/7, JLV, CX and MAH have found some good 6-meter openings, with MAH finally making his WAS. CX, PC, BJB, BIZ, CZZ, ZCA, SDE, VJR and K7ANK are active on 2 meters with the Reno 2-meter net very active. K7BFM, in Austin, is operating on 6 meters. K7ARV joined the ARRL and has a new SX-101. K7AHA is trying out voice control on his DX-100. UPS is building a new kw. final and eying the 3281-7581 combination. K7BFM and K5IPK/7 offer to handle traffic. We need more for complete state coverage. How about you Reno, Las Vegas, Winnemucca and Ely boys? VIU has a new Pacemaker-Thunderbolt combination. Traffic: W7VIU 165.

SANTA CLARA VALLEY—SCM, W. Conley Smith, K6DYX—SEC: W6NVO. PAM: W6ZLO. RM: W6PLG. John Reinartz, K6BJ, gave his first club talk after an extended illness to the Monterey Bay RC in October. K6GKG is back on the air after an illness of several months. The West Valley RC reports a whole covey of new members and an operating contest with amusing wrinkles. W6YHM gave a talk on Cataclysmic Flood Waves (Sic) before the SARO. The San Mateo RC enjoyed its annual Christmas Dinner at the El Rancho. The Santa Cruz Co. RC election results: W6JCZ, pres.; W6VEV, vice-pres.; K6GHA, secy.-treas. The dinner meeting of the Northern Calif. Net (NCN) was held in San Bruno Dec. 14. W6QMO, NCN manager, reports a new station layout a little closer to the ultimate. K6HGV is joining with W6WGO in TVI work. W4ITN/6 is busy lining up a new beam. K6GZ is back after a few weeks QRT because of a license lapse. WA6CLT, ex-W1HFC, ex-W2UZN, is active on 40, 20, 15 and 6 meters. W6CBE is experimenting with the s.s.b. rig. W6WNI made 502 QSOs in 65 sections in the October CD Party and then blew a filament transformer in the third hour of the SS. K6JA is eager to start a chapter of Veteran Wireless Ops. Assn. in the Bay Area. W6NVO now sports a new mobile receiver. W6PBC is building a revised u.h.f. transmitter. W6ZXS has a new vertical on 40 through 10 meters. W6MXO is working on a fishpole vertical. School work is curtailing traffic work for W6RFF. W6MMG, active on 6 meters, reminds us the NPEC Net is on 50.55 Mc. Mon. at 8 P.M. W6UJA was in the Sept. F.M.T. Traffic: (Nov.) K6DYX 341, K6GZ 338, W6BPT 321, W6RFF 67, W6YBV 66, W6AIT 63, K6HGV 47, W6QMO 44, K6YKG 32, W6OH 28, W6ZLO 26, W6YHM 25, W6DEF 19, K6OSX 10. (Oct.) K6GZ 441, W6AIT 113, W6YBV 103, W6RFF 76, W6FON 59, K6YKG 10, W6MMG 5.

EAST BAY—SCM, B. W. Southwell, W6OJW—Asst. SCM: Mary E. Lorenz, W6PIR. SEC: W6CAN. ECs: W6LGW, W6ZZF, W6IUZ, K6EDN, K6JNW and K6QZG. K6QHC made 150,840 points in the SS. K6GK has a Panadapter PAA-3 and would like an instruction manual on same. Can anyone help? WV6AGA and K6ILH operated 6 and 2 meters in the East Bay Party from Mt. Diablo. K6QHC will be QRL the U. S. Navy. K6OSO made BPL. K6OKK is doing FB on 50 Mc. K6GK made BPL. W6CBF is QRL painting the house. The EBRC had an FB dinner meeting and saw pictures of Pacific Weapons Tests. AREC members in the section now total 178, just 150 more than last year. Your SEC and ECs are doing a fine job. W3FYS, with an assist from W6DIX, W6TYQ and W6BIL, made his W.A.C.C. certificate from the Oakland Radio Club. The Southern Alameda County Emergency Net meets at 2100 on 3980

(Continued on page 122)

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kc. and 51 Mc. K6EMR has his Tech. Class ticket. K6JZR and K6BJT are new members of the MDARC. K6KYT is home from Belgium and the World's Fair. K6DQM is home from India. W6LGW has been fishing for real fish, not DX! K6SCF and K6IRB got their Comm. Phone tickets. K6DMW has a new electronic keyer. W6TI has a 271/269 DX score. That's all the reports this time, gang. Keep them coming. Traffic: K6GK 545, K6OSO 117, W6JOH 72, K6DMW 70, K6QHC 9, WV6AGA 5, K6OKK 3.

SAN FRANCISCO—SCM, Fred H. Laubscher, W6OPL—The ANRC, San Francisco, honored W6GGC, W6JWF and W6URA for their outstanding work and presented them with lapel pins designating the many years of devoted service to their community. W6SLX tells us the Humboldt RC is planning a more active program for the new year. W6ZSE was released from the hospital after a relapse. W6GQA just completed his 27th consecutive F.M.T. OOs, please note! Sure sorry to hear that K4ZOH (Mr. AF6AIR himself) is going to leave us for school. All our good wishes go with you, Larry, and the whole gang appreciates the help you have given them. W6HJP is signing K3EFF in Washington, D. C., and is looking forward to living in San Francisco after 20 years of military service in the USAF. How about some station reports from San Francisco section members? It only takes a few moments to write your SCM a postal card. This report is supposed to be mailed to ARRL by the 7th of the month. This month I am writing my report to Hq. on the 10th in hopes that some cards may come in. The only way the other fellows in the section and across the nation can learn of what's going on here is for you fellows and gals to drop me a line so we can put it in print. Perhaps you can get the secretary of the local radio club to drop us a line. It's nice to read an interesting section report, but it takes each of you to do your part to supply the news. If this office can be of service to you or your club pass the word along and we will do all in our power to help. My address is found on page 6, *QST*. Traffic: W6BIP 170, W6OPL 12, W6GGC 4, K6BAQ 1.

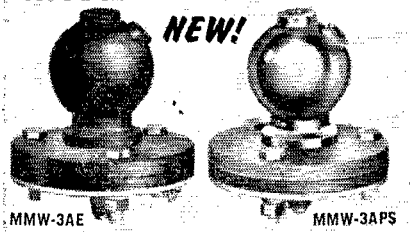
SACRAMENTO VALLEY—SCM, LeVaughn Shipley, K6CFF—Everyone is very proud of W6PIV, who was chosen by the radio clubs of Sacramento as the outstanding amateur of the year. He has always performed many noble deeds during his ham career but this past year tops everything thus far. He has so many hours of tape recordings on the moonwatch operation that the Smithonian Institution has requested copies of them. He is to be our nominee for the Edison Award. Thanks to W6WLI for his report and a very hearty welcome to the Sacramento Valley section. We are glad to have W6AF in the fold with his FB monthly report of rare DX. Sorry to learn that the Redding Radio Club recently sold its club gear. The combined efforts of the Sacramento radio clubs at our recent Christmas Party proves that we do know how. The North Hills Radio Club of Fair Oaks says, "Let's make 1959 'Join an Amateur Radio Club' year." If you live in an area not served by the NHRC they will supply you with information regarding clubs in your neighborhood. If you want to know how to hold a successful auction at a radio club ask K6BMU. Listen for the gals on Mar. 6 as that is the date of the Sacramento Camellia Festival. All amateurs who work one of the Camellia Capital Chirps on that day will receive a really new and different certificate for the wall of the shack. Good luck to W6GDO and all the fellows he has enticed to 2 meters—teletype, that is! W6TZF has been very cooperative in helping the fellows with their RTTY gear. Traffic: K6VBV 707, K6ORT 78, K6SXX 3.

SAN JOAQUIN VALLEY—SCM, Ralph Saroyan, W6JPU—New officers of the Fresno Radio Club are K6CZO, pres.; K6LRQ, vice-pres.; W6QJM, secy.; and W6UBK, treas. W6DVI is on s.s.b. with an HT-32 and an HT-33. K6RUQ is going on 6 meters. W6SPQ has a Communicator III on 6 meters. WV6BTK is doing fine on 40-meter c.w. and is studying for his General Class license. A radio club has been organized at the Downey High School in Modesto with W6USV pres. The Kern County Sheriff Emergency Radio had a trial run working from Mt. Breckenridge with good results. Those helping were W6FBT, K6UYN, K6APE, W6UZG, K6IUX, W6VMB and K6SWR. The Turlock Amateur Radio club held a joint meeting with the Merced Radio Club celebrating Turlock's 30th birthday. W6HC was the guest speaker. W6EUH is busy with college with very little time for ham radio. W6NYT returned from active duty with the Navy. K6LJN is heard on 75-meter phone. W6QFR has a Heath s.s.b. adapter and an Apache transmitter. K6ZCD has a pair of 4E27s in GG on 75-meter s.s.b. K6CZO has his Valiant back on the air. K6AHQ has a quad up in the air on 15 meters. W6PPO held an antenna-raising party and got his quad triband up and on the air. W6JPS has worked 36 states on 6 meters. W6SMS worked four JA stations on 6 meters in one afternoon. W6ARC has a new mobile an-

(Continued on page 124)

HEAVY DUTY
MOBILE BASE MOUNTS

NEW!



MMW-3AE MMW-3APS

Ebony Finish $6.95 Polished Finish $7.95
Ebony Finish, S. S. Hardware $8.95
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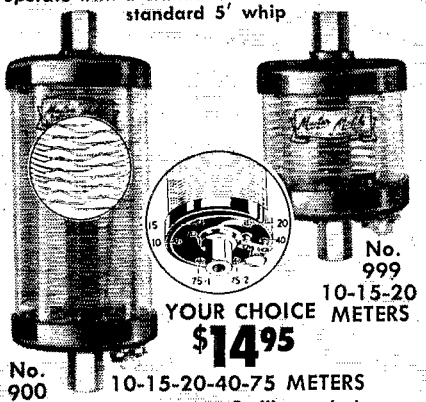
New *Plug-In* type coils for the Ham, designed to operate with a standard 3' base section and standard 5' whip



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- Factory pre-tuned—no adjustments needed

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96" WHIP

FOR 10, 11, 12, 15, 20, 40, 80 METERS

SIZE 1⅜"x 19"

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Positive action, just slide whip in or out to loading point and lock nut into position.

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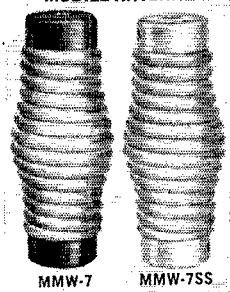

MMW-7 MMW-7SS

MMW-7 Cad. plated, black painted ends **$4.50**

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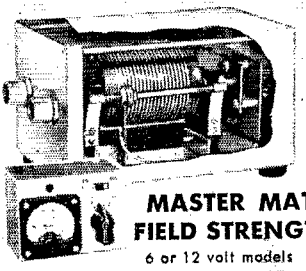

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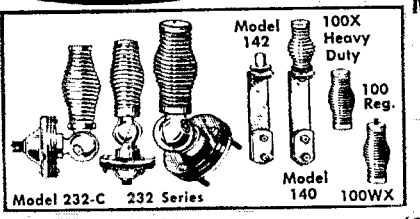
6 or 12 volt models **$24.95**



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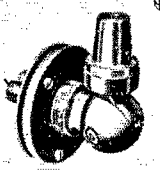

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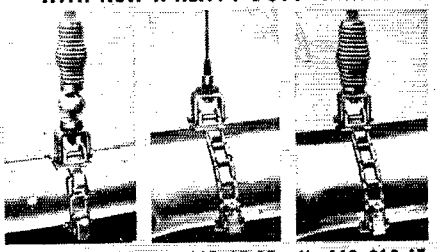
WITH NEW X-HEAVY DUTY CHAINS



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tenna. The c.d. net Mon. at 8 P.M. on 3995 kc. and on 6 meters still is going strong. Keep on sending in reports, fellows. Traffic: W6ADB 100, K6RLX 10, K6SNA 10, W6USV 7, W6ARE 6.

ROANOKE DIVISION

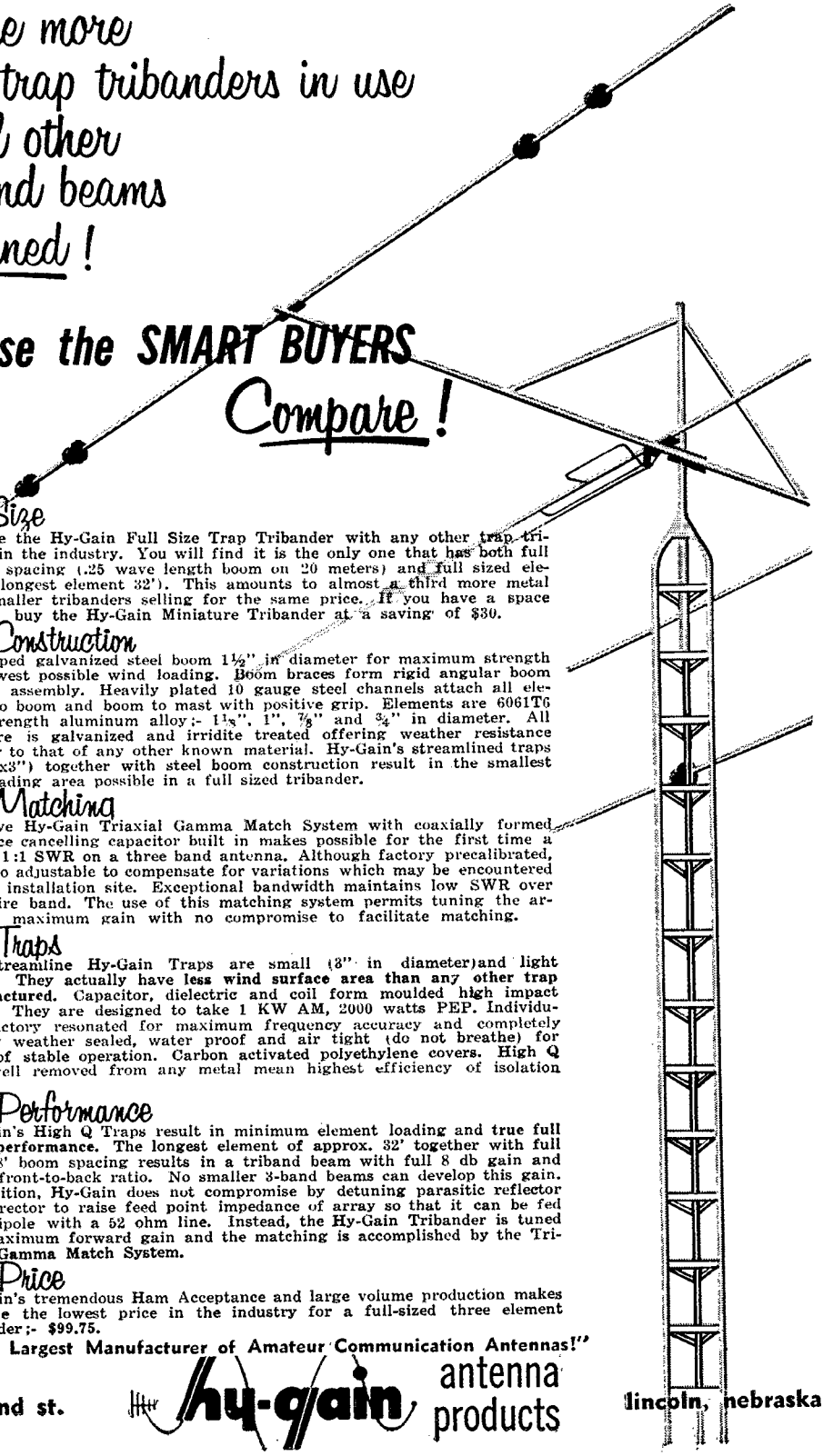
NORTH CAROLINA—SCM, B. Riley Fowler, W4RRH—SEC: HUL, PAM: DRC, V.H.F. PAM: ACY. Activity in the v.h.f. spectrum is on the increase within the State. HRS sent in a good report on the 6-Meter Net and recommended the issuance of certificates to HTL, K4BYN, K4OSS, K4SHT, K4SWN, HRS, K4LLX and K4SFN. All were issued a net certificate. ACY, V.H.F. PAM, sent along a report of v.h.f. work and the *Greensboro Club Bulletin*. ULX, K4LLX and ZXI are holding week-end tests on 220 Mc. HUL, SEC, is now on s.s.b. and promises to send along the schematic of his "Poor Man's" S.S.B. Sounds good on the air. There are ten in Western North Carolina now on 2 meters. Propagation is proving to be excellent. BLV has received a model 15 Teletype from MARS; LOV has a model 14 from MARS. Both of these machines will be on the air before too long. This makes RTTY interesting in the State. CVU, HKB, GHX, RVH, K4RRG, RRH, TLA, UJR, OFV, BLV and LOV are on RTTY. All except HKB, RRG and TLA also are on MARS RTTY. A class in procedure is being taught by RRH on 5850 kc. at 8:30 P.M. each Fri. It is primarily designed for MARS, but would make all operators better operators. You are invited to listen. Twenty-five operators in MARS District No. 1 received proficiency certificates from Col. Jones, MARS Director, Third U. S. Army. Traffic: (Nov.) W4GXR 363, BAW 36, BBZ 8, ZWF 3. (Oct.) W4GXR 574.

SOUTH CAROLINA—SCM, Dr. J. O. Dunlap, W4GQV—SEC: K4PJE, RM: AKC, PAM: YOS. The DX ARC of Camden ratified its constitution on Dec. 5 with DX as, appropriately, its first president, K4GGP as vice-president and K4STM as secretary. Greetings to the Southern Coffee Club on 3815 kc., which meets 0500-0700 EST Mon. through Fri. W4HOU and BHR are regular participants. CNZ, ex-K6RUO/4, is net secretary. K4DFW has completed his mobile s.s.b. rig. New officers of the Dreher ARA are K4AXV, K4OVK, KN4TRX and KN4UEO. K4JVV is president of the newly-formed Greenwood Club. AKC is the new Vice-Director of the Roanoke Division and editor of *Scarab*. We wish him success in his new duties. K4PFC, at last reports, was headed to Winston for his General Class license. 1HDQ, from Headquarters gave a talk to the Aiken RC on Dec. 2. K4RLX completed an elaborate, artistic mast-head for *Scarab* of which we are all proud. AKC, DAW, K4PJE, K4HJK, K4GAT and K4WCZ made BPL for October traffic. K4WCZ and PIA made BPL for November. Traffic: (Nov.) K4WCZ 581, GAT 411, W4PED 161, K4PIA 157, AVU 102, W4AKC 88, K4BVX 68, HJK 67, W4DAW 59, FFH 56, TWW 39, K4HQK 32, W4BHR 14, K4PIK 11, W4CNZ 5. (Oct.) W4FFH 116, K4PIK 68.

VIRGINIA—SCM, John Carl Morgan, W4KX—Virginians continue to be well represented in the BPL column. Both halves of the K4QER/QES family made it in November, while K4EZL racked up an even dozen. OOL is the new VSN manager, succeeding LW who resigned because of Navy business. Dick reports visiting several European points. VSN is thriving, thanks mainly to his fine work. CVO reports working some nero-mobile with a KWM-1. Welcome to BXM, formerly K9BDW, now in Arlington, and to ORT, now on Navy duty in Norfolk. K4JKL received an appointment to West Point. K2GWW, who has kept PFC hot at Quantico Marine Base, is about to return to civilian life. JMB says that K4ZGS now is in operation at the Destroyer-Submarine Piers at Norfolk Naval Base. EMH has been appointed to Governor Almond's Operational-Survival Board. K4DSD has a 3.5-kw. diesel generator for AREC work. New beams are in service at BGP, UIO and K4AET. BYZ is active on VN again, having tamed the bug. CXQ spent the Thanksgiving holiday getting the new kw. home rig perking. K4EUS still is chasing DX on 2 and 6 meters and sporting a new 75A-1 receiver. IF is sweating out the last four QSLs for DXCC before returning as he puts it, to "sanity." BGP, SHJ and YVG are bucking night school at Wm. & Mary-V.P.I., Norfolk. KX finally is giving the clothesline back to the birds in favor of a new vertical. K4JKK's first issue of *Virginia Ham* was a "beaut." If you're not on the mailing list, you're missing something and should drop Ken a card or message. VN report for November: 30 sessions, 448 messages handled for an average of 14.6 per session. Traffic: (Nov.) K4QES 831, JKK 557, EZL 470, KNP 447, AET 313, ASU 233, EIG 230, QIX 171, QER 169, W4SNH 151, KX 113, K4MEV 75, W4QDY 57, K4SGQ 55, W4EMH 50, SHJ 43, BGP 34, K4DSD 28, W4BYZ 27, K4JIP 25, W4AAD 16, OOL 15, CXQ 8, JMB 8, CVO 6, K4JRE 6, DKA 3, IUO 2, YVG 2. (Oct.) W4PFC 728, BZE 51,

(Continued on page 126)

there are more hy-gain trap tribanders in use than all other three-band beams combined!



because the SMART BUYERS Compare!

Compare Size

Compare the Hy-Gain Full Size Trap Tribander with any other trap tribander in the industry. You will find it is the only one that has both full element spacing (.25 wave length boom on 20 meters) and full sized elements (longest element 32'). This amounts to almost a third more metal than smaller tribanders selling for the same price. If you have a space problem buy the Hy-Gain Miniature Tribander at a saving of $30.

Compare Construction

Hot dipped galvanized steel boom 1½" in diameter for maximum strength with lowest possible wind loading. Boom braces form rigid angular boom to mast assembly. Heavily plated 10 gauge steel channels attach all elements to boom and boom to mast with positive grip. Elements are 6061T6 high strength aluminum alloy;- 1⅛", 1", ⅞" and ¾" in diameter. All hardware is galvanized and irridite treated offering weather resistance superior to that of any other known material. Hy-Gain's streamlined traps (only 2x3") together with steel boom construction result in the smallest wind loading area possible in a full sized tribander.

Compare Matching

Exclusive Hy-Gain Triaxial Gamma Match System with coaxially formed reactance cancelling capacitor built in makes possible for the first time a perfect 1:1 SWR on a three band antenna. Although factory precalibrated, it is also adjustable to compensate for variations which may be encountered at each installation site. Exceptional bandwidth maintains low SWR over the entire band. The use of this matching system permits tuning the array for maximum gain with no compromise to facilitate matching.

Compare Traps

The Streamline Hy-Gain Traps are small (3" in diameter)and light weight. **They actually have less wind surface area than any other trap manufactured.** Capacitor, dielectric and coil form moulded high impact styron. They are designed to take 1 KW AM, 2000 watts PEP. Individually factory resonated for maximum frequency accuracy and completely factory weather sealed, water proof and air tight (do not breathe) for years of stable operation. Carbon activated polyethylene covers. High Q coils well removed from any metal mean highest efficiency of isolation action.

Compare Performance

Hy-Gain's High Q Traps result in minimum element loading and **true full sized performance.** The longest element of approx. 32' together with full size 18' boom spacing results in a triband beam with full 8 db gain and 25 db front-to-back ratio. No smaller 3-band beams can develop this gain. In addition, Hy-Gain does not compromise by detuning parasitic reflector and director to raise feed point impedance of array so that it can be fed split dipole with a 52 ohm line. Instead, the Hy-Gain Tribander is tuned for maximum forward gain and the matching is accomplished by the **Triaxial Gamma Match System.**

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Hy-Gain's tremendous Ham Acceptance and large volume production makes possible the lowest price in the industry for a full-sized three element tribander;- **$99.75.**

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QDY 41, K4DSD 10, RZJ 1.

WEST VIRGINIA—SCM, Albert H. Hix, W8PQQ—Asst. SCM: Fes Greathouse, 8PZT. SEC: HZA. PAM: GAD. RMs: GBF, FNI, PBO and VYR. The Kanawha Radio Club had as guest speaker NGW, 8th District QSL Manager. GCN, YBZ and PQQ had as a guest MP48BW from the Bahrein Is. SNP has a new kw. final and an HT-32. DJP is working lots of 20-meter s.s.b. DX with his new beam. BZV has a new three-element Hy-Gain Tribander. K8CSG and K8KLI made a good score in the SS on phone. It would be a good idea if West Virginia hams had their county printed on their QSL cards. This would help those interested in the Worked All County Award. NYH is quite active on the W, Va. and Va. Phone Nets. HNK is back on with a pair of 6L6s. SSA is rebuilding his kw. equipment. ESH furnished a full report of 6-meter band openings for November. 4QCA/8 and GBF did a fine job in the recent Frequency Measuring Test. BRM is a new ORS. Ex-K4EVA is now K8LUR as CAA school in Oklahoma City. New Novices at Valley Bend are KN8MSO and KN8MSP. K8AXU is on 2-meter mobile. GIU is back on WVN. The following assisted in providing communications for a forest fire in Harveytown Nov. 23: K8HRO, K8CYW, K8GOM, K8JTX, K8DWU, K8GWU, GLB, K8EYG, K8BEL, K8IYU, KNC, K4VEZ, FUM and FNI. K8AON is on 75 meters. K8JNF and K8MHC are on 6 meters. The W. Va. Hamfest will be held at Jackson Mills on July 11 and 12. Traffic: (Nov.) K8HID 227, CNB 225, W8PDO 202, K8CSG/KLI 141, W8FNI 128, VYR 99, HZA 50, SNP 50, JLF 35, NYH 30, K8BRM 28, W8BWK 17, PQQ 13, GGC 11, K8HRO 10, W8CCR 9, CRM 2. (Oct.) K8CNB 30, BRM 21. (Sept.) K8BRM 8.

ROCKY MOUNTAIN DIVISION

COLORADO—SCM, B. Eugene Spoonemore, WØDML—SEC: NIT. PAMs: IJR and CXW. OOs: OTR and RRV. OBS: BTU. TX has been laid up with leg trouble, but is getting along OK. OTR, RRV, SIN and IA participated in the September Frequency Measuring Test and all made good scores. According to *Splatter Chatter* KØJST is pres.; KØAYK, vice-pres.; and KNØQAN, secy. of the Larimer County Amateur Radio Club. We understand that UPS has been rebuilding again. According to *RF Carrier* the Valley boys had ARRL films on TVI and Artificial Respiration. The Denver University Amateur Radio Club, ANA, has resumed operation with QAD, K5JLP, KNØOTY, KØONY, K2PIQ, PAB. REQ and FVD operating. KØCEN has a new 10-meter antenna. KØRBV has been conducting code classes at c.d. offices in Pueblo and will give 18 Novice Class exams, also NIT, at Pueblo College, gave 25 Novice and one Conditional Class exams during the Holidays. Send your EC applications to your local EC, SEC or SCM. AMR and LNH spent the holidays with their son George, who is attending Georgia Tech. Our sympathies to CXW on the loss of his equipment during a cabin fire. Congratulations to IC on his reelection as Rocky Mountain Division Director. Traffic: WØIA 1013, KQD 573, KØDXF 159, EDK 94, EVG 92, WØENA 60, DQN 55, KØEDH 55, WØTVI 54, QOT 31, KØALH 30, WØANA 26, NIT 20, FVD 14, CBI 12.

UTAH—SCM, Thomas H. Miller, W7QWH—Asst. SCM: John H. Sampson, 7OCX. SEC: FSC. PAM: BBN, V.H.F. PAM: SP. RM: JBV. BAJ received his DXCC award, the second to be issued to a Utah ham. BAJ, DTB, QWH, GDD, JQU and K7BHE were active in the SS Contest. K7s CLS and CLO were elected pres. and secy. of the Davis High School Amateur Radio Club. BLE put up a Tribander and should have a 40-meter beam up soon. EVK has been working DX with his kw. on 10 meters. JBV has received a TWN certificate. All Novices interested in checking into a Novice net for Utah, please contact JBV giving him your name, call, QTH and the times and frequency you would like to meet. K7s CLO and CLS are both working on 813 amplifiers. CLO worked Japan on 40-meter c.w. with 45 watts. Traffic: W7JBV 216, OCX 108, QWH 12, K7CLS 8, W7BLE 7, K7CLO 5, W7BAJ 4, FSC 2.

NEW MEXICO—SCM, Allan S. Hargett, K5DAA—SEC: CIN. PAM: ZU. V.H.F. PAM: FPB. OOs: LEF and GRI. OBS: RFF. ORSs: WNU, RFF, DWB and K5IPK. OPSs: VC, K5DAB, K5IQL and K5LWN. OBSs: IGO, K5WSP, K5DAB, K5LFE and K5MSE. The New Mexico Emergency Phone Net meets each Sun. at 0730 MST on 3838 kc. and Tue. and Thurs. at 1800 MST. The Breakfast Club meets Mon. through Sat. on 3838 kc. at 0700 MST. The TWN meets Mon. through Fri. at 1900 MST on 3570 Kc. The EC Net meets Sun. at 1900 MST on 3980 kc. There were four v.h.f. nets this month with a total of 39 check-ins. LFH has worked all "49" states and two Southern Rhodesia stations on 6 meters. The Albuquerque V.H.F. Net operates on 146.802 Mc. NVT now is a member of the Quarter Century Wireless Association. The Caravan Club had its

(Continued on page 128)

NEW! FOR FIXED STATION OR MOBILE USE

Globe's Completely Re-Designed — PRINTED CIRCUIT

6 Meter CONVERTER

WIRED & TESTED:
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- ★ New improved circuit provides higher gain, better signal-to-noise ratio.
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- ★ Measures only 3x5½x4½"; complete with tubes, crystal and connecting cables.
- ★ B plus requirements 150-250V at 15-18 Ma. Provisions for changing filaments for 6 or 12V operation.
- ★ Models available for output ranges of 550-1600 Kc, or 10-14 Mc, covering most ham receivers and car radios.

This new and improved model of the popular Globe 6-Meter Converter now offers better signal-to-noise ratio through improved circuitry. Has highly stable, crystal converter with Cascode RF Stage and band pass coupling, made with two output frequencies, enabling converter to be used with many types of communications receivers plus 6 or 12V auto radios for mobile use. Kit extremely simple to assemble with printed circuit. Complete with 6U8 and 6BQ7 tubes, crystal, receiver input cable and power cable. Size: 3x5½x4½.

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COUNCIL BLUFFS, IOWA

first meeting with the new officers on Nov. 26. The club has 28 paid-up members. SFI is back in Portales after 5 years of missionary duty in India. K5INQ has retired after 20 years of teaching and has moved to W6-Land. K5LMJ is back on the air with a Ranger. Traffic: K5WSP 1957, W5DWB 463, K5IPK 25, DAB 10, W5KWR 10, K5IQL 9, W5GD 7, K5LWN 7, W5ZU 6, K5DAA 4, GYA 3, W5VC 3, ESN 2, K5GLJ 2, W5HJ 1.

WYOMING—SCM, Lial D. Branson, W7AMU—The Pony Express Net meets every Sun. morning at 0830 with CQL as net control and YWW as alternate control. Correction on the YO Net: This net meets Mon., Wed. and Fri. at 1830 on 3610 kc. UFB and VTB QSO Japan, KH6s and KL7s on 6 meters. LVU, AMU and UFB are on 2 meters. The committee is spending a lot of time on the license plate bill. It looks good. Traffic: W7AXG 52, CQL 12, 1DO 6, AMU 4, BHH 4.

SOUTHEASTERN DIVISION

ALABAMA—SCM, Clarke A. Simms, jr., W4HKK—SEC: EBD. PAMs: DGH and K4BTO. RM: RLG. New members of AENB are MVM and K4SSE with K4LAY. Congratulations and welcome to the following new hams: KN4CBK and KN4CGL in Northport, KN4BJM in Jasper, K4YGQ in Alexander City. Best wishes for a successful term of office to the following new officers of the Montgomery Club: K4TJM, pres.; BIZ, vice-pres.; GYG, secy.-treas.; and AUP, club RO. CEF has equipment for RTTY now. K4PHH has added two new rigs to his shack. K4GOW needs high-power r.f. and audio components. Anybody able to help him locate them? K4SSB is active on 10-meter c.w. K4QJF has a Viking 500 and is a new OO. K4KQN keeps in touch with his son K4DRL with daily skeds to the U. of Ala. KJD now has a WAC phone certificate. MI and RLG are getting ready for DX with a Triband beam and a new tower. Check your appointments to see if they require renewal. To be ready for emergency, join your local AREC or RACES organization NOW. Traffic: (Nov.) W4RLG 543, K4PFM 114, BTO 64, W4PYG 53, K4SSB 44, W4CEF 35, K4JDA 33, W4KIX 32, K4IPF 26, AOZ 25, CXC 24, W4DGH 24, DRQ 24, MI 22, YRO 20, K4GOW 19, KQN 19, W4CIU 17, K4KJD 17, PHH 10, KAK 5, SAV 5, W4CRY 4, ENO 4, HKK 3, (Oct.) W4CEF 21.

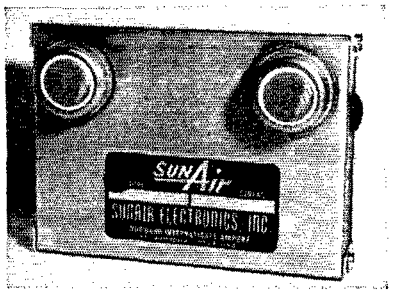
EASTERN FLORIDA—SCM, John F. Porter, W4KGJ—SEC: IYT. RM: K4SJH. PAMs: TAS and RMU. The big news is the visit made in December to several of our Florida cities by 1HDQ, v.h.f. editor of *QST*. His talk was enjoyed by everyone and should give v.h.f. activity in the State a shot in the arm. The new officers of the DBARA are SDR, pres.; MEL, vice-pres.; K4RNS, secy.; K4RNR, treas.; and K4UJW, act. mgr. The Key West Club now has a new DX-40 for Field Day use. K4GSI was the handy man with the tools. New officers of the OARC are K4TMN, pres.; K4KRG and CLJ, vice-pres.: K4ULC, secy.; and K4RUW, treas. TOD has a new monicker, "Captain Video," because of his local work in amateur TV. The 6-meter boys still hold top honors for check-ins on the Dade Emergency Net each Mon. Nov. 17 was tops with 44. The "Worked All Florida Counties" gang is getting real hot with several having over 35 counties confirmed. The Dade Radio Club's code and theory classes on Mon. and Thurs. evenings are going great guns. The Monroe County Emergency Corps held a very successful test in the Keys on Oct. 25. IYT and GGQ are the proud parents of a new son. K4YOQ beat the deadline this month with his traffic report via Western Union. I wish more would show as much interest in their reports. Form 1s are available from your SCM or ARRL if needed. Mae, 3CUL, is back with us for the winter and active in traffic work. MBO is now fully equipped for break-in on c.w. and phone. SJZ is trying to keep his Hi-Bander on the air in order to meet the v.h.f. nets. WUU has a new G-50 and is interested in getting the v.h.f. link-up to Jacksonville. K4LXG has a new SB-10. K4ZOP is now equipped with a KWS-1 and a 74A-4. K4RRC and K4DMF are now on 2 meters using vertical polarized antennas. The radio classes at Dade County C.D. will graduate approximately 60 this year. There are now over 1100 licensed amateurs in Dade. Traffic: (Nov.) K4SJH 770, W3CUL/4532, K4KDN 241, BR 173, GPI 141, ILR 125, RNS 69, W4IYT 62, K4ODS 59, AKQ 55, BLM 52, BNE 47, W4TRN 38, K4AHW 37, W4FJE 34, TAS 30, K4YOQ 30, LCF 28, COO 23, PAD 19, W4SGY 19, MBO 12, K4MTP 12, W4BWR 11, SJZ 11, K4JJZ 10, ANJ 9, JNE 8, W4DPD 6, (Oct.) K4RZQ 173, BLM 22.

WESTERN FLORIDA—SCM, Frank M. Butler, jr., W4RKH—SEC: PQW. RMs: AXP and BVE. Tallahassee: YUU donated tubes and other parts to the Leon H.S. Club for a new transmitter. K4PVU is doing an FB job as president. Panama City: K4OID reports the NWFN is doing very well. Hub puts in a lot of time editing *Sparks*. Section Net certificates have been issued to BVE, OID, PVU, SRK and UBR. Ft. Walton: UBR

(Continued on page 150)

Transistor Power Supplies* and Components

*Complete Units



D SERIES (Standard)

Continuous operation at 30 watts. Selective taps at 200, 250 and 300 volts; intermediate voltage at ½ selective taps. Both voltages can be drawn simultaneously if total power does not exceed continuous ratings. Positive or negative ground operation. Input and output filtering included except for intermediate tap.

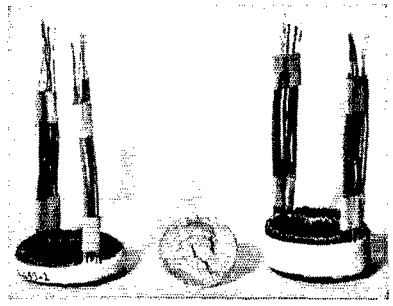
Size: 4⅜" x 3¼" x 1⅛" Wt.: 10 oz. 6- or 12-V Input: **$39.95** 24-V Input: **$61.95**

DA SERIES

Continuous operation at 45 watts. 450 volts and 225 volts simultaneous if total power does not exceed continuous ratings. Intermittent duty to 90 watts, 450 volts at 150 MA; 225 volts at 100 MA (5 min. on, 20 min. off). Positive or negative ground operation. Input (primary voltage) filtering; partial high voltage filtering provided.

Size: 4⅜" x 3¼" x 1⅛" Wt.: 14 oz 12-V Input: **$57.50** 24-V Input: **$79.50**

Toroid Transformers for Transistor Power Supply Application



H SERIES

H-6-450-1 Input: 6-VDC. Output: 450-VAC center tapped...450 and 225 VDC from bridge rectifier...45 watts.

H-14-450-12 Input: 12/14-VDC. Output: 450-VAC center tapped...450 and 225-VDC from bridge rectifier...55 watts.

H-28-450-15 Input: 24/28-VDC. Output: 450-VAC center tapped...450 and 225-VDC from bridge rectifier...65 watts.

H-6-100-125-150-D Input: 6-VDC. Output: Voltage doubler configuration. Secondary tapped for either 100, 125 or 150-VAC. DC Output: 200, 250 or 300-V at 100 MA.

H-12-100-125-150-D Input: 12/14-VDC. Output: Voltage doubler configuration. Secondary tapped for either 100, 125 or 150-VAC. DC Output: 200, 250 or 300-V at 125 MA.

H-24-100-125-150-D Input: 24/28-VDC. Output: Voltage doubler configuration. Secondary tapped for either 100, 125 or 150-VAC. DC Output: 200, 250 or 300-V at 150 MA.

Without Encapsulation (2 ozs.). 1-10 units: **$16.00** ea. With Encapsulation (3 ozs.). 1-10 units: **$18.50** ea.

HD SERIES — 2000 CPS

HD-14-225-300-2-D Input: 12/14-VDC. Output: Voltage doubler configuration. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 200 MA.

HD-28-225-300-2-D Input: 24/28-VDC. Output: Voltage doubler configuration. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 200 MA.

Without Encapsulation (3½ ozs.). 1-10 units: **$18.50** ea.
With Encapsulation (4½ ozs.). 1-10 units: **$21.50** ea.

HDS SERIES — 2000 CPS

HDS-14-225-300-3-D Input: 12/14-VDC. Output: Voltage doubler configuration. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 300 MA.

HDS-28-225-300-3-D Input: 24/28-VDC. Output: Voltage doubler configuration. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 300 MA.

Without Encapsulation (3½ ozs.). 1-10 units: **$21.50** ea.
With Encapsulation (4½ ozs.). 1-10 units: **$24.50** ea.

400 CYCLE SERIES

14-115-1.5-400 Input: 12/14-VDC. Output: 115-V at 1.5 amp.

24-115-1.5-400 Input: 24/28-VDC. Output: 115-V at 1.5 amp.

Dim: 3" dia. x 1" thick. Without Encapsulation (12 ozs.). With Encapsulation (16 ozs.). Per Unit: **$76.00.**

Matched Pair HD Transistors:
12/14-V operation—**$11.00** per pr.
24/28-V operation—**$21.00** per pr.

OEM *Prices on Request*

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Broward County International Airport
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SUNAir ELECTRONICS, INC.

is temporarily QRT awaiting a modified license. Hams assisted police with traffic in the Christmas Parade under the direction of BPJ, the EC. A frequency of 145.2 Mc. has been picked for the 2-meter net. Those active include CSS, MTQ, MTZ, OFP, RKH and TTR. K4JUA assembled a new Heathkit receiver for the Eglin Radio Society. JUA volunteered to be instructor for the code and theory class which started in December. Port St. Joe: K4RZM organized a DXpedition to Holmes County, to help the boys in the Worked All Florida Counties Contest to get this rare county. A lot of interest is being shown in this contest, sponsored by *Fla. Skip* and the Dade Radio Club. Pensacola: AXP is active in the SS and LO Parties. PLI, YVJ, QVY and others are getting much DX on 6 meters. The PARC sponsored a 10-meter transmitter hunt, with hams from Mobile and Ft. Walton taking part. At its last meeting the PARC made a tour of Gulf Power Co. facilities, arranged by K4KBQ. A new TVI committee has been formed with JV, chairman, K4IYQ, EQR, SGU and K4PIQ. Traffic: (Nov.) K4UBR 301, W4BVE 109, K4OID 54, DSH 10, RZM 8. (Oct.) W4SRK 659, K4UBR 616.

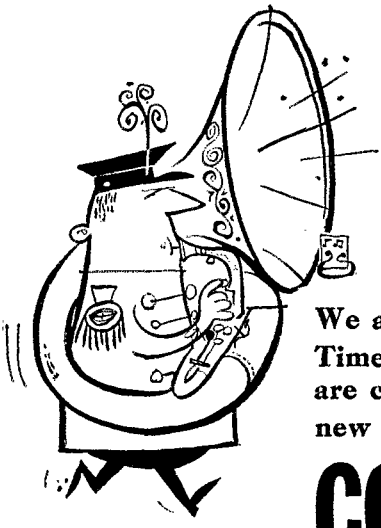
GEORGIA—SCM, William F. Kennedy, W4CFJ—SEC: K4AUM. PAMs: LXE and ACH. RM: PIM. GCEN meets on 3995 kc. at 1830 EST Tue. and Thurs., 0800 Sun.; ATLCW, 7150 kc. 2100 EST Sun.; GSN Mon. through Sat. 1900 EST on 3595 kc., PIM as NC; 75-meter Mobile Phone Net each Sun. 1330 EST on 3995 kc., MV as NC; ATL Ten-Meter Phone Net each Sun. at 2200 EST on 29.6 Mc., VHW as NC; GTAN, Sat. at 1000 EST on 7290 kc.; GPYL Net Thurs. at 0900 EST on 7260 kc., K4CYV as NC; GAN, 7105 kc. at 1800 EST Mon., Thurs. and Fri., K4KZP as net mgr. The Amateur Radio Club of Augusta elected K4AUM, pres.; K4RWU, vice-pres.; K4MIE, secy.; K4KAB, treas.; KN4VNR, program chairman; AAY, *Splatter* editor; and K4KAR, pub. dir. The Confederate Signal Corp's new officers are K4AQX, pres.; K4KVB, vice-pres.; K4RJS, secy.; YEK, treas. and K5AWT/4, act. mgr. The Old Timers Club had its Annual Christmas Party Nov. 22 at the YMCA in Atlanta. Officers are Harry Doughtery, pres.; KL, secy.-treas. The CSCS enjoyed having Ed Tilton, from Headquarters, at its Christmas Party. The Atlanta Radio Club elected K4TFY, pres.; K4MDR, vice-pres.; K4TEF, treas.; K4LDD, secy.; RRW, act. mgr.; K4KRR, bulletin editor. The Atlanta Teenage Club elected K4SUT, pres.; K4UWL, vice-pres.; CLR, treas.; K4UJS, secy.; K4UWH, act. mgr. Georgia hams sure were sorry to lose K4JCN, of Washington, Ga. He, his wife and baby were killed in an airplane accident. TJS has undertaken the job of collecting funds for the couple's two surviving small children. Gladys. K4LVE, is back doing a wonderful job of traffic-handling at Warner Robbins, Ga. PDP has a new NC-303. K4HOU is renovating the shack. EDD is the proud pappy of an 8-lb. boy. KN4CGG is a new Novice in Cedartown. Traffic: K4BAI 261, LEM 236, W4DDY 173, PIM 128. K4LVE 112, CZQ 104, W4BXV 27, MA 1.

WEST INDIES—SCM, William Werner, KP4DJ—SEC: AAA. RM received Mohawk and Apache kits and is QRL! AMG is on 80 and 40 meters with a 20-A Bandhopper v.f.o. and a new 500-watt linear and has a new 20-ft. aluminum tower. KV4BA uses all-band vertical, a Globe King and has ordered an s.s.b. generator. CK works all bands using a 20A/600L combination. PZ converted the Viking I to s.s.b. using a B&W s.s.b. generator and is building a 4-250A linear. PZ now uses a dipole antenna on 75 meters made of No. 4 aluminum wire fed with 75-ohm kw. Twin-Lead. WP4AQB is a new ham in Guanica. WT is now a member of the "Grandmothers" Radio Club. JM worked HC, CE and LU on 6 meters using a 6N2 transmitter. ADR now is on 40 meters with a Globe Chief and ½-wave doublet. HM is on 3925 kc. after a long absence driving a Millen final with a TBS-50. Ex-2BHW, CE3CJ/BJ, now living in P.R., joined the ARRL and is studying for his license. Traffic: KP4WT 30, AKH 3. DJ 2.

CANAL ZONE—SCM, Ralph E. Harvey, KZ5RV—Because of the illness of the SCM, VR and RM took over the writing of this report. RM was in the U. S. on business and took time out en route to visit his father, K4AEE, and brother, K4GYF, in Miami Springs, Fla. as well as K2JYM and K2JYZ in Newport, L. I., N. Y. Thanks to these hams he kept in touch with his XYL, KA. Rog brought home a nice homemade fruit cake. After an extensive visit Stateside KZ5AU and family have returned to our tropical paradise. EM and LC are back on the air after too long a lapse. Ex-KZ5JR and RF are in Ft. Mommouth, N. J. Rod says the KZ5s have it made. W4GVD has joined the KZ5 gang. South Carolina's loss is our gain. His call is SW. Traffic: KZ5WA 43, KA 37, HA 36, VR 26, CC 21, SW 20, HO 12, HQ 3, RD 3, RV 3.

SOUTHWESTERN DIVISION

LOS ANGELES—SCM, Albert F. Hill, jr., W6JQB—
(Continued on page 132)



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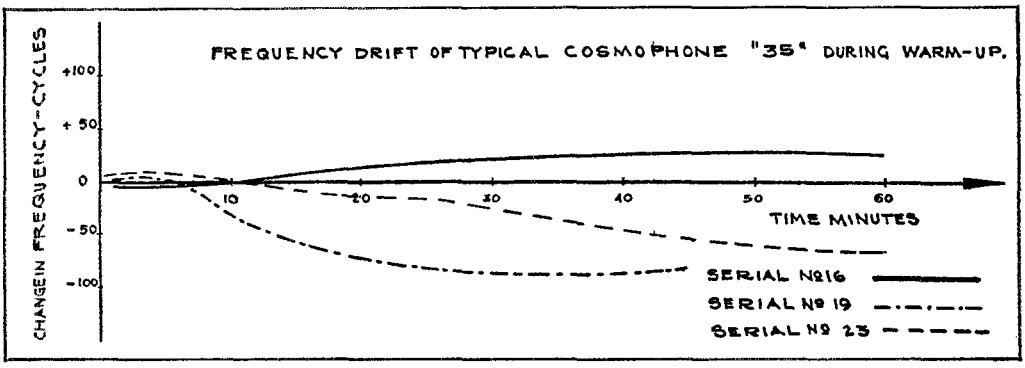
We are sure proud of the Frequency Stability vs. Time tests on a few typical COSMOPHONE "35"s. Here are curves of a few typical units to better acquaint new owners with the Frequency Stability of the new

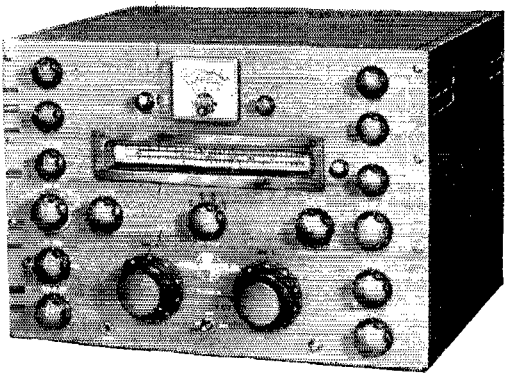
COSMOPHONE "35"



THE FIRST DUAL CHANNEL BILATERAL TRANSCEIVER

- Operates on 10, 11, 15, 20, 40 and 80 meter bands.
- Transmits or receives SSB (upper or lower), single sideband with carrier (AM) or C.W.
- Peak-Null "Q" Multiplier.
- Receiver Sensitivity. 1 Micro-volt @ 6 db S/N ratio.
- Single 6146 output.
- Built-in VOX and QT.
- 40 db suppression.
- Meter Indication for R.F. output, final Grid or Plate current and receiver signal strength.
- Dimensions 17" wide x 12" high x 15" deep.
- 3.1 kc mechanical filter for transmission and reception.
- Dual speed tuning knobs with ratios of 20:1 and 100:1 over a 600 kc band spread.

Power Supply #P35



Amateur Net Price **$799.50** **$139.50**

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FOREIGN REPRESENTATIVES: MINTHORNE INTERNATIONAL CO., INC., CABLE ADDRESS: MINTHORNE, N. Y.

SEC: W6LIP. RMs: W6BHG and K6HLR. PAMs: K6BWD and W6ORS. The following stations earned BPL in November; K6HLR, W6GYH, W6ZJB and K6MCA. Congrats, fellows! K6MKG reports a fine check-in on both the phone and c.w. Barstow Emergency Nets. K6COP reports some fine DX worked. K6GKX reports that the 220-Mc. Inter-County Net is growing fast. W6SRE has been on Malibu Fire duty. W6CMN is now with Hagerty Radio in Burbank. Nice going, Bill! K6PLW has a new kw. on the air. W6BUK has a new Gonset GSB-100. K6EA is on the beach again and working traffic. W6BHG had minor surgery and we all wish Hank a speedy recovery. W6ZJB has the kw. s.s.b. rig back on and is getting new traffic skeds working. Officers of the St. Anthony School Radio Club are W6ORZ, pres.; K6KCV, vice-pres.; Phil Miller, secy.-treas. W6MGB and K6PBI report some more fine 6-meter openings. K6QPG is leaving for KW6-Land. Have fun, Mary! K6IILR has issued a wonderful duty sheet for RN6. Many have reported very fine scores in the SS Contest. Nice going, fellows! Support your section nets —Phone, SoCal Six Net, 50.1 Mc, nightly; c.w., Southern California Net, 3600 kc, at 1930 nightly. Traffic: (Nov.) K6MCA 1263, W6GYH 1099, K6HLR 984, K6OZJ 416, K6LVR 401, W6ZJB 309, WA6BAQ 242, W6BHG 112, W6CMN 71, K6KYJ 65, K6EA 36, W6USY 28, K6PBI 27, K6PZM 25, W6JQB 24, W6BUK 9, K6GLS 9, K2HNW/6 9, W6CIS 8, W6MGB 8, W6SRE 8, W6KTZ 7, K6GKX 4, W6MEP 2. (Oct.) K6MCA 1921, WA6BAQ 193, K6PQM 108, K6GGS 70, K6HVC 48, W6SYQ 46, W6VSH 16, K2HNW/6 9.

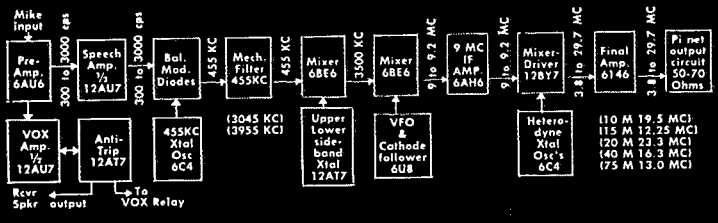
ARIZONA—SCM, Cameron A. Allen, W7OIF—SEC: YWF. PAM Copper State Net: FMZ. CSN is now operating on 3880 kc, QRM was so bad on 3895 kc, that it became impossible to operate there. On Nov. 15 and 16 one of the worst snow storms in 50 years hit the higher parts of the State. Three Boy Scouts were lost in the mountains about 30 miles south of Tucson on the 15th. FWP, who has a cabin near where the boys were lost, called into Tucson on his mobile on 75 meters and had the Catalina Emergency Net alerted. Snow was so deep that cars could not reach the area at once. GFQ, EC for Tucson, and a group took equipment for a fixed station to the base camp. Later in the week a portable unit from Ft. Huachuca was sent in. At one time there were over 700 men on the hunt, which lasted till Dec. 4. BVA, who was there, is writing the complete story of this emergency. The following are known to have taken part: W7s TFQ, DRU, CBN, WUC, FRR, OXN, HQX, HTQ, UX, UCX, DME, KNY, CKU, BVA, LHN, MWD, ZSE, FYL, FWP, PJM, PYE, CUP, LLO, GI, UXB, HXK, OZM, NYT, RTT, HMM, LHF, LHM, YXE, SQX, GFQ, SMZ, K7s FMZ, BAY, IWJ, FCV, CET, CPZ, CPY, EMM, GLC, DSR, CRO, ELZ, KØGXM, W8IIBP, W8EGN, W8SIJ, K4ENA, W9BBP, W5JNA/7, W9VNL/7, WØGBG/7 and W5ACO. Traffic: K7BWN 105, W7OIF 9.

SAN DIEGO—SCM, Don Stansifer, W6LRU—New officers of the Helix Radio Club are K6JYQ, pres.; K6IPV, vice-pres.; and W6YSP, secy.-treas. The annual installation of officers was held at a dinner meeting held on Jan. 10. K6ZCR participated in the YL Anniversary Party. A combination Red Cross and c.d. drill with display of the new mobile van was held in December at Fallbrook. Glad to welcome W6ELQ, of El Cajon, back to the traffic-handling nets. K6BCF, on vacation near Yuma, made a successful contact with San Diego on 144 Mc. through the repeater station in the Laguna Mountains. W3RU/6 is active from this area. K6BTO has been reappointed as OES. W6YDK made BPL in November. The December meeting of the San Diego DX Club was held at the home of W6BZE. K6AOF continues to help at C.D. Headquarters with the 3991-kc. Monday night net at 7 P.M. W6EWU now has a DX-100 on the air. W6JVA is now working as a TV serviceman. K6BHM recently was home on leave from the Coast Guard. Ex-CN8IJ, now in the Long Beach Area, gave an interesting talk with pictures at a San Diego Council sponsored meeting. W6LRU is now on s.s.b. with a Heathkit SB-10 into his 807s. A new club has been formed at Convair Aeronautics. Equipment includes a KWS-1 and a 75A-4 plus beam antennas. W6BGX is now in KL7-Land. Traffic: W6EOT 718, W6YDK 617, W6ELQ 186, K6ZCR 68, W7YKN/6 30, W6MUJ 10.

SANTA BARBARA—SCM, Robert A. Hemke, K6CVR—The Santa Barbara RC recently elected K6UEC, pres.; K6KVW, vice-pres.; K6HTX, treas. After election W6IPE gave a talk on Collins "S" line equipment. A Fishy Hamfest was held at Lake Cachuma. Among those present were W6JVD, W6KSW, W6USH, W6NXT, W6CRZ, K6JHA, K6JGY, K6SWR, K6MLU, K6JRT and K6CVR. W6OUL had an antenna-raising party to put up his new Gonset Tribander. Those present were W6VDW, W6YCF, W6NGJ, WV6AEX and WV6ADP. The Cal. Poly hams did FB on the job of the collection of flash election returns for a San Luis Obispo newspaper.

(Continued on page 134)

The Finest in Single Sideband



NOW—Morrow research and creative engineering make possible the finest performance in single sideband transmission—superior for both home and mobile use. The compact design has been achieved with no sacrifice in the famous Morrow standard of quality, yet this set can be yours at an amazingly low price. You can be the first in your area to get on the air with the new SBT, clean, crystal-clear signal.

For complete details proving the superiority of the SBT, see your favorite ham dealer . . . . . or WRITE to us at Morrow.

Complete coverage: 3.8-4.0, 7.1-7.3, 14.1-14.3, 21.25-21.45, 28.5-28.7 MC. VFO calibrated 0-200 KC (add to frequency shown on band switch). Other 200 KC segments of the bands can be selected when desired by inserting the proper heterodyning crystal.

Mechanical filter for long term maximum suppression (50db) of carrier and unwanted sideband.

Emission—upper or lower sideband, CW-AM (SSB with carrier added). Change bands in 30 seconds with semi-automatic antenna loading designed for 50-75 ohms. Excellent voice operated control system (VOX) as well as push-to-talk. Anti-trip of new improved design. Built-in antenna (VOX) relay. Controls grouped for operating ease. PEP input 90 watts. Matching power supply has "half power" switch for using the SBT as a lower power exciter.

Same cabinet dimensions as MB6 and MB565: 4⅛" x 11⅞" x 7¼". Plug-in connections for easy removal from car.

Amateur Net Price..... **$349.50**

12-Volt DC, 115-Volt AC, Universal Power Supply Unit designed especially for the SBT Transmitter. Includes complete set of power cables for either home or mobile use.

Amateur Net Price..... **$124.50**

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W6DYT reports 41,669 points were made in the 1958 Sweepstakes. W6OQX is active on 40-meter s.s.b. K6JCR is now active on 2 meters. K6SJF has ZL confirmed on 15 meters. Power? 5 watts. Traffic: W6YCF 7, W6-DTY 3. W6FYW 3.

WEST GULF DIVISION

NORTHERN TEXAS—SCM, L. L. Harbin, W5BNG—Asst. SCM: E. C. Pool, 5NFO. SEC: K5AEX. PAMs: BOO and IWQ. RM: ACK. With the ending of activities of the Ground Observer Corps it seems this will be an opportunity for Emergency Coordinators to reorganize their local emergency set-up. Amateurs who have been giving their time to that operation may be induced to give their time and experience to AREC activities. K5-LEZ is the new net control for NTEN. The Terry County Club is going all out for 6 meters. The Cap Rock Club has organized a RACES group and is looking for a building to be used for the base station. Some of the 6-meter group have foreign cars and have mounted Halo antennas on them. CVW goes one better by pulling a 16-ft. sailboat behind his Fiat. FIR and JFN are proud owners of new Triband beams. JFN put his on a 30-ft. tower at midnight. K5AEX can be heard on side-band with a new 20-A. K5DNQ reports working 7 countries with a two-element home-brew 15-meter beam. AUL, BKH, HAJ, JPM, KCQ, PIM, RVI, K5JHG and MBB took part in the September Frequency Measuring Test. Most of them qualified as Class I Observers. Congratulations. We are in need of more OOs. Because of landlord interference K5PIO must work on her antenna system at night; the odd thing about this is that she seems to pick the night with the highest wind. Traffic: W5SMK 344, BKH 120, K5PXV 99, W5BOO 76, K5JSN 56, W5BTH 37, LR 12, GY 11, KYM 10, K5EGB 4, DNQ 3, W5WKH 3.

OKLAHOMA—SCM, Richard L. Hawkins, W5FEC—SEC: K5KFS. RM: JNM. PAMs: DRZ and MFX. The following stations qualified for OLZ/SSZ Net certificates: K5DYW, ERI, FEC, K5JGZ, JNM, KY, K5LGW, K5-MBK, MFX, PNG, K5SDK, VLW and VVQ. New Novices in Copan are KN5TEX and KN5TEY. NS was transferred to Tulsa. K5KFS renewed his OO appointment. ZZG installed a telephone pole for his beam support. EHC QSOed CTICO on 50-Mc. c.w. K5KTW received both WAS and WAC certificates. K5EJC placed No. 15 in the recent S.S.B. WAS Contest. K5USA made one of the top scores in the Field Day. ZXD is trying 75 meters after four years on high frequencies. I hope some of us characters don't discourage him. K5MBK now has a Viking 500. GOL is up and around after surgery. K5CAI made DXCC. The Sooner-Nooner Net reports 24 sessions with 604 stations checking in and 149 messages being handled. Oklahoma's Ham of the Month: DRZ for his work as PAM and his excellent net and NCS on the Sooner-Nooner Net. Traffic: (Nov.) K5CAY 186, JGZ 120, MBK 119, W5DRZ 114, VVQ 105, JNM 88, DXI 76, KY 41, PNG 38, FKL 31, K5INC 30, W5MFX 30, FEC 29, MGK 27, VLW 19, K5DJA 17, KFS 17, CVH 15, W5EHC 13, K5BPV 12, CBA 12, W5WAF 8, ZZG 7, IER 2. (Oct.) K5MBK 126.

SOUTHERN TEXAS—SCM, Roy K. Eggleston, W5QEM—SEC: QKF. PAM: ZIN. RM: K5BSZ. K5-KBS is the new EC at Rockdale. This is the first time in the history of the town that there has been any emergency communication plan. K5GCW has a new Triband beam. K5KBS is working break-in. K5LZB has a new Viking II. QKF and RPH attended the Dental Convention in Dallas. We welcome K5KEX to Sinton. WXT and THU are the proud parents of a baby girl. Congratulations to ETA on his election for another term as Director of the West Gulf Division. The 7290 Net had 38 sessions. 1286 check-ins, with 3490 messages handled. All the 6-meter operators have been having a field day with the good DX that has been coming in. The following districts have been worked: SM6, LA8, VO2, VE7 and JA1. The only problem in 6-meter DX seems to be the popularity of the low end of the band for ragchewing. I wonder, when the present sun-spot cycle is over, how many of the guys can look back with pride on the contacts they QRMed with their low-end ragchewing. K5OQN has a new Globe HiBander. He is now "Col. Yankee Jack" since becoming a member of the Confederate Signal Corp. Another good converted Yankee. Listen for FCX on mobile c.w. KN5TOF is a new call in Corpus Christi. Traffic: K5OEA 292, W5LVC 173, EGD 143, K5JCC 118, W5LVC 87, ZIN 76, HKE 65, K5RYS 51, W5FCX 14, K5MWH 10.

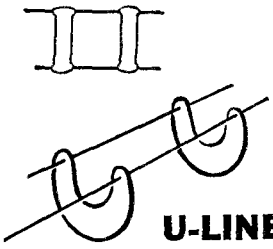
CANADIAN DIVISION

MARITIME—SCM, D. E. Weeks, VE1WB—Asst. SCMs: A. D. Solomon, 1OC and H. C. Hillyard, VO1CZ. SEC: BL. We take pleasure in announcing two new appointments this month, VO1CZ as Asst. SCM for the VO

(Continued on page 136)

LADDER LINE®

IDEAL FOR TELEVISION LEAD-IN, COMMUNITY T.V., TRANSMITTER FEED LINES OR ANTENNA ELEMENTS.



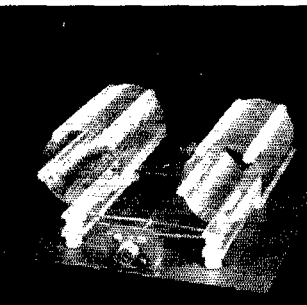
CAT. #	NAME	WIRE SPACING	WIRE TYPE	NET 100 FT.
300 S	SILVER U-LINE	½"	#19S	6.30
300 C	U-LINE	½"	#19C	6.00
500 S	SILVER LADDER LINE	1"	#19S	5.70
500 C	LADDER LINE	1"	#19C	4.80
500 W	STEEL CORE LADDER LINE	1"	#18CW	4.20
500 X	STEEL CORE LADDER LINE	2"	#12CW	8.30

30', 35', 40', 50', 60', 75', 100', 250' self reeling cartons.

S = Copper Wire, Silver Plated, Formvar Covered

C = Copper Wire Formvar Covered

CW = Steel Core Copper sheathed

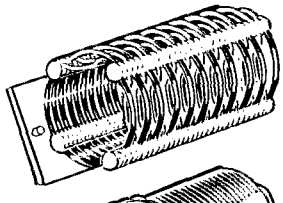


air dux® BALUN

Unbalanced coax lines used on most transmitters can be matched to balanced lines of either 75 or 300 ohms impedance by using the B2009 air dux coils. May be used with transmitters and receivers without adjustment over the frequency range of 80 through 10 meters, and will handle power inputs up to 200 watts.

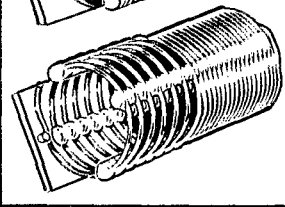
NO.	DESCRIPTION	NET EA.
B2009	Coil with hardware	3.36
MB2009	Mounting plate	1.95

Two coils required.
Coax connector not included.



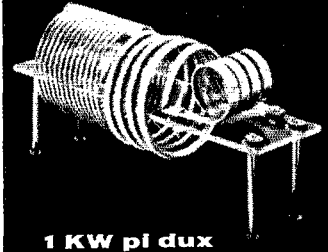
indented pi dux®

Cat.No.	Dia	TPI	Wire Size	Length of Coil	L uh.	Net
816A	1	16	18	3 3/16	18.0	1.25
1014A	1 1/4	14	18	2 25/32	18.3	1.50
1212A	1 1/2	12	16	2 3/4	18.3	1.70
1411A	1 3/4	11	14	2 5/8	18.0	1.90
1609A	2	9	14	3	18.1	2.10
2007A	2 1/2	7	12	3 1/4	18.6	2.60
2406A	3	6	10	3 5/16	18.7	3.25



vari-pitch pi dux®

820D10	1	20 & 10	18	3 1/4	18.0	1.25
1212D6	1 1/2	12 & 6	14	3 13/16	18.6	2.00
1608D6	2	8 & 6	12	4 1/8	18.1	2.70
2008D5	2 1/2	8 & 5	12	3 3/4	18.2	3.25
2408D4	3	8 & 4	10	3 3/4	18.6	3.95



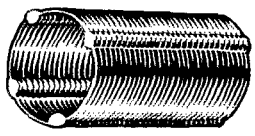
1 KW pi dux

2 new pi dux assemblies

The 500 and 1000 watt pi dux assemblies are compact yet conservatively rated. The high frequency coil sections are silver plated for high tank circuit efficiency. A complete technical sheet is included with each assembly.

	NET EA.
#195-1 500 watt pi dux Assembly	5.95
#195-2 1 KW pi dux Assembly	14.50

air dux



Cat.No. T or S	Dia.	TPI	Wire Size	Length of Coil	Net Price
404		4	18		
406		6	18		
408	1/2	8	18	2	.40
410		10	18		
416		16	20	(Silver .80)	
432		32	24		
504		4	16		
506		6	18		
508	5/8	8	18	2	.45
510		10	18		
516		16	20	(Silver .85)	
532		32	24		
604		4	16		
606		6	18		
608	3/4	8	18	2	.50
610		10	18		
616		16	20	(Silver .90)	
632		32	24		
804		4	16		
806		6	18		
808	1	8	18	3	.65
810		10	18		
816		16	20	(Silver 1.10)	
832		32	24		
1004		4	14		
1006		6	14		
1008	1 1/4	8	16	10	1.65
1010		10	18		
1016		16	20		
*1032		32	24		
1204		4	14		
1206		6	14		
1208	1 1/2	8	16	10	1.80
1210		10	18		
1216		16	20		
*1232		32	24		
1404		4	14		
1406		6	14		
1408	1 3/4	8	14	10	1.90
1410		10	16		
1416		16	18		
*1432		32	24		
1604		4	12		
1606		6	14		
1608	2	8	14	10	1.95
1610		10	16		
1616		16	18		
2004		4	12		
2006	2 1/2	6	12	10	2.25
2008		8	14		
2010		10	16		
2404		4	10		
2406	3	6	12	10	3.40
2408		8	14		
2410		10	14		

"T" series air dux are Tinned copper wire. (Add "T" after Cat. No.)

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call area and VE1BL as SEC. The Halifax Club will be sponsoring the 1959 Hamfest on Labor Day week end, Sept. 5, 6 and 7. Better make plans now to attend this important event. A communications emergency at Saglek Air Base, Labrador, gave amateurs in the area an opportunity to once again demonstrate their capabilities. EP and PQ are competing for the top VE1 DX spot (both have over 200 countries confirmed). HT reports working KH6UK on 6 meters. The Newfoundland, Labrador C.W. Net (NLN) operates nightly, 3505 kc., at 2300 GMT. The pirating of VE1 calls seems to be on the increase, judging from reports received. Additional information in connection with illegal operation would be appreciated. How about an exchange of club bulletins with the other clubs in the section? Please, gentlemen, those traffic reports! Traffic: VE1OM 14.

ONTARIO—SCM, Richard W. Roberts, VE3NG—From the traffic reports it would seem that the bands are very active in all phases. We hear that CGC and CNB are joining the traffic nets (c.w.). The Scarboro ARC, of Metro-Toronto has put out a very excellent paper. The Westside RC voted in the following for '59: VP2GC, pres.; Don Lee, vice-pres.; D. Metcalf, secy.; BTW, treas. It looks like the Nortown ARC won the Field Day Trophy in Ontario for its efforts during '58. The V.H.F. Assn. of Ontario meets the last Fri. of each month at C.D. Hq., 280 Davenport Rd., Toronto. The Hamilton RC is to be congratulated on its efforts in running the '58 ARRL Ontario Province Convention. AVS has a 6-meter beam and is looking for QSOs. BEK receives KH6s on 6 meters. KM is ready to go ton 28 Mc. with the beam. CFI has a new beam. ASE was in VE2-Land for awhile. AZC is active on 75 meters. BYF is going mobile. DTO is visiting VE4-, 5-, 6- and 7-Land. NG was heard on 144 Mc. DQL has a new Apache. DSX has a new mobile. DMI is getting along FB after an operation. The Algoma ARC has an FB paper. EOW, EOV and AOG are editors. DZH is on from Elliott Lake. DCI is close to DXCC. The WOC Award is going over big. Write the Metro ARC for rules at 570 Eglinton Ave., W. Toronto. CGK is a newcomer at the Soo. ALV is hot on c.w. AXH was a visitor to Toronto. When tuning up on any net, PLEASE leave OFF the final. THIS IS A MUST. Please? BMX was in W6-Land. K8ASF and W8DFU are members of the Sarnia ARC. Many of the lads from across the line are members of the Sarnia group. Traffic: (Nov.) VE3AML 130, NG 114, EII 104, GI 70, DPO 63, BJV 61, EJK 60, TM 60, BZB 58, BUR 56, DTB 51, AUU 45, DUU 39, EIH 33, CFR 32, CHF 31, EAM 28, KM 23, BZB 17, DH 17, ANS 14. (Oct.) VE3AUU 78, RIT 18.

QUEBEC—SCM, C. W. Skarstedt, VE2DR—C. W. Net: OQN, daily at 1900 on 3535 kc. Quebec Phone Net: Daily at 1845 on 3780 kc. BAA moved to Ahuntsic. AI is building a DX-100. ATL and YA have towers erected. ABE also is FP8BC. BAO uses a Japanese receiver and homebrew transmitter. AFN is active on the 80-meter Novice band. AKS experiments with portable on 10 meters. AGH likes his Apache. APC heard 4 states and 2 provinces on 2 meters (including Toronto). AZN is active at St. Agathe and skeds HH2HB on 10 meters. AXS returned to 10 meters. AWA now has a KWS-1 and operates 20-meter s.s.b. NM is ex-AKS. MO will operate at James Bay next spring. AZS is trying his quad. MC mobiles on 10 meters. AVR is an s.s.b. enthusiast on 20 meters. ARH does well on 2 meters. ACP used to sign VE1ACY. ARS returned from Northern Quebec and now is settled at Pont-Viau. APU received a private pilot's license. ABE also operates club station DN. AUF is active on phone from Chicoutimi. AAK is heard from Chateauguay Heights. XR added sequence keying. AOM is mostly on 6 meters but also tries 2. AWK and ATL are carrying on a good-natured fight as to who is the champion frequency measurer. AUH, AJD and AOL, at Trois Rivieres, were appointed to the RACES committee. HX, formerly 3XQ of Ottawa/Kingston/Belleville, is an FB c.w. operator. He likes 20 meters. DM, at St. Raymond, used to be known as the "butmobile" when VE3BUT. JP, QRP c.w. station at Quebec City, conducts classes on 3700 kc. at 1900 daily. BK now has his beam way up in the sky. Please keep the news coming during 1959. Traffic: (Nov.) VE2DR 58, CP 27, EC 19. (Oct.) VE2CP 40.

ALBERTA—SCM, Gordon W. Hollingshead, VE6VM—PAM: OD. CARA officers elected for 1959 were VM, pres.; MX, vice-pres.; AC, treas.; HO, secy.; AB, act. mgr. Election of 6AC to life membership in the CARA highlighted the annual banquet held on Nov. 28. HM reports that the NARA will resume supper meetings. KC, RW and HM took a c.d. course with DJ, who has been appointed to the ACDHQ staff on communications. MO and YM currently are active on 2 meters and NX still is piling up new countries on both c.w. and phone. Traffic: (Oct.) VE6HM 127.

MANITOBA—SCM, James A. Elliott, VE4IF—At the November meeting of the ARLM the following were

(Continued on page 138)

WHY USE MAKESHIFT TUBES FOR GROUNDED-GRID OPERATION? THESE RUGGED POWER TRIODES ARE DESIGNED FOR IT!

No need to fiddle with makeshifts. These Penta power triodes were designed specifically for the job. And only Penta makes them. Either tube will boost a 100-watt class transmitter up to a kilowatt. Either tube can be used for both SSB, CW service. There's no neutralization!

PL-6569—250-watts plate dissipation, hi mu (45). With a power gain of 10 or more, this tube gives you more than 800 watts output with only 75 watts drive. Low plate-to-filament capacitance (0.10 uuf) gives you high stability.

PL-6580—400-watt plate dissipation, hi mu (45). More conservative than the PL-6569. Useful in linear amplification of AM signals where carrier efficiency is low, and extra plate dissipation is needed.

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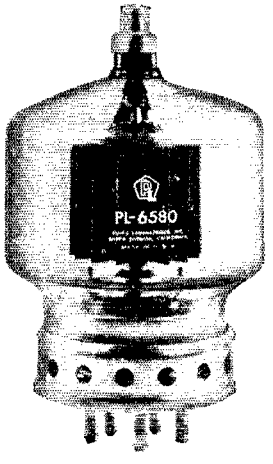

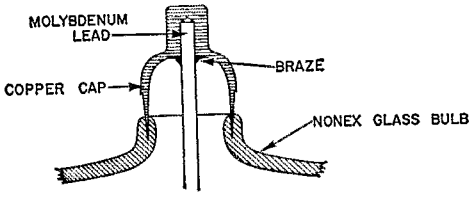

EXTRA-RUGGED PLATE CAP—Penta has designed both these tubes with a one-piece low-loss copper plate cap and seal. It can't break off. And there are no set screws or separate pieces to come loose.

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elected: CP, pres.; EN, secy.; RS, treas.; AR, technical; PM, social; FK, sick visiting. The Smorgasbord was well attended in spite of the howling blizzard. JY and EI again are working on the call letter license plates. VG is building a snow-mobile. While many participated in the October Manitoba Sweepstakes, only a few logs were sent in. Three more W.A.W. awards were given: WS, LJ and UR. The Snowshoe Net meets Sun. evenings on 3760 kc. just after the Manitoba Net. OC worked 26 DX countries in one month with his TBS-50. New officers for the Brandon Amateur Radio Club are YM, pres.; YW, vice-pres.; Willard Elliott, secy.-treas.; HT and KK, public relations. The gang at Churchill is anxious to establish skeds with members of the Manitoba Net. They are most active on 10, 15 and 20 meters. We wish all of the gang in the Manitoba section the very best for the New Year. Traffic: VE4AN 12, GE 12, KN 11, GC 8, RB 6, JW 4, MM 4, QD 4, TE 4, EN 3, IF 2, WW 1.

SASKATCHEWAN—SCM, Lionel O'Byrne, VE5LU—JW is heard on the air again. Welcome, Jim. WG is busy with antennas and towers. VP is active on 20 meters and reports good DX. LE was heard horn-tooting. What, no mobile, Leo? IG having his share of TVI. QL, our PAM, reports that the Sask. Fone Net has the largest membership ever, averaging a check-in of 25 members per session. Good work, Jim. Traffic: VE5LM 18, IG 10, IJ 6, QL 4, RE 4, BF 2, JA 2. QST

Communications Receiver

(Continued from page 17)

The receiver will operate as described above with either setting of the sideband switch. However, by proper choice of b.f.o. frequency a selectivity advantage can be obtained from the 3-kc. filter. If an interfering signal is present, the sideband switch can be thrown to the other sideband position, putting the interfering signal out of the receiver's pass band.

Main Tuning

In general, main tuning controls have left a lot to be desired on all but a few of the most expensive receivers. The case is not much different in this application. The MCN dial is one of the few available that is anywhere close to meeting the requirements of this receiver. However, a more elaborate tuning mechanism would be justifiable in view of the selectivity employed. A higher gear ratio and a reduction in parallax are two features that would be helpful. QST

Electronic Key

(Continued from page 37)

automatic too! It is almost impossible to send poor code with this key. Characters cannot be cut short nor can they be run together. As an example, let's make the letter "N." Push the key lever to the left (dash position). Just as soon as the dash has started, move the lever to right (dot position). The automatic key will finish the dash, make the proper space and begin the dot. Just as soon as the dot has started, move the lever to neutral. The key will finish the dot and stop. Try this at a very slow speed to realize just how automatic it is!

So if you really want to sound like W1AW, put this gadget together. It will take only a few hours and will repay you many times in ease of operation and almost perfect c.w. QST

The World Above 50 Mc.

(Continued from page 75)

for varactor, are unsatisfactory.

W4FWH, Doraville, Ga. — 50-Mc. activity in Atlanta area highest ever, with about 35 stations in the city proper and 15 more within 60-mile radius. Interest in 220 Mc. also rising. Activity good on 144 Mc. also, with Atlanta Net meeting Mondays at 2000 EST. Frequency: 145.35 Mc.

W4FNR, Ft. Lauderdale, Fla. — DX heard or worked on 50 Mc. all but three days during November. Now have 17 countries on 6.

W6PBC, Belmont, Cal. — Heard 21 eastern states on 50 Mc. in a single day, Nov. 15. Despite "impossible" v.h.f. location, am able to work W6VSV, Berkeley, and K6ONM, Mountainview, crossband, 1296 to 432 Mc.

W7MAH, Reno, Nev. — Trying for extended range on both 6 and 2. Work into Bay area on 6, but only local range thus far on 2. Tests show that s.s.b. is much better than a.m. phone for weak-signal work, but c.w. tops both. About 10 stations active locally on 144 Mc., with 2-meter net operating each Monday at 2100 PST. Keeping skeds with K7ETR and K7FEM in Fallon on 50 Mc., and have heard them weakly on 144 Mc.

KL7AUV, Anchorage, Alaska — First ZL-KL7 50-Mc. contact made with ZL1DE Nov. 18. Band open every day except Nov. 20 from Nov. 5 to 30. QST

YL News and Views

(Continued from page 66)

Helen Douglas, W5LGY, reports that 35 certificates have been issued to date, OM W2QHH and YL W4SGD were the first non W5-hams to earn the award. The 104 members of TYLRUN are listed in a new directory which is available for 25 cents.

KH6 YL Club — Pres. KH6CKO, Kay, writes that the club is beginning to grow, and that the membership is "out to let everyone know we're here!" (See separate item on new KH6 YL Certificate.)

LARK — New officers: Pres. K9IVG, V. P. W9TDC, Secy. K9BWJ, Treas. K9EMS, Pub. Chmn. and Editor of **Pinfeather** W9MYC, Novice Rep. K9IWR. Some 65 LARK certificates have been issued to amateurs who contact 10 members and send a list of contacts to Custodian Gladys Jones, W9MYC, 4232 Hampton Ave., Western Springs, Ill. Newcomers are invited to join the LARK Nest, which meets Friday at 10:00 P.M. CST on 29 Mc. and the c.w. net Monday at 1:00 P.M. on 3750 kc.

R. I. YLRC — New officers: Pres. W1OTI, V.P. W1CFT, Secy. W1ZOK, Treas. W1WED.

WHO of Tarrant Co. Inc. — New officers: Pres. W5PFU, V.P. W5GXG, Secy. K5CRH, Treas. W5ETH. Club call is K5LZW.

HAWK — New officers: Pres. W9RTH (re-elected), V.P. K9IXD, Secy. K9ILK, Treas. W9LYU (re-elected). Membership is up to 28.

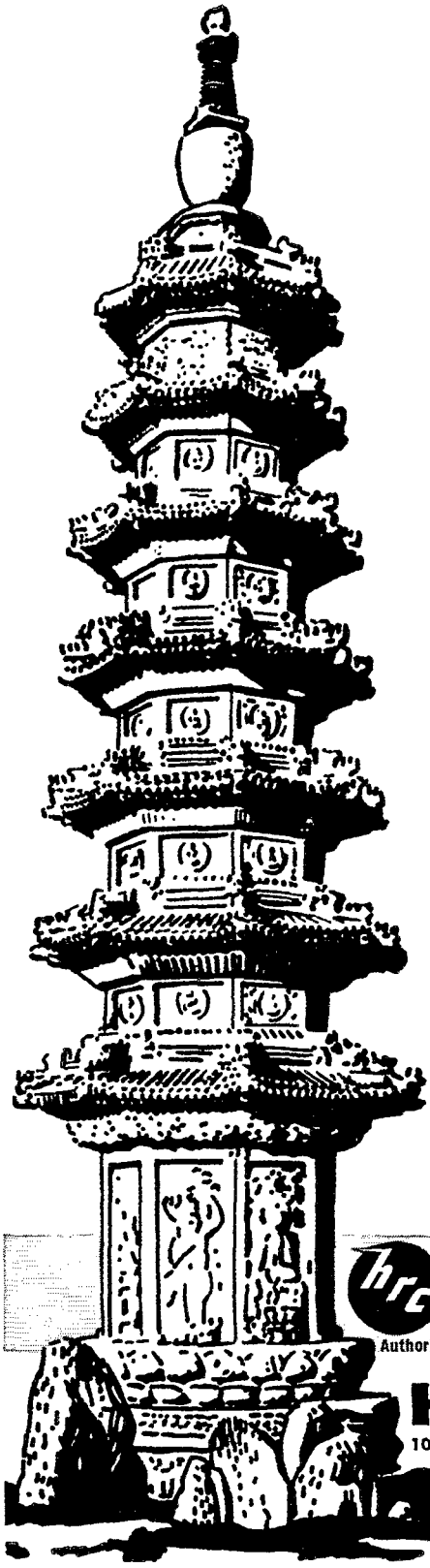
Los Angeles YLRC — Ruby Word, W6WRT, 2140 N. Valley, Burbank, Calif., replaces W6KER as custodian of the Lads N' Lassies Certificate.

GAYLARK — New officers: Pres. W5EGD, V.P. K5PFF, Secy-Treas. KN5SPD, Historian K5HTO. Amended rules for club certificate: six QSOs required for stateside applicants, five for DX applicants. Send no QSLs, but list contacts on log form and send to custodian Audrey Beyer, K5PFF, 7339 Guadalcanal St., Houston, Tex.

Miscellany

Very active sidebander K2GME, Dorothy, lists the YLs she has contacted most often on sideband in the past two years: W1ZXT, *W2s* EEO, IHK, K2TEX, *W3s* GEN, VCB/4, E4BIL, K4ZWW, *K6s* IKF, MHU, W6NAZ, K8IGG, W8SPU, W9RUJ, WØZTH/9, CN8MM, and OQ5IE. Dottie has worked 116 countries on s.s.b., with 109 confirmed (photo in Oct. '58 column). . . . Thanks to K4LMB, Ethel, and OMs K3AXX, K3CSN, and W3CN who raised an antenna for her, W3UTR, Meg, now puts out a potent signal on several bands. . . . W4TDK graduated three more members of her code class. Naomi has been instructing radio beginners for years. . . . Back in the U. S. again after a two-year stay in Lebanon at the U. S.

(Continued on page 142)



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At any point on the globe, from Durban to Dawson, from Bremen to Buna Buna, Harvey Radio's 31 years of service and reliability is with *all hams–regardless of location.*

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Upon your instructions, Harvey's will open the original factory sealed cartons and give the equipment complete inspection and checkout. And there is no charge for this extra service, for Harvey's policy is "satisfaction always guaranteed."

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Harvey Radio carries a complete stock of RCA tubes for every power tube requirement.

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OUR 31st YEAR

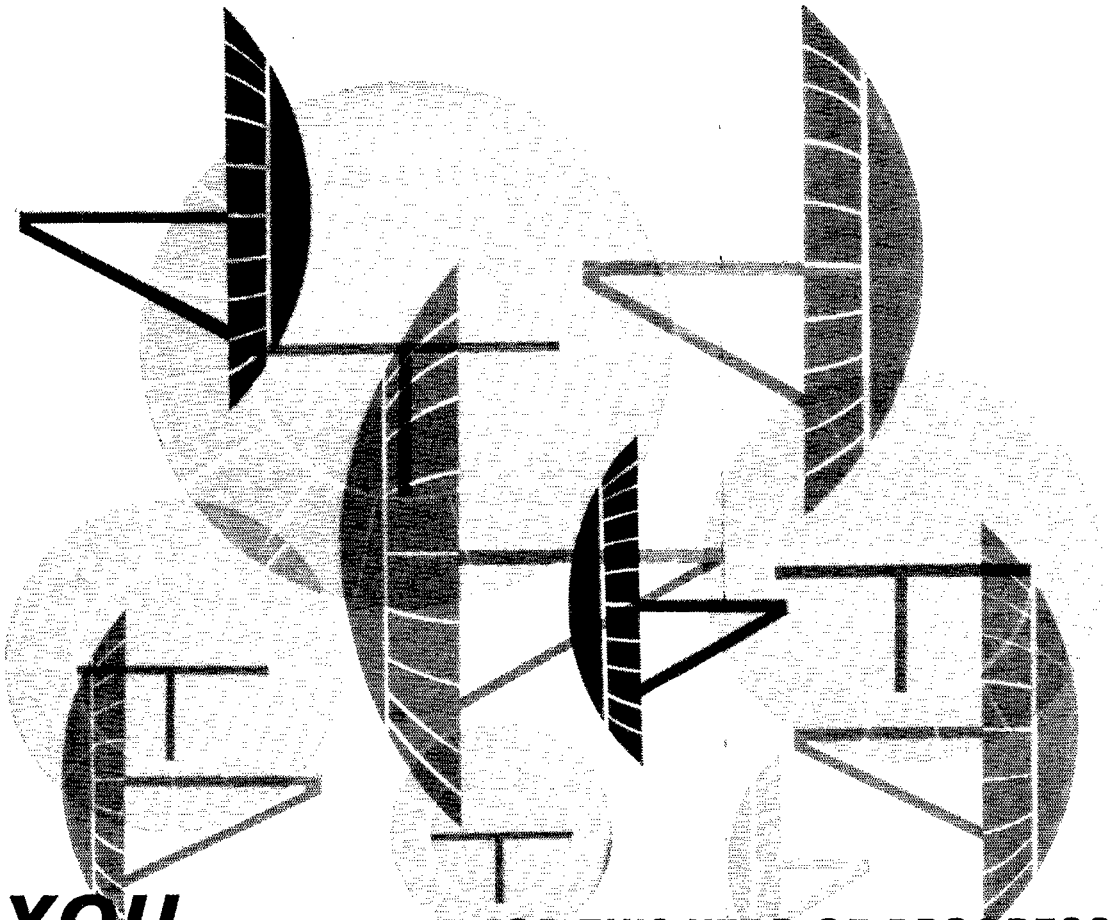
Embassy, Martha, W6QYL/4, promises the girls she worked while she operated as OD5CH will eventually receive a special hand-made QSL. . . . W3AKB, Fran, served on a panel of women engineers in Washington in connection with vocational guidance for high school girls looking towards careers in engineering. . . . K6RQF, Tray, operated mobile in Mexico as XE0RQF recently. . . . W3SLS, Betty, is operating portable on 40 c.w. from a new Westport, Conn., QTH. . . Sixty-eight licensed YLs attended the Southwestern Division Convention last October in San Diego. Hostess YL club was the San Diego YLRC, with Pres. W6WDL presiding and *K6s* MGL and VRH, and *W6s* GGX, MWU, and VSL assisting. Highlight of the YL program was the YLRL Forum. W6MMU moderated a discussion by *W6s* CEE, DXI, and QGX, and *K6s* EXG and KCI on net and contest operation and the new YLRL constitution. QST

How's DX?

(Continued from page 72)

the form of a certification will be given to any amateur radio operator in any part of the world who successfully establishes contact with 17 radio amateurs in the Netherlands Antilles. Decision to present these certificates was made at a recent meeting of the Aruba Amateur Radio Club. . . . Ten contacts must be made with amateurs in Aruba, five in Curacao, one in Bonaire and one in the Windward Islands." This from Hank Meyers Associates, 355 Lincoln Rd., Miami Beach, Fla., who may be able to clarify the Windwards whyfor. QSOs must date after the first of this year and PJ2BA appears to be your only current candidate for Bonaire credit . . . . . W9s YHE and YON contemplate possible Caribbean DXpeditionary work later in the year . . . . . VP9AK tickles KØJPJ and others by flinging their 15-meter phone signals back at them via tape recorder . . . . . W5KNE 5 writes from League City, Texas, a natural QTH for an ARRL booster. And then there's Philadelphia's League Island and the Red-Headed League of Sherlock Holmes. Any others? . . . . . Steady "How's" operative K6QHC now leaves for Navy service with a 132 70 DX record . . . . . VP2s DA and DM utilized the ham gear of VP2s DI and DN in opening the first airport in Dominica's history last September. The island joins the air age with the advent of Melville Field. VP2DA writes, "It was a lot of fun and very helpful to those who were interested in making the first landings as safe as possible." Another feather for the ham hat . . . . . Help, help — W1APU wants more HRØAA (Sept., 1958) information; K2UPD desires HH2KSX (March '58) data; W6MBD's better half seeks EQ3EE (Sept. '48), PK6CS (June '49), VQ8AX (March '49) tracers; and W9MAK could use a lead on ZB1RK (Aug. '56) . . . . . HI8CJY formerly signed KH6CJY, says W6KG . . . . . "The North Jersey DX Association had its first-anniversary dinner at Mario's Bottle Tavern, Madison," reports W2GT. "Good attendance — guest speakers included Capt. Carlsen, W2ZXM; MP4BBW; and W3GHD." . . . . . "Quite a few inquiries arrived concerning 'How's' publicity for our Half-Century Novice certification (pp. 154 and 156, September 1958 *QST*). Our award No. 1 was won by KN5LZO of Houston, Texas." This from W4PRO whose Hampton Roads Radio Club sponsors these tempting tapestries . . . . . OP K4CQV of KG4AO commends WIOFE, K2SHU, W4s FOR GAE NFC SHG ZVE, K1s BLM and TGA for stout traffic services rendered to the Guantanamo gang . . . . . After papering his Puerto Rican bulkheads with DX trophy after trophy all these years, KP4KD has decided to give beams a go . . . . . Via WITS of ARRL Hq.: "OZ7MA manned OX3IGY at Godhavn from June, 1957, through September of '58 while investigating the "dawn chorus" effect, also known as "whistlers", on v.l.f. Among Arne's more memorable contacts from OX3IGY were several confabs with our own CRPL ham group at KØIUK . . . . . With his new QRO KP4AOO is hard put to avoid W K VE callers graciously while attempting to augment his own DX total. Roger schedules his OM, KN8LHL, nightly on 15; mom, too, is awaiting her Novice call. A ham family with a purpose . . . . . At QRT time KZ5BB clocked his log at about 1500 contacts including a thousand with all Forty-Eight and 120 countries confirmed. "See you from K4AE!" . . . . . KØHGB learns that PJ2ME commutes from his new home on the French side of St. Martin to his old radio quarters, thus keeping contact with his many Yank friends. When Vince obtains his FS7 suffix PJ2ME contacts will grow few and far between . . . . . TI2HP tantalizes W8YIN with intimations of a March or April jaunt to TI9's tight little island . . . . . W6CAE of San Diego DX Club's Clipperton conquerors gives next month as

(Continued on page 144)



YOU ARE NEEDED FOR THIS YEAR OF PROGRESS

You are unique. You are a one-of-a-kind man needed to think for a new world of tomorrow. Your greatest gift to progress can be your ability to apply your inherent differences in thought and background to your field of specialty in radio electronics.

To help you think, to help you generate new ideas, come see THE RADIO ENGINEERING SHOW that requires all 4 floors of New York City's Coliseum. Come hear your choice of more than 200 papers to be given during the CONVENTION. You are needed. Yes, it takes a coliseum to hold this great electronic show. Then, it takes you to have the great thought, the INSPIRATION IN RADIO ELECTRONICS.

THE IRE NATIONAL CONVENTION
Waldorf-Astoria Hotel
AND THE RADIO ENGINEERING SHOW
Coliseum, New York City

MARCH
23 • 24
25 • 26

REMEMBERS THE MAN

THE INSTITUTE OF RADIO ENGINEERS
1 EAST 79th STREET, NEW YORK 21, N. Y.

target date for the club's coming Socorro sortie . . . . . K2TMI is seriously inclined toward Tortola operation before the winter wanes . . . . . VP2VB of *Yasme II* managed thousands of multiband QSOs from Montserrat (VP2MX) and Anguilla (VP2KFA) in late 1958. Among difficulties surmounted by Daniel in these doings was a painfully ailing ear . . . . . W8JIN maintains his mastery of the OVARA *Ether Waves* band-countries scoresheet. Jim's 1393 total is followed by W8s FGX JJW SDD and EV with 992, 792, 774 and 609 band-countries respectively.

Ten Years Ago in "How's DX?" — Acknowledging DXing as just about the most competitive angle in day-to-day hamming, your February 1949 column calls attention to new ARRL Operating Aid No. 5, a DX operating code prepared by ARRL's Communications Department to help minimize fraternal frictions . . . . Eighty is warming up with W7KPA/VP2 and ZC8PM as standouts. PY4ZI and other South Americans hop the pond to CT1s AS LP, Gs 2DQ 8VB and PAØNG on 75 phone . . . . Fractious forty furnishes FE8AB, FM8AD, J2s AFC LIO, OY3IGO, ZCs 1CL 6UNT and ZD2T . . . . Twenty c.w. offers AR8AB, Cs 1OH 7AT 7OO, ET3Y, FU8AA, HL1AB, Js 3KBE 6LPP 9ACX 9ADE, KAs 1AP 6AC, KH6QL/KB6, MI3NC, PJØX, TA3AA, VS7NX, Ws 1EEC/KW6 6ZNT/KW6, ZC6s UNJ RE and ZD9AA. The 14-Mc. A3 crowd cavorts with H16EC, J9AKG, NY4JB, W9RZI/KG6 and ZC6UN . . . . Ten phone turns up AG2AD, FQ8SN, HA1KK, MF2AA, MT2D, TA3FAS, UB5KAG, Ws 2LXF/Iwo 3NKS/ZS3 8SIR/KJ6, ZCs 1AC 6XY and ZS8A. On 28-Mc. c.w. we find J2s AAL AHI, ST2FU, VP8AD and VS9AL available . . . . The grapevine indicates that AR1s will shortly become YK1s . . . . Norfolk isle and the Vatican become ARRL Countries . . . . Pictures of prominent 11VS, PAØGN, SM5WZ and VS7PH round out the review. QST

Delivering Messages

(Continued from page 61)

2. The written message is a renewed invitation for the recipient to use amateur radio to acknowledge or reply. Often the recipient is not immediately ready to answer or she may be timid about a reply. Written deliveries have proved to be for me a fruitful source of new traffic to originate. In that connection, even though the message blank carries the printed statement: "Your reply to this message will be handled without charge by the receiving station," I often add, below the typewritten text, "We shall be pleased to handle any reply or acknowledgement you wish to send."

3. The written delivery is a tangible evidence of how excellent our amateur traffic system can be; not your private traffic system nor mine, but our nationwide one. Sometimes the message gets mailed back to its originator and, in turn, is passed to the originating station, for others to share in the glory of the thing. When you yourself have been the originating station, you have perhaps been disappointed to learn from the originator that she had a letter from Mrs. Smith and *Mrs. Smith never even mentioned the message.* If it was delivered by phone, was this a case of "in one ear and out the other"? A written delivery will help Mrs. Smith to remember that she got it! And it may help the originating station to get some repeat traffic.

4. Finally, for messages of greeting: seasonal, birthday and anniversary — a written message or confirmation takes its rightful place alongside other (printed) greeting cards received on the occasion. But ours is unique and novel!

In summary: we can improve the art and prac-

(Continued on page 146)

New... COLLINS S LINE

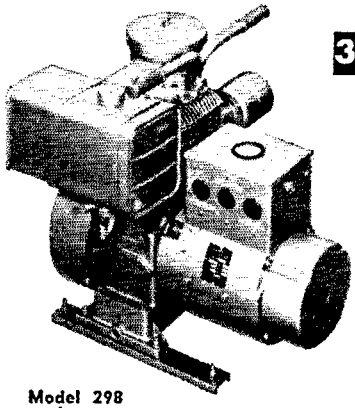
Now in Stock

in RADIO SHACK'S GREAT and EXPANDED Amateur Department

- Deliveries Made Now from our stocks!
- "Easy Pay Plans" —only 10% Down
- Bigger, Better Trades! Ask Al Coe W1RVQ

COLLINS

SALE! POWER PLANTS for field, farm, home!



Model 298 shown

3000 watt Generator with Gas Engine!

$279.95 Model 208

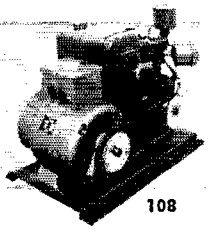
$28 Down, $17 Monthly

- 5¼ HP Briggs and Stratton Ball Bearing Engine
- Generator Directly Connected to Engine (Drip-Proof)
- Extra Large Capacity Fuel Tank — 6 Quarts

Order No.	Model	Starting	Choke	Down	Monthly	Sale!
RMF208	208	Manual	Manual	$28	$17	$279.95
RMF288	288	Push Button	Manual	32	19	319.95
RMF298	298	Push Button	Automatic	34	21	339.95

2000 Watt 4 hp

Models 108 and 88
115 V.A.C., 60 Cycle
With built-in *mechanical governors*



108

Regular Value $345

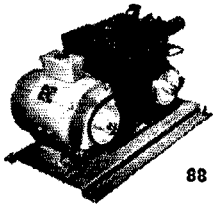
$199.95

$20 Down, $14 Monthly

- Clinton 4½ HP Engine #1200 Ball Bearing
- Voltmeter, Duplex Switch
- 2000 Watt Generator
- Pulley-Belt-Steel Base

1000 Watt 2¼ hp

- Briggs and Stratton 2¼ HP Engine #6B
- 1000 Watt Generator
- Pulley-Belt-Steel Base



88

Reg Value $225 **$119.95**

$12 Down, $10 Monthly

Save Money! Write for used equipment list!

RADIO SHACK CORPORATION Dept. 2D

730 Commonwealth Avenue, Boston 17, Mass.

Please send me:

Order No.	Model	Watts	Ship. Wt.	Sale
☐ RMF208	208	3000	189 lbs.	$279.95
☐ RMF288	288	3000	187 lbs.	319.95
☐ RMF298	298	3000	185 lbs.	339.95
☐ RMF108	108	2000	135 lbs.	199.95
☐ RMF88	88	1000	105 lbs.	119.95

Name _____

Address _____

City _____ Zone____ State _____

RADIO SHACK CORP.

730 Commonwealth Ave., Boston 17, Mass.
167 Washington St., Boston 8, Mass.
230-234 Crown St., New Haven 10, Conn.

tice of message deliveries by careful pre-checking, by considerate handling of telephone deliveries and by use of neat, accurate written deliveries. More perfect deliveries will bring rewarding satisfactions to us all.

Portable ZS9

(Continued from page 54)

I want to express my appreciation to the South African and Rhodesian Railways for deciding to bring the railroad so that it crossed the motor path. There we found what once must have been a motor gate. On the rusting gate were tangled masses of "a stout piece of wire." If you were home you would go out and buy some new stuff but out there the wire looked so good you could eat it. I doubt if ever I have felt such passion for anything so inanimate. In California I could easily have started a wire worship cult! Out came the Brownie . . . the jacks . . . the side-cutters and torches. Ben was soon sweating sub-chassis. He "boppa-ed" (when translated from the ancient Aramaic means "twisted the hell out of") the cross member to the universal mounting. We were on our way again.

Uneventfully we crossed the Limpopo, found petrol, and at 1.30 P.M. on Monday we were back in Klerksdorp. We had ten hours sleep in eighty-five, 1150 miles chalked up on the speedometer, 305 contacts, 35 countries, and a lovely week end. Oh, brother!

A personal tribute must be paid to the Richmond Amateur Radio club in general and Myron Steffy, W4IYC and Joe Galeski, W4IMP, in particular for advice, help and above all for handling the tedious business of QSL cards. These were handled expertly and I doubt if any guy who has sent in his QSL has not received the cherished ZS9. QST

Strays

Five brothers who are all hams *and* Franciscan Padres: W9NHO, W8MUR, W9NEP, W9VRT, KØMFT.

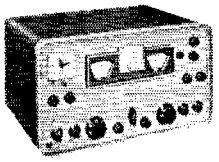
—···—

Another multi-ham family is that of WØNIT, whose XYL is WØVLS. Their three junior ops are WØNCB, WØSKB, and KNØIYY. A sixth ham member of the family is Grandma KØJJJ. Our records aren't complete, but K6UDM says there is another brother ham on the west coast.

—···—

Overseas readers who don't readily hear WWV in the States can get time signal and standard frequency transmissions from ZUO at the Union Observatory in South Africa. The carrier frequencies are 5 and 10 Mc., interrupted from 15 to 25 minutes past each hour. Morse code announcements are made each 15 minutes, giving the call sign ZUO and the Universal Time of the next minute.

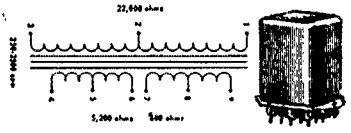
ARROW
For The Best In Ham Equipment



Hammarlund Model HQ-170

All the best features of the finest SSB converters, plus the best features of the finest amateur receivers wrapped up in a single, outstanding receiver. Covers the 6, 10, 15, 20, 40, 80 and 160 meter amateur bands. Separate vernier tuning. Dual and triple conversion 17-tube superheterodyne. Adjustable 60db notch filter. IF passband tuning. Adjustable AVC.

Amateur Net **$359.00**
Amateur Net (With Clock).....**$369.00**



Versatile Miniature Transformer

Same as used in W2EWL SSB Rig — March '56 QST. 3 sets of CT windings for a combination of impedances: 600 ohms, 5200 ohms, 22,000 ohms. (By using the centertaps 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. Brand new. Fully shielded.

Amateur Net, each **$1.39**
3 for **$3.49** 10 for **$10.75**

Sub-Miniature 0-200 Microampere Meter

A high quality instrument made by International Instrument Co. (Model 100). Only 1" in diam. Ideal for limited space applications & transistorized circuits. A natural for transistorized grid dip oscillator as described in June '58 QST.

Amateur Net $3.95 ea. **2 for $7.50**

2" round 0-500 microamperes. Bakelite case. Made by G.E. and Dejur.

Amateur Net $2.95 ea. **2 for $5.50**

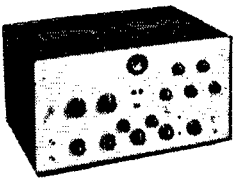
Weston 2" 0-4 amp RF meter Model 507. A giveaway at **$2.95 ea.** **2 for $5.50**

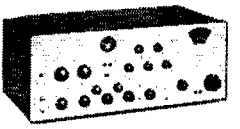
1½" sq. (ruggedized) 0-100 microamps. **$3.95 each** 2 for **$7.00**

"Wonder Bar" 10 Meter Antenna

As featured in Nov. 1956 QST. Complete with B & W 3013 Miniductor. Only 8 ft. long for 10 meters.

Amateur Net.....**$7.85**





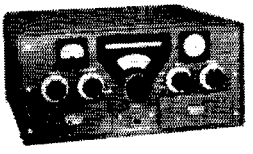
Lakeshore Phasemaster Models II-A and II-B

Band Switching: 160, 80, 40, 20, 15 & 10 meters. 65 watts PEP output from 6146 power amplifier giving sufficient power to drive nearly all types of linear amplifiers including grounded grid finals. SSB or DSB: Suppressed carrier, narrow band phase modulation or break in CW. Voice control and anti-trip circuits built in. Talk-on-frequency or Zero beat. Pi-Network Output: Matches 50-600 ohms impedance coax or balanced antenna output connectors. Voltage regulation of VFO, 9 mc oscillator and 6146 screen. Low pass filter in audio section gives speech cut-off of 40 db at 3800 cps. Temperature compensation in critical 9 mc circuits for improved stability. Novice or CW operation on 160, 80 and 40 meters with direct frequency crystals.

***Built-in VFO** — 100:1 precision dial tuning, anti-backlash gears, no string or cable drives. Frequency stability and reset accuracy better than 100 cyc. Completely independent of Exciter section. Built-in regulated power supply. Individual AC power switch allows VFO to be left on if desired.

*Applies to Model II-B only.

Amateur Net Model II-A ..... **$329.50** **Amateur Net** Model II-B **$459.00**



Central Electronics 100V Exciter-Transmitter

NO TUNING (except VFO), uses famous CE BROADBAND system. PRECISION LINEAR VFO — 1 kc calibration. Single knob bandswitch 80 thru 10. SSB—DSB—AM—PM—CW and FSK. RF output adjustable 10 to 100 watts PEP. Meter reads Watts Input, Amps Output and Carrier Suppression. 2" RF scope. Speech level & load mismatch indicators. Audio filter — Inverse feedback — 50 db Carrier and Sideband Suppression.

Amateur Net **$595.00**

Available early March... Orders taken now for early delivery.

Central Electronics Model 600L Broadband Linear

No tuning controls — CE BROADBAND Couplers in high efficiency class AB² using single 813. Easily driven to 600 Watts PEP Input 160 thru 10 by a 20A or 100V. Built-in Heavy Duty Power Supply — 45 mfd Paper Capacitor. Meter reads WATTS INPUT, GRID DRIVE, RF AMPS, & SWR. Completely shielded — TVI suppressed — parasitic free. Remember there is less than ONE S UNIT difference between the 600L and a 2 kw PEP job.

Amateur Net **$495.00**

Globe Linear LA-1

Complete with well-filtered power supply. 200w input AM Class B. 300w DC or 420 PEP input Class B linear SSB or DSB. 300w Class C for CW. Pi-Net 80-10 meters. 52 ohm Pi-Link coupled on 6 meters. Extensively TVI protected.

Amateur Net (Kit) **$99.50**
Amateur Net (Wired & tested) .. **$124.50**

Hy-Gain Rotobrake

Complete rotating assembly including rotator, brake and wall-map indicator. Built to rotate and hold like the "iron fist" without damage to beam.

Amateur Net **$149.95**

MAIL ORDERS PROMPTLY PROCESSED SAME DAY SHIPMENT FROM STOCK

TO SAVE C.O.D. CHARGES, PLEASE INCLUDE SUFFICIENT POSTAGE WITH YOUR ORDER. ANY EXTRA MONEY WILL BE RETURNED.

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Hints and Kinks

(*Continued from page 50*)

mechanism. The trouble usually shows up as an intermittent bubbling sound and requires a rapid back-and-forth movement of the kilocycles control to reduce the trouble.

A small spring contact makes a mechanical connection between the kilocycles control tuning shaft and ground. When this contact becomes dirty or corroded, the above tuning difficulty becomes apparent and seems to be more prevalent when the KWM-1 is used mobile. It is only necessary to clean the contact to cure the trouble. Apply some contact cleaner and lubricant solution such as the General-Cement DE-OX-ID on the connection with an eye dropper or hypodermic needle injector. —*John Hunt, WØYBE*

Happenings of the Month

(*Continued from page 63*)

Commission licensed amateurs operating beyond continental limits of the United States, its territories or possessions on a more equal footing with amateurs operating within these areas.[3]

The first step toward accomplishing this goal was taken in Docket Number 10501. The rule changes effectuated in that proceeding added the frequency band 21.0-21.45 Mc. to the frequencies which amateurs operating outside the jurisdiction of the United States were previously allowed to utilize. Thus, the present proposal may be regarded as an effort to further implement a previously established principle.

3. The majority of comments filed[4], support adoption of the proposed amendments and no party expressed opposition to the principle which the proposal sought to implement. However, the comment filed by the American Radio Relay League[5] objected to the proposed amendments on the following basis:

> The Commission's proposal to expand amateur maritime-mobile operating privileges was carefully examined at the annual meeting of the Board of Directors of the League on May 9, 1958 . . .
>
> It was the unanimous decision of the Board to oppose at this time, expansion of amateur maritime-mobile privileges beyond areas substantially within the jurisdiction of the United States, on the basis that on the eve of an international conference it is undesirable for the United States to take an action on behalf of its amateur service which may be viewed as having international implications, even if only in Region II. The League is otherwise sympathetic with the needs and desires of amateurs whose

(*Continued on page 150*)

[1] At the time the Notice of Proposed Rule Making in this proceeding was issued, the involved rule provisions were encompassed in Section 12.91 but subsequently were placed in Section 12.90. Therefore, amendment ordered herein is of Section 12.90.

[2] Region 2 is defined as follows: On the east, a line (B) extending from the North Pole along meridian 10° west of Greenwich to its intersection with parallel 72° north; thence by Great Circle Arc to the intersection of meridian 50° west and parallel 40° north; thence by Great Circle Arc to the intersection of meridian 20° west and parallel 10° south; thence along meridian 20° west to the South Pole.

[3] At present amateurs operating beyond the continental United States, its territories, or possessions may utilize only these frequencies in the bands 21.0–21.45 Mc. and 28.0–29.7 Mc.

[4] A total of fifty-six original comments were filed and of this total fifty-five advocated adoption of the proposed rule changes.

[5] Herein referred to as the League.

from CARTON to CONTACT in 47 minutes!

WITH THESE POWERFUL hy-gain TRAP VERTICALS

MODEL 14-AV

The Model 14-AV is only 21 feet high and weighs just 13 pounds. It incorporates the exclusive Hy-Gain capacity hat assembly which increases the electrical length of the maintaining high efficiency on 40 meters.

Model LC-80 loading coil adds 80 meter operation to the 14-AV Vertical. Only $2.00 Ham Net.

Combination mast and radial roof mounting kit complete with hardware, $9.95 Ham Net.

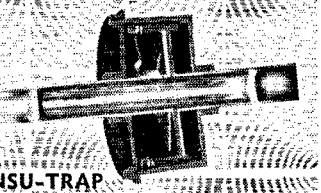
MULTI-BAND OPERATION

Completely factory pretuned with no further adjustments necessary these Hy-Gain Multiband Trap Verticals maintain an SWR of 2 to 1 or less across the entirety of each band for which they are designed. (52 ohm coaxial feed line). True ¼ wave marconi resonance on each band makes possible low angle DX radiation pattern.

the Self Supporting **14-AV**

$27.95

for 6*, 10, 15, 20 & 40 M



INSU-TRAP

Acting as an insulator at resonant frequencies but allowing radio energies of other frequencies to pass freely the Hy-Gain Insu-Trap becomes an automatic electronic switch which isolates various sections of the vertical to make it the proper length for each band. Hy-Gain Traps use exclusive adjustable capacitor plates and are individually factory resonated maintaining a high degree of efficiency. Each trap is completely weatherproof and air tight. No water or condensation can ever enter. Enclosed in carbon activated polyethylene cover and cap assembly the Hy-Gain Insu-Trap is rated to take the full maximum legal input power. Traps are only 2x3", weighing just 8 oz. each.

NYLON BASE MOUNT

Fiber Glass impregnated nylon base assembly makes possible self support. Heavy cast aluminum mounting bracket is adjustable for various sizes of mast. Weatherproof internal coaxial fitting supplied.

*Available as an accessory, the specially designed decoupling stub adds 6 meter operation with low SWR to Models 12 or 14-AV.

Order Model 6MK, $4.95 Ham Net.

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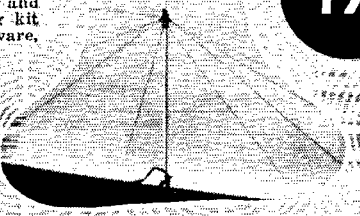

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interest lie in maritime-mobile operation but it is unwilling to risk — however small the risk may be, the possibility of the development of attitudes at the conference unfavorable to amateur radio because of the now-proposed U. S. action set forth in Docket 12307.

The Maritime-Mobile Amateur Radio Club in reply to the League stated:

> The position taken by the League in this docket is exactly the same as that which prompted their objection to the Commission's proposal in Docket 10501, to extend maritime-mobile operating privileges to the 21 Mc. worldwide amateur band. In that proceeding, the League objected on the grounds "that the current international radio situation is such as to make such action highly inadvisable."
>
> In the present proceeding, as in Docket 10501, the League again offers an opinion without supporting evidence that harm may result from the Commission's proposed action. The League, in effect, is saying that the Commission acted unwisely in Docket 10501, and is again proposing to place amateur radio in further jeopardy. MMARC considers the League to be presumptuous in making such representations to the Commission without substantial documentary facts to justify criticism of the Commission's action. Taking into account the time from 1946 through the period during which the Commission's action in Docket 10501 has been in effect, MMARC's investigations failed to uncover a single circumstance or situation which, in the slightest degree, gives evidence of any animosity toward, or "development of attitudes" unfavorable to United State's amateurs engaging in maritime-mobile operation on the high seas. On the contrary, MMARC points to an increased interest in this mode of amateur operation throughout the world. In Docket 10501, MMARC produced a record of foreign amateurs engaging in maritime-mobile operation on a world-wide *all-band* basis. Evidence was submitted to the Commission, at that time, concerning the rules and regulations for maritime-mobile operation of foreign administrations, including that of Great Britain, which was one of the countries specifically pointed to by the League, as unalterably opposed to maritime-mobile operation in any form. Records in MMARC's files show continued maritime-mobile operation with additional countries participating since 1954. For example, Canada recently formalized maritime-mobile operation for Canadian amateurs and, for this purpose, has assigned the special prefix VEØ. Further, since Region 2 is particularly involved in this proceeding, MMARC calls attention to the fact that Argentina, Panama, Ecuador and Colombia have amateurs operating maritime-mobile. Attention is called to the fact that our own Navy and Coast Guard permit maritime-mobile operation where security and operational factors do not prevent. It is significant to note that last fall seven of the vessels involved in the supply convoy to the Dew Line had amateurs aboard who were permitted to operate maritime-mobile. The amateur operators were complimented for their ability to provide informal communications for the benefit of the officers and crews of the ships.

4. As indicated by the reply of the Maritime-Mobile Amateur Radio Club, the League's objection to adoption of the proposed amendments is virtually identical to its objection interposed in Docket 10501. In this circumstance it appears that the Commission's conclusions in Docket 10501 relating to the League's objections are equally applicable in this proceeding. Accordingly, the Commission concludes that the League's objection does not constitute justifiable grounds to dismiss the proposed amendment of Section 12.91 of the Commission's rules.

(Continued on page 152)

5. The Commission believes that differences in privileges accorded amateurs, dependent solely on geographic location, are in the public interest only when clearly justified by compelling reasons. No party to this proceeding has demonstrated "compelling reasons" for continuing that portion of the present differences in privileges which the proposal would eliminate. In addition, the Commission is aware of no other information which would lead it to conclude that continuation of such differences in privileges is justified. Accordingly, the Commission finds that adoption of the rule changes proposed in the Notice of Proposed Rule Making issued in this proceeding would be in the public interest.

6. The petition of the Maritime-Mobile Amateur Radio Club which engendered this proceeding sought, in addition to the rule changes proposed by the Commission, amendments which would allow amateurs aboard vessels "operating between" certain United States ports to utilize frequencies in the 3500–4000 kc. band. The Commission, in the Notice of Proposed Rule Making issued herein, stated that this plea was not granted because "if adopted it would provide no specific boundaries within which such operations would be permitted." The comment filed by the Maritime-Mobile Amateur Club "now requests that the Commission give consideration, prior to its final Report and Order, to the addition of the following:

> Operation may be conducted in the band 3500–4000 kc. when the ship is sailing *directly* between ports on the east coast; *directly* between ports of the Gulf Coast, or *directly* between ports of these coasts; or *directly* between ports of the Pacific coast; and the Hawaiian coast *and Alaskan coast.*"

This "new" proposal merely substitutes "directly between" specified ports for "between" specified ports as set forth in the original petition and fails, as did the original proposal, to provide specific boundaries within which amateur operation on frequencies in the 3500–4000 kc. band would be permitted.

The League, while objecting to the Commission's proposal as set forth in the Proposed Rule Making, advocates "that all authorized amateur bands and modes of emission be made available to amateur operations on vessels plying between United States ports 'while under enrollment'."

This proposal, like that of the Maritime-Mobile Amateur Radio Club, also fails to provide specific boundaries within which amateur operation may be conducted.

7. IT IS ORDERED, pursuant to authority contained in Sections 4(i) and 303 of the Communications Act of 1934, as amended, that the rules set forth in the attached appendix be and are hereby adopted, effective January 30, 1959.

FEDERAL COMMUNICATIONS COMMISSION
Mary Jane Morris
Secretary

Released: December 19, 1958

Part 12, Amateur Radio Service, is amended as follows:

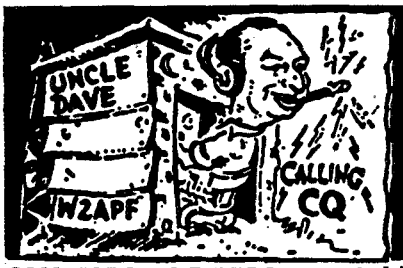
Section 12.90(b) is amended to read as follows:

(b) When outside the continental limits of the United States, its territories, or possessions, an amateur radio station may be operated as portable or mobile only under the following conditions:

(1) Operation may not be conducted within the jurisdiction of a foreign government except pursuant to, and in accordance with express authority granted to the licensee by such foreign government. When a foreign government permits Commission licensees to operate within its territory, the amateur frequency bands which may be used shall be as prescribed or limited by that government. (See Appendix 4 of this Part for the text of treaties or agreements between the United States and foreign governments relative to reciprocal amateur radio operation.)

(2) When outside the jurisdiction of a foreign government: operation may be conducted within Region 2 on any amateur frequency band between 7.0 Mc. and 148 Mc., inclusive; and when not within Region 2, operation may be conducted only on the amateur frequency bands 21.00–21.45 Mc. and 28.0–29.7 Mc. (Region 2 is defined as follows: On the east, a line (B) extending from the North Pole along meridian 10° west of Greenwich to its intersection with parallel 72° north; thence by Great Circle Arc to the Intersection of meridian 50° west and parallel 40° north; thence by Great Circle Arc to the intersection of meridian 20° west and parallel 10° south; thence along

(*Continued on page 154*)



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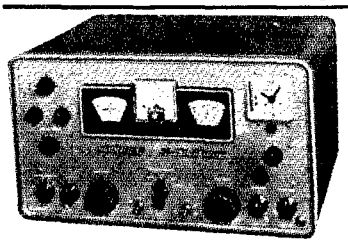

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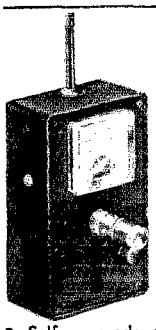

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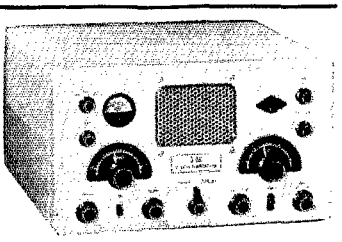

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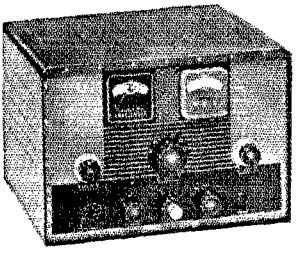

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meridian 20° west to the South Pole. On the west, a line (C) extending from the North Pole by Great Circle Arc to the intersection of parallel 65° 30′ north with the international boundary in Bering Strait; thence by Great Circle Arc to the intersection of meridian 165° east of Greenwich and parallel 50° north; thence by Great Circle Arc to the intersection of meridian 170° west and parallel 10° north; thence along parallel 10° north to its intersection with meridian 120° west; thence along meridian 120° west to the South Pole.)

(3) Notice of such operation, in accordance with the provisions of §12.91, shall be given to the Engineer in Charge of the district having jurisdiction of the authorized fixed transmitter location.

FEDERAL COMMUNICATIONS COMMISSION

In the Matter of Amendment of Section 12.111 of the Commission's Rules, Amateur Radio Service, to provide that only A1-emission may be used in the lower 100 kc. of the 50 and 144 Mc. amateur bands.	Docket No. 12485

REPORT AND ORDER

By the Commission: Commissioners Doerfer, Chairman; and Lee absent.

1. A Notice of Proposed Rule Making was issued in the above-captioned proceeding on June 11, 1958. Ample opportunity was afforded all interested parties to file comments in support of and opposition to the proposal which, if adopted, would allow only those amateurs utilizing type A1 emission [1] to operate in the frequency ranges 50.0–50.1 and 144.0–144.1 Mc. whereas various other types of emission, principally A3,[2] presently may be utilized in such frequency ranges.

2. Rule changes proposed in this proceeding were engendered by a petition filed by the American Radio Relay League, Inc.[3] and have elicited an extremely large number of comments from individual amateurs and organizations representing groups of amateurs. These comments range all the way from those devoid of reasons and which merely state "I request you vote yes (or no) on this matter" to well-reasoned, thoughtful comments both in support of and in opposition to the proposal.

3. The principal arguments advanced by comments supporting adoption of the proposed rule changes may be summarized as follows:

(1) Adoption of the proposed amendments will afford "the many experimentally inclined amateurs now operating in the 50 and 144 Mc. bands the means of further adding to the knowledge of propagation characteristics of the very high frequency portion of the radio spectrum."

(2) The provision of sub-allocated bands in the 50–54 and 144–148 Mc. amateur bands restricted to the use of type A1 emission would encourage "a great deal more useful serious work of amateurs thereby contributing to the development of the radio art."

(3) The proposed amendment, if adopted, would "tend to increase c.w. (A1) activity in the 6 meter band and as a result one could raise his code speed with little difficulty."

(4) "The government is spending large sums to promote research into scatter propagation. The amendments that are proposed will make available to the government, through the ARRL IGY project, coordinated reports from hundreds of amateurs who will use these frequencies. Much of the unusual signal reception will be obliterated if the weak c.w. signals are forced to compete against phone stations occupying the same frequencies."

(5) Adoption of the proposals will enable amateurs to "uphold our tradition of leading the way in experimental work."

(6) Adoption of the proposals "will make it much easier for United States amateurs operating on voice to work for-

(Continued on page 156)

[1] Telegraphy without the use of modulating audio frequency.

[2] Telephony.

[3] Hereinafter referred to as the League.

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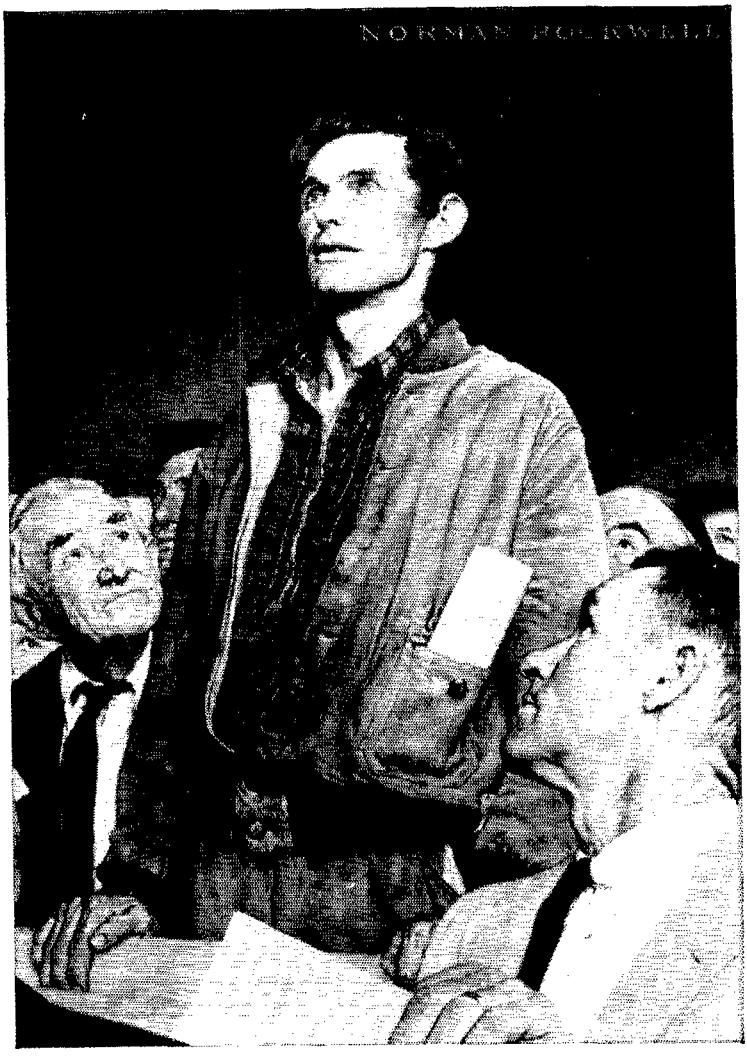

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eign voice stations because foreign voice stations will be able to get away from United States phone QRM by transmitting in our c.w. band."

(7) "The allocation of A1 emission sub-bands in the high frequency amateur bands has been necessary and proved successful through the years. 50 and 144 Mc. bands should not be an exception."

(8) Although the 50 Mc. amateur band extends from 50 to 54 Mc. "frequencies above 52 Mc. in this band are seldom used" and adoption of the proposal will encourage utilization of the band above 52 Mc.

(9) A sub-band allocation in the 50.0–54.0 and 144.0–148.0 Mc. bands would "insure an increase in positive results through decreased A3 interference during years of peak activity by operators not inclined toward propagation experimentation. The value of the results achieved by relatively minor number of dedicated amateurs should more than offset any inconvenience suffered by those not engaged in scientific aspects of the HF communication."

(10) Many serious experimenters employ the bands involved in the subject docket and, because of signal-to-noise ratio advantages, these experimenters most frequently employ A1 emission whereas the general amateur employs A3 or other modes of emission. The "serious experimenters" have in the past suffered extreme difficulties caused by interference from general activity in the bands. The proposed rule making would eliminate a great majority of this interference.

(11) At the present time "many operators refrain from trying to use c.w. solely because of phone interference" and adoption of the proposal will encourage such amateurs to enter the "c.w." field.

(12) Restriction of portions of amateur bands below 50 Mc. for type A1 emission has contributed much to the development of the "low frequency amateur bands" and similar restriction of a portion of the VHF bands is "essential for their development."

(13) "An exclusive A1 sub-band within the 50 Mc. amateur band would do much to 'prod' the Technician Class amateur in upgrading himself by becoming more proficient in code transmission and thereby obtaining a higher type license."

(14) Adoption of the proposed amendments will "permit better coordination with foreign amateur stations specifically licensed for the IGY year. Experience in the fall, winter and spring of the 1957–1958 season shows that considerable harm has already been done by the intolerable local and U. S. A. A3 interference to the frequencies occupied by foreign amateur stations specifically licensed by their respective governments for the IGY year."

(15) Adoption of the proposed amendment would "in no way interfere with the established emergency or civil defense networks, all of which remain considerably higher in frequency than these bands."

(16) "Adoption of the Commission's amendment will promote vital and basic studies in scatter propagation, aurora communications, and space communication technique."

(17) Adoption of the proposals will encourage use of c.w. and "will benefit national defense and security by providing a wider range of skilled and national manpower."

(18) Adoption of the proposals will aid in carrying out the President's desire to encourage scientific progress wherever possible."

4. The principal arguments advanced by those opposed to adoption of the proposed rules are:

(1) "Sunspots will only be with us a few months more and then the c.w. operators will, as in the past, move to greener pastures leaving their 100 kc. segment completely unused. The few contacts made by these operators are of far less value to IGY than the thousands of reports they get from regular operators on that band. C.w. men can easily

(*Continued on page 158*)

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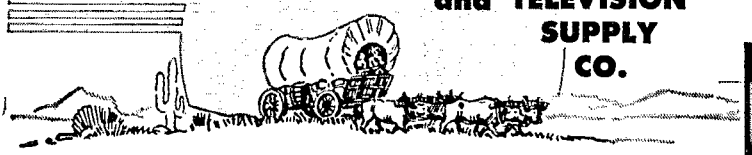

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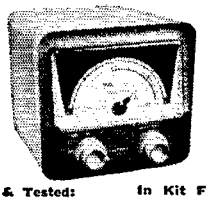

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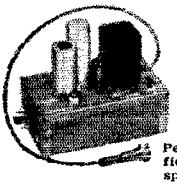

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move above 50.5 Mc. for their work when the lower channels are full.

(2) "When conditions favor c.w., there is seldom any problem of interference from anything but other c.w. signals" in the 144 Mc. band.

(3) Adoption of the proposed amendments would be inconsistent with the Commission's prior refusals to "allocate separate frequencies for single sideband on the lower frequency amateur bands. S.s.b. and a.m. are as incompatible as are c.w. and a.m."

(4) Adoption of this proposal will not eliminate the problem of A1 operation being interfered with by A3 operation because such interference would still be present by virtue of foreign amateurs, such as Canadian, operating with type A3 emission.

(5) "There has been little evidence of interference to A1 by A3 generated by amateurs." To the contrary "commercial harmonics have caused more trouble."

(6) "Unlike the lower frequencies practically all of the early work in the development of the 50 and 144 Mc. bands has been done by amateurs using A3 emission." Therefore, adoption of the proposal would give "the c.w. operator a better and unwarranted opportunity for contact over the phone operator."

(7) Amateur stations using A3 emission, located in areas served by television channel 2, "cause much less television interference, due to fundamental overloading, when said stations operate in the 50.0–50.35 Mc. portion of the 6 meter band. Amateur stations using type A1 emission, on the other hand, can operate in any portion of the 6 meter band[4] with negligible television interference."

(8) Most amateurs utilizing type A3 emission work at the lower portion of the band in order to keep down the TVI[5] complaints, as many TV set owners will not install the proper filters. Adoption of the proposal would cause more television interference than has ever been experienced previously and in particular will cause "more interference to the 35 cities that have channel 2 — to say nothing of the fringe areas around them." It is imperative "that the phone operation be allocated the lower sections (of the 50–54 Mc. band) so as to minimize television interference."

(9) "There are many occasions when the first 50–100 kc. are the only points at which there are signals except for the ground wave signals, and the use of this portion for c.w. only would seem to limit operation on this band." Therefore, since the 50–54 Mc. amateur band is primarily a phone band the proposal is alleged to be both discriminatory and "intended for the benefit of a very small minority of those presently operating the band."

(10) The first 100 kilocycles of the 50 Mc. amateur band is the "most desirable for DX' work" and those amateurs who desire to use type A3 emission resent "being pushed out of this section of the band."

(11) There are presently "hundreds of kilocycles given over to c.w. which are hardly used at all, yet phone is squeezed into a small spectrum of these amateur bands against all good judgment as to the proper use of our frequencies" and any extension intensifies this inequitable situation.

(12) Television harmonics occupy the band above 50.5 Mc. in channel 2 TV areas. Thus the 100 kc. proposed to be restricted to the use of type A1 emission represents 20% of the "useful segment of the band."

(13) There is presently underway serious work on long distance phone communications in the first 100 kilocycles of the 50–54 Mc. band which would be disrupted by the adoption of the proposal.

(14) The 50–54 Mc. and the 144–148 Mc. amateur bands are "essentially local-contact bands." C.w. and phone have been operating simultaneously on the first 400 kilocycles of the 50–54 Mc. band with concentration on the first 100 kilocycles with a minimum of dissension. "There is no necessity for specific allocation of frequencies for exclusive c.w. operation on these bands."

(15) "Limiting the first 100 kilocycles (of the 50–54 Mc. band) to c.w. would not result in effective full time use of these desirable frequencies."

(16) A substantial number of amateurs operate transmit-

(*Continued on page 160*)

[4] 50.0–54.0 Mc.

[5] Television interference.

[6] Amateur operation ordinarily involving communications beyond the customary range of the frequency being used.

ters and receivers that are not built for A1 operation, the crystals of which "for these bands are in this 100 kc. segment." Thus, such amateurs would "have to go to quite a bit of expense and trouble to continue to operate on these (50 and 144 Mc.) bands."

(17) "There will be many hundreds of nets, including civil defense nets, that will be forced off the air or maybe suffer great expense in order to move to another frequency" by adoption of the Commission's proposal.

(18) Adoption of the proposed amendment would "benefit only a few high powered stations which are in a minority" and, therefore, "is not in the interest of the majority of amateurs consigned to the area."

(19) "The c.w. art is as well developed as it will ever be, due to the limitations of the human ear. This type of amateur operation is already well protected on lower frequencies. It has been found that high power scatter is very effective on v.h.f. but that the amateur cannot work on this development because of the one kilowatt input limitation. . . . In this day of high speed communications need it would seem a waste of scarce frequencies to protect it for the use of telegraph which cannot be half as fast as the slowest talker."

(20) "The bottom of the band (50.0–54.0 Mc.) is the best part for the rare DX that we have and should be used by component stations who comprise the overwhelming majority of the amateur use in the 50 Mc. band."

(21) If the proposal is adopted "eleven months or so around the year we will have nothing except the dead spot of 100 kc. in the ham bands in question." On the other hand, "thousands of hams presently use these lower frequencies in the bands for local communications, something that v.h.f. bands are extremely useful for." Furthermore, in contrast to amateurs who utilize type A3 emission, amateurs who utilize type A1 emission "for the most part are completely useless in a local emergency case."

(22) The proposal, if adopted, "will require additional manpower and use of time to enforce the regulation" which will add to the burden of the "monitoring service."

(23) Not only will "TVI complaints increase sharply . . . as a result of phone operation being pushed up 100 kc." but amateur operation will also encounter interference due to the close frequency proximity, of high power to TV stations.

(24) Many times the "m.u.f." reaches into the 50 Mc. band only as far as 50.1 Mc. and adoption of the proposal would mean that "only a few c.w. operators could take advantage of the best DX conditions while thousands would be unable to participate on phone."

(25) Adoption of the Commission's proposal "would hamper the increasing use of this band for the only really practical long-time use of which it is capable, local communications by low-powered amateur stations."

(26) The use of type A1 emission is "on a gradual but steady decline in not only the amateur service but in the military and commercial as well. The tendency seems toward the greater use of narrow band radiotelephone and mechanical radio telegraph systems in all services." Therefore, any benefit which might be gained by adoption of the Commission's proposals relative to the training of additional telegraph operators, is likewise decreasing and should be given little weight in this proceeding. Furthermore, the use of a "clear channel," free of all interference, "does not develop the operator's ability to communicate under all conditions."

(27) The Commission proposal should not be adopted on the basis that other amateur bands are partially restricted for the use of type A1 emission because the 50 Mc. band differs from the lower frequency bands in several respects; namely, it is principally a local band; is not crowded; and the majority of operation is A3. In view of these facts, subdividing these bands for the different modes of operation is unnecessary.

(28) The proposed rule change is "discriminatory" in that it deprives "amateur radiotelephone operators of the use of the preferred portions of the 50 Mc. band. This portion is particularly desirable for at least two reasons: *it is the fartherest removed from the television band*, and *it is a portion of the band where the possibility of skywave communication is most frequent*."

(29) Adoption of the Commission proposal will not aid in encouraging present Technician Class licensees to obtain a higher class of license.

(*Continued on page 162*)

5. The Commission has carefully considered every comment filed and evaluated each as to the position expressed and the reasons or arguments offered in support of such position with particular emphasis upon the soundness of such reasons or arguments. As a result of such consideration and evaluation together with consideration of other information available to it, the Commission finds:

(1) The lower portions of the involved frequency bands, are presently utilized to a much greater extent than are the upper portions of these bands.

(2) Operation in upper portions of the 50–54 Mc. band has been voluntarily avoided by amateurs using type A3 emission in numerous areas so as to reduce complaints of interference to television receivers. As a consequence of this fact and the recognized tendency of amateurs to "group," operation on upper portions of the band has also been avoided in areas where interference to television is not a factor.

(3) Operation in the upper portions of the 50–54 Mc. band, when it has occurred, has resulted in reception by the Commission of a number of complaints from television viewers even though such interference often resulted from faulty television receivers or other factors unrelated to amateur operation per se.

(4) The 50–54 Mc. and 144–148 Mc. bands are normally better suited for local than for long distance communication.

(5) Much more operation on frequencies in the involved bands is conducted by use of type A3 emission than is conducted by use of type A1 emission.

(6) Restricting operation in the lower 100 kc. of the 50–54 Mc. band to the use of type A1 emission will result in more operation in the upper portion of this band.

(7) Increased operation in the upper portion of the 50–54 Mc. band will result in an increase in the number of interference complaints received from television viewers.

(8) Establishment of segments of the involved bands wherein operation may be conducted only by use of type A1 emission will encourage amateur experimentationre lative to "over the horizon" communications in the 50–54 Mc. and 144–148 Mc. bands.

(9) Establishment of segments of the 50–54 Mc. and 144–148 Mc. bands for use of A1 emission only will minimize interference between those amateurs using type A1 emission and those using type A3 emission.

(10) Establishment of segments of the involved bands for use of A1 emission only will benefit those amateurs seeking to "work" foreign amateur stations.

(11) There is no significant difference in propagation characteristics of frequencies in the ranges 50.9–51.0, and 50.0–50.1 Mc. and those of frequencies in the 144.0–144.1 Mc. and 147.9–148.0 Mc. ranges.

6. The Commission recognizes that some members of the League have indicated a position contrary to that taken by the organization but the Commission must conclude that the League represents the view of the majority of its membership.

The Commission concludes that the public interest will be served by establishment, as proposed, of 100 kc. segments of the 50–54 Mc. and 144–148 Mc. amateur frequency bands wherein operation may be conducted only if type A1 emission is used. However, the Commission is also led to conclude that the public interest will not be served by utilizing the lower 100 kc. of the 50–54 Mc. and 144–148 Mc. bands, as proposed, for establishment of such segments for the following reasons:

Those amateurs who have been primarily responsible for the present stage of development of operations in the involved frequency bands would be required to relinquish the preferable portions of such bands for the use of a lesser number of amateurs who have contributed little to such development; complaints alleging interference to television reception as a result of amateur operation would be increased; and other portions of the 50–54 Mc. and 144–148 Mc. bands have only insignificantly different propagation characteristics and, therefore, are suitable for establishment of the desired "c.w." bands.

7. In view of all factors involved, it is concluded that restriction of the frequency ranges 50.9–51.0 Mc. and 147.9–148.0 Mc. so as to permit operation therein only when type A1 emission is used will be in the public interest.

(*Continued on page 164*)

8. Accordingly, IT IS ORDERED, pursuant to the authority contained in sections 4(i) and 303 of the Communications Act of 1934, as amended, that Part 12 of the Commission's Rules be and is amended, effective January 10, 1959 as set forth in the Appendix attached hereto.

FEDERAL COMMUNICATIONS COMMISSION
Mary Jane Morris
Secretary

Adopted: December 3, 1958
Released: December 5, 1958

APPENDIX

PART 12 IS AMENDED AS FOLLOWS:

1. *Section 12.111(h) is amended to read:*
(h) 50.0 to 54.0 Mc. using type A1 emission, 50.0 to 50.9 Mc. using types A2, A3, A4 and narrow band F3 emissions, 51.0 to 54.0 Mc. using types AØ, A2, A3, A4 and narrow band F3 emissions, and on frequencies 52.5 to 54.0 Mc. using types FØ, F1, F2 and F3 emission.
2. *Section 12.111(i) is amended to read:*
(i) 144.0 to 148.0 Mc. using type A1 emission, and 144.0 to 147.9 Mc. using types AØ, A2, A3, A4, FØ, F1, F2 and F3 emission.

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington 25, D. C.

In the Matter of	
Amendment of Section 12.231(a) of Part 12, Amateur Radio Service, to make additional amateur frequencies available for the Radio Amateur Civil Emergency Service.	Docket No. 12719

NOTICE OF PROPOSED RULE MAKING

1. Notice is hereby given of proposed rule making in the above-entitled matter.

2. The Commission has before it for consideration a petition filed by the United States Civil Defense Amateur Radio Alliance which seeks amendment of Section 12.231(a)(1) of the Commission's Rules so as to make additional portions of the amateur frequency bands available for use by amateur stations authorized to operate in the Radio Amateur Civil Emergency Service (RACES).

3. The petitioner proposes that Section 12.231(a)(1) be amended to provide:

(1) For use only by authorized stations or units of such stations which are operated under the direct supervision of duly designated and responsible officials of the civil defense organization:

Frequency Band:	*Authorized Emissions:*
1800–1825 kc.[1]	0.1A1, 6A3, 1.1F1
*1875–1900 kc.[1]	0.1A1, 6A3, 1.1F1
*1900–1925 kc.[1]	0.1A1, 6A3, 1.1F1
1975–2000 kc.[1]	0.1A1, 6A3, 1.1F1
3500–3550 kc.	0.1A1, 1.1F1
3950–4000 kc.	0.1A1, 1.1F1, 6A3, 6F3
7000–7050 kc.	0.1A1, 1.1F1
7250–7300 kc.	0.1A1, 1.1F1, 6A3, 6F3
14000–14025 kc.	0.1A1, 1.1F1
14275–14300 kc.	0.1A1, 1.F1, 6A3, 6F3

"1 Use of frequencies in the band 1800–2000 kc. is subject to the priority of the Loran system of radio navigation in this band and to the geographical, frequency, emission, and power limitations contained in §12.111 of the rules governing amateur radio stations and operators (Subpart A of this part). The use of these frequencies by stations authorized to be operated in the Radio Amateur Civil Emergency Service shall not be a bar to expansion of the radionavigation (Loran) service, and such use shall be considered temporary in the sense that it shall remain subject to cancellation or to revision, in whole or in part, without hearing, whenever the Commission shall deem such cancellation or

(*Continued on page 166*)

* This band was deleted by Commission Order of April 9, 1958, effective May 10, 1958, (FCC 58-345) published in the Federal Register April 15, 1958 (23FR2425).

revision to be necessary or desirable in the light of the priority within this band of the Loran system of radionavigation."

4. Statements in support of the proposal include:

(a) "Four years of endeavoring to operate Radio Amateur Civil Emergency Service networks on channels in the 3500–3510- and 3990–4000-kilocycle frequency bands, confirm the fact that propagation characteristics of signals at the 3.5- and 4-megacycle frequencies do not permit communications over many of the distances required.

"Communications for civil defense operations are not limited to statewide coverage. A vital need exists for inter-state coverage within Federal Civil Defense Administration regions to ensure adequate communications; and the same need exists for inter-region communications. A recent analysis of currently approved RACES plans clearly establishes that numerous paths of over 400 miles are involved in the intrastate and regional communications requirements."

(b) "There have been occasions on which RACES operations were scheduled but could not be conducted because it was impossible to maintain communications over paths of 400 miles or more with the limited RACES frequencies now available. Had RACES channels in the 7- and 14-megacycle region been available, communications could have been maintained.

"To fulfill the existing needs, and to adhere to the original policy of allocating portions of the amateur bands to transmit necessary intelligence during civil defense operations, additional high frequencies are required. The most feasible solution to the problem would appear to be that of making available portions of the 14- and 7-megacycle amateur bands for this purpose as RACES continues to expand."

(c) ". . . the interference problem plaguing RACES communications efforts, in addition to preventing execution of RACES responsibilities, also constitutes a very real and serious threat to the interest of the radio amateur. If the radio amateur is to be asked to accept a responsibility, the necessary frequencies must be furnished to him. Physically, equipment can, in most cases, be made available, but it is all too frequently made ineffective for lack of spectrum space in which to use it. On the basis of the RACES growth trend, . . . further aggravation of the long-range communications problem must be anticipated."

5. The Commission believes that some expansion of frequency space for the RACES is justified. Accordingly, having consulted with interested government agencies on the matter, the Commission proposes to effectuate the purpose of the petitioner's proposals so far as possible by means of the rules set forth in the attached appendix.

6. The proposed amendments are issued pursuant to the authority contained in Sections 4(i) and 303 of the Communications Act of 1934, (47USC 154, 303).

7. Any interested person who is of the opinion that the proposed amendments should not be adopted or should not be adopted in the form set forth herein, may file with the Commission on or before February 27, 1959, written data, views or briefs setting forth his comments. Comments in support of the proposed amendments may also be filed on or before the same date. Comments in reply to the original comments may be filed within ten days from the last days for filing said original data, views or briefs. The Commission will consider all such comments prior to taking final action in this matter.

8. In accordance with the provisions of Section 1.54 of the Commission's Rules and Regulations, an original and fourteen copies of all statements, briefs, or comments filed shall be furnished the Commission.

FEDERAL COMMUNICATIONS COMMISSION
Mary Jane Morris
Secretary

Released: December 29, 1958

APPENDIX

IT IS PROPOSED TO AMEND PART 12, AMATEUR RADIO SERVICE, AS FOLLOWS:

Section 12.231(a) is amended to read as follows:

§ 12.231 Frequencies available. (a) The following tabulation indicates the frequencies and frequency bands, within the regularly allocated amateur frequency bands, which are available for use by stations in the Radio Amateur Civil

(*Continued on page 168*)

Emergency Service. These frequencies and frequency bands may be used, on a non-exclusive basis, by the classes of radio amateur civil emergency stations or units of such stations indicated, and only with the types of emission shown in the right-hand column.

(1) For use only by authorized stations or units of such stations which are operated under the direct supervision of duly designated and responsible officials of the civil defense organization:

Frequency band:	*Authorized emission*
1800–1825 kc.[1]	0.1A1, 1.1F1, 6A3
1975–2000 kc.[1]	0.1A1, 1.1F1, 6A3
3500–3510 kc.	0.1A1, 1.1F1
3990–4000 kc.	0.1A1, 1.1F1, 6A3, 6F3

[1] Use of frequencies in the band 1800–2000 kc. is subject to the priority of the Loran system of radionavigation in this band and to the geographical, frequency, emission, and power limitations contained in § 12.111 of the rules governing amateur radio stations and operators (Subpart A of this part). The use of these frequencies by stations authorized to be operated in the Radio Amateur Civil Emergency Service shall not be a bar to expansion of the radionavigation (Loran) service, and such use shall be considered temporary in the sense that it shall remain subject to cancellation or to revision, in whole or in part, without hearing, whenever the Commission shall deem such cancellation or revision to be necessary or desirable in the light of the priority within this band of the Loran system of radionavigation.

(2) For use by all authorized stations in the continental United States only:

Frequency band:	*Authorized emission*
3510–3516 kc.	0.1A1, 1.1F1
3516–3550 kc.[1]	0.1A1, 1.1F1
3984–3990 kc.	0.1A1, 1.1F1, 6A3, 6F3
7097–7103 kc.	0.1A1, 1.1F1
7103–7125 kc.[1]	0.1A1, 1.1F1
7245–7255 kc.[1]	0.1A1, 1.1F1, 6A3, 6F3
14047–14053 kc.	0.1A1, 1.1F1
14220–14230 kc.[1]	0.1A1, 1.1F1, 6A3, 6F3
21047–21053 kc.	0.1A1, 1.1F1

[1] The availability of the frequency bands 3516–3550 kc., 7103–7125 kc., 7245–7247 kc., 7253–7255 kc., 14220–14222 kc. and 14228–14230 kc. for use during periods of actual civil defense emergency is limited to the initial 30 days of such emergency, unless otherwise ordered by the Commission.

(3) For use by all authorized stations:

Frequency or frequency bands:	*Authorized emission*
3997 kc.[1]	0.1A1, 6A3
28.55–28.75 Mc.	0.1A1, 6A3, 6A4, 6F3
29.45–29.65 Mc.	0.1A1, 1.1F1, 6A3, 6A4, 40F3
50.35–50.75 Mc.	0.1A1, 6A2, 6A3, 6A4, 6F3
53.30 Mc.[1]	40F3
53.35–53.75 Mc.	0.1A1, 1.1F1, 6A2, 6F2, 6A3, 6A4, 40F3
145.17–145.71 Mc.	0.1A1, 1.1F1, 6A2, 6F2, 6A3, 6A4, 40F3
146.79–147.33 Mc.	0.1A1, 1.1F1, 6A2, 6F2, 6A3, 6A4, 40F3
220–225 Mc.	0.1A1, 1.1F1, 6A2, 6F2, 6A3, 6A4, 40F3

[1] For use in emergency areas when required to make initial contact with military units; also, for communication with military stations on matters requiring coordination.

Strays

Ten-year-old Paul Jones, of 559 Shasta Drive, Chula Vista, Calif., is given only a few months to live because of cancer. Young Paul is not a ham, but does listen in, and you could cheer his final months by sending him your QSL cards.

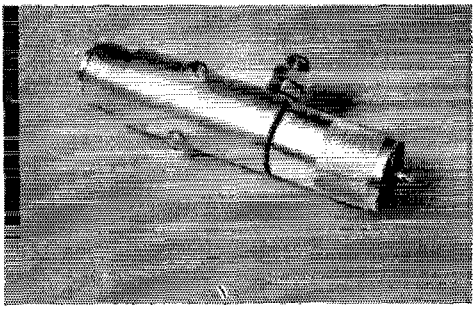
—...—

Oh come now — was this coincidence? W9COW was assigned the phone number National 5-7388.

• New Apparatus

CushCraft Coaxial Cable Lightning Arrester

THE "Blitz Bug," a CushCraft coaxial cable lightning arrester, is a spark-gap device designed to be used in the coax feedline. During a high-voltage surge, such as might occur in a lightning storm, voltage builds up until a spark jumps the gaps. To allow for normal transmitter operation the gaps in the fitting are set so they will not break down at voltages below approximately 1000 volts, and thus the equipment is not protected from surge voltages below this value.



The "bug" is about 3¼ inches long and averages ¾ inch in diameter. The photograph shows two of the three gap screws which project into the center of the fitting. Earth-ground connection is made to the large round-head screw. The gap screws do not need adjustment; when screwed in tightly, they are automatically in the correct relationship with the center conductor.

The fitting is designed to mate with type 83 RF series coax connectors. The Blitz Bug is manufactured by CushCraft, Manchester, New Hampshire.

— *E. L. C.*

Strays

"In July, 1957, I worked KN2ULZ, a fellow in Newburgh, N. Y. Later his license expired and the FCC reassigned the call to another fellow in Sprakers, N. Y., whom I also worked. So, I have worked two separate hams in different locations but with the same call. — *K2YTD.*

(See page 72 of *QST* for May, 1958 — ED.)

For five years the St. Joseph High School Radio Club (Cleveland, Ohio) has been assisting the local police on Halloween, using their mobiles.

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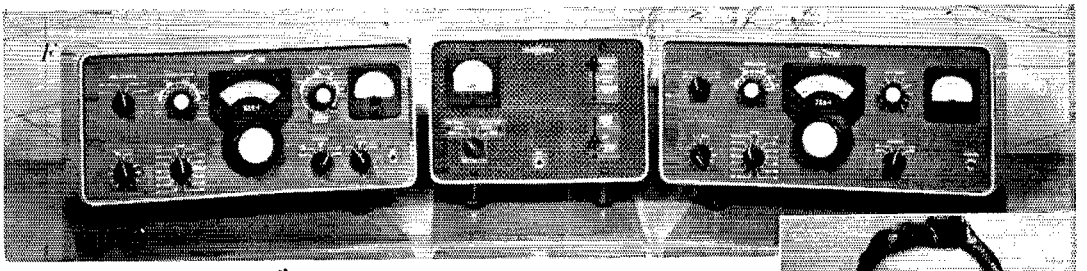

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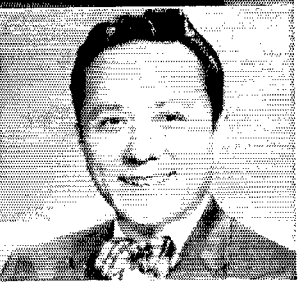

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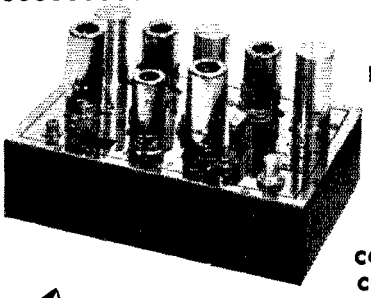

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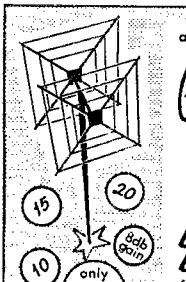

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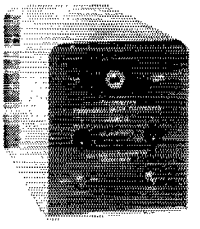

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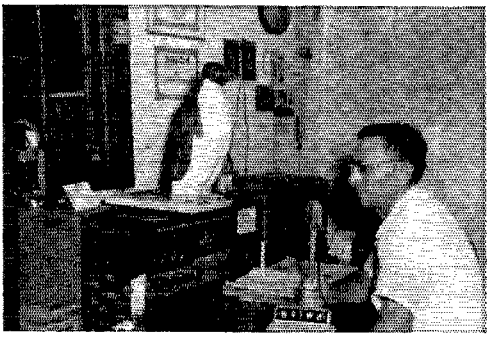
ALLTRONICS-HOWARD CO. Box 19, Boston 1, Mass. *Tel. Richmond 2-0048*

Strays



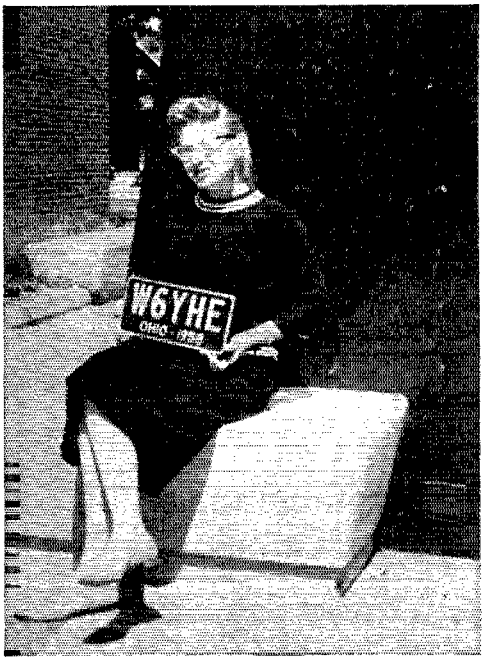
W4TWW, who handled a considerable amount of traffic for some of the Navy men in the Antarctic, received this stuffed penguin as a token of appreciation. The bird, incidentally, was brought back from the Antarctic in the freezer of a Navy ship, and wasn't stuffed until it arrived here in the States.

—···—

W4OHJ recently put up a brand-new beam antenna, and soon received reports from his neighbors that his king-size TV antenna was "sucking up" all the picture from the area.

—···—

If you will just top staring at the attractive Miss W8OSD, you will note that she is holding a rather odd license plate — whoever heard of a W6 call on an Ohio plate? This is to let W6YHE know that every year the Ohio plate manufacturers run off his call on a set of plates just for sample purposes. Obviously a W8 call was to be avoided for the sample, and so W6YHE was selected. *Photo by K8BYT.*



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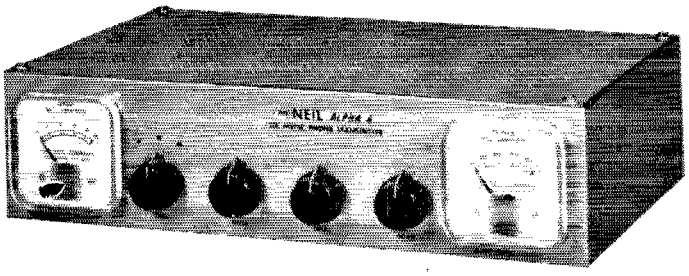

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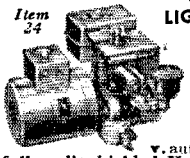

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AC Plant **700 Watts** — 115 v. 60 cyc. Powered by a rugged 2.2 hp. easy starting Briggs gas engine. No wiring necessary; just plug in and operate. Plenty of current for receivers, transmitters, antenna motors, emergency lights, etc. which require up to 700 Watts. Ideal for radio amateurs, Civil Defense, trailers and camps. Complete with Voltmeter and built-in winding to charge 6 v. auto batteries. **Both engine and generator fully radio shielded. Hams report less hash than on commercial power line.**

Item 24. Wt. 75 lbs. Be prepared if war or storms knock out power lines **$143.50**
800 Watt Plant (Item 44) same as above but with larger engine and greater capacity **$169.95**
1200 Watt Plant (Item 45) same as Item 24 but with larger generator and engine — 50% greater output **$199.50**

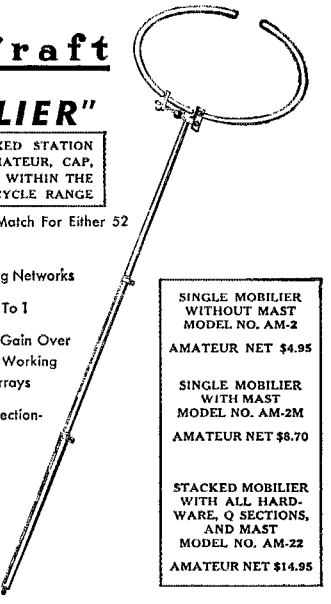
We make all sizes up to 25,000 Watts. Write for information.
Send 10¢ for Big New Catalog. Free with order.
Prices f.o.b. factory. Money back guarantee. Send check or M.O.
Master Mechanic Mfg. Co., Dept. 1-29, Burlington, Wis.

Cush Craft

2 METER

"MOBILIER"

A MOBILE OR FIXED STATION ANTENNA FOR AMATEUR, CAP, CD, OR ANY USERS WITHIN THE 144 TO 148 MEGACYCLE RANGE



- Concentric Gamma Match For Either 52 or 72 Ohm Cable
- No Baluns Or Matching Networks
- SWR — Less Than 1.2 To 1
- From 5 DB To 15 DB Gain Over Vertical Whip When Working Fixed Stations With Arrays
- Near Perfect Omnidirectional Pattern
- Available Stacked
- 3 Section Telescoping Mast
- All Aluminum Construction

SINGLE MOBILIER WITHOUT MAST
MODEL NO. AM-2
AMATEUR NET $4.95

SINGLE MOBILIER WITH MAST
MODEL NO. AM-2M
AMATEUR NET $8.70

STACKED MOBILIER WITH ALL HARDWARE, Q SECTIONS, AND MAST
MODEL NO. AM-22
AMATEUR NET $14.95

Ask your Distributor for Cushcraft Products

Cush Craft — 621 Hayward Street — Manchester, N. H.

Strays

W8ZSA K0MQR, a Bendix systems engineer, has been presented the highest award the Air Force can make to a civilian, in connection with his work on radar systems at the Headquarters, North American Air Defense Command, Colorado Springs. He is a Navy veteran.

—•••—

A Texas broadcasting station has requested permission of the FCC to increase its daytime power from 250 watts to one kilocycle. This from a newspaper clipping sent in by W9AUH/5.

—•••—

From an ad published in India — ". . . Your radio set is a very delicate and sensitive instrument. . . . The broadcasting stations throughout the world have no direct link with your radio except by way of radio waves, created by them, in the atmosphere above your home and everywhere. . . . Your radio can work even without an aerial, but there are no two opinions about the fact that the use of a good aerial with your radio will greatly reduce the strain of work on the radio, will improve its tonal qualities. . . . A bad aerial is as bad as hammering your radio . . . your radio set is in constant peril of losing its long life and efficiency from the JERKY WAVES caused by the use of cheap and inferior aerials."

—•••—

W0LPB, a supervisor of supplies and equipment in the St. Paul, Minn., school system, would like to QSO other phone men who are similarly employed. He's also an aeronautical ground instructor for the University of Minnesota, and would like to work others in that line, too.

—•••—

Being full of the Christmas spirit, W7SEZ mounted a 10-foot illuminated star on top of his 80-foot tower, set the prop-pitch motor for constant rotation, and let 'er go. (Must have had slip rings!) It was visible for miles. — *W7HIO.*

This is KC4USG, aboard the *USS Glacier*, another Navy icebreaker operating in the Antarctic. Unfortunately, the Navy didn't identify the two ham operators—all we know is that the gear was donated by Hallicrafters.

HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others. No Box Reply Service can be maintained in these columns nor may commercial type copy be signed solely with amateur call letters.

(3) The Ham-Ad rate is 30¢ per word, except as noted in paragraph (6) below.

(4) **Remittance in full must accompany copy, since Ham-Ads are not carried on our books. No cash or contract discount or agency commission will be allowed.**

(5) Closing date for Ham-Ads is the 20th of the second month preceding publication date.

(6) **A special rate of 7¢ per word will apply to advertising which, in our judgment, is obviously noncommercial 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 7¢ rate. Address and signatures are charged for. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising so classified takes the 30¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply.

(7) **Because error is more easily avoided, it is requested copy, signature and address be printed plainly on one side of paper only. Typewritten copy preferred but handwritten signature must accompany all authorized insertions.**

(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

Having made no investigation of the advertisers in the classified columns except those obviously commercial in character, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

QUARTZ — Direct importers from Brazil of best quality pure quartz suitable for making piezo-electric crystals. Diamond Drill Carbon Co., 248 Madison Ave., New York City 16.

MOTOROLA used FM communications equipment bought and sold. W5BCO, Ralph Hicks, 204 E. Fairview, Tulsa, Okla.

WANTED: Cash or trade, fixed frequency receivers 28/42 Mc. W9YIY, Troy, Ill.

WANTED: Early wireless gear, books, magazines, catalogs before 1922. Send description and prices. W6GH, 1010 Monte Dr., Santa Barbara, Calif.

WANTED: All types aircraft & ground transmitters, receivers ART-13, RT/ARN7, BC610E, ARN6, BC788, ARC3, BC342. Highest prices possible paid. FOR Action we will buy immediately for cash all types amateur equipment or trade against new amateur gear. Dames, W2KUW, 308 Hickory St., Arlington, N. J.

ATTENTION Mobileers! Leece-Neville 6 volt 100 amp. system alternator, regulator & rectifier, $45.00. Also Leece-Neville 12-volt 100 amp. system, alternator, regulator & rectifier, $85.00. Good condition. R. A. Zimmerman Jr., K2PAT, 115 Willow St., Brooklyn 1, N. Y. Ulster 2-3472.

CASH for your gear. We buy as well as sell. Write for cash offer or trade. We stock Elmac, Gonset, Hallicrafters, Hammarlund, Johnson, Lysco Master Mobile Morrow, National and other ham gear. H & H Electronic Supply, Inc., 506 Kishwaukee St., Rockford, Ill.

SAN FRANCISCO and vicinity. Communication receivers repaired and realigned. Guaranteed work. Factory methods. Special problem, invited, any equipment. Associated Electronics, 58 South P St., Livermore, Calif. W6KF, Skipper.

RECEIVERS: Repaired and aligned by competent engineers ,using factory standard instruments. Authorized Factory Service Station for Collins, Hallicrafters, Hammarlund, National. Our twenty-second year. Douglas Instrument Laboratory, 176 Norfolk Ave., Boston 19, Mass.

TECHNICAL Manuals TM11-273, 120 pages covering BC-312 receivers and BC-191 transmitters, $2.50. ID-60/APA-10 Panadaptor maintenance manuals, $2.75. Both postpaid in U. S. A. Electronicraft, Bronxville, N. Y.

"PIG-IN-A-Poke"? Not if you visit Ham Headquarters, USA, and pick your choice from the hundreds of "Like-New" bargains in the world-famous Harrison Trade-in Center. Greater values, because tremendous turnover means lower overhead! Terms. Trade. Send us postcard for mouth-watering photograph and price-list. For the best in used and new equipment it pays to come to Ham Headquarters, USA! BCNU. Bill Harrison, W2AVA, 225 Greenwich St., New York City.

S.S.B. xfrmrs. exact set for W2EWL exciter (hermetically-sealed) set of 3 brand new $4 postpaid. New compact Stancor bias or screen supply xfrmrs 55v to 550v @ 600 Ma. to 60 Ma. tapped prl (12 lbs.) $6.50. New compact G.E. 100-watt modulation xfrmrs, multi-impedance (10 lbs.), $6.25; new Elmac vacuum condensers 12 $\mu\mu$fd @ 32 kilovolts, $5.50. Please include postage No c.o.d. S. Tucker, W2HLT, 51-10 Little Neck Parkway, Little Neck 62, L. I., N. Y.

WANTED: Receivers, transmitters and accessories. Nehf Enterprises, 118 S. Clinton, Chicago 6, Ill.

TRANSFORMERS (3) W2EWL Special, $3.00 postpaid. SSB, latest diagram, template, 3 xfrmrs, disc ceramic Emica condensers, coils L1 thru L7 for W2EWL Special (Mar. 1956 *QST*), $10.95 postpaid. Vitale, W2EWL, Denville, N. J.

BARGAINS: Reconditioned & guaranteed. 32V-2, $349; 32V-3, $495; B & W 5100, $299; Viking I, $145; Ranger, $199.50; HQ-129X, $159; HQ-140XA, $199.95; HQ-100C, $159.50; HQ-110C, $215; SX-96, $199; NC-300, $319.50; NC-125, $130; NC-173, $139.50; NC-109 w/calibrator, $179.95. Write for complete list. We trade. Complete stock of new gear. Terms with only 10% down. Write Ken, W0ZCN or Glen, W0ZKD for deal. Ken-Els Radio Supply Co., 428 Central Ave., Fort Dodge, Iowa.

QSLS? SWLS? Finest and largest variety samples 35¢ (refunded). Callbooks (winter), $5. Religious QSL samples, 10¢. "Rus" Sakkers, W8DED, P. O. Box 218, Holland, Michigan.

PICTURE QSL cards of your shack, home, etc. Made from your photograph. 1000 for $12.00. Raum's, 4154 Fifth St., Phila. 40, Penna.

FINE QSLS. 1 week delivery: 100 for $2.50; 200 — $4.55; 500 — $9.00; 1000 — $15.00. Postpaid. Samples 8¢. "Rog", 1078 North Broad, Galesburg, Ill.

QSLS "Brownie." W3CJI, 3110 Lehigh, Allentown, Penna. Samples 10¢ with catalogue, 25¢.

QSLS-SWLS. Samples 10¢. Malgo Press, 1937 Glendale Ave., Toledo 14, Ohio

QSLS: Twenty exclusive designs in 3 colors. Rush $3.85 for 100 (ten different kinds) or $6.25 for 200 (20 different kinds) and get surprise of your life. Satisfaction guaranteed. Five days service. Constantine Press, Bladensburg, Maryland.

QSLS, Sharp! 200 one color, glossy. $4.75 Multi-color samples dime. K9DAS QSL Factory, Edward Green & Sons, 4422 Marquette Dr., Ft. Wayne, Ind.

QSLS Neat. Attractive. Samples 10¢. Woody's. Box 164, Asher, Sta., Little Rock, Ark.

COLOR Glamor, scenic & nature. Custom sketch and photo. Samples 25¢ refunded. K4LFZ QSLS, Summerfield, Fla.

QSLS: 4 colors, glossy, 100, $3.00. Samples 10¢. Dick, W8VXK, 1018 Arthur, Mt. Pleasant, Mich.

QSLS. Reasonable, 3 weeks delivery. Catalog dime (coin). Dick, K6GJM, Box 294, Temple City, Calif.

QSLS and SWLS. Send $3.00 for 100 beautiful glossy two-color cards postpaid. David Spicer, 4615 Rosedale, Austin 5, Texas.

QSLS-SWLS that are different! Colored embossed card stock, and "Kromkote". Samples 10¢. Turner, K8AIA, Box 953, Hamilton, Ohio.

CREATIVE QSL and SWL Cards. Are you proud of your card? If not let us print your next order. Write for free samples and booklet. Personal attention given to all requests. Bob Wilkins, Jr., KN6ZMT, Creative Printing, P. O. Box 1064-C, Atascadero, Calif.

QSLS Samples dime. Sims, 3227 Missouri Ave., St. Louis 18, Mo.

QSLS-SWLS. High Quality, Reasonable prices. Samples. Bob Teachout, W1FSV, 204 Adams St., Rutland, Vt.

QSLS-SWLS, 100, $2.85 up. Samples 10¢. Griffeth, W3FSW, 1042 Pine Heights Ave., Baltimore, Md.

QSLS, SWL's VHF's XYL-OM's. (*Sample assortment approximately 9¼¢*). Covering designing, planning, printing, arranging, mailing, eye-catching, comic, sedate, fatabulous, DX-attracting, prototypal, snazzy, unparagoned, cards. Rogers, FØAAB, 737 Lincoln Ave., St. Paul 5, Minn. Also glamorous, pulsating (Wow!)

QSLS. Taprint, Union, Miss.

QSLS, Plain and fancy samples 10¢. Fred Leyden, W1NZJ, 454 Proctor Ave., Revere 51, Mass.

QSL-SWL samples free. Bartinoski W2CVE Press, Williamstown, New Jersey

RUBBER stamps for hams, sample impressions, W9UNY, Hamm. 542 North 93, Milwaukee, Wisconsin.

QSLS: 100 for $3.00, glossy. Samples free. R. A. Larson, 32 Midland Ave., Stamford, Connecticut.

SEND $3.00 for 200 two color QSLs. Samples 25¢. Bolles, 810 Morrow, Austin 5, Texas.

QSLS. Samples, dime. Printer, Corwith, Iowa.

QSLS, Lapel pins, samples dime, Kephart, W2SPV, 4309 Willis, Merchantville, N. J.

QSL's, samples dime. Eddie W. Scott, W3CSX, Fairplay, Maryland.

QSLS, SWLs, attractive, colored, 100, $2.45. Samples dime. Bob Garra, W3UQK, Lehighton, Penna.

QSLS. Plain or fancy, samples dime. QSL printing, Box 12351, Houston 17, Texas.

DELUXE QSLS. Petty, W2HAZ, Box 27, Trenton, N. J. Samples, 10¢.

QSL-SWLS, 100, $2.85 up. Samples 10¢. Griffeth, W3FSW, 1042 Pine Heights Ave., Baltimore, Md.

QSLS: Outstanding — Original — Fast service — Reasonable prices. Samples 10¢. Super quantity, 25¢. Refundable. VYS QSLs, 1704-Q Hale Avenue, Ft. Wayne, Indiana.

QSLs? SWLs? In '59 try mine! Samples 25¢ deductible. C. Fritz, 1213 Briargate, Joliet, Ill.

QSLS, OM-YL, AM-FM-SSB-CW, VHF-UHF, MARS, CAP, BCL-SWL, BC-SWBC. Samples, 10¢. Onondaga Press, Onondaga, Michigan.

QSLS. Samples free. Phillips, W7HRG, 1708 Bridge St., The Dalles, Oregon.

QSLs, 3-color glossy, 100 — $4.50. Rutgers Vari-Typing Service, 7 Fairfield Rd., New Brunswick, N. J.

QSLS-SWLS, $2.75 per 100; QSO file cards, $1.00 per 100; samples 10¢. Rusprint, Box 7505, Kansas City 16, Mo.

QSLS: Cartoons, colors, something different. Samples 25¢. Chris, W9PPA, 365 Terra Cotta, Crystal Lake, Ill.

FREE samples, QSLS-SWLS. Harris, 703 Cumberland St., Richmond, Va.

DISC Tuning and neutralizing capacitors, and heat radiating plate caps: any size. W4UCH, Richardson, Sterling, Va.

SAVE time, Save money! DX QSL's forwarded. 2¢ each after membership. Free flyer. "DX QSL Co-op," Box 5938, Kansas City 11, Mo.

FOR Sale: Hallicrafters SR-500 Console. Includes SX-100 Receiver, HT-30 Exciter, HT-31 Power Amplifier in console cabinet. Like new — used 5 hours, $900. G. A. Buchanan, M. D., W7EVK, 440 Circle Drive, Richfield, Utah.

KWM-1 Wanted. Also few high plate dissipation tubes. W2KUW, 64 Grand Place, Arlington, N. J.

WANTED: RME Mod. LF90 Converter. 90-600 kc. Advise price & condx. W1KJG, Box 295, Morrisville, Vt.

TORIODS: Unceased 88 mhy like new. Dollar each. Five, $4. PP DaPaul, 101 Starview, San Francisco, Calif.

COAXIAL Cable. New surplus. RG-54A/U, 58 ohms impedance — 30 ft. prepaid, $1.00. R. Farmer, 3009 No. Columbia, Plainview, Texas.

KNOX Electronic Supply, Inc. "Where your Trade-In is always worth more!" 67 N. Cherry St., Galesburg, Ill.

ANTENNA 80-40-20-15-10, $21.95. Patented. Lattin, W4JRW, Box 44, Owensboro, Ky.

HAM TV Equipment. Bought, sold, traded. Al Denson, W1BYX, Rockville, Conn.

COMPLETE File *QST's*, 1915-1951 for sale. Landa, Clayton 2, Georgia.

HALLICRAFTERS, Drake, Central Electronics, Gonset, Ham gear. Jerry W8EPI, Swartzlander Radio Limited, 1220 Stillwell Avenue, Fremont, Ohio.

WANTED: KWS-1 this area. SELL: Meissner 150-B, 250 watt AM-CW transmitter, pi-network output, $150. W2VIA, Bernard Fein, 80 Garden Rd., Scarsdale, N. Y.

FIFTH Annual Syracuse VHF Roundup, October 10, 1959.

SELL K&E 12" slide rule #4083-3 with leather case and magnifier. $15. Can be used to calculate power input. W1IKE % ARRL

PARTS For BC-348 Models H, K, L, R. Write for list. Panoramic Adapter ID-60/APA maintenance manuals, $2.75; BC-312 and BC-191 maintenance manuals, $2.50. Electronicraft, Box 269, Bronxville 8, N. Y.

75A4. Serial 5030 KW8I. Perfect. Used very little. Combination $1800. M. Marsley, 2242 Stevens Avenue, Kalamazoo, Mich.

HIGH Fidelity components at rock-bottom prices. Brand new, fully guaranteed. All ma or makes. Amplifiers, tuners, speakers, etc. Our prices can't be beat! Write for quotations. The Ham's Exchange, 228 Stephen St., Levittown, N. Y.

304TL transmitting tubes needed. Contact W2KUW, 64 Grand Place, Arlington, N. J.

FOR Sale: Hallicrafters HT33 with pad for exciter and Johnson TR switch. Murray Singer, 143 Glenview Road, South Orange, N. J. Tel. SO 2-4832.

NC-109 receiver, used about a year, good condition, few scratches on cabinet top. $100. Marshall Lincoln, KN9KTL, 3514 N. Riley, Indianapolis, Ind.

FOR Sale: B&W 5100B transmitter with 51SB-B SSB generator and supplementary equipment, cost $800. New condition in factory carton, $500. W4AD, Box 793, Rome, Ga.

SELL Heath VOX, $20; Heath Conelrad Alarm, $12; SW-500 52 ohm SWR bridge, $12; two meter mobile antenna with extension (less bumper mount), $8; CPO-128A, $14. Postage must be paid on all items. K9IHO, Boyd Colglazier, 770 Cedar Street, Scottsburg, Ind.

GENERATOR-Army PE-108 110 v, 60 cycle 600 watts. Push button start with battery, $100. Leith A. Mangels, 154 Franklin Turnpike, Ho-Ho-Kus, N. J.

SSB. Central Electronics 20-A exciter-transmitter and 458 VFO. R. Houghton, W1NKE, Littleton, Mass.

LEARN Continental code. Will sell little-used Instructograph with tapes, earphones, and key for $35. Bowles, 802 S. 33rd St., Louisville, Ky.

COLLINS 32V3, excellent, one owner, best offer over $450. W3CAV, Uniontown, Penna.

SACRIFICE 54 ft. tower, Tri-Ex 3-section crankup, brand new, never used, with safety stops, mounting bracket, $135. Richard Levy K2OUC, 25 Woodbine Circle, New Providence, N. J.

NOVICES, complete rig! DX-20, $28. Heath AR-3, excellent condx. W5WMV. C.O.D.

ART-13, excellent condx, unmodified with calibration book and complete power supply for 115V AC, 60 cycles, best offer. W2NVO, R. F. Avrutik, 51 Grassy Sprain Road, Yonkers, N. Y. Tel. SPencer 9-5594.

WANTED: Battery receivers of 1920s, Erla, Acme, Radiola, Grebe, etc. Also UV199 thru UV206 tubes for electrical test. Buy or borrow. Grote Reber, Green Bank, West Virginia.

FOR Sale or will trade for radio equipment or "what have you?": 4-250A Class C KW amplifier; 810 Class B KW modulator; 2500 volt power supply; 2000 volt power supply; rack; VFO; excellent condition. List available. Advise trade in your letter. G. Landfield, 821 Waveland Rd., Lake Forest, Ill.

PERFECT Condition. For Sale: Sacrifice: Collins 51-J4 communications receiver. Used short time. Sam Kantor, 295 Glenwood Ave., Bloomfield, N. J.

AUTHORIZED factory distributors for Adjustavolt, B&W, Eimac, Geloso, General Electronics, Glas-Line, Gonset, Hammarlund, Hexacon, Johnson, National, Penta, TMC, Tobe & Vocaline. Wanted: xmttg. and special-purpose tubes and lab equipment. Trade-ins accepted. Open Monday through Saturday. Barry Electronics Corp., 512 Broadway, N. Y. 12, N. Y. Phone WAlker 5-7000.

CANADIANS: NC-125 for sale. In excellent condx. Am going to build Heath Mohawk. Best offer over $175 or what suggestions? D. J. Brant, M.D., Dinsmore, Saskatchewan, Canada.

GLOBE Champ 300A, little used, and less than 1 year old; 280W. phone. 300 w., c.w. bandswitching 160-10 M. Built-in VFO, $300 cash and carry. Also, Collins 75A2, very good condx, $200. Cash and carry. Don Kilgus, 345 Columbus Ave., Valhalla, N. Y. Call W.H. 6-8764.

SELL: Elco VTVM Model 232, factory calibrated, hardly used. First $25 money order. Phil Rubin, K8GRD, 201 N. Broadmoor, Springfield, Ohio.

WILL Swap an FM Pilotuner receiver from 8 88-108 Mc police band for a 24 hour station clock. H. J. Hoover, Jr., K4PIJ, 1126 Elizabeth St., Eau Gallie, Fla.

NEED Money for college: Hammarlund HQ-150 with speaker, $225; Viking 1, Johnson VFO and Matchbox, $215. KØIYZ, 1600 South Lilac Drive, Minneapolis 16, Minn.

FOR Sale: Valiant. Factory-wired, $325. W3ARI, 912 So. 57th St., Philadelphia 43, Penna.

JONES Micromatch coupler plus indicator, $18; W9YSM, 75 N. Highway, 59 Barrington, Ill.

HQ-100 w/c and speaker, in exc. condx, only been used a few weeks; Knight 50 W xmtter, also in exc. condx and only been used a few weeks too; seven crystals and key. Manuals on both. Best offer over $200. James Simons, 906 N. Royal, Florence, Alabama.

WRL Globe Chief 90 for sale, $45; also SX-28, hot on ranges .55 through 21 Mc., $100. K1ITJ, Rocky Hill School, East Greenwich, R. I.

SELL: Hy-Grain 40-10 vert. ant., new condx; pr. Hy-Gain 4-band traps. Dow coax relay, $5. W2BOW.

HALLICRAFTERS SX-28A with matching speaker. Both in gud condx, $135. C. R. Gerst, 2674 West 25th St., Cleveland 13, Ohio.

KWM-1, AC and DC power supplies, speaker, mobile mounting tray, and Bassett Triband antenna, $1050. James E. Farner, 3202 N. Elm, Ft. Worth 6, Texas.

FOR Sale: DX-100 with modified keying, new 6146s. Only $159 plus shipping from Kansas City, Mo. Write: Steve Pakula, KØBIB, Washington University Medical School, 4949 Forest Park, St. Louis 8, Mo.

WANTED: Chimney and SK-500 socket for 4-1000A. W3RBW, Box 252, Accokeek, Md.

SELL: NC-183D, like new, with speaker, $300; Viking Ranger, gud condx, $175. W1AAV, 544 Main St., Medford 55, Mass. Export 6-6172.

THUNDERBOLT, Johnson, with attenuator and low-pass filter. One month old. Now on the air at W9QQU. Unemployed. Need cash. $500 or best offer after you see it, test it at 543 N. 93rd St., Milwaukee, Wis. Telephone SP 4-1556.

TRANSISTOR Mobile power supplies, 12 volts D.C. input, 500/250 volts D.C. output, 75 watts continuous, 100 watts ICAS — $49.95, C.o.d.'s accepted. Electronic Construction Corp., 3125 E. Allerton Ave., Milwaukee 7, Wis.

FOR Sale: Transmitter built from 1958 Handbook, p. 183, less power supply, $40; Viking Mod. 122 VFO, $15; 2-813s new, $5 each; 1-304TH, new, $10; sockets for tubes, 50¢ each, 2-10V, 12 A. xfrmrs, $7 each; 1-5V, 50 A xfrmr. $10. Wm. Madigan, W1UGE, 159 Nott St., Wethersfield, Conn.

SELL: 2 power supplies, 1500V at 400 mills, both on one chassis — half-gallon final 812As in final modulated pr. of TZ40s, also Hi-Fi speech ampif. Best offer over $85. Eldico, TR75V 4 xtals, key, $30. Steve, KØJTL, Ellsworth, Iowa.

TG34A code keyer with complete set of 15 practice tapes, $30. Bill Lamb, K5EUM, Rte. #1, Box 11, Haughton, La.

SELL Or swap: New B&W CX-59A butterfly variable condenser; Gonset Tri-Bandconverter. Also have six-tube Superhet, excellent for Conelrad. $9.95. J. Springer, 187 Connellsville St., Uniontown, Penna.

SELL: 'Scope Weston 983 5 in. with book, like new condx, $200 Want: Valiant Xmttr. W2FDK.

WANTED: Millen Grid Dip meter, Bandmaster T-90 xmttr. Write, stating lowest price and condx. Jesse Bryant, K1AJE, US8 "Trout," New London, Conn.

HRO Coils wanted, any bands, types, condition! W8RDT, A. Eckhart, Jr., Rd. #1, Grafton Rd., Valley City, Ohio.

RUBBER Stamps for hams, sample impressions, W9UNY, Hamm, 542 North 93rd, Milwaukee, Wis.

WANTED! MacMurdo-Silver Model 900 Vomax. State price and condx. Will also consider any VTVM with tube probe. WØERI, 5112 Nall, Mission, Kansas.

JOHNSON Kilowatt and desk, in excellent condition: $1150; Johnson Audio Amplifier, $60; Johnson power divider, $17.50. Will buy or take Thunderbolt in on trade. Lewis West, WØAIO, 3414 West St. Louis, Wichita 12, Kansas.

FOR Sale: 250-watt modulation transformer, 500 Ma. choke, 2200 volt half amp. power supply, HQ140X, $160. K5IPK.

BRUCE (N. L.) W7HRF (?). Please get in touch with "TX", W5GTT., 3220 Ethel, Waco, Texas.

SX-100, with manual, less speaker. Little used, no modifications. Guaranteed. $175. F.o.b. Madison, Wisconsin. C. Rambow, W6RIJ/9, 1001 South Brooks.

WANTED: Mechanical filter 500-cycle (type F455J-05) or 800-cycle (type F455J-08) for Collins 75A4. WØLPB, Sam Hamilton, 900 So. Fairview Ave., St. Paul, Minn.

SELL: Several surplus PW condensers, gear drive, 0-500 dial ten rev. manufactured. National Co. New, $5.75 P.P. C.W. Low, McDonough, Ga.

SELL: Viking Ranger. In excellent shape, factory-wired. $180. Prefer sale in Colorado or adjoining states. Joe Prewitt, WØTUT, Hayden, Colorado.

CANADIANS! Wanted: Collins 32V3 transmitter. Please send full details on its condx and lowest price acceptable. C. Gutman, 7526 Mountbatten Rd., Montreal 29, Quebec P., Canada.

SELL: Single 813-500 watt pi-newwork transmitter, 10 thru 80 meters, 8-49 power supply, 50 watt transmitter, 4 μfd, 2000 and 3000 vdc capacitors, B&W TVL coils with swinging link, full size 20 meter beam; TMC-100D and 75-D transmitting condensers; Weston model 280, 150 VDC meter, G-E ammeter type 0, 40 amps, 50 and 1000 Ma. meters, 15 amp. r.f. meter, U-98 thrust bearing, NC-853 neutralizing condensers, 805, 1626 tubes, 810, 826 sockets, 300 vdc reg. power supply, T-17B mike. Phono pre-amplifier G-E UPX-003. Throat mike with cord, jack box unit. Make offer. W. E. Jones, W2QQ, Box 4, Bowmansville, N. Y.

SELL: Johnson Ranger transmitter (factory-wired); Matchbox, low pass filter, Astatic (D-104 mike) plus stand; hand-key, barely used. $250 complete. W. N. Levy, 2 Sutton Place So., New York 22, N. Y.

DRAKE 1A, single sideband receiver, guaranteed like new. Owner overseas: $225. W2BPT, J. C. Costello.

SELL: Collins 32V3 transmitter, in excellent condx, with spare 4D32, $450. FM-3, tuner, $25. M. H. Klapp, 17 Kenosha St., Albany 9, N. Y.

SALE: Mobile: Elmac AF-67 with rack; Gonset Super-Six, Master All-band antenna and heavy duty mount; Shure 505B dynamic mobile microphone. All but the AF-67 are brand new and unused. Cost me $248. All go for $170. Jim Roux, W3ROU/4, 21 Copeley Hill, Charlottesville, Va.

SELL: HQ-100, $140 and DX-100, $180 (two weeks use only, absolutely perfect, never made General). A. Schwelgard, R.D. #1, Westwood, N. J.

FOR Sale: Viking II and VFO, vy gud condx. Best offer. E. J. Slaga, K9BTX, Spring Green, Wis.

I Belong to ARRL. Do you? K2KJV.

FOR Sale: 75A4, $500. Wanted: Eldico 100F, 664 mike. W4CPQ, 1351 Bolling, Norfolk, Va.

FOR Sale: 2 Fecraft 2-meter converters, one 7–11 i.f., one 11–14 i.f. $20 ea. New SCR 522 with tubes, $25. Five new polar relays, $5 ea. WU type, 2 B teletype machine. Uses ¼" tape. Has keyboard. In operating condx, $75 or best offer. Heath Q Multiplier, $5. New BC375 with some coils, $40 or best offer. New tubes: 813, $5, 211, $3.50; 832A, $1.50; BC645 transceiver, new, $20. Am cleaning house. You pay shipping. All inquiries will be answered. R. Corbett, 46 Prospect St., Torrington, Conn. W1JJL.

TELREX 10 meter 10M-3-A, $25; 15 meter 15M-56–99, $45, both beams excellent condition; complete with original assembly instructions. F.o.b. El Paso, Texas. Hap Davis, W5LBC, Box 1645.

HAVE 36 ft. custom cabin cruiser, recently rebuilt. Sleeps six, Chrysler royal power, 12 volt auxiliary generator, electric bilge pump, many extras. Will take late type ham gear in trade. W. Moenter, W2HUN, 90–51 54th Ave., Elmhurst 73, L. I., N. Y. Tel TW 9-0607.

WANTED: 20A with VFO. Must be factory-wired and in this area. Please state age of equipment, condx. Morris Cohen, W3JZR, Providence Rd., Chester, Penna.

WANTED: Collins 75A4. State price, condx and serial number. Arthur Maybury, Seymour, Conn.

PORTABLE Mobile, complete, mounted in case, Elmac AF-67, Morrow 5BR2, James 3-way supply, 6-tube superhet, coax relay, mike, all manuals. Perfect condition, $250.00 f.o.b. East St. Louis. Photo on request. Ronald Corrado, Parks College, Box 100, East St. Louis, Ill.

WANTED: S-85, Globe Scout 680-A; I.T. clock, Vibroplex bug; code practice oscillator and monitor, large w. map. Good set headphones, T. key, microphone, Q multiplier. Mark Hansen, Mazomanie, Wis.

FOR Sale: Complete station, *NC98* in excellent condition, 30 watt c.w. transmitter with home-built modulator, many extras including handbooks and electronics parts. Best offer from $130. Will demonstrate Howie Fleisher, 2025 East 34th St., Brooklyn 34, N. Y.

SIX Uncirculated Mexican silver Centenario coins year 1921 (worth $4.00) swap all for Millen 1" 'scope. Deal? M. A. Ortiz, 13 Sur 907, Puebla, Mexico.

SELL-Trade: New components: 813 tube, 813 socket and filament transformer, 1000–0–1000/300 Ma. plate transformer, two 300 Ma. chokes, two 1500v. filter condensers, sockets and filament transformer for 866s, bleeder resistors, Weston 0–500 milliameter, 5 amp. 6.3 transformer. Everything $45.00. Sylvan TR-1 30-watt 2-meter *phone xmttr, $20, new 40 watt plate modulator with xtal mike, $22.* New power supplies: 1000–600–300v./275 ma, $25; 625–300v/250 ma., $15. 7 new plate modulators for DX-20, Knight Adventurer, AT-1, Globe Chief xmttrs, Stan, W8QKU, 2748 Meade St., Detroit 12, Mich.

CANADIANS! DX-40 and VF 1. Will sell for $100. Wish to buy a DX-100. VE3BPB, Lambeth.

FOR Sale: Elmac AF-67 xmttr w/PS-2V, mobile rack mount included. In exc. condx: $150. *James A. Hanson, KØSLY, 1238 West* Center St., Rochester, Minn.

ATLAS Missile QSLS, 100 glossy 3-color, $4.00. Paye, W4ZKK, 824 Avondale, Cocoa, Fla.

FOR Sale: Model 100 teletype, complete with table, cover, sync motor; Model 12 reperforator; transmitting-receiving distributor with sync motor; Model 7-B tape head; Model 21-A strip printer; teletype motor, governed type with lamp bracket, looks like Model 15 type, brand new; best offer within reason takes any or all. Write if you are interested; 50 watt isolation transformers, $2.50, brand new, 11/16" teletype tape 15¢ a roll, cheaper by the dozen. Be among the first to clean my cellar out of this stuff. Postage extra. Stanley Pierston, W1BRJ, 224 Eastern Ave., Lynn, Mass.

GONSET G-66 with three way power supply. Perfect condition. $175 prepaid freight. Lee Jason, P.O. Box 1708, Fresno, Calif.

SELL Or swap: Receivers and transmitters for controlling model airplanes, boats. Write for list. Want mobile gear. Hal Sillman, K4SCT, 14259 N.W. 7th Ave., Miami 68, Fla

VIKING 500 with extra 4–400 Elmac, $700, used less than 20 hours. Will ship F.o.b. Dayton, Ohio, for $100. Balance c.o.d. Donald Mack, 125 N. 10th St., Miamisburg, Ohio.

COLLINS 75A-3 for sale, one of last 75A-3s manufactured; like-new condx, $385. Also Viking II and Viking VFO, factory-wired, like-new condx, $225. WØOMH, RFD #2, Hastings, Nebraska.

WANTED: KWS-1. State condition and lowest price. First letter. Dave DeArmond, 581 Emerald, San Carlos, Calif.

FOR Sale: *Complete mobile rig consisting of* Elmac PMR-6A rcvr, Elmac AF-67 xmttr, power supply, dynamo, custom racks, cables, whip, loading coil; presently on air from 1956 Chevie: $250. Bill Mueller, W1WQN, 10 Dover St., Pittsfield, Mass.

FOR Sale: DX-100 with keying unit as per September 1958 *QST*, Lynmar TR switch installed: $190 with free delivery within 100 miles. Also Knight-kit amateur receiver with 100 Kc calibrator and S meter, $100 with free delivery within 50 miles. Emory A. Cox, *WØCGZ*, 916 North 13th St., *Leavenworth, Kansas.*

INSTRUCTOGRAPH, Complete with 10 tapes, send/receiver, etc. in fine condx, $25.00. Mrs. Elizabeth Harrell, 320 W. Lime, Lakeland, Fla.

SELL: Reproduction of popular Handbook 500 watt multiband VFO transmitter, complete with separate 400V and 2500V power supplies, both with Variac. Speech amp.-driver and modulator for above, each with own power supply, all mounted in rack cabinets. $275 takes the units. Locals only please. Special sacrifice offer, leaving area due to job changing. All inquiries answered. Ralph H. Benson, K1GZG, 21 Wilna St., New Britain, Conn. Phone BAldwin 3–7993.

FOR Sale: Viking II, $170; Heath VFO, $14; AM-2, $12; Grid Dip Meter, $12; Hy-Gain 3-el. 15 meter beam, $20; Hallicrafters SX-100 only six months old, in perfect condition, only $240 with R-46B speaker; CDR TR-4 rotor, $18. Dickie Marshburn, K4LTI, P.O. Box 581, Whiteville, No. Carolina.

WANTED: Vacuum pump, Cenco Hyvac, in gud opertg. condx. Details and price to: W1HD, D. Spender, Country Club Road, Cheshire, Conn.

COMPLETE Station for sale: Heathkit DX-100, Hallicrafters SX-96 with spkr, Viking Matchbox, Heathkit reflected power meter, 10 meter Hy-Gain beam, Alliance Tenna-rotor, co-axial lead-in, xtal microphone, key, switching console and Conelrad alarm. Everything like new condx, $350 complete. Sorry, no shipping. Come operate and pick it up. W3UYW. M. A. Karr, 1023 Hoover Ave., Feasterville, Penna.

OSCILLOSCOPE: Precise 300B wired by experienced technician; used only about 20 hours, in excellent condx, $95; Dynakit Mark II HiFi amplifier in excellent condx, used 30 hours, $69; Good ID-6 A/APN-4 Loran indicator, complete, $17. F.o.b. Box 412, Sedona, Arizona, or will trade for small valuable unusual equipment. J. K. Green, W6MMC/7.

AUCTION! Ft. Lauderdale, Florida's Broward Amateur Radio Club announces its third big annual auction and get-together, Saturday, Feb. 14th, in the Armory, SW 24th St., (Rte 84) and SW 4th Ave. *Doors open at 9 A.M.* Chow at noon. Auctioning starts at 1 P.M. Everyone welcome!

BARGAINS-New guarantee: SX-88 $449.00; Rotobrake $49.50; Leece-Naville 6 volt $35.00; Gonset 30–40 mc FM tuner $39.50; P-H LA400 linear *$115.00; P400GG linear* $199.00; *BC610 with tuner* $495.00; Gonset 500W linear $249.50; Elenco 77 SSB $399.00; Elenco PA400 linear $99.00; KWM-1 $650.00; BC221 $49.50; DX-35 $55.00; Scout 680 $89.00; L A-1 linear $89.95; NC183D $319.00; NC300 $299.00; Globe Chief 90 $44.50; Globe Champ 300A $399.00; King 500 $425.00; Johnson KW w/desk $1,150.00; HT-30 SSB $339.00; HT-31 linear $289.00; test and audio equipment, inquire. Trial, Terms, Write Leo, WØGFQ-Box 811-World Radio Laboratories, Council Bluffs, Iowa.

SPECIAL: Oil-filled filter condensers 4 μfd 5000 D.C.W.V. $9.95 each. C. Brooner, Box 261, Morton, Ill.

DALLAS Vicinity sell little used BC-312 converted, separate power supply, $60. Henry VonThun, 4501 Normandy, Dallas, Tel. LAkeside 6-1826.

FOR Sale: Model 26 teleprinter, $90. Reply to W3VDA, Barney, Box 1225, Harrisburg, Penna.

NEW: *S-38, S-53, S-86, SX-99, S-95, S-85, SX-100, NC-60, NC-188,* HQ-100, HQ-110, HQ-145, HQ-170, etc. Used: NC-173 receiver. Transmitter, Mackay 167-BY 813s in final, best offer. Trade, terms. Write Jim, W3VGZ, J. V. Stout Co., 4640 York Rd., Baltimore 12, Md.

NATIONAL NC-183 with Model A Slicer and xtal calibrator in gud condx. first offer over $175. F.o.b. Westbrook, Maine. W1MBR, O. A. Fick, Jr., 77 Oakland Ave.

SELL: *DX-100*, perfect condition. New tubes, $170. *Ralph Krebs*, RD 60, Allentown, Penna.

SWAP: 6-element deluxe ten Telrex twelve forward towards 4 to 6 element twenty fifteen Telrex. Tom Hardy, Hardy, Ark.

TRADE for what have you: 300 watt linear amp. with P/S coax switch. Dow key relay, etc. Write to Joe Kearse, 10 Rolla Garden, Rolla, Mo.

SELL: Viking Courier 500W linear amplifier, excellent condx: $230; NC-183 receiver, average condx: $120; B&W TR switch, $15; Heath SWR Bridge, $10; all prices as stated, or make reasonable offer. F.o.b. Moorestown, N. J. Art Cox, K2OMT, P.O. Box 142.

SELL: Heathkit, WA-P2 and UA-1. Never used, $40. W8UAI, 1301 Penn Ct., Traverse City, Mich.

SELL: BC224H revr, 12V version BC348 converted to 115 VAC, mint condx, $65; Hallicrafters T54 7" rack mounted television with cabinet, $25; Cornell-Dubilier Vib. converter 110V DC input, 110V AC output, 500 w 350W continuous, best offer; RCA AVT-112A transmitter 10W AM 2.5 to 6.5 Kc, w/matching receiver, 12V DC power supply, $75 or best offer separately; Collins PTO oscillator 70E-15, make offer; dynamotors: 5.5 V DC 6 A, output 225 V DC .06A, 14 V DC 3.3A, output 230v DC .100 A; 13.8V DC 2.3A, output 220 V DC .07A, $10 each. S. E. Lipsky, 64–85 Wetherole St., Flushing 74, L. I., N. Y. TW 7-5577.

HAM Licenses, resident courses, 3 evenings weekly. Prepare for Novice Class in 4 weeks, General Class in 2 months. Delehanty Institute, 117 East 11th St., New York 3, GR 3-6900.

SELL: S-85, excellent condition. Best offer over $85. R. Schulte, 3013 Valentine Ave., Bronx, N. Y. K2ZSY.

COMPLETE Station: 80 thru 6; Hallicrafters S-85 receiver with accessory socket, AVC jack, coaxial antenna connector, and provision for one-switch station operation on rear. Heavy duty antenna relay in black crackle case with built-in S-meter and carrier-on light. Heathkit Balun coil Model B-1. Harvey-Wells TBS-50D w/four crystals and 10 tube. Well regulated power supply. B&W model 426 low-pass filter. International Crystal converter f/six, w/power supply. All in A-1 condition, $275. I prefer you pick up. Hal Fichter, K2TSZ, 38 Burnet St., Livingston, N. J. Tel. WYman, 2-3594.

FOR Sale: SX-71 and R-46 speaker, $135; DX-35, $45; factory-wired WRL 755 VFO, $35; Stancor 60 watt polypedance modulation transformer, $7.00; ATR 12 DME inverter, $7; pair Reyco multiband antenna coils, $8.00. Francis Yancey, Rte. 2, Lexington, Va.

ALUMINUM for every ham need. Write to Dick's, Cherry Avenue, Route 1, Tiffin, Ohio, for list of tubing, angle, channel, castings, plain and perforated sheet, and complete beam kits.

COLLINS 75-A3, like new, just recently aligned and worked over by Collins factory; with product detector; a real beauty. First check for $385 takes it; Also: Heathkit tube-tester, bought new in April, 1958. *Will sell for $20. E. D. Clements, Box 226, L'Anse, Michigan.*

SALE: DX-35 and Johnson 122VFO, $75; Vibroplex Original deluxe, $18. N. Lilien, 491 Mayhew Ct., South Orange, N. J.

WILL Swap one Jackson dynamic tube tester, mod. 648, in gud condx, for Millen grid dip meter, or B&W grid dip meter, in gud condx. H. J. Hoover, Jr., K4PIJ.

COLLINS 75A-3, vy late model, used little, with 3 KC mechanical and xtal filters, factory condition, $380; Hy-lite 10 meter 3 element close spaced beam, with Alliance rotor, $45. F.o.b. Rochester. James Thompson, WØTRT, 509 Seventh Ave., S.W., Rochester, Minn.

WANTED: R220/URR communications receiver. W1IBY, Harvard, Mass., Woodchuck Hill Road.

500 Millen 90881 amplifier, 80-10M, push-pull 812s; push-pull 811As modulators, 866s, 816s in power supply; rack panel mounted; gud condx. Write for details. Quick sale price, $175; HQ-140X and QF-1. Used 150 hours, $195. Just purchased DX-40 and Viking VFO, brand new, $89. Whole station for $425. R. R. Hove, K7DAI, 219 So. Hillcrest Ave., Yakima, Wash.

SELL: Meissner 150B phone/c.w. xmttr with FVO, in vy gud condx. Complete with tubes, manual, and major spare parts. Has 1600 volt power supply, 813 final, pair 811 mod., $165. W1AJZ 38 Ayer Lane, Harwichport, Mass.

SALE, Like new, 7" Sylvania mod. 403 'scope, lab quality, net $279 for $145; following items new, Hycon #615 digital VTVM, net $397 for $250; Hickok #690 VHF-UHF marker calibrator, net, $362 for $249; Sylvania #221Z polymeter net, $99/50 for $55 and Sylvania #506 color dot generator net $129 for $69. Will ship postpaid. Received equipment in payment of debt. Ken Eggert, W9MOT, 4845 N. 64th St., Milwaukee 18, Wis.

GONSET Communicator III, 2 meter model, new condx, 3 months old: $210. K2POA, 29 Boone St., Bethpage, L. I., N. Y.

SELL: 600L, $330, 20A with 458 VFO, 10 meter converter, and QT-1, $180; electric Instructograph, less one tape and instruction manual, $19; all new condition except Instructograph, W6WZD, P.O. Box 761, Menlo Park, Calif.

HQ-129X, $129; NC-66 recvr, $69; NC-183D, $269; NC-200 and spkr, $139; HRO-60 and spkr, $345; Collins 51J-3, $675; T47A/ART-13, $79; ARC-1 59; Meissner 150-B and VFO, $99; SX-101 MK III $299. All types amateur and commercial radio transmitters, receivers and test equipment taken in trade for new Johnson Thunderbolt, Valiant, Hammarlund, Hallicrafters HT-32, National NC-303, Fisher Hi-Fi, etc. Write to Tom, W1AFN, Altronics-Howard Co., Box 19, Boston 1, Mass. (Richmond 2-0048) Store: 60 Spring St., Newport, R. I. (Fred, W1JFF), Viking 7-3435.

LATE 75A3, with speaker, calibrator, product detector, 3.1 mechanical filter. Barker & Williamson 5100-B and 51SB-B. All in exc. condx. Make me an offer. All inquiries will be answered. W1PNM, Glen Cove, Maine.

SAVE Time and money. Build your own rig with the help of our customized, prepunched chassis and panels. Free planning service. Electronic Chassis Company, Box 1225, Boston 4, Mass.

CRYSTALS Airmailed. Individually boxed new crystals. Novice, net, General, FT-243, custom finished to .01%. Any kilocycle, 3500 to 8700–99¢. Same range in small hermetic holders, .050" or .093" pins, $1.95. Airmailing 9¢ per xtal. Special activity checked surplus SSB filter xtals, all channels, 25¢. Write for additional frequencies and brochure. Crystals since 1933. C-W Crystals, Box 2065Q, El Monte, Calif.

SELL Harvey-Wells Bandmaster TBS50C. Perfect condition, $65. F.o.b. Want AF-67 Elmac, new or like new condx. Barton Matthews, W9BLP, 70 Middle Park Dr., Canton, Ill.

FOR Sale: DX-100, perfect, $100; parts for 600 watts final, bargain, $40. 400 watts final, modulator, power supplies, TVI-suppressed speech clipping, 5 meters, Variac, etc. $100. Jack Miller, W5NHB. 4615 Laurel, Bellaire 101, Texas.

FOR Sale: Communicator III, 6 meters, in original box, like new for $225, plus shipping charges. K6SRM, 402 4th St., East, Sonoma, Calif.

TUBES: Brand New 4D32's $22.50 4-125A $12.50, 4-250A $30.00, 810's $8.50, 811's $2.50, 828 $3.50, 829 $6.50, 832A $4.75 833A $24.50, 4E27 $6.50, slightly used, 813's $5.50, 815's $1.50 955 75¢ ARC-5 Receivers BC-453 $10.00, BC-454 $8.00, BC-455 $8.00, Transmitters BC-457, BC-458, BC-459 $6.50 each. BC-456/ARC-5 Screen Modulator $3.50. Collins ART-13 Transmitter, unmodified, perfect condition $60.00. SCR-522 Transceiver, Ideal for 2 and 6 meters $25.00. APN-1 420 Mc. Transceiver, Has modulator $9.50 BC-610 Modulation Transformer. Brand New $45.00, New Batteries BA-37, BA-38 for BC-611 walkie talkie $1.75 pair. C.O.D's OK. all guaranteed. Bill Slep W4FHY, Box 178, Ellenton, Florida.

FOR Sale: Heath VFO. K2CCV.

HAMMARLUND HQ-129X with speaker excellent condition, no scratches or worn spots: $140. W5MIR, 3347 East Virgin St., Tulsa, Okla

SELL: Collins 32V3, Serial #1328, excellent, $400; Deluxe home brew K.W. conservative components, make offer; Olivetti page teleprinter and tape printing reperforator in excellent condx, with manuals $240. Call Don Kellogg, 1-1579, Deal, N. J. After 6:00 P.M. Don Vinik, W2DVD, 20 Popular Ave., Deal, N. J.

WANTED: Gonset Communicator III, 6 meters, will consider a 12-volt model II. Either must be in top condition. For shipment New York City. Send description and price your first airmail letter. All replies answered. T. H. Nicholls, K2IHU, Apartado 45, Barcelona, Venezuela, S. A.

MULTIBAND Final tanks, National MB-150, MB-40SL. Also 550 volt power supply. Walt, K6JNG, NOrmandy 4-0820, 850 North Kenmore Ave., Hollywood, Calif.

SELL Viking II, VFO, HQ150, perfect; $400 or separately. Anderson, K8CSW, 3822 Freemont Road, South Euclid 21, Ohio.

SELL: Trade, 400W, c.w. rig, custom-built. Heavy duty power supplies, fully metered, matched antenna coupler, B&W coils, all bands. Consider gud recvr or 2M gear. Billings, W2BIV, 2114 Albemarle Rd., Brooklyn, N. Y.

COLLINS KWS-1 and 75A4, both in exc. condx. Curtailing operations so am anxious to sell. Only $1500 at my QTH, W9GGT, J. V. Heuer, 2475 Grand Avenue, Cedar Rapids, Iowa.

WANTED: 75A1-2, 10B-20A, sell best offer; TBS50-D w/AC supply, BC348 w/AC supply, Morrow 3BR converter. Middleton, K2UIT, 241 Fairmount Ave., Liverpool, N. Y.

WANTED: 75A4, State price, condx, and serial number. For sale: DX-40 and Knight VFO, K8LDC, 738 Truesdale Rd., Youngstown 11, Ohio.

GLOBE SCOUT 65A, reconditioned by WRL, $55; Heath VFO, $17.50. M. F. Greene, Box 586, Douglas, Ga.

WILL Trade $1300 worth of ham gear for a Cessna 140 or equivalent needing some work. I have Collins 75A-4 recvr, used about 20 hours; 813 final (pi-network) and power supply, 250 watts, Meissner signal shifter, antenna relay, Vibroplex bug, dynamic mike, 20 meter Telrex, medium spaced beam, parts for modulator, 1 large, new all metal shack desk, and assorted parts. Elmer G. Smith, K4DXI, P.O. Box 724, Greensboro, N. C.

SELL: S-85 with Hallicrafters S meter, $90; DX-40, $60; VF-1 VFO, $15; AR-3 recvr with cabinet, $27; also QF-1, $7. All in A-1 shape. James Maloof, Jr., K1GUX, 143 Sprout, Middleboro, Mass.

SHACK Cleaning: 813 TX exact duplicate QST 45 complete but no outer shielding, never used parts, $85; 75 watt xtal TX 80/40 Mts, $50; 100 watts TX, remote VFO, 40–10 Mts, 809 PP final, rack mounted, $100; pwr supply 2500V/300 Ma, never used, $65. Will deliver up to 40 miles, otherwise F.o.b. W3AAZ, L. Vydra, Glen Road, Rockville, Md.

FOR Sale: Gonset 6M linear, like new, $125. F.o.b. Sorry, no terms. K4SPJ, Box 132, Hazard, Ky.

MODULATOR 120-watt with filament supply, $69.50; Stancor 125-watt modulation transformer, A-3829, $9.75, 500 watt 1600 volt power supply, $59.50; Weston 0–100 milcroammeter, 4" rectangular, $9.50; tubes, unused, 829-B, $5.50; 5763, $1.25 UTC LS-12 low-impedance to grid, $9.75; Trimm 600 ohm headphones, with plug, $6.50; Advance 110 AC antenna relays, $6.75; B&W coils BCL 80 to 10, $1.75 each; and shipping charges. J. T. Maloney, W2BE, 33–63 154th St., Flushing 54, L. I., N. Y.

WANT Used Instructograph or other economical tape type code-training device for my boys. Marvin Moll, Battle Lake, Minn.

HEATH DX40 and Dow ant. relay, in gud condx, $70. Fred, K2KYH, 3553 Lockport Rd., Lockport, N. Y.

SELL: SX71 recvr, Viking 122 VFO, final amp. with PR 813s and mtrs, Johnson SWR bridge, also Elmac 4-125. Best offers. Robert Kubala, 2822 N. Kenneth, Chicago, Ill. PA 5-7780.

RME 4350 dual conversion, brand new condx. Sells for $230 new. Would like $180 or lt. Bruce Hobson, 1902 Asylum Ave., West Hartford, Conn.

KWM-1 owners: An easily built accessory lets you use that fine receiver on 75 and 40. One dollar will bring the dope. Hetro-Verter Products, Box 575, New York 8, N. Y.

SELL: BC-794 with power supply, 1.2 to 40 Mc., 6 Bands, excellent condition, $115. Robert Erickson, W9QNH, 1860 Rome, St. Paul, Minn.

FOR Sale: Globe Chief 90 converted for phone and c.w. Heath VFO, 2 months old; $60 for both. 40 watts modulator 807 pp with pwr supp. $25. Mosley all-band vert. ant. V-4-6 75M coil inc., $17. Local sale only. Seymour Kaftan, HY 3-5773. 65 E. 52nd St., Brooklyn 3, N. Y.

FOR Sale: Johnson Viking II and VFO, factory wired. Johnson lo-pass filter, Advance coax relay, and D-104. $185 takes all. K2CJP, Harv, Fieldstone 7-8651, 87-18 259th St., Floral Park, L. I., N. Y.

Reconditioned and guaranteed. Satisfaction guaranteed. Terms financed by us. Hallicrafters S38 $29.00; S85 $89.00; SX99 $119.00; SX96; SX100; SX101; HQ100 $139.00; HQ110 $189.00; HQ140; HQ150; National NC98 $99.00; NC125 $129.00; NC300 $279.00; HRO50T; HRO60; NC183D; Globe Scout $69.00; Viking 11; Ranger; Valiant; Pacemaker; Thunderbolt; Heath DX35; DX100; Collins 32V; 75A2, 75A3, 75A4, etc. Many other items. Write for free list. Henry Radio, Butler, Missouri.

FOR Sale: Collins 32V2, perfect, complete with manual; Turner 99 mike and stand, Only $300. W1ACM, James A. Mulligan, 30 So. Broadway, Lawrence, Mass.

PHILCO 200 hi-fidelity tape recorder nearly new, $150. Remit money order or certified check. Rev. Everett Battin, W9OWD, 616 Glenwood Ave., Elgin, Ill.

SELL Complete 75 meter SSB exciter, Power supply, xtal filter, VFO, sideband switch, Vox, 2E26 final. Excellent operation and construction, $75. W3QOU, 15 S. Old Oak Dr., Beaver Falls, Penna.

SELL: Factory-wired Viking 6N2, $110, 1500V-500 Ma. Power supply, $35. Pick-up deal only. R. Norby, K2CQG, RFD 2, Box A-2186, Yorktown Heights, N. Y.

SALE: National NC-88; Heathkit DX-35. Used very little. Best offer James Jennings, Stillville, N. Y.

SELL: Complete ham station: B&W 5100 with 51SB SSB exciter; SX-96 receiver with speaker, Z-match coupler, Mosley 20m 3-el. VP-beam plus assorted tubes, coaxial cables and surplus electronics equipment. Will consider mobile equipment. Best offer over $500. Albert Germain, K1JBB, (formerly DL4CX-KA2AG-W9YWL). 7 Columbia St., Holyoke, Mass. Tel: JEfferson 2-4431.

KWS-1 and 75A4 with 800 and 3000 filters, all like new barely used. Take HT32 and other good gear in trade, or $2000 cash. W9BNF, Glen H. Byars, Box 105, Kearney, Nebr.

SELL: HQ129X with matching speaker, $125; Electro-Voice speech clipper, mod. 1000, $12; Heath VFO, $15; Two 0–2 r.f. meters, Weston, $10; new Elmac 4-125A, $15; Cushcraft 20-meter vertical, $10. Robert Ehrler, W2CTO.

SIX Meter crystal converter printed circuit kit, rf stage, variable noise limiter, mobile or fixed. Write "Printed Circuits," Trucksville, Penna.

WANTED: HRO-50-R1 complete with coils A through F inclusive or other good rack mounting receiver. Give details and best cash price, or trade. M. Eidson, W5AMK, Temple, Texas.

KWS-1, *perfect*. $1450; 75A-4, $475; *both together*, $1900. Cash or terms will be arranged. Herb Hollister, WØDRD, Box 17, Boulder Colo.

SELL: Collins KWM-1 transceiver with 516F-1, A.C. power supply and 312B-1 matching speaker. Brand new. *Never used. In factory* sealed unopened boxes. Regular amateur net, $981. Need cash urgently and will sell this complete SSB station for $875. John Drexler, K4BZR, 1117 Baxter Ave., Louisville 4, Ky.

SELL: *Collins 75A3 receiver just reconditioned by Collins;* 100 kc crystal calibration, mechanical filter, $375; Central Electronics 20A exciter with VFO factory wired, $175. W3ARR, 11 West Hedgerow Dr., Morrisville, Pa. Phone CY 5-5564.

32V2, *factory converted to V3, complete, with cabinet. $300 f.o.b.* Springfield, Mass. W1RB, 90 Montrose St.

SX-28, $129; SX-71, $149; NC-125, $124; NC 183, $167; factory wired Ranger, $169; Johnson lo-pass, $10; HRO-60 NBFM ad, $7; HRO-60 xtal call., $18; HRO-E, F, B, D, AA coils, $17 each. Guaranteed in like-new condx. F.o.b. Chicago 35, Ill. Treger, W9IVJ, 2023 N. Harlem Ave.

SELL or trade for clean linear amp. Elmac AF67, PMR-6, PMS-6, B&W SSB adapter mod. 370, equipment is in like new condx with Manuals. James King, W4JPP, P.O. Box 1042, Jupiter, Fla.

INFORMATION free on Casbah Bulletin. Tom Kelly, KN1IWP, 26 High Plain, Andover, Mass.

SELL: $300 prepaid brand new HQ-160 with speaker. A marvelous receiver. *Quitting. M. R. Wright*, 222 24th Street Drive, S.E., Cedar Rapids, Iowa.

MUST sell PP807 100W Transmitter, 6146 60W transmitter, each in cabinet, VFO or Xtal, phone or CW, TVI proof. 10 meter broadband converter. *6 volt trickle charger. Miscellaneous parts, magazines,* handbooks etc. Pick up all at your price at W1JUL, 62 Fisher St., Natick, Mass.

FOR Sale — Globe Chief 90 excellent condition express prepaid $45, Lysco 600 TVI-suppressed & in gud condx plus Model 50 antenna coupler, prepaid express, $55. L. M. McGee, Herington, Kansas.

TRADE DX35, Heath VFO Coupler. Want higher power, home brew? W8LTO, Terra Alta, W. Va.

FOR sale — Globe Scout 680A, Heath VFO, FCL-1 Speech Booster, Excint condx all manuals. Price $110.00. Lou Haviland K1DBC, 253 Highland Av., West Haven, Conn.

COLLINS 75A-4 in good condition for $400 local sale. James MacLachlan, 99 Irving St., Cambridge, Mass. EL43692.

VIKING Ranger, $145; NC 125 with speaker, $120, both in good condition and with manuals; Vibroplex Champion, $7.50. Caracena, 5442 Wayne, Philadelphia 44.

AT last! Custom frame to fit ham license. Two-week delivery. $1.50 includes mailing. Choose black, green, red, gold. Money order or check to Farmil Crafts Co., Box 461, Warner Robins, Ga. (W4UZS).

SELL: Complete 6 Meter Station: Letine 242 6 Meter transmitter, C.D.R. AR-22 rotor, Telrex 4 el. beam. Hardly used. $100. Joseph Frey, K2VRW, 67–15 180 St., Flushing, N. Y.

HELP me go SSB, can't afford it until present equipment is sold. Only $165.00 buys DX-35 with VFO and 400 watt 813 final, modulated with 811As. Complete with separate power supplies for amplifier, audio and screen in 3-foot rack cabinet TVIed. Also complete mobile rig, Gonset 10–11 conv. 25 watt mobile single bander (described 1958 *Handbook*) VFO, TNS, Dynamotor, Vibrapack, Mike, Bumper MNT, cables, mount, 10 mtr Whip and center load all band. All for $85.00 K2TCQ, 282 W. 23 St., Deer Park, L. I. DE-2-7725.

FOR Sale: WRL 300A factory wired $350. Heath DX100 with MK-1 SSB modification and added 500ma Simpson 127 plate meter $200. Heath VX-1 voice control $17.50. Will ship prepaid. K4GAX, Box 266, Franklin, Kentucky.

GLOBE Champion 300 transmitter. Factory built. VARIAC control incorporated to run 65 to 350 watts cw, 65 to 275 fone. Final class C or B for SS 300 w pep. Timed sequence keying and shaping control. Push to talk. Built in VFO and meter illuminated. TVI proofed. See it. Operate it. $365 cash. Mosley beam 20M, VP A20-3, three element. $40 was $79.95. Both in excellent condition. Both used less than year. Going to movie equip. Carlos Lane, 233 Pratt Ave., Somerset, Mass. Tel. OS 36821. W1ZGD.

GONSET 2, 12 volt, 8 element Telrex beam, 6 crystals, ground plane, $160.00. 7940 Algon Avenue, Phila., Pa. Pilgrim 2-6633.

SELL: OF-1, FCV-2 (2M). Steve, Aneta, N. D.

FOR Sale: Model 26 Teleprinter $90.00. Drake 1A receiver, Serial 311, new April 58 $225.00. Telrex 20M three element super deluxe *medium spacing $150.00 beam for $75.00. Telrex 20M two element* mini-beam $27.50. W3VDA, Box #1225, Harrisburg, Pa.

FOR Sale: Telrex Super Deluxe 20 meter 3-El. wide-spared beam, model 503-A, $90. Getting Tri-bander. K2BWP, 26 Lenox Ave., Clifton, N. J.

MIMS Rotator wanted. R. Yeager, 1455 Wilson Ave., Chicago 40, Ill.

SELL: Perfect Eldico TRITV and VFO, 300W AM/CW, 125A final $250; like new HT-30 $275; factory wired Globe LA-1, $95; PE103, $15. Harry Taubin, W2GCW, 731 Gerard Ave., Bronx 51, N. Y.

SELL: Johnson Adventurer $40; National Rcvr N C 109 $150. Both in A 1 condx, W. A. Piercy, 230 Hamilton Road, Ridgewood, N. J.

WANTED: Heath QF-1. Write Ronald Mellen, 408–57 St., West New York, N. J.

SELL: *Collins 75A4, latest model with fine tuning knob, Ser. Number* 4970. Used 10 hours, in original carton. Moved Qth and no time for hamming. $550.00. W2SHE, 87 Westmont Ave., Elmira, N. Y.

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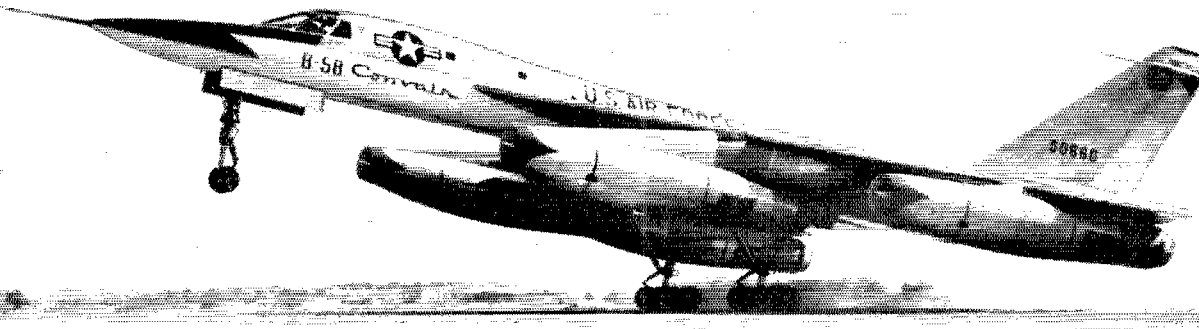

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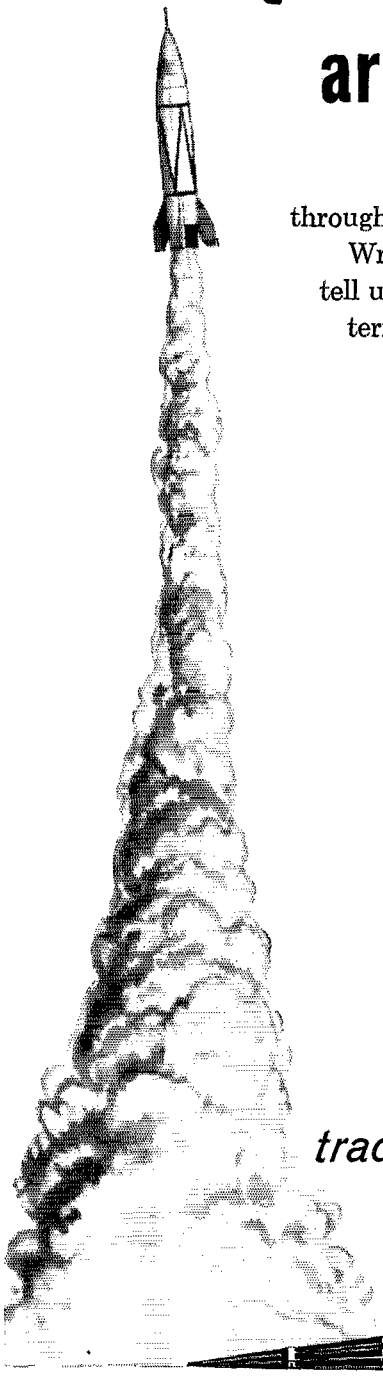

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National News Dial

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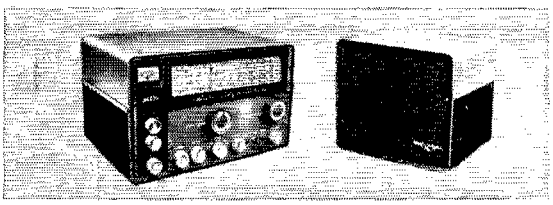

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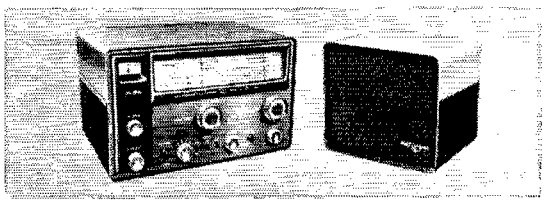

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> *"...If a comparison is made of available tubes for a modulator to deliver from 300 to 600 watts of audio power, it will be found that triodes will require from 5 to 10 watts of driving power while pentodes will require 1 watt at most. This results in a considerable saving in speech amplifier output power requirements, and consequently the speech amplifier can be reduced from something in the class of push-pull pentodes or tetrodes (6V6s or 6L6s), and associated power supplies, to something like a single 6AQ5."*

Here is how *QST* summarizes it: "813s can supply all the audio power needed for modulating a kilowatt—or they can be operated in a variety of ways at lower power for transmitters in the several-hundred-watts-input class."

RCA-813 beam power tubes are available at all RCA Industrial Tube Distributors. For a technical bulletin covering modulator and rf amplifier operating conditions, write RCA Commercial Engineering, Section B-37-M, Harrison, N. J.

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