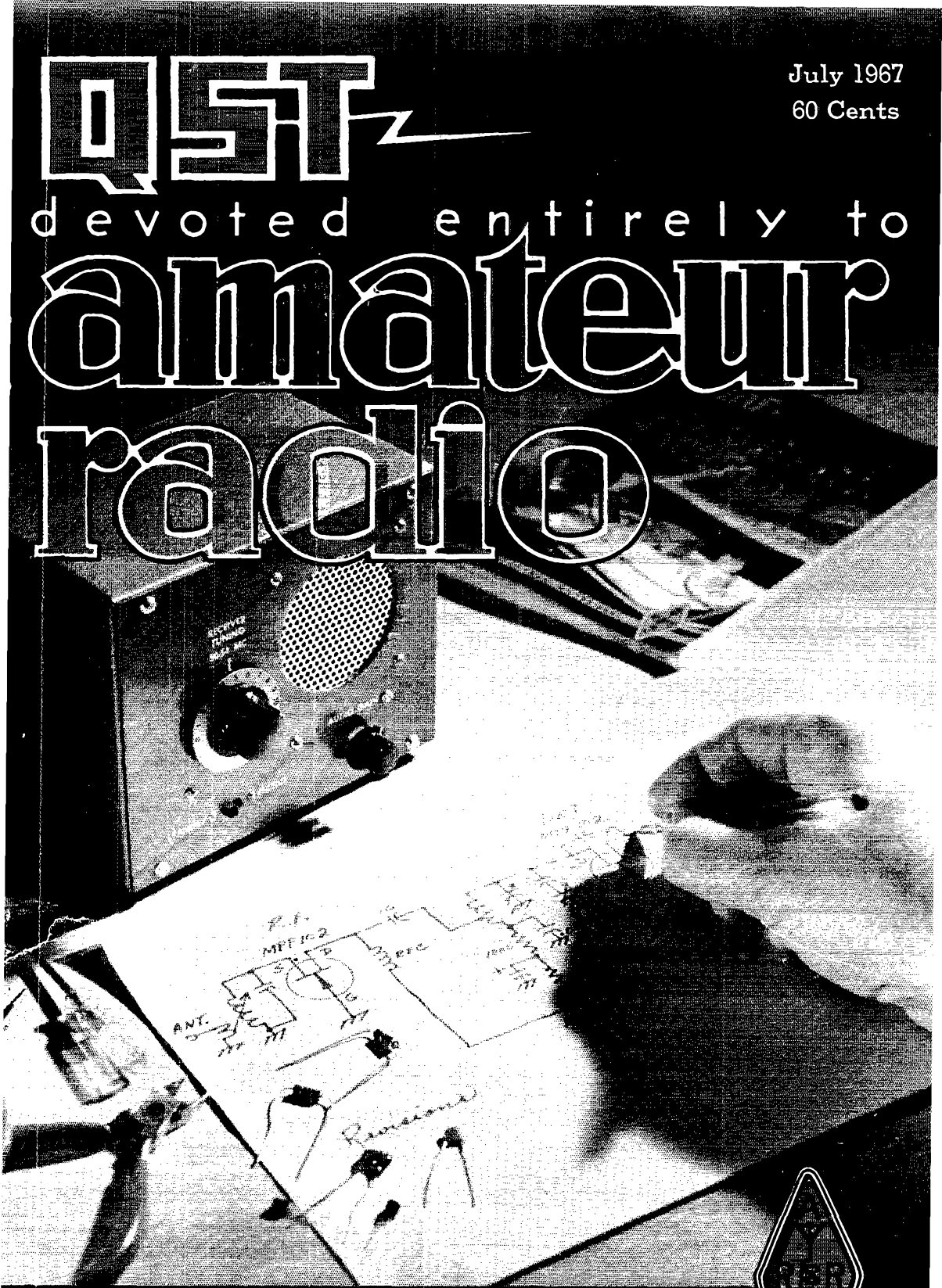
QST

July 1967
60 Cents

devoted entirely to

amateur radio



OFFICIAL JOURNAL OF THE ARRL

Please do not write for this 25,000-word free book unless you are really interested. *It's pretty expensive.*

26 lbs. of pure "hurricane" —maximum legal input, in a box no bigger than an overnight bag.

Receiver Incremental Tuning... Amplified Automatic Level Control... and a tremendously effective new noise blanker are among the exclusive features of Hallicrafters' SR-2000 that you'll read about in voluminous detail.

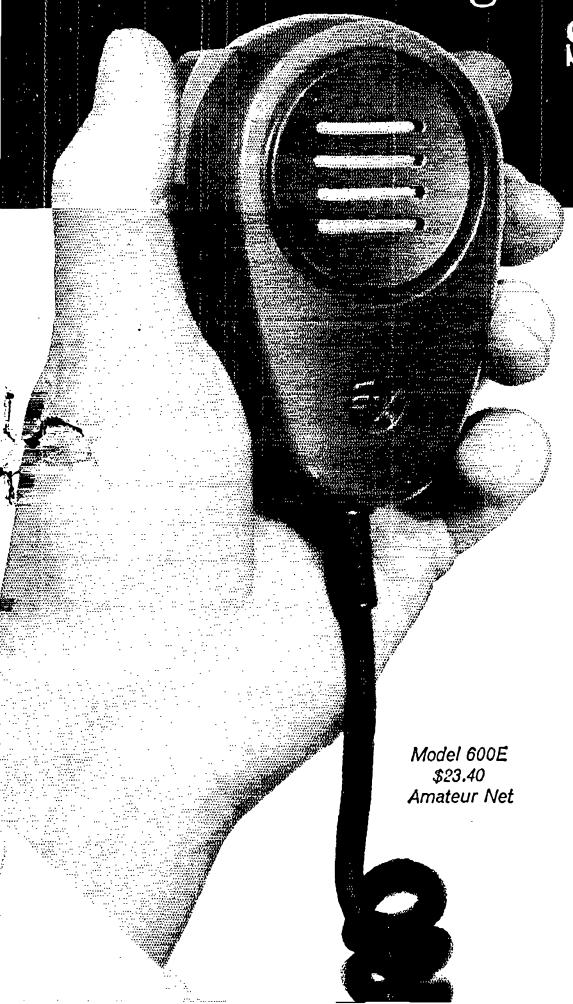
SR-2000 "Hurricane"
5-BAND TRANSCEIVER WITH M.L.P.
(Maximum Legal Power)

hallicrafters
A Subsidiary of Northrop Corporation
5th & Kostner Aves., Chicago, Illinois 60624
Export: International Division. Canada, Gould Sales Co.

Specifications in brief... Special Features: Patented Receiver Offset Control (RIT) permits ±2 kc adjustment of receiver frequency, independent of transmitter, for round-table, net or CW operation. Hallicrafters exclusive Amplified Automatic Level Control. **Frequency Coverage:** Full coverage provided for 80, 40, 20, 15 and 10 meters. Upper, lower sideband and CW operation. All crystals provided for 28.0 to 30.0 mcs. **General:** Dial cal., 1 kc. Linear gear drive with less than 1 kc readout. Adjustable IF noise blanker. Provision for plug-in external VFO/DX adapter. Built-in VOX plus break-in CW and PTT. Built-in CW sidetone. Hi-Low power switch for SSB.* 2.1 kc 6-pole crystal lattice filter. S-meter-RFO-AALC and final screen metering.* Two-speed blower. 100 kc crystal cal. VFO covers 500 kc. **Transmitter Section:** Two 8122 output tubes. Variable Pi network. Power input, 2000 watts P.E.P. SSB; 1000 watts. CW. Carrier and unwanted SB suppression, 50db; distortion products, 30 db. Audio: 500-2600 cps @ 6 db. **Receiver Section:** Sensitivity less than 1 uv for 20 db S/N. Audio output, 2W.; overall gain, 1 uv for ½ W. output. **SR-2000 transceiver—$995** amateur net, **P-2000AC Power Supply—$395** amateur net.

*Meters for final plate current and voltage built into P-2000AC power supply. Also Hi-Low power switch, and loudspeaker.

There Is Nothing Tougher Than Mobile Service...Except Our New Model 600E!



Model 600E
$23.40
Amateur Net

MOBILE SERVICE is the most demanding form of voice communications you use. Power and size limitations are extreme, putting an unusual premium on efficiency. The environment is tough, putting an accent on reliability. In the final analysis you will benefit fully from your mobile equipment only by paying strict attention to every detail of installation and operation.

Mobile service performance starts with the microphone—the first active element in the system—and there's no better way to start than with the new E-V Model 600E dynamic microphone. It is a little more costly than many microphones you can buy that "just work", and rightly so. For the E-V 600E is a lifetime investment in top-notch performance.

Look closely. The dynamic element of the 600E is the direct descendant of a long line of military microphones built to perform faithfully under battle conditions. This element was chosen for high intelligibility and its ability to withstand any environmental conditions. The proved ruggedness of the E-V Acoustalloy® diaphragm easily withstands ear-shattering sound pressures with no change in characteristics. But there is more to the 600E than ruggedness. Its sound quality has no equal. Here's why.

The frequency response of the 600E is ideally suited to SSB and critical AM transmission. You get highest intelligibility with any ALC circuit or frequency-shaping network in common use. That's been proved with on-the-air tests with every commercial SSB mobile transmitter and transceiver on the market today. Further, the high output level of the 600E will fully modulate even the "Scotch" input circuits sometimes found in mobile rigs. The 600E is available in 150-ohm or Hi-Z models.

Now pick up the 600E. It is shaped for comfort, with an easy-acting switch that gives you positive control, even when you are wearing heavy gloves. The case is molded of Cycolac®, a space-age plastic that absorbs a fantastic amount of abuse. The 600E never feels hot or cold to the touch, regardless of the climate. The shielded coiled cord has passed flexing tests that far exceed normal life, while the switch has test-cycled on and off over a half-million times without a sign of failure. Even so, both cord and switch are designed for easy field service, if necessary.

The E-V 600E is built to outlast every other piece of mobile equipment you may use, while outperforming every other microphone on the market. It will probably be transferred from rig to rig as the one most useful communications tool you own. Actually, the 600E, like all E-V microphones, is guaranteed forever against defects in workmanship or materials. It must perform as stated, or your money back.

The one best way to find out what the E-V 600E can contribute to your mobile installation is to try it. We guarantee you have nothing to lose. Ask your Electro-Voice distributor to help you put the new E-V 600E dynamic microphone to work in your rig, today!

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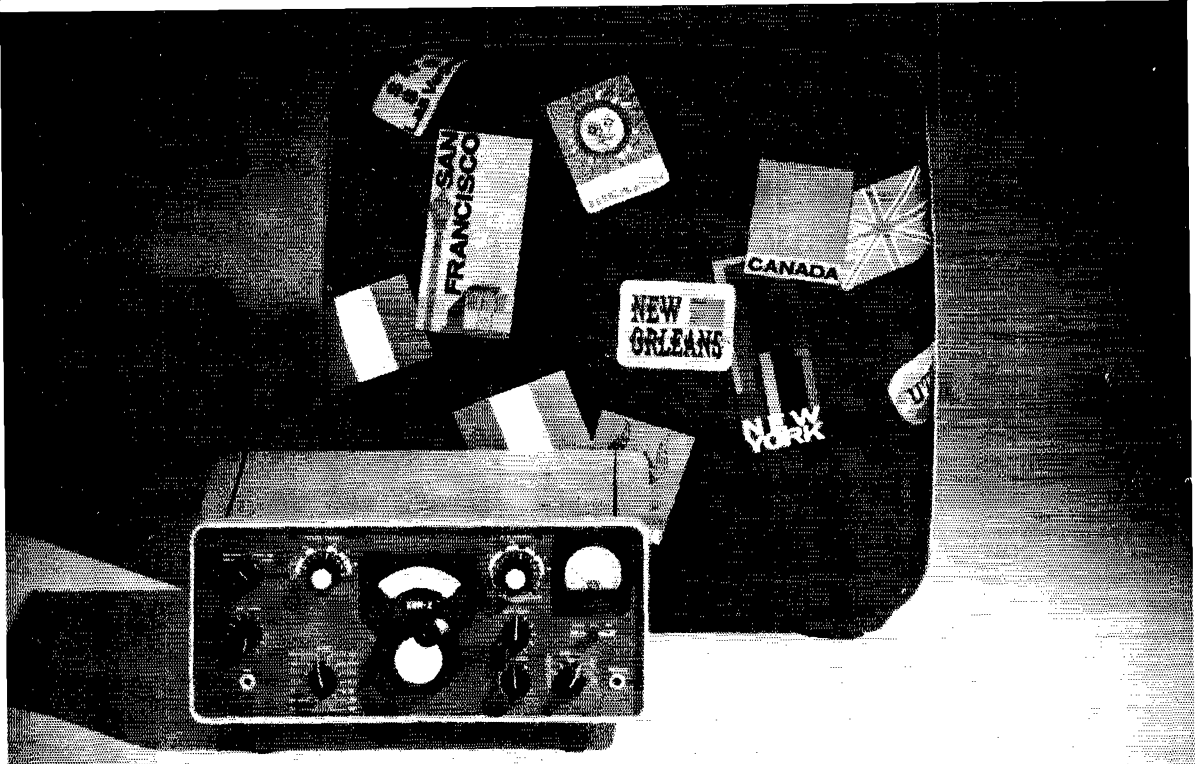
SETTING NEW STANDARDS IN SOUND



Traveling Companion

Over the Rockies in a camper. Umpteen weekends on the lakes. A workhorse during the spring flood. To southern Mexico and back in a jeep. Hunting trips up north. All the Collins KWM-2 Transceiver asks out of a robust life is to go where you go, do what you do, and tell the world about it.

COLLINS

QST

JULY 1967

VOLUME LI NUMBER 7

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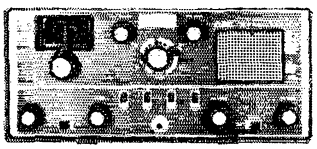
OUR COVER

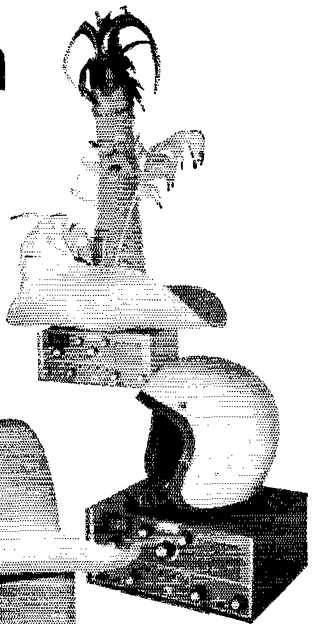
The 6-Meter "Rushbox" from July 1966 *QST* is revisited, this time with JFETs. A worthwhile improvement in performance is the result of a few simple circuit changes

—CONTENTS—

SBE



on vacation SB-34 wears many hats



Small . . . 11¼"W, 5"H, 10"D and only 19 pounds—SB-34 transceiver is an easy tuck-in for any baggage-loaded, vacation-bound car, boat, plane. Dual, 12V DC/117V AC built in supply—operate coming, going and while you're there! Four-bands give short or long haul contacts. On vacation SB-34 wears many hats—and almost fits inside any of them!

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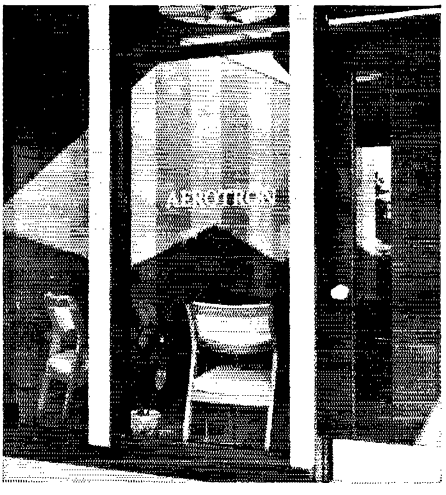

Ameco Ham, AMECO CB and Short Wave Listening Equipment is now being manufactured in the Award Winning Aerotron plant in Raleigh, North Carolina

Ameco Equipment Corporation, formerly of Mineola, Long Island, New York was recently acquired as a wholly-owned subsidiary of Aerotron and the entire manufacturing, engineering and sales functions have been moved to Raleigh.

If you are the owner of any of the fine Ameco products and desire service, parts, information or even if you just wish to say "howdy", we'd be happy to hear from you at our new address.

Aerotron is now in its 20th year of manufacturing two-way radio equipment. We have over 30 models of VHF-FM, Single-sideband, Independent Sideband and accessory equipment to offer for most any application.

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You're among friends at Aerotron. Here are the call letters of some of our employees who are licensed amateur operators: W2GHK-W2GHK/4, W4YRY, WA4VCZ, W4WYV, K4SAM, WN4EUF, W4WDN, W4VLZ, K4LRS, W4TNG, W4KXW, WA4WDR, WØCUB, W4LOV, WA4EHL, K4NFI.

AEROTRON, INC., U. S. HIGHWAY 1, NORTH • RALEIGH, NORTH CAROLINA

Section Communications Managers of the ARRL Communications Department

Reports Invited. All amateurs, especially League members, are invited to report station activities on the first of each month (for preceding month) direct to the SCM, the administrative ARRL official elected by members in each Section. Radio club reports are also desired by SCMs for inclusion in *QST*. **ARRL Field Organization station appointments** are available in areas shown to qualified League members. General or Conditional Class licensees or higher may be appointed ORS, OVS, OPS, OO and OBS. Technicians may be appointed OVS, OBS or V.H.F. PAM. Novices may be appointed OVS. SCMs desire application leadership posts of SEC, EC, RM and PAM where vacancies exist.

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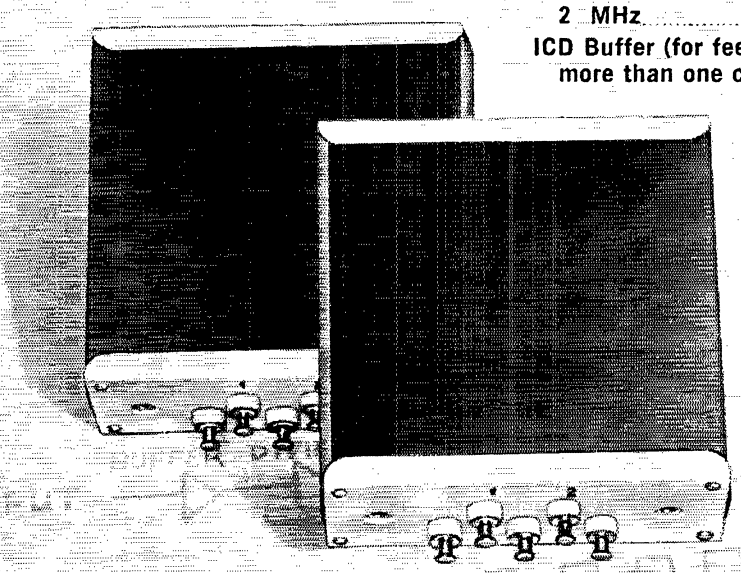

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THE AMERICAN RADIO RELAY LEAGUE, INC.,

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

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

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

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

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"It Seems to Us..."

MEMBERSHIP DUES

BECAUSE of discussion in membership circles, and various items in the Correspondence section of *QST* the past year, it is probably no surprise to anyone that the Board of Directors acted at its May meeting to raise membership dues. The new rate, effective August 1, 1967, is $6.50 per year — in the U.S., possessions, Puerto Rico and Canada.

The former rate was set by the Board in May, 1959 — eight years ago. It will be apparent, we trust, that in those intervening years the costs of operating a membership association such as the League have risen much the same as in every other phase of our economic life. The costs of printing are up, and so are those of postage, travel, salaries, office supplies and operations, telephone and telegraph, shipping, taxes, and so on and on.

A rise in dues has been avoided until now by alternative means of increasing revenue — for example, increasing prices for the *Handbook* and some other ARRL publications, and increases in advertising rates, to make them also more realistic in today's economy. Membership participation in The Building Fund drive, rather than depletion of League assets, also put off the day of reckoning. Careful watch has been kept over expenditures, and savings effected by use of new printing papers, more economical methods of production, etc. But these areas have been explored to the point where there is little left to cut without noticeable decreases in quality.

Not since 1932 has the Headquarters shown a loss from basic operations. But there are additional expenditures which, although separately kept on the books of account, are most essential — and indeed the very theme of a membership association. They include the expenses for Board meetings, director travel and other expenses within divisions, Executive Committee and board committee meetings, and the very important travel of SCMs, SECs, QSL Managers and National Traffic System officials, to promote and develop the public service activities of amateur radio. They are very much a part of the financial package.

In 1964 the League showed its first recent overall loss, some $25,000. To a large extent this — as did future difficulties — resulted from a tapering off of amateur radio's previous substantial yearly growth. It caused a static or reduced level of membership, of sales of publications and — with fewer customers — a smaller market and thus less advertising. The effect was to reduce income, while at the same time the basic costs of operating the Hq. organization remained, or increased slightly with the economy. An expense-trimming program held the loss in 1965 to $11,000. But the facts of life caught up with us again in 1966 when — despite a reduction in total expenses of some $65,000 — the over-all loss was $41,000. The projected loss for 1967 was considerably more.

This is a matter for concern, but not alarm. The League is a non-profit membership association and financial results of several earlier years had similar figures — but in the black rather than the red; so over a period of years we have come out about even. But it is obvious the current trend could not continue.

Should the Board order cutbacks in services and League activities to fit reduced income? Not one director felt this a desirable course of action. The flow of information in each division to its director indicated a near-unanimous sentiment among the membership for continuance — and expansion where feasible.

Most of the dues rise will simply close the gap between present income and outgo. But, especially in 1968 when the full effect of the increase will become available, more extensive League activities and services should result. It is the present feeling that such increases should be across the board, in all fields — rather than concentrated in any one, again to cater to the differing current interests of amateurs.

The League's programs are aimed at promoting the health and strength of amateur radio both domestically and internationally. This dues increase will permit the League to push forward its programs vigorously and on a sound financial footing. QST

League Lines . . .

Last call for the 1967 National Convention at Montreal's Place Bonaventure, June 30 to July 2. It's got everything . . . international flavor, the latest in operating and technical info, the newest in gear from the top manufacturers, entertainment for the gals, socializing for all . . . all this and Expo 67, too. See you there.

At the Dakota Division convention several hams endorsed the ARRL dues rise and expressed surprise it was not more. They cited comparisons--the same price as two cartons of cigarettes, and not much more than one cup of coffee a week. One went so far as to figure the new League membership dues cost 1.78 cents a day.

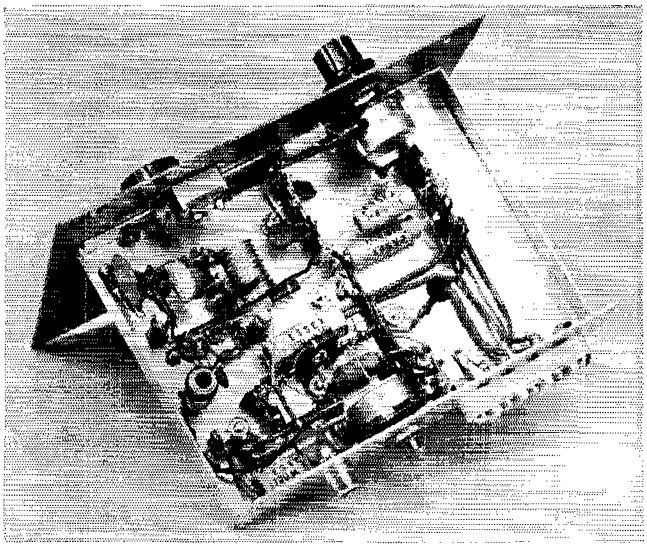
Early response to the Board's recent establishment of ARRL Life Membership has been great. Applications received with payment of $130 fee by August 1, 1967 will get "Charter" Life Memberships. An alternative quarterly installment plan is also available. See page 78 for details.

Two amateur radio stations will be on the air from the World Scout Jamboree at Farragut State Park, Idaho, August 1-9, 1967. The exhibition station, K7WSJ, will use the following frequencies: c.w.--3.525, 7.025, 14.025, 21.025 and 28.025 Mc.; phone--3.95, 7.29, 14.29, 21.29 and 28.59 Mc. The traffic station, K7BS, will work near 3.545, 7.045, 14.045, 21.045 and 28.045 Mc. on c.w., up 20 kc. from the exhibition station. For phone traffic, try 3.97, 7.27, 14.27, 21.27 and 28.61 Mc. During the Jamboree-on-the-Air August 5-6, K7WSJ will attempt to keep three operating positions going around the clock.

Exploratory discussions with some local Citizens Band groups indicate substantial interest in learning more about amateur radio, closer cooperation with amateur clubs. A survey is now underway among CB clubs nationally to find concrete ways in which closer relationships can be established between the two groups and how better to encourage CB interest in amateur radio.

"Happenings" this month (p. 72) has several items particularly worthy of your attention--Board meeting minutes, some new questions on the Novice exam, and another FCC denial of a request for no-code exams.

From time to time there are openings on the Hq. staff. Although each applicant must be a licensed radio amateur, we are looking for qualified people who can be part of a professional staff. The three areas most often needing additional personnel are the Secretarial, Technical and Communications Departments. If you would like to work for amateur radio, and feel that you have some skill to contribute, please indicate your specialized interest and ask for a personal résumé form. Write to Personnel, ARRL, 225 Main St., Newington, Conn. 06111.



Bottom view of the receiver chassis. The new r.f. and detector circuitry is at the upper left. L_3 and C_1 are mounted on an insulated terminal strip. Regeneration control R_1 is mounted on the rear apron of the chassis.

Low-cost JFETs have been substituted for the bipolar transistors originally used in the r.f. and detector circuits of the "Rushbox." The revised circuit has better selectivity, is less critical to get operating, and exhibits smoother superregeneration.

Updating the 6-Meter Rushbox with an FET Front End

BY DOUG DEMAW,* WICER

FOLLOWING Motorola's announcement that the MPF102 economy JFET was available at $1.00 per copy, and that it was intended for use up to 100 Mc. and beyond, the author immediately secured a few units to experiment with. The 6-Meter Rushbox receiver[1] offered one of many proving grounds for the new device; although the receiver worked satisfactorily, it seemed worthwhile to take advantage of the better features of FETs. A significant improvement in performance resulted.

The New Circuit

Fig. 1 shows the new "head end" for the receiver. Q_1 and Q_2, originally 2N706As, are MPF102 JFETs. These semiconductors are N-channel types, so the battery polarity remains the same as in the original version. Q_1 operates in a common-gate arrangement, making it unnecessary to employ neutralization; L_2 and RFC_1 should be kept separated, however, to discourage instability which could result from mutual coupling. No bias network is required for Q_1, thus the wiring is simpler than in the earlier r.f. stage. The r.f. stage has a broad frequency response, hence requires no front-panel peaking control. Once it is set for the middle of the 6-meter band, no further adjustment is necessary.

Q_2 operates as a common-gate superregenerative detector. The signal is taken from Q_1's drain through a 10-pf. coupling capacitor which is tapped on L_3 near the cold end. L_3, an air-wound inductor, offers better circuit Q than was possible with the slug-tuned base coil of the previous detector. C_1 serves as a trimmer capacitor across L_3 and provides some minimum tuned-circuit capacitance when C_2 is at minimum. This contributes to smooth superregeneration over the entire 4-Mc. tuning range. C_4 is a feedback capacitor. A 50-μf. capacitor and a 1000-ohm

* Assistant Technical Editor.

[1] DeMaw, "The 6-Meter 'Rushbox'," *QST*, July 1966.

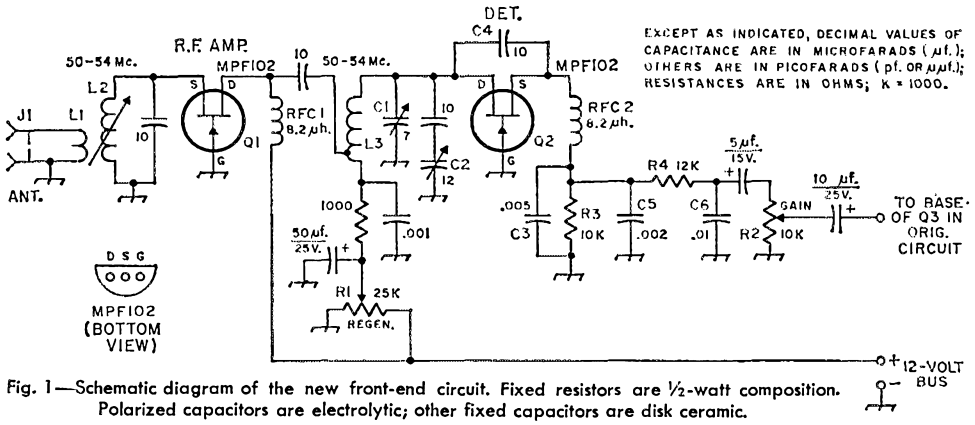


Fig. 1—Schematic diagram of the new front-end circuit. Fixed resistors are ½-watt composition. Polarized capacitors are electrolytic; other fixed capacitors are disk ceramic.

C_1—1.5- to 7-pf. ceramic trimmer.
C_2—12-pf. miniature variable.
C_3–C_6, inc.—For text reference only.
J_1—Phono connector.
L_1—2 turns small-gauge insulated wire over ground end of L_2.
L_2—9 turns No. 24 enam. wire, close-wound on ¼-inch diameter slug-tuned form (Miller 4500-4).
L_3—10 turns No. 20 tinned copper wire, air-wound to ½ inch dia., spaced one wire diameter between turns. Tap 2½ turns from d.c. feed end.
Q_1, Q_2—MPF102 JFET. (Motorola component available from any authorized Motorola distributor.)
R_1—25,000-ohm linear-taper control.
R_2—10,000-ohm audio-taper control.
R_3, R_4—For text reference only.
RFC_1, RFC_2—8.2-μh. miniature choke (Millen J300-8.2).

resistor are used as an audio decoupling network between L_3 and the regeneration control, R_1, to prevent low-frequency "motorboating."

The quench frequency of the detector is established by the resistors and capacitors — C_3, R_3, etc. — in Q_2's source circuit. The quench frequency is just above the audible range, giving optimum selectivity for this type of detector. R_3 acts as a source-bias resistor and provides a take-off point for the audio output from the detector. R_4 and C_6 prevent the quench voltage from reaching the first audio amplifier, Q_3. R_2 sets the audio level.

In the original receiver, a transformer (T_1) was used to couple the audio from the detector to the first audio stage. In the revised circuit T_1 was eliminated because the impedance match was good enough without the transformer to provide plenty of output from the speaker. A terminal strip has been placed where T_1 used to be. Details of the under-chassis layout are given in the photograph. The regeneration control, R_1, has been moved from the center to the rear lip of the chassis, as it is more convenient to have R_1 accessible from outside the cabinet. Variations in supply voltage sometimes affect the performance of the detector, especially if R_1 is adjusted so that the detector is just superregenerative. If the supply voltage falls off slightly, Q_2 may cease to oscillate.

Adjustment and Use

Tuneup and checkout is pretty much the same as it was with the earlier model. Several MPF102s were plugged in at Q_2, and despite the usual variations in transistor characteristics all units worked properly. R_1 had to be touched up slightly on a couple of tries, and the tuning of C_2 needed minor readjustment to maintain the same frequency setting. If any difficulty is encountered in securing superregeneration, C_4 may have to be replaced by a unit of slightly larger value. Usually, 20 pf. will be the maximum capacitance needed to make Q_2 oscillate. However, 10-pf. worked well with all transistors tried.

L_2 should be tuned for peak response while listening to a weak signal; R_1 should be set for maximum detector sensitivity; when it is properly adjusted, a loud rushing sound will be heard from the speaker. The hiss noise should remain constant as C_2 is tuned through its range. If it does not, advance R_2 slightly until the condition is met. If any so-called dead spots are found in the tuning range, the chances are that the r.f. stage is too tightly coupled to the detector. Moving the 10-pf. coupling-capacitor tap nearer the cold end of L_3 should resolve the problem.

Performance tests showed that the receiver has good immunity to cross-modulation and overload. When used with a 125-foot end-fed wire at the writer's QTH, no spurious signals could be heard despite the close proximity of several TV, f.m., and a.m. broadcast stations. The sensitivity is good; a 0.3-μv. 30-percent modulated signal produced a perfectly audible response from the speaker. The selectivity is such that a 1000-μv. signal occupies approximately 400 kc. of the band. Weaker signals occupy less space.

Care should be taken to prevent burnout of Q_1 when the receiver is in the immediate vicinity of a 6-meter transmitter. A shorting-type coaxial relay should be used for antenna switching when the receiver is used in combination with a transmitter. The relay should short-circuit J_1 when the transmitter is activated. QST

R.F. CLIPPERS FOR S.S.B.

Observations on Measurements and On-the-Air Performance

BY WILLIAM SABIN, WØIYH *

Increased talk power on s.s.b. at the same peak-envelope power, with a *reduction* in out-of-channel splatter. R.f. clipping and filtering is the answer. And it doesn't take complicated circuits.

It has been verified, through extensive tests, that the ordinary voice contains high-amplitude peaks which are about 14 db. greater than the average level. It is also recognized that voice-communication systems are often peak-power limited. For example, a certain single-sideband linear amplifier will handle 2000 watts peak power before it flat-tops, even though it can handle 1000 watts average. From these facts, one infers that the natural voice may not provide the maximum utilization of the equipment. Let's say it another way: the *talk power* [1] is not as great as it could be if the peak-to-average ratio were not so high. If we can elevate the average level without overloading on peaks, the weaker components of the voice become more prominent. The result is that in a noisy, or cluttered, channel a higher level of *articulation*, or understandability, is achieved.

In order to reduce the peak-to-average ratio it is necessary to modify the signal waveform. This inevitably leads to distortion of the voice signal. This distortion reduces the articulation. From all of this we conclude that the best method of speech *processing* is the one that gives the greatest increase of talk power and the least distortion.

A figure of merit for speech processors is the ratio of peak signal to r.m.s. noise which is required for a given degree of articulation. For example, one system may require a ratio of 10 db. for an articulation index of 0.3. If an audio compressor is used, perhaps only 7 db. will be required.

Fig. 1 is a comparison of three different methods of speech processing used in s.s.b. work. The audio compressor had an attack time of 0.005 seconds and a release time of 0.5 seconds. As these time constants are shortened, the performance approaches that of the audio clipper. The r.f. compressor had 0.001 seconds attack time and 0.2 seconds release time (typical of a.l.c. circuits). As these time constants are shortened, the performance approaches that of the r.f. clipper.

Not all the possible schemes are shown in Fig. 1. This article is concerned only with "simple" techniques. Moreover, the type of audio limiting described by Schleicher [2], which might be called "simple," has not been considered here.

Fig. 1 shows an advantage of several db. for r.f. clipping, for 20 db. of processing, over its nearest competitor. This article is concerned with this type of processing. At this point, previous material should be reviewed.[3,4,5]

Sideband Clipper Performance

Fig. 2 is a block diagram of the setup that was used to study the r.f. clipper. The measurement equipment was all of very high quality. The transmitter and receiver were standard amateur gear with the clipper unit outboarded.

Fig. 4 shows a two-tone envelope, measured right at the point of clipping, after various amounts of clipping. Note that the peak-envelope signal remains nearly equal to the single-tone envelope of Fig. 5. The clipped envelope is quite flat. At large amounts of clipping, the peak-envelope signal is nearly the same as the average. That is, the peak-to-average ratio of the envelope approaches zero db.

Fig. 6 shows the output of the second filter for the single tone and for a two-tone signal with 20

* % Collins Radio Company, Cedar Rapids, Iowa.

[1] *QST* January, 1954, Page 19.

[2] Schleicher, "A Passive Limiter," *QST*, December, 1966.

[3] Craiglow, et al. *IRE Trans.* Audio, Nov. 1961.

[4] Squires and Clegg, "Speech Clipping for Single Sideband," *QST*, July 1964.

[5] Pappenfus, et al. *Single Sideband Principles and Practice*, Chapter 20. (McGraw-Hill).

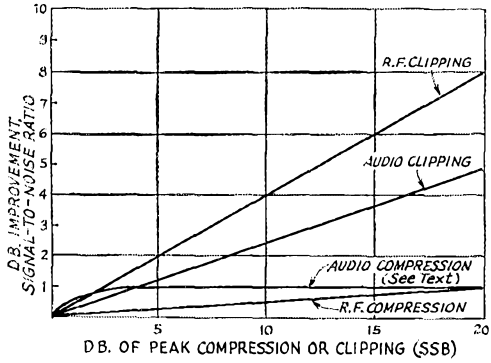


Fig. 1—Comparison of simple single-sideband speech processing methods.

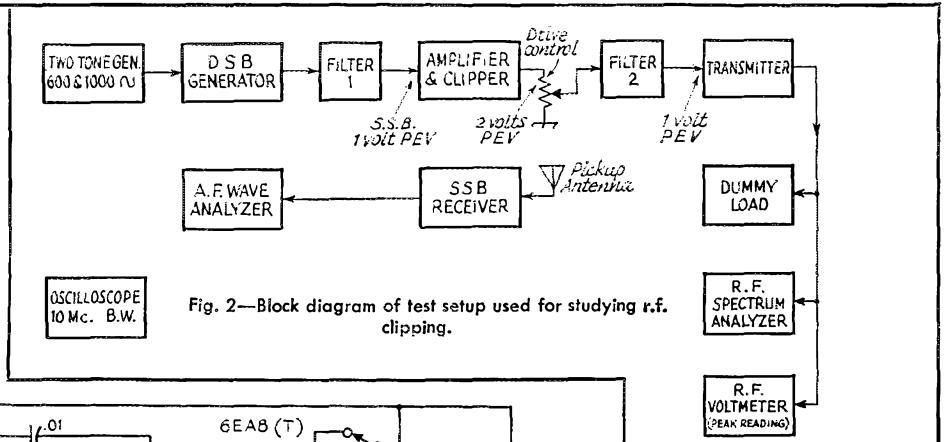


Fig. 2—Block diagram of test setup used for studying r.f. clipping.

EXCEPT AS INDICATED, DECIMAL VALUES OF CAPACITANCE ARE IN MICROFARADS (μf.); OTHERS ARE IN PICOFARADS (pf. OR μμf.); RESISTANCES ARE IN OHMS; K = 1000.

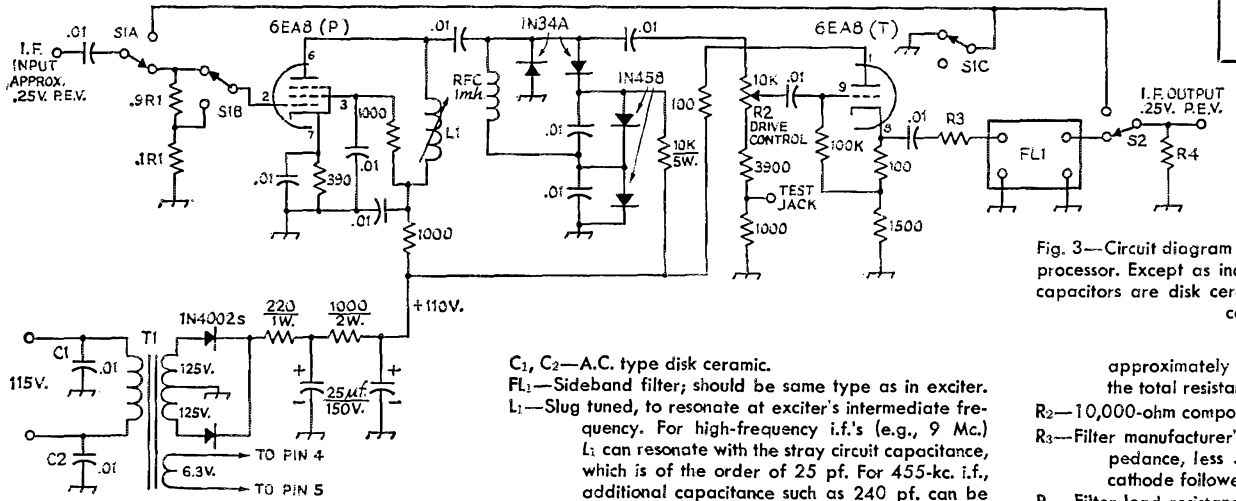


Fig. 3—Circuit diagram of the single-sideband r.f. speech processor. Except as indicated by polarity (electrolytic), capacitors are disk ceramic; fixed resistors are ½-watt composition.

C_1, C_2—A.C. type disk ceramic.

FL_1—Sideband filter; should be same type as in exciter.

L_1—Slug tuned, to resonate at exciter's intermediate frequency. For high-frequency i.f.'s (e.g., 9 Mc.) L_1 can resonate with the stray circuit capacitance, which is of the order of 25 pf. For 455-kc. i.f., additional capacitance such as 240 pf. can be used in parallel with L_1. Approximate inductance values are 15 μh. for 9 Mc. and 500 μh. for 455 kc.

R_1—Load resistance for filter (in exciter) as recommended by filter manufacturer. Sections shown represent approximately 90% and 10%, respectively, of the total resistance.

R_2—10,000-ohm composition control, linear taper.

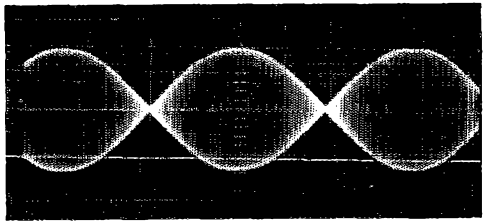
R_3—Filter manufacturer's recommendation for source impedance, less 500 ohms (output impedance of cathode follower).

R_4—Filter load resistance recommended by manufacturer for FL_1. (0.1 megohm for Collins mechanical filter).

S_1—3-pole, 2-position ceramic switch.

S_2—1-pole, 2-position ceramic switch.

T_1—250 volts c.t., 25 ma. (Knight 54 A 2008).



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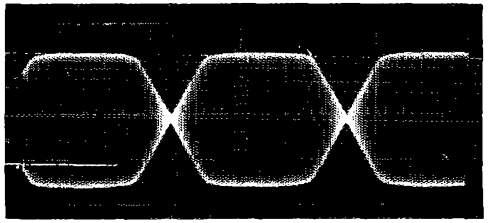

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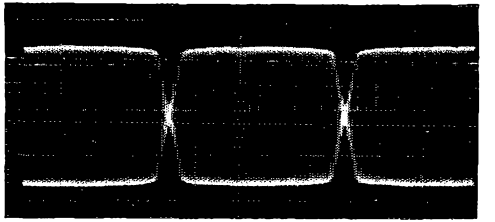

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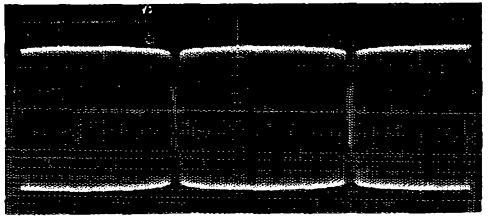

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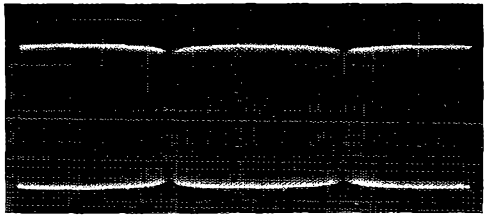


(E)

Fig. 4—Two-tone envelope patterns with various degrees of clipping. All patterns taken at the test jack at the clipper output (Fig. 3), using tones of 600 and 1000 c.p.s. A—at clipping threshold; B—5 db. of clipping; C—10 db. of clipping; D—15 db. of clipping; E—20 db. of clipping.

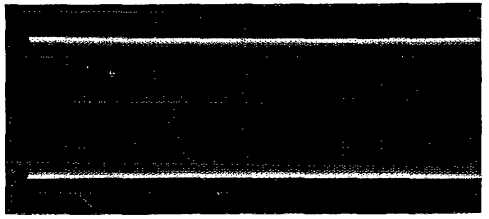
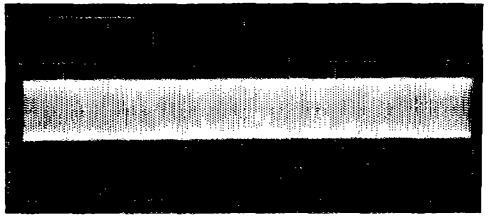


Fig. 5—Single-tone envelope measured at test jack.



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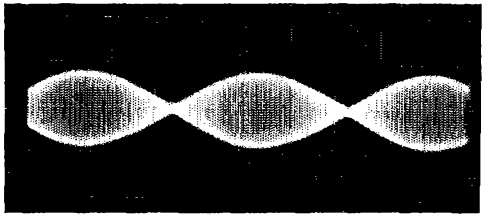


(B)

Fig. 6—Envelope patterns at filter output: A—single tone; B—two-tone envelope, same frequencies as Fig. 4, with 20 db. of clipping.

TABLE I

Wave Analyzer Data Receiver Output

	Two-Tone Source	S.S.B. Receiver	0-db. R.F. Clipping	10-db. R.F. Clipping	20-db. R.F. Clipping
f_A 600 c.p.s.	0 db.*	0 db.*	0 db.*	0 db.*	0 db.*
f_B 1000 c.p.s.	0 db.*	0 db.*	0 db.*	0 db.*	0 db.*
$2f_A$ 1200 c.p.s. (2nd harm.)	−70 db.	−50 db.	−48 db.	−46 db.	−42 db.
$2f_B$ 2000 c.p.s. (2nd harm.)	−80 db.	−50 db.	−48 db.	−46 db.	−41 db.
$2f_B-f_A$ 1400 c.p.s. (3rd order)	−75 db.	−35 db.	−26 db.	−11 db.	−10 db.
$3f_B-2f_A$ 1800 c.p.s. (5th order)	−80 db.	−45 db.	−40 db.	−20 db.	−17 db.

* Normalized

db. of clipping. Several interesting things are illustrated by these photos. For one thing, the heavily-clipped two-tone signal is restored to almost the original form, except for distortion products which lie in the passband of the filter. Secondly, the peak-to-average ratio of the restored waveform is almost equal to its original 3 db. These things happen because the filter rejects all of the out-of-band distortion products.

Now, from the photographs, we make the following measurements. At the input to the filter, we see that the two-tone peak (20 db. of clipping) is 2 percent higher than the single tone. At the *output* of the filter, the two-tone is 31 percent higher than the single tone. The net increase through the filter is 29 percent. Theory predicts 27 percent. Voice waveforms exhibit approximately the same effect, and this fact must be considered when adjusting the transmitter. If we tune up and adjust clipping on a single tone, we will flat-top like mad on voice. This situation is aggravated by the higher d.c. plate and screen voltages which are available on speech as compared with single tone.

We now look at the output of the receiver with a wave analyzer. Thus we are duplicating an actual communications setup and examining what comes out of the loudspeaker. We are looking at *in-band* distortion products. The results are listed in Table I. The quality of the two-tone audio source and the receiver are included, for reference. Looking first at the column for zero db. of clipping, we see that the harmonic distortion is very good, and the third and fifth order intermodulation products are pretty good. Proceeding to the 10-db. column, we see that the harmonic distortion is hardly affected, but the intermodulation products get larger. We have now put the finger on why r.f. clippers sound better than audio clippers. Audio clippers add a lot of harmonic distortion as well as "intermod." In the r.f. clipper, the harmonic distortion appears at multiples of the filter frequency, and is therefore rejected.

Proceeding to the 20-db. column, we see that the intermod products increase only slightly. This in itself is very interesting and is substantiated fairly well by listening tests. The harmonic distortion is degraded a little, because in this particular test we deliberately drove the audio cir-

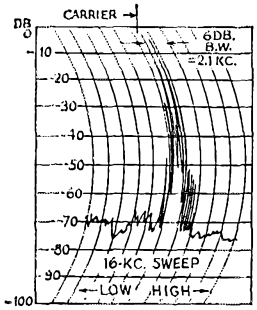


Fig. 7—Spectrum distribution of two-tone signal, exciter only, no clipping. Filter 6-db. bandwidth 2.1 kc. Sweep width 16 kc.

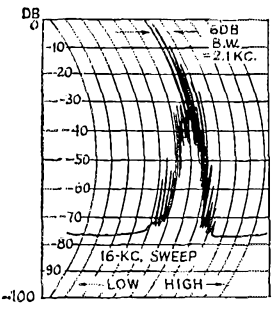


Fig. 8—Two-tone spectrum, 20-db. clipping with circuit shown in Fig. 3. Filter 6-db. bandwidth 2.1 kc. Sweep width 16 kc.

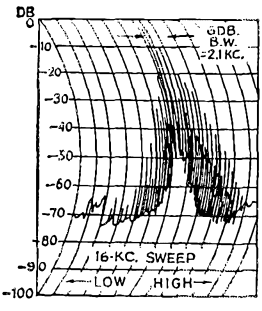
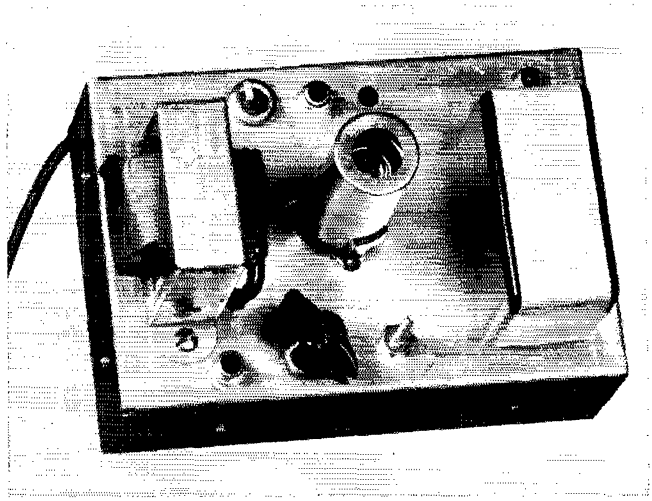


Fig. 9—Two-tone spectrum, 20-db. clipping, no output filter (measured at test jack in Fig. 3). Filter 6-db. bandwidth 2.1 kc. Sweep width 16 kc.



The outboard s.s.b. clipper built by the author is on a 6 × 4 × 2-inch chassis. The filter is at the right; the test jack, drive control, and slug-tuned coil are along the edge at the bottom. The chassis wall at the top in this photo is bolted to the rear of the exciter cabinet in normal use. This model does not have the bypass switch S_1 in Fig. 3.

cuitry in the exciter harder. The data shows that this is all right, as long as we don't overdrive the balanced modulator or run into hum problems.

Figs. 7, 8 and 9 are spectrum sweeps (16 kc. wide) measured at the output of the transmitter. The filter response is indicated. We see that with 20 db. of clipping, Fig. 8, the out-of-band performance is acceptable, in terms of present-day amateur practice. The particular exciter used for these tests was a fairly inexpensive unit, and does not represent the best that can be had. Aside from all of this, it is a fact that the complete absence of flat-topping, despite the high average level, is a great big plus mark for the r.f. clipper.

It is interesting to see what the "garbage" looks like if we leave out the second filter. See Fig. 9. Surprisingly enough, the intermod. products are down at least 65 db. at each end of the 16-kc. sweep. If higher pitched tones had been used, the results would have been worse looking. Nevertheless, the higher-order products do drop off rather quickly. Still, the second filter should be of good quality, and should have low leak-through, outside the pass band.

Transmitter Adjustment

When first starting out with a clipper it is easy to get confused. Because of the irregular behavior of meters and scope patterns with speech signals, it takes some headscratching and experience to know what is going on.

The best place to begin is to tune up the rig on a two-tone audio signal with the clipper in the "tune" position. The level of the two-tone signal should be set just below the point at which clipping begins (see Fig. 4A). This measurement is made with a scope at the clipper test jack. The drive control and all succeeding adjustments may then be set for best output and linearity, in the usual way. If a.l.c. is used the peak envelope signal should be set, using the drive control, right at the point where a.l.c. begins. If the peak-envelope voltmeter to be described later is used, it may now be adjusted for ten percent deflection.

Now switch over to microphone input. Turn up the mike gain until the same peak output is indicated on the output monitor scope. The a.l.c. meter will flicker occasionally and the peak-envelope voltmeter will show occasional activity. Now turn the switch on the clipper to the "clip" position. You now have about 20 db. of peak clipping. While talking steadily into the microphone, adjust the drive control so that the proper peak level is maintained. The peak-envelope meter will kick up on scale very frequently and the final plate meter will kick up to a level which is just about equal to that obtained in the two-tone test. That is to say, on voice peaks the peak-to-average ratio will approach 3 db. for short intervals.[6] The ratio over a longer period will be about 9 db.

The mike gain control can be used to make minor adjustment of clipping. A little experience will enable the operator to set the gain for good quality and lively meter action. Avoid the temptation to run the gain way up. The rig won't flat-top, of course, but distortion and room noise can become excessive and communications effectiveness is hardly improved at all.

Any change of gain after the clipper due to mistuning or line-voltage changes will cause the peak level to become too high or too low. The peak voltmeter makes a good monitor for this condition. If a.l.c. is applied to the exciter after the clipper, it can be used to adjust the drive level. One or two db. of fast-attack, slow-release type a.l.c. should be used. If a.l.c. is applied ahead of the clipper, it will be worthless.

The Clipper Circuit

The signal at the input of the clipper unit should be about 0.25 volt peak envelope. The signal at the clipper diodes should be enough to

[6] See page 160, *Single Sideband for the Radio Amateur*, 3d ed., 1962, "Power Ratings," by L. Norton.

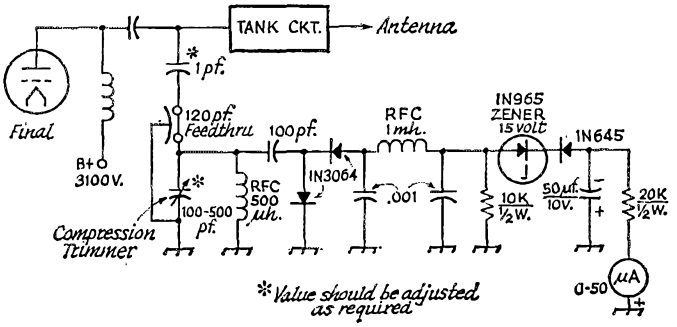


Fig. 10—Peak-envelope voltmeter circuit. Resistances are in ohms; K = 1000. Capacitor with polarity marked is electrolytic; other fixed capacitors are ceramic or mica.

make up the loss in the drive control, cathode follower and filter, and to drive the rig to full output. In the exciter used by the author, one volt peak envelope was enough. The diode clipper circuit shown gives flat clipping, good symmetry and freedom from rectification effects which can spoil the clipping symmetry during the transient conditions encountered in speech waveforms. An important feature is that the clipping level is independent of line-voltage fluctuations. Also, hard, flat clipping prevents overloading the transmitter on the strongest peaks.

From the above it can be seen that for 20 db. of clipping, a total voltage increase of forty (32 db.) is required. The amplifier should be biased so that the control grid does not go positive on peaks. The inductor L_1 in the plate circuit resonates with stray capacitance, about 25 pf., at the i.f. frequency. This adjustment may be made with a small one-tone input. Before clipping, the plate load is essentially 15,000 ohms. During clipping the plate load drops to less than 100 ohms. After all adjustments are complete, recheck the resonance of the tuner circuit.

Finally, on c. w. it is best to switch the clipper out of action altogether.

Construction

The clipper unit is built on a small chassis which is bolted to the exciter cabinet for good grounding. The coax leads must be kept very short to prevent distortion of the filter response. Leakage paths around the filter must be eliminated by careful shielding and lead dress. The filter should be kept away from both a.c. and d.c. magnetic fields. A soft-iron cover for the filter may be needed. Stray r.f. from high-power amplifiers should not be allowed to sneak in and gum up the works.

Peak-Envelope Voltmeter [7]

Fig. 10 shows that the peak-envelope voltmeter consists of an adjustable capacitive divider from the plate of the amplifier to ground, a rectifier, an r.f. filter, a zener diode and isolation diode, a 50-μf. storage capacitor, and a 0-1 voltmeter. The principle of operation is that if the peak-envelope signal exceeds the zener voltage, the capacitor will charge up quickly, causing the meter to "hang up". After several syllabic peaks the meter will give a pretty good indication of peak-envelope voltage. The adjustable capacitor should be set for about ten percent deflection of the meter. The quantity being measured is the r.f. voltage supplied to the plate load. After the initial adjustment, previously described, it makes a good tuning and loading indicator. A glance at its activity also tells you if the drive and clipping are adequate (or too much).

[7] Bruene, "Directional Wattmeters", *QST*, April 1959.

Results

When you build a gadget like this, you start out in a wave of optimism. You are going to knock 'em dead on the DX phone bands. However, after battling it out with the gang, you become a realist again. (*Will I ever beat those stacked Yagis in Saddle Brook??*)

The following statements tell the story for a good 20-db. r.f. clipper:

1) *If* you start out with good, clean audio and a high-quality microphone, the signal has a crisp, clean communications quality with a very high degree of articulation. You get a lot of "solid copy" and "perfectly readable" reports.
2) Clipping is most effective under very weak-signal conditions. It is also helpful (but apparently no panacea) in the big pileups. For ordinary state-side ragchews it provides effortless readability. The clipper has definitely *improved* the author's competitive capability in DX chasing.
3) The clipper provides a very excellent way of keeping amplifiers linear and clean, even in the "heat of battle."
4) In the author's opinion, and according to the best laboratory data available, the r.f. clipper is significantly better than any *simple* audio compressor.
5) It also requires that you dig into the exciter and do a little work. You don't just "plug it in."
6) An additional sideband filter is required. They are somewhat expensive.

Acknowledgments

Many thanks to Mr. R. Craiglow for reviewing this material and to Mr. Larry Wilson, WØKVL, who helped out with the measurements. QST

The L-Match for 2-Meter Yagi Arrays

Adjustable Independence-Matching Balun for Split Dipoles

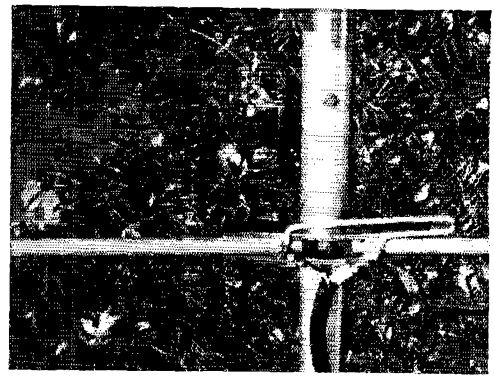


Fig. 3—The L-Match as installed by W4KAE.

THERE are many ways to match the driven element of a Yagi array to its feed line. To select a method we must first decide whether the element is to be one piece, or broken at the midpoint. The former is the more common in v.h.f. arrays, but there may be mechanical or electrical advantages in the broken dipole.

Whichever type of driven element is used, if it is to be fed with coax there must be some provision for converting from the unbalanced line (coax) to the balanced load represented by the dipole. Various types of baluns are often used for this purpose. The coaxial types described in most information on v.h.f. arrays are not suitable for feeding a broken dipole in a v.h.f. Yagi, since the impedance is always too low to be fed with a balun that gives either a 1:1 or 4:1 impedance transformation. The boot-shaped inductive stub shown here was devised by Ralph Campbell, W4KAE, for the dual purpose of raising the driven-element impedance and balancing the r.f. power in the two halves of the dipole.

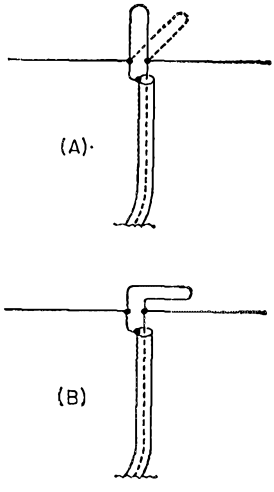


Fig. 1—Evolution of the L-Match. Perpendicular loop, solid line, raises feed impedance, but leaves problem of unbalance unsolved. Moving loop to the right partially corrects balance. Boot-shaped loop, B, combines impedance-matching and balun effects.

If the question of balance is ignored, an inductive stub of U shape, solid line in Fig. 1A, can be used in conjunction with a shortened driven element, to effect an impedance match between the transmission line and a driven element of lower impedance. Such a stub tried by W4KAE in a 2-meter Yagi having a two-piece dipole fed with coax gave something approaching an impedance match, but left the problem of balance unsolved. Checks with an r.f. probe showed that the portion connected to the inner conductor was hot with r.f., but the other side was practically cold. In effect, the driven element was acting like the fed portion of a ground-plane antenna,

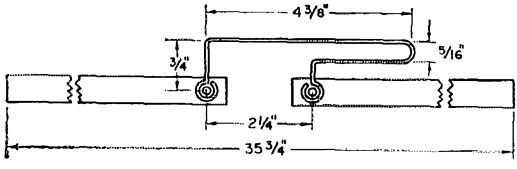


Fig. 2—Dimensions of the L-Match used with a broken dipole in a 15-element 145-Mc. Yagi. Dimensions vary with frequency and driven-element impedance, but those shown should be average values.

with the other half and the metal boom acting like the radials.

When the loop was bent toward the side of the dipole that was connected to the inner conductor of the coax, (broken line in Fig. 1A) the balance of power in the halves of the dipole improved, and the s.w.r. indication on the line went lower than could be obtained with a perpendicular stub. This led to experiments with a boot-shaped loop, Fig. 1B, varying the position of the "toe" with respect to the hot half of the driven element. Soon nearly perfect balance was achieved, and the s.w.r. indication on W4KAE's bridge was brought down to 1.05:1, as measured in the line at the antenna. Presumably very careful adjustment of the length of the driven element, and the length and position of the stub,

(*Continued on page 150*)

The Verti-Vee

Omnidirectional Antenna Combination for Short and Long Distances

BY STIRLING M. OLBERG,* W1SNN/AF1SNN

Base insulator and mounting for the vertical radiator.

SPACE for radiating systems has never been a problem at the author's station in the past. However, an affiliation with the Air Force MARS program recently increased the number of antennas needed, threatening to make the area available look like a spider web.

An appraisal of the situation indicated that omnidirectional radiators would be desirable, both for local-area nets as well as for longer-distance work. A vertical antenna was indicated. However, while the vertical is good for distances of 1000 miles or more, as every DX hound knows, it is not so effective for local stuff (400 to 600 miles).

So, what next? Well, an inverted-vee dipole had always worked great between Framingham and Kentucky, and the like. It occurred to me that I might solve the problem by having a vertical for DX, and using the inverted-vee type dipole for short-haul work. To conserve space, a 36-foot base-fed vertical might be used as the support for two 40-meter inverted vees oriented at right angles to provide all-around short-range coverage. The vees could serve as guys for the vertical.

In spite of discouraging opinions from other hams in the area who predicted that the three antennas would intercouple so that the hoped-for performance would not be obtained, I decided to go ahead with the "Verti-Vee."

Ground System

First of all, an earlier disappointing experience with a vertical had indicated that a good ground field is an absolute requirement. So, a pattern of 36 aluminum wires (aluminum clothes line), each 75 feet long, was laid out to radiate from the hub of a circle around the base of the vertical. These radials were set 10 inches into the ground. All radials were joined together at the hub, and connected together at 10-foot intervals, forming an underground spider web. I am sure that the success of this antenna lies largely in this effort.

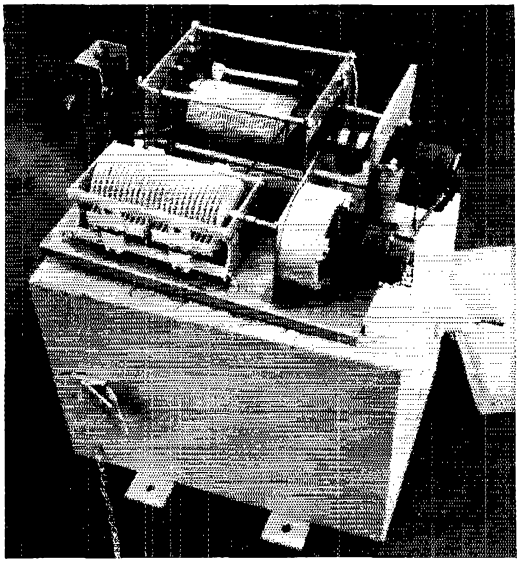
At the time the radials were installed, a length of semirigid vinyl-coated coaxial cable was buried so that one end came out at the hub of the radials, while the other end terminated at the operating position. A 12-conductor cable, protected by plastic pipe, was also included in this buried installation.

Antennas

At the hub of the radials, a 6-foot section from an old triangular steel tower was sunk 3 feet into the earth. A giant beehive deck insulator (from a battleship), designed to support a telescoping vertical radiator (from the same source) was mounted on the tower section. Since neither the insulator nor the collapsible antenna are common commodities, suitable substitutes will probably have to be used by others. The base insulation should be reasonably good if the vertical is to be used on other than the 40-meter band, because on certain bands some rather high voltages can appear at the base if a fair amount of power is used. It would also probably be advisable to erect a picket fence, or other barrier, around the base to avoid a possible hazard to curious trespassers. Since telescoping is not a requirement, the vertical can be made up of sections of TV masting, or similar material. It should be fairly rigid, however, to bear the strain of the dipoles attached to the top.

A pulley is mounted at the top of the vertical, and nylon sisal rope is used to hoist the apexes of the two inverted vees. The two coax lines from these dipoles are held away from the vertical

*79 Apple D'Or Rd., Framingham, Mass. 01701.



The motor-driven inductor and capacitor used for remote tuning of the vertical antenna are normally housed in the weatherproof box on which they are resting in this photo.

a distance of 1 foot at the base by means of tie ropes. The outer ends of the dipoles are tied to supports that provide 90-degree angles at the apexes, and the two dipoles are oriented at right angles, one running north-south, the other east-west. They were cut for the same frequency, using $490/f_{Mc}$. to determine the total length in feet, and then pruned for minimum s.w.r. The vertical is 36 ft. long.

Tuner for Vertical Antenna

Two small reversible motors are used in the remote tuner for the vertical. See Fig. 1 and photograph. The rotary coil has a maximum inductance of about 25 μh. It is a surplus unit having 26 turns of No. 14, double spaced, 3 inches in diameter. A 5-turn link was added at the ground end. The capacitor has a maximum capacitance of about 200 pf. This capacitor should have a voltage rating (plate spacing) about the same as the tank capacitor in your final amplifier.

The driving motors are small reversible surplus with gear boxes. The shaft speed of the one driving the coil is 26 r.p.m., and the motor is rated at a torque of 30 ounce inches. The one driving the capacitor has a shaft speed of 2 r.p.m., and a torque rating of 16 ounce inches. Suitable motors are obtainable from a number of sources, such as Barry Electronics, 512 Broadway, New York; Lectronic Research Labs., 715 Arch St., Philadelphia; or Herbach and Rademan, 1204 Arch St., Philadelphia. A potentiometer-type remote indicator, similar to the one shown on page 32 of *QST* for May, 1967, is used for the inductor. No indicator for the capacitor is necessary, since it is capable of continuous rotation. The relays are coaxial types.

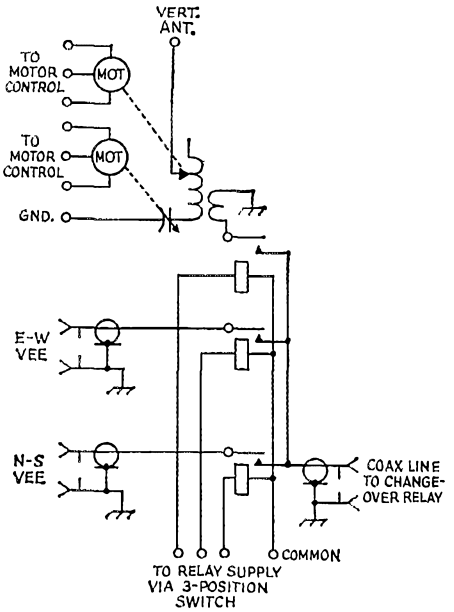


Fig. 1—Remote antenna switching and tuning system. Components are discussed in the text.

Results

Judging from the results obtained on 40 meters, intercoupling appears to be negligible. The inverted vees are very effective over short distances, and the marked change in signal amplitude that is often observed when switching from one dipole to the other is most rewarding. Signals from extremely distant stations invariably increase in strength when the vertical is switched in. Signal-strength reports usually show a minimum improvement of 3 db., and frequently the improvement is greater than this. I have used the vertical with its tuner most successfully on MARS RTTY circuits at frequencies as low as 2 Mc.

Of course, the installation involved a lot of work, and the cost wasn't negligible. But things worthwhile seldom come easily or cheaply. QST

Strays

The 6th Annual QRP QSO Party will be held from 0200 on August 19 to 2300 GMT on August 20 (with a limit of 20 hours operating time). *Frequencies:* 3540, 7040, 14,065, 21,040, 28,040 and 50, 350 kc. on c.w.; 3855, 7260, 14,260, 21,300, 28,540, and 50,350 kc. on a.m./s.s.b. *Exchange:* QSO nr., RST, ARRL section and QRP nr. (NM for non-members). *Scoring:* Each DX contact counts as 5 QSOs. Included in DX listings are VO1, VO2, VE8, KH6, and KL7 but not VE1 through VE7. Multiply total contacts by the total number of different sections and countries combined. Power multipliers, 21–30 watts — 1.2, 11–20 watts — 1.6, 1–10 watts — 2.0, and under 1 watt — 5.0. Certificates will be awarded. Mail all logs to K8TBR, 817 Springdale Drive, Charleston, W. Va. 25302 postmarked on or before September 23, 1967.

The WØEPV Squeeze Keyer

A Different System of Character Formation

BY JIMMY MOSS,* W5GRJ

The completed squeeze keyer. The two controls at the right are for side-tone volume (above) and pitch. A 1⅛ × 3-inch cutout in the area above the monitor tubes is covered with a piece of perforated metal.

THIS is the long-promised unveiling of the WØEPV Squeeze Keyer, Ed Brown's remarkable gadget that has kicked up a right smart bit of talk on the c.w. bands for longer than a year, now. It has passed all initial tests and is now ready for the acid test — an evaluation by the whole gang.

This new electronic keyer is different — so different, in fact, that it may change the whole concept of keying code. This does not mean that the new technique is difficult to master. So far, it has taken an average of about three weeks for one to learn the new system, and bring his code speed up to his customary level. The majority of users enthusiastically stamp an approval on this keyer, acclaiming it superior to anything yet developed.

The outstanding feature of the WØEPV keyer is its "single-dot memory and injection" system. This feature makes the keyer capable of forming any letter, except X, with only one closure of a double-lever key. Called "squeeze" keying, this method of character formation has proved most effective, since the entire character is created electronically, practically assuring machine perfection. The operator is responsible only for the spacing between letters and words, the keyer being responsible for the individual characters.

Endowed with other features that provide a high degree of reliability, the keyer is still simple enough to encourage home-brewing. The circuitry calls for only four dual triodes, one transistor, and about a dozen diodes (in the keyer proper) in simplified logic configurations. Construction and adjustment should present very few, if any headaches for the average builder. To my knowledge, at least seven keyers have been built by fellows across the country, and only two were failures, both caused by carelessness, or possibly something less than explicit instructions. I built 26 keyers, and only one failed to function properly when first plugged into an a.c. outlet. All keyers have been in operation for as long as a year and a half, and not a single failure has been reported.

The keyer is very versatile. It can be used in the conventional manner with a single-lever key, and its performance will be found to be exceptionally good, since the perfection of each dot and dash is assured by a shaping circuit not found in other keyers. A pleasant surprise, however, awaits the operator who ties a double-lever key to the front end of the keyer and starts using the "squeeze" technique, for which this keyer was designed. It is nothing less than a genuine pleasure to turn out such good c.w. with so little effort.

Oscillator

The circuit of the keyer proper is shown in Fig. 1. The oscillator (V_1) circuit is of the blocking type. It generates control signals for the other circuits. The rate of generation of these signals is determined by the setting of the speed control, R_3. The oscillator has an input keying terminal K, and three output terminals P1, P2 and ST. The oscillator starts functioning when the K terminal is grounded (through Q_1). The output at P1 is a narrow negative pulse, about 1 millisecond in width. This pulse appears at the beginning of each oscillation cycle. The output at P2 is a positive pulse, coincident with that at P1. The main output signal is taken from terminal ST, and is sawtooth in shape, with a steep negative-going front, the decay extending over practically the full oscillation period.

Flip-Flops

Flip-flop FF_1 functions during dash-signal generation, and flip-flop FF_2 during the injection of a dot between dashes. (Neither functions during normal dot generation.) The two circuits are identical. Each has two input terminals (labeled S for "set" and R for "reset") coupled to the grids of the triode sections. These terminals are also the output terminals from which the plate signals are coupled out.

* Box 442, Natchitoches, Louisiana 71457.

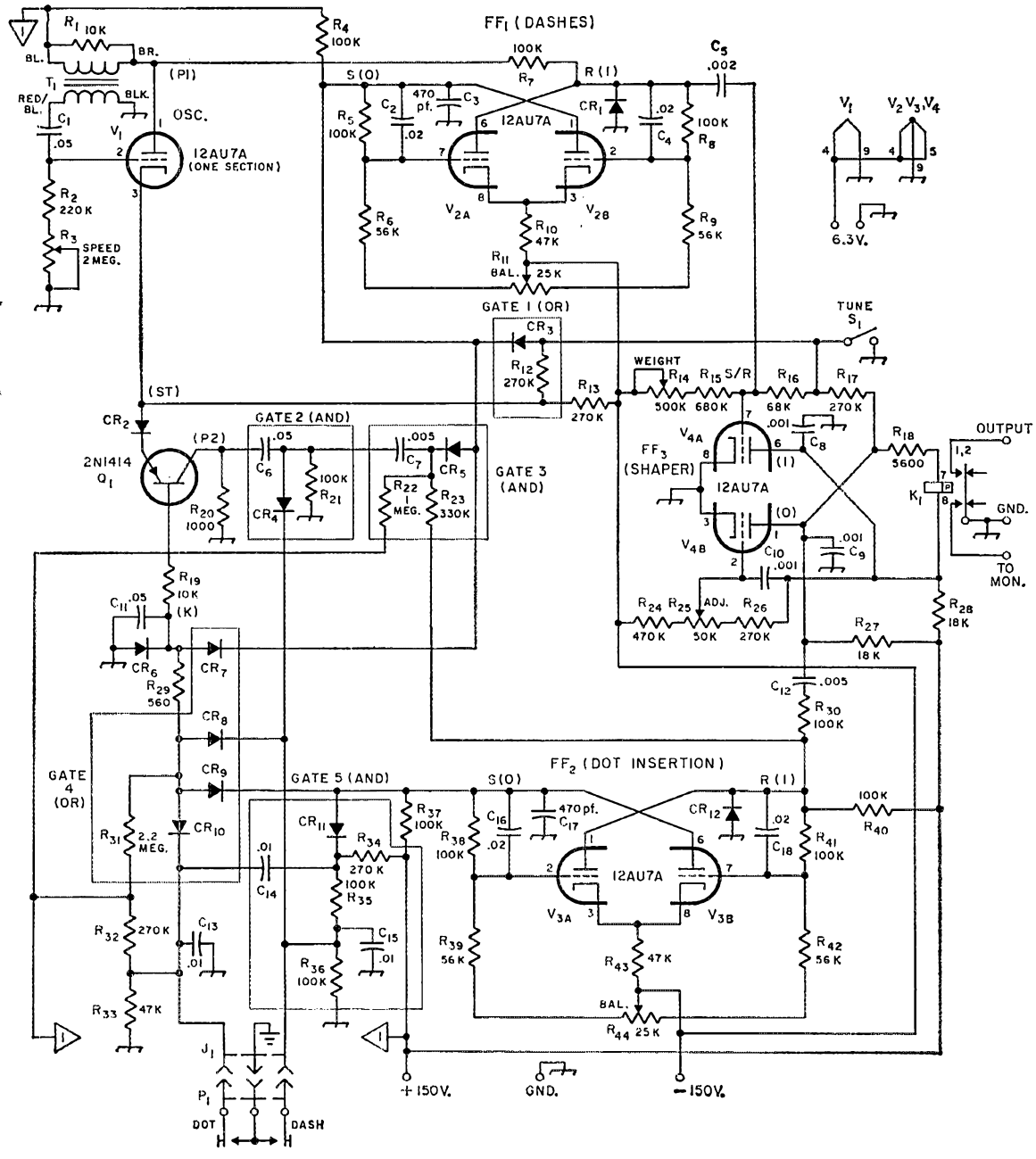


Fig. 1—Circuit of the WØEPV electronic keyer. Unless indicated otherwise, capacitances are in μf. and resistances are in ohms (K = 1000). Fixed resistors are ½-watt. With the exception of C_3 and C_{17}, which are disk ceramic, all capacitors are Mylar (Mallory PVC). All diodes are 400-p.i.v. (International Rectifier 10D4).

J_1—Two-pin female receptacle (Amphenol 80-PC2F).

K_1—Polarized relay, 4000-ohm coil (Clare HGP-1003, Potter & Brumfield JML-5200-81).

P_1—Male plug to fit J_1 (Amphenol 80-MC2M).

R_3—Special taper control (Centralab F3-2 Meg.). A linear taper control may also be used with some sacrifice in ease of adjustment.

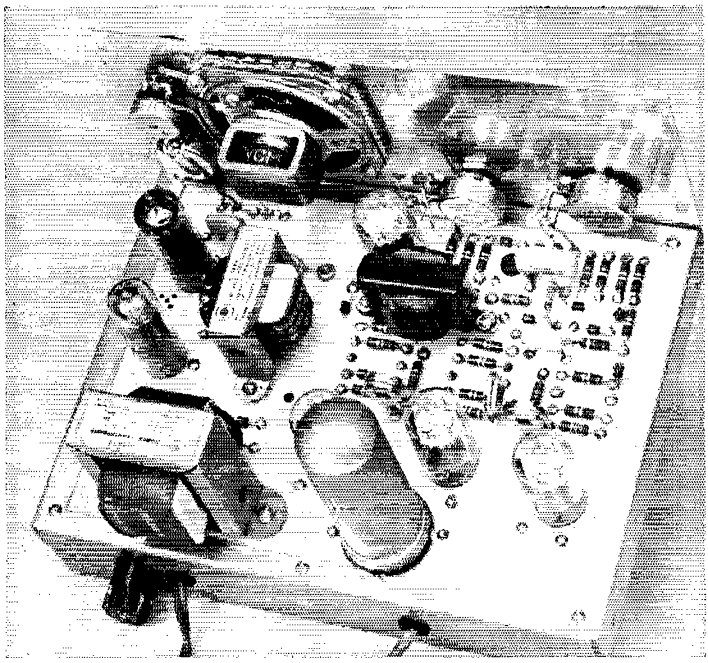
R_{11}, R_{25}, R_{14}—Linear-taper control (Mallory MTC).

R_{14}—Linear control, conventional type.

S_1—S.p.s.t. toggle switch.

T_1—5-watt modulation transformer (10,000 ohms to 10,000 ohms (Triad M-1X).

Other component designations are for text-reference purposes.



Top view of the squeeze keyer. Progressing from right to left, and from top to bottom are:

First row—R_{35}, R_{32}, R_{36}, R_{33}, C_6 (which hides CR_6 and R_{20}), Q_1, CR_2, R_{12}, R_{13}, and R_2.

Second row—R_{34}, CR_{11}, CR_9, CR_4, C_7, CR_5, R_{19}, CR_3 (largely hidden by T_1), and CR_1 (to left of T_1).

Third row—R_{22}, C_{12}, R_{16}, and R_7 (partially hidden by T_1).

Fourth row—CR_{12}, R_{41}, R_{17}, and R_8.

Between fourth and fifth rows —R_{42}, and R_9.

Fifth row—R_{38}, R_{25} (control), R_{26}, and R_5 (partially hidden).

Sixth row—R_{39}, R_{14} (control), R_{24} (partially hidden), R_{11} (control), and R_6 (partially hidden).

Across the back of the chassis, from right to left, are V_3, V_4, K_1, V_2 (largely hidden), and T_2. Grouped at the upper left are T_3, V_5 and V_6. T_1 and V_1 are at the upper center.

In the normal, or idle, condition the grid of V_{2A} is biased so that V_{2A} is conducting heavily, bringing its plate to ground potential, logic state (1). The grid of V_{2B} is at cutoff bias, and the plate of V_{2B} is at a positive potential, logic state (0). This state of the flip-flop is defined as the "reset" state. A negative pulse fed to the grid of V_{2B} at the R terminal will have no effect so long as FF_1 is in the reset state, since the pulse merely drives the grid further into the negative region. However, a negative pulse fed to the grid of V_{2A} at the S terminal will drive the grid to cutoff. The circuit will then flip, causing the plate of V_{2B} to go to ground, and the plate of V_{2A} to go positive. This is defined as the "set" state. The circuit will now flop, and be returned to the reset state, if a negative pulse is applied to the reset terminal R. FF_2 operates in a similar manner.

The shaper circuit, another flip-flop, FF_3, with polarized relay K_1, generates the output signal, and has control of the mark-to-space ratio. The input terminal S/R ("set/reset") of the shaper circuit is normally at a positive potential. Under this condition, the (0) output terminal is more positive than the (1) terminal, and the direction of current through the coil of the relay, connected between the two plates of V_4, is such as to hold the relay contacts in the spacing condition.

When the potential of the S/R terminal is drawn negative, the circuit abruptly switches the relative potentials of the output terminals, reversing the direction of current through K_1, and operating the relay to its marking condition. The circuit and relay will revert abruptly to the spacing condition as the potential at the S/R terminal reaches a critical value in its swing back into the positive region.

Gates

Two *OR* gates (Gates 1 and 4), and three *AND* gates (Gates 2, 3, and 5) are employed. The *OR* gates function in passing any negative signal from the multiple inputs to the common output. The *AND* gates, with the exception of Gate 2, will pass a signal to the output only when both inputs have a negative signal present. Gate 2, in effect, generates a negative pulse with the presence of a positive pulse and a negative control input. The gates provide signal coupling from inputs to output without coupling the input-signal sources together. Where series capacitors appear in the signal leads, only the transitional portions of the signals are coupled.

Dot Generation

When the dot lever is closed, the base of Q_1, which is normally back-biased positive, is grounded through CR_{10}, turning Q_1 on. This grounds the cathode of the oscillator through CR_2 and R_{20}, turning the oscillator on. The negative sawtooth signal from oscillator output terminal ST passes Gate 1, and immediately switches the shaper and relay to the marking condition. Near the midpoint of the sawtooth cycle, the critical level at the input terminal of the shaper circuit is crossed, terminating the marking period. Should the dot lever still be closed at the end of the sawtooth period, the cycle will be repeated, and another dot will be generated.

Neither FF_1 nor FF_2 can operate during normal dot generation. P1 will not trigger FF_1 because FF_1 is already in the reset state. Gate 2 cannot generate a negative pulse, which would set FF_1,

because the pulse is blocked by the positive voltage from the dash-lever line. The pulse that triggers FF_2 (a transient from the dot-lever circuit) cannot reach FF_2 because Gate 5 is also held closed by this positive voltage.

Dashes

Closing only the dash lever grounds the base of Q_1 through CR_8. The resulting sawtooth signal from ST switches the output circuit to marking as when generating a dot. However, closing the dash lever also removes the positive potential at the input to Gate 2, allowing it to generate a negative pulse from the P2 pulse. The input to Gate 3 is already at ground potential because it is connected to the R terminal of FF_2 which, at this instant, is in (1) state (ground potential). Gate 3 therefore also passes the P2 signal, and transmits it to the S terminal of FF_1, causing FF_1 to flip to the set state. This switches the S terminal of FF_1 to ground, in turn grounding the input of the shaper circuit through Gate 1. Thus the shaper input circuit cannot swing positive, and the relay is held in the marking condition for the remainder of the sawtooth cycle. The ground from FF_1 is also fed, via CR_7 in Gate 4 to the base of Q_1, so that Q_1 and V_1 remain on, even though the dash lever may have been released before completion of the first sawtooth period.

At the start of the second sawtooth period, the P1 pulse from the oscillator resets FF_1, removing the ground from the input of the shaper. (Should the dash lever be held closed, a set pulse will also be applied to FF_1 about 1 millisecond later from P2. However, the time constants of the cross-coupling circuits in the flip-flop will not permit the circuit to change state so soon after being reset, so FF_1 remains in the reset condition.) The second sawtooth period now keeps the shaper and relay on mark until the shaper switches to spacing at the mid-point of this second sawtooth period. If the dash lever is still closed at the end of the second sawtooth cycle, the whole process is repeated and another dash is formed.

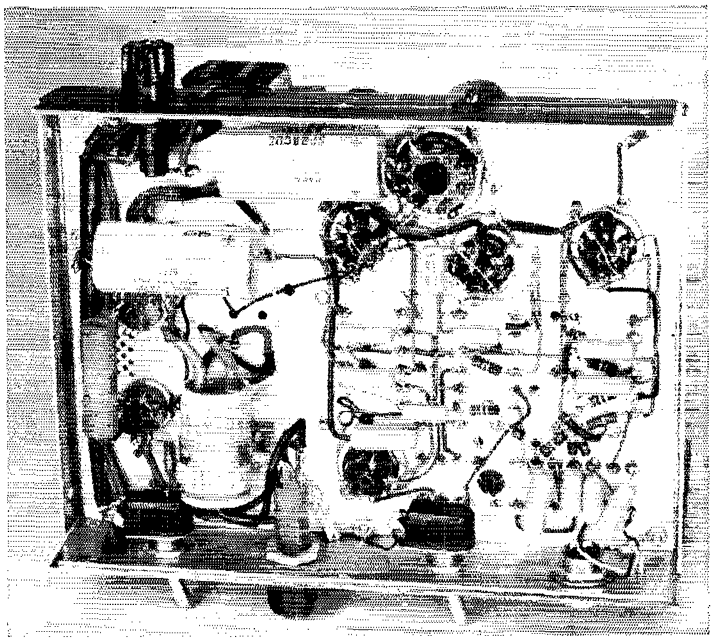
From the above, it may be seen that the dot length is equivalent to one half of the sawtooth period (the first half), the length of the following space is also one half period (last half), while the dash is 1½ periods long. It is obvious that this method of forming the dot and dash establishes their relative lengths independently of the oscillator repetition rate.

With the dot lever closed, the operation of the dash lever merely enables Gate 2 without affecting the oscillator or its output to Gate 1. This permits a transition from dot to dash generation without the introduction of mark or space distortion.

Dot Insertion

If, while generating dashes, the dot lever is closed, the negative transient generated by the closure will pass Gate 5 (which is now open because of the grounded dash lever) and set FF_2. With FF_2 set, Gate 3 cannot pass pulse P2, and therefore FF_1 cannot be set. Consequently, the next output signal generated will be a dot. FF_2 is reset by the next space-to-mark transition from the shaper, the front of the dot so injected.

With both key levers still closed, the keyer reverts to generating dashes, since only a re-operation of the dot lever with the dash lever held closed will trigger FF_2 to the set condition again. If both levers are released immediately after FF_2 is set, the oscillator will be held on by the ground at the set terminal of FF_2 until



Bottom view. At the center, from top to bottom are C_2, R_4 (largely hidden), R_1 (partially hidden), C_4, C_5 (slightly to the right), and C_1. To the immediate right are C_{10}, R_{28} (largely hidden), R_{27}, R_{15}, CR_7 and Q_1. To the extreme right are C_{16}, R_{37} (completely hidden by C_{16}), R_{40}, C_{18}, R_{30} (completely hidden by C_{18}), R_{23} (partially hidden), R_{31}, R_{29}, CR_8 (right), and CR_{10} (left). Grouped in the lower right-hand corner, from left to right, are C_{11}, R_{21} (largely hidden), C_{13}, C_{15} and C_{14}.

C_8 and C_9 are mounted at the V_4 socket (center). R_{10}, and C_3, R_{43} and C_{17} are mounted at the sockets of V_2 (left) and V_3 (right), respectively. R_{18} is mounted at the relay socket. R_{50} may be seen above the toggle switch (S_2) to the left. A series of ventilating holes should be drilled in the circuit board immediately above the large resistor (R_{51}) at the left.

the stored dot has been initiated. Opening the keying circuit of the oscillator after the cycle has been initiated will not affect the sawtooth signal being generated. This, along with the keying interlock with the flip-flops, assures self-completion of signals.

The power-supply circuit is shown separately in Fig. 2, and the circuit of the side-tone monitor in Fig. 3. Early models of the keyer were built without the monitor. However, most of those who duplicated the keyer wanted to include side tone. The circuit shown fills the bill, but you may want to substitute one of your own. The keyer circuit proper is designed to provide a constant load from the supply with key open or closed, to avoid the need for voltage regulation. Operation of

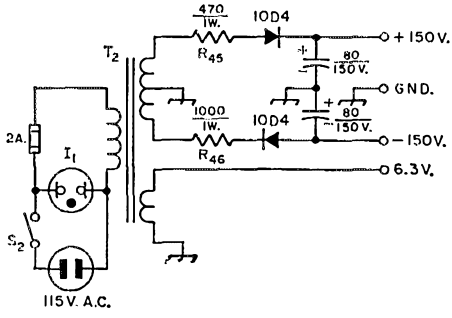


Fig. 2—Diagram of the power supply for the squeeze keyer. Capacitances are in μf.; resistances are in ohms. Capacitors are electrolytic. Diodes are 400-p.i.v. (International Rectifier).

I_1—115-volt neon pilot lamp.
S_2—S.p.s.t. toggle switch.
T_2—Power transformer: 250 volts, c.t., 25 ma.; 6.3 volts, 1 amp. (Thordarson 22R39, Stancor PS-8416).
Other component designations are referred to in the text and/or photo captions.

the monitor from the keyer supply might upset this balance. For this reason (and also because the power transformer is already loaded to its maximum rating), the monitor is operated (in this instance) directly from the line in "a.c.-d.c." fashion. Such an arrangement is permissible in this case, since the a.c. line is isolated from the cabinet. However, some may prefer to make room for a small isolation transformer, or mount it externally. A transistor monitor would be another possibility. Removal of the monitor tubes would provide space for a small transistor supply, and also reduce the considerable heat generated in this section.

Construction

Most of the essential constructional details should be evident from the photographs and their captions. The unit is housed in an LMB type W1C cabinet which includes a 6 × 8 × 1½-inch chassis. The top of the chassis is cut away, leaving only ⅜-inch lips along the front and rear edges, and ¼-inch lips along the sides.[1]

The main lines of eyelets are spaced ¾ inch, while the individual holes in the lines are on ¼-inch centers. This makes it convenient to use ¼-inch graph paper in laying out a drilling template (see board photograph). Be sure to leave adequate space around the edges of the board so that the peripheral eyelets will clear the chassis lips. The eyelets (or tubular rivets) are 0.121 inch in diameter and 3/16 inch long (General Cement/Walsco). The eyelet holes are made with a ⅛-inch drill. The eyelets are flared on the top side of the board, using a wide-angle center punch. The board should be backed up with a flat metal plate while doing the flaring. Do not flare the eyelet more than necessary to hold it firmly in place, otherwise the eyelet may split and spoil the appearance.

Most of the assembly and wiring can be done before the board is mounted in the chassis. The tube sockets should be mounted first, using eyelets as rivets, since they make convenient grounding points. The three interior controls (R_{11}, R_{25}, and R_{44}) should be installed next. These are mounted by soldering their terminals directly to eyelets which are arranged in a triangular group to match the control terminals. These groups are indicated in the board photo.

When mounting the fixed resistors, don't make right-angle bends in the terminal leads; simply

[1] Subsequent experience has shown that the power transformer runs cooler if the small chassis area where the transformer is mounted is not cut away, so that the transformer rests on the metal.

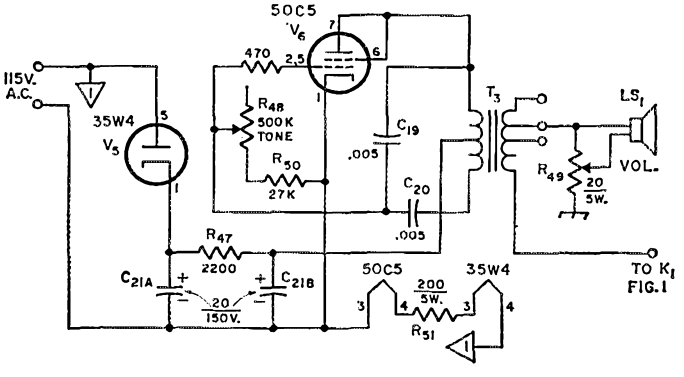
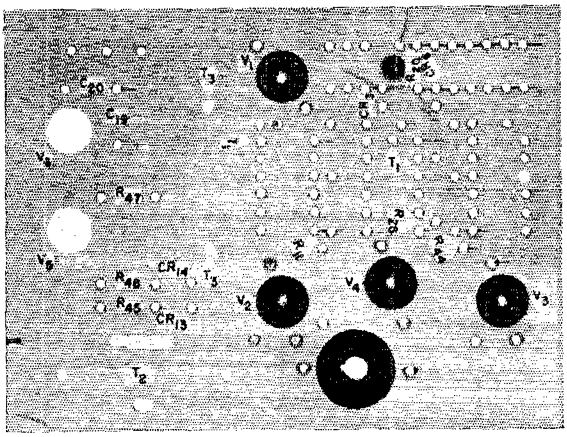


Fig. 3—Circuit of the side-tone oscillator section. Capacitances are in μf.; resistances are in ohms (K = 1000). Unless indicated otherwise, resistors are ½-watt. C_{19} and C_{20} are 400-volt Mylar. C_{21} is a dual-section electrolytic. R_{48} and R_{49} are linear controls. T_3 is a 4-watt universal output transformer, 4000- to 14,000-ohm c.t. primary (35 ma. d.c.); tapped voice-coil secondary (Stancor A-3856). Use full primary; select secondary tap for desired speaker volume. LS_1 is a 2½-inch speaker. Note: Only the single ground connection shown at R_{49} should be made.
Other component designations are referred to in the text and/or photo captions.



The $7^{15}/_{16} \times 5^{15}/_{16}$-inch component board is made up of two sheets of kitchen-counter Formica, back to back. Brass eylets, set in ⅛-inch holes, serve as tie points. The main rows of eyelet holes are ¾ inch apart. The holes in the rows are on ¼-inch centers. Labels identify the transformer mounting holes, and the location of some of the components not visible in the top-view photo of the assembled unit. The terminals of interior controls R_{11}, R_{25}, and R_{44} are mounted by soldering their terminals to the triangular groups of eyelets indicated.

form them into a soft curve with the fingers until they fit the eyelet spacing. Pull the leads from the other side of the board until the resistor is reasonably snug against the board. Then bend the leads out at right angles to hold the resistor in place until it is time to secure it with solder. Do the same thing with capacitors and diodes.

Do not apply solder to any eyelet until you are sure that all wires going to that eyelet are in place. Use a small-size soldering iron, or a soldering gun with the tip filed to a point. A heat sink should be used when soldering diode leads. Mueller "Micro-Gator" clips make good heat sinks for this purpose; ordinary alligator clips are too large to be used in tight places. After an eyelet has been soldered, allow the solder to cool; then make a finished appearance by placing a drop of solder on the top-chassis end of the eyelet.

As the components are mounted, it may be a good idea to identify each with pencil or ink on the board (or on a sticker of "invisible" Scotch tape). This should help considerably in the final-wiring stage, since there are several identical components. Perhaps the best wiring procedure is to select a junction in the diagram, and make all connections to this junction before proceeding to the next junction, checking the connections off on the circuit diagram as the connections are made. For instance, one end of R_7, Pin 6 of V_2, the cathode of CR_1, one side of C_4, one end of R_8, and one side of C_5 may be connected as one step. Remember to tie together the three plus terminal points shown in Fig. 1.

I mounted T_1 and T_3 in eyelets. A No. 4 machine screw was fastened in each mounting hole of the transformers with a nut. The shank of the screw was then filed down until it would pass through the eyelet. The screw was then soldered in the eyelet, elevating the transformer, as necessary, to clear any component in the area. I also used larger eyelets as tie points for the a.c.-line and power-switch connections. To avoid exposure of the tie points on top of the board, the eyelets were inserted in the bottom layer of the board only, with the heads of the eyelets in between the two Formica sheets. A conventional tie-point strip could be substituted, of course.

Only one precaution need be taken with the wiring. The side-tone audio leads should be kept well away from the keyer wiring proper. Neglecting to do this resulted in the single case of initial failure mentioned earlier.

Adjustment

Before applying power to the keyer, check the wiring thoroughly. Then set the weight control to midposition. Adjust the balancing controls (R_{11} and R_{44}) fully clockwise (relative to the "case" side of the control).

Now turn on the power. As soon as the tubes come up to temperature, the keyer should produce a continuous string of dots with both paddles open. If not, try adjusting R_{25}. If this doesn't correct the situation, start looking for errors in wiring, or poor soldered connections. Check the voltages from the power supply, both positive and negative. Check the oscillator operation by connecting a voltmeter from Pin 3 to ground. You should get a pulsating reading of about 18 volts negative. The continuous string of dots must be obtained at this stage, otherwise the keyer is not going to work.

When the string of dots is obtained, adjust the weight control until the dots "sound" right. Then turn R_{44} to a point where the dots just stop. You should now be able to key only dots with either control lever. If not, check the keying leads from the paddle all the way to the transistor base. Check the voltages at the levers. The reading from the dot lever to ground should be about 5 volts less than the voltage at the dash lever. The voltage at the latter should be reasonably close to 25 volts. The voltage on either lever should drop to zero when the lever is closed. If not, the lever ground connection is open.

Assuming proper operation as described up to this point, hold the dash lever closed and turn R_{11} counterclockwise until dashes start. Note the point where the dashes first start and keep turning the control counterclockwise until the relay remains closed. (This explains why the control was set initially fully clockwise; if it had not been set sufficiently clockwise, it might not have been possible to obtain dots for the first check.) Note the point at which the relay stays closed; then set the control midway between this point and the first one mentioned above.

You should now have control over both dots and dashes, and you should be able to key in conventional fashion. This might be a good point at which to adjust the weight control carefully, either by ear or by using an ohmmeter across the relay contacts in the usual manner.

The next step is to adjust for proper dot injection. Set the speed control to minimum, and close the dash lever. Keep this lever closed for the entire adjustment. Now also close the dot lever, and adjust R_{44}. At some point in the adjustment, you should hear a single dot injected in the string of dashes, after which the continuous string of dashes will resume. Try opening and closing the dot lever several times. Each time, you should hear the single dot injected. For the final adjustment, turn R_{44} counterclockwise, while the dot lever is being operated, until there is no dot injection at all. Then turn the control slowly clockwise again until a single dot is consistently injected. Now turn the control very slightly more in the clockwise direction. Make sure that an occasional second dot is not injected. A little experimenting with this adjustment will put you right on the nose. You are now ready to attack squeeze keying.

Operation

"Squeeze" keying is exactly what the term implies — a squeezing movement of the thumb and forefinger is applied to the two levers of the key to form each character. It takes only one squeeze per character, except for the letter X. Since the keyer cannot distinguish between squeezes if they are all alike, the operator must direct the keyer in the formation of any particular character. This is done with a timing difference in the closing and opening of levers. The relative timing is clearly shown in the chart of Fig. 4.

Before trying to form characters, it would be advisable to become familiar with the basic action of the keyer. First, turn the speed control to slow speed, and hold the dot lever closed to produce a string of dots. Then, with the dot lever still held closed, close the dash lever. You will find that the dash lever overrides the dot lever, causing the keyer to shift to dashes. This means that in sending any character starting with a dot, the dot lever need not be released until the end of the character.

Now try squeezing the two levers together briefly at approximately the same time, but with the dot lever leading by a hair. The result should be an A. A slightly longer squeeze of the same kind should give you a W. A still longer squeeze will produce a J, and a yet longer squeeze, a numeral 1.

After you have practiced these characters for a while so that they come easily, proceed to other characters starting with a dot. Letter R is made with an A squeeze, but with the dot lever released a bit late. Letter L is made in the same manner with the dot release a bit later still.

Letter P is made with a W squeeze, but with the dot release a bit tardy.

Letters U and V, and numeral 4 should be easy. Make these characters as you would an A, but with a progressively lazier closing of the dash lever. Maintain the squeeze technique by holding the dot lever closed until the end of the character. Numerals 2 and 3 are made like a U and V, respectively, but holding the squeeze a bit longer.

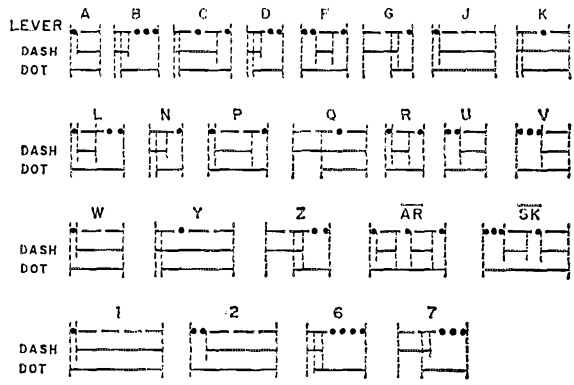


Fig. 4—Chart showing lever timing in the formation of various characters with the squeeze keyer.

Letter F is made like a U, but delaying the release of the dot lever a bit. Practice each step as described until you get the hang of it.

Now turn to the characters starting with a dash. Letter N is made with a single squeeze similar to the A squeeze, but with the accent on the dash side — close the dot lever a hair later than the dash lever. Letters K and Y are a breeze. Simply hold the N squeeze a bit longer for the K, and a little longer still for the Y. (Here is where the single dot injection really comes to light!) Letter C is made similarly to a Y, but by releasing the dash lever a little ahead of time.

The characters consisting of all dots or all dashes are made in the conventional way, of course. Practice the letter G by making an M and squeezing the dot lever just before the end of the M. The dot memory will add the dot at the proper interval. (The dash lever need not be released until the end of the character.) Letter Q can be formed by simply prolonging the squeeze on a G. Numeral 9 is made in a manner similar to that used for the G, delaying the squeezing of the dot lever until the fourth dash has started.

Letters D and B and numeral 6 are made with an N squeeze, but with an increasing delay in the release of the dot lever.

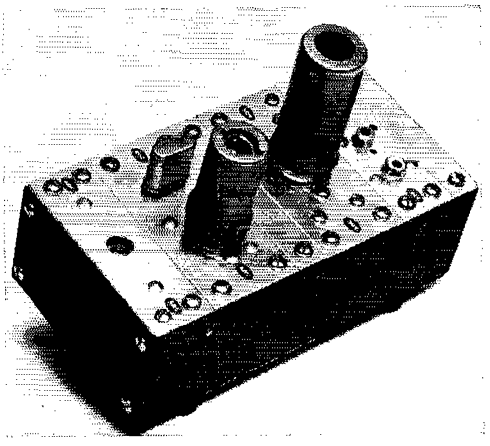
Letters X and Z, and numerals 7 and 8 are made in conventional style, although you will find that the dot memory makes the timing of the transition from dashes to dots less critical. The chart of Fig. 4, which indicates graphically the manner in which various characters are formed, illustrates this latitude.

All operators who have used the keyer for an extended period agree that the dot-injection feature contributes far more to easy and accurate keying than its mere description would imply. In fact, I think that I have brought about a "first" in telegraphy — ham or commercial. By virtue of the ease with which the keyer can be mastered, I can do the keying with my toes! Excusing an error here and there, each character is flawless, and I can attain a speed of about 23 w.p.m., actual timing. As far as I can determine, this feat has never been accomplished before.

(Continued on page 154)

A Transceiving Converter for Less Than $30

BY JOHN L. CLARK,* W2MJI



View of the assembled transceiving converter. Modular construction is used throughout the unit.

After missing countless contacts on 20-meter sideband because of the time it took to zero beat the BC-458 v.f.o. with the SX-101A receiver, touch up the 20A exciter's mixer stage, and peak up the linear-amplifier grid tuning, I was tempted to replace the whole works with a transceiver. Then I realized that there was really no point in discarding a perfectly good c.w. and sideband receiver and exciter when the real problem was the length of time it took to get them both working on the same frequency. The obvious answer was to devise some way to do this automatically.

The SX-101A instruction booklet states that the incoming signal is heterodyned with the output of the first-conversion oscillator in the first mixer stage. The first-conversion oscillator operates 1650 kc. higher than the incoming signal. Thus, to tune from 14 to 14.35 Mc., the SX-101A oscillator would tune from 15.65 to 16 Mc. The 20A exciter contains a 9-Mc. master oscillator. The external BC-458 v.f.o. produces 5- to 5.5-Mc. output which is mixed with the 9-Mc. oscillator output to produce 14- (9 + 5) and 4- (9 − 5) Mc. outputs. Therefore, if we could convert some of the 15.65-Mc. output of the SX-101A oscillator to 5 Mc., and inject the 5-Mc. output into the exciter, it would mean that when the receiver was tuned to 14 Mc. the exciter would also be tuned to 14 Mc. Simple arithmetic indicated that a 10.65-Mc. crystal would provide the necessary conversion, but would it?

*724 Locksley Road, Yorktown Heights, N. Y. 10598.

The crystal in the 20A is rated as 9000 kc. ± 1 kc. The SX-101A oscillator nominally operates at 1650 kc. above the incoming signal, but how exact is that? Finally, what about the ± 1-kc. calibration tolerance we'd expect to get in a moderately-priced 10.65-Mc. 0.01 percent crystal?

This business of cumulative tolerances didn't sound too good. Just on a hunch we posed the question to the International Crystal Company. They promptly replied that they could supply a 10.65-Mc. crystal with a calibration tolerance of ± 0.005 percent and a complete crystal-oscillator subassembly with a built-in trimmer, C_1 of Fig. 2, for zeroing the crystal to the desired frequency. We also discovered that they stock a high-level mixer assembly, and slug-tuned coils.

I checked the junk box and decided that I'd be ahead in terms of both dollars and frustration if I built the entire oscillator/mixer assembly from the commercially-available subassemblies. However, this was more a reflection of the state of my junk box than an indication of the complexity of the circuitry, which is quite straightforward and conventional.

As shown in the block diagram, Fig. 1, 10.65-Mc. output from the crystal oscillator is mixed with 15.65-Mc. output from the receiver oscillator to produce a 5-Mc. output. This signal is amplified by a buffer stage and then fed into the 20A exciter. The same principle may, of course, be applied to other receiver-exciter combinations if you have a stable receiver.

The Circuit

Circuit details are shown in Fig. 2. The sections separated by dotted lines and designated

An interesting solution to the problem of how to "transceive" with separate receiver and transmitter combinations is offered here by W2MJI. Although this modular converter is set up for use with specific types of equipment the principle adopted by the author should be applicable to other units, as well. Modification of the crystal-oscillator frequency will be necessary if the receiver has a different i.f. from the one described in this article.

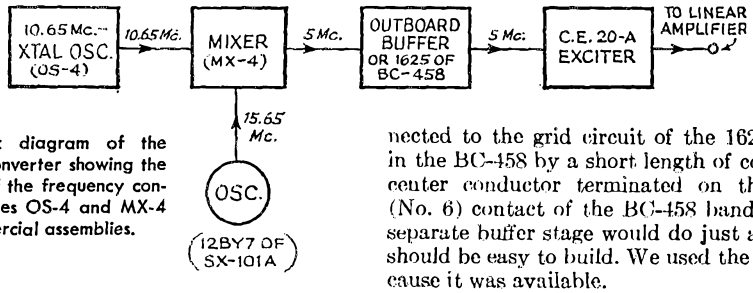


Fig. 1—Block diagram of the transceiving converter showing the progression of the frequency conversion. Modules OS-4 and MX-4 are commercial assemblies.

OS-4, MX-4 and C-12 are the crystal oscillator, mixer, and slug-tuned coil assemblies manufactured by the International Crystal Company. The crystal is a standard International Crystal type CY-6 unit and the remaining components are standard, readily-available parts.

We took the 6.3-volt heater voltage and approximately 180 volts of B plus from the accessory socket of the SX-101A. (Note: You can use up to 250 volts. If you take the B plus from Pin 7 on the SX-101A accessory socket, be sure to jumper the 100,000-ohm resistor, R_{81}. This resistor is normally shorted out only when the receiver band switch is in the CONVERTER position.)

Pin 7 of the SX-101A's first-conversion oscillator, the 12BY7, is coupled to Pin 7 of the 6BA7 mixer through a 100-pf. capacitor and a short length of coaxial cable such as RG-58/U. The output of the 6BH6 crystal oscillator stage is coupled to the 6BA7 mixer through a 100-pf. capacitor. The output of the 6BA7 mixer is connected to the grid circuit of the 1625 amplifier in the BC-458 by a short length of coax with its center conductor terminated on the movable (No. 6) contact of the BC-458 band switch.[1] A separate buffer stage would do just as well, and should be easy to build. We used the BC-458 because it was available.

Be sure to disable the oscillator in the v.f.o. by removing the 1626 tube or by installing a switch on the B-plus line. If you overlook this, you'll have *two* 5-Mc. injection signals on your hands.

Operation

Adjustment of the equipment is straightforward. Turn on the receiver, BC-458 (less 1626 oscillator stage), exciter and auxiliary oscillator/mixer unit. Set the b.f.o. pitch control on the receiver in the center position and adjust the trimmer capacitor, C_1, in the 10.65-Mc. crystal oscillator stage so that you can hear the exciter output in the receiver. Peak up the 6BA7 mixer coil, L_1, by adjusting the slug, then adjust the tuning dial of the BC-458 for maximum exciter output. (Plugging the converter unit into the BC-458 will throw the BC-458 calibration off

[1] The BC-458 discussed here is a modified version with band-switching capabilities. The switch is not part of the original BC-458 transmitters — *Editor*.

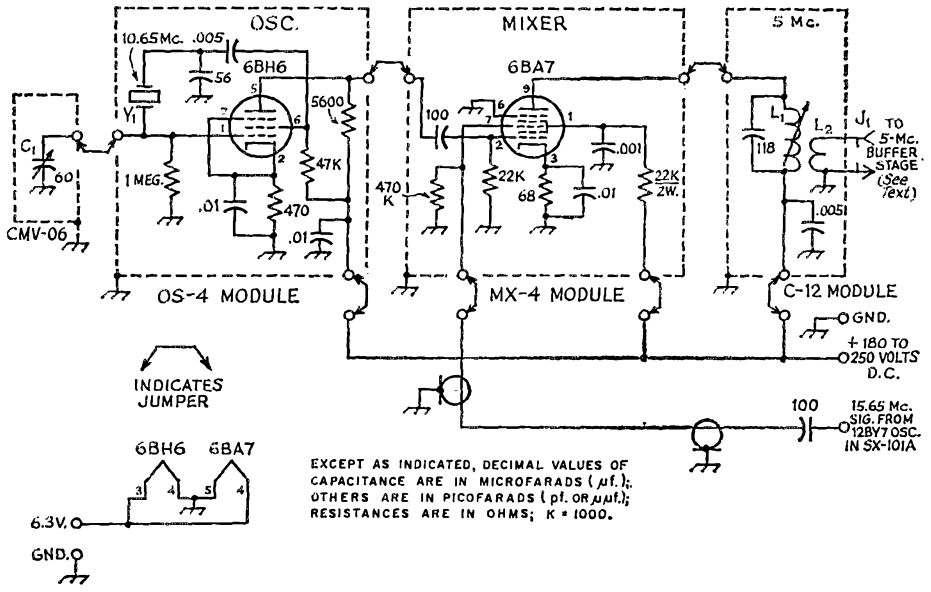
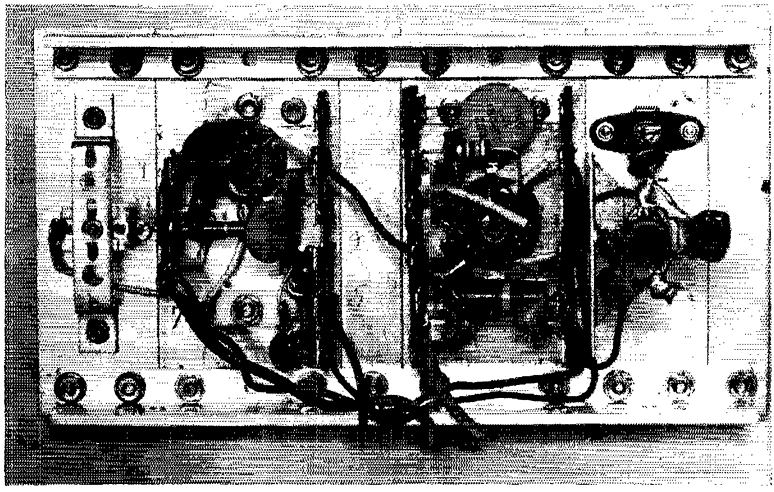


Fig. 2—Schematic diagram of the transceiving converter. Capacitors are disk ceramic. Resistors are ½-watt composition unless otherwise indicated. Modules CMV-06, OS-4 MX-4, and C-12 are available from International Crystal Company.

C_1—8-60-pf. compression trimmer (part of CMV-06).
J_1—Phono connector (part of C-12 module).
L_1, L_2—Part of C-12 module.
Y_1—International Crystal type CY-6.



Underside of the assembled unit. C_1 is at the left, the mixer is at the center, and L_1 is at the right.

quite a bit, but this is unimportant because you will only use the BC-458 dial to make a non-critical peaking adjustment. Then you can forget about it unless you make a substantial shift in frequency.)

Once these adjustments have been made, you'll be able to hear yourself right on frequency no matter where you tune the receiver in the 20-meter band. As an added bonus, you can use the pitch control to provide about ± 2 kc. of incremental tuning. Thus, after you call CQ, you can tune around the frequency with the pitch control, and can also make slight tuning adjustments to improve receiving conditions without altering the transmitting frequency.

To go back to using the BC-458 as a v.f.o., all you need do is energize the 1626 oscillator stage by replacing the tube, or by flipping a B-plus switch, then disconnect the converter by unplugging the cable connecting the 6BA7 mixer to the BC-458.

Costs will vary, depending on what you have on hand. The whole project, including the crystal, oscillator and trimmer assembly, mixer assembly, slug-tuned coil assembly and a matching case, can be completed for less than $30. QST

Strays

Feedback

We goofed in the circuit of Capt. Ellison's article in June *QST* ("An Audio Filter for Speech Reception"). One winding of the 88-mh. surplus telephone toroid has an inductance of 22 mh., not 44 mh. Two toroids in series, one winding being used on each, will give the proper inductance. An alternative is to use the 44-mh. variety of surplus toroid, usually available from the same sources as the 88-mh. type.

—•••—

Think it's rough to stay awake for an SS contest weekend? Think of Randy Laye, K1YGH, who claims the record for continuously playing the organ. K1YGH recently finished a session that lasted 110 hours and 4 minutes. During the marathon he played a total of 1382 pieces!

At a recent dinner meeting of the East Coast V.h.f.-S.s.b. Association, Sam Berlin, WA2CVF, (center) was presented a plaque in recognition for monitoring interest in v.h.f.s.s.b. and as NCS of the Association's net. Making the presentation was Abe Cutlet, WA2ONB, and George Weilenmann, W2REB.

THE ECONOMATCH

BY ROBERT E. ANDERSON,* K1TVF

THE usefulness of the Monimatch-type reflectometer has been proven over and over again. The main advantage of the unit shown here is its one-piece construction, combining the bridge and indicator in one relatively-compact box. In addition it can be built, using all new parts, for less than five dollars and should take even the most inexperienced builder only a couple of evenings to complete. The pick-up element used in the "Economatch" is the same as the one described by McCoy in an earlier issue of *QST*.[1]

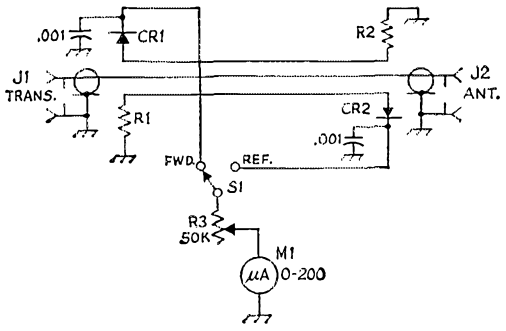
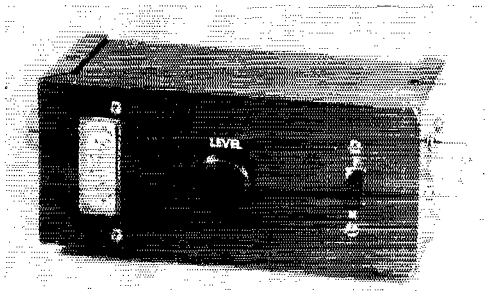


Fig. 1—The "Economatch" circuit. Capacitances are in μf.; fixed capacitors are disk ceramic.

CR_1, CR_2—Germanium diode, 1N34A or equivalent.
J_1, J_2—Coaxial receptacle, chassis-mounting (SO-239).
M_1—Miniature 0-200 microammeter (obtainable from Burstein Applebee, catalog No. 18B345).
R_1, R_2—For 52-ohm load, 68 ohms; for 70-ohm load, 47 ohms; ½-watt composition.
R_3—Miniature linear control, 50,000 ohms.
S_1—S.p.d.t. slide switch.

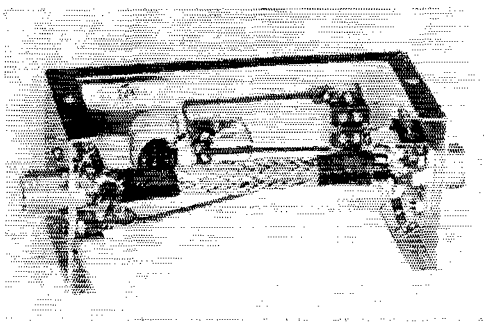
Construction Details

The "Economatch" is built in a 5 × 2¼ × 2¼-inch Minibox. We centered our level control and flanked it by the meter and the switch as shown. The coax connectors are mounted 1½ inches back from the front panel. Rubber feet were added to the box to prevent scratching the operating table. The rectangular holes for the switch and meter can be easily filed out. The meter is mounted by using a U-shaped bracket which is in turn fastened to the front panel with two screws. The U cut-out in the bracket was made with a half-round file. Each coax connector is mounted on the inside of the box, using four screws and lock-type solder lugs.



The pickup unit is made from a 6-inch length of RG-8/U coaxial cable. First the outer jacket is removed and then the copper braid is carefully slid clear. The remaining cable is cut to 4¼ inches total length, and then a 3/16-inch section of the insulating material is removed from each end. The pick-up wires are 4¼-inch lengths of No. 16 enamel-coated wire. It's best to scrape off the enamel about ⅛-inch from each end and tin the leads before assembling the pickup. The pickup wires are then taped to the 4¼-inch length of conductor, each pickup wire on opposite sides of a given diameter. Taping the entire length of the pickup wires will help prevent slipping.

Next, the copper braid is slipped over the entire pickup assembly. Pull the braid at each end until it fits snugly over the conductor.



Interior view of the "Economatch." The meter is partly visible at the left, under its flat U-shaped mounting bracket. Method of grounding the braided sections of the outer conductor of the cable section is shown at each coaxial connector.

*McCoy, "A Versatile Transmatch," *QST*, July, 1965.
[1]103 Hillcrest Ave; New Britain, Conn. 06053

Now tightly wrap a length of electrical tape around the braid and conductor ⅜-inch from each end. Next, twist four braids at each end of the large copper braid until the newly-twisted braids reach the tape. All eight braids should now be tinned. Each of these braids connects to a solder lug mounted on the coax connector. The termination resistors, R_1 and R_2, go directly from the pickup wires to a solder lug. The diodes are connected between the pickup and a terminal strip. Care should be taken when installing the diodes to avoid heat damage, and also to use the proper polarity.

Operation

When construction is completed the unit may be calibrated, if desired. The values given for R_1 and R_2, although nominal, are fine for all but the perfectionist. Remember that the sensitivity control should be set at maximum resistance to start with, to avoid meter burnout.

Should you desire to calibrate the Economatch, a dummy load of known impedance should be used. Observe both reflected and forward readings on the highest band to be used (up to 30 Mc.). If the reflected reading is greater than one division for a full-scale forward reading, the termination resistance in the reflected circuit should be slightly altered — say two or three ohms plus or minus. The symmetry of the Economatch can be checked by reversing the input and output connections. Once you're satisfied with the null the unit is ready to go. Remember, though, the Economatch is only a relative indicator and should be treated as such. QST

Instruction Books, Who Needs Them?

BY ED KIRCHHUBER,* W4NLI

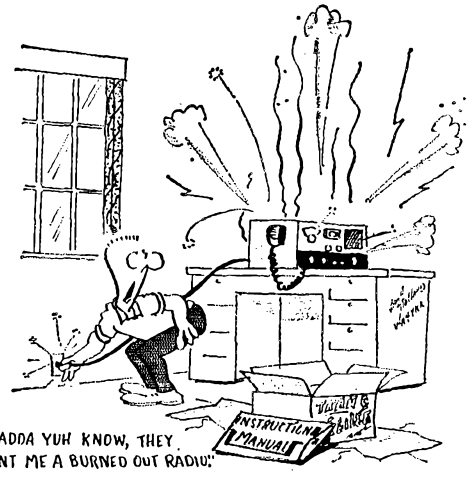
You fellers up there at Headquarters, with all that book learning and smart stuff keep printing in *QST* information like "Read your Instruction Manual" before using complicated equipment.

Well . . . I'm just a hit or miss mechanic and radio fixer but I know you're dead wrong!

For instance, I watch TV a lot, my rig is a day time geterouter — and on that tube I see the war serial, Kombatt. In that series, many durn times our boys come on a German arsenal of weapons and with no training or *reading of instruction manuals* they load the guns and shoot up the enemy. They once found a German tank and discovered the trouble with the engine, repaired same and proceeded to drive the monster through the mine field to wipe out a whole division. All without any durn *instruction manual* reading.

In the outer space program the good guy sneaks into a Martian space ship and manages to lock the doors, blast off and maneuver the ship to a safe landing on top of the Pentagon. And he didn't have any *instruction book*. In the detective-type TV program, our hero was locked in a subterranean cell. He picked the lock with a piece of rusty wire, jammed the intercom system of the jail, escaped to the street, hailed a taxi (foreign-speaking driver) directed him (in sign language, maybe) to an airport where he rented a single-seater jet, flew it to the good-guy country. He had no *instruction book*.

Did you see the thriller "North To The Pole?" They were pulling the sleds themselves, because the dogs froze to death. A blizzard had been raging for two days. Visibility was zero. The boss man stopped in the white nothingness and spoke. "This looks like the place Col. Stapleton of the British Polar expedition camped in 1948." He moves ten feet to find a door knob, the door opens to reveal a ten-by-twenty room completely equipped. The group sets the fires going in the stoves, fixes the lights and then radios back to USA without an *instruction book* or even a frequency adjustment or time schedule consultation.



"WADDA YUH KNOW, THEY SENT ME A BURNED OUT RADIO."

The Postman just brought me a package. It must be my Goose TR4 transceiver. I unwrap the unit and plug the first cord I find into the a.c. line.

Durn thing just sets there and smokes and sparks.

Boy! That quality control at the Goose factory must be snuffin' glue again.

What's this thing? An instruction book. "Place a.c.-d.c. switch in a.c. position."

Wadda yuh know. They sent me a burned out radio. QST

* 2804 Broadview Dr., Huntsville, Ala. 35810

Semi- and Super-Cathode-Driven Amplifiers

BY WILLIAM I. ORR,* W6SAI AND WILLIAM H. SAYER,** WA6BAN

Operating conditions for linear amplifiers exist which offer advantages to the circuit designer and equipment user. Power gain and "feed-through" power of the stage may be varied, and reduced intermodulation distortion is achieved by manipulation of the ratio of cathode to grid drive, as discussed in this article.

In a previous article covering problems peculiar to cathode-driven ("grounded-grid") amplifiers[1] it was pointed out that when well-shielded tubes are operated in cathode-driven circuits in the h.f. region, neutralization is not always necessary for achieving circuit stability in properly designed equipment. If required, neutralization could be easily applied in one or more forms. The cathode-driven amplifier, moreover, permits the designer to include a degree of additional negative or positive feedback, in the form of grid driving voltage, to establish desired operating conditions. Specifically, the applied grid voltage may be used to vary the power gain and so-called "feed-through" power of the amplifier and, in a special case for tetrode and pentode tubes, this permits the elimination of the screen supply, screen power being taken from the r.f. drive. Circuits that make use of auxiliary grid-drive voltage are termed *semi-* and *super-cathode* driven. This article discusses the application of these circuits to amateur practice.

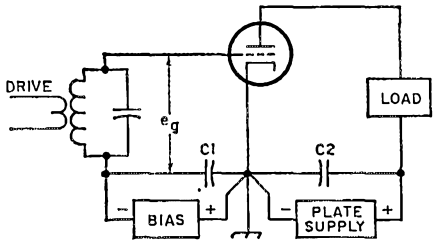


Fig. 1—The grid-driven amplifier. Drive signal (e_g) is applied between grid and cathode. When the grid is positive with respect to ground, plate potential becomes more negative with respect to the cathode (ground). Instantaneous plate voltage is out of phase with grid drive voltage, and the two circuits are common only at the cathode (ground) point. Bias and plate power supplies are considered in the circuit for d.c. and out of the circuit from an r.f. point of view, by virtue of bypass capacitors C_1 and C_2. Class of operation is determined by bias and drive signal voltage levels.

The Grid-Driven Circuit

The grid-driven circuit is a good place to start investigation.

Fig. 1 is a block diagram of a conventional grid-driven triode amplifier. For simplification, neutralization is not shown, and power and r.f. circuits are greatly simplified. The driving signal, e_g, is applied between grid and cathode (ground). In a perfect amplifier, input and output tuning adjustments are independent of each other and the grid and plate voltages are 180 degrees out of phase.

Driving power is the amount of signal power dissipated by the grid, if the grid is driven sufficiently positive to attract electrons from the cathode, plus any power demanded by various circuit losses. The class of operation is defined by bias voltage and driving-signal level. In the case of Class AB_1 operation, grid-drive requirements are very low because the grid is never driven positive and therefore no grid current is drawn. Class AB_2 or class B operation may call for a moderate amount of driving power on positive signal peaks when grid current is drawn. For Class A and B modes of operation, the output waveform is a replica of the input waveform, and the circuit may be used for linear amplification. When the circuit is adjusted for Class C operation (with bias greater than the cutoff value and plate current flowing in pulses less than one-half an operating cycle) the linear relationship between input and output signal no longer exists and the operating parameters are unsuited for linear amplification.

The Cathode-Driven Circuit

Fig. 2A illustrates a triode amplifier, simplified as previously explained, in which the drive signal e_c is applied between grid and cathode, with the grid grounded with respect to the r.f. signal. Operation of this *circuit* is strikingly different than that of the grid-driven configuration of Fig. 1, but *tube* operation is the same. That is to say, when the grid is driven positive in either case, the cathode is driven negative and plate current flows. The mode of operation is, of course, determined as before by choice of bias and drive signal levels.

In the linear mode, if it is assumed that the cathode is driven negative with respect to the grid (r.f. ground), the grid is then positive in relation to the cathode. With a positive grid signal, the plate becomes more negative with

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[1] Orr and Sayer, "The Cathode-Driven Amplifier", *QST*, June, 1967.

respect to both cathode and ground. On the other half of the operating cycle, when the cathode is positive with respect to the grid, the plate becomes more positive in relation to ground. Thus the plate potential responds in like polarity to the cathode-drive signal. During the time that the cathode is driven negative, converted drive voltage is added to the d.c. plate potential, as shown in Fig. 2B. An extra amount of instantaneous plate voltage is developed in series and in phase with the cathode signal. The driver, then, may be pictured as a second plate supply effectively in series with the main plate supply of the amplifier. The portion of *converted drive power* which appears in the plate circuit as additional r.f. output is commonly called "feed-through" power, even though it does not "feed through" anything. The effective d.c. plate-to-cathode voltage on the cathode-driven tube during negative signal excursions of the cathode voltage is the sum of the d.c. plate voltage and the r.m.s. value of the cathode voltage, e_c. During positive signal excursions (when the grid is negative with respect to the cathode) the tube is cut off, so the subtractive portion of the drive voltage during this part of the operating cycle is ineffective.

The plate voltage of the cathode-driven amplifier thus varies over the operating cycle, deviating from the nominal power supply value to a somewhat higher value in accord with the modulation envelope of the drive signal. The value of converted drive power in the plate circuit is approximately the product of the r.m.s. cathode voltage and the d.c. plate current ($e_c \times I_p$). The total drive requirement is the sum of grid-drive power, converted drive-signal power, and grid-circuit losses. Grid-drive power and grid-circuit losses remain relatively constant in either mode of operation, the extra converted grid-drive power appearing only in the cathode-driven mode.

As in the grid-driven case, the cathode-driven amplifier may be operated Class A, B or C by proper choice of bias and drive-signal level. High-μ triodes and *some* tetrodes may be operated in near Class B condition, with zero grid bias and screen grounded. This subtle distinction should again be emphasized: Circuit configuration and operating mode are two separate and distinct things, and the use of the loose, inclusive term "grounded-grid" tends to blur and confuse the distinction. A circuit may be cathode driven, but is not necessarily "grounded-grid" from either an r.f. or d.c. point of view.

Envelope Modulation

Comparison of the operating parameters of grid-driven and cathode-driven circuits utilizing the same tube type in the same class of operation reveals that drive requirements of the tube are identical, with the obvious exception of the converted drive power which is a characteristic of the cathode-driven circuit. When comparing stage gains between the two modes of operation, the additional converted-drive-power requirement of the cathode-driven stage effectively reduces the overall power gain of the circuit and provides a degree of inverse r.f. feedback roughly equal to the reduction of stage gain.

In the case of tetrode and pentode tubes, a portion of the converted drive power is used to supply screen power as well as plate power during negative drive-signal excursions. This is why such tubes operating in cathode-driven service usually have reduced d.c. screen voltage: the remainder of the required screen voltage is supplied by the driving source, reaching the desired maximum value at the peak of the driving signal (an example is the Collins 30S-1 amplifier, which utilizes a Class AB_1 4CX1000A tetrode in this circuit).

R.f. envelope modulation resulting from envelope variations of plate and screen voltage affords a degree of inverse feedback not easily obtainable in a grid-driven stage. A reduction of intermodulation distortion has been observed for various tetrode tubes operated in this fashion, amounting to 3 to 10 decibels improvement in unwanted third-order products.

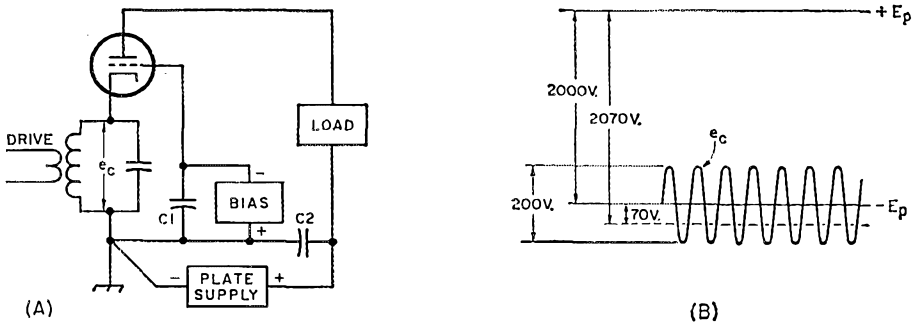


Fig. 2—The cathode-driven amplifier. (A) Drive signal (e_c) is applied between cathode and grid (r.f. ground). When the cathode is driven positive with respect to the grid, the plate potential becomes more positive in relation to ground. Instantaneous plate voltage is in phrase with cathode drive and in series with it, from a d.c. point of view. (B) Effective plate voltage during the negative portion of the cathode drive signal is the sum of the d.c. potential plus the r.m.s. value of the converted drive voltage. In this case, d.c. plate voltage is 2000, peak-to-peak r.f. drive voltage is 200, and r.m.s. drive voltage is 70. The effective plate voltage is 2070.

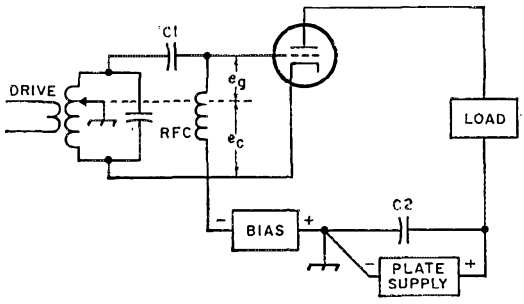


Fig. 3—The semi-cathode-driven amplifier. Auxiliary drive voltage (e_g) is applied to the grid out of phase with the cathode signal (e_c), raising the stage gain and lowering the converted drive power. Total drive requirement is reduced as the proportion of grid to cathode excitation is raised. When e_g is large compared to e_c, the circuit resembles a grid-driven stage, with e_c serving to boost drive level and reduce stage gain over simple grid-driven requirements.

Semi-Cathode-Driven Operation

Operating modes between grid-driven and cathode-driven states are possible by movement of the ground point to positions between the configurations of Figs. 1 and 2. The r.f. ground return is thus electrically placed between the grid and cathode of the tube (Fig. 3). This configuration is termed semi-cathode-driven service. In this mode of operation, a portion e_g of the drive signal is applied to the control grid out of phase with the cathode signal, e_c. While the total grid-to-cathode driving voltage remains the same no matter where the ground point is placed, the ratio of cathode volts to grid volts varies with the position of the ground return. The limiting condition is reached, of course, when the cathode is at r.f. ground and full drive is applied to the grid of the tube. At intermediate points the degree of converted drive power varies directly with respect to the cathode drive voltage. Stage gain is inversely related to cathode drive voltage, and the total drive power is closely related to cathode drive voltage. Thus, stage gain is enhanced and total drive power is reduced as the circuit departs from the cathode-driven mode and approaches the grid-driven mode.

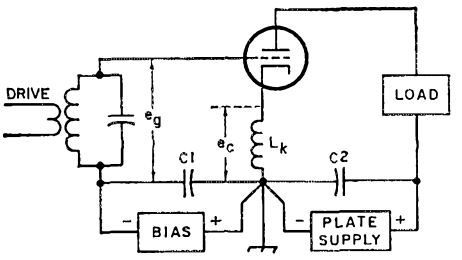


Fig. 4—Grid-driven amplifier having cathode lead inductance. Drive voltage, e_g, flowing through input circuit creates voltage drop (e_c) across cathode lead inductance, L_k, by virtue of cathode r.f. current. Cathode voltage tends to oppose grid drive, lowering power gain of stage and making it more difficult to drive.

In other words, if an auxiliary voltage, out of phase with the cathode signal, is applied to the control grid of a cathode-driven stage it will boost stage gain and reduce converted drive power. This is a very convenient scheme to match the drive level of a linear amplifier stage to the power output of a given exciter, if the output of the latter tends to be marginal.

Looking at the other side of the coin, it can be realized that introduction of out-of-phase cathode-drive voltage into a grid-driven stage will tend to lower the power gain of the stage, making it more difficult to excite, as excitation power must be translated into converted drive power. This is exactly the case in v.h.f. amplifiers having excessive cathode lead inductance across which a portion of the drive signal is developed (Fig. 4). Cathode lead inductance, in other words, robs the v.h.f. amplifier of grid drive because it converts needed excitation into converted drive power appearing in the plate circuit, thus effectively lowering the power gain of the stage and boosting the excitation level required for a given value of power output.

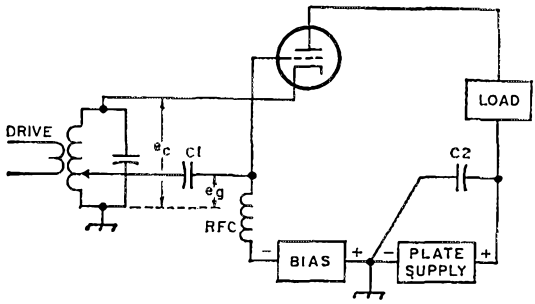


Fig. 5—Super-cathode-driven amplifier. Drive voltage, e_c, is applied to cathode, and a portion, e_g, is applied to the grid in phase with cathode signal. Stage gain is lowered and converted drive power is raised. This circuit may be used to absorb extra driving power of exciter and convert it to plate-circuit power.

By judicious division of the drive signal between grid and cathode of an amplifier stage it is possible to balance the drive requirement with the available power from the exciter. Many modern s.s.b. linear amplifiers make use of cathode-driven circuitry, but the drive requirement is something of a hit-or-miss situation. If the s.s.b. exciter is modest in power output, it is possible to raise the power gain (reduce the converted drive requirement) of a particular "grounded-grid" amplifier by introducing out-of-phase drive voltage into the grid circuit, effectively "matching" the drive requirement of the amplifier to the power capability of the exciter.

Super-Cathode-Driven Operation

Shown in Fig. 5 is a circuit in which a portion, e_g, of the total drive signal is applied in phase to the grid of a cathode-driven amplifier to effectively oppose the cathode voltage. This is

TABLE I

4CX300A, Class B, Typical Super-Cathode-Driven Service	
Plate Voltage	2000
Grid Voltage	0
Screen Voltage	330 (peak)
D.C. Plate Current	
no signal	15 ma.
max. signal	250 ma.
Drive Power	75 watts
Measured Power Output	375 watts
Intermodulation Distortion Products:	
3rd order =	−46 db.
5th order =	−49 db.

4CX300A, Class AB_1, Typical Grid-Driven Service	
Plate Voltage	2000
Screen Voltage	350
Grid Voltage	−55
D.C. Plate Current	
no signal	100 ma.
max. signal	250 ma.
Drive Power	0 watts
Measured Power Output	300 watts
Intermodulation Distortion Products:	
3rd order =	−27 db.
5th order =	−36 db.

termed super-cathode-driven operation. Drive power is increased and stage gain is decreased, as compared to a conventional cathode-driven circuit. It may appear fatuous to design an amplifier which demands more than the minimum driving power; however, this circuit may be used to advantage when it is necessary to absorb excess drive power from the exciter, over and above that value required by normal drive and "feed-through." The circuit, moreover, has other advantages that make it appealing to the circuit designer. An early s.s.b. transmitter design, for example, had series-connected super-cathode-driven low-μ tubes adjusted so that the drive power contributed by the first stage and amplified by the second stage equalled the power supplied by the second stage. Each stage thus contributed 50 per cent of the total output power, permitting the transmitter to make use of four tubes in a two-stage amplifier, neither stage being individually capable of producing the desired power level.

The Super-Cathode-Driven Tetrode

When used with a tetrode or pentode tube, super-cathode service permits the cathode driving signal to serve as a screen power source. Screen-to-cathode voltage (e_{sg}) is supplied on alternate half-cycles of the drive signal as shown in Fig. 6. The control grid may be driven (tied to the cathode) or tapped to a point on the cathode circuit. In the former case, the tube resembles a low-μ triode having an abnormally high converted-drive-power characteristic combined with an unusually low value of static plate current. (Static plate current, of course, is low because static screen voltage is zero.) Operating data for a 4CX300A in this mode are given in Table I. Note the great degree of improvement in intermodulation distortion as compared to grid-driven service. Super-cathode drive requirement is high, but a large proportion of this is converted to output power as indicated.

The super-cathode-driven tetrode circuit of Fig. 6 may be modified by the inclusion of screen and bias voltages to shift the operation to near Class AB_1. Power gain rises and rectified drive power drops as this shift is made. Screen and grid potentials, in fact, may be varied to match the power gain of the stage to a predetermined

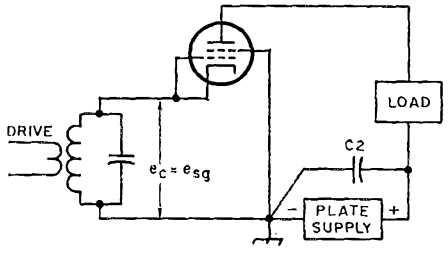
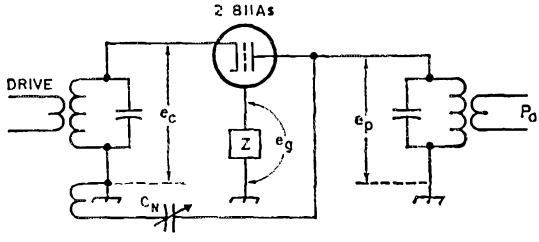


Fig. 6—Super-cathode-driven tetrode amplifier. Tetrode tube may be strapped as a triode with control grid tied to the cathode. Drive voltage, e_c, serves as screen voltage, e_{sg}, since screen is at ground potential. Resting plate current is low as screen voltage is zero with no drive signal. Converted drive power is large, as is total grid drive requirement. Screen and control-grid bias voltages may be added to this circuit to raise power gain of tube and decrease total drive requirement.

TABLE II

Two 811A, Class B, Cathode-Driven, Neutralized
(values for two tubes given)

	$Z = 0, e_g = 0$	Z = 75 μμf./tube e_g = 70 volts, r.m.s.
Plate Voltage	1500	1500
D.C. Plate Current	335 ma.	335 ma.
Power Input	500 watts	500 watts
Grid Current	50 ma.	50 ma.
Plate Load	3000 ohms	3000 ohms
Drive Power (total)	25 watts	50 watts
e_c (r.m.s.)	61	130
e_g (r.m.s.)	0	70
e_p (r.m.s.)	980	1080
Converted Driver Power	20 watts	46.5 watts
Power Output	322 watts	386 watts



drive level, falling between the very low requirement of Class AB_1 service and the rather large Class B requirement specified in Table I. Power gain is set by screen-voltage adjustment, and the static plate current is determined by the bias level.

Plate-Circuit Feedback

The circuits discussed so far are special instances of the general circuit of Fig. 3 where the control grid of a cathode-driven amplifier is lifted above r.f. ground to permit the injection of an auxiliary drive signal. The previously-mentioned circuits are ones in which the feedback voltage is derived from the driving signal. It is also possible to derive the feedback voltage from the output signal of the stage, with the tube included in the feedback loop.

In the circuit of Fig. 7A, the feedback signal is applied to the grid of a cathode-driven stage. Generally speaking, external feedback is not applied to the tube element receiving the drive signal; applying it to separate element minimizes the reaction of the feedback signal upon the driving source. If the feedback is in, or out of, phase with plate and cathode signals, amplifier operation is comparable with that of the super- and semi-cathode-driven circuits discussed earlier.

The degree of feedback is determined by the capacitance ratio C_1/C_2. In normal practice, C_1 is of the order of 1 to 5 pf. and C_2 may fall in the range of 100 to 500 pf. The greater the capacitance of C_2 as compared with C_1 the less will be the feedback signal at the grid of the tube.

This feedback technique is used in the Collins 30L-1 amplifier to match the drive requirement of four cathode-driven 811A tubes to the nominal power output of the S-line exciter (about 100

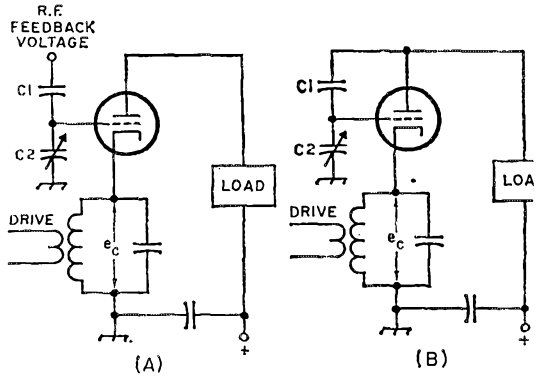


Fig. 7—Plate-circuit feedback. (A) Auxiliary control voltage may be applied to the grid of a cathode-driven stage, either in phase or out of phase with the driving signal. Capacitors C_1 and C_2 form a voltage divider, with grid voltage determined by setting of C_2. (B) Feedback voltage at grid of amplifier may be derived from plate signal, providing negative feedback and increasing drive requirements. Stage gain is decreased and rectified drive-power level is increased. As feedback level is increased, stage must be reneutralized.

watts). The nominal drive requirement of four cathode-driven 811A's is about 50 watts without additional feedback. Sufficient feedback is introduced by the choice of capacitor C_2 to raise the drive requirement of the amplifier to about 100 watts. At the same time, a reduction in intermodulation distortion of about 3 decibels is achieved. The feedback voltage is derived from the plate circuit as shown in Fig. 7B.

It should be noted that use of the grid element of the cathode-driven stage for auxiliary signal injection tends to upset the neutralizing balance of the stage to a degree. This may not be too important with well-shielded tubes used below 30 megacycles, but can become important in the lower reaches of the v.h.f. spectrum. As the power gain of the stage is reduced by decreasing the value of C_2 in Fig. 7, the neutralizing circuit (if any) must be rebalanced for minimum intrastage feedback.

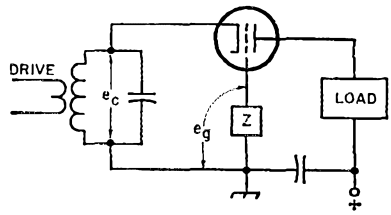


Fig. 8—Grid impedance in cathode-driven amplifier. General case for semi- and super-cathode driven amplifiers is summarized by placement of impedance Z in grid return. Magnitude and sign of Z determine stage gain, converted drive power, and total drive power. For average tubes in h.f. region, Z is usually positive (inductive), making the stage somewhat easier to drive than normal, and also making stage prone to instability and oscillation when external feedback circuits are not controlled. Feedback current (Iz) flows through grid-plate capacitance.

Effect of Grid Impedance

Both the semi-cathode-driven and super-cathode driven circuits may be summarized in the general case shown in Fig. 8, where an impedance Z is placed between grid and ground. Amplifier operation is assumed to be below the self-neutralizing frequency of the tube. It can be shown that when Z is positive (inductive) the amplifier is in a semi-cathode-driven mode and (as compared with a simple cathode-driven amplifier) requires a lower-than-normal value of driving power and exhibits less-than-normal converted drive power. On the other hand, when Z is negative (capacitive) the amplifier is in a super-cathode-driven mode, requiring a higher-than-normal value of driving power and exhibiting more-than-normal converted drive power. An example of an 811A cathode-driven amplifier having both zero and negative grid-impedance characteristics is shown in Table II. The magnitude and sign of Z, therefore, set the stage for operating parameters of the seemingly simple "grounded-grid" amplifier. Practical limits to the manipulation of impedance Z exist, as large values of impedance prevent effective neutralization of the cathode-driven stage.

Envelope-Modulation Circuits

A number of unorthodox linear amplifier circuits have come into vogue in the past decade (the "ZL-linear," the "Class C" linear, the "G2DAF" linear, etc.), all of which utilize some form of envelope modulation. A subsequent article will deal with these interesting circuits.

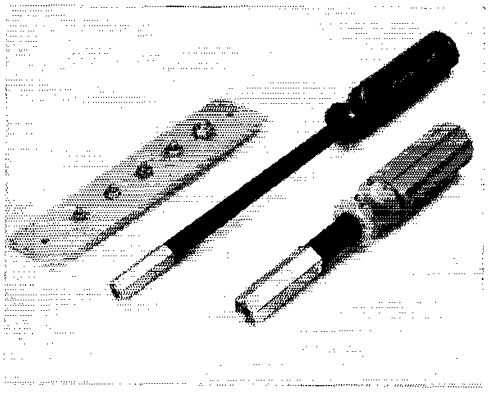
The authors wish to thank W. H. McAulay, W6KM and Raymond Rinaudo, W6KEV, for their assistance in the preparation of this article. QST

• New Apparatus

Adapt-A-Size Wrench

It has taken at least ten different nut drivers to handle the many sizes of hex nuts found in amateur gear. Recently, Accurate Industries, Inc. of 3750 N.W. 46th Street, Miami, Florida 33142, introduced two types of automatic drivers called "Adapt-A-Size Wrenches" that can do the job of three or five standard nut drivers. To use either one of the models, it is only necessary to slip the wrench over a hex head and turn the tool slightly until the wrench adjusts itself to the correct size, after which it can be used like any other nut driver. Model 1111, the shorter of the two wrenches shown in the photograph, can handle 3/16-, 1/4-, 5/16-, 3/8- and 7/16-inch nuts; model 1710, the nut driver with the longer shaft, will fit 3/16-, 1/4- and 5/16-inch hex heads. Although the latter type of socket wrench does not replace as many sizes of nut drivers as the former, its 11½-inch overall length makes it especially useful in deep crowded compartments. The only apparent disadvantage of an Adapt-A-Size Wrench is that, because of the width of its head, it can't be used with small hex nuts that are located close to fixed components such as tube sockets and terminal strips. Models 1111 and 1710 have suggested list prices of $5.95 and $3.95 respectively.

— *W1YDS*



The BOA—A Constrictor for Unwanted Radiation

BY H. W. KASPER,* K2GAL

Among the earliest devices tried for TVI reduction was the transmission-line stub, which at the time seldom gave much relief because the transmitters of the day lacked vital shielding and r.f. filtering. Simple in design and easy to install, the stub should do a good job on a transmitter of modern construction. The "BOA" described here can be used to suppress any selected frequency, whether or not harmonically related to the designed operating frequency.

If you live in a Channel 2 fringe area, the second easiest way to upset your neighbors is to get on ten meters (the first is to get on six meters). That second harmonic almost always manages to find its way into neighboring TV sets. The 56-Mc. interfering signal also makes itself known during 20-meter operation, although the disturbance on the TV set is usually of smaller magnitude.

A relatively simple and inexpensive way of eliminating even-order harmonics — 2nd, 4th, 6th, etc. — is by the use of quarter-wave stub filters. As shown in Fig. 1, either the shorted- or open-end type can be used. The shorted parallel stub, being a quarter wavelength long at the operating frequency, presents a high impedance at this frequency and lets the energy pass. At the second harmonic the stub appears as a short circuit and prevents transmission. The open-end series stub presents a low impedance to the line at the operating frequency and effectively opens the line for even harmonics. The shorted stub has been used on several occasions and is extremely effective.

What can we do, though, when the spurious radiation is *not* a harmonic of the output frequency? Then we use the BOA.

Enter the BOA

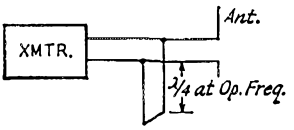
The BOA, as a harmonic (although it is not restricted to harmonics only) killer, has for its basic structure an open quarter-wave stub (*A* of Fig. 2). The stub is a short circuit on the line at the undesired frequency. The short remains a short at this frequency regardless of what value the terminating impedance is. In other words, we get the same amount of suppression of the undesired frequency irrespective of the antenna type being used.[1]

But what does this dangling stub do at the operating frequency? It presents a reactance which, by upsetting the line match, makes the final amplifier unhappy. Here's where the second stub, *B*, comes in. The shorted stub, *B*, must introduce an equal and opposite reactance to cancel out the reactance of stub *A* at the operating frequency. Stub *B* can be either open or shorted, but the shorted stub requires a smaller length for the same reactance. At the *undesired* frequency *B* is of no consequence since *A* is a short across the line at this frequency.

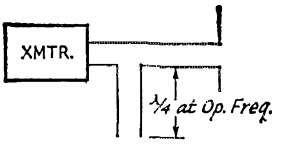
The net result is a device which theoretically has zero loss at the operating frequency, and at the undesired frequency is a short circuit unaffected by the terminating impedance.

Simply stated, it consists of an open stub a quarter wave long at the *undesired* frequency shunted across the line, plus a shorted section of sufficient length to make the total approximately a quarter wave at the *operating* frequency.

As the separation between the undesired frequency and the operating frequency is increased, a response-curve "lobe" structure builds up. This is because the open stub is also a short circuit at all frequencies for which its length



SHORTED PARALLEL STUB



OPEN-END SERIES STUB

Fig. 1—Quarter-wave stub filters. These allow the fundamental frequency to pass with little attenuation, but suppress even-order harmonics of the fundamental.

[1] This is strictly true only when the stub is a "perfect" short circuit, which implies that the stub losses are zero —i.e., the stub has no resistance itself. A practical stub always has some losses, so the "short" is actually a very low, but not zero, resistance. Its effectiveness will vary, therefore, with its position in the line with respect to the harmonic standing-wave pattern which varies with the termination (the antenna). The effect should be practically negligible in most installations, however. — *Editor.*

* R.D. 1, Box 134, Mays Landing, New Jersey 08330.

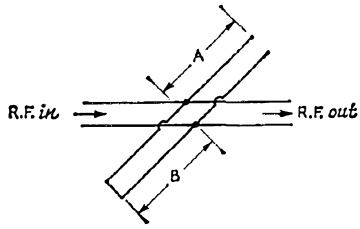


Fig. 2—An open-ended stub, *A*, a quarter wave-length long at the frequency to be suppressed, is shunted across the line in the "BOA." The reactance it introduces at the fundamental is compensated for by the shorted stub, *B*. The sum of the lengths of both stubs is approximately a quarter wavelength at the operating frequency.

is an odd multiple of a quarter wavelength, while the full stub impedance is maximum at all frequencies for which the *total* length is an odd multiple of a quarter wavelength. Thus there is a series of harmonically-related rejection frequencies, between which the BOA impedance rises to a maximum.

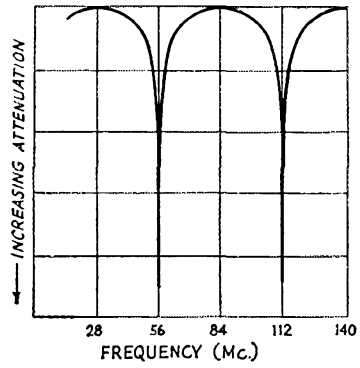


Fig. 3—Typical attenuation curve for a 10-meter BOA designed for rejection of Channel-2 harmonics.

Some Examples

Let us take the case of a 14-Mc. harmonic interfering with Channel 2 (the fourth harmonic at 56 Mc.). Stub *A* is made a quarter wave long at 56 Mc. At 14 Mc., *A* is only 1/16 wavelength long. By making *B* 3/16 wavelength long at 14 Mc., the total reactance of *A* and *B* at 14 Mc. is zero.

A more common problem is ten-meter second-harmonic interference on Channel 2. We unleash the BOA against this problem in the following fashion: At 56 Mc., *A* is made a quarter wave long. At 28 Mc., *A* becomes 1/8 wavelength long. By making *B* also 1/8 wavelength long at 28 Mc., the total reactance of *A* and *B* at 28 Mc. is zero. The resultant attenuation curve is shown in Fig. 3.

A Practical Design

Fig. 4 shows the construction of a BOA designed to eliminate ten-meter second-harmonic interference. Various types of 52-ohm coaxial cable were tried, and the performance was practically identical. The unit was assembled as follows:

1) The four-terminal junction box was made by soldering the inner conductors of four SO-239 chassis-type connectors as shown in Fig. 4. Top and bottom brass plates were soldered to the flanges to make the unit r.f. tight.

2) Two 34-inch lengths of coaxial cable (RG-8/U) were fitted with PL-259 connectors.

3) The length of Section *A* was found at approximately 58 Mc. by clipping the cable and observing the relative received power on a power meter. Minimum power indication meant that the stub was as good short circuit as possible.[2]

4) The length of Section *B* was found at 28 Mc. by clipping the cable, shorting the end, and observing the power meter for a maximum indication.[3]

The resultant structure exhibits the following characteristics:

Attenuation

28 Mc. — negligible
58.5 Mc. — greater than 39 db.
144 Mc. — 0.5 db.
294 Mc. — 32.5 db.

V.S.W.R.

28 Mc. — less than 1.1
144 Mc. — less than 1.1

(*Continued on page 152*)

[2] Few amateurs will have the equipment needed for a measurement by this method, but the stubs can be resonated at the desired frequency by using a grid-dip meter. Before soldering the second cover piece to the connector junction, temporarily short the center contacts to the frame through a short length of wire to which the grid-dip meter can be coupled. Screw on Stub *A*, but not the other cables, and clip the open end of the stub until the resonant frequency is the one at which maximum harmonic suppression is wanted. Then remove the temporary short. — *Editor.*

[3] This can be done with gear most amateurs have — a 50-ohm dummy antenna and an s.w.r. meter/relative output indicator. The shorted-stub length should be adjusted with all cables and stubs connected to the junction box. — *Editor.*

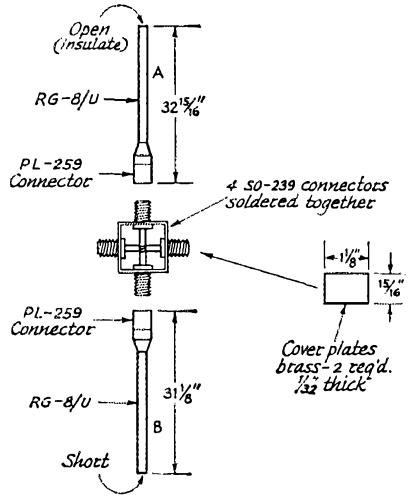
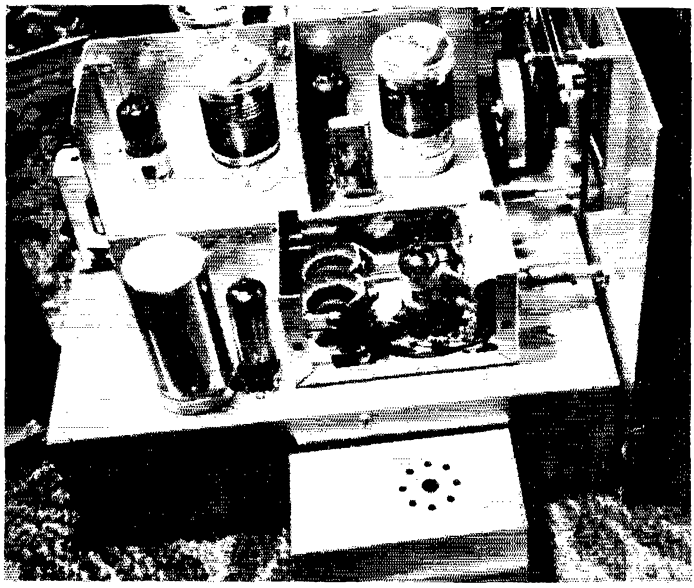


Fig. 4—Construction of the coaxial BOA. Dimensions shown are for 28-Mc. operating frequency and maximum supression at 58.5 Mc. Dimensions for other frequency combinations can be determined as described in the text.



The Selectoroid installed in the HBR-13C. Built in a small Minibox, it is mounted on the chassis to the left (viewed from the front panel) of the receiver's r.f. section. Cover in foreground may be omitted, but if used it should be drilled as shown.

Audio Selectivity for the HBR

BY ELMO W. PHILLIPS,* WØSX

REGARDLESS of the exceptionally good single-signal selectivity of the HBR-13C communications receiver[1] there will be times when QRM from immediately adjacent c.w. signals within its pass band will be encountered, and some additional filtering is to be desired. I know of no simpler, more effective, and less expensive method for coming up with a 100-cycle-wide passband for c.w. than the "Selectoroid,"[2] and at the suggestion of Ted Crosby, W6TC, this article describes a modified version designed as an integral part of the HBR-13C, which now becomes the HBR-14C.

The schematic of the modified audio filter appears in Fig. 1. The components are housed in a 2¼ by 2¼ by 4-inch aluminum Minibox, with all parts mounted on the U-shaped flanged portion of the enclosure. The remaining half of the box can be used as a shield or cover, but this is not necessary for the proper functioning of the filter. If the cover is used, several ⅛-inch ventilation holes should be drilled at appropriate points in the top and along the two lower sides. A 3/16-inch hole centered immediately above the 6C4 tube socket also is needed, to clear the glass tip of the tube.

The 7-pin miniature tube socket is of the printed-circuit spider type, with the socket-pin soldering lugs extending at right angles. Two or three layers of gummed plastic tape form a thin 2¼ by 3-inch insulating layer, between the tube socket and the bottom of the enclosure. At audio frequencies, the insulating properties of this material are more than adequate. A 4-40 screw sufficiently long to extend down through the receiver chassis not only holds the tube socket securely in place, but provides some additional anchorage for the filter enclosure as well. The Minibox is mounted flat against the upper side of the receiver chassis and secured with a 4-40 screw at each corner. The forward end of the enclosure is 1⅝ inches in from the front edge of the receiver chassis, with its right hand wall ⅛ inch from the receiver's 5 by 7 by 2-inch front-end subchassis. This location allows ample

The c.w. sharpness of the Selectoroid supplements the single-signal reception of the HBR receivers to make a combination that really lets you pick 'em out. Here's how WØSX added one to his HBR-13C — now, with one more tube, the HBR-14C.

* 4521 No. 42nd St., Omaha, Nebr. 68111

[1] "HBR Developments," *QST*, October, 1965.

[2] McCoy, "The Selectoroid," *QST*, December, 1966.

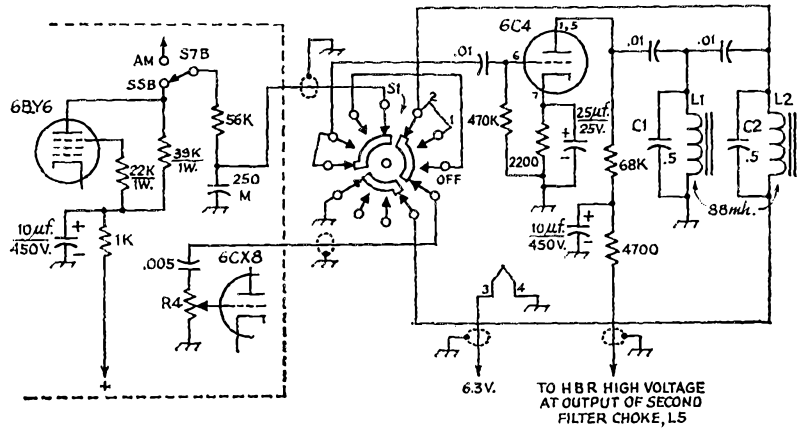


Fig. 1—Circuit diagram of the Selectoroid for the HBR-13C. Portion enclosed in dashed lines is the original receiver circuit, as modified. Capacitances are in μf.; polarity marking indicates electrolytic, 0.01-μf. capacitors are disk ceramic. Resistances are in ohms (K = 1000); except as indicated, resistors are ½ watt. S_1 is viewed from the rear.

C_1, C_2—0.5-μf. paper, 100-volt (Mallory PVC-105).
L_1, L_2—88-mh. toroid (see Ham-Ads for suppliers).
S_1—Phenolic wafer, 1 section, 3 poles, 3 positions (Centralab PA-1007 or equivalent).

space for the subsequent mounting of the filter control shaft and coupling, and does not block the vent holes along the upper left-hand side of the front-end subchassis.

The 3-pole, 3-position wafer switch is mounted on the forward wall of the Minibox, 13/16 inch up from its bottom edge and 13/16 inch in from its right hand side. A matching ⅜-inch hole is drilled approximately 2½ inches in from the left hand end and 5⅛ inches down from the upper edge of the receiver's front panel, and a panel bushing for a ¼ inch shaft is installed therein. The panel-mounted control knob for the filter will then be in line with the control knobs for the antenna trimmer and b.f.o. Cut off the wafer switch shaft to a ⅜ inch length, and use a solid coupling to a ¼-inch-diameter metal extension shaft approximately 1½ inches long between the wafer switch and the panel control knob.

The two toroid coils are mounted on a ⅜-inch diameter solid plastic rod 1½ inches long, the two ends of which are drilled and tapped for 6-32 screws, ¼ inch long. A 5-pin terminal strip (center pin is ground) is mounted on the rear wall ½ inch above the bottom of the Minibox, secured by a 6-32 bolt encircled by a ⅝-inch long tubular spacer. The two 0.5-μf. 100-volt capacitors are installed in the ½-inch space between the terminal strip and the base of the enclosure. The two toroid coils are mounted above the terminal strip, supported by two L-shaped, hand-

(Continued on page 154)

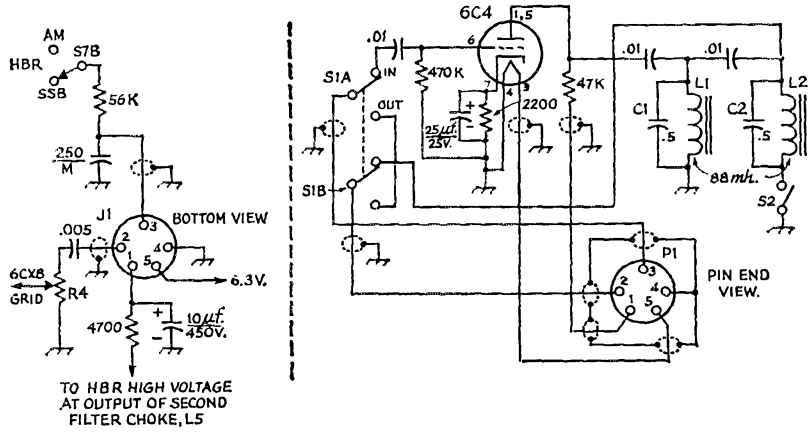


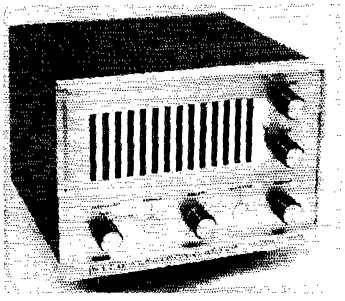
Fig. 2—Outboard Selectoroid for HBR models not having room for the built-in circuit of Fig. 1. Circuit to left of dashed line is installed in the receiver; except for J_1, the 4700-ohm resistor, and the 10-μf. electrolytic capacitor, components in this section are in the original receiver. See Fig. 1 for component values not listed below.

J_1—5-pin miniature accessory socket (Amphenol 78S5s).
P_1—5-pin miniature cable plug (Amphenol 71-5S).
S_1—D.p.d.t. toggle.
S_2—S.p.s.t. toggle.

Recent Equipment

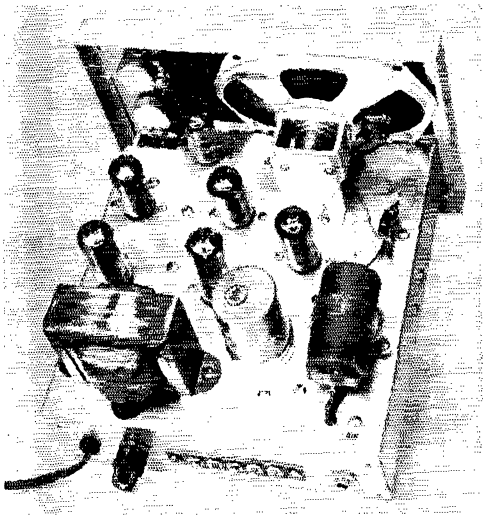
To acquaint you with the technical features of current amateur gear.

Eico 717 Electronic Keyer Kit



THE Eico 717 Electronic Keyer will work with almost any keying system, regardless of polarity, because it has a relay as its output device. However, this relay is different than used in most previous keyers. It is a "dry-reed" type with no "bearings" to wear loose, nor any spring tension or armature spacing to fiddle with. In this application, "return" is electromagnetic. Contacts are sealed in a glass tube containing an inert gas, so oxidization is practically eliminated. Operating time is far shorter than required for the highest keying speeds, and contact bounce is negligible. Operation is, of course, completely noiseless.

The unit includes a side-tone monitor with speaker output. No paddle is provided, which is probably just as well, considering the sharp personal preferences that prevail. There are five panel controls. A range switch selects one of four speed ranges, within the limits of which the desired speed may be set by a continuously-variable control. The ranges are 3 to 8, 7 to 18, 17 to 40, and 38 to 75 words per minute — a wide-enough scope to satisfy both the beginner and the pro, and everyone in between. The small overlap in ranges makes changing from one range to the next very convenient, since the controls can be shifted from maximum speed on one range to minimum on the next, or vice versa, with no abrupt change in speed. A rotary switch provides positions for "power on," a steady signal for v.f.o. set, and regular operation. The other two controls are for side-tone volume and pitch. A panel neon bulb indicates "power on," while another serves as a visual keying monitor.



Top-chassis view of the Eico 717 Electronic Keyer. The reed relay is in the lower righthand corner adjacent to the power transformer and filter capacitor. Terminals for the relay output and key-lever input, headphone jack, and power fuse are along the rear apron.

There is no weight control. Some may consider this a disadvantage, since it leaves no means of compensating for possible modification of the keying characteristic by Class C transmitter stages. On the other hand, it makes impossible some of the exotic adjustments one sometimes observes on the air.

There are six tubes in all, some of them providing dual functions.

Circuit Operation.

Referring to the block diagram of Fig. 1, V_1 is an astable flip-flop oscillator. The "on" time of V_{1B} is fixed, while the "off" time is variable by means of the speed controls. See Fig. 2, which shows the plate-voltage characteristic of V_{1B}. The oscillator is keyed by switch tube V_4 which, in turn, is actuated when its input is grounded by the key lever.

Transients from the oscillator drive the bistable flip-flop, FF_1 which, in turn, drives the dash flip-flop, FF_2, by a transient from output (2). Either flip-flop will change state upon receipt of a negative-going pulse from the preceding stage. (A positive-going trigger has no effect.) As the state changes, the output of the first section of each flip-flop (V_{2A} and V_{3A}) will alternate between ground potential (0) and a negative potential. In the normal, or key-open, state, these outputs are at 0.

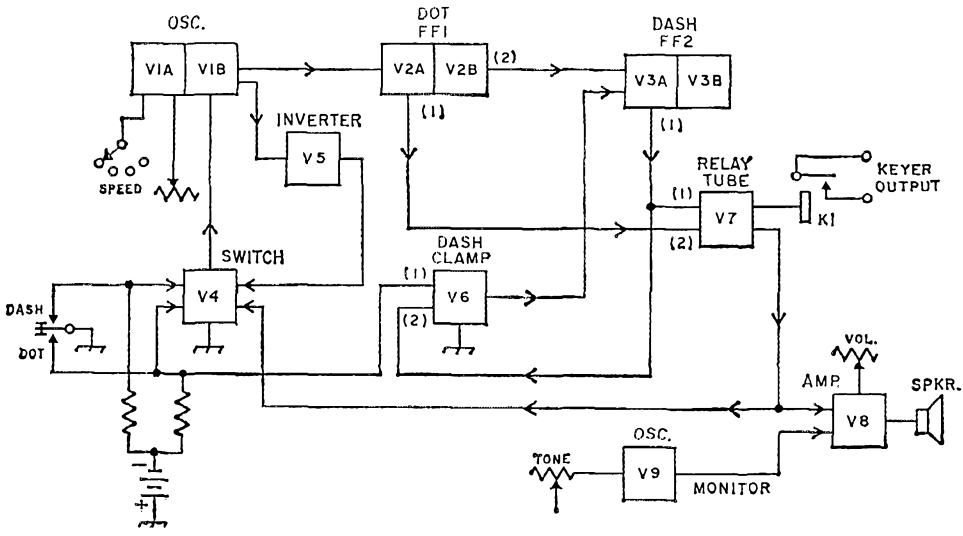


Fig. 1—Block diagram of the Eico 717 electronic keyer.

The flip-flops drive relay tube V_7. The keying relay, K_1, has two field coils. One of these is in the power-supply output and is permanently energized, holding the contacts on make, unless the second coil, in the output of V_7, is also energized. With either or both inputs of V_7 negative, this latter coil is unenergized, and the contacts of K_1 are on mark. Both inputs to V_7 must be at 0 to energize the second coil and place K_1 on space. Since the outputs of both FF_1 and FF_2 are normally at 0, both inputs of V_7 are also normally at 0, and the relay is on space.

V_6 is a clamp that keeps FF_2 from changing state during the formation of dots. V_6 is on "clamp" only if both inputs are at 0. With either input negative, the clamp is released. Input 2 is normally at 0, because of its connection to FF_2. Input 1 of V_6 is grounded to actuate the clamp only when the key lever is on the dot side.

Dot Formation

Dots are formed by the alternate 0 and negative output of FF_1 applied to Input 2 of V_7, as shown in Fig. 3, since Input 1 does not change, because it is connected to FF_2, which is clamped at 0 output. Since the oscillator pulses are equally spaced in time, regardless of the speed adjustment, the result is a series of dots and spaces of equal length, so long as the key lever is held closed on the dot side.

Dash Information

The formation of dashes is most easily explained by referring to Fig. 4 and Table I. Table I shows the relative potentials at significant points over the first five oscillator pulses following the closing of the key to the dash side. Since Input 1 of V_6 is not grounded with this closure, the clamp is removed from FF_2, allowing the latter to function. It can be seen that after the key has been closed, one or the other of the inputs to V_7 is negative over the first three oscillator pulses, keeping K_1 on mark for this period, and making the dash length three times as long as the dot length. On the fourth oscillator pulse, both inputs of V_7 are at 0, and K_1 goes to space for one pulse, and then resumes mark if the key is still held closed.

Self-Completion of Characters

Self-completion requires only that the switch tube, V_4, remain "on" long enough to permit the

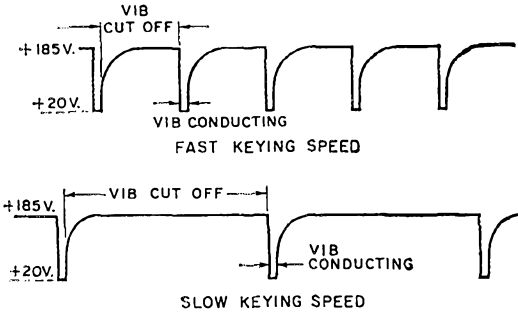


Fig. 2—Oscillator-output waveforms for two keying speeds.

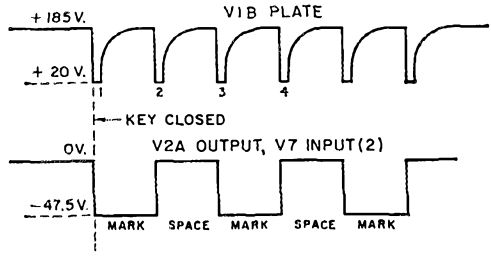


Fig. 3—Pertinent waveforms in formation of dots.

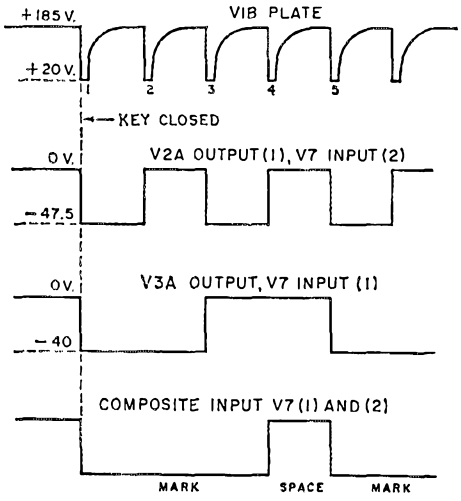
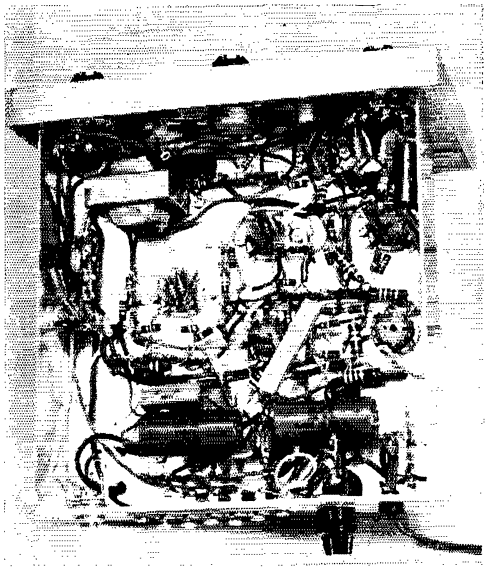


Fig. 4—Waveforms at significant points in the formation of dashes.

oscillator to deliver the required number of pulses to complete the character. As shown in Fig. 1, the positive output of V_7 is fed back as an input to V_4. As soon as V_7 goes on mark, its output voltage rises to a value sufficient to overcome the negative bias that would cut off V_4 if the key lever were to be opened prematurely. This voltage will prevail until a sufficient number of pulses has been generated to bring both inputs of V_7 to 0. This occurs only at the completion of the character in progress. At this instant, the V_7 output drops and, if the key lever is still open, V_4 will be cut off.



Bottom view of the Eico keyer after assembly. The transformer in the upper left-hand corner is in the side-tone monitor circuit.

Space Completion

Unless some provision is made, there exists the possibility that a space might be shortened should the key lever be shifted too rapidly between dots and dashes. An examination of Fig. 2 reveals that V_{1B} is cut off over a large portion of the cycle by virtue of its own characteristic. Therefore, opening and reclosing of the key lever during this period has no effect. However, if the transition were made during the portion of the cycle when V_{1B} is conducting, the cycle in progress would be interrupted and a new one started. Feedback from the inverter, V_5, is used to prevent this possibility in the same manner that feedback from V_7 is used to assure character completion. When V_{1B} is conducting, its positive output voltage is low, and is not sufficient to overcome the normal bias applied to V_5. Under this condition, the positive output voltage of V_5 is high, and is sufficient to hold V_4 "on," even though the key may be opened, until V_{1B} ceases to conduct. The output voltage of V_{1B} then rises to overcome the bias on V_5, the output voltage of V_5 drops, and normal turn-off bias appears at V_4.

Table I

Point	*Normal*	P_1	P_2	P_3	P_4	P_5
FF_1 *out* (1)	0	−	0	−	0	−
FF_1 *out* (2)	0	−	+	−	+	−
FF_2 *in*						
FF_2 *out*	0	−	−	0	0	−
V_7 *in* (1)	0	−	0	−	0	−
V_7 *in* (2)	0	0	−	−	0	0
K_1	Space	Mark	Mark	Mark	Space	Mark

Anti-Interruption

A too-rapid transition from dots to dashes cannot cause a dash to override a dot, because once FF_2 has missed the initial trigger, which it would on closure of the key to the dot side first, FF_2 cannot receive another trigger until the dot and its following space have been formed.

A dash cannot be interrupted by a too-rapid transition of the lever from the dash contact to the dot contact. This is assured by the connection of the output of FF_2 to Input 2 of V_6. From Table I, it can be seen that the output of FF_2 is negative over the first two thirds of the dash. This negative potential, applied to Input 2 of V_6, holds the dash clamp off. Over the last one third of the dash, the output of FF_1 is negative, and this keeps V_7 on mark, regardless of what happens in FF_2.

Side-Tone Monitor

The side-tone monitor consists of a neon-bulb relaxation oscillator, V_9, and amplifier, V_8. Frequency is varied by changing resistance in the neon-tube supply lead, while volume is controlled by a variable resistance shunting the primary of the output transformer. The monitor

Eico 717 Electronic Keyer

Height: 5½ inches.
Width: 8 inches.
Depth: 8½ inches.
Weight: 9 pounds.
Power Requirement: 40 watts, 100-130 v.a.c., 60 cycles.
Price Class: $50.00 (kit); $70.00 (wired)
Manufacturer: Eico Electronic Instrument Co., Inc. 131-01 39th Avenue, Flushing, New York 11352

is amplifier-keyed by using the increase in output voltage of V_7 on "make" to overcome a negative bias applied to the screen of V_8.

The 3-inch speaker is automatically disconnected if headphones are plugged into the jack provided. Maximum volume is more than adequate.

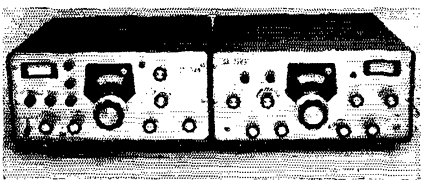
Assembly and Operation

The panel of the 717 is of heavy burnished aluminum. The cabinet is of perforated metal finished in dark green. Separate operating and assembly manuals are furnished. The assembly manual is easy to follow, and describes a procedure in which most of the actual wiring below chassis is done before the resistors, and finally the capacitors, are added. No one should have any trouble in completing the assembly in 25 hours or less. There is nothing that requires preadjustment. If the keyer doesn't work properly the first time it is put into operation, you can be pretty sure that you've made an error somewhere.

The operating manual shows the circuit schematic and includes a table of significant point-to-point resistance values and typical idle-state voltages at all tube terminals.

Although not mentioned in the instruction book, it appears that simultaneous closure of both levers of a dual-lever key will cause dots to override dashes. This means that the dash lever can be held closed for the entire length of the character, and dots inserted by squeezing the dot lever at the proper intervals, if the operator so desires. — W1TS.

Next Month



Inter Star Transmitter and Receiver

• *New Apparatus*

Ami-Tron Ferrite Beads

THE ⅛-inch high by ⅛-inch diameter ferrite beads shown in the photograph can be used to make r.f. chokes whose d.c. and audio frequency losses will be negligible. All that has to be done is to slip one or more of the beads over the wire going to the circuit element that needs to be decoupled, isolated or provided with parasitic suppression. For example, by stringing beads on the ungrounded filament lead of a v.h.f. amplifier and using suitable bypass capacitors, r.f. decoupling can be achieved without any accompanying d.c. loss.

The d.c. resistance of ferrite-bead chokes is extremely low because there aren't any turns of fine wire, as with ordinary r.f. chokes, to contribute to copper losses. Choke impedance varies with bead permeability which increases with frequency. This impedance does not increase indefinitely, but levels off in the v.h.f. range. For example, a choke made from a 1-inch length of No. 20 wire and a single ferrite bead is said to have resistive and reactive components greater than 50 ohms over the entire v.h.f. spectrum.

To be most effective, ferrite beads should be installed as close as possible to the element, such as a grid or base, to be decoupled. The beads are sold in packages of twelve for $2.00 from Ami-Tron Associates, 12033 Otsego Street, North Hollywood, California 91607. A sheet describing their installation and use is included in the parcel. — *W1VDS*

Hints and Kinks For the Experimenter

SALVAGING COMPONENTS FROM SURPLUS PRINTED-CIRCUIT BOARDS

SURPLUS component boards, currently available at very reasonable prices, are a good source of diodes and transistors. However, it's easy to damage the parts during their removal. If the components are unsoldered, they can be damaged by excessive heat; if the parts are cut loose, they may be of no value because their leads are too short. On the other hand, if the circuit board is literally cut from around them, all the parts can be salvaged.

Cut the board between the components with a pair of diagonal side-cutting pliers or small tin snips. Although the circuit board will be completely destroyed, this is of no consequence since we are interested only in salvaging components. As the board is successively cut into smaller and smaller fragments, each with a single mounted component, it will become easy to completely free the desired item. As a final step, cut through the hole where the lead was inserted and soldered (on the reverse side of the board). This will free the item, with only a blob of solder remaining on each lead tip. Remove the blob by simply crushing it with a pair of long-nose pliers.

As described above, I have salvaged components without heating them or further shortening leads that were already short. I have removed without damage 1/10-watt resistors with 5/16-inch leads and transistors with leads sufficient in length to allow their insertion into transistor sockets.

One word of caution: Some circuit boards shatter violently when cut with diagonal cutters, so the use of safety glasses is strongly recommended. — *John J. Risch, WØFEV*

PREVENTING LOOSE ROTATOR BOLTS

ON numerous occasions the four bolts which hold together the two bell-shaped sections of my Cornell-Dubilier Ham-M antenna rotator have worked loose. As a result, the lower section fell off along with many of the ball bearings. I tried to hold the bolts in place by sealing the space into which they sank with wax, putty and similar material, but nevertheless they freed themselves. In desperation I did the following: First I removed the bolts which came with the motor. Then I drilled the holes directly through the top of the upper casing and tapped them. Next I screwed longer rust-proof bolts into the new holes, firmly fastening both sections of the casing together. Finally I placed lock nuts on top of the bolts and sealed the area around them with a special putty used for air conditioners. I defy the bolts to come loose now! — *Gay E. Milius, W4NJF*

MOBILE LOGGING

MOBILE log keeping at highway speeds can be dangerous. Why not do it the safe and easy way? Buy a small battery-operated tape recorder and tape the time, station, frequency and any other desired information. When you make your next stop, transfer the data to the log. This method of logging is not only safer than writing while driving, but far more accurate than trying to remember the information until the next safe place is found to log it. — *Jim Cason, WB4CCU*

INCREASING THE BANDSPREAD OF THE SP-400

A SIMPLE method of increasing the bandspread of the Hammarlund "Super-Pro" and most other older receivers is shown in Fig. 1. The bandspread-tuning knob was removed and a small planetary drive installed between the control shaft and the knob. As a result, it now takes five turns of the knob to cover ten dial divisions, whereas before it took one revolution of the knob to tune ten divisions. This increase in bandspread is a big help on crowded bands.

The planetry drive used in the modification is a Jackson Brothers type 4511/DA which sells for only $1.50. Threaded bushings are used to space the drive from the panel. If you don't care to take the receiver out of its cabinet, you can drill two small holes in the panel and tap the holes for threaded rods that will fit both the panel and the bushings. Otherwise, the panel can be drilled and the bushing attached to the panel with appropriate screws inserted from the inside of the receiver. — *John F. Gallagher, W2VAQ*

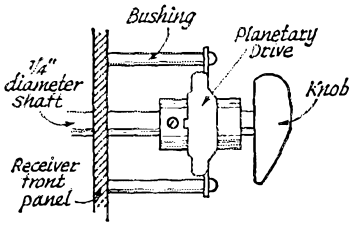


Fig. 1—W2VAQ's method of improving the bandspread of older receivers.

ALTERNATIVE WHIP FOR WINDOW-SILL ANTENNA

If you plan to follow W1NXY's design for a window-sill antenna, as described on pages 20 and 21 of *QST* for April 1967, and are unable to find an AN-131A collapsible whip, you might consider using mast sections MS-49, -50, -51 and -52 which are plentiful in the surplus stores, at least in the Chicago area, for a total cost of about $1.30 for the four sections. The masts measure about 40 inches long; when assembled together, they form a 12-foot, 8-inch whip which weighs only slightly more than the AN-131A. At the stub end of an MS-52 base section is a $\frac{3}{8}$-inch diameter rod which can be threaded with an inexpensive die available from Sears and most hardware stores. The top section, MS-49, can be trimmed if required. Apartment dwellers may well find this antenna what they have been looking for. If desired, the disassembled whip can be stored easily in a closet. — *Herb Clark, W9FKV*

FET CODE PRACTICE OSCILLATOR

The FET code practice oscillator shown in Fig. 2 will provide a loud tone when used with magnetic headphones having an impedance of 2000 ohms or more. Although a P-channel field-effect transistor is used in the circuit, an N-channel type can be substituted if the polarity of the battery is reversed. The frequency of the tone depends mainly on the values of the capacitors and the impedance of the headset. If a different tone is emitted from the oscillator than that desired by the builder, the value of C_1 can be changed accordingly. Any small 9-volt battery should be suitable for powering the unit, as the current drain is only about 0.3 ma. — *Robert E. Flanagan, WA1HAU*

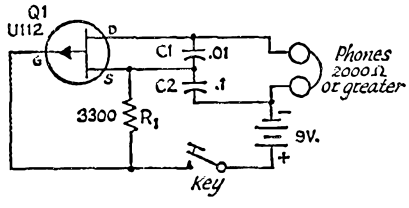


Fig. 2—Schematic of the FET oscillator. Resistances are in ohms; R_1 is ½ watt composition. Capacitances are in μf. C_1 is disc ceramic and C_2 is paper tubular. Q_1 is a Siliconix U112. If the battery polarity is reversed, a Motorola MPF104 can be substituted.

STRIPPED THREADS

Are you having trouble with stripped threads on aluminum boxes? Try fastening hex nuts over each hole on the inside of the box with epoxy glue. Then use machine screws with lock washers to hold the case together. Vibration and repeated disassembly won't bother the box after this is done. — *Thomas Webb, W4YOK*

LOG KEEPING

A simple convenience in log keeping is shown in Fig. 3. It is a stunt that has been used by communications people for many years. One of the outside corners of the log book is cut as pictured. As each page is filled, its corner is cut to agree with the cut in the cover. When the operator wants to make a log entry, he lifts all the pages which are cut, exposing the current page. This method of log keeping results in clean and unsoiled pages, which is not the case if the book is left open at the current page. — *Lewis E. Elicker, Jr., W3ADE*

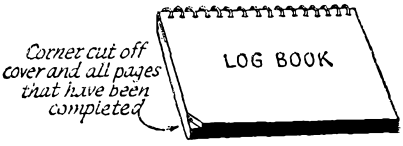


Fig. 3—A simple method for keeping the log book neat and clean.

STABILIZING THE THREE-BAND 4CX250 AMPLIFIER

The 4CX250A amplifier for 144, 220 and 432 Mc., originally described in *QST* for February 1957 and now appearing in *The Radio Amateur's V.H.F. Manual*, has been built by many v.h.f. enthusiasts and used in all classes of service. The original served its builder, W1VLH, and W1DXE for several years as a 2-meter a.m. linear, and it has been used at W1HDQ on all three bands. Though this unit operates stably without neutralization, some builders have experienced oscillation trouble when attempting to operate similar amplifiers as AB_1 linears. In a recent OVS report, Bob Reif, K9AQP/1, Acton, Mass., tells how he cleared up the instability in his amplifier.

"When I converted my 4CX250 amplifier to linear service, after using it for a long time in Class C, it oscillated. The nature of the two-band grid circuit made neutralization a special problem, as it was not immediately obvious where an out-of-phase r.f. voltage could be taken off. I drilled a small hole next to the grid line's bypass capacitor, C_3, and soldered a piece of stiff wire to the capacitor lead. I brought the wire up into the plate compartment and bent it so that it runs parallel to the plate line, L_3, for about 1 inch at a distance of ½ inch below the line."

The length of the wire and its nearness to the line depend on the value of C_3. If 1000 pf. is used at C_3, the neutralizing capacitance will be about twice that required with a bypass capacitor of 500 pf., since this is, in effect, a capacitive-bridge system. The wire's position should be adjusted or its length trimmed for minimum r.f. feed-through, using a 50-ohm dummy load on the amplifier and applying drive, but no plate or screen voltage. — *W1HDQ*

Technical Correspondence

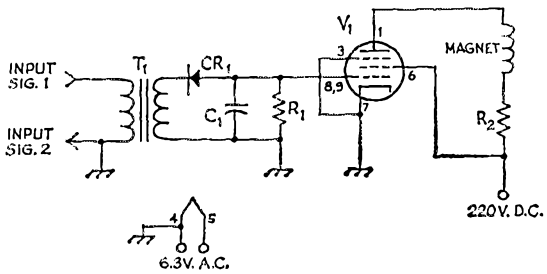
CIRCUIT DIAGRAMS BY RTTY

Technical Editor, *QST*:

Many times in contacts with other RTTY stations, the occasion arises where different circuits are discussed. There may be a desire on the part of one operator to send to another operator a diagram of a new circuit or filter arrangement that he suggests trying.

The author will describe in this letter a simple system to be used that will be very effective in transmitting circuit diagrams by RTTY.

Suppose we desire to transmit the circuit of Fig. 1, taken from the 1966 ARRL *Handbook*, page 298.



The RTTY copy under this system would look as follows:

COMPONENTS
T1-AUDIO OUTPUT XFMR 5000 OHM PRI, 3 OHM SEC
CR1-SILICON DIODE 400 PIV 750 MA
C1-.02 UF
PRINTER MAGNET
R1-100 K
R2-2000 10 W
V1-5763
SCHEMATIC
INPUT SIG 1-T1 (SEC)GND-INPUT SIG 2
GND-T1 (PRI)-KCR1-C1-GND-R1-(CR1-C1)
(CR1-C1)-8, 9 (V1) 7-GND-3 (V1) 1-MAG-R2-220 VDC
(V1) 6-220 VDC
6.3 VAC1-GND-4 (V1) 5-6.3 VAC2
END

As you can see, the schematic code is merely a point-to-point wiring chart which the receiving operator reconstructs with pencil and paper.

The following points should be noted:

1) Tube and pin locations are designated. 6 (V1) 3 refers to pin 6 of tube V1 as well as to pin 3 of the same tube.

2) (CR1-C1) refers to the intersection of these two components.

3) KCR1 indicates the cathode side of the diode.

4) If electrolytic capacitors are used, their polarity would have to be noted; for example, PLUS C1 or NEG C1.

Now that you have got the hang of it, let's suppose you are on the receiving end of an RTTY contact and the following coding appears on your page printer.

COMPONENTS
R1-330K ½ W 5 PERCENT
R2-180K ½ W 5 PERCENT
R3-50K POT
R4-120 ½ W 5 PERCENT
R5-150 ½ W 5 PERCENT
L1, L2-88 MH TOROID
C1-.06 UF
C2-.03 UF
C3, C4-.004 UF
SCHEMATIC
2975-R1-R3-R2-2125-L1-R4-R5-L2-2975
2975-C2-GND-C1-2125-C3-GND-C4-2975
(R4-R5)-GND
INPUT-ARM R3
END

Can you recognize this popular RTTY circuit? If you weren't able to reconstruct the diagram, it may be found in August 1966 *QST*, page 18, Fig. 3. — *Rolf W. Carlson, W2ZBS, 57 Alda Drive, Poughkeepsie, New York 12603.*

TELEPHONE INTERFERENCE SUPPRESSOR

Technical Editor, *QST*:

Since the appearance of my article on telephone interference (*QST*, June 1966) I have had numerous letters for more information as to when and where the networks may be obtained.

I have just learned that the new network is now in production, and distribution to the affected Bell Systems will begin soon.

The new network will be called the 425-J (instead of 425-RF) and information may be found in *Bell System Practices* 500-150-100, which is already in the hands of the field people. — *James R. Balmer, W8KRS, 1868 Edsel Drive, Trenton, Michigan 48183.*

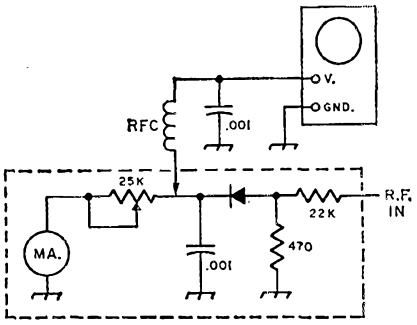
MONITORING WITH A D.C. SCOPE

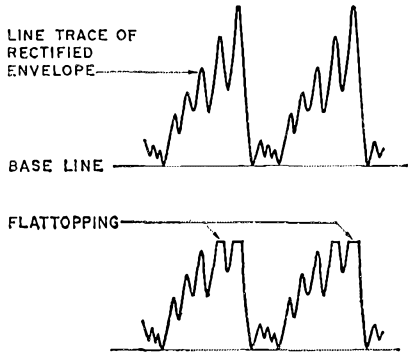
Technical Editor, *QST*:

For some time now I have used an Eico Model 460 oscilloscope as a modulation monitor. Being a d.c. scope, it is possible to use it for s.s.b. monitoring with good effect, as well as for a.m. and c.w. It has surprised me that I have never seen any reference to the use of such scopes as continuous monitors, when it is so easy to do. Many stations have reflectometers or output-level indicators available for tuning up, and these are all set for use with a d.c. oscilloscope with little or no change.

For example: page 215 of the 1965 *Handbook* (page 223 in the 1967 edition — *Ed.*) shows an amplifier with an output monitor. The monitor circuit is shown here with a scope added. The scope will show the true modulation envelope as long as most of the 25K potentiometer is in use. The diode-circuit time constant is short enough for proper reproduction of audio rates. Note that output is *not* taken from the meter, as this may introduce distortion. The added r.f. choke and 0.001-μf. capacitor prevents r.f. from blocking the scope, as it otherwise may. The scope presentation will be the rectified *envelope* of the modulated signal.

Since a Monimatch may be left in the line at all times it will provide a scope monitor signal external to the transmitter itself and with no additional





equipment. Bring out a line from the diode end of the d.c. load resistor and add r.f. filtering as before.

Another useful application is when testing a rig with a dummy load such as the Heath Cantenna. Merely connect the d.c. output to the scope and add a 10,000-ohm resistor across the scope input to reduce the time constant.

When using an s.s.b. rig on a.m., it will tell instantly if you have the correct ratio of carrier to sideband:

1) Set the carrier to ½ the c.w. level.

2) Bring up the sideband output while modulation peaks approach flat-topping and zero.

3) Keep the waveform symmetrical by resetting the carrier level slightly, if necessary.

You can also see your c.w. keying waveform — sharp, smooth, bouncy, or what have you — you always know. — *R. L. White, W3UIG, 5019 Lewis Ave., Rockville, Maryland 20851.*

WHIP ANTENNA

Technical Editor, *QST*:

Re "An Antenna for the Traveling Man" in the April issue of *QST*: It should be noted that in addition to the AN-131A the AT-271A may also be used. It is of almost identical construction but is a bit shorter (by one section). Loading would have to be adjusted differently.

The AN-131 is more available on the surplus market since it is the older unit. However, some AT-271s are available and the Army is buying them in quantities of hundreds of thousands for the Vietnam war. One of these years the supply should be excellent. — *David L. Wiesen, W2WUB, Adec, Inc., 86 Frelinghuysen Ave., Newark, New Jersey.*

THAT GE SCR

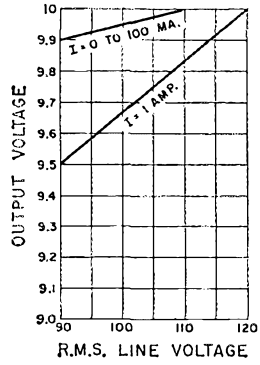
Technical Editor, *QST*:

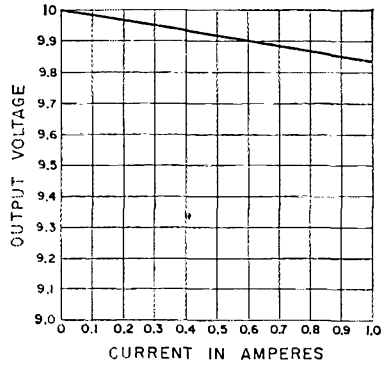
Relative to my article, "A Mobile Equipment Protective Alarm," which was published in March 1967 *QST*, I have received many letters expressing difficulty in procuring the GE C106Y2 silicon controlled rectifier. This unit is apparently not available at the corner radio-parts store. It is listed in the Allied Electronics Industrial Catalog No. 670 on page 72 at $1.05. It is also available from GE Semiconductor Distributors around the country. To find out who the nearest GE distributor is it may be necessary to write to the General Electric Company, Distribution Services, 1 River Road, Schenectady, New York. — *Herman Luk Jr., W3UTF, 506 Dresbertown Road, Fort Washington, Penna. 19034.*

ADJUSTABLE REGULATED SUPPLY

Technical Editor, *QST*:

A few simple changes in the circuit of the regulated supply described in May *QST* ("An Adjustable Regulated Transistor Power Supply") will greatly improve the capabilities of the supply. The changes amount to beefing up the primary d.c. end and then deleting the short-circuit protection to take full benefit of the regulating properties. Referring





to Fig. 1, page 29 of the May issue, C_3 and C_4 should each be increased to 4000 μf., 15-volt rating, and T_1 should be changed to a 24-volt 1-amp. transformer.

The improvement is quite noticeable, as shown by the revised regulation curves above — *Arleigh B. Baker, KØPSG, 720 N.E. 4th St., Waseca, Minn. 56093.*

Scouting And The Radio Amateur

Jamboree-on-The-Air The Year Round?

BY EDWARD A. GRIBI, JR.,* WB6IZF

Fcc Chairman Rosel H. Hyde has recently said "Statistics seem to suggest . . . some lack of interest in the amateur service by our youngsters. . . . (This situation) . . . does require our earnest attention" (*QST*, April, 1967, p. 61). O.K., so we need to keep the younger fellows coming along to keep amateur radio progressing. How do we go about approaching these youngsters and whetting their interest? One of the best ready-made avenues is via the Scouting movement — with over four million active boys in the U. S. between 8 and 18.

The radio amateur should look on Scouting as one of the several areas in which he may implement the "service" aspect of the amateur service. Certainly one of our purposes is to create enough interest on the part of boys so that some may become amateurs. However, we can't expect all boys to be equally motivated. Simply by exposing boys to amateurs and amateur operation we will be molding their image of amateurs as "cool heads" instead of "those nuts that wreck TV." And certainly the amateur has many capabilities that can be of vital aid to the Scouting program.

Some of these areas where we've helped in the past include providing communications for various Scouting events and training boys in code and electronics. Besides expanding these services future possibilities might include help in the formation of Scouting nets to let Scouts and Scouters get to know each other better. The Jamboree-On-The-Air event is doing that already but it only happens once a year. Perhaps our goal should be Jamboree-On-The-Air year round. Let's take a look at specific aspects of possible amateur radio service to Scouting.

Cub Scouts — These 8- to 11-year olds are full of fun and enthusiasm. They're organized into small Dens with a Den Mother; and a group of Dens makes a Pack led by a Cubmaster. Their three ranks, Wolf, Bear, and Lion, are gained by accomplishing a series of achievements and electives. Under electives are such things as "Make and use a crystal set" and "Make and operate a radio using one or more tubes." Lots of opportunity here to dig through your junk box to help a boy make a radio. A Den Mother would probably love to have you invite her Den to your shack even if they do no more than talk to another Den across town on two meters.

Remember, though, that whether Den Mother, Scoutmaster, or Council Scout Executive you may find the person has little idea of what amateur radio may do for them. You may have to use some low pressure salesmanship with persistence.

Boy Scouts — Boys 11 through 17 may become Boy Scouts by joining a Troop and passing the Tenderfoot tests. Patrols, run by boy leaders, comprise a troop with the adult Scoutmaster in overall charge. Advancement through set requirements gains Second Class and First Class rank while set requirements plus elective merit badges gain the Star, Life, and much coveted Eagle rank. Emphasis in the early stages is on outdoor achievements but in the higher ranks the sky's the limit! (The Space Exploration merit badge was recently introduced.) The First Class Scout, among other things, is required to "send and receive at least 20 words, using either international Morse or semaphore codes and necessary procedure signals." There are merit badges on Atomic Energy, Communications, Electricity, Electronics, Radio, and Signaling, to name those where an amateur might most likely help. Of the seven requirements for the Radio merit badge, a current amateur license is a substitute for the code requirement of 5 words a minute. Amateurs are always welcome in Troops to help boys with the First Class code requirements and to act as merit badge counselors.

* Advisor, Explorer Post 1, 229 Vivian Street, King City, California 93930.

Scouts operate at LA1O, Oslo Technical School, Norway

The station at Circle B Scout Ranch in the Kern River headquarters is the only communication for this remote California camp. Last summer it proved its worth relaying messages to anxious parents in the Los Angeles area when a bus break-down prevented several units from leaving the camp for home until a day behind schedule. Perhaps you can't take several weeks off during the summer, but how about providing your mobile or portable set-up at a Camporee or for a weekend at a Scout camp?

Explorers — A boy going into high school and reaching age 14 may then join an Explorer Post. Emphasis in Exploring is on boy organized and conducted activities with a boy-elected President and other leaders, with adults participating as Advisors and consultants. Posts are classified as "general interest" or "special interest," with special interests ranging from aviation to zoology. The two types of Posts overlap activities in that they all attempt to provide experience for these teenagers in social, vocational, outdoor, personal fitness, service and citizenship areas. Several Explorer Posts have amateur radio as a specialty and quite a few have specialties in electronics and other scientific fields.

Post 1, King City, California, has amateur radio as a specialty and its activities may be more or less typical of a meshing of amateur and Scouting fields. Half of the members are licensed, mostly Technicians. Club station license, WB6SBL, is held and the Post owns equipment for capabilities from 80 through 2. Post members have participated in SET exercises, Jamboree-On-The-Air, a local fair, have visited Oscar headquarters and electronics manufacturers, and have used amateur gear on several activities including 55-mile backpack hikes and beach trips. Activities for the immediate future include providing communications at a District Camporee and at a Council-wide Explorer Road Rally over a hundred mile course. While amateur activities are included only insofar as members' interests dictate, all members have been exposed.

Scouts operating from the high school station near Salzburg, Austria.

Scouts of the U.S.A., visiting the Johnston Historical Museum at the National Headquarters in New Brunswick, N. J., spoke to brother Scouts in 17 countries and 43 of the United States, over K2BFW, the Hq. station of the Boy's Life Radio Club. Trustee of K2BFW is W2GND, shown interviewing Scouts. K2BFW had over 1500 c.w. and phone QSOs during the JOTA weekend.

Sea Exploring — This branch used to be known as "Sea Scouting" but it is now the division of Exploring that is involved in boating, seamanship, and other marine activities. Little has been done in the past by amateurs in this field, but it requires little imagination to envision the services amateur radio could perform.

Jamboree-On-The-Air — This event was organized 10 years ago out of the thought that amateur radio might provide a vehicle for Scout to Scout communication for that vast majority of Scouts who will never have an opportunity to participate in the great National or World Jamborees. Of course, in the process it will expose many youngsters to amateur radio as an avocation and a service and to the general field of electronics.

The Ninth Jamboree, October 22–23, 1966, was a great success in spite of its coinciding with a major DX contest. More than 3000 stations were known to have participated from 67 different countries. U. S. participation, heretofore modest, showed a fantastic tenfold jump over prior years with at least 1500 stations participating. Through the layers of QRM, U.S. stations succeeded in having many successful QSOs with other U. S. and Canadian stations and an occasional DX "catch." Participants

(Continued on page 154)

Neighbour To The North

The League's Canadian Division

BY NOEL B. EATON,* VE3CJ

ANYONE active on the amateur bands these days must surely be aware that something unusual is taking place in Canada: amateur calls using the prefixes 3B and 3C have attracted world-wide attention to our Centennial of Confederation, being celebrated on July 1st of this year. In addition, all the fanfare about Expo '67, the World's Fair, now in progress in Montreal, has resulted in much publicity for Canada as a whole. So it seems appropriate to take a look at what is, geographically at least, the League's largest division.

Any school boy knows that Canada is large, but few people realize just how enormous it really is. With an area greater than that of the fifty United States, it has only one tenth of the population, and our amateur population is proportionately smaller still. Our licences now total just over 12,000, or around five percent of the U.S. figure — the major reason being, I believe, the absence of Novice or Technician Class licences in this country. The great proportion of this population, and hence of the amateurs, is located in a relatively-thin strip along the U.S. border, over half being in the provinces of Quebec and Ontario.

Licensing

Our licensing authority is the Federal Department of Transport, successor to the earlier Department of Marine and Fisheries. Located in Ottawa, with regional offices in six major areas, it operates much as the Federal Communications Commission does in Washington, although its legal position is much different. Our basic enabling legislation, the Radio Act, establishes policy and requirements, and gives the Minister of Transport (i.e. the D.O.T. staff) authority to write detailed regulations for each type of service. This makes it possible to obtain, without complex procedures, changes in our regulations when desired, and gives the Department considerable leeway in interpretation.

Our licensing requirements are simple and straightforward, since we have only two classes, Amateur and Advanced Amateur. The first requirement is that a candidate must be a Canadian citizen, or a British subject, or a recent immigrant settling permanently in Canada. We must then pass examinations in Morse, theory, and regulations to obtain a Certificate of Proficiency of either grade, and then apply for a station license. Morse requirements are 10 w.p.m. for the Amateur Certificate and 15 w.p.m. for the Advanced Amateur — but this is tougher than it sounds, for we are not allowed one error in a full five-minute test. Theory includes modern techniques such as single sideband, RTTY, and solid state devices, and is an essay type examination rather than a multiple choice type, including the drawing of circuit diagrams for receivers, transmitters, and so on. The standard of theory required, in the case of the Amateur Certificate, is somewhat below that of the U.S. General Class, but much higher than the Novice; for the Advanced Amateur, it falls between General and Amateur Extra.

Having obtained an Amateur Certificate, we are restricted to c.w. for six months; our licenses may then be endorsed for telephony on ten meters and the v.h.f. bands but we must remain active on c.w. for a total of one year before trying the Advanced Amateur examination. Only then do we acquire phone privileges on the high frequency bands, privileges which include access to the so-called "DX portions" of the various bands. An incentive system? Certainly, and few of us would have it otherwise, since we have a sense of achievement not attainable in any other way.

Canada has always issued licenses to visitors and immigrants from the British Commonwealth, usually without further examination. And our agreement with the United States is of long standing. This grants "permission to operate," and many hundreds of American citizens take advantage of it each year. American calls are as familiar to us in summer as Canadian calls are to amateurs in Florida in the winter. Recently Canada has announced that full reciprocity will be granted in the future to amateurs of any country extending similar privileges to Canadians, using procedures even simpler than those in the United States.

Equipment and Operations

It would be difficult to see any major difference between a Canadian amateur station and one in the U.S. Most of our equipment is of American origin, although we do have a small but growing representation from England. The size of the amateur market in Canada has not up to now appeared to warrant manufacture in this country, although there is some assembly and parts production. As a result, we pay much higher prices for our equipment, about 55%

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when duty, sales tax and exchange are included. This is something of a sore point with Canadian amateurs and the Canadian Division has been trying to do something about it; two years ago representations were made to the Tariff Board but so far no decision has been handed down.

Our operating habits are much the same as those of amateurs anywhere in the world. We have devotees of DX, traffic, contests, v.h.f., and so on, but the size of the country and the population distribution have encouraged reliance on the lower frequencies, v.h.f. being confined in most cases to the population centres. More than one visiting American amateur has noted the highly-populated 75-meter phone band when here on holidays. It simply is the most logical frequency to use in the vacation areas of our north country.

Handling traffic for those in remote areas has long been part of our amateur existence. The Arctic and the northern bush, usually without adequate communication, are often dependent on amateurs for a link with the "outside." In the last few years we have been able to provide a tie with home for our servicemen on U.N. peace-keeping missions abroad, notably in the Gaza Strip.

Clubs in Canada are much like those elsewhere. We have local clubs in most areas with special interest ones, such as DX clubs, in the larger centres; more than fifty of these are League-affiliated. In addition each province now has some form of provincial organization, either a federation of the clubs or a society with individual members. These can, and in many cases do, serve a very useful function in relations with provincial governments on such matters as license plates, and with the regional offices of the Department of Transport on local matters. Finally, the League has some 3200 full members in the Division, representing I believe the great majority of active amateurs in the country.

VE2MS (l.) and VE2PX operate VE2XPO on opening day. The station is now in the youth portion of the Quebec pavilion. RAQI, and its president VE2AOS, were largely responsible for the existence of ham installation at EXPO 67.

Discussing a permanent amateur installation at the Centennial Centre of Science and Technology are (around table) VE3CO (Chairman of committee), VE3AFM, VE3CJ, VE3BBC and VE3CLL. The group hopes to have the station in operation soon.

Organizational Aspects

It was at the request of Canadian amateurs themselves that the League formed four Canadian Divisions in 1920; these were later amalgamated into one, with its own Canadian General Manager, who still later became a full Director of the League. The arrangement has worked well over the years and most Canadian League members appear to be in favour of it, since the Division was one of the first to exceed its quota in contributions to the Building Fund.

Thus, we have the best of both worlds; we have all the advantages of League membership, plus complete independence in purely Canadian matters. The Division has its own membership in the International Amateur Radio Union, and in the I.A.R.U. Region II organization. Since radio pays no attention to political borders there is considerable advantage in being part of the League Field Organization; participation in League contests, traffic nets, and other activities is both easy and natural.

Now that you know a little about us, why not — to quote a famous blonde — "Come up and see us some time." You will enjoy your visit, for Canada has much to offer the vacationer; this year in particular, Expo '67 makes a trip more than usually worth while. Providing you have a General Class license or better, permission to operate is easily obtained and you will find many friends when operating mobile or portable. Many amateurs from the U.S. will be present in Montreal for the League's National Convention over the first weekend in July, and I hope to meet many of you there at that time. QST

This article is based upon the real life experiences of a ham who has been the Program Chairman and President of the Penn Wireless Association and President of the Frankford Radio Club. The author does not claim to have originated all of the ideas, but he does attest to their effectiveness. If your ham radio club is in trouble from a program standpoint, here are some helpful pointers to get you back on the road to recovery.

Ideas For The Club Program Chairman

New Vigor For Your Ham Club

BY JOHN B. JOHNSTON,* K3BNS

Too many local ham clubs, the meaning of the word "program" is synonymous with the word "speaker." You may have heard a disappointing announcement like this at your club meeting: "Sorry, no program tonight; we couldn't find a speaker." While it would be nice to be able to arrange for interesting visitors to entertain your club at every meeting, it is a little too much to expect time after time.

Interesting programs at every meeting are possible, however. There are many programs that can be conducted by just using the talent in the membership with an occasional visiting speaker to augment your programs. When a club has found out how to do this well, it is rare that an outside speaker can hold the interest that a member-participating program can.

There are several little techniques that a program chairman can use to advantage to bring about a self-sustaining situation like this. As a starter, try to establish an atmosphere in the program of light-hearted fun, always include a serious interlude, and above all, have a purpose for the program. For this last requirement, the program should have a theme — a reason — for happening. Each member in the audience attends a meeting for one reason or the other. Provide a good reason so that he can join in the spirit of the program right away. For example, consider if your attitude would be the same as you enter the hall for a meeting that had been announced like this:

Regular Club Meeting
Monday 8 P.M.

or like this:

PUBLIC SERVICE NIGHT!
Monday 8 P.M.

Program: "All About The NTS". W3MPX
"Public Service In The AREC".....W3ICC
"RACES Needs"
County CD Director
Quiz Game! Prizes!
ARRL Film: "And A Voice Shall Be Heard"
Come and find out how you can meet your responsibility to ham radio!

Business: Field Day Plans.....K3AHH

Social: Ragchews, raffle, refreshments
See The Astro Ten created by W3YZC

Good program themes are not as difficult to come by as you might think at first. They should reflect the character of your club. Examine the committees and other areas of interest in your club for ideas — you might choose to have a V.H.F. NIGHT, OPERATING NIGHT, RTTY NIGHT, DX NIGHT, or all of these, depending upon your club. Look for theme ideas from other areas that your club does not now cover. It just might stimulate a whole new field of interest.

The night before a club meeting is not the ideal time to try to arrange a program. If you can consistently come up with a good one on such short notice, you are a miracle-man. Here is where programs that fail really go astray. Your best bet is to plan ahead by selecting a theme for each meeting for the entire calendar year. Then sketch out a program with several items that fit into each theme: speaker topics, films, contests, etc. Now you can look over the entire year

* 11 Fieldstone Road, Levittown, Pennsylvania 19056.

"SORRY, NO PROGRAM TONIGHT; WE COULDN'T FIND A SPEAKER"

to double-check that everything is being covered with the proper emphasis and attention. Now you can go to work lining up the program material.

Think of each program as a little production. Try to get good balance: fun, service, knowledge, skill. Who are the experts in your club for the selected themes? You'll be pleasantly surprised to find how cooperative they will be to appear on *that* program. What films or training aids are suitable? They can be used to supplement the program very effectively. Check the ARRL and local industry film library lists. How about a short quiz game? Often this little device can balance out the program and add audience participation at the same time. If the technical content of the program is sparse, use ten questions requiring one word answers with material right from the Handbook. If the program was pretty serious fare, make the questions light for a change of pace. For instance, base the quiz on novice exam questions (no one will get them all!).

There are many variations on the quiz game you might want to try from time to time. Have them try to remember the names of ham equipment manufacturers from their slogans, or try to guess the names of certain members from one word hints. Another variation is to cut out pictures of ham equipment from old and new catalogs, blot out any identifying names and tape them around the room. Ask them to list the manufacturer and model number. Then there is the "Question Man" variation. You supply a set of answers beforehand in the club bulletin or at the previous meeting, and offer prizes for the best questions. Example: answer — "semiconductor," question — "What do you call a part-time trainman?" The prizes need only be small token ones, say a free ticket for the raffle.

Publicize all of the themes that are being planned to let it be known what you need. When someone mentions that he is interested in a certain topic, line him up for a specific program right on the spot. It is much easier to find something when you know what you're looking for. Use *your* club bulletin to get *your* program themes across.

In addition to announcing the next program, work with the bulletin editor to have other articles included that are related to the theme. If your president writes a message, ask him to cover the topic, too. Have the chairman of the committee closest to the subject matter turn out an article. By scheduling the program themes well in advance, there is no time pressure upon anyone.

Most likely your club has some form of meeting format consisting of the program, a business session and a social mixer. Make sure that you have a good understanding with the president as to the timing for each; otherwise a good program might have to be foreshortened because of an overly-long business harangue. An Executive Committee, or some such group, should be assigned routine business functions to keep meetings from bogging down in such detail. Make sure that the program doesn't run over into the social time, or the audience may become restless and noisy. Also, a guest speaker should not be made to wait around a long time while the club does business.

Here are several tried and proven themes that you might wish to consider:

Auction: Ask everyone to bring choice items from his junk box and have a member act as auctioneer. This one is guaranteed to aid an ailing treasury. The custom is usually to pay a commission of 10 percent or so to the club treasury on all items sold.

Town Hall Tonight: Prepare a few slips of paper with controversial topics (a.m. should/should not be outlawed; c.w. is/is not an outmoded communication mode). Select a member to present a five minute impromptu talk on his view for one subject. Then call for a five minute rebuttal from the audience. Next allow 2 minute talks alternating pro and con from other members. Hold a strict time limit to add to the fun.

ARRL Night: Obtain several speakers from the field organization members in your club. Maybe your SCM, Director or Vice-Director can make the meeting, too. Ask them well in advance. Show the league headquarters slides.

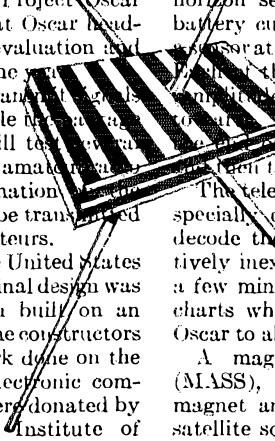
Public Service Night: Invite organizations such as the Red Cross, Emergency Squads, CD Officials, and the local police, who may have a need for emergency communications (some may not even know it) to send a representative out to the meeting to talk it over with the club. Have member speakers cover the ARPSC and the emergency capability in ham radio. Ask them to discuss their needs. Show one of the League films on emergency communications.

Station Night: Have everyone bring in a few slides of his station and antennas. Ask each member to describe his station while the slides are projected. This gives him a chance to show

(*Continued on page 150*)

AUSTRALIS-OSCAR ARRIVES IN U. S.

On June 1, the Australis-Oscar amateur radio satellite built by the Melbourne University Astronautical Society and the Melbourne University Radio Club arrived in San Francisco for presentation to Project-Oscar officials. The satellite was accompanied by three members of the Australian project team, Messers. Paul Dunn, VK3ZPD,[1] Owen Mace, and Richard Tonkin. They conducted special tests on the satellite and conferred with the Project Oscar staff. The package now remains at Oscar headquarters for further testing and evaluation and perhaps will be launched later in the year.



Australis-Oscar is designed to transmit signals in our 10- and 2-meter bands. While it contains no repeater device, it will test several systems which may be used in later amateur communications satellites. Information on the performance of these systems will be transmitted from the satellite to listening amateurs.

The arrival of the satellite in the United States comes just fifteen months after its final design was approved. The satellite has been built on an entirely voluntary basis. None of the constructors received any payment for the work done on the project. Similarly, most of the electronic components used in Australis-Oscar were donated by Australian firms. The Wireless Institute of Australia (an IARU member society) gave the project a cash grant for the purchase of special materials and components.

Australis-Oscar will somewhat resemble Oscar III in physical appearance. It is a 35 lb. rectangular satellite, measuring 17 inches by 12 inches by 6 inches. The package will be thermally controlled by a black-and-white paint pattern which hopefully will keep the internal temperature within a range of 60 to 100 degrees Fahrenheit.

The satellite carries two transmitters. One transmitter operates on 144.050 Mc. and has an average output power of 100 milliwatts. It will operate continuously from the time that the satellite is put into orbit until its batteries are exhausted — about two months after launch.

The second transmitter operates on 29.450 Mc. and has an average power output of 250 milliwatts. This transmitter will be commanded to switch on and off by a number of specially-equipped amateur radio tracking stations. (It is most likely that it will be switched on only during week-ends.) It is hoped that by studying the signals from Australis-Oscar, more can be learned about which times of the day and seasons of the year are most suitable for using the 29 Mc. band for long-distance communications.

[1] "Z" calls identify VK experimenters class of license.

The telemetry system in the satellite converts data produced by its sensors, such as battery voltage and temperature, into audible tones. These tones are then fed to the two transmitters which relay the information to radio amateurs on the ground. The telemetry unit is also linked to a keyer which produces the letters, *Hi*, every 60 seconds. The satellite carries seven sensors which feed the telemetry system. These consist of three horizon sensors, a sensor for battery voltage, battery current drain, battery temperature and a sensor attached to the inside skin of the satellite. [illegible] their outputs appear as an audio tone [illegible] modulated) on the signals sent back [illegible] is sampled for 7¼ seconds. At [illegible] the seventh tone, *Hi* is sent twice [illegible] then the whole sequence is repeated.

The telemetry system in the satellite has been specially designed so that radio amateurs can decode the information transmitted using relatively inexpensive equipment. It will take only a few minutes to decode this information using charts which will be supplied through Project Oscar to all radio amateurs tracking the satellite.

A magnetic attitude stabilization system (MASS), which consists of a permanent bar magnet and hysteresis rods, will stabilize the satellite so that one of its faces will always be pointed toward the earth. This should reduce the fading effects of signals as it orbits the earth. Australis-Oscar is the first amateur radio satellite to incorporate such a system.

While it is not yet known when the launch of Australis-Oscar will take place, it is hoped that the satellite will orbit the earth at a height of about 500 statute miles, with an inclination to the equator of approximately 70 degrees. This means the satellite would orbit the earth once every 103 minutes and it would complete about 15 orbits every 24 hours. Although the satellite will operate for about two months, it is expected that it will remain in orbit for 50 to 100 years.

Australis-Oscar credits go to David Bellair, VK3ZFB (command decoder); Paul Dunn, VK3ZPD (satellite package); Peter Hammer, VK3ZPI (transmitter and *Hi* signal); Stephen Howard (satellite stabilization); Owen Mace (orbital prediction); John Monro, VK3ZGY (telemetry); Geoff Tomson (satellite testing); Richard Tonkin (project manager); and, John Zmood, VK3ZAU (command receiver).

QST will carry future news about Australis-Oscar and other Oscar V contenders as it occurs. News of especial timeliness will be transmitted from W1AW and W6EE. QST

A DXers Dream

BY BOB RINALDI,* WICNY

After a night of avid DXing, I flopped into bed and dreamt of the DXers never-never land. It went like this:

I felt Chile, and my trusty dog Svalbard was Hungary, so I gave him a Turkey leg, which I had fried earlier in Greece. It was getting late, and Ifni were Ghana Togo to Goa and be there by Friday, we'd have to gulp our Java (2 Cubas please) and step on it.

About Midway there, we spotted a beautiful Canary with a bright red Mozambique. It was Glorioso.

In Egypt, we were fortunate enough to meet the Faroe, and an old friend, Jan Mayen. I hadn't seen Jan in a dog's age. Ooops! Sorry Svalbard! I asked Jan "What's Niue?" He said he had just returned from a trip down the Nile, and was recovering from a rash of Azores (an affliction not uncommon in Egypt). He was with his beautiful wife Dode-canese. She was as lovely as a Swan. All Yemen went Cocos over her!

After lunch, which consisted of a South Sandwich with Orkney sauce (which by the way, came in a Vat-i-can) and a side order of Anguilla (for you Italians) we parted company.

I decided to spend the night in Egypt, but the Roumanias I had Heard about not being able to operate gave me Indonesia, and I couldn't sleep.

I Cook-ed breakfast, and I washed my Monaco, which had gotten dirty in the desert, and inserted it into my left eye, and Kuwait to get outta' there.

Travelling down the Nile is quite an experience. If you don't get those nasty Azores, you'll probably suffer from a Laccadive! My Gambia became swollen, and the Morroco, the more it hurt (the Gambia is the little boxing-bag like object that hangs over your Tonga).

Coming upon a lake, we, Svalbard and I, decided to go for a swim. But Svalbard bashed his leg on the Gold Coast, and I had to put a Spratly on it. Sort of a Mal-dive, eh Svalbard? Oops, sorry boy — easy! Be a good dog and I'll Fiji. How would you like a nice juicy Bonin?

Continuing on down the Nile, Macao got sick (seems he drank some water with a lot of Algeria in it) so we were now drinking Madeira instead of Macao's milk. Madeira was more Tangier to the taste. (However I still prefer a Martinique to Madeira, but we were fresh out of green olives.)

Entering the rapids proved to be an impossible task. So we hired a pilot to take us to Lake Victoria.

Boy, you Navassa such a beautiful sight as Africa from an airplane! We sat back, enjoying the scenery along with a smoke of Nicobar-full Tobago.

Our greatest thrill of the day was crossing the Ecuador. Our pilot, Cy-prus was having difficulty, as his Tunisia (a long flowing cape) was stuck under his seat. He asked "Kenya see where its caught?" "Yes" I said, "its caught under the Zanzibar." "See if you can Liberia it, will you?" "OK!" Iran over and was willing Tibet I could free it. Svalbard just stood there watching, with his leg still in that Spratly. Well, I couldn't get the Tunisia free, so I called Svalbard "Here Boy, Guam and Sikkim fella." Sudan Svalbard began chewing away at the Tunisia, and eventually got it loose. Cy-prus was thankful, and said when we landed, he would take us to Iceland in his Rhodesia-Royce and buy U.S. a strawberry Malta. At the mention of food, Svalbard's mouth dropped, and his eyes lit up. I asked him "Bechuanaland now eh feller?" He said yes, but he wanted to get a few more pictures with his Cameroun before we landed.

Soon we would have a Reunion with the Sultans of Muscat and Oman, whom we hadn't seen since Christmas (or was it Easter?) anyway, not for a long time.

We landed on Lake Victoria, of Corsica a sea-plane!

Just about then a buzzer sounded in the pilot's cabin, and of course it was the alarm clock in my bedroom announcing it was time to leave DX heaven. I got up, and went to work as usual. But I seemed to be humming a melody I had remembered from my dream. I don't recall the lyric, but the last line, for some strange reason, still sticks in my mind. It goes something like this:

"but there ain't no Ebon Atoll'." QST

* Assistant Circulation Manager.

Alaska 67

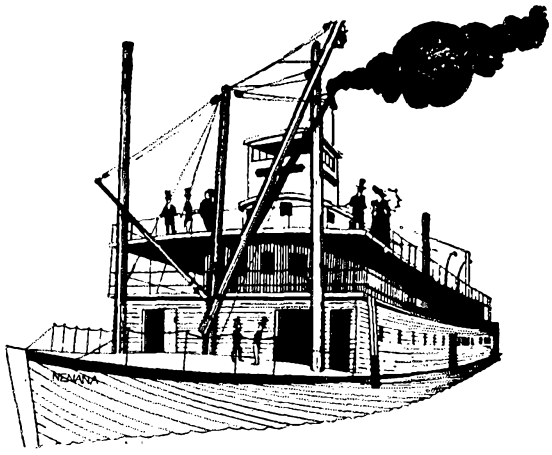
GOING north for vacation this summer? If so, the members of the Arctic Amateur Radio Club invite you to travel to the *Far North* on the occasion of the Alaskan Centennial Exposition — *Alaska 67*.

The Centennial celebrates the 100th anniversary of Alaska's purchase by U. S. Secretary of State Seward from the Tsar of Russia. Fairbanks, located in the geographic center of the state, serves as the focal point of activity.

A complete Gold Rush Town has been reproduced in authentic detail showing the boom town days at the turn of the century. Mining techniques from gold panning to the most modern techniques are featured in the Mining Valley. Alaska's past and future are linked together at Bartlett's Plaza, the main exhibition area. The exhibits present a cross-section of Alaskan art, industry and culture, as well as exhibits from other states and nations.

KL7ACS, "The Alaska Centennial Station" operates from aboard the historic riverboat *Nenana* which has been retired to the exposition grounds. Visiting mobiles entering the Fairbanks area may request information on 3866 kc. a.m. and l.s.b., and 145.35 Mc. a.m.

The Arctic Amateur Radio Club meets on the campus of the University of Alaska in the Duckering Building at 8:00 P.M. on the first Friday of each month. Informal get-togethers take place at noon every Saturday at Kings Kup in downtown Fairbanks.



The Centennial runs from May 27 to September 10, 1967. Further details may be obtained from the Arctic Amateur Radio Club, Box 389, Fairbanks, Alaska 99735. QST

July 1942

. . . K. B. Warner lengthily discusses the new pronouncements of the Office of Civilian Defense. The War Emergency Service is now established with all the rules, etc. published. Hams are going to have to be the mainstay of this outfit although the service is by no means limited to hams. The organization will be under the direct control of Civilian Defense Corps, which makes the appointments, etc. Hams will have to use their own gear or make it for the most part, using different calls, frequencies, etc. Gear previously described in *QST* for 2½ and 1¼ meters will be much used.

. . . George Grammer, W1DF has a comprehensive article, giving construction and circuit details of a Panoramic Radio Spectroscope Adapter. Can be used with any superhet. I took one look at the bottom view and quickly went on to other things!

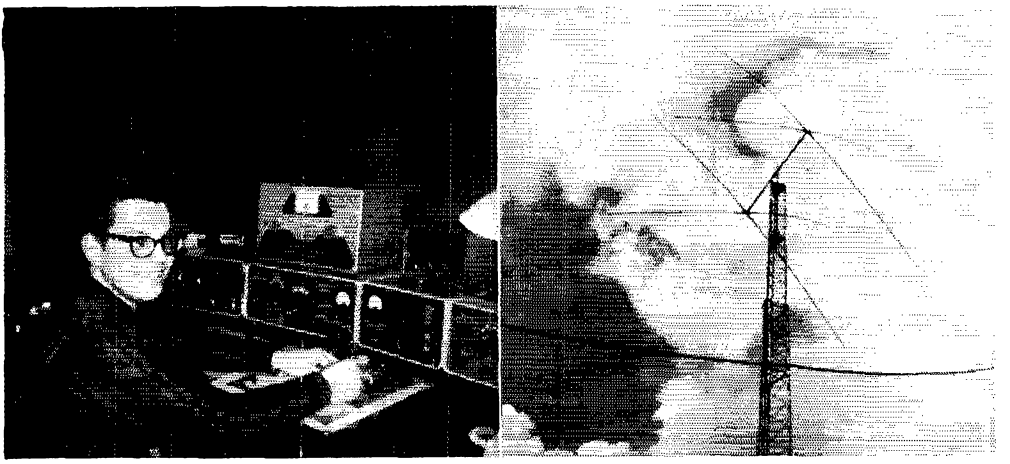
. . . 100 Cm. and Down is a review of microwave technique by Robert F. Shaw, W3AOC, the first of a series of two. Some parameters which are relatively unimportant on the lower frequencies become all-important when we go to the microwaves. He tells about the Klystron oscillator, etc. Very interesting and instructive.

. . . Clinton B. DeSoto, W1CBD has a piece on How Recordings Are Made. He is talking about disc records and takes us through the technique in considerable detail.

. . . Wanna go to sea on a Navy destroyer on patrol? Eddie Dieckmann, W2NDZ takes us out for a most interesting trip, describing what goes on. An amusing and instructive tale.

. . . This month F. E. Handy, W1BDI, leaves and goes into the Service with the rank of Major. He is stationed in Washington in the office of the Directorate of Communications, Army Air Force. John Huntoon, W1LVQ, Assistant Secretary, assumes Ed's old duties. Dave Houghton is elected Treasurer of ARRL. Charlie Service, W4IE comes back to us as Assistant Secretary. George Bailey, W1KH is reelected President of the ARRL. Nice picture of George.

. . . The Experimenter's Section describes experiments in Carrier Current, Audio Frequency Induction and Earth Currents, Acoustic Aircraft Detectors, with sketches, results, etc. — *WIANA*



WN2YQH of Buffalo, New York recently passed his General exam. His OM is W2FXA, well-known DXer. Bob's 2-element quad on 15 meters really helped in the sections department and paved the way for the Western New York section certificate.

• 1967 Novice Roundup Results •

ANOTHER SUCCESSFUL ROUNDUP

ANYONE who tuned the Novice bands during the period of the 1967 ARRL Novice Roundup, February 4-19, knows well the impact of this contest. Imagine the confusion present in the minds of the few who were not aware of this activity . . . they learned quickly!

Participation and scores are up again this year, perhaps a bit reminiscent (for the old timers) of the last sunspot peak almost 10 years ago. Top scorer in the contest was WN3FLN posting 37,133 points with 508 QSOs in 71 ARRL sections and 38 hours on the air pounding brass. Others in the top bracket scoring over 20,000 points were WN3GZM WN5PPF WNØPHA WN2YQH WNØPPK WN1GTH WN8UHN WN9SKU WN9SWO and WN6SVV. FB OMs! And well done to all 320 Novices and 133 Non-Novices who submitted logs.

Certificate awards for all section leaders are scheduled for July 15 mailing. — *W.I2B.1H*

SCORES

Scores are grouped by ARRL Divisions and Sections. The operator of the station listed first in each section is award winner for that section. *Example of listings:* WN1GDA 2376-66-36-14, or final score 2376, number of stations 66, number of sections 36, total operating time 14 hours.

ATLANTIC DIVISION

Delaware

WN3FWN	3630-121-30-27
WN3GKI	2125- 85-25-23
WN3GQY	1173- 51-23-15
WN3GNU	420- 28-15-14

Eastern Pennsylvania

WN3GAR	14,248-254-52-34
WN3GQP	9471-231-41-40
WN3GMS	4698-162-29- -
WN3GNV	4469-109-41-27
WN3GLX	4070-110-37-26
WN3GYU	1458- 66-18-30
WN3FWM	851- 37-23-10
WN3FRF/3	441- 24- 9-12
WN3GOV	325- 25-13- 5

Maryland-D. C.

WN3GZM	30,504-482-62-35
WN3FOY	12,480-208-60-21
WN3GFN	10,350-192-50-39
WN3GLP	7350-175-42-24
WN3GUT	5418-126-43-16
WN3GMC	1704- 71-24-29
WN3GKH	1298- 59-22-11
WN3HIL	1029- 49-21-13
WN3FON	672- 48-14-19
WN3GHV	70- 10- 7- 9
WN3GUI	33- 11- 3-11
WN3GUH	24- 8- 3- 9
WN3GUJ	15- 5- 3- 6

Southern New Jersey

WN2WOZ	18,336-372-48-30
WN2WQH	9684-269-36-34
WN2ZEU	8618-268-31-39
WN2ZED	1242- 54-23-13
WN2YJN	176- 16-11-40

Western New York

WN2YQH	26,164-402-62-35
WN2YVP	14,098-256-53-33
WN2WTW	9793-229-41-39
WN2YQO	4872-148-29-13
WN2YIK	4280-107-40-13
WN2YAC	2850- 95-30-24
WN2YKG	1980- 89-20- 5
WN2ZGD	364- 26-14-13

Western Pennsylvania

WN3FLN	37,133-508-71-38
WN3GXF	15,416-328-47-28
WN3GSC	8448-166-48-18
WN3GKY	6072-138-44-13
WN3FMS	3584- 97-32-34
WN3FTR	2880- 86-30-22
WN3GSB	2759- 79-31- 8
WN3FYJ	2640- 73-31- 8
WN3GPP	2592- 81-27-13
WN3FOZ	867- 41-17-21

CENTRAL DIVISION

Illinois

WN9SKU	22,388-386-58-39
WN9SWO	20,976-304-69-18
WN9TOR	16,936-272-58-40
WN9TKK	16,864-257-62-29
WN9STQ	12,650-220-55-33
WN9SLD	12,376-238-52-40
WN9RJL	10,050-201-50-31
WN9SVT	4446-101-39-15
WN9SLU	4440-128-30-22
WN9TGK	4140-115-36-26
WN9SRZ	3648-114-32-40
WN9TGU	3589- 97-37-16
WN9TXL	2700-108-25-36
WN9TIX	2584- 76-34-22
WN9TCW	2244- 68-33-10
WN9STO	102- 7- 6- 3

Indiana

WN9SWR	11,524-248-39-33
WN9SIZ	7568-161-43-19
WN9SCK	6798-191-33-28
WN9SPF	5535-125-41-22
WN9SLM	4200-120-35-20
WN9SMN	3360-189-30-24
WN9TKH	2910- 97-30-18
WN9SWU	1026- 44-19-13

Wisconsin

WN9SQN	16,936-292-58-40
WN9RUE	16,344-262-59-27
WN9TIA	15,768-292-54-38
WN9SUU	11,925-215-53-25
WN9TUP	6975-135-45-15
WN9SPM	6885-153-45-23
WN9RUH	5712-121-42-19
WN9RUD	1342- 46-22- 3
WN9SYD	4- 2- 2- 1

DAKOTA DIVISION

Minnesota

WNØPRL	18,386-317-58-24
WNØPRT	16,472-284-58-40
WNØPWY	9016-169-49-39
WNØPRS	4392-107-36-16
WNØPFV	4035-105-39-19
WNØOXL	3850-110-35-24
WNØQEK	3348- 93-36-18
WNØQHL	1764- 49-36-30
WNØPWZ	66- 11- 6- 7

North Dakota

WNØPPK	25,152-383-64-39
WNØQGN	3276- 84-39-18

South Dakota

WNØOML	6016-128-47-40
WNØPNC	4224- 86-44-27

DELTA DIVISION

Arkansas

WN5PFH	8046-149-54-26
WN5PDW	1653- 42-29-18
WN5RCK	648- 36-18-15
WN5RBA/5	90- 8- 5- 5

Louisiana

WN5QAP	18,700-340-55-37
WN5QZH	8928-279-32-40
WN5QIG	6108-142-43-26
WN5PMX	5775-165-35-12
WN5QPA	5661-153-37-12
WN5PWW	1980- 60-33- 9
WN5QFA	966- 42-23- 6
WN5QBR	595- 35-17-19
WN5OXK	351- 27-13- 2

Mississippi

WN5RAX	3708-103-36-18

Tennessee

WN4EKI	15,544-258-58-21
WN4DAA	9776-188-52-39
WN4DGT	8077-182-41-30
WN4CUN	4148-112-34-17
WN4ESE	1690- 65-26-12
WN4DGW	1026- 54-19-15
WN4CRJ	336- 14-14- 5
WN4ECE	176- 16-11- 1
WN4EAB	39- 3- 3- 1

NOVICE DIVISION LEADERS

Atlantic.....	WN3FLN	New England.	WN1GTH
Central.....	WN9SKU	No. Western	WN5QMX/7
Dakota.....	WN9PPK	Pacific.....	WN6THT
Delta.....	WN5QAP	Roanoke....	WN8TMA
Gr. Lakes...	WN8UHN	Rocky Mt....	WN0PUV
Hudson.....	WN2ZOM	Southeastern.	WN4EPD
Midwest....	WN0PHA	Southwestern.	WN6SVV
		West Gulf...	WN5PPF

GREAT LAKES DIVISION

Kentucky

WN4CJM	782- 46-17- 9

Michigan

WN8TNY	16,368-244-62-35
WN8USU	14,850-275-54-40
WN8TAL	12,079-237-47-31
WN8VGQ	9266-216-41-34
WN8VBL	8685-168-45-26
WN8USD	5652-157-36-29
WN8VCR	4410-147-30-25
WN8VJT	3663-111-33- -
WN8URE	3399-103-33-13
WN8VIF	3348-124-27-26
WN8TWZ	2856- 87-28- 9
WN8UMC	2352- 98-24- -
WN8VBY	578- 21-18- 3
WN8VCI	279- 31- 9-20
WN8UKC	25- 5- 5- 9
WN8VRB	25- 5- 5- 3
WN8UOY	15- 5- 3- 8

Ohio

WN8UHN	23,026-382-58-30
WN8TXS	9243-222-39-24
WN8TGQ	6800-200-34-15
WN8TFO	3729-103-33- 7
WN8VAM	3348- 93-36-24
WN8UOA	1643- 53-31-13
WN8UCF	1595- 56-29-17
WN8UGT	576- 36-16-11
WN8VOK	161- 23- 7-15
WN8TDN	64- 8- 8- 5
WN8VFP	2- 2- 1-11

HUDSON DIVISION

Eastern New York

WN2YPM	12,716-265-44-33
WN2WVM	11,660-205-53-23
WN2YVH	10,251-201-51-24
WN2YRB	5040-126-40-18
WN2YDU	3500-125-28-23
WN2YIL	2548- 78-26-20
WN2YSG	1919-101-19-14
WN2ZAV	1403- 46-23- 9
WN2WNB	1008- 53-16-13
WN2ZBE	962- 37-26-15
WN2YTM	840- 70-12-13
WN2ZPW	693- 99- 7-19
WN2WLW	504- 26-14-12
WN2VAK	294- 30- 6-25
WN2YQK	243- 12- 9- 4
WN2WVY	39- 3- 3- 1

N.Y.C.-L.I.

WN2ZOM	16,675-275-61-33
WN2ZAM	7272-202-36-21
WN2WZD/2	4370-115-38-19
WN2YZO	3051-104-27-17
WN2AJZ	2700- 90-30-11
WN2ZFC	2263- 63-32- 6
WN2YMG	1680-110-14-21
WN2ZOB	1380- 69-20-12
WN2ZIT	966- 36-21- 8
WN2ZNZ	620- 31-20- 5
WN2YKL	312- 25-13- 4

Northern New Jersey

WN2ZNO	12,448-223-56-35
WN2YOJ	12,195-271-45-27
WN2ZCI	5330-190-26-35
WN2YNM	5070-169-30- -
WN2WIX	4587-139-33-18
WN2YDV	4247-137-31-28
WN2ZSH	4216-126-31-18
WN2ZJB	1472- 54-23-15
WN2ZQN	760- 40-19- 5
WN2ZQP	435- 29-15- 3
WN2YXV	406- 19-14- 1
WN2WMY	154- 14-11- 1
WN2WWP	76- 9- 4- 1
WN2ZCX	4- 2- 2- 1

MIDWEST DIVISION

Iowa

WN0QND	2645-115-23-19
WN0ORM	1219- 43-23- -
WN0PVB	425- 25-17- 4

Kansas

WN0PHA	26,400-385-66-40
WN0OUI	7525-160-43-29
WN0PWP	3072- 96-32-15
WN0PUK	3003- 91-33-20

Missouri

WN0QQK	1708- 61-28-18

Nebraska

WN0PRR	14,877-261-57-39
WN0PDW	10,764-214-46-33
WN0OPQ	7304-151-44-32

NEW ENGLAND DIVISION

Connecticut

WN1GSS	19,320-325-56-31
WN1GRB	17,094-327-52-32
WN1GLS	16,800-350-48-36
WN1GFH	9630-201-45-40
WN1FXP	8970-195-46-32
WN1HGU	8131-163-47-30
WN1GUD	7245-141-45-18
WN1GSO	6650-175-38-19
WN1GOI	3534- 73-38-24
WN1GDA	2376- 68-36-14
WN1GGN	1491- 71-21-17
WN1GYP	1325- 53-25-13
WN1GFD	1860- 60-31- 8
WN1FXO	1080- 60-18-27
WN1HCT	328- 41- 8- 9
WN1HAO	285- 19-15- 6

Eastern Massachusetts

WN1HES	13,296-262-48-38
WN1GZY	10,501-187-52-23
WN1ETC	8225-175-47-22
WN1HCL	1904- 83-23-32
WN1GYZ	143- 13-11- 2

Maine

WN1HCO	855- 95- 9-33

New Hampshire

WN1FZB	492- 41-12- -

Rhode Island

WN1GNR	2744- 98-28-20
WN1HDB	1984- 54-31-12
WN1HBG	45- 9- 5- 6

Western Massachusetts

WN1GTH	23,940-355-63-38
WN1GWV	10,296-198-52-37
WN1HEC	2944- 92-32-22
WZ1HFF	1316- 47-28- -
WN1GJM	1302- 62-21- 9

NORTHWESTERN DIVISION

Montana

WN7FBL	11,368-203-56-38

Oregon

WN7GJC	1632- 68-24-20
WN7GFS	1428- 58-21-38
WN7GJZ	336- 21-16-14
WN7GGD	85- 7- 5- 6

Washington

WN5QMX/7	12,996-228-57-33
WN7GPZ/7	4545-101-45-23
WN7GLC	1705- 55-31-20

PACIFIC DIVISION

East Bay

WN6UQS	1248- 52-24- -

Nevada

WN7GCY	4255-100-37-23
WN7FBF	3420- 75-38- -

Sacramento Valley

WN6UVH	5461-127-43-11
WN6SVN	2280- 85-24-20

San Francisco

WN6UQU	1932- 59-28-25
WN6UJF	828- 36-18- 6

San Joaquin Valley

WN6UMX	14,694-222-62-39
WN6TYH	6360-144-40- -
WN6UFT	3104- 97-32-20
WN6TFE	324- 27-12- 7

Santa Clara Valley

WN6THT	17,324-259-61-27
WN6UOL	5200-130-40-28
WN6UUT	2812- 74-38-17

ROANOKE DIVISION

North Carolina

WN4CWM	16,038-282-54-40
WN4DWN	9460-220-43-26
WN4CVM	5244-123-38-16
WN4BQW	5180-140-37-30
WN4EAC	722- 38-19- 7
WN4FBY	120- 12-10- 4

South Carolina

WN4DFW	2635- 75-31-19

Virginia

WN4DKY	5889-151-39-19
WN4ERV	5460-140-39-29
WN4DNV	1050- 50-21- -

West Virginia

WN8TMA	17,184-338-48-30
WN8TQD	11,883-233-51-40
WN8UTH	10,600-212-50-19
WN8TWR	4794-141-34-35
WN8TOX	3840-120-32-16

ROCKY MOUNTAIN DIVISIOIN

Colorado

WN0PUV	16,695-315-53-40
WN0PPV	12,428-224-52-31
WN0PAF	1752- 73-24-37
WN0PRJ	1734- 51-34-20

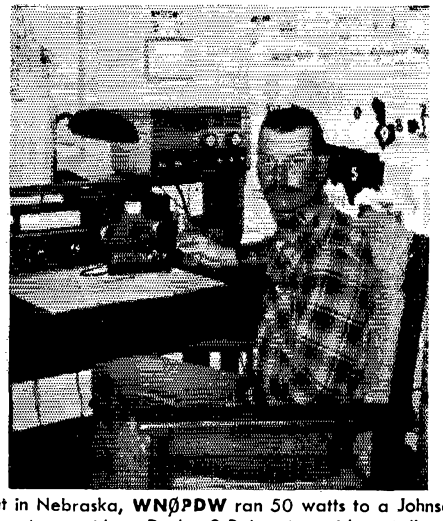
New Mexico

WN5RGI	4970-142-35-30
WN5QFD	4180- 94-40-23

Utah

WN7FSB	3094- 91-34-40
WN7FLK	1166- 53-22-14

Here's Central Division leader **WN9SKU** with various receivers and transmitters to see him through the contest. Looks like Bob made it pretty tough for Murphy this trip, but we understand he's still lurking around the corner. Equipment at the Chicago QTH includes SX100, SX101 and SX111 receivers with T-150, Ranger II and a 1-watt homebrew rig that Bob used to earn the QRP "1000 mile per watt award."



Out in Nebraska, **WNØPDW** ran 50 watts to a Johnson Adventurer with a Drake 2-B hearing aid to tally up 214 QSOs in 46 sections for 10,764 points. Credit for 20 w.p.m. code proficiency really helped Roger's score.

SOUTHEASTERN DIVISION

Alabama

WN4ENX	14,190-238-55-23
WN4DOR	5110-146-35-40
WN4DXZ/4	629- 37-17- 8

Eastern Florida

WN4EPD	15,300-285-51-37
WN4EPC	14,355-261-55-24
WN4ECA	3048-117-24-21
WN4DVK	1830- 61-30-13

Georgia

WN4EMF	4860-125-36-26
WN4DDN	2176- 68-32- –
WN4FAM	1728- 54-32-28

SOUTHWESTERN DIVISION

Arizona

WN7FNB	14,716-263-52-30
WN7FIK	12,350-232-50-29
WN7DUB	11,448-201-53 38
WN7GAH	3990- 90-38 10

Los Angeles

WN6SSO	16,686-309-54-30
WN6UMD	7840-150-49-14
WN6TQS	7791-139-49-15
WN6TBL	3936- 96-41-27
WN6TFJ	1840- 61-30-29
WN6SLU	1682- 43-29-31
WN6UBD	756- 54-14-19
WN6TYD	372- 31-12- 1
WN6UIA	242- 22-11-18
WN6VGC	143- 13-11-20
WN6S8Z	60- 12- 5-16
WN6UWJ	2- 2- 1- 1

Orange

WN6SVV	20,160-321-60-39
WN6UDC	18,042-291-62-34
WN6VCT	420- 28-15-12

San Diego

WN5QMQ/6	4480-128-35-16
WN6VFL	1410- 47-30-12
WN6TPP	1134- 54-21- 7

WEST GULF DIVISION

Northern Texas

WN5PPF	28,770-401-70-34
WN5QXD	14,742-253-54-20
WN5PPG/5	10,452-201-52- –
WN5QVD	9250-185-50-20
WN5QEU	2460- 82-30- –
WN5QEZ	2050- 62-25-22
WN5RAI	507- 24-13- 9

Oklahoma

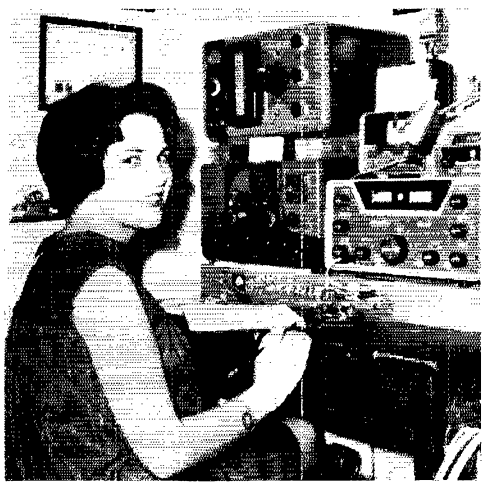
WN5PSA	10,094-191-49- –
WN4EDP/5	4141- 91-41- –
WN5QGM	1440- 90-16-14
WN5QIM	1197- 63-19-15

Southern Texas

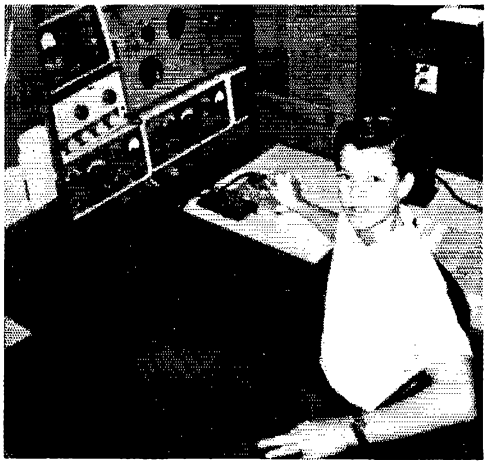
WN5QXR	13,392-228-54-33

NON-NOVICE SCORES

W1AQE 16,900, W1BDI 4200, W1BKC 272, WA1EDS 1725, WA1EYF 1820, WA1FCD 648, WA1FGN 1748, WA1FPS 84, K1NWE 5324, W1PDI 60, K1RNZ 1360 K1TVE 504, K1WXC 36, WA2BAH/1 81, WA2LOR 2044, W2NEP 5720, K2PDK 3528, WB2QJY 1768, WB2RKK 11,650, WB2TBP 7920, W2TPJ 4140, W2UAL 1890, WB2ULK 799, WB2UVB 5217, WB2VRW 147, WB2WAD 3410, WA2WBF/3 1976, WB2WFJ 1197, WB2WFO 6688, WB2WKR 1430, WB2WPJ 1144, WB2YCX 494, WB2YIT 444, WA3AMH 2528, WA3BSV 256, WA3DHV 2210, W3-DPR 4290, WA3DSD 20,608, WA3DYW 2324, WA3EEE 3360, WA3EMO 480, WA3ERF 1206, WA3EXX 2175, K3RIW/3 1584, K3WTV 544, K3YBW 434, K4ADT 3552, K4AEH/1 300, WB4AJR 1311, K4BAI 4797, WB4BGL 3750, W4DR 4716, K4DTT 4694, WA4EPM 1612, WB4-FDK 102, K4GMR/4 3317, W4KFC 944, WA4UFW 3287, WA4VUG 30, WA4ZSF 5889, K5KDG 10,443, WA5HBP/5 1652, WA5MBC 6439, WA5MUF 96, WA5NWB 48, WA5QBO 8918, WA5OKW 3936, WA5OOB 5461, WA5-OYU 3008, WB6IEX 9288, W6LS (W6DDB, opr.) 18,117, W6OEO 2485, WB6ROR 665, WB6RZH 3362, WB6STA 3256, WB6TIF 476, WA7ETQ 5014, WA7EVI 5940, K7-KCZ 1000, K8CUV/VO1 2842, WA8KME 572, WA8KXZ 465, WA8LWH 2310, WA8MCQ 3616, WA8OYR 104 WA8PFD 1872, WA8PRA 861, WA8PVN 400, WA8PWZ 943, W8QHW 13,176, W8RHF 250, WA8RLW 1856, WA8RQU 1560, WA8RZM 4000, WA8SCZ 11,094, WA8-SLW 748, WA8SOV 6106, K8SWW 8740, WA8TFJ 689, WA8TNO 1590, WA8TWC 7426, WA8TYF 3564, WA8UMY 2871, W9CRN 1176, K9GDF 8536, W9GXR 12,420, WA9ITB 3520, W9JKM 7636, WA9KYE 294, K9LVK 8685, WA9MMT 5590, WA9NVY 7875, WA9OMO 3335, WA9PLG 338, WA9QBM 1680, WA9QQC 10,050, WA9RLF 494, WA9RTU 4360, WA9SVR 585, W9YT (5 oprs.) 3535, WAØHRM/9 646, WAØIHV 532, WAØMLE 330, WAØNLN 4920, WAØNND 532, WAØNZU 2581, WAØOXO 792, WØ-PAN/KH6 336, WAØPEM 2640, WØQMS 13,197, VE3-BBQ 2375, VE3DGB 3589, VE7BLO 3838, 3C3DSB 2262.



Here's Brenda, **WN4EPC** of Orlando, Florida pounding brass to the tune of 14,355 points in the Roundup. Incidentally, that Viking 500-watt linear is sole property of the OM, K4IXC (for the time being, anyway), well known with his E Fla. exchange in contest circles.



WN3GZM of Wheaton, Maryland turned out the second highest score in the contest. Bill is 15 years old and has already worked 30 countries as a Novice. Guess that DX-60 got a good workout!

Soapbox

"Really enjoyed the contest. 15 meters was great and I worked 18 new states plus my first Canadian!" — *WN6-VFL.* "Thanks for the Novice Roundup. I made three new states for W.A.S. and got my mother so interested I'm teaching her the code." — *WNØPWZ.* "It was a great contest. I got 5 new states and learned quite a bit about operating procedures." — *WNØPUK.* "Would like to thank the Generals for helping us Novices to get those hard to work multipliers." — *WN1GRB.* "Thanks for the contest. Sorry I couldn't spend more time, but wait till the SS!" — *WN9-SWO.* "Just can't wait till Field Day and the SS!" — *WN4-CJM.* "A very FB contest. I regret that I can have but one Novice ticket to use in the NR." — *WN4EAB.* "I had a little trouble for a while when I broke my nose Friday night the 10th during a basketball game and had to miss Saturday while I was laid up in the hospital . . . but I got on again Sunday morning." — *WNØPRT.* "If only the SS had such Novice participation! Stuck my fallen dipole up in record time with 2½ feet of white stuff on the ground and 0° temperature. A nice closing to my Novice ticket which ran out February 16. Now have a Tech. with General on the wing." — *WN9RJL.* "I may not win any prizes but even so, I enjoyed the Novice Roundup. Not having had my Novice ticket too long, I was not well equipped to enter a contest. My approach was more of that of having a new experience and that I had. To me the Novice Roundup was a success!" — *WN8UKC.* "Are there still WN7s?" — *WN1HES.* "Enjoyed the contest very much. Worked my first 1 and first Conn. on 80 meters. Can't wait until next year. Not much activity after first 3 days." — *WN7FLK.* "Thanks for the great contest. I wasn't getting out too well at first because I forgot to connect the coax to the antenna! Worked 3 stations with just the coax!" — *WN4FBY.* "Good contest, but where was everybody on 15? I only worked 2 stations (both Generals) on that band." — *WN3GOV.* "The

(*Continued on page 146*)

1967 ARLL International DX Competition

High Claimed Scores, Multiplier, QSOs

EVEN to a seasoned contest reporter, the volume of logs received for this year's ARRL International DX Competition is impressive. With the cooperation of Old Man Sol and a brand new set of rules, we came up with a smash! Initial scores are so large that the cut-off figure for these high claimed scores was raised to 600-K across the board. Initial reactions to the changes in format indicate enthusiastic acceptance by both DX and W/VE, c.w. and phone.

Many exotic logs are continuing to arrive and will be shown with the final results, tentatively scheduled for October *QST*. Please note that DXCC credit for contest claims may not be made until after the final results appear.

Nice going gang!

— *W1YYM*

W/VE — C.W.

Single Operator

K1DIR.....1,820,016-383-1584
W4KFC.....1,754,595-369-1585
W2VJN.....1,538,570-410-1259
W9IOP.....1,521,542-341-1489
W1BPW.....1,484,730-351-1429
W3BES.....1,483,155-345-1433
W3GRF.....1,417,348-336-1406
W1JYH.....1,401,177-359-1301
W9EWC (W9LKJ, opr.) 1,377,720-356-1290
W3MFW.....1,303,836-358-1214
W1EVT.....1,284,380-370-1162
W1BIH.....1,275,612-338-1258
W2MEL.....1,176,940-332-1183
WB2CKS.....1,173,381-341-1157
W6ITA.....1,156,482-282-1367
W3LOE.....1 151,213-371-1035
W2GGE.....1,125,069-331-1139
W2PCJ.....1,111,968-352-1056
K2DCA.....1,110,174-331-1118
W4JDR.....964,926-334- 963
W4LCP.....953,370-330- 963
K3NHL.....941,535-305-1032
K1UHY.....932,790-310-1003
W5WZQ.....921,684-356- 863
W2LXK.....909,321-301-1007
K2LWR.....883,008-288-1022
W1ECH.....854,358-302- 943
W3EKN.....856,994-313- 918
W6WX.....822,822-274-1001
W3HHK.....810,900-265-1020
W6CUF.....796,752-264-1006
W5BRR.....790,128-279- 944
W3MSR.....779,418-258-1007
K1ZND.....731,557-277- 881
K2GUN.....731,442-303- 808
K3HTZ.....723,801-277- 873
W4BRB.....709,630-290- 819
W4CKD.....667,296-331- 672
W6NJU.....663,000-250- 884
WA4IKU. ..657,720-290- 756
W9IRH.....655,659-263- 831
W4PTR.....649,587-271- 799
W4GRG.....638,437-269- 791
K1YKT.....638,397-267- 800
W4YGY.....622,377-267- 777
WA6EPQ.....618,328-238- 852
3C2NV.....605,472-272- 742
WA2UJM....603,024-272- 739

Multioperator

W4BVV.....4,821,600-480-3349
W3WJD....4,020,096-464-2889
W3YUW....3,379,998-433-2602
W8UM.....3,007,800-450-2228
W6RW.....2,732,884-418-2180
W3TMZ/3..2,525,097-401-2099
W3MSK....2,498,130-410-2031
W3VKD....1,530,900-324-1575
K4ZA/4....1,462,245-355-1373
W4ZXI.....1,213,112-347-1166
W4KXV....1,207,050-325-1238
W7SFA.....1,095,120-270-1352
W3IYE.....922,500-300-1025
W4JD.....747,812-292- 854
W6ANN.....737,586-261- 942
W3GHS.....707,130-270- 873
W6UMI.....657,066-246- 933

W/VE — PHONE

Single Operator

K8DOC (K8YWG, opr.) 1,462,188-364-1339
W6ITA.....1,373,319-331-1383
K1DIR.....1,308,384-352-1239
W4QCW....1,243,350-405-1025
W3BES.....1,212,435-315-1283
W3BGN (K3FGO, opr.) 1,157,760-335-1152
W4AXE....1,157,652-397- 972
W4BCV.....1,081,656-332-1086
K2GXI.....1,080,360-360-1001
K3NHL.....1,065,594-337-1062
K4MSK....1,007,030-334-1015
W1JYH.....868,500-300- 965
WA4WAO....774,900-315- 820
VE1PL.....762,468-313- 812
W3LOE.....754,018-331- 760
W7ESK.....742,960-251- 990
K6OHJ (W6BHY, opr.) 739,626-262- 941
WAØEMS....730,296-294- 832
W4QBK 716,301-299- 801
K3TPL 708,948-282- 838
W9EWC.....703,245-271- 865
WA4GCS.....681,312-302- 752
W1BIH.....667,377-261- 853
K2LWR.....664,608-301- 735
W5KTR.....663,030-278- 797
WB2FON....660,888-274- 804
WØCU.....650,628-318- 682

Multioperator

W3MSK....6,240,483-549-3789
K2GL.....6,183,322-551-3749
W3WJD....3,922,550-475-2753
W4BVV....3,511,776-466-2512
W4ETO....3,102,885-477-2170
K2USA.....767,232-256- 999
WØLTE.....702,219-281- 843
W4ZYS.....697,296-296- 799

DX — C.W.

Single Operator

HI8XAL....3,257,550-285-3810
KH6IJ.....3,006,954-267-3754
PY2BGL....2,572,434-241-3571
KP4CRT....2,456,100-249-3300
PY2SO.....2,315,502-238-3426
KH6UL.....2,242,800-267-2800
HK3BAE...2,076,737-221-3133
GI3OQR....1,886,304-224-2807
KV4AM....1,831,728-248-2462
KZ5JF.....1,763,574-246-2390
VK2EO.....1,571,760-222-2360
F3KW.....1,490,562-162-3067
G4CP.....1,446,552-222-2259
ZD8J.....1,380,942-214-2151
CM2BL....1,373,790-230-1991
CR6GO.....1,363,635-185-2457
I1NT.....1,248,060-155-2684
XE2AAG...1,175,811-219-1795
OA4PF.....1,139,067-201-1889
ZL3QH.....1,012,092-193-1748
YV1DP/5.....979,020-222-1470
PY7AKQ.....939,060-185-1692
XE2OK.....938,172-222-1410
DL6WD.....913,740-194-1570
G2RO.....861,883-187-1538
GW3JI.....828,240-203-1360
DL1JW.....782,320-176-1507
PAØXPQ.....779,205-181-1442
FG7XX.....740,322-198-1218
EI9J.....739,190-193-1280
CR6AI.....727,668-164-1479
JA1CWZ.....707,940-171-1382
9L1TL.....702,918-162-1451
KH6FSP.....697,668-188-1237
F8VJ.....697,424-182-1278
OZ1LO.....670,425-175-1277
DL8KJ.....666,630-162-1374
SM4CMG.....663,668-166-1347
CR6CK.....633,786-146-1447
KL7FRY.....627,642-197-1062
CM2BA.....615,888-168-1222
PAØLOU.....604,464-168-1234
VQ9AR.....602,280-140-1434

Multioperator

OH2AM....2,092,524-203-3436
G3SSO.....1,912,464-228-2796
LU1DAY...1,455,478-211-2336
GI3SXG....1,170,112-188-2171
DJ7IK.....1,169,532-189-2122
G3GRS.....1,007,064-197-1704
DL8KO.....942,462-186-1689
DL9FR.....866,187-189-1530
UAØKFG.....826,182-166-1659
G3LPC.....787,169-181-1454
GW3ITZ.....735,098-182-1350
KL7AIZ.....611,556-164-1243
UP2KBC.....602,208-153-1312

DX — PHONE

Single Operator

HI8XAL....3,727,719-279-1452
KP4AST....3,142,500-250-4190
KH6IJ.....3,045,120-244-4160
HC1TH.....2,676,398-254-3520
HK4KL.....2,671,704-226-3348
DJ6QT.....2,247,264-216-3468
VP5RS.....2,053,350-234-2925
CE6EZ.....2,012,208-206-3256
DJ2YA.....1,830,608-208-3194
VP5RB.....1,892,376-216-2935
I1BAF.....1,725,750-195-2950
HP1JC.....1,526,325-235-2165
ZL1KG.....1,522,125-205-2475
YV5BPG....1,405,346-223-2106
WØPAN/KH6 1,391,518-199-2299
KL7EBK....1,316,952-216-2037
KV4AM....1,289,916-171-2532
PAØXPQ....1,241,478-177-2350
VP7NH.....1,230,761-193-2126
ZS6DW.....1,202,880-179-2240
G4JZ.....1,171,596-178-2194
G3UML....1,162,800-190-2040
OE2EGL....1,135,035-165-2293
YS2OB.....1,120,896-192-1946
KA7AB.....1,099,506-178-2059
VK2APK.....910,860-190-1598
G3IAR.....905,958-171-1766
OZ9SL.....868,434-161-1798
CX9CO.....867,160-152-1911
ZL3QH.....860,310-158-1815
PY1BYK/7..713,310-155-1534
5N2AAF.....701,400-140-1670
EP3AM.....653,265-135-1613

Multioperator

KS6BV.....2,590,146-234-3700
PY2NM....1,733,394-203-2612
OH2AM....1,668,750-178-3125
GB2DX....1,342,191-177-2572
SM6CAS...1,167,120-180-2170
I1RB.....1,146,000-250-1525
3C3FJZ/SU..802,575-145-1845
KA9MF.....738,738-154-1599
G3SME.....701,552-163-1441
6W8CD.....684,972-159-1436

QST

Strays

The publication *Illustrated Certificate Guide*, written and published by Christian Zangeri, OE9CZI, Nachbauerstr. 28, A-6850, Dornbirn, Austria, contains over 100 pages which describes in considerable detail 78 certificates of general interest to hams and of particular interest to SWLs. The pages detail the name of the award, issuing country, physical dimentions, language, paper quality and the author's private opinion of the grade of difficulty in acquiring the certificate. Price is $1.00 or 7 IRCs.

— *W1YYM*

1966 VE/W Contest Results


PROFICIENCY AWARD

VE/W Contest

SPONSORED BY

THE MONTREAL AMATEUR RADIO CLUB INC.

Awarded to Amateur Radio Station ... as high scorer

In Section ... during the 19 ... Annual Contest

With a total score of ... points.

THE MONTREAL AMATEUR RADIO CLUB INC.

COMPILED BY RON EBERTS, VE2AE and DAVID WEINER, VE2DCW*

On behalf of the Montreal Amateur Radio Club, Inc., VE2DCW is pleased to submit the results of the 1966 VE/W Contest. We would like to thank all the participating stations for their fine efforts and encouraging comments.

Because a discrepancy existed in logs as to whether or not Labrador, VO2, was to be counted as a section separate from VO1, the MARC Contest Committee decided to give section multiplier credit to both. This will account for the increase in the final scores of many participating American stations.

Congratulations to WØTDR, who placed first in the test with a score of 162,720 points. He receives not only the club trophy but also the certificate for first place in Missouri section. K2EIU/5, with one QSO less, places second with 162,000 points. Top scorer in Canada was VE6US, operated by VE5UF, who racked up 127,575 points and 63 American sections. VE2NI followed with 119,475.

Top phone scorer was VE3GBX, with 13,050 points. WA4WIP nabbed first place in United States with 12,420 points. Both these have been awarded certificates for ranking first in their respective countries. No other phone certificates were issued.

* Address all correspondence to D. Weiner, 676 Wiseman, Ave., Outremont 8, PQ, Canada.

TOP TEN

C.W.		*PHONE*	
WØTDR	162,720	VE3GBX	13,050
K2EIU/5	162,000	WA4WIP	12,420
W4NBV	156,960	W9YT	10,920
W9YT	156,960	VE1ARM	10,695
W4YWX	154,800	VE8AG	7,918
WA9KQU	145,440	VE1EH	7,564
K4BAI	143,280	W4YWX	3,780
W3HQU	136,800	VE3EFX	2,394
WAØHGY	133,920	W2GKZ	2,200
VE5US	127,575	WA9JCV	1,800

The Contest Committee of the MARC hopes that you enjoyed last year's test and that you will mark your calendar for the Centennial 1967 VE/W Contest Sept. 23 and 24.

Rules will appear in a subsequent issue of *QST*.

Soap Box

"Many thanks for a fine contest" — WA2ASM . . . "Where was the PEI gang?" — K2CC . . . "Sigh" — WB2OYE . . . "It would seem that a multiplier for stations running 75 watts or less might be a realistic encouragement" — W2TER . . . "I entered the 1966 VE/W Contest very much but was hindered greatly by using two crystals" — WA3EEE . . . "Where is all the 15-meter activity?" — W3QOT . . . "My first contest and first c.w. operation since going QRT in 1959, consequently my c.w. was really rusty." — W4NBV . . . "Signals were all outstanding" — WB6IEX . . . "Couldn't make any contacts the first hour until I discovered that I didn't have the transmitter connected to the transmission line. That's like trying to take off in an airplane without wings" — WA6JDT . . . "Many thanks to the fine operators who took the trouble to pull my QRP 60 watts through the QRM" — W7IUO/7 . . . "I must say you folks put in a f.b. contest. Keep your ears open for me in '67 — I'll be in there adding to the QRM" — K8CGD . . . "Boy, was fun with 18 watts! Why not have separate c.w. and phone contests?" — WAØEMS . . ."It's a rough day for everybody" — WAØHUU . . . "To get in the contest I had to build a receiver in a hurry, borrow a transmitter, and put up a new antenna" — WAØKDS . . . "Blew the traps in the antenna while getting ready to start contest and in this small town was unable to get anything to substitute" — WØKON . . . "I'll be there in '67" — VE3DDU . . . "A real opportunity to try out a new antenna" — VE3BLY . . . "Very fine contest" — VE3GCO . . . "I found that by the fifty mark my voice was well on its way out and I could see the wisdom of the c.w. ops" — VE8AG . . .

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Scores are grouped by divisions and sections. The station first listed in each section is the certificate winner for that section. Likewise the "power factor" is indicated by A or B; A indicates power unput up to and including 200 watts (multiplier of 1.5), B indicates power input over 200 watts (multi-

plier of 1). The total operating time to the nearest half hour is indicated by the fourth figure.

Example of listings: K3LCK–36,600–61–10–8½–A, or, final score of 36,600, 61 stations worked, section multiplier of 10, total operating time 8½ hours, and power factor of 1.5.

Any multi-operator stations are grouped in order of score following single operator station listings in each section tabulation, and are ineligible for awards.

C.W. RESULTS

ATLANTIC DIVISION

Delaware

K3LCK 36,600- 61-10- 8½-A

Eastern Pennsylvania

WA3ATX 99,840-128-13-19 -A
K3HNP 44,880-102-10- 6 -B
W3QOT 25,920- 54- 8-11 -A
WA3DHV 9,000- 30- 5- 6½-A
WA3DVH 7,440- 31- 4-14 -A

Maryland-D. C.

W3HQU 136,800-190-12-18 -A
WA3EEQ 79,920-111-12-15 -A
K4GSU/3 63,360- 96-11- 8 -A
W3MNE 36,960- 86-11-12 -B
WA3FZJ 17,280- 48- 6-10 -A
K3OAE 12,180- 29- 7- 1½-A
W3DYC 8,100- 27- 5- A
WA3EEE 6,000- 20- 5- 6½-A
W3MSR 5,400- 15- 9- 1 -B

Southern New Jersey

WB2MRA 25,600- 64-10- B
WB2YCI 5,040- 28- 3- 5 -A
WB2SCK 4,080- 17- 4- 5 -A

Western New York

WA2BEX 110,880-168-11-20 -A
W2ADN 84,960-118-12-16 -A
W2MTA 61,560-114- 9-11 -A
WB2SMP 38,420- 80- 8-13 -A
W2PXL 21,400- 54-10- 9 -B
WB2OYE 9,360- 78- 4- 6½-A
WA2FRR 3,120- 13- 4- 6 -A
WA2SSJ 1,680- 7- 4- 1½-A
WB2UKO 360- 3- 3- -A
K2CC (W1TWX, K2BFF, WA2RJZ, WB2AFS) 46,640-106-11- B

Western Pennsylvania

W3GJY 49,680- 69-12- 7½-A
WA3EKI 48,240- 67-12-11 -A
WA3ENR 4,680- 26- 3 A

CENTRAL DIVISION

Illinois

WA9KQU 145,440-202-12-19½-A
W9LKJ 79,860-121-11-11 -A
W9FFQ 52,140- 79-11- 9½-A
WA9FBC/9 36,000- 60-10-14 -A
WA9HJM 28,800- 40-12- 4½-A
W9WR 25,080- 57-11- B
W9VBV 24,600- 41-10- 4 -A
WA9QQC 17,600- 44-10-17 -B
WA9RBU 12,300- 41- 5- A
W9HBJ 10,920- 31- 7- 7½-A

Indiana

WA9ITB 90,240-188-12- B
K9DWK 39,840- 83-12- B
WA9QHB 2,160- 12- 3- 1½-A

Wisconsin

W9YT(K9LBQ, opr.) 156,960-218-12- A
K9GDF 90,000-125-12- 9 -A
WA9IAT 61,380- 93-11-20 -A
W9CHD 47,520- 72-11- A

DAKOTA DIVISION

Minnesota

WØVXO 120,960-168-12-20 -A
KØZXE 111,600-155-12-20 -A
WAØKDI 29,400- 49-10- 6 -A
WAØKDS 19,680- 41- 8- 4 -A
WAØKUI 12,600- 35- 9- 7 -B
WAØKNP 9,360- 26- 6- 7 -A
WAØNCS 8,640- 48- 3-13½-A

North Dakota

WAØGQI 39,600- 55-12- 5 -A
WØKON 100- 5- 2- 1½-B

DELTA DIVISION

Arkansas

W5DTR 6,720- 14- 8- 2 -A

Louisiana

W5BUK 82,800-115-12-14½-B

Mississippi

W5AMZ 66,000-100-11-15 -A

Tennessee

W4NBV 156,960-218-12- A
W4VNE 75,000-125-10-16 -A
K4QZV 31,680- 44-12- 6½-A
K4UWH 25,620- 61- 7- 7½-A

GREAT LAKES DIVISION

Kentucky

W4FDT 108,000-150-12-18 -A
K4KSB 102,960-143-12-17 -A
K1GUD/4 19,360- 45-11- 3 -B

Michigan

K8CGD 87,120-121-12- A
K8YEK 85,800-130-11-13 -A
W8OQH 60,000- 91-11-11 -A
WA8FLK 36,600- 61-10- 9 -A
WA8MCQ 21,600- 36-10- 6 -A
K8OOK 14,400- 30- 8- 8 -A
W8RTU 1,260- 7- 3- 5 -A
WA8GUF (WA8s GUF RGT) 111,540-169-11-20 -A

Ohio

W8GOC 99,000-140-11-17 -A
WA8NSL/8 78,200-115-11-18 -A
WA8CWU 72,600-110-11-15 -A
W8YGR 52,140- 79-11- 8 -A
W8MJG 38,880- 81-12-20 -B
W8KMF 32,160- 67- 8-10 -A
WA8LVT 29,760- 62- 8- 7 -A
WA8LWH 25,920- 48- 9- 7 -A
W8QDH 24,420- 37-11- 3 -A
W8ERD 24,420- 37-11- 4 -A
W8DWP 18,240- 38- 8- 3½-A
WA8KPO 16,200- 30- 9- 3½-A
W8MXO 8,700- 29- 5- 3 -A

HUDSON DIVISION

Eastern New York

WB2DXL 74,580-113-11- A
WB2KOY 52,800- 89-11- 5½-A
W2TER 48,600- 90- 9-13½-A

N. Y. C.-L. I.

WA2UWA 61,600-140-11-12½-B
W2GKZ 55,200-115-11- 8 -B
W2HAE 41,580- 63-11- 8 -A
W2DUN 38,860- 81- 8-10½-A
WB2QKJ 37,260- 69- 9- 8 -A
K2OSA 17,840- 33- 8- 5 -A
WB2THU 1,800- 15- 2- 2 -A

Northern New Jersey

W2TSL 118,800-165-12-14 -A
WB2NZU 106,260-161-11- A
WA2ASM 100,800-140-12-18 -A
WA2TAF 87,840-122-12-20 -A
W2KHT 68,640-104-11- 8 -A
W2MNN 44,640- 93- 8-10 -A
W2DMJ 42,600- 71-10- 5 -A
WA2LGX 34,080- 71- 8-16 -A
W2NEP 31,020- 47-11- 3½-A
K2KFP 25,200- 42-10- -A
WB2UEK 18,360- 34- 9- A

MIDWEST DIVISION

Iowa

WØHZC 82,500-125-11- A
WAØKXJ 36,600- 61-10- 8 -A
WAØKST 31,200- 52-10- A
WAØHIK 9,660- 23- 7- 4 -A

Kansas

WØVFE 79,200-110-12-16 -A
KØBHM 78,540-119-11-12 -A
WØINH 71,280-108-11- 9 -A
WAØHUU 18,360- 51- 6- 6 -A

Missouri

WØTDR 162,720-226-12-20 -A
WØOAW 124,560-173-12-20 -A
KØDYM 53,460- 81-11-10 -A
WAØEMS 33,120- 46-12- 5 -A
WAØELM 26,400- 60-11- 4 -B
KØYGR 9,120- 38- 4- 6 -A
WØEEE (WA9GUU, WAØs DGG, FQE1KI, KØs, JXI, VXU) 101,640-154-11-20 -A

Nebraska

WAØHGY 133,920-186-12-19 -A
WAØNVZ 64,680- 98-11-13½-A
KØOAL 2,400- 10- 4- 2½-A

NEW ENGLAND DIVISION

Connecticut

W1BGD 115,960-223-13-12 -B
W1TS 95,760-133-12-11 -A
W1IFM 24,000- 50- 8- A
K1DPB 12,960- 27- 8- 4 -A
K1MOT 8,640- 36- 4- 4½-A

Eastern Massachusetts

W1AQE 42,720- 89- 8- A
W1DMD 11,520- 32- 6- 6½-A
K1UCA 6,300- 15- 7- 4 -A
K1SWT 1,800- 10- 3- 1 -A

Maine

W1GKJ 68,640-104-11-12 -A

New Hampshire

W1FZ 45,600- 76-10- 9 -A
W1HTE 30,360- 69-11-12 -B

Rhode Island

W3YVJ/1 79,120- 96-12-15 -A
WA1BLC 64,800- 90-12-13 -A
WA1FRW 28,000- 70-10- B

Western Massachusetts

K1IJU 4,200- 20- 7- 2½-A

NORTHWEST DIVISION

Idaho

W7IUO/7 31,680- 44-12-14 -A

Montana

WA7BQS 4,500- 15- 5- 3 -A

Oregon

K7QXG 66,660-101-11-17½-A
WA7AXK 7,200- 20- 6- 7 -A

Washington

WA7DLO 11,340- 27- 7-16 -A
WA7CXD 8,400- 20- 7- 2 -A
W7GYF 6,480- 18- 6- 1½-A
K7RSB 3,300- 11- 5- 4 -A

PACIFIC DIVISION

East Bay

WB6FHH 28,800- 48-10- 3 -A
K6BXI 13,240- 47- 7- 7- B

Hawaii

KH6IJ 18,080- 53- 9- 7½-B
KH6FON 3,300- 11- 5- 1 -A

Nevada

K7KHA 44,000-100-11-14- B

Sacramento Valley

W6ZGM 33,000- 55-10- 7½-A
WA6JDT 27,600- 46-10-10½-A
K6DQB 18,000- 30-10- 8 -A

San Francisco

W6MSM 95,760-133-12- A
W6BIP 64,320-134-12-13 -B
WB6NUO 34,200- 57-10- 6½-A

San Joaquin Valley

K6RTK 54,780- 83-11- 8 -A

Santa Clara Valley

WA6NYK 72,000-100-12-12 -A
WA6HRS 32,880-137-12-10 -B
W6CLM 21,600- 60- 9-13 -B
W6NTQ 14,400- 30- 8- 4 -A

ROANOKE DIVISION

North Carolina

W4HJS 84,160-103-12- 9 -A
W4OMW 79,840- 97-12-13 -A
WA4LSA 37,400- 85-11- 8½-B
WA4ZQM 15,000- 50- 5- 7 -A
W4OYT 2,640- 11- 6- 3 -B

South Carolina

WB4EDD 12,000- 25- 8- 6 -A

Virginia

W4CKD 122,400-174-12-16 -A
W4YGO 112,320-156-12-20 -A
W4WRG 36,960- 88- 7- 8 -A
W4JUK 36,000- 50-12-10½-A
W4GHW 3,900- 13- 5- 6 -A

West Virginia

WA8CNN 14,880- 31- 8- 6 -A
WA8QYK 7,020- 13- 9- 9½-A
WA8RDW 120- 2- 1- 1 -A

ROCKY MOUNTAIN DIVISION

Colorado

KØVFN 88,440-134-11-19 -A
KØJJB 19,440- 36- 9 -A

New Mexico

W5ODJ 63,360- 96-11- 9 -A
W8BZY/5 26,400- 44-10- 5 -A

Utah

K7SQD 27,720- 42-11-11½-A
WA7BSG 6,300- 15- 7- 2 -A
K7UOT 3,900- 13- 5 -A
WA7DDW/7 60- 1- 1- ½-A

SOUTHEASTERN DIVISION

Alabama

K4NMN 43,200- 60-12- 5 -A

East Florida

W4FRO 79,920-111-12-13 -A
W4ILE 76,320-108-12-15 -A
WA4LCO 73,440-102-12-19 -A
W4ORT 60,720- 92-11 -A
W4HOS 33,000- 55-10 -A
W4NQZ 28,620- 53- 9 -A

Georgia

W4YWX 154,800-215-12 -A
K4BAI 143,280-192-12-17½-A
W4BEY 84,480-176-12-18 -B
K4JSZ 36,300- 55-11- 7 -A
W4HYW 29,400- 49-10- 5 -A

Western Florida

K4VFY 103,680-141-12-10 -A
WA4ECY (Op. K3DZB)
31,200- 65-12 -B

SOUTHWESTERN DIVISION

Arizona

W7AYY 79,920-111-12- 8 -A
K7TVS 48,000- 80-10 -A
WA7AHH 20,320- 38- 9- 3 -A
WA7ETQ 18,480- 44- 7-14 -A
W7ENA 17,200- 86-10- 5 -B
W7FCD 5,400- 15- 6- 2 -A

Los Angeles

WB6KIL 100,800-140-12-17 -A
WB6HGU 82,800-115-12 -A
WA6URY 77,280-161-12-18 -B
W6RCV 60,000-125-12-13½-B
K6BPC 59,580-124-12-16 -B
W6OEO 56,760- 86-11-13½-A
WB6PCV 39,360- 82- 8-15 -A
W6ONG 33,600- 56-10- 7 -A
WB6TMC 5,400- 15- 6- 4 -A

Orange

KØGJD/6 87,780-133-11-19½-A
W6QFU 82,080-114-12-16 -A
K6EIU 12,240- 34- 6- 2½-A
WA6RND 4,800- 16- 5- 3 -A

San Diego

WB6IEX 61,380- 93-11-14½-A

Santa Barbara

WB6LIV 47,520- 72-11-10 -A
WB6DPU 38,880- 81- 8-14 -A
W6GEB 19,200- 40- 8- 4 -A

WEST GULF DIVISION

Northern Texas

K2EIU/5
162,000-225-12-18 -A
WA5JMK 96,480-134-12-20 -A

Oklahoma

K5OCX 121,680-169-12-12 -A
K5VTA 42,240- 96-11-13 -B
W5OZH 9,000- 25- 6- 3 -A
WA5NOM 8,640- 18- 8- 2 -A
WA5NTI 5,040- 14- 6 -A

Southern Texas

W5TPZ 70,620-107-11-16 -A
WA2ZJF/5
23,040- 44-11 -A
K5JGU 2,640- 11- 4- 4 -A

CANADIAN DIVISION

Newfoundland

VO1HQ 62,832-374-56-18 -A
VO1HP 48,051-281-57 -A
VO1IM 6,789- 73-31-12 -A

Nova Scotia

VE1MX 45,474-286-53-14 -A
VE1AI 41,550-277-50-17 -A
VE1EK/1 22,317-173-43-10½-A
VE1ANL (Op. VE1ZT)
18,480-140-44 -A
VE1DB 6,732- 68-33 -A
VE1EH 3,024- 48-21 -A

New Brunswick

VE1ZS 43,368-282-52-11 -A
VE1DH 40,290-395-51-17 -B
VE1AIT 5,124- 61-28- 8½-A

Quebec

VE2NI 119,475-675-59-17 -A
VE2AE 87,975 Noteligible
VE2BVY 77,850-519-50-20 -A
VE2WA 57,594-331-58-11 -A
VE2AYU 43,230-393-55-13 -B
VE2BCB/2
29,862-237-42-18½-A
VE2JL 24,480-170-48-14½-A
VE2HN 22,440-170-44-11 -A
VE2BV 20,900-209-50- 8 -B
VE2BWL 14,382-141-34- 9 -A
VE2BUP 5,742- 66-29- 3 -A
VE2DCJ 4,524- 52-29- 9 -A
VE2AJ Log check
VE2DCW (VE2s DCW, BOW)
50,085-315-53-20- A
VE2UN (K3ZJG, VE2s BQO, BUW)
48,924-453-54-17 -B
VE2KO (VEs 2KO, 4JI)
14,880-121-41- 4 -A

Ontario

VE3BJK 90,480-511-60-20 -A
VE3DDU 64,206-373-58-17 -A
VE3EEW 57,456-336-57 -A
VE3TT 52,920-315-56-13 -A
VE3MI 50,325-305-55-20 -A
VE3EES 49,608-319-52-14 -A
VE3FBP 49,608-312-53-14 -A
W3AYS/VE3
49,296-316-52-16 -A
VE3EYC 46,332-297-52-17½-A
VE3GAG 42,864-306-47-19½-A
VE3DKB 42,351-267-51-16 -A
VE3DGB 42,336-288-49-17 -A
VE3IR 39,900-350-57-10 -B
VE3BQL 35,673-253-47-18 -A
VE3EUM 35,376-270-44 -A
VE3DN 32,259-250-43-14 -A
VE3EZM 26,469-173-51- 9 -A
VE3GCE 18,135-155-39- 8 -A
VE3GCO 15,876-147-36-10½-A
VE3GFG 14,280-140-34-15½-A
VE3BLY 8,325-111-25- 5 -A
VE3DSB 6,912- 72-32- 4½-A
VE3PV 6,885- 85-27 -A
VE3DPG 1,860- 31-20 -A
VE3FHQ 504- 14-12- 3 -A

Manitoba

W9AQW/VE4
95,760-532-60-17 -A
VE8NO/4 71,409-417-59-18½-A
VE4ZX 24,656-268-46-11½-B

Saskatchewan

VE5US (Op. VE5UF)
127,575-675-63-20 -A
VE5KT 99,882-537-62-18 -A
VE5DZ 19,710-146-45-10½-A
VE5DC 12,240-102-40 -A

Alberta

VE6AJJ 57,584-488-59-18 -B
VE6UF 51,255-335-51-15 -A
VE6AKY 47,204-324-43 -A
VE6ABV 39,909-251-53-16 -A
VE6AMR 21,942-159-46-10 -A
VE6ASN 5,850- 65-30-19 -A

British Columbia

VE7AWH 14,478-127-38- 8 -A
VE7BAG 11,433-103-37- 5 -A
VE7BLO 10,989- 59-37- 9 -A
VE7BUI 2,760- 40-23- 7 -A

VQC

VE7BQB 53,424-318-56-14½-A
VE7BEL 43,725-265-55 -A
VE7AGN 22,896-159-48-12 -A

Northwest Territory

VE8BB 74,340-413-60-16 -A

PHONE RESULTS

Eastern Florida

WA4WIP 12,420- 23- 9- 4½-A

Illinois

WA9JCV 1,800- 6- 5- 1 -A
W9HBJ 1,200- 5- 4- 1 -A

Georgia

W4YWX 3,780- 9- 7- -A
K4JSZ 1,200- 5- 2- 1 -A

Maryland-D. C.

W3MNE 80- 2- 1- -B

North Carolina

W4OMW 1,200- 5- 4- 1 -A

N. Y. C.-L. I.

W2GKZ 2,200- 11- 5- A

Northern Texas

K2EIU/5 960- 4- 4- ½-A

Oregon

WØGJD/6 280- 2- 2- A

Ohio

WA8CWU 6,840- 19- 6- A

Southern New Jersey

WB2SCK 600- 5- 4- ½-A

Virginia

W4CKD 240- 4- 1- A

Wisconsin

W9YT 10,920- 26- 7- A

CANADIAN DIVISION

Nova Scotia

VE1EH 7,560- 84-30- A

New Brunswick

VE1ARM 10,695-108-33-11 -A

Ontario

VE3GBX 13,050-145-30-15 -A
VE3EFX 2,394- 38-21- A
VE3PV 630- 15-14- ½-A
VE3DPQ 168- 8- 7- 1 -A

Manitoba

W9AQW/VE4
105- 7- 5- ½-A

Northwest Territory

VE8AG 7,918-107-37-11 -B

QST

AMATEUR RADIO PUBLIC SERVICE CORPS

CONDUCTED BY GEORGE HART,* WINJM

The C.W. Hotshots

EVERY once in a while you hear someone referred to as a "hotshot operator," but there seems to be no specific definition of this term. The reason is that it means different things to different people. In traffic handling by c.w., the "hotshot" is not just an operator of reasonably good proficiency, he is a super-efficient operator possessed of unusual gifts of know-how in handling traffic rapidly and efficiently.

He is not necessarily a speed demon. Clipped, terse, businesslike procedure can more than make up for the ability to manipulate a fast bug or keyer. The hotshot c.w. traffic man at 25 w.p.m. can out-traffic the unknowledgeable speed demon at 40. Let's discuss some of the attributes of the kind of operator we are talking about — because we all aspire to be hotshots if we can.

The first thing the real hotshot c.w. traffic operator must have is perfect break-in. You don't get this by using a VOX relay that disables the receiver on transmit — not even a fast-acting one. If you can't hear the other guy break you between your dots and dashes, it isn't good enough, not to be hotshot, anyway. It doesn't matter *how* you do it (but K1WJD has a good article on the subject scheduled for this issue of *QST*), just so it is done.

When both stations on a circuit have perfect break-in, there is no need to stand by at the end of each message. You just keep on going until all the traffic is sent; if the receiving operator misses anything, he'll break you.

Some hotshot operators like to have the receiving operator send something between messages to assure that their receivers haven't drifted or some other condition arises which causes copying to cease without warning. We have been known to send as many as ten messages in a row, without a break, thinking that the guy on the other end was *really* good (not to mention being a mind-reader for copying our lousy fist), only to discover that he'd had a power failure in the middle of the first message and hadn't copied any of them. Just a dit or a short dash at the end of each message will suffice. This doesn't mean "QSL," or even "RK." It means "I'm still here" and implies that the message was received OK, otherwise he'd have broken you. (Don't forget identification every ten minutes.)

When he does break you, the hotshot doesn't fool around, and neither do you. He sends the first letter or two of the word he missed, or the last word he received correctly. If the latter, you go on from there without repeating that word (unless, of course, he had it wrong). If the former, you start with the word he missed. You *never* repeat words unnecessarily.

Once in a while you rattle off a difficult or unusual word, and feel you should repeat it. The hotshot operator, however, will have received it the first time and won't want you to waste time repeating it, so he'll step on his key. In a case like this, if you're a hotshot too, you'll send $\overline{AA}$ and go on with the next word; and after that you won't bother repeating words, no matter how difficult or unusual.

This is the Policy Committee of the New York State Phone Traffic and Emergency Net. Shown in the front row, left to right, are; WB2AEK, WB2HLV, WB2RHJ and VE3BEB, back row: W2PVI, K2AAS, WBZQAP, WB2ASK, K2MPK, WA2TUI and WB2NGZ.

The hotshot operator sends carefully. He makes few mistakes. When he does make one, he corrects it, he doesn't keep on going in the hope the other guy knows what was intended.

The hotshot c.w. operator doesn't "snow" the operator copying him. He adjusts his speed in accordance with the number of "breaks" he gets, or other indications of the other guy's receiving ability.

A hotshot receiving operator copies behind at least one word. He doesn't write (or type) a letter at a time, he does it by whole words or, in the case of long words, by syllables. He never breaks you for a repeat of the word you are sending; he's copying further behind than that, or in any case he waits until the word is completed, maybe it'll be obvious.

What of the procedure for getting fills? Phooey! A couple of real hotshots have no need for them. In the rare instances they are used, they are cut

*Communications Manager.

to the bone. If the receiving guy asked for WA, *the word after* is all he gets. If he asks for a missing phrase, this is all he gets; words he has already received are not repeated.

Hotshot operators leave out all superfluous procedure signals but religiously include all necessary ones. CK, TO and SIG are superfluous. The name of the month can be omitted. NR might be omitted, but this is usually included because it signals the start of a new message. But AA between the parts of the address, BT to bracket the text and AR to signal the end of the message (or book of messages) are necessary, and all hotshots *include* them.

Just as hotshots slow down when asked to, they never slow down *unless* asked to. To do so can be insulting if the other operator is a hotshot. It can also be confusing if you slow down at one place and not another, especially if you slow down by increasing letter spacing instead of word spacing. If you QRS without being asked and the other guy says "Thanks for QRS," he's probably a hotshot being sarcastic.

Hotshot operators copy traffic on a typewriter (mill), ten words to the line. If you can't copy on a mill, you're not a hotshot. If a hotshot doesn't have a typewriter handy, he uses whatever he has, but requests the other guy to slow down, so the writing will be legible. The words in the text are always counted as copy is made (none of this AS at the end of each message to count the words). A message is never transmitted without a check, even if it is received without one. If you hear anyone say CKXX, he's a lid.

Hotshots never use the word SAME in place of any part of a message. Putting messages in standard "book" form is *good* procedure; using "same" is very liddy.

The typical hotshot c.w. traffic operator will take part in phone traffic nets when this is the best way to get his traffic through. When he does this, he is usually as proficient as the best of the phone operators.

Not many of us are hotshots, including the writer; but if more of us would aspire to be, our traffic handling would be a great deal more efficient.

How about hotshot phone and RTTY operating? Please, one subject at a time. — *W1NJM.*

Here is WA7EWV, well known in the Idaho section, who holds OBS, OPS, EC and RO for Nez Perce County and also assistant NCS for the FARM Net.

"Uncledave," Marks, W2APF.

OPERATION GOODWILL

"Uncledave" Marks, W2APF, of Albany, N. Y., has run annually in December for the past several years an activity called "Operation Goodwill," to enable servicemen to receive taped messages from the folks at home. Tapes are recorded by telephone and in person, using a battery of more than 12 tape recorders. Over 20,000 tapes have been sent out so far.

Where amateur radio fits into the picture is in the origination of radiograms to the prospective recipients of tapes that a tape is on the way. WB2VJB has been coordinating this end of things, while K2LKI and K2TLF have passed many of these messages into the Mike Farad, QTC and New York State Phone Traffic and Emergency Net. Since most of the traffic goes to Vietnam, it is transferred into MARS circuits at some point for handling. K3MYS, K4CG, K1KBO and W2OE have been especially noteworthy in this respect. A special message form is used, passed to many stations in advance, so that a large number of messages can be passed in a comparatively short time.

National Traffic System

We take pleasure in announcing the formation of the Central Area Staff of the National Traffic System. Organized very much along the lines of the PAS and EAS, CAS plans to have its first meeting at the Central Division Convention in Milwaukee, July 7–8.

The CAS, similar to organizations in the other two NTS areas, is an advisory group to the ARRL communications manager in NTS affairs in the Central Area. It is also available to advise NTS managers at section and lower levels, upon request, but its function is principally area-wide and it does not intrude into the internal affairs of NTS nets.

The chairman, elected by the other members of the Staff, is W9JUK (formerly W4ZJY), who is also TCC director-Central Area. Other members include W9DYG (CAN manager); K5IBZ (RN5 manager); W9QLW (9RN manager); WØLGG (TEN manager); W5CEZ, W9VAY and WØLCX (members at large).

This completes the advisory staffs of the three NTS areas. To review, the other Area Staffs consist of the following:

Pacific Area Staff: W6HC (chairman and member-at-large); W7DZX (TCC); W6VNQ (PAN); W6BBO (RN6); K7JHA (RN7); K7NHL (TWN); W6EOT, WA6BRG (at large). *Eastern Area Staff:* W2ZVW (chairman and member-at-large); K1WJD (EAN); W1EFW (1RN); WA2GQZ

This group of amateurs in Philadelphia County, Pa., were active in the 1966 Simulated Emergency Test. Left to right WA3FBK, K3ZXA, K3ZXO and WA3EKW.

(2RN); K3MVO (3RN); W4SHJ (4RN); W8CHT (8RN); VE3BZB (ECN); W3EML (TCC); W2SEI, W4DVT (at large).

Let's have a round of applause for these dedicated amateurs who have volunteered their considerable leadership abilities and experience to assisting in the making of decisions regarding the overall aspects of NTS operation. — *W1NJM*.

April Reports:

Net	Sessions	Traffic	Rate	Average	Representation %
1RN	60	540	.330	9.0	91.9
2RN	60	468	.565	7.8	99.7
3RN	60	633	.511	10.5	100.0
4RN	59	535	.384	9.1	95.8
RN5	60	634	.335	10.5	87.4
RN6	60	986	.813	11.1	100.0
RN7	30	508	.550	16.6	80.6[1]
8RN	60	534	.387	8.9	97.2
9RN	60	698	.573	11.6	93.3
TEN	60	697	.513	11.6	90.6
ECN	30	90	.201	3.0	75.5[1]
TWN	29	333	.328	11.1	80.7[1]
EAN	30	1651	1.173	55.0	97.2
CAN	30	1327	992	43.9	100.0
PAN	30	1238	1.002	41.3	96.8
Sections[2]	2521	15,058		5.9	
TCC Eastern	120[3]	665			
TCC Central[3]	93[3]	648			
TCC Pacific	122[3]	806			
Summary	2639	28,049	EAN	10.3	83.9
Record	2704	28,169	1.183	19.1	——

[1] Region net session based on one session per day.

[2] Section and Local nets reporting (83): AENB, D, H, M, R, T (Ala.); ARSN, OZK (Ark.); NCN, SCN (Calif.); CCN, CEPN, CPN, Columbine, HNN (Colo.); CPN (Conn.); FAST, FMTN, FPTN, GN, QFN, SATN, TPTN, WFPN (Fla.); GSN (Ga.); QIN (Ind.); Iowa 75; OKS (Kans.); KRN, KTN, KYN (Ky.); LAN (La.); PTN, SGN (Me.); MDD, MDDS, MEPN (Md.-Del.); EMN, WMN (Mass.); M6MTN, QMN (Mich.); MJN, MSN, MSPN (Minn.); MNN, MTTN, PHD (Mo.); NJN, NJPN (N. J.); Roadrunner (N. Mex.); NLIVHF, NLS, NYS, (N. Y.); NCN, NCNN, NCSB, THEN (N. C.); BN, OLN, OSN, OSSB (Ohio); OLZ, OPEN, SSZ (Okla.); EPA, KSSN, PTTN, WPA (Pa.); RISPN (R. I.); SCN (S. C.); TEX (Texas); BUN (Utah); VN, VSN, VSBN (Va.); WSN (Wash.); WVN, WVPN (W. Va.); BEN, SWRN, WSBN (Wis.); ISBN (Alta.); RTQ (Ont.-Que.).

[3] TCC functions performed, not counted as sessions.

W1EFW reports that 1RN is now operating on the system that the EAN receiving station becomes the NCS of the next session. So far conditions have been OK but our fingers are crossed anyway. WA2GQZ sez things seem to be shaping up. NLI has improved attendance thanks to K2DXV. K3MVO reports that spring fever must be the cause of a drop in traffic. W4SHJ issued special 4RN certificates to W4FPC and W4PIM attesting to more than 10 years service to the net. K5IBZ is wondering where the Miss. RM went. QRN is rough but surely no worse than in years past when RN5 did better than this year. K7JHA is the new SCM for Wash. WA7BYP, age 15 will be NCS on the late session of RN7. Two sessions per night effective May 1. W8CHT is not pleased with the effects of daylight time on the operators of 8RN, lost two NCS spots and two EAN reps. WØLGG states attendance is holding up but traffic is down. "I have had wonderful cooperation and it has been a pleasure guiding the net and keeping records," sez Bertha. W6VNQ issued certificates to W8BZY/5 and W7WHY.

Transcontinental Corps, W3EML reports that traffic is down considerably, compared with the totals of April 1966. W7DZX has been getting very good response to the monthly TCC Pacific bulletin. This is the first time he will have good extra help standing around for the summer vacation period, which leaves several open skeds for TCC.

April TCC reports:

Area	Functions	% Successful	Traffic	Out-of-Net Traffic
Eastern	120	83.6	1770	665
Central	93	86.1	1373	648
Pacific	122	86.1	1626	806
Summary	335	85.5	4769	2119

April TCC roster: Eastern Area (W3EML, Dir.) *W1s* EFW EMG NJM, K1WJD. *W2s* GKZ GVH SEI, *K2s* RYH SSX, *WA2s* BLV UPC WBA/5, WB2OHK. *W3s* EML NEM, K3MVO, WA3EEQ, *W4s* DVT ZM, *W8s* CHT HQL, K8KMQ, *WA8s* CFJ POS. Central Area (W9JUK, Dir.) W4OGG, K4DZM, WA4WWT, W5GHP, WA5JOL. *W9s* CXY DND DYG JUK QLW VAY YT, *WA9s* NFS NPB, KØAEM, *WØs* LCX TDR, *WAØs* IAW MLE. Pacific Area (W7DZX, Dir.) *W6s* ADB BGF EMS EOT HC IDY IPW TYM VNQ, *K6s* AJU LRN, WA6ROF WB6HVA, *W7s* AAF DZX HMA ZIW.

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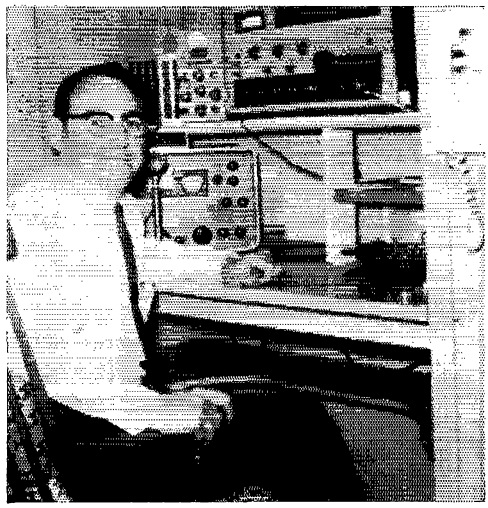
Other Net Reports:

Net	Sessions	Check-ins	Traffic
North American	25	822	612
20 SSB	21	392	2352
7290	40	1251	610
New England Teenage	29	276	67
75 Interstate	30	1172	702
Hit and Bounce	30	429	622
Mike Farad	55	510	372



This is W5EZY, RM for South Texas, at his operating position.

This is W8HZA at the operating position during the West Virginia Flood at the Emergency Operating Center of Charleston. Assisting is W8VYI. Details are in the June "Diary of the AREC."

Diary of the AREC and RACES

On April 4 through 16, the RACES group of 31 amateurs provided communications for the city of Clinton, Iowa. The Mississippi river was forecast to crest at 22 feet and a dike had to be built in a short time. 60 local CBers helped keep the 24-hour-per-day operation going and provided extensive mobile coverage. Operations were concerned mainly with dispatching sand, materials and equipment. The local amateurs made preparations well in advance, as a result of the flood in 1965, and these preparations really paid off with a system that worked smoothly and permitted a high density of traffic — WAØEFN *EC Clinton County Iowa.*

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On April 7, WØRVO received a phone call from the XYL of WØMBD saying that their 3½-year-old son was seriously ill and in the St. Cloud Hospital. She wanted to locate WØMBD who was in the Garrison, N. Dak., area. The alert was passed to WAØDAS and about 1½ hours later WØMBD found out about his son and chartered a plane for St. Cloud. Moments after take-off word via amateur radio notified the airport that the destination should be the University Hospital in Minneapolis. This message saved WØMBD about two hours, but unfortunately his son passed away. — *WØHEN.*

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On April 7, CP8AB tried to obtain a medicine needed to save the life of a two-year-old boy, desperately ill with a rare kidney disease. The medicine arrived in La Paz the next day and was flown the remaining 500 miles via a local flight. A few days later CP8AB reported that the child was out of danger. Amateurs known to have assisted were *KZ6s* DH FU IK, and WØGWR.

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On April 11, K4HKD/portable north of New Hope, Ala., checked into the Alabama Emergency Net M and reported that a grass fire along the highway was limiting visibility to less than a car length for a half-mile stretch of highway. K4DJU in Auburn called the Highway Patrol. WA4EEC and WA4AQM assisted by relaying between K4HKD and K4DJU. Only five minutes after the initial call, patrol cars were dispatched to control traffic. — *W4FPI.*

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On April 18, four different unreported traffic accidents were reported to the West Coast Amateur Radio Service Net. W6HLC called in concerning two different freeway accidents. Net Control designated WA6WHP to collect the information and relay to Highway Patrol and other needed services. K6AZB and WA6NWR reported two other accidents. Although four different accidents were reported in fifteen minutes, each individual accident was handled within two minutes after the initial break. Other stations known to have participated were *W6s* AEV DZJ, K6KT, WB6IZF — *WB6IZF.*

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On April 21 and 22, a tornado struck Belvidere, Ill. WA9PIJ, in the disaster area, operated on emergency power, and W9s HSD MTO and EUN relayed and acted as key stations. The Red Cross notified K9KJT that Belvidere needed communications aid and a food service truck. Eleven amateurs from the Milwaukee and surrounding area responded and dispatched a mobile unit to Rockford. The hams at Rockford maintained the h.f. link and handled the incoming traffic. W9RGU handled the casualty reports and used them to answer inquiries. The Milwaukee crew secured after 21 hours of operation, 90 miles from home. WA7BVN in Kayenta, Ariz., tried for several hours to get a report from Belvidere on behalf of some visitors who had heard a report that nine students of Belvidere High School had been killed. The visitors had three relatives who attended the school. Finally, WA7BVN found that one of the relatives had been injured but certainly things could have been much worse.

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On April 21, The Hoosier Lakes Radio Club activated their emergency net on 52,525 kc. at the request of the Kosciusko County C.D. Director. Other nets were established on 50,400 and 3900 kc. Indiana was adequately covered and many stations were inquiring about conditions in the area. The tornado alert involved about 37 amateurs.

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The April 24 "Operation No Fire" is a real example of how hams will go out of their way to provide their services voluntarily. Cloudcroft, N. Mex., was in a potentially dangerous position with a community virtually helpless because half of the Forest Service personnel of N. Mex., Texas, Ariz. and Okla. were busy with the Sacramento forest fire. High winds were forecast and thousands of campers were expected to use the forests on all sides of Cloudcroft. The governor made the first declaration of an emergency in New Mexico ever made to prevent a disaster. W5ALL, SEC of N. Mex., quickly and efficiently organized the communications system of amateurs. Promptly a number of amateurs from El Paso, Alamogordo, Sunspot, Roswell and Las Cruces set out for Cloudcroft. Amateurs in Albuquerque and other regions were ready to come if needed. The New Mexico Roadrunner Traffic Net and the Del Norte Net of El Paso were instrumental in the setting up of the operation. W5PTQ, WA5FLG, W8BZY/5, W5HDR and many others left important duties at home and proceeded to Cloudcroft with their mobile and other amateur radio equipment. The amateurs patrolled the area and extinguished at least 25 illegal campfires. There were about fifty amateurs who participated in this operation and performed an outstanding job of supplying communications.

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On April 28 through 30, about 45 amateurs participated in a search that covered over 400 square miles near Hamilton, Ontario. The object of the search was a ten year old girl, and the police feared that she had been abducted. The following amateurs operated the base station VE3FYV: *VE3s* BOD CJ DZP ELY FBZ GBX RCB, G8AIU. There were many mobiles in operation on two and 75 meters and some who responded to a call by VE3EUM on the Ontario Phone Net and also the Chicken Junction Net. The communications were provided for police, Army, Scouts and other officials, to coordinate the various search areas. — *VE3GBX, EC Wentworth County, Ont.*

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On April 28, during a party for the eighth graders of the Indiana School for the Blind, a girl was missed. A search was held on the campus throughout the night and the next morning without success. The police were notified and W9JPX, the club station, was NCS of the 6 Meter Emergency Net. A number of mobiles participated in the search and late the next evening the girl was found in fine condition. Twenty-three amateurs participated in the search. — *WA9CYG*

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On April 30, without warning a tornado ripped into Waseca, Minn. KØUYN alerted KØUGR on 6 meters and in 15 minutes both amateurs and KØKGR were at the major disaster scene operating mobile. WAØGKN and

(*Continued on page 148*)

Board Meeting Minutes
New Novice Questions
Canadian Rules Changes
Court Upholds FCC on CB
"Anti-Smog" Bill in Congress

FCC ACTION ON CB UPHELD

The U. S. Court of Appeals for the Ninth Circuit has upheld the FCC's orders of 1964 and 1965 toughening the rules for the Citizens Radio Service. The California Citizens Band Association, Inc., had challenged the Commission on a number of grounds, including lack of a public hearing, adoption of rules not included in the notice of rulemaking and several other points.

The Court in effect upheld the Administrative Procedures Act as Constitutional, and ruled that the Commission had properly followed the procedures outlined in the Act. FCC was not required to outline every detail in its notice, so long as the general tenor of the final rules was covered by the notice. Hearings are not required under the Act, so long as ample opportunity is given for all parties to present written data, views or arguments. Thus the FCC acted fully within its scope of authority in changing the CB rules.

MSTS AMATEURS WARNED

The Navy's Military Sea Transportation Service has issued a warning to masters of ships being used by MSTS to and from Viet Nam about carelessness by amateur radio stations aboard. The message said in part:

"It has been reported that merchant ships have been broadcasting on amateur radio frequencies while in Vietnamese waters or ports. In one reported incident a commercial ship, while in Southeast Asia waters, made known its position, the fact that it was carrying military vehicles, its next port of call and its estimated time of arrival, all by means of an amateur radio station aboard the ship. This action is not only prejudicial to military efforts in Vietnam, but is also expressly forbidden by . . . Article 97.95 (of the FCC amateur rules) . . ."

This item has been picked up by some daily newspapers with headlines highly unfavorable to the amateur service. A motto we've seen in a club paper seems appropriate: "Be sure brain is turning over before engaging the talk switch." One careless act by one amateur can undo weeks of public relations work, not to mention the dangers — in this particular case — to the men who must unload such ships within range of terrorist elements.

Baltimore's Amateur of the Year is Tom Robinson, K3LMX. A framed certificate was presented to Tom by Art Hofmeister, W3IF (left) at a joint dinner meeting of the Baltimore Amateur Radio Club and the Chesapeake Amateur Radio Club on April 4, 1967.

"ANTI-SMOG" BILL IN CONGRESS

In the 89th Congress there was a bill, S-1015, requested by FCC, which would give the agency control over the manufacture, sale and distribution of devices likely to cause interference to licensed radio services — butter conditioners, electric fences, heating pads and a host of similar devices which contribute to "radio smog." The bill passed the Senate, but Congress adjourned before any action was taken by the House.

A similar bill has now been introduced by Representative John D. Dingell, Democrat of Michigan. Assigned the number H.R.9665, it has been referred to the Committee on Interstate and Foreign Commerce.

Representative Harley O. Staggers of West Virginia is chairman of the committee, and Representative Torbert H. MacDonald of Massachusetts is chairman of the subcommittee on Communications and Electricity which probably will be assigned the bill for study. The bill is very important to amateurs; letters should be written to your representatives in the House, not only asking for support of the bill when it reaches the floor, but also asking Congressmen to urge its early consideration by the committee. Your neighbors should be interested, too, since passage of the bill should eventually help to reduce interference to TV from electrical devices.

MORE NEW NOVICE QUESTIONS

FCC has added nine new questions to the study material for the Novice examination. Here are the new ones, as released publicly by the Commission, together with answers prepared here at headquarters.

One old question, #29, has been deleted since it duplicates part of question #40; thus, there are now a total of 50 questions with which Novice applicants should be familiar. For a reprint of the nine newest questions, send a self-addressed stamped envelope to ARRL headquarters.

42. When is one way communication permissible?

The following kinds of one-way communications addressed to amateur stations are authorized: emergency communications, including bonafide emergency drill practice transmissions; information bulletins consisting solely of subject matter having direct interest to the amateur service as such; round-table discussions or net-type operations where more than two amateur stations are in communication, each station taking a turn at transmitting to other stations of the group; and code practice transmissions intended for persons learning or improving proficiency in the International Morse Code. (Section 97.91)

43. What is a Hertz? kiloHertz? MegaHertz?

The term Hertz means "cycles-per-second." A kiloHertz therefore is a thousand cycles-per-second and a MegaHertz is a million cycles-per-second.

44. What are some correct ways to call and answer other amateur stations via telegraphy?

The call sign of the station being called is sent first, followed by the signal "de" (meaning "from") and the callsign of the station transmitting. Example: W1ABC W1ABC W1ABC de W2DEF W2DEF W2DEF AR. W2DEF W2DEF W2DEF de W1ABC K. (Other examples, particularly for portable and mobile operations, appear in Section 97.87 of the rules.)

45. What are some common Q signals and what purposes do they serve? What do QRA, QRM, QRN, QRS, QRT mean when transmitted as questions via telegraphy?

Q-Signals are a form of radio "short-hand," adopted by the International Telecommunications Union for use by all radio services to transmit, precise meanings in a brief period of time. The specific signals have these meanings: QRA? What is the name of your station? QRM? Are you being interfered with? QRN? Are you troubled by static? QRS? Shall I send more slowly? QRT? Shall I stop sending?

46. What important functions do diodes perform?

Important functions performed by diodes in radio equipment are (a) changing alternating current to direct current in power supplies, (b) detection or demodulation, (c) modulation, (d) clipping and limiting, (e) switching. All are based on the fact that a diode will allow electric current to pass through it in only one direction; i.e., a diode will "rectify" an alternating current, changing it into a pulsating direct current.

47. What units are used to measure capacitance?

The fundamental practical unit of capacitance is the *farad*. As this unit is too large for ordinary use, capacitance usually is measured in *microfarads* (a microfarad, abbreviated, μf., is one millionth of a farad) or *picofarads* (a picofarad, abbreviated pf., is one millionth of a microfarad). The picofarad formerly was known as a micromicrofarad, abbreviated $\mu\mu$f. A farad is defined as that amount of capacitance in which one unit of electric charge (one coulomb) will cause a potential difference of one volt. Thus one millionth of a coulomb will charge a 1-μf. capacitor to 1 volt, etc.

48. How are transistors made, used and diagramed? What are some common transistor parameters?

The commonest form of transistor is the *bipolar* type consisting of two layers of semiconductor material of the same type (N or P) separated by a thin layer of the opposite-type material. The most-used materials are pure crystals of germanium or silicon to which small amounts of "dopant" have been added to convert them into semiconductors of the desired type. In the N type the dopant contributes free electrons; in the P type the dopant causes *holes* (electron deficiencies) in the atomic structure. The middle layer is called the *base*, one of the outer layers is called the *emitter*, and the other outer layer is called the *collector*. Although the emitter and collector are made of the same type semiconductor (either N or P) the two usually have differing concentrations of dopant in order to obtain desired transistor operating characteristics.

Circuit symbols for P-N-P and N-P-N transistors are shown in Fig. 1. The emitter symbol is a slanting line with an arrowhead. The direction of the arrowhead indicates whether the transistor is P-N-P (arrowhead pointing toward junction) or N-P-N (arrowhead pointing away from junction). The collector symbol is a slanting line, with no arrowhead, while the base connection is a line at right angles to the semiconductor region (vertical line in Fig. 1), on the opposite side from the emitter and collector symbols.

Transistors can be used as oscillators by feeding some of the amplified signal output power back into the input circuit in proper phase. They can also be used as amplifiers, mixers, frequency converters, and in other applications requiring an amplifying device.

The operating characteristics of transistors can be specified by various *parameters*, which may be expressed in numerous ways appropriate to particular applications and calculations. Some of the commonly-used ones are

α — Collector-to-emitter current ratio (or "current gain") with the transistor in the common-base circuit. ($\alpha = \frac{I_C}{I_E}$ where I_C = collector current and I_E = emitter current.)

β — Collector-to-base current ratio (current "gain") with the transistor in the common-emitter circuit. ($\beta = \frac{I_C}{I_B}$ where I_C = collector current and I_B = base current.)

$f\alpha$ — (α cutoff frequency) — The frequency at which α decreases to 70% (3-decibel decrease) of its d.c. value.

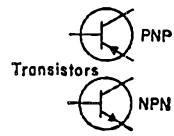


Fig. 1

49. Why is impedance matching necessary?

It can be shown mathematically that the greatest possible output is obtained from a source of power if the impedance of the load on the power source is the conjugate of the internal impedance of the source itself. (If the load and source impedances are pure resistances this means that for maximum power output the load resistance must equal the source resistance.) When a load of the correct impedance for maximum power output is connected to a power source the impedances of the two are said to be *matched*. Obtaining maximum power output is a principal reason for impedance matching.

50. What is chirp and how can it be remedied in a c.w. transmitter?

Chirp is a rapid change in transmitter frequency that occurs on closing or opening the key in a c.w. transmitter, the frequency usually being constant while the key is held closed. (A frequency change occurring while the key is closed is called frequency *drift*, although the distinction is not always clear when the transmitter is keyed rapidly.) Such frequency changes invariably occur when an oscillator is keyed. The extent of the frequency change is proportional to the operating frequency, other things being equal, and is therefore greater on the higher-frequency bands. It also depends on the inherent stability of the keyed oscillator; the more stable the oscillator the less the chirp. Crystal-controlled oscillators are usually best in this respect. Chirp also is affected by the voltage on the oscillator; if keying the transmitter causes the oscillator supply voltage to change chirp will result. Another factor is isolation of the oscillator from the following amplifier stages; for example, r.f. feedback from an amplifier into the oscillator circuit also can cause chirp.

The remedies for these conditions are (1) do not key the oscillator; (2) use an oscillator of high inherent stability; (3) use regulated supply voltage on the oscillator; (4) use a buffer amplifier between the oscillator and the keyed stage or stages; (5) shield the oscillator and provide r.f. filtering in its supply leads to eliminate feedback.

CODELESS LICENSE DENIED

The Federal Communications Commission has denied a petition, RM-1091, by Robert B. Bose, Ormond Beach, Florida, which asked the agency to delete the code requirement in respect to Technician Class licenses. In its order, the Commission said:

"Pursuant to Article 41 of the International Radio Regulations (Geneva, 1959), it is pro-

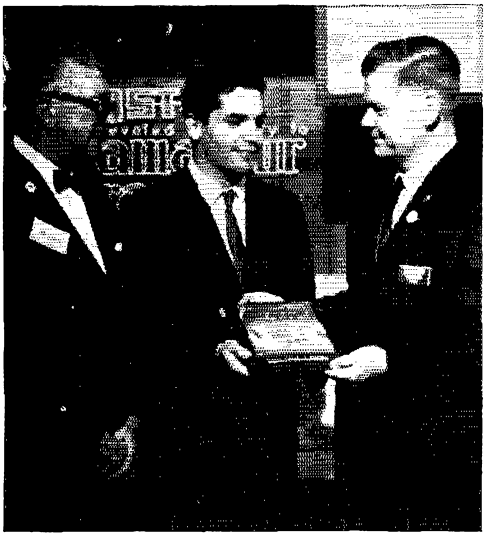
vided that any person operating the apparatus of an amateur radio station shall have proved that he is able to transmit and receive the Morse Code. The adoption of any rule that would permit operation of an amateur radio station in contravention to this regulation and to the procedures established by the Commission pursuant to this regulation for the administration of code tests would not be appropriate."

Walter Bradley Martin, W3QV

With deep regret *QST* records the passing on April 24 of Walter Bradley Martin, W3QV, ARRL director from the Atlantic Division from 1936 to 1946 and from 1948 to 1952. Brad had served in the U. S. Navy Reserve from 1934 to 1964, with active duty from 1939 until 1951, retiring with the rank of captain. After leaving military service, he was employed as communications engineer for the Montgomery County District Attorney, directing operations of the county-wide police radio system.

Brad was an amateur for fifty years, active in the Old York Road Radio Club, the Phil-Mont Mobile Radio Club, Inc., the Montgomery County and Abington Township civil defense organizations and Red Cross communications.

Born in 1903, Brad was a resident of Abington, Pennsylvania. He leaves his wife, Laura, a son, W. Bradley Martin, Jr., W3AUF, a daughter, Lucille Clayton (wife of K3HIE) and three grandchildren. The May 28 edition of the Phil-Mont club paper, The Blurb, carries a tribute to Brad. The club has also applied for his call, W3QV, as a permanent memorial.



Sometimes it takes a while to catch up with *QST*'s far-flung authors: at the 1967 New England Convention, ARRL Directors W1QV (l.) and W2TUK (r.) finally cornered Paul Horowitz, W2QYW to present him the Cover Plaque Award for his August, 1965 article, "Perfect Code at your Fingertips."

CANADIAN RULES CHANGES

Several changes have been made in the Canadian General Radio Regulations governing amateurs, at the request of ARRL — Canada.

Section 51 now reads: "(1) A distinctive call sign shall be assigned to each station, and that call sign shall be transmitted (a) at intervals not greater than thirty minutes during any period during which the station is transmitting; and (b) at the termination of a single transmission or each exchange or communications with another station. (2) The station call sign shall be transmitted *either* by telegraphy in the International Morse Code or by telephony according to the type of emission authorized for the frequency being used.

Section 60 of the rules is changed to say: "The carrier frequency shift of a transmitter used for frequency shift teletype operation shall not exceed 900 cycles."

The new section 110 reads: "(1) To be eligible for an Advanced Amateur Radio Operator's Certificate the candidate shall (a) have been the holder of a license for a station performing an Amateur Experimental Service, whether that license was issued in Canada or elsewhere, and shall submit proof that he has actively operated the station under that license for at least twelve consecutive months, or (b) satisfy the Departmental Examiner that he has operating experience and knowledge equivalent to that required by paragraph (a). . . .

"(3) Notwithstanding paragraphs (a) and (b) of subsection (2), a candidate may (a) send on a semi-automatic or electronic hand key and (b) transcribe by means of a typewriter if such equipment is supplied by the candidate."

The parallel part of Section 111 is amended in like fashion, also to permit typewriters and keyers or bugs.

—...—

As of March 31, there were 12,120 licensed amateur stations in Canada, as follows:

Region	*1967*	*1966*	*1965*	*1964*
Vancouver	1,711	1,635	1,549	1,398
Edmonton	1,138	1,132	1,091	1,073
Winnipeg	1,231	1,252	1,283	1,201
Toronto	4,472	4,313	4,149	3,907
Montreal	2,169	2,055	1,935	1,890
Moncton	1,399	1,306	1,273	1,161
TOTALS	12,120	11,693	11,280	10,640

This is an increase of 3.65%, about the same as last year's growth.

ARE YOU LICENSED?

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

E. W. Pappenfus, WB6LOH (l.), won the ARRL Cover Plaque Award for November with his KKH article, "The Conical Monopole Antenna." Admiring the chromed printing plate is Herbert Spierling, W6EHU.

MINUTES OF EXECUTIVE COMMITTEE MEETING

Minutes of Executive Committee Meeting

No. 316

May 4, 1967

The Executive Committee of The American Radio Relay League, Inc., met at the Shoreham Motor Hotel, Hartford, Conn., at 6:20 p.m., May 4, 1967. Present: President Robert W. Denniston, WØNWX, in the Chair; First Vice President W. M. Groves, W5NW; Directors Charles G. Compton, WØBUO, Gilbert L. Crossley, W3YA, Noel B. Eaton, VE3CJ, and Carl L. Smith, WØBWJ; and General Manager John Huntoon, W1LVQ. Also present were General Counsel R. M. Booth, Jr., W3PS, Southeastern Division Director Charles J. Bolvin, W4LVV, and Central Division Vice Director Edmond A. Metzger, W9PRN.

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

The Amateur Radio Club of Margaretta High School, Castalia, Ohio; ARINC Amateur Radio Club, Annapolis, Md.; Bedford High School Amateur Radio Club, Bedford, Ohio; Brantford Amateur Radio Club, Brantford, Ont., Can.; Clallam County Amateur Radio Club, Inc., Port Angeles, Wash.; Douglas Space Systems Center Amateur Radio Club, Huntington Beach, Calif.; The Duke University Medical Center Amateur Radio Club, Durham, No. Car.; East Aurora High School Amateur Radio Club, Aurora, Ill.; Emerald Amateur Radio Society, Springfield, Ore.; Fordson Electrons Communications Club, Dearborn, Mich.; Livermore High School Amateur Radio Club, Livermore, Calif.; Notre Dame High School Radio Club, Niles, Ill.; Radio Amateurs Downstate Illinois Organization, Mt. Carmel, Ill.; SDC Amateur Radio Club, Santa Monica, Calif.; Taconic Amateur Radio Club, Jefferson Valley, N. Y.; The Techams of H.C. Technical High School, Buffalo, N.Y.; The Uintah Basin Amateur Radio Club, Vernal, Utah; University of Detroit Radio Amateur Club, Detroit, Mich.; The Utah DX Association, Salt Lake City, Utah; Wadsworth Hall Amateur Radio Club, Houghton, Mich.; Western Electric Co., Missouri (WECOMO) Amateur Radio Club, Lee's Summit, Mo.; 128 Contest Club, Chelmsford, Mass.

On motion of Mr. Crossley, unanimously VOTED to approve the holding of a joint Pacific and Southwestern Division Convention in Los Angeles, California, on September 8-10, 1967.

There being no further business, the Committee adjourned, at 6:55 p.m.

JOHN HUNTOON
Secretary

Minutes of the 1967 Annual Meeting of the Board of Directors

The American Radio Relay League, Inc.
May 5-6, 1967

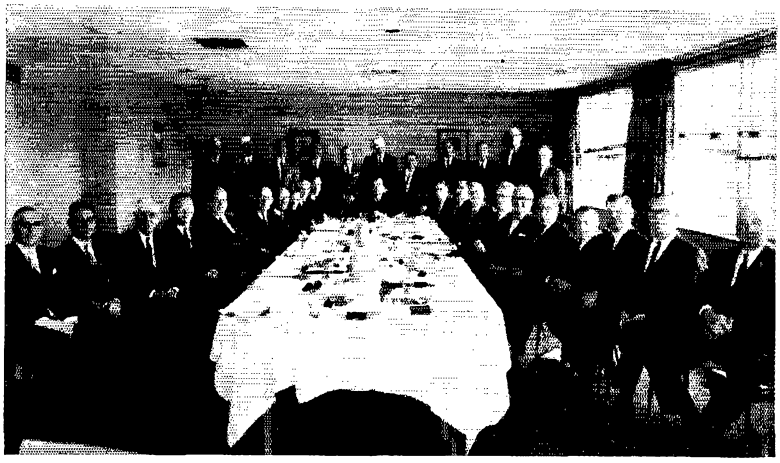
1) Pursuant to due notice, the Board of Directors of The American Radio Relay League, Inc., met in annual session at the Shoreham Motor Hotel, Hartford, Connecticut, on May 5, 1967. The meeting was called to order at 9:30 A.M., with President Robert W. Denniston, WØNWX, in the Chair, and the following directors present:

Roemer O. Best, W5QKF, West Gulf Division
Charles J. Bolvin, W4LVV, Southeastern Division
Dana E. Cartwright, W8UPB, Great Lakes Division
Robert Y. Chapman, W1QV, New England Division
Victor C. Clark, W4KFC, Roanoke Division
Charles G. Compton, WØBUO, Dakota Division
Gilbert L. Crossley, W3YA, Atlantic Division
Harry J. Dannals, W2TUK, Hudson Division
Noel B. Eaton, VE3CJ, Canadian Division
Harry M. Engwicht, W6HC, Pacific Division
Sumner H. Foster, WØGQ, Midwest Division
John R. Griggs, W6KW, Southwestern Division
Philip E. Haller, W9HPG, Central Division
Carl L. Smith, WØBWJ, Rocky Mountain Division
Philip P. Spencer, W5LDH, Delta Division
Robert B. Thurston, W7PGY, Northwestern Division

Also in attendance, as members of the Board without vote, were Wayland M. Groves, W5NW, First Vice President; and John Huntoon, W1LVQ, General Manager. Also in attendance, at the invitation of the Board as non-participating observers, were Atlantic Division Vice Director Jesse Bieberman, W3KT; Central Division Vice Director Edmond A. Metzger, W9PRN; Delta Division Vice Director Max Arnold, W4WHN; Hudson Division Vice Director Stan Zak, K2SJO; Roanoke Division Vice Director L. Phil Wicker, W4ACY; and Southwestern Division Vice Director Thomas J. Cunningham, W6PIF. There were also present Treasurer David H. Houghton; Honorary Vice President Francis E. Handy, W1BDI; General Counsel Robert M. Booth, Jr., W3PS; Assistant General Manager Richard L. Baldwin, W1IKE; Technical Director George Grammer, W1DF; Communications Manager George Hart, W1NJM; and Senior Assistant Secretary Perry F. Williams, W1UED.

2) The meeting was welcomed and briefly addressed by the Chair.

3) On motion of Mr. Smith, unanimously VOTED that Item 10 of the Agenda, Consideration of Reports of Committees, be moved to follow the oral reports of the officers, with permission to the chairmen of committees to offer motions at that time.



The ARRL Board interrupts its deliberations for a family portrait. (Seated, l. to r.,) WØBUO, W4LVV, W5QKF, W5LDH, W6KW, W6HC, W5NW, WØGQ, W7PGY, W3PS, WØNWX, W1LVQ, W1UED, Treasurer Houghton, VE3CJ, W1QV, WØBWJ, W8UPB, W2TUK, W9HPG, W3YA, (Standing,) W1DF, W1BDI, W1NJM, W4ACY, W6PIF, K2SJO, W3KT, W4WHN, W9PRN, W4KFC, W1IKE.

Whereupon, on motion of Mr. Chapman, unanimously VOTED that the Agenda, as modified, is ADOPTED.

4) On motion of Mr. Eaton, unanimously VOTED that the minutes of the 1966 annual meeting of the Board of Directors are approved in the form in which they were issued by the Secretary.

5) On motion of Mr. Engwicht, unanimously VOTED that the Annual Reports of the Officers to the Board of Directors are accepted and the same placed on file.

6) Mr. Eaton, as Chairman, presented the report of the Finance Committee; Mr. Dannals, as Chairman, presented the report of the Planning Committee; Mr. Best, as Chairman, presented the report of the Membership & Publications Committee; Mr. Compton, as Chairman, presented the report of the Public Relations Committee; Mr. Groves, as Chairman, presented the report of the Merit & Awards Committee.

7) On motion of Mr. Dannals, unanimously VOTED that the Annual Reports of the Directors to the Board of Directors are accepted and the same placed on file.

8) At this point, supplementary oral reports were offered by the Officers of the League and the General Counsel. On motion of Mr. Spencer, unanimously VOTED that the Board expresses its appreciation for the outstanding representation our General Counsel has provided during the past year.

9) The Board was in recess from 11:01 A.M. to 11:30 A.M.

10) On motion of Mr. Eaton, after extended discussion, unanimously VOTED that the Building Fund be closed as of December 31, 1967, and that this Board go on record as thanking all those who have contributed.

11) On motion of Mr. Eaton, unanimously VOTED that the Board expresses its appreciation to the individuals and firms who have contributed funds and equipment to the League for overseas promotion of the amateur radio service.

12) On motion of Mr. Best, after extended discussion, unanimously VOTED that the Membership & Publications Committee, and the headquarters, reinstitute a membership program along the lines of HamQuest 67. On further motion of Mr. Best, unanimously VOTED that the membership blank and League publication blank be continued in *QST*.

13) On motion of Mr. Best, unanimously VOTED that the Board expresses its thanks to George Thurston, W4MLE, for his untiring efforts and assistance in compiling the new "Radio Amateur's Operating Manual."

14) Moved, by Mr. Chapman, to amend By-Law 1 by adding a new section to read as follows: "(c) a paid-up life membership in the League shall be available to any Full Member upon payment of $100 and that said life membership enjoy all rights, benefits and privileges commensurate with the grade of license held, said life membership to be non-transferable." After extended discussion, during the course of which the Board was in recess for luncheon from 12:15 P.M. to 1:28 P.M., on motion of Mr. Compton, VOTED that the matter is laid on the table; Mr. Griggs requested to be recorded as voting opposed.

15) Moved, by Mr. Chapman, that the Board should empower the General Manager to employ a professional qualified public relations person to become a permanent employee of the League. It is further recommended that this individual have duties that encompass providing public relations counseling service to the communications manager and his staff, authorized direct liaison with the affiliated clubs in furthering promotional functions such as conventions and hamfests, conduct such membership studies as the Board may deem necessary, and serve in any additional management capacity the General Manager may require. But, after extended discussion, the motion was rejected, 6 votes in favor to 10 opposed; Mr. Griggs requested to be recorded as voting in favor.

16) On motion of Clark, after discussion, unanimously VOTED that the President appoint from the Board a three-man committee to study and report upon the feasibility of creating a limited number of formal advisory groups, composed of qualified amateurs, as vehicles for systematically processing and channeling advice and expertise from the membership in various specialty areas of amateur radio, such as (1) recruitment of new amateurs, (2) international affairs, (3) DX, (4) operating competitions, (5) radioteletype, (6) v.h.f., and (7) space communications.

17) Moved, by Mr. Groves, to amend By-Law 30 to add the Merit & Awards Committee to the list of standing committees. On a roll-call vote, all 16 directors voted in the affirmative; so the By-Law was AMENDED.

18) On motion of Mr. Smith, after discussion, unanimously voted that the ARRL Technical

Merit Award for 1966 be presented to William Conkel, W6DNG and Ray Naughton, VK3ATN, for outstanding effort and accomplishment in the moonbounce field of v.h.f. signal propagation.

19) The Board was in recess from 2:44 P.M. to 2:58 P.M.

20) Mr. Spencer read to the meeting a letter from Dr. Donald A. Miller, W9WNV, as follows: "On behalf of myself and the thousands of amateur radio DX enthusiasts, I wish to sincerely thank the Members of the Board of Directors for the opportunity to be fully and impartially heard on matters regarding my DX expedition, and for the fair and complete consideration given these matters by the entire board, and for resolving this matter in the best interest of the Amateur Radio Service and in the finest tradition of the American Radio Relay League." On motion of Mr. Spencer, after extended discussion, unanimously VOTED that the Board of Directors acknowledges with thanks the letter received from Dr. Miller concerning the extensive review by the individual directors, in informal session, of the recent Awards Committee rulings on his DX activities, and that his letter be entered in the record of this meeting.

21) On motion of Mr. Best, unanimously VOTED that the Board express its appreciation to members of the Awards Committee for their integrity and untiring efforts in behalf of all radio amateurs on contest and DXCC matters.

22) On motion of Mr. Spencer, after extended discussion, unanimously VOTED that the Headquarters staff study the advisability of requesting a phone and/or c.w. assignment of a 200-kc. portion of the 10-meter band for Novices.

23) Moved, by Mr. Spencer, that the Board should request that a self-addressed, stamped envelope be sent with all inquiries from members and non-members; but, after discussion, Mr. Spencer withdrew his motion.

24) On motion of Mr. Dannals, after extended discussion, unanimously VOTED that in order to maintain the League's leadership and forward thinking in the field of advance communications via satellite and other means, the General Manager is directed to support a space communication facility at or near the ARRL headquarters site and that an amount up to $1500 be authorized specifically for this purpose.

This discussion, augmented by finger-talk on the part of President Robert W. Denniston, WØNWX, also includes Delta Division Director Philip P. Spencer, W5LDH and Hudson Division Director Harry J. Dannals, W2TUK.

25) The Board was in recess from 4:12 P.M. to 4:26 P.M.

26) On motion of Mr. Dannals, after extended discussion, unanimously VOTED that, in recognition of the increased amount of member interest in new equipment and the current predominance of manufactured equipment in use on the amateur bands, the General Manager is directed to study the establishment of a new format for the "Recent Equipment" section of *QST*. This new format would include a product survey complete with measured performance parameters as observed in the League's laboratory under actual test conditions. All parameters usually associated with the equipment under test and referenced in the *QST* advertisements for the specific equipment would be measured and reported.

27) On motion of Mr. Foster, after discussion, unanimously VOTED that the Board of Directors approve the holding of an ARRL National Convention in Des Moines, Iowa, on June 20–22, 1969, under the sponsorship of the Des Moines Radio Amateur Association.

28) Moved, by Mr. Chapman, to amend Article 4 of the Articles of Association to read as follows: "The affairs of the corporation shall be governed by a Board consisting of sixteen Directors who shall be elected for terms of four years by the members eligible to vote. Eight Directors shall be elected for terms beginning with alternate even-numbered years, and eight Directors shall be elected for terms beginning with alternate odd-numbered years. Election of Directors shall be by mail vote in accordance with the rules and regulations prescribed by the Board of Directors in the By-Laws. The Board shall meet annually at a time and place as provided in the By-Laws. Special meetings of the Board shall be called by the President upon written request of at least one-half the membership of the Board as then constituted." After extended discussion, on a roll-call vote, the motion to amend was rejected, 3 votes in favor to 13 opposed; Messrs. Chapman, Compton and Foster voted in the affirmative; all other directors voted opposed.

29) Moved, by Mr. Chapman, that ARRL division or state conventions must be sponsored by affiliated clubs and said clubs legally incorporated by State or Commonwealth law. But, after extended discussion, during the course of which the Board was in recess for dinner from 6:22 P.M. to 8:24 P.M., Mr. Chapman withdrew the motion. Further moved, by Mr. Chapman, that the Board go on record as recommending that ARRL conventions be sponsored by affiliated clubs or councils or organizations legally incorporated. After discussion, the vote was a tie, 8 votes in favor to 8 opposed. The Chair cast the deciding vote in the negative; so the motion was lost. Mr. Griggs requested to be recorded as voting in favor.

30) Moved, by Mr. Chapman, that the Board direct management to conduct a study to determine the merits of having two classifications for affiliated amateur radio club memberships, a senior or full membership status for clubs legally incorporated holding scheduled meetings and a junior associate membership status for clubs with limited activities.

The senior or full membership status club would be assessed a fixed fee on a yearly basis. As a measure of compensation these clubs would receive in return more direct League administrative and technical functional support. The junior or associate membership status would not pay any fees and would receive support proportional to their own interests and activities. The growth of all clubs would be encouraged and fostered as has been done to date but their activities would be more precisely assessed and duly rated. But, after discussion, the motion was rejected.

31) Moved, by Mr. Chapman, that our journal *QST* list monthly all contests sponsored by bonafide clubs, societies, and incorporated businesses, promoted in the best interests of amateur radio communications. But, after discussion, the motion was rejected.

32) Moved, by Mr. Chapman, to amend By-Law 4, effective August 1, 1967, to read as follows: "The dues of members of any class shall be $6.50 per year in the United States and Possessions, the Commonwealth of Puerto Rico or in Canada, payable annually in advance." After extended discussion, on a roll-call vote, all 16 directors voted in the affirmative; so the By-Law was AMENDED.

Assistant Secretary Perry F. Williams, W1UED and Vice President-Dakota Director Charles G. Compton, WØBUO chat during a recess.

33) Moved, by Mr. Chapman, to amend By-Law 5, effective August 1, 1967, to read as follows: "Provided that a member is without sight, or is the husband or wife, brother or sister, son or daughter, father or mother of another member living at the same address paying dues at the rate of $6.50 per year in the United States & Possessions, the Commonwealth of Puerto Rico or in Canada, he may at his request pay dues of $1.00 per year, in advance, but without the right to receive *QST*; said membership to be concurrent with that of the member receiving *QST*." After discussion, on a roll-call vote, all 16 directors voted in the affirmative; so the By-Law was AMENDED.

34) On motion of Mr. Compton, unanimously VOTED to take from the table Mr. Chapman's motion on life membership. On further motion of Mr. Compton, unanimously VOTED to amend the motion to provide that By-Law 1 be amended, effective August 1, 1967, by addition of a new section (c) to read as follows: "A paid-up life membership in the League shall be available to any Full Member, other than a family member, upon payment of a fee of twenty times the annual dues rate, and that said life membership enjoy all rights, benefits and privileges commensurate with the grade of license held, said life membership to be non-transferable." Whereupon, the question then being on the motion as amended, on a roll-call vote all 16 directors voted in the affirmative; so the By-Law was AMENDED. During the course of the above action, the Board was in recess from 10:20 P.M. to 10:33 P.M.

35) Moved, by Mr. Chapman, to further amend By-Law 5 to read as follows: "Provided that a member is without sight, or is the husband or wife, brother or sister, son or daughter, father or mother of another member, living at the same address and either a life member or one paying dues at the rate of $6.50 per year in the United States and Possessions, the Commonwealth of Puerto Rico or in Canada, he may at his request pay dues of $1.00 per year, in advance, but without the right to receive *QST*; said membership to be concurrent with that of the member receiving *QST*." After discussion, on a roll-call vote, all directors voted in the affirmative; so the By-Law was AMENDED.

36) Moved, by Mr. Thurston, to amend By-Law 8 to read as follows: "No person shall be President, Vice President, Secretary, Director or Vice Director

RULES FOR LIFE MEMBERSHIP

1. The Board of Directors has established a provision for Life Membership in The American Radio Relay League, Inc., effective August 1, 1967.
2. Life Membership is granted only by the Executive Committee, upon proper application from a Full (U.S. or Canadian licensed) Member. (Write to headquarters for application forms.)
3. The Life Membership fee is twenty times the annual dues rate, or currently $130.
4. Applications, with full payment, received on or prior to August 1, 1967, will, if accepted, be granted "Charter" Life Memberships.
5. An applicant may choose an alternative time-payment plan of 8 quarterly instalments, $16.25 each. In such instance he will be provided an interim two-year Full Membership certificate. Upon completion of the payments, Life Membership will be granted.
6. Life Memberships are non-transferable, and dues payments are non-refundable. In the event an applicant is unable to complete payments on the instalment plan, he will be given a term of membership, at the annual dues rate, commensurate with payments received.
7. Other licensed amateurs in the same family, and at the same address, of a Life Member may retain or obtain Family Membership upon payment of the annual dues of $1, but without receipt of *QST*. The dues of the Family Member may be prepaid for any number of years in advance, but there is no special rate.

of the League unless, at the time of nomination, he has reached his 21st birthday and is a member of the League and the holder of at least a General Class amateur license, or a Canadian Advanced Amateur Certificate." After discussion, on a roll-call vote, all directors voted in the affirmative; so the By-Law was AMENDED.

37) On motion of Mr. Thurston, after discussion, unanimously VOTED that in line with the present incoming QSL bureau at Headquarters, a committee be appointed by the President to study the feasibility of also creating an outgoing QSL bureau, said committee to make its report no later than the 1968 Board meeting.

38) On motion of Mr. Eaton, the Board recessed at 11:07 P.M., reconvening at 9:07 A.M. on May 6, 1967, with all directors and other persons herein before mentioned in attendance. President Deniston read a radiogram #1 from VE2XPO conveying greetings from the amateur station at EXPO 67, and, on behalf of the Board of Directors, his reply of congratulations and best wishes.

Southeastern Division Director Charles J. Bolvin, W4LVV, *stands during discussion of a motion.*

39) Moved, by Mr. Engwicht, (a) That the existing Awards Committee be relieved of its association with the administration of DXCC. (b) That a new committee known as the "DXCC COMMITTEE" be formed. Said Committee to consist of one recognized and qualified Radio Amateur from each of the ARRL Divisions plus one member from the Headquarters staff who will act as a Coordinator for the League and for the Committee. (c) That with the exception of the Headquarters Coordinator, qualification for committee membership will require existing DXCC status of at least 250 credited countries and current paid-up membership in the American Radio Relay League which has been in effect, continuously, for a period of at least one full year. (d) That each committee member shall be appointed by the ARRL Headquarters Communications Manager for a term of one year. No restriction shall be made as to the number of consecutive terms an individual committee member may serve. (e) That "Application for Change" in DXCC rules or country status shall be presented to the Coordinator who shall in turn notify all committee members of the "Application for Change" by mail. (f) That a period of thirty days be allotted from the date the Coordinator mails said "Application for Change" to the committee members for their consideration and the return of individual decisions to the Coordinator. (g) That a simple majority of returns received will constitute a decision. (h) That the Headquarters Coordinator and any staff assigned to him will carry out the functions of awarding DXCC Certificates and credits in accordance with the rules established by the committee. (i) That initially, the committee will accept and administer existing rules previously established by the ARRL Awards Committee and that certificates and credits issued by that committee will be honored. (j) That the ARRL will publish in "*QST*" and/or by special release, all findings or decisions of the committee relating to rules or country status of DXCC. (k) That ARRL Headquarters may rescind a committee decision when it is determined by competent authority, that the decision condones a violation of FCC or DOT regulations, that exposure to violation of communication laws or statutes of other sovereign nations is evident, that, by its actions, the committee would expose the League to the possibility of civil action through the courts, or to the incurrence of extraordinary expense. After extended discussion, on motion of Mr. Bolvin, VOTED to amend the motion by striking the text and substituting therefor the following: "That the Planning Committee or other committee as appointed by the President study the problem of the make-up of the Awards Committee and its recommendations be presented to the General Manager." Mr. Engwicht requested to be recorded as voting in favor, and Mr. Griggs requested to be recorded as voting opposed. Whereupon, the question being on the motion as amended, the same was unanimously ADOPTED.

40) On motion of Mr. Engwicht, after discussion, unanimously VOTED that the Advertising Department continue to solicit advertisements in the field of component parts and, with suitable safeguards, in the field of surplus equipment, to encourage construction of amateur radio equipment.

41) Moved, by Mr. Engwicht, that all Headquarters officials and other officials from SCM and SEC up be required to have at least a General Class license with a specified period or schedule for upgrading. But there was no second, so the motion was lost.

42) Moved, by Mr. Engwicht, that *QST* be returned to general newsstand sales. But there was no second, so the motion was lost.

A word by General Counsel Robert M. Booth, Jr., W3PS, seems to trigger a "What can you expect?" gesture from Treasurer David H. Houghton.

An occasional hearty laugh punctuates the proceeding—here enjoying a witty remark are Directors Carl L. Smith, WØBWJ, of the Rocky Mountain Division; Dana E. Cartwright, W8UPB, from the Great Lakes Division; Harry J. Dannals, W2TUK of the Hudson Division; Philip E. Haller, W9HPG (partly hidden) representing the Central Division, and Vice President/Atlantic Division Director Gilbert L. Crossley, W3YA, with Southwestern Vice Director Thomas J. Cunningham, W6PIF visible over W3YA's shoulder.

43) On motion of Mr. Engwicht, after discussion, unanimously VOTED that the Editor of the ARRL *Handbook* include in the forthcoming yearly handbooks more material on the following subjects: RTTY, FM, Mobile, Repeater Equipment, Transistor, FET, and MOS.

44) On motion of Mr. Clark, after discussion, unanimously VOTED (Mr. Eaton abstaining) that the Board instruct the General Manager and the General Counsel to request the Federal Communications Commission (1) to increase the number of examining points for amateur radio licenses to provide examinations at least twice each year in metropolitan areas having over 100,000 population, and the largest city in each state in which examinations are not currently conducted, and (2) wherever possible to schedule examinations on Saturday.

45) On motion of Mr. Clark, after discussion, unanimously VOTED that the General Manager and the Membership & Publication Committee study and report upon the feasibility of creating an introductory membership rate to new amateurs; a 1- or 2-year low-cost membership at substantially below the regular membership cost to new amateurs of any class is suggested.

46) On motion of Mr. Bolvin, after discussion, VOTED that there be a feasibility study directed towards a possible request for a small phone frequency assignment in the Commonwealth of Puerto Rico, outside W/K continental assignments, on one or more of the bands, the responsibility for this study to be assigned to the Planning Committee for report at the next Board meeting. Mr. Eaton abstained, and Mr. Griggs requested to be recorded as voting opposed.

47) On motion of Mr. Bolvin, after discussion, unanimously VOTED that the General Manager be directed to give prompt consideration of assignment of the affiliated club administration to a full time supervisor with public relations orientation.

48) Moved, by Mr. Bolvin, that the Membership & Publications or other appropriate committee consider a design contest for a standard League member QSL card, winning design plates to be made available to members and/or QSL printers at cost. But, after discussion, the motion was rejected; 5 votes in favor to 11 opposed. Messrs. Griggs and Thurston requested to be recorded as voting opposed.

49) Moved, by Mr. Bolvin, that vice director travel expenses be authorized to attend the first Board meeting following his election or re-election. But there was no second, so the motion was lost.

50) Moved, by Mr. Bolvin, that the Membership & Publications or other appropriate committee consider and take action if feasible on a program of translation of training material and selected portions of League publications into Spanish and French with any pilot program cost to be charged to the frequency protection fund. But there was no second, so the motion was lost.

51) Moved, by Mr. Bolvin, that the Planning Committee consider minimum qualifications and standards of performance for the assistant director appointment and that the committee present its recommendations at the next Board meeting. But, after discussion, the motion was rejected.

52) Moved, by Mr. Bolvin, that the DXCC and WAS awards continue to be issued without any limitation as to League membership, but that endorsement on the original be limited to members and non-W/K/VE applicants. After discussion, on motion of Mr. Spencer, unanimously VOTED to amend the motion by striking the text and substituting therefor the following: "That WAS and DXCC awards and endorsements be subject to a service charge for non-members, except those outside the operating territory of the League (Canada, the United States, its Possessions, and Puerto Rico), and applicants be required to certify on the application blank that they have paid their dues." Whereupon, the question then being on the motion as amended, the same was ADOPTED.

53) The Board was in recess from 10:55 A.M. to 11:15 A.M.

54) On motion of Mr. Griggs, after discussion, unanimously VOTED that the Board does hereby commend the continuing frequency study being conducted by League headquarters, and further authorizes the establishment of a frequency allocation study committee to consist of three technically-qualified members of the Board or of the League for the purpose of examining the use and occupancy of the existing amateur frequency allocations and to pursue a study of such other frequency allocations as may present possibilities of future assignments to the amateur service, the cost of such study to be charged to the special reserve for the defense of amateur frequencies.

55) Moved, by Mr. Griggs, that the Board does hereby recommend for consideration by the DXCC Awards Committee the following criteria for the granting of "country" status by the DXCC Awards Committee: (a) that the area concerned shall consist of at least one square mile; (b) that the area has a minimum population of 100 people; (c) that the area shall be considered only if autonomous as evidenced by its own issue of money, coinage or stamps. But, after discussion, Mr. Griggs withdrew the motion.

56) On motion of Mr. Griggs, after discussion, unanimously VOTED that the Board does hereby direct the Membership & Publications Committee to study the desirability and the methods for instituting a program whereby the means would be established by which any ARRL affiliated club may adopt as a "brother" club any one amateur

radio club in another country for the benefits that may be derived from the mutual exchange of visits, correspondence, technical assistance, components, equipment and social enterprises.

57) On motion of Mr. Griggs, after discussion, unanimously VOTED (Mr. Eaton abstaining) that the Board does hereby instruct the General Manager and General Counsel to consider requesting the Federal Communications Commission to make changes in part 97, Amateur Regulations, concerning operation above 50 Mc. as follows:

97.3 Definitions

Add: (j) Amateur Repeater Station
An Amateur Station used to retransmit, by automatic means, signals, data, and information originated by other amateur stations.

(i) Amateur Relay Station
An Amateur Station used to retransmit, by automatic means, signals, data and information originated by an amateur station from one geographical point to another geographical point.

97.87 Transmission of call signs

Add: (a) (1) (v)
Amateur repeater, and relay stations shall transmit their call signs at intervals not exceeding three minutes. Automatic methods may be used.

Honorary Vice President F. E. Handy, W1BDI makes a point with Robert B. Thurston, W7PGY, director from the Northwestern Division.

97.103 Station log requirements

Add: (i) The log of an amateur repeater or relay station will require:
(1) The signature of the licensed operator on duty.
(2) The date and time of each transmission. If the transmitter is turned on and off by the signal being repeated or relayed, the log shall show the time span that this capability was in operation.
(3) The data required by p/p (d), (e), (f) and (g) above.

58) At this point, the President being called from the meeting temporarily, First Vice President Groves assumed the Chair.

59) On motion of Mr. Eaton, unanimously RESOLVED, by standing in a moment of silence, that the members of this Board record their sorrow and regret in the recent death of Alex Reid, VE2BE, and their gratitude for his years of devotion to the League and his fellow amateurs, and that the Secretary be instructed to so advise Mrs. Reid.

60) On motion of Mr. Haller, unanimously VOTED that the Board expresses its deepest appreciation to the vice directors present for their interest in League affairs and their willingness to give of their time and money to better represent their division membership.

61) On motion of Mr. Haller, unanimously VOTED that the Board extends its appreciation to the Field Engineering Bureau and the Amateur and Citizens Radio Division of the Federal Communications Commission, and to the Telecommunications Division of the Department of Transport, for their continuing assistance and cooperation in administering affairs of the amateur body during the past year.

62) The Board was in recess for luncheon from 12:05 P.M. to 12:37 P.M. Mr. Denniston resumed the Chair.

63) On motion of Mr. Best, unanimously VOTED that the Board expresses its sincere thanks and appreciation for the untiring work and devotion to the League and to amateur radio by the vice directors, assistant directors, SCMs, SECs, QSL managers and all the members of the League and it is the sense of the Board that their contribution to amateur radio has done much to enhance amateur radio in the field of public service, convenience and necessity.

64) On motion of Mr. Best, after discussion, unanimously VOTED (Mr. Eaton abstaining) that a study be made as to the advisability of submitting a petition to the Federal Communications Commission to allow Technicians to operate c.w. only in the Novice bands, power limitations and rules as applied to Novices to be the same as now outlined in the rules and regulations of the FCC.

65) On motion of Mr. Groves, the following resolution was unanimously ADOPTED by a rising vote (Applause):

WHEREAS, Francis Edward Handy, W1BDI, has served the American Radio Relay League faithfully and well as Communications Manager for 42 years; and, WHEREAS, he has been throughout that time an example of utmost devotion to duty and thereby has contributed to the growth and stature of the League and amateur radio; and, WHEREAS, he retired from the League's staff on January 31, 1967; NOW THEREFORE BE IT RESOLVED, that the Board of Directors of the American Radio Relay League, Inc. in annual meeting assembled, do hereby express to Francis Edward Handy, W1BDI, their deep appreciation for his long and diligent service to the League and amateur radio.

66) On motion of Mr. Groves, after discussion, unanimously VOTED that all acceptable applications for life membership in the League received by August 1, 1967, be issued as "Charter" Life Membership Certificates, the certificates themselves not to be numbered.

67) At this point, announcement was made of committee appointments by the President as follows:

Planning Committee: Mr. Dannals, Chairman, Mr. Thurston, Mr. Clark.

Finance Committee: Mr. Eaton, Chairman, Mr. Chapman, Mr. Compton.

Membership & Publications Committee: Mr. Best, Chairman, Mr. Spencer, Mr. Engwicht.

Public Relations Committee: Mr. Cartwright, Chairman, Mr. Haller, Mr. Griggs.

Merit & Awards Committee: Mr. Groves, Chairman, Mr. Bolvin, Mr. Foster.

68) On motion of Mr. Compton, unanimously VOTED that the General Manager is hereby authorized to reimburse the division directors for actual expenses incurred by them during the year 1967 in the proper administration of ARRL affairs in their respective divisions, up to amounts as follows:

Canadian Division Director	$1500
Atlantic Division Director	2400
Central Division Director	2400
Dakota Division Director	800
Delta Division Director	2400
Great Lakes Division Director	2400
Hudson Division Director	2000
Midwest Division Director	1500
New England Division Director	2000
Northwestern Division Director	2200
Pacific Division Director	2000
Roanoke Division Director	1500
Rocky Mountain Division Director	1600
Southeastern Division Director	2100
Southwestern Division Director	2700
West Gulf Division Director	2400

69) On motion of Mr. Thurston, unanimously VOTED that the General Manager is hereby authorized to pay expenses for the operation of ARRL committees during the year 1967, but not to exceed amounts as follows:

Finance Committee	$2000
Planning Committee	1500
Membership & Publications Committee	1000
Public Relations Committee	500
Merit & Awards Committee	400

70) On motion of Mr. Crossley, unanimously VOTED that to continue the Board's policy of reimbursing Section Communications Managers and QSL Managers of the League for certain travel in furthering ARRL organizational activities, the General Manager is hereby authorized to pay during the year 1967 a total amount not to exceed $12,500 under terms prescribed by the Communications Manager for SCMs, and the General Manager for QSL Managers, following the general pattern established by the Board.

71) On motion of Mr. Thurston, unanimously VOTED that to continue the Board's policy of reimbursing SECs for certain travel in furthering ARRL organizational activities, the General Manager is hereby authorized to pay during the year 1967 a total amount not to exceed $9,500, under terms prescribed by the Communications Manager following the general pattern established by the Board.

72) On motion of Mr. Smith, unanimously VOTED that, to continue the Board's policy of reimbursing National Traffic System officials above the section level for certain approved travel in furthering ARRL organizational activities, the General Manager is hereby authorized to pay during the year 1967 a total amount not to exceed $6,000, under terms prescribed by the Communications Manager following the general pattern established by the Board.

73) On motion of Mr. Cartwright, unanimously VOTED that the General Manager is hereby authorized to pay, during the period between January 1, 1968 and the 1968 meeting of the Board, expenses against usual authorizations for administrative and committee operations in no greater amount than 1967 authorized amounts.

Here, listening carefully, is Burl—ooops, John R. Griggs, W6KW, director from the Southwestern Division.

74) The Chair announced the opening of nominations for director members of the Executive Committee. Mr. Cartwright nominated Mr. Smith. Mr. Dannals nominated Mr. Eaton. Mr. Best nominated Mr. Compton. Mr. Haller nominated Mr. Crossley. Mr. Thurston nominated Mr. Engwicht. Mr. Engwicht nominated Mr. Chapman. On motion of Mr. Cartwright, unanimously VOTED that the nominations are closed. The Chair appointed Messrs. Bieberman and Zak as Tellers. The Tellers announced the results of the balloting as follows:

Mr. Smith	15
Mr. Eaton	15
Mr. Compton	13
Mr. Crossley	11
Mr. Engwicht	5
Mr. Chapman	5

whereupon Carl L. Smith, Noel B. Eaton, Charles G. Compton and Gilbert L. Crossley were declared elected as members of the Executive Committee for the ensuing term. (Applause)

75) On motion of Mr. Crossley, after discussion, unanimously VOTED that in the interests of space conservation in *QST*, and since the reports of the standing committees are acted upon by the Board and their actions recorded in the minutes, these reports should no longer be required to be printed in their entirety in *QST*; however, the reports should continue to be available to members upon request.

76) At this point the Board discussed FCC Docket 17315, concerning the proposal for facsimile authorization of certain RACES bands, as well as RACES matters in general. On motion of Mr. Bolvin, unanimously VOTED (Mr. Eaton abstaining) that in view of the various types of RACES plans and equipment requirements in different parts of the country, the Executive Committee is requested, in cooperation with Communications Department, to study the docket and file appropriate comment.

77) At this point the Board discussed FCC Docket 17377, concerning station identification requirements in the amateur service. On motion of Mr. Clark, unanimously VOTED (Mr. Eaton abstaining) that the League file comments generally

in support of the proposal, but that the identification requirements for RTTY operations be eased, and that the League request an additional provision in the rules reading as follows: "Where the exchange is of brief duration (less than 2 minutes) such as that normally employed in net activities and competitive events, transmission of the call sign of the amateur station and the call sign of the station with whom contact is made need be transmitted only once."

78) On motion of Mr. Chapman, after discussion, unanimously VOTED that the General Manager work with the newly-organized Amateur Radio Industry Association in fostering technical speaking program material for affiliated clubs.

79) On motion of Mr. Chapman, unanimously VOTED that the Board go on record as commending Director Compton for his voluntary contribution of time and effort to assist headquarters personnel in data-processing systems study. On further motion of Mr. Chapman, after discussion, unanimously VOTED that, with the aforementioned material furnished by Director Compton in substantial completion of the League's evaluation of automatic data processing procedures as applied to headquarters operations, the General Manager is requested to report his recommendations to the Board by September 1, 1967.

80) On motion of Mr. Dannals, unanimously VOTED that the Board commends those participants in the Intruder Watch program and strongly encourages greater participation by all amateurs in this most important work.

81) On motion of Mr. Dannals, after discussion, unanimously VOTED that the League recognize the many years of active amateur radio service by the Old, Old, Old Timers and establish a 50-year award available to all applicants upon proof of licensed status for 50 years, such an award to take a form recommended by the Merit & Awards Committee.

82) On motion of Mr. Dannals, after discussion, unanimously VOTED that in order to recognize the value of continuous membership in the League and acknowledge the dedication of amateurs with many years of continuous League membership, a study be conducted by an appropriate committee to establish ways and means to cite such membership continuity.

83) On motion of Mr. Spencer, after discussion, unanimously VOTED that the General Manager insert a small ad for gift memberships occasionally in *QST*.

84) On motion of Mr. Spencer, after extended discussion during the course of which the Board was in recess from 2:35 P.M. to 2:50 P.M., unanimously VOTED that a short financial resume of the League be published in the July issue of *QST*.

85) Moved, by Mr. Spencer, that the President shall appoint a three-man committee to study and make recommendations as to revising DXCC rules and regulations. But there was no second, so the motion was lost.

86) Moved, by Mr. Engwicht, that a study be made by the Membership & Publications Committee on ways and means to pay the authors of articles that are published in *QST*. But there was no second, so the motion was lost.

87) Moved, by Mr. Groves, to add a new By-Law to read as follows: "The Merit and Awards Committee shall receive and act on nominations for the awards offered by the Board; it shall also act as a reference body to which the Board may from time to time by resolution refer proposed awards and similar matters." After discussion, on a roll-call vote, all directors voted in the affirmative; so the By-Laws were AMENDED.

First Vice President Wayland M. "Soupy" Groves, W5NW gazes down the table at a speaker.

88) On motion of Mr. Thurston, unanimously VOTED that the Board urges early implementation of plans for re-installation of the rhombic antenna at W1AW, to provide better service for members on the west coast.

89) At this point the President expressed thanks to the vice directors in attendance for their interest in League affairs; each spoke briefly in appreciation. (Applause)

90) On behalf of the Board, Mr. Compton thanked the President for his outstanding service to the League during his first year in office, with particular compliments for the manner in which he had conducted the meeting. (Applause)

91) Whereupon, on motion of Mr. Groves, the Board adjourned, *sine die*, at 3:20 P.M.

92) (Time in session 15 hours, 1 minute; total direct authorizations, $66,000.00.)

JOHN HUNTOON
Secretary

Strays

To commemorate the 50th anniversary of the Naval Aviation Engineering Center at Philadelphia, a pioneer research and development arm of the Navy's air activities, members of the South Jersey Radio Assn. will operate K3USN and K2AA/3 intensively on July 29–30. Watch for them on most major bands, s.s.b., and pick up a special commemorative QSL.

I.A.R.U. News

INTERNATIONAL AMATEUR RADIO UNION

REGION II CONFERENCE

The second triennial conference of the *Union Interamericana de Radioficionados* — Region II of IARU — was held in Caracas, Venezuela, May 14–19, with the *Radio Club Venezolano* as host. Ten countries were officially represented — Argentina, Bolivia, Canada, Colombia, Jamaica, Mexico, Panama, Peru, U.S.A. and Venezuela — and five others were represented by proxy: Bermuda, Chile, Ecuador, Guatemala and El Salvador. The five days of meetings and informal discussions, while often vigorous, ended in complete unanimity of agreement on mutual objectives and plans for the amateur radio service in this hemisphere.

The opening ceremony, presided over by Union Chairman, XE1CCP, and Honorary Conference President, YV5BPJ, was distinguished by the presence of the Minister of Communications, who paid tribute to the activities of amateurs worldwide. He was particularly complimentary, from first-hand knowledge, of the accomplishments of Venezuelan amateurs — singling out for special mention their emergency networks, effective cooperation with the government and other agencies (such as the private Aero Club) in search and rescue work, and rapid communications in obtaining urgently-needed drugs in medical emergencies. (Indeed, two of the latter instances occurred during the conference!). The Minister also announced his proposal to the government council for amendment of the Venezuelan law looking toward the setting up of reciprocal operating agreements with other nations.

The first few days were occupied in study and evaluation of various proposals which had been submitted by various member-societies. Yeoman work was provided by a staff of secretaries and translators, under the very capable guidance of Union Secretary OA4AV, to keep moving a veritable mountain of documents in both official languages. For efficiency, the conference divided into committees — A, Administrative matters, YV5BNW chairman; B, Operating matters, LU3DCA chairman; C, Credentials and Finance, VE3CJ chairman. Full reports were made to the plenary sessions later in the week which, to the credit of the working committees, were adopted with only minor changes.

Reports of the status of amateur affairs in each country were too voluminous to digest at the time, and CP1AD of the *Radio Club Boliviano* agreed to undertake the task of compilation and later report to member-societies. Many of the documents were largely informative, and they were ordered published in the Region II bulletin. Indeed, dissemination of information was a major topic discussed at the meetings, and it was agreed that each society should name one individual as liaison with Region II headquarters to avoid past difficulties in lack of proper handling of correspondence.

Developing plans for an expanded network for emergency communications, based largely on a report by net control station XE1AX, were endorsed. Each society was urged to set up an "intruder watch" to guard against invasion of amateur bands. The conference approved the concept of a special advisory committee of one person from each region to work with the President of IARU in instances, such as at international radio conferences, where rapid decisions would be required on the IARU attitude toward possibly dangerous proposals.

Venezuela's Minister of Communications, Sr. J. M. Dominguez Chancin, receives hearty applause from IARU officials as he heads for the rostrum at the Region II conference in Caracas. L. to r., IARU President WØNWX; UIRA (Region II) Secretary OA4AV; Sr. Chancin; UIRA Chairman XE1CCP; Radio Club Venezolano President YV5BPJ; Director of Telecommunications Sr. Mario del Moral.

The conference unanimously felt that more attention should be paid to the development of v.h.f. and u.h.f., and urged member-societies to carry in their publications more articles and information on such equipment and operating procedures. It was agreed to stage an annual Region II operating contest, the first to be under the sponsorship of the *Liga Colombiana de Radioaficionados*, and details to be announced later.

Considerable discussion developed concerning the composition of the Executive Committee which would guide the Union for the next three years until the succeeding conference (scheduled for Jamaica, 1970). Eventually, all current members were re-elected, although only one such decision (treasurer) was unanimous. They are: XE1CCP, chairman; YS1IM, vice-chairman; OA4AV, secretary; VE3CJ, treasurer; LU3DCA, member; and WØNWX, member. It was additionally agreed that no longer could a member of the Executive Committee also represent a specific society.

Delegates worked long and hard, paying little attention to meal and social schedules. When daily adjournment was finally reached, however, the delegates -- along with various observers and quite a number of YVs attending -- took full advantage of outstanding hospitality in luncheons, cocktail parties and buffets offered by the *Radio Club Venezolano*, the Commanding General of the Air Force, the Aero Club of Caracas, the Minister of Communications, and a picnic excursion at the summer home of YV5AES and YV5AFF. The participants left Caracas with a unanimous feeling both of considerable progress in Union affairs, and of the most cordial hospitality accorded in YV land.

AMATEURS SERVE AT PUNTA del ESTE

Uruguayan amateurs demonstrated the value of amateur radio to many heads of state during the April conference of American States at Punta del Este, Uruguay.

Under the leadership of Domingo E. Tassino, CX5BC, a network of communications was organized between Punta del Este and Montevideo and each of the American capitals represented at the conference. The network was gladly accepted by the new Uruguayan Minister of Communications, Dr. Carrere Sapriza. During the first day of the conference the commercial communications channels were so saturated that the amateur network was needed to carry news of the conference between Punta del Este, Montevideo, and the outside world. Six stations fed traffic to CX1XA in Punta del Este, and at Montevideo, six more stations fed CX1XR. In addition to the domestic traffic, numerous messages were transmitted internationally for the delegates of the conference.

The Radio Club Uruguayo and the Uruguayan Federation of Radio Clubs assisted in the week-long operation and received the compliments of many presidents for their work.

Honduras President Perez Arellaous, HR1OL, thanks Uruguay President O. Gestido for the help of Uruguayan radio amateurs during the Punta del Este conference. Also shown are CX5BC, CX1BL and the Montevideo Police Chief.

THREE SEEK IARU MEMBERSHIP

Three societies have recently applied for membership in the IARU. They are the *Association des Radio Amateurs Ivoiriens* (Ivory Coast), the Radio Club of Honduras and the Central Radio Club of Bulgaria. The Bulgarian organization is by far the largest, boasting 3584 members! The Honduras club has 82 members and there are 54 members of the Ivory Coast association.

Each application will be voted upon in the June IARU Calendar.

POLAND ISSUING COURTESY LICENSES

Polski Zwiazek Krotkofalowcow (PZK) says the Polish government is issuing temporary licenses to foreign amateurs having a license in

At Punta del Este, United States President Lyndon B. Johnson met Domingo Tassino, CX5BC, and Raul Barbitta, CX1BL.

his own country. Applications are to be made to the Ministorstwo Lacznosci, Biuro Koordynacji Lacznosci Radiowej, Plac Malachowskiego 2, Warszawa, Poland and should include a photostat of the home license and statements of intended station location, input power and the length of operation. Call signs issued consist of the applicants home call with the appropriate SP district added, e.g. WØXXX/SP5.

JAPANESE 160-METER MEETING WITH W1BB

During a recent world tour, Stew Perry, W1BB, and his wife Alice, W1DQF, met with many 160-meter enthusiasts in Japan. Stew says many JAs are interested in 1.8 Mc. but that many are hampered by high noise levels and limited space to erect antennas. The path between JA and W/VE first, second and third call districts has yet to be covered, but JAs are able to contact the western United States and Canada and the Pacific.

U.S. SIGNS RECIPROCITY WITH TRINIDAD AND NORWAY

The United States has signed reciprocity agreements with the governments of Norway and the island of Trinidad. The agreements are the 24th and 25th, respectively, between the United States and foreign governments.

(**Bold face** indicates changes since the most recent *QST* listing.)

JA3 160-meter operators met with W1BB and XYL W1DQF at Kyoto. Pictured are JA3s JM, GKP, ART, AA, HVC, GMI, AH, ECR, EGD and Kyoto Radio Club sponsor. *(JA3EGG photo)*

United States Reciprocal Operating Agreements currently exist *only* with: Argentina, Australia, Belgium, Bolivia, Canada, Colombia, Costa Rica, Dominican Republic, Ecuador, France, India, Israel, Germany, Kuwait, Luxembourg, Netherlands, Nicaragua, Paraguay, Peru, Portugal, Sierra Leone, **Trinidad** and United Kingdom. Several other foreign countries grant FCC licensees amateur radio operating privileges on a courtesy basis; write headquarters for details concerning a particular place. QST

COMING A.R.R.L. CONVENTIONS

June 30, July 1-2, 1967 — ARRL NATIONAL, Montreal, Quebec
July 1-2, 1967 — West Virginia State, Jackson's Mill
July 7-8, 1967 — Central Division, Milwaukee, Wisconsin
July 14-16, 1967 — Alaska State, Anchorage
September 2-4, 1967 — Maritime Section, Moncton, New Brunswick
September 8-10, 1967 — Southwest/Pacific Divisions, Los Angeles, Calif.
September 9, 1967 — Kentucky State, Louisville, Kentucky
October 27-29, 1967 — Ontario Province, Ottawa, Ontario

ALASKA STATE CONVENTION

Anchorage **July 14-16**

The Anchorage Amateur Radio Club is sponsoring an ARRL Alaska State Convention in conjunction with the Alaska Centennial celebration. The convention is being held at the Edgewater Country Club. Preregistration including two banquets is $15 and must be made by July 5th. All inquiries should be directed to the Anchorage Amateur Radio Club, Dell Wolfington, KL7EKB, Box 211, Anchorage 99501.

Strays

In 1963, IMRA (International Mission Radio Association) was an idea; today it's a reality. Purposes? One of them is to provide ham equipment to Peace Corps Workers, Missionaries, etc., of all faiths in overseas services. IMRA is growing and needs your help. Interested in helping them to help others? Contact Brother Carmen, C.M., WB2TUO, Box 1865, Albany, N. Y. 12201.

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A "Shocking" revelation was made concerning the "WV-77A" manufactured by RCA. That model meter was discovered to produce 1000 volts to ground when used to measure negative direct voltage. The meter is designed with an internal "ground to case" and is equipped with a two-wire plug for 110 volts a.c. The same hazard was found to exist on other types of RCA Senior Voltohmyst meters, models WV-97A and WV-98A. Later models of these instruments, with grounding plug 3-wire cords, do not share the hazard because the internal design has been changed. (*From N.A.S.I. Safety Journal, No. 67-3.*)

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The Post Office Department promises faster mail service with the new Zip codes. Use yours when you write League Headquarters. Use ours, too. It's 06111.

Hamfest Calendar

Alberta — The Calgary gang is working hard to make the Alberta Expo '67 Hamfest the biggest ever. Make it a date to be there on July 8 and 9.

Alberta — Don't forget the Glacier-International Hamfest to be held at Apgar on July 22 and 23.

British Columbia — The 1967 Okanagan International Hamfest will be held on July 29 and 30 at Dolly Varden Auto Court, Okanagan Falls, British Columbia. For information write John Munro, VE7AO, 949 Hull St., Penticton, B. C. Canada.

California — The San Fernando Valley Radio Club, W6SD, is holding its 11th Annual Hamfest on Sunday July 16 at Devonshire Downs at 18000 Devonshire Blvd., Northridge, Cal.

Idaho — The 1967 WIMU Hamfest will be held at Big Springs, Idaho on August 4, 5, and 6.

Illinois — The Quad-Co. ARC, Inc. will sponsor the 10th Annual Hamfest of the "Breakfast Club" on July 15 and 16 at Terry Park, ¾ mile east of Palmyra. All other groups are invited to meet at the hamfest, giving prior notice to the Hamfest Committee. There will be dancing and movies Saturday night. Bring your own basket lunch, sandwiches and soft drinks available on the grounds. Mobile talk-in on 3873 kc. from noon Saturday to 11:00 A.M. Sunday. Games, contests, golfing and fishing. Bring your swap gear. Camping facilities open from Friday afternoon until Monday morning. Pre-registration until July 7 is $1.50; $2.00 at the gate. Write "Hamfest", % Quad-Co. ARC, Inc., Box 323, Chatham, Illinois.

Illinois — The Six Meter Club of Chicago will hold its Tenth Annual Picnic and Mobile Meet on Sunday, August 6 at Picnic Grove on Route 45, one mile north of Route 30, Frankfort, Illinois.

Indiana — The Evansville Hamfest will be held on July 16.

Indiana — The Indiana Radio Club Council, Inc. will hold its annual Hamfest and family picnic on July 9 at Brown County State Park, New Nashville, Indiana.

Indiana — The 19th Annual Hamfest of the Tri-State Amateur Radio Society is to be held July 16 at the Rural Center (air conditioned) on Highway 41 North (5 miles) of Evansville, Indiana. $1.50 advanced registration and $2.00 at the gate. Bingo for the XYLs. Adult dinners $1.25, child's plate 65¢. For registration and information write Jack Young, K9LAU, 1715 Madison Ave., Evansville, Indiana.

Indiana — The Wabash Valley Amateur Radio Assoc. will hold its annual U.H.F. Picnic Sunday July 30 at Turkey Run State Park, about 40 miles north of Terre Haute, on U.S. 41 and Ind. 47. One dollar registration at the gate only. Full day of events planned. Contact E. Clehouse, K9EJU, 925 Barton Ave., Terre Haute, Ind. 47803.

Kentucky — The Annual Hamfest of the Henderson ARC will be held on Sunday July 30, rain or shine, at the Audubon Raceway. For more information contact WA4WTE, Box 83, Henderson, Ky.

Michigan — The WSSB and B/R Nets Picnic will be at Grayling, July 22 and 23.

Michigan — The UP Hamfest is to be held August 5 and 6 at Manistique.

Minnesota — The Worthington ARC will sponsor a picnic at Worthington on June 4. Check the nets for details.

Minnesota — The OGS Picnic will be at Gunn Park in Grand Rapids on July 9.

Minnesota — The Piconet Picnic will be at Edgewater Park in Albert Lea on July 9.

Minnesota — The Mankato ARC will have their picnic on July 30 at the Blue Earth Co. Fairgrounds in Garden City.

Mississippi — The Jackson ARC is sponsoring the 1967 Mississippi Hamfest on July 23 at the State fairgrounds at Jackson, Mississippi. The "Ham-Feast" will be on July 22 at 7:00 P.M. at the Millsaps College Student Center. For information, write P.O. Box 8371, Jackson, Mississippi.

Missouri — The Zero Beaters Radio Club will hold its annual Hamfest at the Washington, Missouri City Park on Sunday, August 6. The site is a large open pavilion, plenty of room for all on trader's row, or for commercial exhibitors. Come early and enjoy our delicious lunch and refreshments, with added attractions for the XYLs and YLs, plus swimming pool for the harmonics. Registration will be $1.00. For information or advance registration write Zero Beaters ARC, P.O. Box 24, Dutzow, Missouri 63342.

Missouri — The 2nd Annual Hamfest of the Suburban Radio Club, Inc. of St. Louis, Mo. is to be held on Sunday, July 30 at the Creve Coeur Lake Park, St. Louis County, Mo. from 10:00 A.M. until ?. Talk-in on 6 and 2 meters. Advance registration is $1.00 from KØAHD.

Nebraska — The Central Nebraska Radio Club will hold its Annual Steak Fry at Victoria Springs State Park (18 miles N.W. of Broken Bow, Nebr.) on Sunday July 30. Registration will be $1.25. Bring your family and a covered dish. Club will provide the steaks and soft drinks. Additional information from Lawrence Lindly, WØIRZ, Anselmo, Nebr. 68813.

New Jersey — The Knight Raiders V.H.F. club will hold its first Picnic Style Hamfest on Saturday July 22 at Weasel Drift Picnic Grove, Garret Mt. Reservation, West Paterson, N. J. Talk-in frequencies on 146.898 and 50.4 Mc. Equipment displays and auction will be held. For more details write K2DEL.

New York — The Southwestern New York V.H.F. Assoc. will hold its annual field day and picnic on July 15 and 16 at Wades Sign Shop on Route 242, Ellicotville, N. Y. Family style picnic, six- and two-meter transmitter hunts, and an auction will be held on Sunday.

New York — The FLIRC Point Lookout Hamfest will be held on Sunday July 16. For more information, write FLIRC, P.O. Box 304, Long Beach, New York 10115.

North Dakota — The International Hamfest will be held at the International Peace Gardens on July 15 and 16 on the Canadian side in the Erick F. Willis Centennial Building.

Ohio — The Steubenville Area Amateur Radio Club will hold its first Hamfest-Picnic on July 30, from 10:00 A.M. until ? at Lake Marvin Park which is located a couple of miles off Route 7, one mile south of East Liverpool, Ohio. Food must be purchased at the park or bring your own. Park entrance fee is 35¢ per person. For more information write Joe Plesich, W8DYF, 812½ N. 4th St., Steubenville, Ohio 43952.

Pennsylvania — The South Hills Brass Pounders and modulators annual Hamfest will be held August 6 at St. Clair Beach (5 miles South of Pittsburgh on Route 19).

Pennsylvania — The Two Rivers ARC, Inc., of McKeesport, Pa. will hold its third Annual Hamfest on Sunday, July 16, at the Balkan Hotel grounds near McKeesport. The affair will start at noon with refreshments, swap and shop, awards, etc. Registration will be $2.00. For more information contact W3MIW, Bernard Zimmerman, 1005 Clydesdale Ave., McKeesport, Pa. 15135, Tel. 412-751-7057.

Tennessee — The Oak Ridge, Tenn. Radio Operator's Club will hold their Annual Crossville Ham Picnic on the third weekend in July. This year, events will begin with a dinner on Saturday night, July 15. The traditional dutch picnic will be Sunday, July 16 at Cumberland Mountain State Park near Crossville, Tenn.

Texas — "Big-D-Hamboree," August 4-5, Market Hall, Dallas, Texas.

Washington — The NARCS Camp-out is at Indian Creek on White Pass July 15 and 16.

Washington — The Third Annual Washington State Hamfest will be held in Yakima, Wash. on July 8 and 9 at the Central Washington Fairground. Camping space is available on the fairgrounds or, nearby motels and hotels will reserve rooms. Activities include mobile hunts, mobile judging, resistor hunt, eyebank net display, QCWA display, manufacturers' displays, informal dinner, and activities for XYLs and youngsters. For more information or reservations contact W7BUN, 1601 S. Madison St., Tacoma, Washington 98405.

Wyoming — The 1967 WIMU Hamfest will be held at Big Springs, Idaho on August 4, 5, and 6. QST

Correspondence From Members-

DX POSSIBILITIES

¶ While over the horizon propagation via ducting, inversions, *E* layer, meteor scatter, aurora, etc., are interesting, they must be classified as freaks of nature which have limited use in communications. Forward tropo-scatter, while statistically more reliable, is marginal for the amateur and limited in range. This leaves satellite communication as the remaining long and short haul predictable communications medium. It is unfortunate that the Oscar program cannot be accelerated because I believe active satellites can provide excellent service for the amateur in the v.h.f.-u.h.f. spectrum.

Passive satellites are operationally more difficult to use but could provide a second order system. The broad band spherical reflectors are fine but for our purposes a relatively narrow band resonant passive reflector (a spherical cluster of corner reflectors for instance) for say 1296 Mc. ± 100 kc. could do.

But finally there is the moon, our natural satellite. Its position in the sky and dependability are completely defined. The major deterrents to using the moon for amateur communications are of course path loss and the poor surface conditions of the moon which produce reflection coefficients of 7% or so and surface roughness multipath effect manifest as deep fades and only narrow band coherent reflection. Nevertheless, this satellite can provide reliable long-haul DX communication at the expense of more elaborate ground stations. Our experience, but more important, the simple state-of-the-art and facts of nature indicate that 432 Mc., 144 Mc. and lower are not practical for the amateur. This leaves 1296 Mc. and perhaps 2300 Mc. as the desirable bands to pursue for moonbounce. — *Dick Turin, W2IMU, Colts Neck, N. J.*

ANOTHER LEAGUE SERVICE

¶ As criticism of the ARRL continues to grow from some sources, I would like to commend you on one aspect of your program rarely mentioned. . . . Compare your publications on a cost vs. content basis with comparable ones obtainable from other sources. What would be the cost of some other handbook containing information equaling that of the *Radio Amateur's Handbook*. I would guess probably at least twice that of the latter. One of my long-time standbys has been the ARRL *Antenna Handbook*. Its price is from ⅔ to ½ that of "competitive" publications.

All the ARRL publications to date have seemed well organized, concise presentations of authoritative and useful information. They are well worth the reasonable price to anyone wishing to extend his knowledge of theory as well as practical applications. As a graduate electrical engineer, I find myself using them for references more frequently than it would be wise to admit. Keep up the good work. — *David E. Newman, K5SGH, Houston, Texas.*

WELCOME BACK

¶ Several years ago I resigned from the ARRL over the incentive license issue. Since then I attended the World's Fair as an operator of K2US, a National Convention of ARRL in New York, and a HARC Convention in Tarrytown. I have been teaching amateur radio to a young group at a local YMHA, using the *License Manual* and other ARRL publications. I am working for my Amateur Extra license, listening to W1AW for code practice and reviewing the ARRL *Handbook* . . .

I realize now that without ARRL, amateur radio has no voice in the U.S. and therefore I reinstated my membership at the HARC Convention. I hope others who have dropped out will rejoin as all of us at one time or another must use some of your aid or facilities. — *Ira Zwillich, W.12FMB, Bronx, N.Y.*

TAKE HEED!

¶ While working many U.S.A. amateurs, I regret to see so much bad feeling toward the ARRL. To my mind, this is a very bad condition for amateurs the world over.

I owe my first allegiance to my own national society. But, I know that I owe amateur radio to the ARRL.

The old saying, "United we stand, divided we fall" rings true for amateurs. The Powers-that-be could take bands away from us, and then who would speak for us. Amateurs, take heed! Keep your League strong. — *Francis S. G. Rose, G2DRT, Buckinghamshire, England.*

DIVERSITY W1AW RECEPTION?

¶ *QST* readers have complained of interference to W1AW broadcasts during code practice sessions. I use two receivers, one set to 3.555 Mc. and the other to 7.08 Mc. In this way, one is unlikely to get interference on both and they reinforce each other. A random wire antenna in the attic works well for the second receiver while the first is on the regular antenna. — *Phyllis Richmond, WB2CEO, Rochester, N.Y.*

THANKS

¶ It has come to my attention that W6RT has been instrumental in handling traffic for personnel aboard the U.S.S. *Repose* (AH-16) for a considerable period of time.

As a radio amateur myself first licensed more than 40 years ago, I know how much time and dedication such activity demands, and want to extend my gratitude for his continuing efforts.

As Technical Director of Clinical Research and Medical Education, and advisor in this capacity to the Surgeon General, I wish to express great appreciation of W6RT's efforts in support of morale of the personnel of the *Repose*. — *George H. Reifenstein, M.D., W3DKN/K6LZI, Technical Director, Clinical Research and Medical Education, United States Navy, Bethesda, Maryland.*

REMINISCENCES

¶ Your little article, by R. B. Bourne, in May *QST* about my old receiver gave me quite a kick. I'll wager that my old friends, Hiram Maxim and Ken Warner, up there in the land of Forever Whence, tapped out a "Hi."

Incidentally, this set was one of the first to be air-borne. In August 1912 I took it up over Cicero Field, Chicago, in a Wright "B." Using a long trailing antenna I attempted to pick up any wireless signals that might be in the air, including those from a Ford spark-coil transmitter at the field. No luck. I heard nothing except the swoosh of air past my Holzer-Cabot headphones and the noise of the engine.

However, when the receiver was located on the ground, in the Lillie-Thompson Hangar, with a long antenna, signals were received from the plane when I lofted it with the spark-coil, a fixed spark-gap, a window glass condenser, direct coupled helix and a key.

As a "ham dropout" I'm studying the ARRL books with the fond hope of getting a replacement of the "ticket" that foolishly I let expire some 35 years ago. — *Harry D. Copland, ex-10S, Fort Lauderdale, Florida.*

ABOLISH C.W.? CONTINUED

¶ I just read (May *QST*) where a neophyte has said c.w. is on the way out. I have been a ham for many years and have modern single sideband, push to talk, equipment. But, I prefer to use code.

Maybe he prefers phone, but some people don't. I can take a selective receiver and listen to those weak c.w. signals from the other side of the world and I am in hog heaven. Tell him to hold off his crusade a few more years, just for me. — *Raymond Cratty, WA5JUA, Little Rock, Arkansas.*

¶ Speaking as a very busy physician who just passed her General exam, I'd like to speak up in defense of the c.w. test.

I found it very difficult to learn the code, especially in finding the time to practice. I usually ended up with a headache from concentrating too long. Having come through the ranks of CB, knowing what a mess it is, I feel that becoming a ham should not be made too easy. The technical portion of the general examination, I feel, is very superficial. I had my Tech. license shortly after my Novice one because of this, and if anything the exam I took for my general was even easier than the Tech. exam.

I now hold ARRL's code proficiency certificate at 15 w.p.m. and hope to get the 25 w.p.m. now that I can get off that crowded, miserable Novice portion of the 80-meter band. I'm tired of these "crybabbies" who just don't want to make the effort required for c.w. — *Christine E. Haycock, M.D., WB2YBA, Newark, N. J.*

¶ The letter to the Editor in May *QST* using the word "lid" is a slap in the face for many hams.

I am 55 years old and recently passed the 13 w.p.m. code test and received my general license. I go on the air almost every night and stumble through many c.w. contacts. I not only work many hams in the same situation, but also many oldtimers who enjoy slowing down and helping us newcomers along. Many hams with years of c.w. behind them have helped me and given me much confidence . . . — *Arthur F. Comtois, WA3GYZ, York, Penna.*

¶ I would very much like to clarify a portion of my statement in May *QST*. Having had time to think about this, I realize that my choice of words was poor. I also realize that I have stepped on the toes of a lot of hams who are much more worthy to be amateur radio operators than I. I wish to apologize for this statement, and also to say that I stand ready, willing and able to assist in any way I can, any ham wishing to improve his code speed, and also to assist any person in his or her efforts to become a Novice licensee . . . — *John F. Reynolds, WA1FYN, Malden, Mass.*

NOVICE ROUNDUP DX

¶ How about making provision for DX QSOs to count in the Novice Roundup? This year I had the pleasure of a couple of QSOs with Novices who were participating, and I'm sure they were uncertain whether or not I counted for points. Imagine their disappointment when they discovered I was not! Perhaps DX QSOs could count one point each and other ideas might include two points over 5,000 miles, three between 5 & 10,000, and four between 10,000 and up. Or, a multiplier could be introduced for each continent worked. It could be said that this would unduly favour Novices using 21 Mc., but then Novices using only the 145–147 Mc. band are at a disadvantage, anyway. Given good advance publicity in overseas magazines I'm sure many DX stations would be pleased to give a little of their time to working Novices. — *F. Allan Herridge, G3IDG, Basingstoke, Hampshire, England.*

NEW LOOK

¶ Thanks a lot for the new format you are now using for the Operating Events calendar in *QST*. It is a lot easier to read! — *Harry Bowers, W2EWZ, Roselle, New Jersey.*

CORRESPONDENCE COLUMN

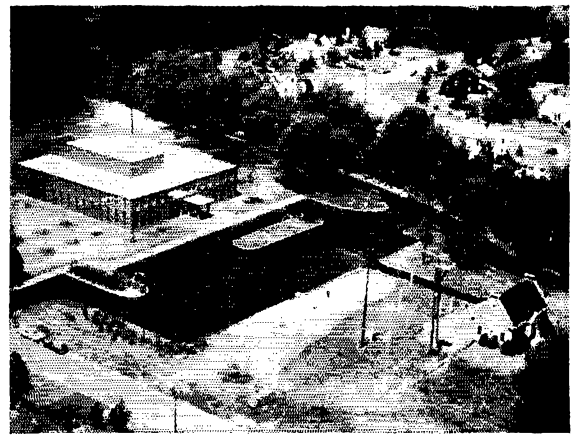
¶ I have been a member of the ARRL, and have read *QST* ever since I joined the ranks of amateur radio some years ago. I would like to thank the publishers of *QST* for printing the correspondence from members, no matter how right or wrong they may appear to be. It still gives the amateur the right to express his opinion through your fine magazine. I might add that at times it offers plenty of food for thought. Tnx again. — *John D. Lovelace, WA4RDB, Boynton Beach, Florida.*

NEW AWARD?

¶ Three cheers for WAZPC (worked all zip codes)! I think K2ZGF has a FB idea. You could have awards for individual cities and then endorsement stickers for additional cities. If some lucky soul works a complete state, an extra large sticker could be supplied for framing. I'm sure this would increase the use of zip code. My zip is 22204. I'll be waiting! — *Frank Cahill, WB4DBI, Arlington, Virginia.* QST

The ARRL Building Fund

Drive Closes December 31



FROM the early 1930s until the middle 1950s the League headquarters was adequately housed at 38 LaSalle Road, West Hartford. As amateur radio and the League grew rapidly after World War II, the staff and its various services gradually outgrew the West Hartford facilities. In 1957 the Board appointed a Housing Committee to study the problem, and in 1962 construction was started on the present building at 225 Main Street, Newington, which had also long been the site of the W1AW headquarters station.

In the March, 1962, issue of *QST*, the editor discussed League finances and various means of paying for the new building. Members were asked whether a Building Fund drive should be undertaken, in preference to using up reserves built up as a "war chest" for legislative or regulatory battles. The response was instant and encouraging, and the League's Executive Committee announced a Building Fund Drive in May *QST*, with the goal set at $250,000.

Now, five years later, the League's Board has decided to terminate the Building Fund Drive as of the end of 1967. We report to you now the success of the drive to date, and we urge those of you who still would like to qualify for one of the handsome Building Fund certificates to make your contribution before the end of the year.

The Honor Roll of ARRL Divisions Achieving Their Building Fund Quota

Canada	New England
Central	Northwestern
Dakota	Pacific
Delta	Roanoke
Hudson	Rocky Mountain
Midwest	West Gulf

How did the Building Fund Drive fare? Quite well. We did not achieve 100% of quota, but as of this writing a total of $235,000 has been contributed, by some 14,500 individuals. The largest contribution by an individual was $15,000, and the smallest was 42¢.

Early in the campaign, a quota was established for each division, based on its amateur population and economic factors. Twelve of the sixteen ARRL divisions have achieved or exceeded their assigned quota. The highest achievement was by the Dakota Division, which reached 123.5% of its quota, while the Hudson Division contributed the greatest number of dollars — $30,747.

Highlights of the campaign, in addition to what we have already mentioned, were the creation of two matching funds and a special club drive. Early in the Building Fund Drive, a group of men particularly successful in their business life, and who felt they owed a great deal to their enthusiasm for amateur radio, banded together to create a "matching fund," promising to match dollar-for-dollar every amount contributed by the members at large. Later on, a group in Houston, Texas, did the same thing for members of the West Gulf Division. Likewise, up in the Central Division, the Milwaukee Radio Amateurs' Club promised to match dollar-for-dollar the contribution of any other affiliated club in the Central division.

The staff moved into your new League Headquarters building on the first of July, 1963. It is a handsome building, an opinion shared by every one of the hundreds who have visited us since then. Amateur radio, and especially all of those who have taken advantage of the many services rendered by the League, is much indebted to those whose contributions have made this headquarters building possible.

December 31, 1967, is the closing date. For those of you who have not yet contributed, six months remain. Any amount from 42¢ to $15,000 will be gratefully accepted! QST

The World Above 50 Mc.

CONDUCTED BY BILL SMITH,* WIDVE/KØCER

VK3ATN and W6DNG Win ARRL Merit Award

RAY Naughton, VK3ATN, and Bill Conkel, W6DNG, have been named recipients of the 1966 ARRL Technical Merit Award for "outstanding effort and accomplishment in the moonbounce field of v.h.f. signal propagation."

Both of these gentlemen are deserving of the award. Ray has worked essentially alone except for high-frequency schedules with several stateside moonbouncers. Ray has set himself a goal of working the United States on *all* bands; so far he has done it from 1.8 to 144-Mc. with the exception of 50-Mc. That, too, will undoubtedly be accomplished before long. Ray is now making plans for 432 and 1296 moonbounce.

Bill Conkel, W6DNG, winner of the 1966 ARRL Technical Merit Award. Also named award recipient by the ARRL Board of Directors was Ray Naughton, VK3ATN. A photograph of Ray appeared on page 77, May 1967 QST.

Bill has worked hard developing specialized receiving systems for weak-signal detection. He has also constructed more than 60 arrays for 144 Mc. moonbounce. And back in 1964, Bill became the first American to work Europe on 144 Mc., a feat which he has repeated well over one dozen times since.

Writing lines about Ray and Bill is difficult. They are not braggarts — they are *doers*. And while on the subject, I think we should also recognize such amateurs as OH1NL, F8DO and K6MYC who were on the other end of those QSOs. Without them, the *contacts* would not have been possible.

Well done and congratulations, fellows!

Oscar Bulletin Net

The Oscar Net has been reactivated. W6ASH is transmitting Oscar information on 14.030, Fridays at 0200 GMT and on 7.015, Fridays at 0500 GMT. The operator stands by following transmission of the bulletin to answer questions.

Central States V.h.f. Conference

The Central States V.h.f. Net (3.815 Mc., 0230 GMT, Mondays) has organized a v.h.f. conference to be held near Wagoner, Oklahoma August 19 and 20. The exact location is at the Western Hills Lodge located in the Sequoyah State Park in northeastern Oklahoma.

A full two-day program, including technical sessions and an antenna measuring contest, is being planned as well as activities for the family. Further information may be obtained from Sam Whitley, W5WAX, 409 North "O" Street, Muskogee, Oklahoma 74401.

The conference is the work of W5UGO, WØEYE, WØYMG, W5ORH and W5WAX. *This sounds like a good one for the whole family to attend. See you there.*

432-Mc. Antenna Measuring Contest

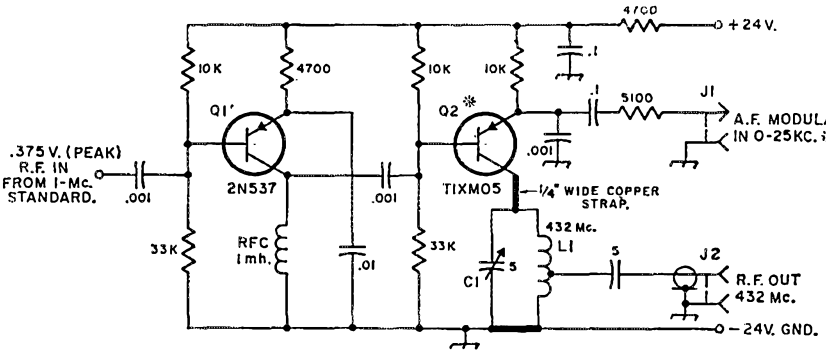
The Central New Jersey V.h.f. Society will sponsor a 432-Mc. antenna measuring contest August 13 in Johnson Park at Brunswick, New Jersey. Registration for the contest and hamfest begins at 10 A.M., the contest at 2 P.M. Any antenna may be entered as long as one man can hold and aim it. Termination should be a 50-ohm Type N connector, but adapters will be provided. Further information is available from Paul Wade, WA2ZZF, 176 Meadowbrook Drive, North Plainfield, New Jersey 07062.

Harmonic Generator and Modulator for 432-Mc.

There was a day when it was not too important to know exactly what frequency one was using. But today operation even on 432 Mc. demands as precise a frequency readout as possible. The circuit described here was originally described by William Smith, W3GKP, and modified for 432 Mc. by Paul Wilson, W4HHK.

The generator is built in a $2\frac{1}{4} \times 2\frac{1}{4} \times 5$-inch Minibox with an octal plug mounted on one end, and BNC connectors J_1 and J_2 on the other. Almost all of the remaining parts are mounted on a $2\frac{1}{8} \times 4\frac{7}{8}$-inch phenolic board. The board is mounted on edge with two small right-angle brackets (see photograph). C_1 and L_1 resonate at 432 Mc. The exact size of L_1 depends on the length of the $\frac{1}{4}$-inch strap connecting the piston trimmer, C_1, to the collector of Q_2. Adjustment of C_1 is not critical as the peak is broad. A small triangle of copper-clad phenolic

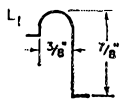
*Send reports and correspondence to Bill Smith, W1DVE, ARRL, 225 Main St., Newington, Conn. 06111.



* Q2 WAS 2N537 IN W3GKP ORIGINAL CIRCUIT, FOR OUTPUT UP TO 144 Mc.

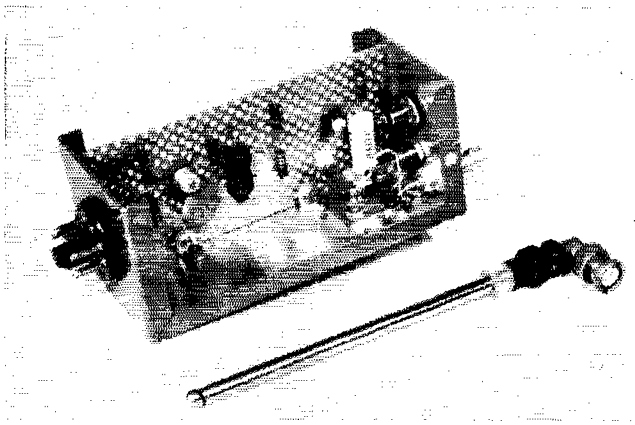
** 0.25 V. (PEAK) OPTIMUM.

C1 = PISTON-TYPE VARIABLE CAPACITOR 0.5-5pf.



HAIRPIN LOOP OF NO. 18 WIRE OUTPUT TAPPED 1/4" FROM GROUND END.

EXCEPT AS INDICATED, DECIMAL VALUES OF CAPACITANCE ARE IN MICROFARADS (μf.); OTHERS ARE IN PICOFARADS (pf. OR μμf.); RESISTANCES ARE IN OHMS; K = 1000.



The harmonic generator and modulator. The transistors are, left to right, Q_1 and Q_2. The 432 Mc. output circuit, C_1 and L_1, is located at the right end near the BNC connector. Jacks for a ground and for an a.f. input are also mounted near J_1. The octal plug on the left is used to connect the unit to a 1-Mc. r.f. and 24-volt d.c. source. The antenna in the foreground is a quarter-wave at 432 Mc., or about 6-inches. The other half of the Minibox is not shown. (photo by W4HHK)

board serves as an r.f. ground for C_1 and L_1. The board is fastened to the Minibox with two 4-40 screws. C_1 mounts on the board. A good quality transistor socket should be used for the transistors. The 5100-ohm resistor at J_1 is used for r.f. isolation. The 0.1-μf capacitors are the small mylar type and the 5-pf. output capacitor is silvered mica. All other capacitors are disk ceramic. The resistors are all ½-watt composition. The leads of the 1000-pf. emitter bypass on Q_2 should be kept short — a good practice in any construction.

Drive from a 1-Mc. standard is applied through the octal socket as is the 24 volts d.c. for the generator. A quarter-wave rod antenna is connected to J_2, and with a similar antenna on the converter input, a signal of fair strength.

Paul says there is no doubt where 432.000 is when using this generator with a calibrated 1-Mc. standard.

OVS and Operating News

50 Mc. DXers found the band open for interesting contacts during late spring and early summer. From Japan, KA2JP reports having heard a stateside c.w. signal buried in the JA QRM on May 7. John said he copied only the stations Zip Code which identified the station as being in Sunnyvale, California. John and KA7AB are active around 50.5 with s.s.b. and c.w. and are looking for W/K contacts this fall. Geoff Wilson, VK3AMK, writes from Australia that conditions from there to Japan have been excellent. He says 52.525 is used in VK as the f.m. net frequency and that 53.032 is used for a.m. nets. Geoff points out that VKs can operate only between 52 and 54 Mc. but that they do listen between 50 and 52 Mc. The power limit in VK is 150 watts. Geoff recommends using Australian TV as a tip-off to possible 50 Mc. openings. He says stations in Melbourne, Brisbane and Wagga Wagga are using 46.25 (100 kw. visual) and 51.75 (20 kw. audio). Allan, ZB2AP, in Gibraltar, says he should be active this fall using the call ZB2VHF. VE3-FXS in far northern Ontario is now active and wants stateside stations to look for him around 50.1 a.m. and c.w. He reports several *Es* openings in May to Minnesota, Tennessee and Louisiana. 3C2TQ is now active on the shore of Hudson Bay in northern Quebec. Larry, too, wants us to look for his s.s.b. and c.w. on 50.15 and 50.17. He says the closest 50 Mc. station to him is 750 miles to the south! Larry is going to have some company this summer. KØGJX and W6CUC will again be working near Fort Churchill and will have s.s.b. gear along. WA6HXW at Inglewood, California reports hearing or working LU3DCA, LU3EX, CE3QG and CE3BM during April and May on several occasions. In Torrance, WA6WKF, reports South American DX as does W6PUZ at Pasadena. Both Californians reported the same stations as WA6HXW. W6PUZ also worked several U. S. stations on back-scatter. W5WAX in Oklahoma also worked several South Americans and K7ICW reports the first *TE* opening he ever heard in Las Vegas. Al says the band opened to Argentina and Chile on April 25. Al also heard numerous stations via back-scatter.

The summer *Es* season apparently began May 7 for many areas of the States. Openings to and from all call districts were reported by WA2PMW, W3BWU and KØGJX.

144 Mc. operators are on the lookout for *Es* this summer. W5ORH says many of the fellows are using 144.10 as the calling and monitoring frequency. Headquarters is especially interested in receiving reports of suspected *E* openings on two this summer.

The Lyrids meteor show in April produced a number of contacts including those between K2DNR in New York and Florida's K4IXC; K1ABR in Rhode Island and W9YYF at Joliet, Illinois. K1ABR also worked K4QIF, North Carolina, and W8TIU in Michigan. During the May Aquarids, K2HLA on Long Island and Connecticut's K1HTV clicked with W5GVE/4 in Alabama.

An excellent aurora followed a *SID* of May 23 when W4HHK measured Sun noise on 432 Mc. at db, — three times his previously high reading. The May 25 opening apparently began about 1930Z and the last station copied at W1DVE was W1AZK at 0530Z. At least six call districts plus VE2-3 were workable from New England. K1HTV reported his best DX as K4QIF and W4HJZ, both in North Carolina, and W9YYF in Illinois. W2AZL had similar success from New Jersey. The same opening was accompanied by *Es* on 50 Mc. between the first call district and the fifth and tenth. The aurora coincided with several days of observed high sunspot activity. Deadline time prevented receipt of additional reports in time for this issue.

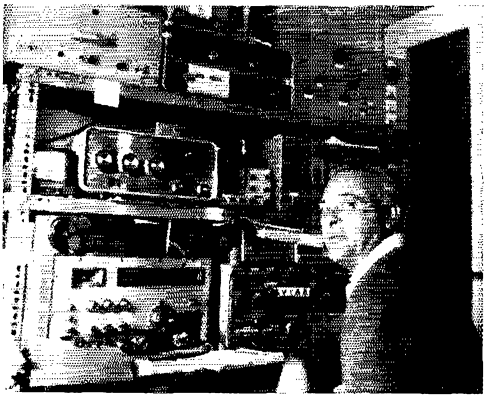
Tropospheric propagation has been poor to good, depending upon your particular area of the country. Several good openings have occurred through the mid-Atlantic, Southeastern and Southern states while conditions were generally just fair in New England and the upper-Midwest. There have been no reports from the Far West.

W8PT has a warning to planners of the LaPort rhombic. Jack says the vertical angle of radiation is very low and not changeable. It is impossible to work stations with other rhombics, such as VK3ATN, because his "window" cannot be matched. Jack goes on to say the rhombic is recommended for working stations between coasts and foreign stations who can tilt their arrays. KØMQS at Cedar Falls, Iowa has a LaPort ready which he is going to try on aurora this fall.

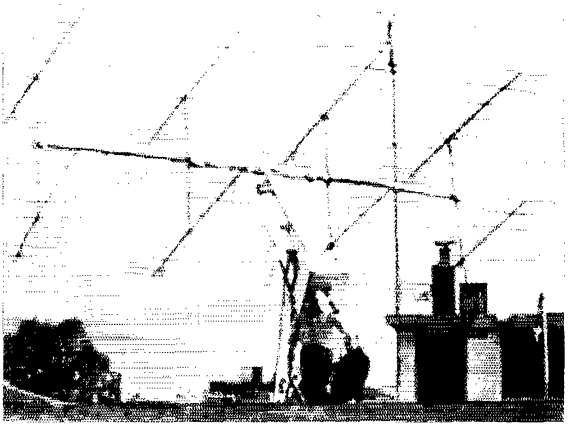
The 1N3730 switching diode used in the ARRL Handbook (1967, page 431) is apparently no longer available. W1CER says any high-speed, silicon switching diode having low capacity should work equally well.

432 Mc. interest is increasing in practically every area of the country. Paul Wilson, W4HHK, reports hearing the e.m.e. signals of W2FZY/2 on April 22 and also what was apparently a radar signal being bounced off the moon. The W2FZY/2 group also reported hearing the radar signal. Smitty, W3GKP, at Spencerville, Maryland and W4HHK have begun a series of e.m.e. tests. W3GKP has a 28-foot dish; W4HHK an 18-footer. Lee Gray, K9AAJ, also participated in the April 432 e.m.e. test at W2FZY/2. Lee heard the New Jersey group but was not able to make a contact. Lee did raise his states total on 432 though by working W4HHK under "average" tropo conditions. K9AAJ now has 11 states on 432 from his Quincy, Illinois location. At Warren, in the far northwest corner of Minnesota, Wally Lamb, WØPHD, says he worked WØBJV at Watertown, South Dakota for Wally's second 432-Mc. state. The distance was about 225 miles. Wally has also worked North Dakota, but has yet to work his own state. Al Tyler, WØDRL, at Topeka says he is the only station in Kansas on 432 with the exception of one ATV station. Al is running low power to stacked 11-element Yagis and a Nuvistor converter. He is open for schedules. W1GAN is also looking for schedules from his Salem, Mass. location. John runs 250 watts to a 32-element extended collinear. WA2YXS would like to contact anyone active on ATV in the New York City area. From Baton Rouge, Louisiana, John White, W5UKQ, reports several good tropo openings in May. John worked K4NTD in Oakland, Florida and WA4BYR at Englewood, Florida. Another interesting and detailed report comes from Eric Hjerpe, W5FCD, in Port Arthur, Texas. Eric has a 4CX250B running 300 watts and stacked 11-element Yagis at 30 feet. For receiving he has a pair of TIXMO5's ahead of a Nuvistor converter. Eric says that both he and Chic, W5LDV, in Houston, recently worked WA4BYR. Eric and Chic both are using c.w. and s.s.b. W5AJG is reported active on the band from Dallas. W5WAX in Oklahoma is on 432. Sam's first QSO was with W5ORH over a 138 mile path. Sam is running 7 watts to 44-element array and a transistor converter.

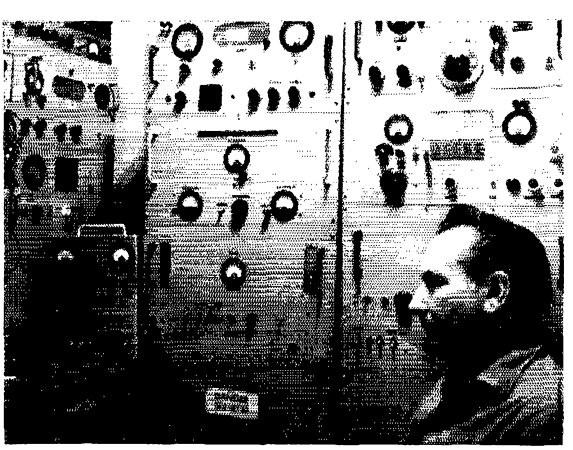
W3RUE at Belle Vernon, Pennsylvania believes in homebrewing his equipment. He has an 829B on 6, an 829B on 2, a 5894 on 220, and a 4CX250B on 432. The antennas and converters are all also homebuilt. Without using meteor scatter, Ted has worked 36 states on 144 Mc.



George Vernardakis, SV1AB, in his Athens, Greece shack. OM George has a pair of 4-125As on 144 Mc. running a kw. For receiving he uses a Hallicrafters HA-2 with a 417A preamp into a Collins R390A.



This is the 72-element array at SV1AB in Athens, Greece. OM George uses the polar-mounted array for moonbounce and meteor scatter. Shown l. to r. are SV1AB and SV1CB, who helped George with the polar.



YL news and views

CONDUCTED BY LOUISE RAMSEY MOREAU,* WB6BBO

1967 YL/OM Contest Results

The word "contest" has a different connotation to everyone who enjoys that form of operating. To some it is the thrill of bucking the crowd, while many work to match and top a former score. For still others it is a chance to acquire needed contacts for certain certificates. For everyone there is that special exhilaration of matching ability and skill, and the never-ending excitement of logging some hard to get prefix.

One of the more specialized contests is YL/OM, that has been sponsored by YLRL since 1950. Each year since then this annual "guys and dolls" activity has been high on the popularity list. This is one time when it is possible to find those elusive YLs who are usually well hidden in the obscurity of call letters and acquire the needed QSLs for the many available awards whose rigid requirements are that the contacts must be feminine.

Brenda Garlough, WA4HOM, walked off with the top honors in both the YL c.w., and phone portions, coming up from her third place c.w. and second place phone in the 1966 contest. In

Legion of Honor certificates. WA3ATQ, K3FYS, K3ZDN, W3EQZ, W3AAU.

the phone portion, WA5NVY, Patricia Dyer, retained her 1966 second place, and WAØEXX, Betty Lindsay, was third. YL c.w. second place honors went to Sonia Rotenberg, PY2SO, of Brazil, and third place was taken by Ivy Smythe, VE3EZI, Ontario, Canada.

The OM honors in phone brought A. R. Truhlar, W9LNQ from his 1966 third place to top spot this year. W9LKI, R. W. Sanders, was second, and W1BAB, W. E. Holgren, was third. In the OM c.w. portion, Robert Kopstein, WA9LHH, was first, W9LNQ was second, and W1PYM, Paul Day was in third place.

Marte Wessel, KØEPE, vice president YLRL, and whose duty it was to check the logs, advises that there were about twenty logs submitted after the deadline, some with high scores, but because of the rules, and in fairness to all the other

Members and officers of LARK at their 15th Anniversary dinner. Back row: W9SJR, Bernice. WA9PAF, Lolita, WA9CCP, Yolanda, K9IWR, Marilyn. Front row: K9SRD, Phyllis, Treasurer, W9GJB, Gladys, President, K9TRP, Diane, Vice President, WA9ABG, Mildred, Secretary.

WN8VTS, Ann, passed her Novice test just a week before the OM, Lou, received his General License. A member of Buckeye Belles, and ARRL, Ann may be found on both 40 and 15 meters.

*YL Editor, *QST*. Please send all news notes to WB6BBO's home address; 1036 East Boston St., Altadena, Calif. 91001.

contestants, could not be counted. Marte also notes "If your score is changed, it is because of duplication either in contacts or in multiplier."

Congratulations to the winners. To all those who are eager to try it again, the 1968 YL/OM contest dates will be: Phone, February 24, 25, 1968, and c.w. March 9, 10, 1968. Rules will be published later.

Feb. 25-26, 1967

YL Phone

WA4HOM, Brenda Garlough....81,696
WA5NVY, Patricia Dyer....75,240
WAØEXX, Betty Lindsay....65,450

OM PHONE

W9LNQ, A. R. Truhlar....3,690*
W9LKI, R. W. Sanders....2,430*
W1BAB, W. E. Holgren....2,351*

Mar. 11, 12, 1967

YL C.W.

WA4HOM, Brenda Garlough....38,625*
PY2SO, Sonia Rotenberg....36,100
VE3EZI, Ivy Smythe....27,375*

OM C.W.

WA9LHH, Robert Kopstein....2,867*
W9LNQ, A. R. Truhlar....2,544*
W1PYM, Paul Day....2,356

YL PHONE

W1RLQ....41,856
W1YPH....11,856
K1WLX....7,431*
WA1DZX....6,517
K1GSF....1,450*
W2OWL....11,752
K2KQC....6,412*
W2EEO/2....4,212
K3WAJ....15,183
W3UTR....1,144
WA4HOM....81,696
WA4VKG....35,275*
WA4UWK....8,008
WA7DEP/4....5,577*
WA5NVY....75,240
K5TEY....5,176*
WB6CGA....40,170
K2ETC/6....6,042
K7MRX....2,362*
W7GGV....2,112
K8ONV....45,962
WA8ENW....12,349
WA8UYJ....12,200
WA8FSX/8....10,125*
W8WUT....8,400*
WA8OFW....7,748
WA8KMT....6,072
WA8DWL....210*
W8LGY....110*
K9LUI....46,500
WA9IYG....34,821
K9QGR....11,205*
WA9FRS....8,580*
WAØEXX....65,450
WØJUV....20,032
KØEPE....8,700
VE3EZI....38,497*
VE2KO....20,790*
3C4ST....14,025*
VE1AQI....13,746
VE3BBO....5,085*
PY2SO....9,660
DL3LS....9,435
DJ2YL....9,020*
VK3KS....3,187*
ZS5OB....2,296

YL C.W.

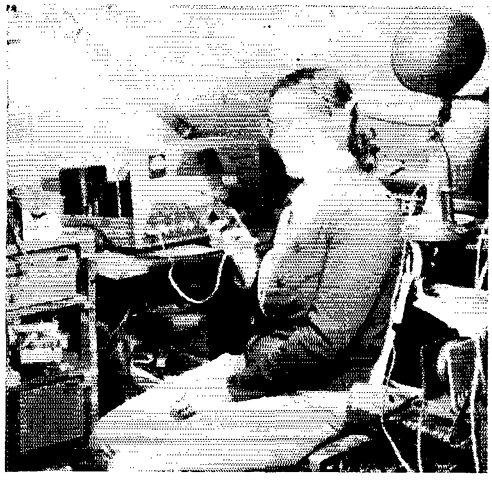
K1QFD....20,282
K1NEI....10,736
W1YPH....9,790
K1WXF....2,448
WB2JCE....18,290*
WA2WHE....17,995*
WB2PYI....9,804
WB2OQU....9,212*
W2EBW....9,212
K2CEP....5,292
K2KQC....2,025*
W3SLS....10,120*
K3SJS....3,547*
WA3AZU....2,320*
W3UTR....1,664
WA4HOM....38,625*
W4NGE....10,862*
K4LMB....10,660
W4WE....7,901*
K4RHU/4....6,825*
WA4VKG....4,162*
WB6CGA....12,555*
WA6VTM....1,375
K8ONV....18,954
WA8KMT....11,970
WA8ENW....9,856
WA8FSX/8....9,296
WA8OFW....6,384
W8WUT....1,560*
WN8USU....110*
W9MLE....11,685*
WA9MHU....2,400*
KØZSQ....8,062*
VE3EZI....27,375*
VE3BII....15,956*
VE6ABV....13,775*
VE1AQI....10,672
VE3BBO....2,635*
VE5DZ....735*
PY2SO....36,100
VK3KS....8,731*
SP6AZY/YL....4,972*
SP5YL....2,016
SP6BDF....552*
ON4QP....1,680*
YU1JDE....1,080*
G2YL....244*
OK2BBI....101*
JA4EHI/YL....45*
OH2YL....31*

OM PHONE

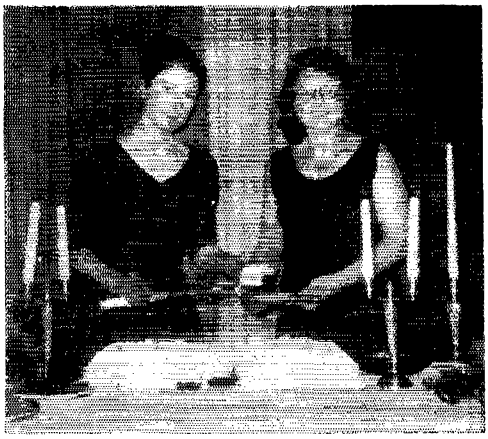
W1BAB....2,351*
K1NWE....1,755*
WA1CJR....1,428
W1HOZ....1,150*
W1PYM....840
K1VII....60*
K2RAR....1,125
W2COB....984
W2QKJ....900
W2CPF....836
WB2EXZ....703
W2LQP....680*
K2SBW....289*
W2IP....220*
W3BVL....2,137*
K3ORP....784*
W3BQN....54
WA3EXX....20
WA4WAO....1,488
K4BAI....1,450
K4GHR....1,100
W4CHK/m....1,312*
W4JUJ....997*
WA4UFW....540*
K5VTA....1,075
K2DEM/5....522*
W5FFA....90
W6CLM....180
W7YEX....306
K8YBU....768
W8BTW....440*
W8JM....285*
W8SS....9
W9LNQ....3,690*
W9LKI....2,430*
W9VF4....1,536
W9KXK....1,008
W9NLF....814*
K9UCR....300
K9GDF....20*
KØETA....2,120*
WAØJEG....1,728
WAØGZA....861
WAØJKT....748
KØRFX....513
KØTVF....460*
WAØKYT....162*
VE2BYJ....807*
3C7AKB....687*
VE3OL....650*
3C1ANT....325*
VE2BWU....300*
K8CUV/VO....110
VE1AFP....60*
VE3DEU....36
VP5R8....594*
PY2DBU....56
CR6DX....56

OM C.W.

W1PYM....2,356
W1HOZ....1,380
K1PRB....770*
W1JDS....609
W1ZLX....605*
W1HYF....11*
W2AAU....2,223
K2DDK....1,800
W2CPF....1,650
WB2FRE....1,486*
WB2MRA....1,419
WB2UQJ....1,232
W2IP....255*
WB2UVB....219*
W3HQU....2,146
W3BQN....1,734
W3DYA....1,400*
W3JET....1,094*
W3MSR....825
WA3EXX....414
W3RYV....356
W4LK....1,720*
W4ZOK....1,148
W4JUJ....936
W4SOT....828
W5BUK....1,053
K5IQA....425*
W6DDB....1,537*
WA6KHK....1,085*
W6OEO....770
W6CLM....690
W6OJW....108
WB6IEX....56
W7RGL....713
K7WL....475
WA7ENC....262*
WA8KME....485*
W8JM....480*



K1BJZ, Carolyn, active in WRONE, Army MARS, likes to build her own equipment. She is active in Girl Scouts, and local church work.



Gladys, W9JGB, and Diane, K9TRP, President, and Vice President of LARK, cutting the LARK 15th Anniversary cake.

W8BUM	472*	HA5KDQ	121
WA8MCQ	425*	UP2AN	64
WA8MAM	300*	OZ1QW	61*
WA8RDW	243*	OZ4II	61*
W8VDF/8	125*	DL4LA	61*
W8SS	99	JA2FCR	52*
WA9LHH	2,867*	JA1ACA	5
W9LNQ	2,541*	JA4BSO	42
K9GDF	1,800*	LA6U	50
K9LVK	1,137*	UP5TQ	16
K9RFU	852*	UH8DR	11*
W9KXK	800	G3WP	5*
WA9QFL	394*	SM5BDY	2
K9IRC	252	SP9BN4	22
K9OAL	570*	UT5HP	1
KØVPM	20		
VE1AE	1,744*	*OM and YL Confirmation Logs*	
K8CUV/VO	1,232		
VE6UP	999	K1WXF	
IT1AGA	570*	W1HTE	
I1ER	64	W2CQP	
SP8MJ	285	W2NIH	
SP9AWV	90*	W3CDQ	
SP6AWY	11*	WA7DEQ/4	
SP5BMU	5*	W4CHK	
SP3KAU	1	W5AWT	
YU1MV	211*	W6OJW	
YU1SF	7*	W6AWY	
OH3MF	192*	W8VDF	
OH6NH	2	W9UCR	
OK2QX	150*	WAØELO	
GD3A1M	124*	OY3H	
PAØVB	124*	SP7GH	

Five YLs Honored

Five YLs of the Philadelphia area were presented Legion of Honor Membership Certificates, for public service rendered via Amateur Radio. This recognition was made in the Chapel of the Four Chaplains, an interfaith shrine established as a memorial to the four chaplains who went down on the S.S. Dorchester during World War II.

The recipients of the certificate are:

WA3ATQ, Harriet Creighton, for her work on the Eye Bank Net, handling traffic, and organization of the Hospitality House in Philadelphia, for visiting and DX amateurs.

K3FYS, Millie Silverstein, honoring her work in getting crippled children, retarded young adults, and emotionally disturbed children started in amateur radio.

K3ZDN, Jane Jones, conducting classes in amateur radio for teen age groups.

W3EQZ, Carolyn Currens, for her job in coordinating and planning the communications work of the "Powder Puff Derby."

W3AAU, Edith Rosner, work with the Boy Scout Jamboree, and any event that calls for mass traffic handling by amateur radio.

The citations read: "In recognition of outstanding service to all peoples regardless of race or faith."

Coming Events

Summer is a good time to plan ahead for special on-the-air events, and make sure that, short of the intervention of "Murphy," all is ready. YLRL announces their own particular "YLs Only" contests. Details will be published later.

YLRL "Howdy Days" — September 27, 28, 29, 1967

YLRL Anniversary Party — c.w. October 18, 19, 1967
phone November 1, 2, 1967.

Right now, is not too early to start saving and planning for the Fifth Annual YLRL International Convention, in Denver, Colorado, June 13 through 16, 1968. It will be here before we realize it.

Stray

When Linda, WA9HJS, and Gary Adams, K9EUD were married on March 11, 1967, they had a small "hamfest" wedding. The father of the bride is WA9HIO, best man K9KZP, brother of the bride WA9HGH, and sister WA9RTI. QST

WØHJL, Kayla Bloom was presented the YLRL Past President plaque by Betty Lindsay, WAØEXX, President of the Colorado YLs at the Colorado YL club meeting.

Strays

Feedback

In W8BPE's article on modifying the S-Line for independent frequency control (April 1967 *QST*) the connections to the stationary contacts of K_{501A} should be interchanged. The lead from J_7 should go to the normally-closed contact (relay not energized) and the lead from L_{27} should go to the normally-open contact.

—•••—

In the "Solid-State Receiver Design" article in May *QST*, the transistor type specified for Q_{18}, Fig. 9, page 24, is an n-p-n while the drawing shows (correctly) a p-n-p. WB6AIG advises that Q_{18} should be a 2N3638 or equivalent. Q_{19} should be a 2N3568, 2N3567, or equivalent, and Q_{17} remains as shown.

—•••—

Our apologies to VO1AI and VE6API; their names and calls should be transposed under the photographs in the "YL Column" for June *QST*.

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

Who:

She wasn't a ham but, brother, could she work DX! All the world had a crush on pert Amelia Earhart thirty years ago this month. It was the close of an era when giants still roamed the earth, when rugged individuals pitted meager but heroic resources against untamed skies.

Vivacious tomboy "AE" had done just about everything a gal could do with an airplane. By late June of '37 she verged on triumphant return from a tremendous flight around the world with adventurer Fred Noonan, ace navigator. The toughest and longest leg, New Guinea to tiny Howland island, was still ahead. But she had, as usual, made everything look easy — 22,000 miles of flying in forty hectic days.[1]

Not only the public press was charting a weary but game Amelia. Radio literature of the time identified her Lockheed Electra's a.m./c.w. station as KHAQQ. W6NNR (now W6DI) and friends lined up a corps of leading DX men to help close communications gaps along her perilous route.[2] On the alert were W2s APV FPT, Hawaiian K6s AYD BAZ CRW NTV, Howland's K6GNW, CL3AC, FY8C, HP1A, HS1s PJ RJ, PKs 1BB 1MO 1PK 1RT 1VM 3BZ, PY7s AA AB, PZ1s AB AL, ST2WF, TG2JZ, VKs 2ADV 4DJ 8AA, VPs 3BG 4TC 4TH, VSs 1AB 1AF 1AJ 3AA, VUs 1AN 2AS 2BJ 2BX 2CS 2EM 2HQ 2HV 2JN 2LM 2LZ, XE1s AH AW BZ G GC JF, YN1AA, YVs 2AM 5AK and other 20- and 75-meter big guns. Alas, to little ultimate avail.

AE and colleague Noonan took off from Lae the morning of July 2, 1937, for what should have been a twenty-hour run to Howland, a flight over the date line into yesterday. It was a flight into no tomorrow. Pacific weather swallowed them up and onboard radio troubles killed all chances for survival. Nations were shocked and saddened.

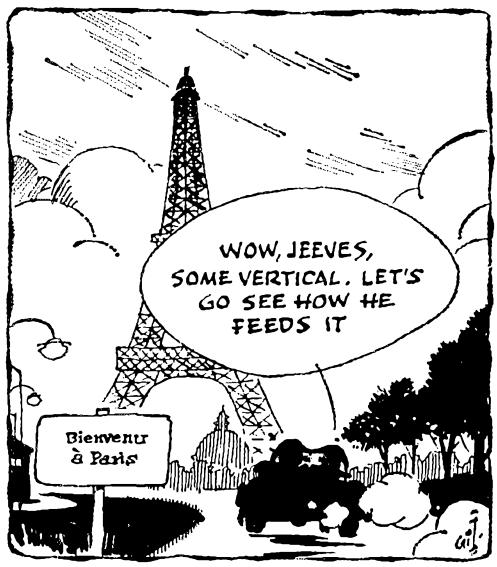
Aircraft radio may have come of age in this loss. Never afterward was dependable communication considered merely an accessory convenience in such undertakings. Curiously enough, as search was abandoned and hope surrendered, OM Marconi passed into the great beyond in Rome, almost as though dispirited by the failure of AE's wireless.

Tousle-haired Amelia had expressed a wish to go down flying when the Great Controller called. But wouldn't she have made a wonderful ham? A woman's special immortality is hers. Particularly in the thoughts of those who remember that tragic summer of long ago, Amelia Earhart will always be a daring, youthful 39.

What:

Up our way it's a twenty-meter DX world this time of year, although 15 and 40 stay gay enough to keep things interesting. Good chance to sun in the hammock and idly tune with one finger while convalescing from (ouch!) Field Day. Hey, let's see what's doing up near the broadcast band. . . .

160 is just the slot for those who prefer their DX sliced across the grain. Top-band specialist W1BB, who finally fought his way through a foot-deep mailbank on his return from the orient, feels that the 1966–'67 1.8-Mc. season, though down somewhat from previous years, still exceeds general DXpectations. We're indebted to Stew, WØVXO and VK5KO for the following data . . . . . Japan, with its new 1907.5-1912.5-kc. hamming segment, has become a hotbed of 160-meter interest. JAs 1BHG 1PVK 3AA and 3JM already have clicked with W6s BHZ HRG JTB LRA RW YY, WA6ATY, W7s AVV DL DOL FP SFV, KL7FRY, VE7AKI and 9V1LP. A burning JA goal is to QSO the U.S. east coast. Judging from the absence of WCC's 2036-kc. marker over there, this will be a toughie. Other handy conditions indicators to watch are KPH on 2045 kc., and WNU, New Orleans, 2018 kc. . . . . KL7FRY, strategically situated in the Aleutians, those stepping-stones to Japan, works our Sixes and Sevens regularly and has contacted JAs 1BHG 1RST 3AA, KA2s AK and AIF, the latter two on phone. Farthest east for KL7FRY is WØVXO but he keeps digging for Atlantic coast business on week ends, 0930-1100 GMT on 1803 kc. . . . . What kind of skyhooks do these birds use? Well, KL7FRY likes his 800-ft. wire and is going for 2000 feet. WØVXO's big sig is launched by a 136-ft. vertical with fifty longer radials below. But W1BB, cruising the Pacific 4100 miles distant, heard 160-meter r.f. from W6PBR's skimpy 40-meter wire ground-plane last winter, so don't sell your own limited layout short. The modest tower supporting many a 10-meter beam is potentially a fine 160-meter radiator . . . . . On the gray side, G3PQA says 320-kv. power grids badly hash up 1.8-Mc. reception in England. And our Coast Guard continues to review its navigational-aids requirements in this range, so keep your

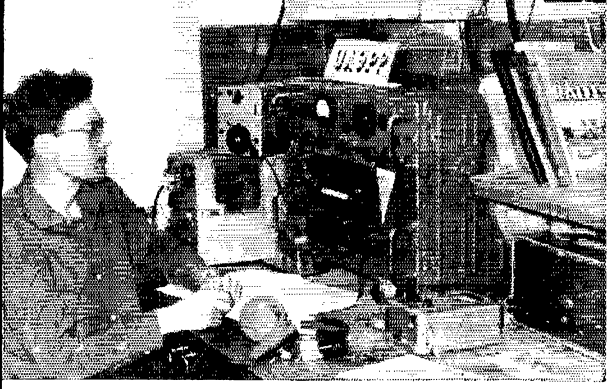


— Reprinted from October, 1959, QST, thanks to WB2HZY.

*7862-B West Lawrence Ave., Chicago, Ill., 60656.

[1] *Daughter of the Sky*, by Paul L. Briand, jr.; Duell, Sloan and Pearce, New York; 230 pp.

[2] *Radio* magazine, April, 1937.



UA9PP's quad was pictured in January's "How's". Here's the rest of Gena's layout, an outfit that really boils into W/K/VE-land when 20-meter polar paths peak toward Novosibirsk. (Photo via W1YYM)

fingers crossed. At this time FCC-licensed amateurs use the band only as "guests" of the USCG, you know . . . . . HI8XAL and VP5AB, reliables on 160 for some time, have pulled the big switch. HI8XAL turned his set-up over to HI8BC, however, along with, we hope, his static-piercing enthusiasm . . . . . W2RAA, intrigued by daylight long-haul work, has hooked Fours and Nines around noontime on 1.8 Mc. . . . . W1BB and friends acknowledge that 160-meter DX is bound to tighten up as the sunspot count rises. But *activity* remains the true limiting factor, so the boys are straining to lure more overseas DXers into the swim. Plans are being made for another bang-up 1.8-Mc. season — will you be there for the 1967-'68 campaign?

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Next month we'll flip the "How's" bandswitch to other ranges via the logs of (20) c.w.) **Ws** 1CNU 1DYE 2GRD 3DPR 3HNK 4NXD 6EQB 7OEB 7VCB 8PKU 8YGR 9LNQ, **Ks** 3MNJ 4IEX 5EIZ 7INE ØDEQ ØJPJ ØREV, **WAs** 1FGN 2KSD 4CZM 4QLP 6JDT 7AUW 7BOA 7BOB 8GGN 8MCQ 8SXQ ØOXO, **WBs** 2RJJ 2VYU 6VVS, 1IER, VE3GLG; (20 phone) **Ws** 1DYE 2DY 2EWO 6EQB 8YGR 9LNQ, **Ks** 7INE 9UCR ØJPJ, **WAs** 6JDT 7BOA 8GGN 8PKG 9SXQ ØDYZ, **WB2RJJ**, **VE2s** AQI BUW, s.w.l.s P. Kilroy and D. Smith; (15 c.w.) **Ws** 3HNK 8YGR, **KØJPJ**, **WAs** 3GJU 6JDT 7AUW 7BOA 7BOB 8MCQ ØOXO, **WBs** 2RJJ 2VYU 2WKR 4EFE 6VVS, **WNs** 2ZQE 6UVH, 1IER; (15 phone) **Ws** 2GTQ 3HNK 8YGR 9LNQ, **WAs** 6JDT 7BOA 7BOB 8PKG, Mr. Kilroy; (10 c.w.) **WAs** 7AUW 7BOA 7BQB, **WB6VVS**, **KH6BZF**, 1IER, **5Z4SS**; (10 phone) **Ws** 8YGR ØTGG; (40 c.w.) W3HNK, K4IEX, **WA8MCQ** and **WB6VVS**, plus other informants to file. Anyone still scoring on 80?

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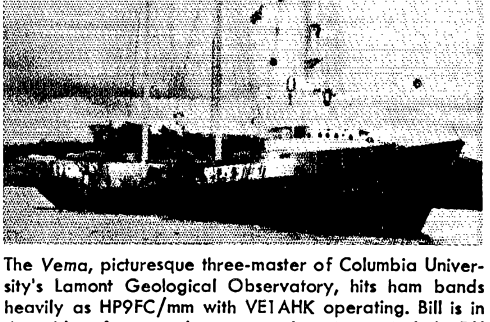
We're due for a dash of DX *vox populi* as space will allow: "Here's my last Novice report. Passed my General!" — *WN6UVH*. . . . "It's great to be at the DX end for a change." — *K8VPX/mm*. . . . "Wonder how many U. S. s.w.l.s have confirmed 300 countries." — *Josef of OK2KMB*. . . . "Sideband work is almost impossible in Hungary due to parts scarcity." — *W4GRG, ex-HA2U*. . . . "After getting on the air in Germany I'll plan for San Marino." — *W8IMZ*. . . . "3V8BZ was my indoor dipole's No. 121!" — *DL4LA*. . . . "Plan to DX from Mason City for a few months." — *WØPAN/KH6*. . . . "Still have 50 s.w.l. cards to answer as K3SWW/KG6." — *W5QBL*. . . . "You guys sure wring the db. out of W1AW's 80-meter kilowatt." — *WB2EWH*. . . . "After opening up on 15 I'll try 10, 20 and 40 meters." — *W3DWG/VR6*. . . . "Been following *QST*'s DX coverage closely since 1928." — *VK5KO*. . . . "I'll urge pal VQ9MB to try some rarer Indian Ocean isles." — *K1QGC*. . . . "Sorry to see old ZS6Q join Silent Keys." — *ZS6DW*. . . . "I'll be teaching in Japan this summer." — *KH6IJ*. . . . "ZS8L manages to get personable good humor into his many QSOs." — *W4BRE*. . . . "FL8HM needs a good used transceiver." — *W7WLL*. . . . "Was it a long winter or a short spring? The long path was jumpin'." — *W1APU*. . . . "Noise! Wish I could put the local power company on that DXHPDS sliding stage." — *W8YGR*. . . . "Caught W9WNV on the *Today* show." — *W9GFF*. . . . "I'd like to see *all* of Jeeves rerun." — *WB2HZY*. . . . "KV4EY has forsaken his old vertical to join the beam set." — *W3HNK*. . . . "The old Viking I still knocks 'em dead on 28-Mc. a.m." — *WØTGG*. . . . "Southwest long path is good to Africa on 10." — *KH6BZF*. . . . "Generally very good conditions in Arizona this spring, especially on ten." — *WA7BOA*. . . . "Back to DX after a layoff. How sweet it is!" — *KØJPJ*. . . . "New job requires a move from my good Ohio DX QTH to Pittsburgh." — *WA8PKG*. . . . "I don't go for the 'listen for my friend' business." — *K7INE*. . . . "Frustrated to hear VS9MB working only HBs in the H-22 Test." — *W3DPR*. "Oh, for a rig to fit with my receiver." — *W6EQB/Iran*. . . . "Test conditions quite good in Missouri." — *KØDEQ*. . . . "I appreciate my new call after 47 countries as K2PSX/4." — *W4NXD*. .

"DU1RS has an amazingly consistent 14-Mc. s.s.b. signal." — *WAØDYZ*. . . . "Our third jr. op, Eric, arrived in March and makes plenty of QRM." — *W7VCB*. . . . "Just got bitten by the DX bug and sorry to have missed the Test." — *VE3GLG*. . . . "Thought it was long path, but I find my beam works better backwards." — *WA6JDT*. . . . "Takes plenty of will power to stay off the air when QRL with grad school homework." — *W1DYE/1*. . . . "Even the SP contest sounded like a Sweepstakes over here." — *W7OEB*. . . . "Must catch up on my DXing during college vacation." — *WA4QLP*. . . . "Loads of new JA calls roll through on 10 and 15." — *W1CNU*. . . . "Here's my log for your tasty DX chowder." — *K2QMF*. . . . "Man, February was *some* month for DX!" — *W8PKU*. . . . "Good to be more active again, especially in the tests." — *WB6ITM*. . . . "*Echhh!* Line noise in my neighborhood nearly pins the meter." — *KØWWC*.

Where:

ASIA — XW8BJ writes from Vientiane, "A lot of QSLs, some confirming QSOs as far back as 1964, have been transmitted to me by several QSL bureaus. I'm sorry to report that numerous cards are for stations unknown or nonexistent. The fact that the XW8 prefix is used does not mean they are or were properly established in this country. Licenses have been issued alphabetically up to XW8CG, so the following false call signs are involved: XW8s CI CW DD DL DQ DSD DX DY EG FT KM LO HHF HL HZ RF SBP SN XG ZI and ZY. My own call, too, has sometimes been used by others without authorization." . . . . . "From June to November, 1963, I operated aeromobile over international waters in the eastern Mediterranean," recalls WA6HSH. "Logs, however, have been destroyed, so I am unable to QSL all stations worked. I do know the days I operated and the approximate times I was airborne, so I'll answer all QSLs showing reasonable proof of two-way communications." You can reach Del through the ARRL Bureau's 6th call area branch . . . . . VE3IIL hears that EP2HB, averaging 600 W/K/VE QSOs monthly, would appreciate the services of a reliable Stateside QSL tender.

AFRICA — Middle East turmoil may be reflected in this note from VE2NV via W1YYM: "I've been unable to forward QSLs for VE2BUJ/SU. He has not picked up his cards. I'm still trying, but I have no logs or current QTH." . . . . . "It is the intention to QSL 100 per cent," assures G3APA, QSL aide to VQ8CG (G3NBQ), who ordered cards and stood by for initial log delivery in May . . . . . ZD8BUD, due for a move to the Bahamas last month, says ZD8AR will forward QSLs straggling into Ascension. Bud recommends use of K4DEN's address for quickest results . . . . . Concerning future DXpeditionary doings with WA6SBO, W9WNV announces, "Direct cards will be sent from all locations to our staunchest friends and supporters. On completion of the DXpedition I will QSL 100 per cent for all QSOs." . . . . . "I have logs for ZD7IP, now back in England, since the start of his operation,"



The *Vema*, picturesque three-master of Columbia University's Lamont Geological Observatory, hits ham bands heavily as HP9FC/mm with VE1AHK operating. Bill is in the midst of a year-long research cruise to include DU KH6 KM6 KW6 PY VK VQ8 VS6 ZS and other regions. HP9FC/mm is regularly workable near 14,110 and 14,255 kc.

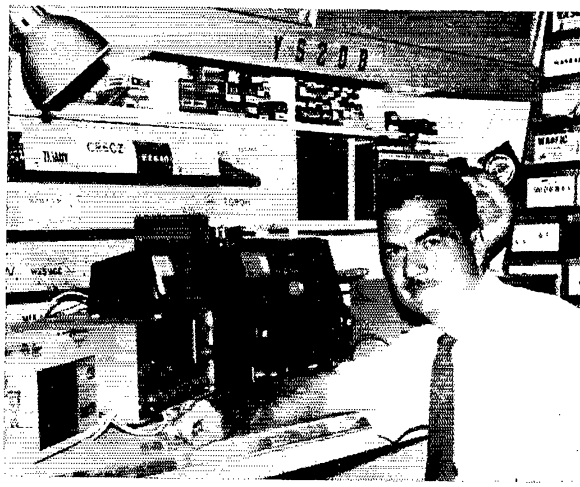
confirms K2HVN. "I sked ZD7KH Mondays and Thursdays for Keith's log transcript." For his St. Helena QSL labors Bill requires self-addressed stamped envelopes from W/K applicants, International Reply Coupons from others, and he usually can supply one-week service . . . . . "Still have a small quantity of QSLs for stations deserving cards," offers 5Z4SS regarding earlier activity as VQs 3SS 4SS and 5H3SS . . . . . "On receipt of cards I will QSL all contacts made in this year's ARRL DX Contest," guarantees ZS6DW through W1WPO . . . . . K1QGC laid in a large stock of QSLs for friend VQ9MB (WB6TLT). S.a.s.e. and GMT, of course . . . . . CR5SP came through with overdue logs to W2GHK. Stu and GB2SM are specified as ZD9BH QSL helpers . . . . . "The Libyan bureau has yet to forward about a thousand QSLs destined for ex-5A3TX," regrets W3HNK. Try Carl again via Joe.

OCEANIA — "K3SWW/KG6 is no more," pens Conrad from new Mississippi diggings as W5QBL. "Still receive QSLs via the Guam and ARRL Bureaus and I'm answering these on receipt. There was considerable delay while moving and getting resettled. Anyone still needing my card can now reach me at [the address in the list to follow]." . . . . . WA6MWG's term as FO8BQ QSL manager commences with April '67 QSOs . . . . . VERON's *DXpress* understands that DXpedition of the Month's W2GHK continues to handle QSLs for VK9s DR and XI with VK6RU as an alternate outlet . . . . . WØPAN/KH6's ten kilo QSOs resulted in 2500 outbound Hawaiian placards.

EUROPE — "I'm QSL manager for HBØLL's contacts after April 1, 1967," affirms WA4QVQ. Hugo, Liechtenstein's resident amateur, formerly signed HE9LAA . . . . . "It's possible that some stations I worked from Greece didn't get the QSLs they're looking for," admits ex-SVØWG, now W4EMP/4. "Anyone needing confirmation for QSO between September, 1964, and November of '66 can obtain same via [the address to follow]." . . . . . "I'm trying to be the fastest QSL manager," states DL7FT, requesting GMT and customary s.a.s.e. or s.a.e.-plus-IRCs cooperation from seekers of EA6AR, KL7EBK, TG9EP and 3V8BZ pasteboards . . . . . HMOL designates WA1GIA as his QSL assistant for possible vacation action in Luxembourg and Belgium. He often signs PA9CN from Holland . . . . . SM6UG hastens to say that, contrary to some reports, Sweden is a member of the International Postal Union with full IRC reciprocity . . . . . You takes your choice and you mails your mail, OMs. The spring '67 *Callbook* lists two different SVØs WAA and a pair of SVØs WBB. 'Tain't the publication's fault, though, since Greek calls apparently are loaned out like library books . . . . . We see that CT1LN's XYL is an avid philatelist and that W3DPR is a first-day cover bug.

HEREABOUTS — "We've answered all QSLs received for our operation as PJ5s BC BD CG CH SA and SB," declare KØs GZN and GZO. "However, we just learned that two packages of cards sent us by the Curacao bureau have evidently been lost in the mails. Anyone who QSLd us via PJ-land without response should try us direct with s.a.s.e." . . . . . W2GHK's QSL service at DXpedition of the Month headquarters is expecting logs from GDs 3VBL 6UW, HZ2AMS/3, 3A2BF, 9U5ID and 9X5GG . . . . . As-if-you-hadn't-heard department: U. S. mail rates to overseas foreign points, except for the APO variety, shot up again in May, and another boost in domestic rates is imminent. W2ADP, P. Kilroy and others think it may soon be cheaper to QSL via Telstar . . . . . "Boy, what a job it is trying to check DX logs against PST, MST, CST, EDST, etc.," groans QSL aide W3HNK. "I'd say more than half of my petitioners fail to use Greenwich Mean Time, and I'm amazed at the number of guys who apparently think it's still 1966." . . . . . "I'm no longer VP2SY's QSL manager," reminds K2MRB. "I believe K1IMP can help, or you can try VP2SY direct." . . . . . W2BEB's mail indicates a slip-up somewhere. William has no QSL managerial arrangements . . . . . "IRCs are always welcome," says HP9FC/mm (VE1AHK). "We QSL 100 per cent on receipt at VE1DH." . . . . . Now your "QSLers of the Month," each nominated by acclamation for especially snappy QSL production: CN8FC, CT1s BH KT, ELs 2D 9NA, EPs 2BQ 3AM, ET3USA, FG7XT, FM7WD, FR7ZP, FY7YM, HB9s IN JG, HC8FN, HK3AVK, HP1BR, I1FLD, KG6s IF IG, KL7MF, KS4CC, KX6ER, LU7HL, MP4BFK, OH5UA, OZ5DX, PAØWAC, SVØWV, TF2WJN, VKs 2AVA 2PV 9VM, VPs 1VR 2LA 8HJ 8JB, VQ8BG, VR4CR, VS9ALV, VU2s GW LE, WA3FUV/KH6, XE2KF, XP1AA, YN1CML, YO2BB, YS2OB, YU2NFJ, YV5BXB, ZD5R, ZF1RD, ZP5JB, 3C3FZJ/SU, 4U1ITU, 4X4ZR, 6Y5UC and 7Z3AB, together with QSL agents Ws 2CTN 2GHK 4ECI 7TDK 7VRO 7ZAS 9WHM, Ks 1DFC 1VWJ 5AWR 6ENX 6UJW 8LSG, WAs 2RAU 2WUV 5IBK, VEs 3EUU 4OX, CR6GO, CXs 2AM and 3BBD. These dependables are commended in dispatches by "How's" reporters Ws 3DPR 8YGR, Ks 1YKN 8GQG ØDEQ, WAs 2HIU 7BOA 7BOB 8MCQ 8PKG 9RLF and ØOXO. We'll be pleased to present plaudits here for *your* recent rapid receipts as well . . . . . *Alp!* W1BGD and K1AFC hunger for ZS9P QSL angles, W2GKE hunts for VR3L '62 and VS9AQ 61 confirmations, K9QGC wants word on TT8AN '65, K9UCR needs news on HC8CA, HI8XFS, VP2SX '60 and 6YALT of '63 . . . . . W8KYD, Ks 1ZWK 3FKU 5IKL, WA9s NBU RLF, WB2s RJJ and WKR place themselves on the growing list of Statesiders willing to sweat QSL chores for overseas DX ops . . . . . Don't forget that foreign editions of the *Callbook* now contain a flock of QSL managers, also that W6GSV specializes in such info . . . . . Now some representative QTH quotations from the "How's" mailsack, but remember that such data are necessarily neither complete, accurate nor "official". . . .

CM2BA (via CAV, attn. OK1GL)
CP6FN, Box 33, Camiri, Santa Cruz, Bolivia
CR4BQ, P.O. Box 4, Sao Vincente, Cape Verde Is.
CR5CA, Box 47, Sao Thome, Portuguese W. Afr.
FM7s WO WT, P.O. Box 575, Fort-de-France, Martinique
FO8RS, Box 274, Papeete, Tahiti
FO8BT, Box 45, Papeete, Tahiti
FO8BU (F5IG, ex-5T5AB-6W8AB; via REF)
G5AFD, Box 349, APO, New York, N. Y., 09127



YS2OB of Huachapan likes 20 and 40 c.w. with his T-150A and HE-30. Oscar enjoys homebrewing sundry shack accessories when conditions are slow. (Photo via K3FKU)

HBØLL (ex-HE9LAA; via WA4QVQ)
HH9EH, P.O. Box 70-B, Port-au-Prince, Haiti
HR1DS, % U.S. Embassy, Tegucigalpa, Honduras
HS4AK, A. Kosko, Box 11/121, Bangkok, Thailand
K2ILQ/KG6 (via Marianas bureau)
ex-K3SWW/KG6, C. Bluhm, W5QBL, Rte. 3, Box 346, Meridian, Miss., 39301
K8VPX/mm, USS *Charles H. Roan* (DD-853), FPO, New York, N. Y. (or via W8QKO)
K8VWM/KG6, % CMR, Box 901, 27th Comm. Sqdn., APO, San Francisco, Calif.
ex-KA2s MR TR (to W6SMU)
PX2AB, Box 22701, Paris, France
PY3HT, H. Trennepohl, Box 63, Panambi, R.G.S., Brazil
PY7s AOA/Ø APS/Ø (via PY7AKW)
SV5GT, J. Mandels, E. Kastelli Police Stn., Kastelli, Crete
ex-SVØWG, N. Pinney, W4EMP/4, 1736 Eleventh St., Langley AFB, Va., 23365
TA1KT, Kamuran, Box 699, Karakoy, Istanbul, Turkey
TJ1AB, Maka, Cameroon
TJ8QQ-TL8QQ-TR8QQ-TT8QQ (via W4DQS)
TU2BQ (direct or via DARC)
UY5MH, V. Savjalow, Morzyn nr. Lvov, Ukrainian S.S.R., U.S.S.R.
UY5ZA, A. Serebrennikov, P.O. Box 5/35, Zaporozhie, Ukrainian S.S.R., U.S.S.R.
VP2SY (see preceding text)
VP8FL (via RSGB, attn. BRS-26222)
VQ8CC, S. Gibbs, Box 14, Curepipe, Mauritius
VR4EK, % Weather Office, Honiara, Solomon Is.
W3DWG/VR6, R. Maples, AMS-09, Satellite Tracking Team, Adamstown, Pitcairn Is.
WØPAN/KH6-KH6FRO (to WØPAN)
XW8CC, W. Wright, American School, APO, San Francisco, Calif., 96352
ZD3I, % *Yasme* Foundation, P.O. Box 2025, Castro Valley, Calif.
ZD9BH (via W2GHK or GB2SM)
5A4TZ, Capt. E. Ackerman, Wheelus AFB, Libya

ex-5H3SS-VQ3SS-VQ4SS (to 5Z4SS)
5R8AN, L. Bucci, 54 rue de Grenoble, 06, Nice, France
7X0PQ (direct or to F9PQ)
9G1GA, P.O. Box 625, Tema, Ghana
9M6MG, P.O. Box 229, Labuan, Sabah, E. Malaysia
9X5SP, Box 420, Kigali, Rwanda

DL5GB (via WA5LYX)
DU1DL (via DL6PE)
FO8BQ (via WA6MWG)
FU8AG (via REF)
HL9TJ (via W4WSB)
HL9TK (via W6FRZ)
HP9FC/mm (via VE1DH)
HZ1KE (via G3FWR)
JT1AJ (via JT1KAA)
JX5CI (via NRRL)
K8NHW/XV5 (via W6FAY)
K8PKY/KB6 (to K8PKY)
KA2IJ (to KH6IJ)
KL7EBK (via DL7FT)
MP4BFK (via W2CTN)
OH0NM (via OH0NC)
SM4CPW (via K1ZWK)
VQ8CG (via G3APA)
VQ9MB (via K1QGC)
VR3L (to K8PKY)
VR3O (to K6UJW)
VS9AHN (via RSGB)
W0ICJ/KM6 (to KM6CE)
WA8BCU/VE8 (to WA8BCU)
ZD7s IP KH (via K2HVN)
ZD8BUD (via K4DEN)
ZP5DY (via RCP)
ZS3JJ (via WB6ADY)
3V8BZ (via DL7FT)
4U1SI (via HB9SI)
4W1L (via HB9ABV)
9M6JP (via MARTS)
9M8II (via 9V1NT)
9V1NX (via MARTS)

Contributors of the preceding specifications are **Ws** 1APU 1WPO 1YYM 1ZJE 2ADP 2JBL 3DPR 4NXD 7WLL 8YGR 9GFF 9LNQ, **Ks** 2MRB 7INE 8GQG 9UCR 0DEQ 0JPJ, **WAs** 1FGN 7BOA 7BOB 9RLF 0DYZ, **WBs** 2RJJ 2WKR 4EFE, **KH6BZF**, **5Z4SS**, E. Collins, P. Kilroy, D. Smith, Columbus Amateur Radio

HA1VA, a skillful c.w. hound, mans a homespun 100-watter on 80 through 10 meters. That venerable BC-348 is equipped with converters for 21 and 28 Mc. Two of Feri's three 'teen-aged daughters operate HA1KVM, local Szombathely club station. (Photo via W4GRG, ex-HA2U)

Association *CARAScope* (W8ZCQ), DARC's *DX-MB* (DLs 1EP 3RK), DX Club of Puerto Rico *DXer* (KP4RK), Far East Auxiliary Radio League News (KA2LL), Florida DX Club *DX Report* (W4BRB), International Short Wave League *Monitor* (A. Miller, 62 Warward Ln., Selly Oak, Birmingham 20, Eng.), Japan DX Radio Club *Bulletin* (JA1DMI), Newark News Radio Club *Bulletin* (L. Waite, 39 Hannum St., Ballston Spa, N.Y.), North Eastern DX Association *DX Bulletin* (K1IMP), Northern California DX Club *DXer* (Box 608, Menlo Park, Calif., 94025), Southern California DX Club *Bulletin* (WA6GLD), Utah DX Association *Bulletin* (W7LEB) and VERON'S *DX press* (PA0s FX LOU TO VDV WWP). Thanks, team!

Whence:

SOUTH AMERICA — LCRA announces this year's all-mode Independence of Colombia DX Contest slated to run from 0000 GMT July 22nd to 2359 the 23rd on 10 through 80 meters. North American stations earn 3 points per HK contact, 1 point per non-HK contact, and for final score multiply contact-point total by the sum of HK call areas and DXCC countries worked (no crossmode work allowed). Trade the usual RS- or RST001, RST002, etc., serials. Logs, a separate sheet for each band and mode, go to Colombia Independence Contest, %. LCRA, Box 584, Bogota, Colombia, for arrival no later than September 30, 1967, to be eligible for trophy and certificate awards. Last year's ICDXC results show our boys finishing in this order: Ws 2GRD 4YDD 4YGO 3UVH 2NCG 9TCU, WA2OIL, K8EJN and W5MSG. Colombian leaders by call area were HKs 1BCL 3RQ 4JC 5JS 6FI 7AHM 3AMU/9 and 0AI, with winners per continent UA9WL, UP2OK, VE2BUJ/SU, VK2APK, W2GRD and YV5FT. We hate to keep bringing up this aspect, but Russian entries outnumbered W/Ks 31 to 9. And where were the VE/VOs? . . . . . LU1DJU notifies that RCA's "CCC" certification has been toughened by a new two-bands requirement . . . . . K4IEX finds LU1SE hunting holdout Nevada for the full Fifty . . . . . PY7s AOA/0 and APS/0 made Fernando in May . . . . . VP8IE, So. Georgia, expects to be sidebanding this month courtesy W2GHK.

RCV (Venezuela) announces the phone-only Venezuelan Independence Contest, open to all amateurs world wide from 0001 GMT July 1 to 2359 GMT July 2. Stations in the Americas will swap the usual RS001, RS002, etc. with stations outside their own countries, for one point per contact. Score is obtained by multiplying contact points on each band by the number of countries (and Venezuelan call areas) on each band separately, then taking the sum. Various awards and certificates will be issued to certain high scorers for entries received by RCV, Concursa Independencia de Venezuela, P. O. Box 2285, Caracas, Venezuela, before Sept. 15, 1967, accompanied by a dollar's worth of IRCs.

ASIA — Reminder: From 0900 GMT on the 3rd of this month to 1500 the 4th, FEARL's annual field day will feature plenty of KAs. KH6IJ may return to Japan in time to join the frolic as KA2IJ . . . . . "I've been especially active on 21 and 28 Mc. with an R-4A," reports XW8BJ, a Laos national. "Until the receiver portion is fixed I cannot operate 20 meters." W2GTQ finds neighbor XW8AX extremely solid around 21,350 kc. at 2200 GMT . . . . . "I'll be active in Seoul for the next few months," confides HL9TJ. "My HW-32 and 3-element yagi will be on 14,300 kc. almost daily." Quite a few fresh HL9s around . . . . . W6FAY gets a chance to visit K8NHW/XV5 occasionally. Bob's Saigon QSOs were still off limits for FCC licensees in May but W1AW may have sprayed out further info by the time you read this . . . . . Infantry officer K7INE, back from Viet with painful souvenirs, is thankful for another crack at 20-meter DX. Bob pleads, "Tell W/Ks to quit calling CQ DX and do a little listening." . . . . . W6EQB, monitoring the bands from his Iran post, has another complaint: testing, *testing*, TESTING. Would you plunk your car on a highway without first checking traffic? "I'm copying more c.w. lately for a go at the Extra Class when I return home." . . . . . Asian gossip via the clubs press: UA1CK was hard to keep up with in April, signing UA1CK/JT, JT1JT and JT1KAA. . . . JA7s AKQ and ERN intend operating jaunts to rare Japanese prefectures and cities, and the KA crew is eyeing KA4 and KA6 dormancy. . . . Formerly "easy" Middle East regions may grow scarce unless peace breaks out over there. . . . KAs 2AR (K1WOK) and 9KC (WA5QNT) clutch fresh FEARL credentials. League brass includes KA2s VT pres., SF v.p., DJ secy., JC treas., EB gen. mgr., LS QSL mgr., DL awards mgr. and LL News ed.

AFRICA — "FL8s AO and RA are due for return to France," notes W7WLL. "FL8DY, a new one on s.s.b. and c.w., will be in Somaliland six months or so. Ex-FL8MC, now in Germany, expects early assignment to another French outpost. FL8HM remains the only resident amateur." . . . . . ZS8L-ZS9D anticipates a Stateside visit this fall, according to W4BRE. Ulli, a government surveyor, has a host of sideband friends on 10, 15 and 20 meters . . . . . G3APA writes, "VQ8CG (G3NBQ) was licensed in late April and should be active for some time, possibly from another VQ8 area." . . . . . 5Z4SS took a liking to 28 Mc. back in '46 as G3SS and is delighted to find old ten up to its DX tricks again. "In the first new batch of Kenya licenses since 1963 there are three Americans, so there will be more 5Z4 activity from now on. Among the newcomers 5Z4KL uses c.w. near 14,080 kc. almost daily starting at 1400 GMT, and 5Z4KN (WA6PKN) likes 14,020-kc. c.w. with an NCX-5. The latter will soon try s.s.b., also 10 and 15 meters." . . . . . The South Africa power limit has been upped to 150 watts, notifies ZS6DW via W1WPO. "My location doesn't seem too bad, 200 sideband countries in five months." Not bad, indeed . . . . . VQ9MB (WB6TLT) expects to go at it from Mahe with a KWM-2, remoted v.f.o. and 3-element spinner, says K1QGC, Merle's Stateside liaison. Some climatic switch from OX4AA! . . . . . Africa addenda thanks to aforementioned clubs and groups: CR5CA's c.w., 14,080 or 21,065 kc. at 2000-2100 GMT, backs up CR5SP's

FL8HM's DX activity paused emphatically in February due to marriage. We hope Wahida will encourage Hassan's continued collection of North American QSOs and friends. While we're at it, let's applaud the understanding and patient XYL of every DX operator, for each lady is quite responsible for many a DXCC membership! (Photo via W7WLL)

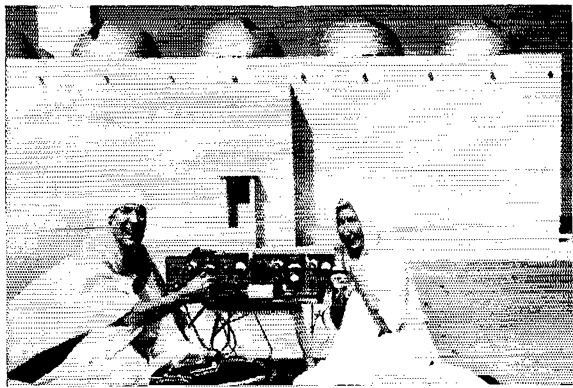
well established Sao Thome s.s.b. program. . . . ZD9BH (G3NTL) is to spell ZD9BE on Tristan for a few months. . . . 3V8BZ skeds KL7EBK around 14,200 kc., 0630 GMT, while 3V8s AC and AD are heard on 80 c.w.'s! ow edge.

OCEANIA — "ARRL President WØNWX had to really work hard to get this one," chuckles VK5KO. John refers to a six-bands-within-24-hours c.w. DX sweep he scored with Bob during the fine conditions of April 30th and May 1st, QSOs on 28,055, 21,041, 14,027, 7013, 3507 and 1802 kc. "I recall that G6CJ and VK5KO worked on 80, 40, 20 and 10 meters within 40 minutes in 1949. For the WØNWX grand slam 1.8 and 3.5 Mc. were actually out of season, 21 Mc. well past optimum, and 14 Mc. almost two hours too late. I used about 100 watts to a loaded 50-ft. vertical on 160 and 80, a vertical dipole on 20, ground-planes on 40, 15 and 10, so I think most of the 'work' was done at the Iowa end." . . . . . VR4EK may be off already, according to K7INE and W1YYM. Fred started a shortie in May using the apparatus of VR4CR . . . . . K7INE opines that "VK2AVA handled those Lord Howe pile-ups very well for hours on end." . . . . We've always thought of Pitcairn island as eternally safe from the bulldozers of civilization. Now comes a letter from W3DWG/VR6 of the Adamstown satellite tracking station. Ron has a VR6 cal lcoming up and should keep his S-line outfit well displayed on 21,010, 21,200 and 21,400 kc. till January . . . . . FO8RV, a speedy c.w. op, likes 14,035 kc. around 0700 GMT. "Roland said I was his first QSO," gloats KØJPJ . . . . . WB2EWH says KH6GGP (ex-KA2KR) is good for rousing rag chews on 20's low c.w. edge. "More QSOs like his would revitalize the game." . . . . . WØPAN/KH6-KH6FRO tells W1WPO his 10,000 Hawaiian contacts include 160 countries and WAS. "Released from Navy duty in June, future undecided. As soon as I select a permanent QTH I'll get back into the ORS-OBS-OPS swing. It will seem strange not to be signing some portable sulfix at the end of my call." . . . . . W5QBL, just back from K3SWW/KG6, writes, "Beautifully quiet location here near Meridian, Miss. On Guam I was plagued by line hash and noise from near-by high-powered transmitters." . . . . . FO8BU, 14,037-kc. c.w., offers Gambier isle around 0900 GMT . . . . . WIA (Australia) provides ample advance announcement of this year's VK/ZL/-Oceania DX Contest. It's October 7th-8th and 14th-15th, voice and code respectively. We'll bring up the subject again in detail.

EUROPE — Amateurs the world over are invited to participate in the annual *YO Contest*, 1800 GMT Saturday, August 5th, to 2400 GMT Sunday, August 6th. This is a c.w.-only test on 80, 40, 20, 15 and 10 meters. Non-YO stations will try to contact as many YO stations as possible exchanging RST and serial number, starting with 001 (regardless of band). The calls of YO stations will be followed by two letters indicating their own region, as follows: BU, Bucharest City; AG, Arges; BC, Bacău; BT, Banat; BV, Brasov; CJ, Cluj; CR, Crisana; DB, Dobrogea; GL, Galati; HD, Hunedoara; IS, Iasi; MR, Maramures; MS, Mures; OL, Oltenia; PL, Ploiesti; SV, Suceava; RB, Reg. Bucuresti. Each YO region is a multiplier on each band; thus the maximum multiplier is 85, 5 bands times 17 regions. Complete contacts are two points, partial ones one point. Final score is the sum of QSO points times the multiplier. Logs must contain date and GMT, station worked, serials exchanged, notation of new multipliers and QSO points. A summary must be enclosed with score information, operator's name and address, equipment description and a signed pledge certifying that all rules and regulations have been observed and that the report is a true one. Logs must be postmarked no later than September 1, 1967, and addressed to: Central Commission of the Radio Sport, P.O. Box 95, Bucharest, Rumania . . . . . 3A2CQ, one of the few resident Monaco hams on DX bands, hopes to supplement 20-c.w. work with s.s.b. output soon. "If anyone considers 3A-land rare enough to supply a transceiver I'll be happy to cooperate as a sort of stationary DXpedition." . . . . . DL4LA (WAØISO) says the 14-Mc. gang can't touch K3JH's 7-Mc. signal strength in Europe. Jim notes that DL5NC has moved to Berlin, DL5KJ should be available for a few more months on 20 c.w. DL5HH went back to Fiveland, and DL4LZ is testing his luck in Vietnam. DL4LA managed 121 countries with 100 watts and indoor dipoles. "The average European operator is good, but quite impatient. Because of the language barrier he may fail to follow instructions in phone pile-ups." . . . . . K9UIY, on European honeymoon, hobnobbed with the GB2SM gang, G3JUL, OZ7GI, DJ5VF and others . . . . . DJ7XC/M1 scored 1500 contacts on his recent invasion of San Marino . . . . . W8IMZ heads for Germany this month. "Sure has been rough being QRT in Spain for two years." . . . . . From W4GRG, formerly HA2U: "I find much interest in chatting with hams in my old country and I try to work as many as possible. So far I have 56 HAs logged and I keep weekly schedules with my old classmate, HA3MB." . . . . . Josef of OK2KMB says OK5KMB will be active on several DX bands this month from a special meeting of Czech amateurs . . . . . K8VPX/mm operates 14-Mc. c.w. and phone from the Med with a TR-3 and half-wave vertical . . . . . Ex-SVØWG greets old DX buddies on 20 sideband as W4EMP/4 . . . . . W3DPR points out that G3UCW, active on 14-Mc. c.w., represents rare Isle of Wight, also that GM3JDR's QRP has rolled up a hundred 21-Mc. countries this year . . . . . The Algarve gang, c/o Paul Vieira, Apdo. 93, Faro, Algarve, Portugal, offers eight DX certifications of possible interest to wallpaper collectors . . . . . DARC (Germany) holds its gala WAEDC affair August 12th-13th (c.w.) and September 9th-10th (phone), specs due here next month . . . . . Continentalisms courtesy club literature: SSA's SM5SSA emits DX bulletins on Saturdays at 1400 GMT on 7025 kc. . . . HB9 tourists may come and go but HBØLL stays on in Liechtenstein, transceive near 14,205 kc. . . . . DL7FT should be active from EA6AR again this month, 10, 15 and 20 phone. . . . GM3s RFR, 7080 or 14,125 kc. at 1900 or 2300 GMT, and SVR, 14,150 kc. at 1800-1900 GMT, are in wide demand from the Shetlands.

HEREABOUTS — With more than 50 JA contacts on 21 Mc., WN6UVH colors eastern Novices green . . . . . WA7BOA didn't think much of phone DX possibilities until JA7YAG hollered at him on 15. Brother WA7BOB finds his DX input stunted by discovery of "wine, women and song," the bane of many a young DX hound . . . . . WB2RJJ perspires freely now, just below the 100-confirmed mark . . . . . K7INE finds his kilowatt linear quite superfluous these fine DX days, preferring to spear goodies with an HT-44 and 70-ft.-high 4-element rotary . . . . . WA8OTI's 16-year-old buddy WA8SNM notched 177 countries in eight months on 20 sideband . . . . . WA3ATX/7 closes shop in Esmeralda Co., Nevada, early this month after much phone and c.w. DX sport with a T-4X/R-4A combo . . . . . Forty-meter stalwart W9NN confesses to an occasional QSY to the 15- and 20-meter DX gardens. "Just coaxing some raries down to 40," says Bob . . . . . VE3ACD announces specifications changes in Ontario DX Association's Centennial Award (p. 146, February '67 *QST*). Among the required 100 Canadian contacts there must be at least one QSO with each call area, VE1 through VE8, plus any VO. VEØ is acceptable but not mandatory, and the 3C prefix is, of course, okay. Also, there now is no fee involved . . . . . Hint & kink in W4BRB's peppy FDXC *DX Report:* W4EEO croons to DX through a lamp shade during wee hours when near-by unbelievers snooze . . . . . So. Calif. DX Club almost quadrupled its ARRL Test score of two years back. Hurrah for 10 and 15! . . . . . KP4s BBN CK CL MO RO and WD renewed DX Club of Puerto Rico affiliation . . . . . K1RQE paced all pundits in W1YYM's DX Quiz at the New England DXCC shebang in April.

QST



5T5KG, DXpeditionary production of W6s KG and DOD, certainly symbolizes the DX spirit in this Mauritanian desert shot. The Colvins, after some 175,000 contacts from 109 countries, continue their current swing through Africa.

Operating News

GEORGE HART, W1NJM, Communications Manager
ELLEN WHITE, W1YYM, Deputy Comms. Mgr.
Administration: LILLIAN M. SALTER, W1ZJE — *DXCC:* ROBERT L. WHITE, W1WPO
Contests: STANLEY H. ISRAEL, WA2BAH — *Training Aids:* GERALD PINARD
Public Service: WILLIAM A. OWEN, W1EEN

QRM. This seems a favorite topic of conversation (and correspondence) these days, so let's take a crack at it. Like the weather, everybody talks about it but nobody seems to do anything about it. Some of the letters strongly imply that ARRL ought to do something about it.

Well, there are a lot of amateurs, and it seems most of us like to crowd into a small space. While space in the v.h.f.'s and above goes begging, the h.f. bands, when conditions are good, are a bedlam. QRM gets to be a sort of way of life to the average amateur. We expect it, sometimes even accept it as a challenge to be overcome. Nobody really likes it, of course, and there isn't an amateur alive who doesn't get annoyed when someone camps on "his" frequency without so much as a by-your-leave.

There are certain things we can do to alleviate QRM, but nothing we can do to prevent it. Such being the case, let's concentrate on the former.

To begin with, no amateur or station or amateur group has any exclusive or prior right to any frequency in any amateur band. Here at the headquarters we are continuously receiving letters from nets, DXers, traffic men, civil defense and AREC groups, and listeners to W1AW bulletins and code practice that someone is causing QRM. Seldom is it conceded that the QRM is probably accidental; nearly always it is assumed to be deliberate, and the question asked is either what can he do about it, or why don't *we* do something about it?

There is no regulation against QRM in the amateur bands. The only regulation is against willful or malicious QRM. In 99% of the cases, the interference caused is neither of these. "Willful" means deliberate, and "malicious" means with malice aforethought, an intentional commission of an unlawful act in order to cause someone harm. You may *suspect* this to be the case, but it's an extremely difficult thing to prove — and if you make the accusation, the burden of proof is yours. If the operator of the station causing the QRM knows he is doing so, this is in itself neither willful nor malicious. He may be engaged in a perfectly legitimate type of amateur operation. Only if he is making the transmission for the purpose of interfering is he violating a regulation. And how do you go about proving such a thing?

So in our daily operating, we amateurs have evolved a number of gentlemen's agreements, a sort of code of ethics. Not everybody agrees with it, and some of those who disagree refuse to follow it; those few can cause a great deal of difficulty, but we guess we're stuck with them. Suppose we enumerate some ethics of operating to alleviate QRM, thusly:

1) Listen before transmitting. This is basic. How many times, during a QSO, have you been QRM'd by someone tuning up, or someone calling a CQ? We should, of course, supplement this by adding, "If the frequency is in use, find a comparatively clear spot before putting your signal on the air." It may not be possible to find a *completely* clear spot; but the idea is to avoid transmitting "blind," not knowing (or caring) whether or not you are causing QRM.

OPERATING EVENTS (*Dates in GMT*)
ARRL-IARU Societies-SCM-Affiliated Club-Operating Events

July	August	September
1-2 Venezuelan Independence Contest, p. 100, this issue.	1-9 Boy Scout World Jamboree, K7WJS, p. 52, this issue.	1-30 B.C. Centennial QSO Party
6 **Qualifying Run, W6OWP**	4 **Qualifying Run, W6OWP**	7 **Qualifying Run, W6OWP**
8-10 **CD Party (c.w.)***	5-6 Illinois QSO Party, p. 108, this issue.	9 **Frequency Measuring Test**
12 **Qualifying Run, W1AW**	5-6 YO Contest	9-10 **V.H.F. QSO Party**
15-17 **CD Party (phone)***	6 Maryland-D.C. QSO Party, p. 107, this issue.	9-10 WAE DX Contest, phone
16 Minnesota QSO Party, p. 109, this issue.	12-13 WAE DX Contest, c.w., next issue.	9-11 Zero District QSO Party
22-23 Independence of Colombia Contest, p. 100, this issue.	17 **Qualifying Run, W1AW**	15 **Qualifying Run, W1AW**
*League Officials and Communications Department Appointees, *only*.	26-27 South Carolina QSO Party, next issue.	16-17 / 23-24 Scandinavian Activity Contest
		16-18 Washington State QSO Party
		23-24 VE/W Contest

Meet Your SCMs

Clark Mercer Hubbard, **K4LNJ**, has served as Section Communications Manager of the South Carolina section for over a year. In addition to heading up the S. C. Field Organization, he holds the posts of EC, PAM, Net Manager, Net Control Station, RO etc. He started studying amateur radio back in 1938 and his interest revived postwar when his son became interested. Network operation on 75 and 80 is his favorite phase of the hobby and football and track his favorite sports.

2) Use a dummy antenna for resonating your transmitter. If properly done, the process of loading the transmitting antenna need take only a very few seconds; make all other adjustments on the dummy load.

3) Don't "butt in" on a QSO in progress. This is very impolite and unmannerly, whether on the air or in person. If you want a QSO, find a "clear" spot and call CQ; or find a CQ and call the station. If you want to talk to one of the principals in a QSO, wait until they are finished.

4) The same principle applies to nets and roundtables. Don't inject yourself into them unless some indication is given that you will be welcome.

5) The world is full of talkative people, most of whom have nothing to say and whose transmissions are just so much QRM. Make your transmissions short and to the point. Don't try to "capture" your audience. Give the other guy a chance to get a word in edgewise once in a while.

If anyone has an addition to the above points, let us have it, maybe in a subsequent issue we can have a supplementary list. Fellows, let's be gentlemen (and ladies) on the air. It will pay off, and won't hurt anybody one bit.

QRM to/from W1AW. We are getting two different kinds of letters regarding W1AW QRM. One is complaints about stations camping on W1AW's code practice and making reception next to impossible. The other is about W1AW coming on without warning and lousing up a QSO.

First, about the QRM *to* W1AW. The headquarters station has no more right to a frequency than anybody else. After all, it's an amateur station, just like the rest of us. Sure, we know it's annoying for a struggling beginner, trying to get his code speed up to pass the General, to be subjected to a long, drawn out CQ by someone who doesn't have the courtesy to listen first to see where he's camping, or to be QRMed by a QSO going on on the same frequency. But we can't do anything about it, except to ask all concerned to give W1AW a clear channel for code practice. We do so, herewith. Please, gang, give the newcomer a break. We don't ask it for the sake of W1AW or even of ARRL, but for the benefit of all amateurs or would-be amateurs who are trying to improve themselves. Take a look at the schedule and times elsewhere on these pages, and give the matter some consideration, eh?

Perhaps some of the QRM arises from QSOs in progress when W1AW comes on the air, in which case there can be a question of who QRMs whom. We are sorry about that. The headquarters station operates on about seven bands simultaneously for code practice, and it just isn't practical to monitor each of them prior to the scheduled time and adjust frequencies accordingly. All the one-way transmissions (bulletins and code practice) from W1AW are a service to the general amateur fraternity. They are as concise and brief as possible to accomplish the desired end. We hope not too many are in-

BRASS POUNDERS LEAGUE

Winners of BPL Certificate to Apr. Traffic:

Call	Orig.	Recd.	Rel.	Del.	Total
K6BPI	4201	1879	1714	165	7959
W3CUL/4	185	1589	1501	36	3311
K9ONK	118	766	728	22	1634
W7BA	6	709	653	51	1419
W5OBD	29	652	651	1	1333
W1PEX	62	613	518	49	1242
K6EPT	35	595	550	45	1225
W7HMA	47	482	465	5	999
K5TEY	17	757	220	1	995
W6GYH	77	414	407	3	901
WA4SCK	23	430	426	7	886
WØLGG	12	444	390	15	861
W6RSY	93	407	242	81	823
K7TCY	9	392	356	30	787
W7ZIW	21	374	356	18	769
W3EML	27	395	288	3	713
K9YFK	26	319	2	345	692
K9IVG	18	361	251	7	637
WA4DYL	18	328	245	34	625
WA7DXI	50	301	210	42	603
WB6BBO	51	272	226	17	566
W7JEY	7	275	278	1	561
W1DOM	73	231	221	5	530
WA4BMC	355	101	54	10	520
W3VR/4	181	173	137	11	502
WB4DXX	23	239	221	18	501
Late Reports:					
WA9MIO (Mar.)	10	300	263	6	579
WA9CCP (Mar.)	408	77	30	3	518

More-Than-One-Operator Station

W9ODD	524	26	21	5	576

BPL for 100 or more *originations-plus deliveries*

KØZSQ 210	WA4AUG 118	WB2QLF/OA4 105
W6OSC 191	WA9QVU/1 117	WB2SSZ 104
WA9CCP 171	K1PNB 115	WA3BLE 103
W3CVE 149	K7CTP 115	K8LRK 103
W8IV 138	WA4UIH 114	WB6GMM 102
K4TRT 133	WB2WWH 113	W8KMQ 102
W6WPF 133	WA4NEV 112	K8NAL 102
WA1FGN 132	K1ZGH 109	Late Reports:
WB2IYQ 131	WB6UTC 108	WB2SSZ (Feb.) 133
WA4BGW 130	WA4TJS 106	VE7BHH (Mar.) 133

More-Than-One-Operator Station

WØEEE 175	WØZLN 147	K4CG 129

BPL medallions (see Aug. 1954, p. 54) have been awarded to the following amateurs since last month's listing: K1PNB, K1RQO, WB4CIY, W8IV, W8NAL, WA9QKP, WA9SEO.

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

convenienced by them, and that those who benefit from them more than make up for any slight inconvenience caused.

Alaska Centennial. The KL7s are a little jealous about all the publicity being given to the Canadian Centennial. Few seem to realize that it was back in 1867 that Uncle Sam paid Russia about 2¢ per acre for a vast, unexplored area felt to be largely uninhabitable, which is now our State of Alaska. The Fairbanks Radio Club is setting up a ham station at the Centennial Exposition Grounds in Fairbanks, to use the specially-assigned call KL7ACS, aboard the historic river steamer *Nenana*. Amateurs traveling in Alaska are invited to visit the Exposition, and to meet the local gang at the Kings Kup, on Noble Street behind the Northward Building in downtown Fairbanks, Saturdays at noon. The gang gets together at that place and time for this specific purpose. — *W1NJM*.

APRIL CD PARTIES

With activity down, number of logs received down, and K2EIU's S. Tex portable taken down, operators in the April CD Parties really had to dig deep for the extra QSOs. No 100K in four hours this time! In fact, it took W4KFC six and a half hours to run up 103-K, so you know conditions weren't the best either.

W9YT topped both parties with K9ZMS doing the trick on c.w. and K9LBQ operating the Badger Amateur Radio Society club station during the phone portion. W1AW was on promoting some activity, even on 160 and 6 meters. After the first 4 hours of operation on the c.w. weekend, an unidentified (at least in this text) station called the W1AW op on 80 meters and wanted to know how many contacts had been made. "1201 . . . impossible . . . how?" . . . "4 transmitters simultaneously, so that's how you change bands so fast!!" Incidentally, K2EIU did show up for a while during the phone weekend . . . in South Texas

DX CENTURY CLUB AWARDS

From April 1, through April 30, 1967 DXCC Certificates based on contacts with 100-or-more countries have been issued by the ARRL Communications Department to the amateurs listed below.

New Members

OH2BH....298
OH2BQ....261
WA6PMK...220
WA2PXI....205
JA3CWV....203
OE7UD.....203
W6ABJ.....186
HZ3TYQ....162
WB4RDO...157
WA6UZA...148
W8UM.....148
OK1PG.....143
W8BRL.....142
DJ8FF.....138
DJ8JY.....130
SP6AZY....129
SP8AJE....128
DL8MIL....125
K9KBW/4...121
K1CDN/5...120
KØEIA.....117
DJ9VW.....114
W3NNX....111
DJ8OF.....110
W4JUK.....110
VE3GCO....109
VE6ALX....109
K4KWE....107
VO1HH.....107
LU6FBR....106
HA7PJ.....105
K3FDQ.....105
K9CJU.....105
OK1ALZ....105
W2VJO.....105
G2BXJ.....104
W2IYW....104
W2JMZ.....104
HB9ABH....103
WB2RKH...103
WA7FIG....103
G8LC.....102
HA1VA.....102
K2SIG.....102
W3BZN....102
W3ZNH....102
WB4BKV...102
WA4ECY...102
W6MTP....102
W9VCQ....102
KØEEL.....101
W1WX.....101
WB2BYF...101
WB6OXR...101
W8GKX....101
WA9AZL...101
XE8KGA...101
SP5YL....100
VE2BGJ....100
W3ABT....100
WA4CQN...100
W5IRG.....100
W8KVF....100
WA8NDL...100
WA8QXC...100
W8WUT....100

Radiotelephone

WA2PXI...171
Z88L.....171
JA3CWV....159
W8QBG....146
OH2BH.....139
W4WR.....119
OH2BQ.....113
WB4BDO...112
JA1ALX....109
6Y5GG.....108
JA7BSD....107
K4UOW....106
W5LXX....106
WØLHP....106
K2CHS.....104
WB6RMZ...104
DJ8OF.....103
K2GPL.....103
LU2FAO....103
OE2UE.....103
W4QBY....102
K3FNW....101
KH6FNV...101
LA4VG.....101
W2QIS.....101
WB2RKH...101
WØDP.....101
K2DGI.....100
KØEEL.....100
OA4EE.....100
WB4BKV...100
W5MIR....100
W7ANW....100
W7UTL....100
WA9PZU...100

Endorsements

Endorsements issued for confirmations submitted from April 1, through April 30, 1967 are listed below. Endorsement listings through the 300 level are given in increments of 20, above the 300 level they are given in increments of 10. The totals shown do not necessarily represent the exact credits given but only that the participant has reached the endorsement group indicated.

330
W6IBD
W6KZL
W6RKP

320
W3GRS
W6HYG
W6KUT
W7ADS

310
WA2RAU
W3INH
W5TIZ
W7UMJ

280
WB2EPG
W4FRO
W4HOS

300
DJ9GD
K1YRO
K3DCP
W1DGJ
W2ZTV
WB2HXD
W4UKA

260
DJØKQ
HB9PL
K8EHD
VK3YL
WA4HOM

240
HK3AFB
K4ZCP
VE1ADY
WA2FQG

W8QNW
W9KXK

W6EUF
W9UZS
ZS6YQ

W4NBV
WA4WAO
W6CUF
WB6LZI
WØCAW

220
HCWN
K1TUQ
KØJPL
SM5BVF
W2MOF
WB2BOV
W4GTS
W4ID
W6BZ

W7RVM
ZL1HW

200
JA1ZZ
K1OOJ
K5SSZ
KØBHM
SP8SZ
SP9DH
W2HUG
WB2PGM
W3AXW
WA3ATP
WB6EFA
W8ELE

WA9LZA
WA9NUQ
WØRZU

180
EI5F
F2PO
HB9AT
HIZYM
K9AWK
PAØXPQ
SM4CMG
WB2AMO
W7TLG
W7VRO
WA9IVL

160
K1NWE
K5IIN
WA1ABW
W2NCG
W2RIR
WA2BEX
W3KJ
W4ETO
W5NLP
WB6JWY
WA6OIU
ZS5RS

140
K1EIN

K1QGC
KL5LZ
K1VSK
K2AGU
KØBHT
OZ3PO
VE2JD
VE5DP
WB2HZH
WA2QHK
W3IWS
WA3GTX
W4CRW
W4JTX
W5KFN
W8AL
W9POC
7Z3AB

120
JA1AKH

K1IEM
K3SGE
K5BYV
KØBHT
OZ3PO
VE2JD
VE5DP
WB2HZH
WA2QHK
W3IWS
WA3GTX
W4CRW
W4JTX
W5KFN
W8AL
W9POC
7Z3AB

Radiotelephone

330
WØQVZ

320
W2BQM

310
ON4DH

300
K5JEA

W6HYG
W6MBD

280
W1CGX
W2CZF
W2NUT
WB2EPG
W6CHV
W6QOG
W7QPK

W9JT

260
K5AWR
K9PPX
SM5CZY
W6KUT
ZS6YQ

240
VE1AFY

VE2ANK
W2FXA
W3GRS
WA4HOM

220
HCWN
K4FTZ
W2JAE
WA4WAO
W8ACT

200
HLAG
K4GXO
K4PQV
OE7UD
WB2NIC
WA3ATP
W4NBV
WA5IEV
W7DQM
WA9NUQ

F5JA
HIYRK
VE3AAZ
W6ABJ
W9KXK

160
EA2EL
K4UFE
PAØXPQ
W1FXD
W3KJ

WB6JWY
W6MBV
WA6OIU
WA8LUC
YV3KV

140
K2OOJ
K4UFE

WB2WOU
W4ETO
WA4WTG
W7JWE
W8FOV
WA8SNM
WØYDB

120
K1IYD

K5EXW
WØPAN/-
KH6
WB2GSK
W4KOU
W4UF
W6GRX
WB6EFA
YV3CN

using a single band low power transceiver on 75 meters.

Based on logs received by May 18, the following are high claimed scores, numbers of QSOs and sections with final corrected results to appear in the July CD Bulletin — *WA2BAH*

C.W.

W9YT (K9ZMS, opr.)	229,775-700-65
W8UM (K2SIL, opr.)	221,100-653-67
W6DGH	206,695-610-67
W1FJJ	202,005-597-67
K1LPL	194,880-602-64
K1ZND	191,425-582-65
K1WJD	181,170-544-66
WA9NFS/9	178,605-562-63
W4DVT	168,640-520-64
WØEEE (KØVXU, opr.)	166,635-526-63
W6ASH	100,225-483-65
WB6KIL	143,850-407-70
K4BAI	139,190-442-62
W2SEI	138,260-439-62
WA2UWA	134,200-440-61
KØAZJ	132,900-439-60
WB2RKK	126,480-401-62
W4BZE	124,745-404-61
W2GKZ	121,920-374-64
WB2OHK	119,400-398-60
K3HNP	118,900-405-58
KØORK	116,510-376-61
W4WHK	114,900-378-60
K5OCX	113,680-386-58
W8VPC	107,590-364-58
W3KJJ	106,020-336-62
W4KFC	103,090-331-61
K2AJA	102,660-341-59
W1ARR/3	100,605-346-57
WA3BGE	100,595-336-59
WA9ITB	100,040-323-61
W1AW (6 oprs.)	302,940-887-68

PHONE

W9YT (K9LBQ, opr.)	70,755-260-53
WA9ITB	64,000-251-50
K2QDT	48,400-216-44
K8HKB	40,050-172-45
W1AW (WA2BAH, opr.)	33,135-136-47
K2AJA	30,100-133-43
K1YSD	20,400- 97-40
WA2UWA	20,125-115-35
K4TTN	20,000-100-40
W6DGH	19,260-100-36
W2ZVW	18,645-106-33
W3KJJ	14,880- 90-31
W9LNQ	14,025- 78-33
WA9NFS	14,000- 75-35
K9LVK	13,695- 79-33
W9GIL	13,530- 76-33
K2EIU/5	13,190- 66-36
WAØGVJ	11,840- 59-37
WB2RKK	11,340- 74-28
3C3GBX	10,500- 75-28
K9IVG	10,360- 72-28
W1GKJ	10,350- 64-30
KØLGZ	10,240- 61-32

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 July 12 at 0130 GMT. Identical texts will be sent simultaneously by transmitters on c.w. listed frequencies. The next qualifying run from W6OWP only will be transmitted July 6 at 0400 Greenwich Mean Time on 3590 and 7129 kc. *CAUTION!* Note that since the dates are given per Greenwich Mean Time, Code Proficiency Qualifying Runs in the United States and Canada actually fall on the evening previous to the date given. *Example:* In converting, 0130 GMT July 12 becomes 2130 EDST July 11.

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 is sent daily by W1AW at 2330 and 0130 GMT, simultaneously on listed c.w. frequencies. At 0130 GMT Tuesday, Thursday and Saturday, speeds are 15 20 25 30 and 35 w.p.m.; on Monday, Wednesday, Friday and Sundays, speeds are 5 7½ 10 13 20 and 25 w.p.m. For practice purposes, the order of words in each line may be reversed during the 5 through 13 w.p.m. tests. At 2330 GMT daily, speeds are 10 13 and 15 w.p.m. The 0130-0220 GMT runs are omitted four times each year, on designated nights when Frequency Measuring Tests are made in this period. To permit improving your fist by sending *in step with W1AW* (but not on the air!) and to allow checking strict accuracy of your copy on certain tapes note the GMT dates and texts to be sent in the 0130-0220 GMT practice on those dates:

Date Subject of Practice Text May *QST*.

July 7: *It Seems to Us*, p. 9
July 11: *The Bonus FET 21-Mc. Converter*,* p. 19
July 13: *Antenna Rotators and Indicators*,* p. 31
July 17: *Don't Lose Your Mobile Rig*, p. 55

Date Subject of Practice Text from *Understanding Amateur Radio*, First Edition

July 19: *Tank-Circuit Response*, p. 68
July 24: *Overloads*, p. 68

* Speeds will be sent in reverse order, with highest speed first.

W1AW SCHEDULE, JULY 1967

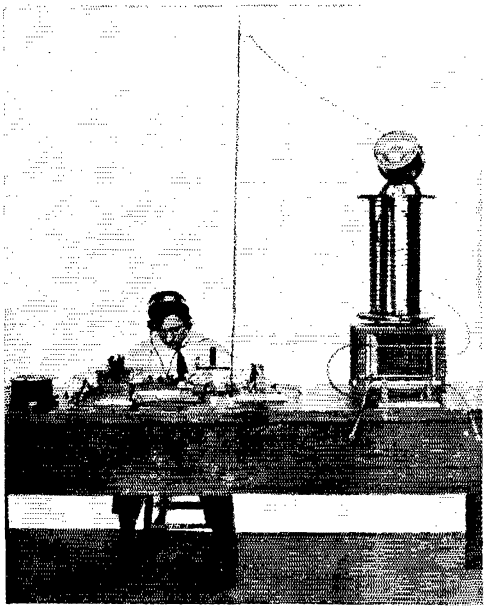
The ARRL Maxim Memorial Station welcomes visitors. Operating-visiting hours are Monday through Friday 1 P.M.–1 A.M. EDST, Saturday 7 P.M.–2:30 A.M. EDST and Sunday 3 P.M.–10:30 P.M. EDST. The station address is 225 Main Street, Newington, Conn., about 7 miles south of Hartford. A map showing local street detail will be sent upon request. The station will be closed July 3–4, in observance of Independence Day.

GMT*	*Sunday*	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*	*Saturday*
0000	.....	CW-OBS[1]	CW-OBS[1]	CW-OBS[1]	CW-OBS[1]	CW-OBS[1]	CW-OBS[1]
0020-0100[4]	.....	.....	3.555[6]	14.1	14.1	7.08[6]	14.1
0100	.....	Phone-OBS[2]	Phone-OBS[2]	Phone-OBS[2]	Phone-OBS[2]	Phone-OBS[2]	Phone-OBS[2]
0105-0130[4]	.....	145.6	3.945	145.6	50.7	1.82	21.41
0130		**Code Practice Daily[1A] 15-35 w.p.m. TThSat., 5-25 w.p.m. MWFSun.**					
0230-0300[4]	.....	.....	3.555	7.08	1.805	7.08	3.555
0300	RTTY-OBS[3]	.....	RTTY-OBS[3]	RTTY-OBS[3]	RTTY-OBS[3]	RTTY-OBS[3]	RTTY-OBS[3]
0310-0330[4]	.....	.....	3.625	14.095	3.625	14.095	3.625
0330	Phone-OBS[2]	.....	Phone-OBS[2]	Phone-OBS[2]	Phone-OBS[2]	Phone-OBS[2]	Phone-OBS[2]
0335-0400[4]	.....	.....	7.255	3.945	7.255	3.945	7.255
0400	CW-OBS[1]	.....	CW-OBS[1]	CW-OBS[1]	CW-OBS[1]	CW-OBS[1]	CW-OBS[1]
0420-0500[4]	.....	.....	3.555[6]	7.08	3.945	7.08[6]	3.555
1700-1800	.....	21/28[5]	21/28[5]	21/28[5]	21/28[5]	21/28[5]	.....
1900-2000	.....	14.28	7.255	14.28	7.255	14.28	.....
2000-2100	.....	14.1	14.28	14.095	21/28[5]	7.08	.....
2200-2300	.....	21/28[5]	21.075[6]	21/28[5]	7.255	14.28	.....
2300	.....	.....	.....	RTTY-OBS[3,7]	.....	.....	.....
2330		**Code Practice[1A] Daily 10, 13 and 15 w.p.m.**					

[1] CW. OBS (bulletins, 18 w.p.m.) on 1.805, 3.555, 7.08, 14.1, 21.075, 50.7 and 145.6 Mc.
[1A] Code practice on 3.555, 7.08, 14.1, 21.075, 50.7, and 145.6 Mc.
[2] Phone OBS (bulletins) on 1.82, 3.945, 7.255, 14.28, 21.41, 50.7 and 145.6 Mc.
[3] RTTY OBS (bulletins) on 3.625, 7.045, 14.095 and 21.095 Mc. 170/850 cycle shift optional in RTTY general operation.
[4] Starting time approximate. Operating period follows conclusion of bulletin or code practice.
[5] Operation will be on one of the following frequencies: 21.075, 21.1, 21.41, 28.08 or 28.7 Mc.
[6] W1AW will listen in the novice segments for Novices on band indicated before looking for other contacts.
[7] Bulletin sent with 170-cycle shift, repeated with 850-cycle shift.

Maintenance Staff: W1QIS W1WPR W1NPG. *All times/days in GMT, general operating frequencies are approximate.

Strays



These two photographs above represent a spread of nearly 60 years in amateur radio. The young chap seated at the apparatus in the photograph at the top is Dean Farran, now W6DF. The year is 1908 and the place is the amateur radio station at the Los Angeles Polytechnic High School. Old timers will recognize the anchor gap and the hot-wire ammeter sitting on top of the sending helix. The bottom photograph shows Dean at his 1967 station which enables him to keep in touch with his many amateur radio friends in all areas of the world. On the wall is Dean's first license, an "Operator's Certificate of Skill in Radiocommunication," dated June 25, 1912, and his current Amateur Extra Class License.

This is the group of amateurs who gathered at the Grand Chapter meeting of the Morse Telegraphy Club in Los Angeles. The occasion was the annual Morse Day celebration on April 22. Shown from left to right: (front row) W6LC, W6FZC, (kneeling) W6MLZ, K6WL, W6DDB, (back row) W6EDZ, W6WPF, W6VVX, Mrs. Cavadini, WB6BBO, W6GHY, and WA6VTM (*Photo by WB6BBL*)

А	A	Р	R
Б	B	С	S
В	W	Т	T
Г	G	У	U
Д	D	Ф	F
Е	E	Х	H
Ж	V	Ц	C
З	Z	Ч	$\overline{\text{MN}}$
И	I.	Ш	$\overline{\text{MM}}$
Й	J	Щ	Q
К	K	Ы	Y
Л	L	Ю	$\overline{\text{IM}}$
М	M	Я	$\overline{\text{AA}}$
Н	N	Ь	X
О	O	Э	$\overline{\text{UI}}$
П	P		

Amateurs working USSR c.w. stations may be interested in this table. It shows the Russian or Cyrillic alphabet and its international morse code symbols represented by Latin characters. For example, добрый день (good day) is sent as "dobryj denx," or до свидания (good bye) is sent as "do swidaniaa."

Station Activities

• 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

DELAWARE—SCM, John M. Thompson, W3HC—SEC: K3NYG. RM: W3EEB. Del. Army MARS had an FB meeting at Dover. W3DRD is vacationing in Europe and the Middle East. W3HC went to California for the month of May. W3DQZ will be touring to the West Coast July 22 and will be looking for Delaware QSOs with a mobile rig. W3SMA has the call W3AHK which he will use at his Delaware Bay location. W3LML spent his vacation in Florida and worked yours truly from W4HSN. W3KI/4 is operating from his new home in Venice, Fla., and looking for his Delaware friends on 14 Mc. W3EEB ordered a Polycom 62 and will be on 6 and 2 soon. WA3DUM says there is not much traffic on MDDS for Delaware. DEPN reports QNI 65, traffic 25. DSMN reports QNI 64, traffic none. W6FKB, ex-K3UNH, is looking for Delaware contacts from his new QTH in California. *Traffic*: W3EEB 250, W3HC 133, W3DKX 23, WA3DYG 21, K3NYG 10, WA3DUM 6.

EASTERN PENNSYLVANIA—SCM, Allen R. Breiner, W3ZRQ—SEC: W3ELI. RMs: K3YVG, K3MVO, W3EML, W3MPX. PAMs: W3FGQ, W3SAO. At the Spring E. Pa. Section Dinner-Meeting held Apr. 22 all three section traffic nets concluded they would operate on Eastern Daylight Saving time for the summer season. The EPA C.W. Net had QNI of 463 and QTC of 371. The PTTN (*training net*) had QNI 369 and QTC 287. The Eastern Pennsylvania Emergency Fone & Tfc. Net had QNI 774 and QTC 252. Fourteen years ago your editor joined the EPA C.W. Traffic Net and since that time has not regretted one *second* of its experience and friendships it has afforded. Among the 89 awards and certificates I hold, I shall cherish and recall the ORS, OPS, OBS, EC, OO, RAI and Asst. Director appointments. In May, 1959, the section elected me as its Section Communications Manager and since that time I have mentioned my personal station activities only three times in eight years, so you will forgive me for utilizing the foregoing space to catch up. I wish to convey my thanks and appreciation to the two c.w. traffic nets for sponsoring me as candidate for another term as SCM. With apologetic and sincere regrets I had to decline at the last minute. It is better to lose the battle than to have lost a friend. W3ELI was nominated for the SCM office and rather than run against my best friend, I chose to drop my hat from the ring. In the past eight years I have made many friends. I also have accumulated those of the oppisite extreme. These are the spoils of notoriety, yet I never actually cared who the victor was, *but* how fair the game was played. All section appointments, traffic netters and clubs please note: All future station activity reports should be forwarded to your new SCM, George Van Dyke, Jr., W3ELI, 4607 Convent Ave., Philadelphia, Pa. *Traffic*: W3EML 713, K3MYS 320, K3MVO 299, WA3CTP 238, W3AEQ 197, W3MPX 175, K3YVG 161, WA3ATQ 157, WA3FVK 131, K3RTX 114, W3AIZ 92, W3FGQ 86, WA3AFI 77, W3NNL 74, WA3BSV 68, WA3FWT 65, W3CBH 57, W3VAP 54, W3OY 48, K3KKO 41, WA3EMO 39, WA3AIB 38, WA3GLI 35, WA3CFU 33, WA3GAT 32, WA3EXW 31, K3VBA 27, K3HHB 26, K3KTH 24, WA3EEC 19, WA3EXB 19, W3RV 18, W3KJJ 14, K3HKW 13, W3JKX 12, K3MDG 12, WA3ERA 5, W3BUR 3, K3FOB 3, WA3CKA 2, K3VAX 2, K3WEU 2.

MARYLAND-DISTRICT OF COLUMBIA—SCM, Carl E. Andersen, K3JYZ—

Net	*Freq.*	*Time*	*Days*	*Sess.*	*QTC*	*QNI*	*Mgr.*
MDD	3643	0000Z	Daily	30	254	13.2	K3OAE, RM
MEPN	3820	2200Z	M-W-F	21	66	19.8	K3NCN, PAM
MEPN	3820	1700Z	S-S				
N. OWL	50.250	0400Z	Daily	30		10.0	
MTMTN	145.206	0130Z	T-W-F-S	16	15	6.3	K3NOQ

New appointments: K3ANA and WA3GTX as OOs Class IV; WA3BDK as ORS/OPS. Renewals: W3LDD as EC for Harford County; K3LFD as ORS/OPS/PAM. New AREC stations: W3DQH, WN3GZM, W8APZ/W3CBG, W3KMV, W3EGR, WA3EWT, W3OSZ, WA3FVA and WA3FRL. In April your SCM visited the Easton ARS, Maryland Two-Meter Termites and the St. John College High School ARC. W3LUL sends an interesting schedule of technical topics to be discussed at coming RCARA meetings. WA3ELA reports activity in the V.H.F. SS and hearing VP7NH on 6 meters. W3GKP sends data on 2-meter f.m. operation and a paper on "channel-switching trick" for mobiles. K3LLR is on the air on all h.f. bands again. W2NIY/3 has resumed his OO operations. W3CVE had an SET for Prince Georges County Apr. 30. W3TN still is QNI on many nets many times each month. K3LFD is reworking antennas and improving the station layout. K3QDC reports 37.5K in the April CD Party. W3ZNW is on 2 meters but needs a better antenna. K3NOQ is 6-meter mobile with a Swan 250. WA3EKS says the last windstorm converted his dipole to a random wire. Welcome back to W3ATQ, who has returned to MDD after a long absence. W3MCG lost 9 feet from the reflector of his 40-meter beam but with the return of EDT he will have more time for maintenance and yard work. W3UE has been ailing but now is back on his feet. W3PRC has been appointed RACES Officer for Harford

MARYLAND-D.C. QSO PARTY

August 6, 1967

All amateurs are invited to participate in the second MD-DC QSO Party, information forwarded by the MD-DC, SCM, K3JYZ.

Rules: 1) The party begins at 0001 GMT and ends at 2359 GMT August 6. 2) A station may be contacted only once on each band and mode (i.e. c.w.-phone-RTTY). Separate logs must be submitted for each mode. 3) Exchange: MD-D.C. stations send QSO number, RS(T), and county. (Independent cities, Baltimore and Washington, D.C. count as separate counties). All others send QSO number, RS(T) and ARRL section or country as applicable. 4) Scoring: MD-D.C. stations score one point for each number sent and one for each received, multiplied by each different ARRL section of country. All others score one point for each number sent and one point for each number received, multiplied by each different Maryland county, (25 total). 5) Certificates will be awarded the highest scoring station (total all modes and bands) in each ARRL section and country. When more than six stations submit logs from one section, second place will be awarded. More than ten, third place will be awarded. 6) A readable copy of the log showing contest station call and location, QSO numbers sent and received, times, date, stations contacted, RS(T) sent and received, county and/or ARRL section or country should be mailed to C. E. Andersen K3JYZ, 14601 Claude Lane, Silver Spring, Maryland, 20904 (post-marked before Sept. 1, 1967). Each entry must include a signed statement that the operator has observed all the regulations of his country and that the decisions of the contest committee will be accepted as final. No logs will be returned. Enclose an s.a.s.e. if the contest summary is desired. 7) Suggested frequencies: 3575 3850 7075 7275 14,075 14,275 21,075 21,325; 50.1 and 145.1. Novices 3735 7175 and 21,110.

County. WA3GAD reports working lots of DX with a new Galaxy 5 MK II. K3QDD is in the final 2-month countdown at M.I.T. W3TMZ/3 reports 2525K from the gang on the second week end of the C.W. DX Test. WA3-GJD is a new General. K3OAE soon will have a new DR-30 receiver. K3CYA is chasing and reporting intruders. WA3EEQ's XYL is now on the road to recovery. Traffic: W3CVE 162, W3TN 154, WA3CFK 133, WA3EKP 82, W3DPR 81, K3LFD 80, WA3EEQ 77, K3JYZ 66, K3-QDC 60, K3FQF 43, K3QFG 43, W3ZNW 32, WA3BNL 30, WA3ELR 26, W3GZK 26, W3PQT 24, K3OAE 20, WA3CBC 17, W3ECP 16, K3URE 16, K3LFN 14, K3NOQ 14, K3TBD 14, WA3CEK 13, WA3EKS 13, WA3ERL 13, K3FKU 13, W3ATQ 12, WA3EOP 10, W3MCG 10, W3EAS 8, W3UE 7, K3VHS 7, K3VLS 6, WA3GVH 4, W3BWT 2, WA3GAD 2, W3PRC 2, K3QDD 2, WA3BDK 1, WA3GLP 1, K3NCMI.

SOUTHERN NEW JERSEY—SCM, Edward G. Raser, W2ZI—Asst. SCM: Charles B. Travers, W2YPZ. SEC: W2BZJ. RMs: WA2KIP, WA2BLV. PAM and NJPN Net Mgr.: W2ZI. NJN reports QNI 525, total traffic 294; NJPN reports QNI 622, traffic 175. I have had many requests this past year to visit the W2ZI Historical Wireless Museum, a project of some 35 years standing. Just write or phone me at 609-882-6645 for an appointment date. I'll try to accommodate all. WB2MOQ was high man in the Jan. CD Party. W2ZVW top man on phone. The West Jersey Radio Amateurs of Burlington is now ARRL affiliated. WB2UZB is a new ORS. WA3BBI 2 has the new call WA2ANL in Bordentown. K2JOX and W2VCX did very well in the Feb. FMT. We are sorry to lose WB2VFX, Jr. and Sr., as OVSs and active AREC stations. They are moving to Chester. WB2MRD is attending school in Philadelphia. WB2VVJ, Gloucester EC, has a very well-planned and active AREC group. W2ZI and WA2KIP attended the Navy MARS meeting Apr. 9 at Navy Yard, Phila. W2EBW recently received her DXCC certificate. W2ORS rejoined ARRL. W2ZEW's new job with RCA will curtail activity on the nets. W2-ZVW has a new SB-100 rig in the car. WB2SBD received a QSL card from Arthur Godfrey. The Annual NJN Confab was held at Red Cross Hq. in New Brunswick Apr. 30 with both SCMs, Asst. SCMs and RMs in attendance. Traffic: WA2KIP 139, W2ZI 104, WA2UPC 93, WA2BLV 78, W2ZVW 50, W2CKF 48, W2YPZ 42, WA2ANL 12, WB2MRD 10, K2SHE 10, WA2DVU 9, W2ORS 6, WA2-KAP 4.

WESTERN NEW YORK—SCM, Charles T. Hansen, K2HUK—SEC: W2RUF. PAM: W2PVI. RMs: W2EZB and W2FEB. The NYS C.W. Net meets on 3670 kc. at 1900; ESS on 3590 kc. at 1800; NYSPTEN on 3925 kc. at 2200 GMT; NYS C.D. on 3510.5 and 3993 kc. (s.s.b.) at 0900 Sun. and 3510 kc. at 1930 Wed.; TCPN 2nd Call Area on 3970 kc. at 0045 and 2345 GMT; NYS County Net on 3510 kc. Sun. at 1400 GMT and 2345 GMT on Mon. Appointments: WB2OYE and WB2DMU as ORSs; WA2-YNS as OPS; WA2EKE as OVS. Endorsements: W2IDM as St. Lawrence County EC, K2KTK as ORS, WA2HSB as OPS, W2RQF and K2KTK as OOs and W2IDM as OVS. W2IDM is retiring as RACES Radio Officer and will be succeeded by WB2ASK in St. Lawrence County. W2FVI received A-Operator and top c.w. for W.N.Y. in his first CD Party. WB2SIA was elected pres. of W1CTQ (Exeter Academy RC in N.H.). All 12 members of the NYSPTEN Policy Committee met in Syracuse. W2SEI reports that W2RUF won the c.w. receiving contest at the RAGS Hamfest, 40-w.p.m. pencil copy! RAGS again will participate in the 1000 Islands Regatta, providing complete communications including ATV coverage. W2EMW reports 291 countries confirmed; he's still using his 90 watts. WB2KTB now is back in full operation following an illness and change in QTH. 6-meter mobiles traveling to Expo 67 should monitor 51 Mc. as that is the most used frequency from the Albany area north. 146.94 Mc. on f.m. is used throughout N.Y. state and in the Montreal area. K2AYQ, Glens Falls area EC, reports that AREC provided communications for the White Water Derby at North Creek. Anyone who desires to become a communications advisor to a local ski patrol, please contact K2-HUK. The RARA elected W2SXV, pres.; WA2FVG, vice-pres.; WB2HLI, treas.; WB2MCP, secy.; WA2KMI, WB2WK, WB2ERE, WB2FJU, WB2RVV, W2MPM and WB2MAC, executive committee. The BARRA supplied mobiles and base to WKBW for an all-day radio appeal for funds for multiple sclerosis. DJs rode bikes and mobiles monitored the race. Some of the calls heard on the 50,000 watts were W2EUP, WB2NFD, W2PVL, WA2-EGW, K2GUG, WB2WEI, WB2QKC, K2ISO and WA2-ZZZ. Traffic: W2SEI 261, W2OE 220, WA2IHP 167, K2-RYH 156, W2RUF 138, W2GVH 134, WB2OYE 95, W2-FEB 86, WB2GAL 74, WA2HSB 53, W2FCG 49, W2RQF 43, K2JBX 33, K2OFV 33, WB2SMD 32, WB2SIA 28, W2HYM 27, K2KTK 18, W2CFB 17, K2IMI 17, WA2-MWF 16, W2MTA 11, WA2AWK 10, K2DNN 9, W2PNW 8, W2PVI 8, WA2ANE 7, K2AYQ 6, WB2BJN 5, WB2-UQJ 5, W2EMW 4, K2SSK 4, K2HUK 2.

WESTERN PENNSYLVANIA—SCM, Robert E. Gawryla, W3NEM—SEC: K3KMO. PAM: K3VPI (v.h.f.). RMs: W3KUN, W3MFB, W3UHN, K3SOH. Traffic nets, WPA, 3585 kc. daily at 0000 GMT; KSSN, 3585 kc. Mon. through Fri. at 2330 GMT. W3GJY reports W3SIR was declared the 1966 winner of the William G. Walker W3NUG Memorial Award. New appointments during Apr. were K3SJS as ORS, WA3FLM as OPS, K3CYR as OBS, WA3EPQ as EC for Centre County. WA3EPQ replaces K3CXZ, who has left for W6-Land for additional education toward his PHD degree. WA3-BLE made the BPL for the second time and the second month in a row. WA3BLE and WA3FLM operated in their first CD Party (Apr.). WA3BGE finally broke 100,-000 points in the April CD Party. WA3BGE also received his FCC 1st-class commercial license. The *Radial* reports W3LTH is giving code lessons to the Novices in the club; WN3GKL replaced his old dipole with a vertical skyhook; WN3GKY finally got his rotor; WA3CAQ has been working DLs from his mobile station located in the vicinity of the local cemetery. W3KUN reports another record-breaking month for the WPA Traffic Net with 30 sessions, 346 messages cleared and 474 total QNS. This is a new QNS record for the WPA traffic gang. Traffic: (Apr.) WA3BLE 334, W3KUN 168, W3NEM 157, K3SOH 133, W3LOS 117, WA3EPQ 58, K3SJS 38, K3RZE 32, K3PYS 30, W3MFB 24, K3SJN 21, K3HCT 18, WA3FLM 10, W3YA 10, WA3BGE 9, K3EDO 8, K3HKK 5 (W3-NEM op.). (Mar.) WA3CCF 70, WN3GZK 11.

CENTRAL DIVISION

ILLINOIS—SCM, Edmond A. Metzger, W9PRN—SEC: W9RYU. RM: WA9GUM. PAMs: W9VWJ, WA9-CCP, and WA9KLB and WA9RLA (v.h.f.s). Cook County EC: W9HPG. Net reports:

Net	*Freq.*	*Times*	*Days*	*Tfc*
IEN	3940 kc.	1400Z	Sun.	16
ILN	3760 kc.	0000Z	Daily	171
NCPN	3915 kc.	1200Z	Mon.-Sat.	303
NCPN	3915 kc.	1700Z	Mon.-Sat.	368
Ill. PON	3925 kc.	1700	Mon.-Fri.	329
Ill. PON	50.25 Mc.	2000	Mon. & Thurs.	2
Ill. PON	145.5 Mc.	2000	M-W-F	49
TNT Net	145.36 Mc.	2100	Sun.-Fri.	100

The 75-Meter Interstate Single Sideband Net had a traffic count of 702 and 9RN traffic was 672. W9KEZ, W9JZL, W9ZQT, K9ZNZ, W9JUV/K9OSO, W9WYB, K9-WMP, W9CNC/KØBLB, K9AAJ, K9IFE, W9HPG, W9-HSD, W9QKE, W9MKL, K9HDZ, WA9QLN, K9WEH, W9VOX, W9REC and WA9QXT participated in the recent ARRL FMT. K9GHR, W9IBX, WA9FGP, W9NWK and W9SKX were elected officers of the Wheaton Community Radio Amateurs. W9HXW pres. of the Illinois Teleprinters Society, joined the ranks of Silent Keys. WN9-

ILLINOIS QSO PARTY

August 5-6, 1967

All amateurs are invited to participate in the Fifth Annual Illinois QSO Party, information as forwarded by the Illinois SCM. The contest starts at 1600 GMT August 5 and ends at 2200 GMT August 6. The same station may be worked once on phone and once on c.w. Suggested frequencies are 3600 3900 7040 7220 14,080 14,300 21,100 21,300 28,100 and 28,700 kc. Exchange QSO number, report and county (in Illinois) or state, province or country, Illinois stations multiply total QSO points by the number of different states, provinces and countries worked. All others use the number of different Illinois counties for multiplier. In Illinois single and multiple-operator stations will compete for 1st, 2nd and 3rd place certificates. Outside Illinois, a certificate will go to the high scoring station in each state, province and country. Logs must show dates, times, stations, exchanges, band, mode and score claimed. Illinois stations must show whether single or multiop. Postmark logs no later than Sept. 1, 1967 and send to Illinois QSO Party c/o Cliff Corne, K9EAB, 711 West McClure Avenue, Peoria, Illinois, U.S.A., 61604.

UHI and WN9UHJ are new calls in Princeton. The Elmwood Park Net has changed its name to the Twilight Net. K9PPX and WA9IIA have new Swan 350s. The Montgomery County Amateur Radio Emergency Corps celebrated its annual Ham Scramble Apr. 16. WA9LGT has erected a new three-element beam on a 40-ft. tower. K9CBN has gone s.s.b. The Hamtesters will celebrate its 33rd Hamfest Sun., Aug. 13 at Santa Fe Park, Willow Springs. Individual operators and also the various nets were very active in providing emergency traffic and welfare messages during the recent tornado in the northern part of the state. W9IPG and W9PRN spoke at the Apr. meeting of the Champaign Radio Club. W9IHSD has replaced his ice-damaged antenna with a 50-ft. tower and a TA-33 beam. The Bowen High School Amateur Radio Club is now ARRL-affiliated. WA9OTD was appointed ORS and WA9RLA is a new OPS. W9ZTK is bringing in the CD scores with a new Windom. The Worth Township Amateur Radio Club, Hamtesters and the Six Meter Club put on a demonstration of amateur radio at Ford City in Chicago, May 18 to May 21. W9-TRO, WA9RKI, WA9RJR, W9RQR, WA9CEO and K9-RWE were elected officers of the St. Clair Amateur Radio Club. WN9TIK received his license. K9KQR passed the Extra Class exam and is now in Japan with the Air Force. W9FBB and K9RZP have been working good DX on 10 meters. WA9PDT is now a major in the Missouri Air National Guard. W9EUN, the Men's Residence Hall Club station at the U. of L., conducted an Easter Greetings Radiogram service for students on campus. The first Chicagoland TV programs on amateur radio made its Ham debut on Channel 32, WFLD-TV, May 6. WA9RLA was named Ham of the Month by the Tri-Town Radio Amateurs Club. Traffic: (Apr.) WA9CCP 257, K9KZB 230, WA9MHU 204, W9DOQ 184, WA9PPA 165, W9EET 150, WA9GUM 137, W9CGC 127, WA9OTD 118, W9NXG 96, WA9QXT 92, W9EUN 71, WA9POZ 62, W9HOT 52, WA9RSN 50, W9HSD 47, WA9LGT 37, W9LAU 27, WN9-SPA 25, WA9QFT 20, W9IDY 18, W9PRN 18, W9YGH 18, W9LNQ 14, WA9LDC 13, W9IPG 9, K9IISK 9, W9-HJM 7, K9HRC 5, WN9UHA 5, WA9FIH 4, WA9HVQ4, WA9RLA 3, K9RAS 2, K9DQU 2. (Mar.) WA9CCP 518, W9YH 7.

INDIANA—SCM, Mrs. M. Roberta Kroulik, K9IVG—Asst. SCM: Ernest Nichols, W9YYX. SEC: WA9GKF.

Net	*Freq.*	*Time*	*Apr. Tfc.*	*Mgr.*
IFN	3910	1330Z daily 2300 M-F	280	K9IVG
ISN	3910	0000Z daily 2130Z M-S	427	K9CRS
QIN	3656	0000Z daily	163	W9HRY

W9PMT, mgr. of Hoosier v.h.f. nets, report Apr. traffic 56, K9EFY, mgr. PON, reports Apr. traffic 119 and Mar. traffic 271. K9YFT, mgr. White River AREC, reports Apr. traffic 7. So. Bend 2-Meter Net, reports Apr. traffic 2. K9DHC, mgr. of RFN, reports Apr. traffic 44. QIN Honor Roll: WA9KOH 30, K9HYV 25, W9QLW 25, K9-VHY 24, K9WWJ 20, WA9KAG 19, WA9RNT 18, W9BDP and K9RLW 16. W9QLW reports Indiana was represented 100% on 9RN. The Evansville Hamfest will be held July 16. W9KVE and W9MOH had a wonderful time in Europe. The Ft. Wayne ARC has been reactivated with W9TE as pres. New pres. of the No. East Indiana ARC is WA9GNA. WA9HQP is now serving a tour of duty in the Navy. WA9AXF passed the General Class exam and is building an HW-12. WA9GJZ made WAS and received his 20-w.p.m. c.w. certificate. K9KTB, K9YKA and WA9TNH have all passed the Gen. Cl. exam. K9 FZU now has an Invader and an RME 6900. WA9CHY and WA4-RBQ/9 can be heard operating mobile these days. WA9-EAA put up a trapped dipole for 40 and 80. New calls heard in the So. Bend area are WA9TFV and WA5KGZ. *Amateur Radio exists because of the service it renders.* A BPL certificate went to K9IVG. Traffic: (Apr.) K9-IVG 637, W9QLW 340, W9HRY 225, W9JUK 222, K9FZX 147, K9HYV 121, W9MM 99, K9OXA 73, W9DKR 72, WA9KAG 68, WA9GLS 67, K9CRS 65, WA9KOH 64, WA9BWT 61, WA9FDQ 48, WA9LTI 48, K9VHY 46, K9EFY 43, W9SNQ 43, K9FZU 40, W9YYX 38, K9CBY 35, WA9RNT 35, WA4RBQ/9 26, W9PU 25, K9WGN 24, WA9BGI 22, WA9CJR 22, WA9BHG 21, W9UB 21, WA9-KVP 20, W9BUQ 17, W9FWH 17, K9ILK 17, WA9MVW 16, W9DGA 15, K9KTB 15, WA9FSZ 14, WA9GJZ 14, K9RWQ 14, W9BZI 11, W9FJI 11, W9EJW 10, K9GBR 10, K9JQY 9, W9HRW 8, K9KFM 8, W9PMT 8, W9BDP 7, WA9CWF 7, K9YFT 7, W9CMT 6, WA9TBT 6, W9-URQ 6, W9DZC 5, WA9JIX 5, K9STN 5, K9UEO 5, WA9AXF 4, K9FPA 4, WA9NGN 4, K9IIV 3, W9TTK 3, W9ZZR 3, K9UHQ 2. (Mar.) WA9GLS 27, WA9ITB 1.

WISCONSIN—SCM, Kenneth A. Ebneter, K9GSC—SEC: K9ZPP. RM: WA9MIO. PAMs: K9IMR, W9NRP and WA9QKP.

Net	*Freq.*	*Time*	*QNI*	*QTC*	*Mgr.*
WIN	3662 kc.	0015Z Daily	382	138	WA9MIO
BEN	3985 kc.	1200Z Mon.-Sat.	305	170	W9NRP
BEN	3985 kc.	1700Z Daily	599	130	WA9QKP
WSBN	3985 kc.	2215Z Daily	1057	313	K9IMR
SWRN	50.4 Mc.	0200Z Mon.-Sat.	301	23	W9JZD

Net certificates went to WA9DHN, WA9OMO, WA9QKP, WA9RAK, WA9SRV, W9MNG and W9JPC for WIN; K9EMG and WA9QQZ for BEN; WA9SRV for WSBN. New appointments: W9KHH as OVS and WA9OMO as ORS. Renewed appointments: WA9MIO as ORS; W9-ITW, K9UTQ, K9UTN, K9QKG and WA9NBU as ECs, WA9MIO, K9IMR and WA9NBU as OPSs; W9RKP and W9VSO as OOs. W9ODD made the BPL in Apr. and WA9MIO in Mar. W9RKP led the OOs with 21 notices sent. W9KQB was the top WIN QNI in '66. W9YT is NCS on CAN and active TCC. Wisconsin Valley Radio Assn. officers are K9EBL, pres.; K9WDW, vice-pres.; K9BCB, treas.; K9HFR, secy. The Milwaukee AREC group and many other individual stations assisted with communications following the tornadoes in Northern Ill. WA9RAK earned a 9RN Net certificate. Traffic: (Apr.) W9ODD 576, WA9NPB 365, W9YT 315, W9DND 211, W9DYG 167, K9UTQ 150, W9IFS 146, WA9RAK 146, WA9QKP 117, WA9MIO 112, W9ABH 108, W9CXY 94, WA9NDV 85, W9DXV 78, K9GDF 76, W9NRP 65, WA9-NVY 57, K9FHI 52, W9RTP 43, W9AYK 40, WA9NFG 36, W9JKM 29, WA9PKM 29, WA9TXF 29, K9CPM 26, WA9FRV 24, W9IRZ 21, W9BCH 20, W9CBE 19, K9GSC 7, K9IMR 3, K9FWF 2, K9ZMS 1. (Mar.) WA9MIO 579, W9CXY 326, WA9IZK 68, K9CPM 34, W9KQB 33, W9-BCH 20, W9HQT 2, K9IMR 2.

MINNESOTA QSO PARTY

July 16, 1967

All radio amateurs are cordially invited to participate in the second annual Minnesota QSO Party, sponsored this year by the Viking Amateur Radio Society.

Rules: 1) Contact will be between a Minnesota station and a station outside of Minnesota, or between two Minnesota stations. Valid contacts may be made once on c.w. and once on phone, on the same band). 2) Time periods are as follows, in GMT: Phone operation 0000 to 0400, and 1600 to 2000. C.w. is from 1200 to 1600, and 2000 to 2400. 3) Suggested frequencies: C.w.—3580 7080 14.080 21.080 28.080. Phone—3880 7280 14.280 21.380 28,680 and 29,600 (channel 60). Contacts on any other bands or frequencies are valid and are encouraged. On all bands, but especially on 75 and 80, please listen carefully for nets and avoid them. 4) Scoring for Minnesota stations: Multiply total QSOs times your multiplier which is the total number of different ARRL sections and countries worked on c.w. PLUS the total number of different ARRL sections and countries worked on phone. Minnesota may be counted as a section, if worked. Countries must be listed on the ARRL countries list and may not include or be a part of any ARRL section. 5) Scoring for stations outside of Minnesota: Multiply total Minnesota QSOs times your multiplier, which is the total number of different Minnesota counties worked on c.w. PLUS the total number of different Minnesota counties worked on phone (Possible 87 on each mode). 6) Exchange: Minnesota stations send QSO number, RS(T), and county. Others send QSO number, RS(T), and section or country. 7) First place award certificates will go to the highest scoring station in each section or country, provided that station makes at least 5 QSOs, and to the highest scoring station in each Minnesota county, provided that station makes at least 20 QSOs. Certificates will also be sent to the highest scoring Minnesota station and the highest scoring station outside of Minnesota. 8) Logs must contain all of the contact exchange information, plus date, time, band, mode, multiplier lists, and score computations. Logs must be postmarked on or before July 29, and a self-addressed stamped envelope should be enclosed if certificates or the published results are desired. 9) Send logs to: Viking Amateur Radio Society, Box 3, Waseca, Minnesota 56093.

MINNESOTA QSO PARTY

See p. 109

DAKOTA DIVISION

MINNESOTA—SCM, Herman R. Kopischke, Jr., WØTCK—SEC: WAØIEF. RMs: WØISJ, WAØEPX. PAMs: WAØMMV, WAØJKT, WAØDWM, WØHEN. MSN meets daily on 3595 kc. at 2330Z. MJN meets Tue.-Sun. on 3595 kc. at 0000Z. Noon MSPN meets M-Sat. on 3820 kc. at 1705Z, holidays at 1400Z. Evening MSPN meets daily on 3820 kc. at 2300Z. MSTN meets Tue.-Sat. on 50.4 Mc. at 0330Z. Sun. at 0100Z. Minn. WX Net meets daily on 3830 kc. at 2330Z. With the assist of WØRVO, WAØDAS, W9DKN and WØGNS, word was relayed to WØMBD/M in North Dakota, that his son was seriously ill. Through their efforts, Jack was able to fly to his son's hospital bedside in Minneapolis before he passed away. Our deepest sympathies to Jack and his family. WØPHD was able to work WØBJY in Watertown, a distance of some 225 miles, on 422 Mc. for his second state. A new General in Albert Lea is WAØPXT. Bob is running a T-150A and a Knight R-100A. WAØPEV traded his T-60 for an NCX-5 and has worked 46 states and 40 countries with it so far. Newly-elected officers of the Mankato ARC are WAØIDB, pres.; WAØFHK, vice-pres.; and KØCBZ, secy.-treas. Our sincere thanks to all who participated in handling traffic after the damaging tornadoes in S.E. Minn. WØHUU lost his home and antennas to the storm. Congrats to the following new ECs: WØBUC for Crow Wing Co., WAØGGH for Sherburne Co. and WAØAID for Kandiyohi Co. ECs renewed: WØAZR for Mower Co. WØZSW for Olmsted Co. and WAØDFT for Nicollet Co. WAØIEF renewed as OPS. Traffic: (Apr.) WAØEPX 286, WAØPEV 134, WAØJKT 105, KØORK 88, WØOEZ 44, KØSRK 44, WØTCK 42, WAØEDN 40, WØISJ 36, WAØMMV 35, KØFLT 33, WØBUO 21, WAØMJF 21. WAØODB 19, WAØPXT 17, KØICG 16, KØIGZ 16, WØHEN 14, WAØJPR 12, WAØQAK 11, WØKLG 10, WØUMX 8, WAØDFT 5, KØLWK 5, WØAAU 4, WØSZJ 4, WAØFFU 3. (Mar.) WAØPEV 97, WØPET 20, WØHEN 15.

NORTH DAKOTA—SCM, Harold L. Sheets, WØDM—SEC: WAØAYL. OBS: KØSPH, The NDSU Hamfest held Apr. 30 was well attended in spite of adverse weather conditions with 163 registered for the event. The ND RACES Emergency Net went into action to give aid and comfort to those battling the elements to get back home. Everyone made it. Our Director, Charlie Compton, attended from St. Paul. WØEFJ and WAØMND are moving to Devils Lake. WAØPPK finally received her Conditional Class license. WØTNI has a new HW-12A on the air, so has WAØGQI at Fargo. The International Hamfest is going to be held at the International Peace Gardens July 15-16 on the Canadian side in the Erick F. Willis Centennial Building. The Grand Forks gang took the hidden transmitter hunt again at the Fargo Hamfest. WAØAYL got there first. WAØDQX got a cubical quad at the hamfest. Two-meter activity is going along in Grand Forks as a newcomer, K8CLA/Ø, is on two and 432 Mc. WAØMJF, from Crookston, Minn., has joined the fellows in this work. KØOVE contacted WØBHT out at Milton, which is a hop of about 80 miles. KØOVE will be going to Texas for a month. ND RACES Net: KØSPH SO Mon.-Fri. 6:30 P.M. CDT 3996.5 kc. ND PO Net: WAØHUD Mgr. Sun. 9 A.M. and 5:30 P.M. CDT 3845 kc. ND RACES Mar. report: 22 sessions 792 check-ins Tfc 90. Apr. report: 18 sessions 692 check-ins Tfc 57. Traffic: WAØELO 45, W9QNI/Ø 32, WØDXC 21, KØSPH 19, WØDM 15, WAØPPK 4, KØOVE 3.

SOUTH DAKOTA—SCM, Seward P. Holt, KØTXW—SEC: WØSCT. RM: WAØAOY. S.S.B. Net Mgr.: Bob Schaaf, NJQ Net Mgr.: WAØLLG. The South Dakota WX Net closed Apr. 1 to resume Nov. 1 after a very successful season. KØJGM and KØYGZ returned from wintering in California. All of South Dakota mourn the death of WØYVF. His XYL, KØDHA, and two children survive. KØAIE and his XYL celebrated their 34th anniversary Apr. 25. WAØLLG is now net manager of the noon S.D. Net (Nine Jacks and Queen). All interested amateurs are invited to participate. WØSCT, having served since 1957, has resigned as net manager. The South Dakota S.S.B. Net reports 975 QNI, 52 QTC and 148 informal. South Dakota C.W. Net reports 65 QNI, 13 QTC, in 12 sessions. Traffic: WØZWL 368, WAØCIJ 128, WAØPDE 59, KØVYY 46, WAØLLG 44, WAØAOY 33, WØSCT 17, WØDVB 13, WØDJO 10, WØHOJ 7, KØYGZ 6, KØTNM 5, KØJGM 4, KØKOY 4.

DELTA DIVISION

ARKANSAS—SCM, Don W. Whitney, K5GKN—SEC: W5DTR. PAM WA5GPO. RM: W5NND. NMs: WA5PPD, W5DTR, W5MJO and K5ABE. The third Annual Arkansas MARS Hamfest with a special section for a get-together for ARRL members will be held June 3-4 at Calico Rock. Fourth Army MARS command director Roland E. Belk will be the principal speaker. The ARRL section of the convention will deal with "Traffic in Arkansas." WN5RTG, 13 years old and the son of W5DRW, is a new Novice. John reports that Stan worked 20 states and 6 countries his first month of operation. Our congratulations, Stan. Net reports for Apr.:

Net	*Freq.*	*Time*	*Day*	*Sess.*	*QTC*	*QNI*	*Time*
RN	3815 kc.	0001 GMT	Daily	30	49	755	580 min.
AFN	3885 kc.	1100 GMT	Mon.-Sat.	25	9	694	1489 min.
OZK	3790 kc.	0100 GMT	Daily	30	69	238	546 min.
APON	3825 kc.	2130 GMT	Mon.-Fri.	20	126	313	600 min.

Traffic: W5OBD 1333, W5DTR 129, W5MJO 110, WA5KEF 46, WA5PPD 44, K5TYW 8, WA5KQU 2.

LOUISIANA—SCM, J. Allen Swanson, Jr., W5PM—RM: W5CEZ. V.H.F. PAMs: W5UQR, WA5DXA.

Net	*Freq.*	*Days*	*Time*	*Net Mgr.*
LAN	3615	Daily	2330Z	W5GHP
LaPON	3870	Sun.	1300Z	W5KC
Delta 75	3900	Sun.	1330Z	WA5EVU

Please address your communications to W5BUK, Acting SEC for the duration of the hurriance season, at 2609 Halsey St., NOLA. Rumor has it that the BRARC Hamfest was the best ever. W5PM has a new 2K-2 and is pushing 20 with ye ole key. WA5EID has sold his 75A-4 and ordered an R4-A. WA5KLF has been spending his time on MARS. W5MBC promises to be more active during the summer. WA5PWX is very active on LAN. W5BUK, a big DX gun in the state, now has 306 confirmed. WA5LGO has put up a 50-ft. tower and is chasing DX. W5BJG reports great fun in the recent CD Party. W5MXQ says the Jefferson gang is putting up a 2-meter beam on top of 55-ft. pole. W5AJY reports his antenna trouble is cleared. W5CEZ has been named Asst. State Director, Louisiana Army MARS. W5JYA had a nice trip to Puerto Rico and the Virgin Islands. W5GHP outlets on LAN in the northern part of the state. W5LDH held a meeting of all Asst. Delta Division Directors, SCM, etc. prior to his departure for the ARRL Annual Meeting. WA5PWX and WA5NYY, newcomers to LAN, have been doing excellent traffic-handling. WA5OHH and WA5PAN, brothers, have a new Drake T-4X. WN5RTN, their father, recently received his Novice Class license and is working on his General. CLARC's Ham of the Month was W5BBV. K5ABD, WN5RKL and K5EYP are newcomers to the LARC. W5NQQ has been appointed an Asst. Director by W5LDH. Members of the GNOARC are in the process of planning their new club room in the famous International Trade Mart Tower. Traffic: W5GHP 306, W5CEZ 135, WA5PWX 130, K5OKR 77, W5PGT 69, W5MXQ 54, W5BJG 24, WA5LGO 22, W5AJY 21, W5MBC 21, W5JYA 12, W5KC 7, WA5LGO 5, W5EA 4, WA5KLF 3.

MISSISSIPPI—SCM, S. H. Hairston, W5EMM—SEC: W5JDF. WA5OCU is on from Enterprise with a good signal. W5JDF now has both rigs to cover MARS and amateur frequencies 80 through 10 meters. K5UUN is back from overseas. W5OVY, WA5RKP, W5BW, WA5OHQ, WA5CAM are net controls this quarter for the Miss. Sideband Net. W5WMQ is doing a fine job as net mgr. W5JHS has everything under control on the Gulf Coast Sideband Net with the help of his new XYL. W5WMQ has a new frequency meter. W5ODV is a big help as PAM. W5DDZ, W5BW and K5ZGE did a good job as relay stations during the Baton Rouge flood Apr. 14. Some of the faithful stations for regular check-ins lately are WA5PZI, W5HZQ, WA5KPS, WA5MPI. K5SYG and W5BW, as well as WA5OKI and W5WMQ, are to be commended for their net activities. WA5CAM is now working lots of 15-meter DX with a new three-element beam. WA5MPI is operating NCX-5 and a Heath 2-meter rig. Traffic: WA5OKI 275, W5BW 48, WA5JWD 4, WA5MPI 3, WA5JTB 1.

TENNESSEE—Acting SCM, Franklin Cassen, W4WBK—SEC: K4RCT. RM: K4UWH. PAMs: WA4CGK, WA4EWW, W4PFP.

Net	*Freq.*	*Days*	*Time*	*QNI*	*QTC*	*Mgr.*
TSSB	3980	M-Sat.	2330Z	1331	138	WA4CGK
TPN	3980	M-Sat.	1145	1079	137	W4PFP

		Sun.	1300			
ETPN	3980	M-F	1040	365	28	WA4EWW
TN	3635	Daily	0000	121	57	K4UWH
			0130			

New appointees are W4DIY as ORS and WA4NEC as ORS and EC for Bristol. Please contact K4RCT if interested in an EC assignment. Anyone interested in starting a 40-meter c.w. net, slow speed, contact WB4-EPC. WA4ZMK is sporting a new tower and tri-band beam. Active Tennessee stations in the Eye Bank Net are W4ZBQ, WACGK, W4WBK, WA4TTY, WA4DCO and W4ZDK. All roads will be leading to Crossville July 15 and 16. This annual event is sponsored by the Oak Ridge Radio Operators Club. Details may be found on the various nets, or write K4VOP. Ten-meter activity should perk up now with transceivers available from an adjacent band. K4CPM will be happy to furnish details. K4UWH reports cooperative activity with the civil defense group in Johnson City. Communications were furnished for various activities of the Cotton Carnival in Memphis, coordinated by WA4HBY. W4OQG/DL4ZE can be heard on 21,060 talking to the gang back home. ARRL needs your continued support, don't let your membership lapse. Traffic: (Apr.) W4FX 283, W4OGG 190, W4DIY 146, W4WBK 136, WA4YEM 125, K4UWH 77, W4PQP 61, WA4YDT 53, WA4NEC 37, WA4TWL 25, K4UMW 22, W4PFP 21, W4TZJ 21, K4WZY 19, W4LU 16, WA4YHO 14, W4CAT 11, W4TYV 10, W4TZB 10, WA4CGK 8, K4MQI 6, W4SGI 6, WA4DJF 2. (Mar.) W4SP 20, K4VIS 6.

GREAT LAKES DIVISION

KENTUCKY—SCM, Lawrence F. Jeffrey, WA4KFO —SEC: W4OYI. Appointments: WB4BTM as PAM-MKPN. Endorsements: WB4AIN, W4CDA, W4OYI as ORSs.

Net	*Freq.*	*Days*	*GMT*	*Sess.*	*QNI*	*QTC*	*Mgr.*
KRN	3960	M-F	1130	20	384	46	K4KIS
MKPN	3960	Daily	1330	30	382	165	WB4BTM
KTN	3960	Daily	0000	30	767	560	WA4AGH
KYN	3600	Daily	0000	50	364	610	W4BAZ

WB4AIN is operating portable this summer from his summer QTH at Rabbitt Hash, Ky., with a big antenna system. WB4CJM is a newcomer to the Kentucky traffic gang. WA4AGH has new frequency measuring equipment to help him with his OO job. W4ISF is getting 6- and 2-meter finals ready. Officers of the newly-ARRL-affiliated Central Kentucky Amateur Radio Club are K4VZC, pres.; WA4SGB, vice-pres.; WB4BBC, secy.-treas. WA4AGH, K4KGE, K4KZH, W4URG and W4USE provided needed communications during a forest fire in Bullett County Apr. 9. K4PNA is pres. of the Wilderness Road Amateur Radio Club, Danville. Your SCM attended the April meeting of the Kentuckiana Radio Club in Louisville. W4BAZ, RM of Ky., has suspended the slow-speed net for the summer months. Traffic: (Apr.) WA4DYL 625, WA4WWT 354, WA4UIH 190, WA4VUE 160, K4TRT 148, WA4TTE 147, W4BAZ 146, K4DZM 144, WA4AGH 131, WA4KFO 128, WA4AUG 118, K4MAN 105, WA4UAZ 101, WB4BTM 45, WA4TWB 31, WB4CJM 30, W4NBZ 28, W4CDA 27, WB4AIN 23, WB4-AGO 22, K4VDO 21, WA4IBG 20, W4RCE 20, WA4GHQ 15, W4KJP 14, W4OYI 12, K4UMN 8, K4HOE 7, W4BTA 5. (Mar.) W4NBZ 40, W4ISF 12, K4HOE 11.

MICHIGAN—SCM, Ralph P. Thetreau, W8FX—SEC: K8GOU. RMs: W8ELW, K8QLL, W8EU, K8KMQ. PAMs: W8CQU, K8JED, W8IWF. V.H.F. PAMs: W8-CVQ, W8YAN. Appointments: W8IWF as PAM/WSSB Net; WA8CHA, WA8IUT, W8LUH, W8RWK as ECs; K8HLR, WA8IML, K8IRC, WA8ROJ, W8WQH, W8YAN, W8ZLK as ORSs; W8IWF, W9QPO, W8YAN as OPSs; K8HLR as OO; WA8KME as OBS. WA8GRI as OVS.

Net	*Freq.*	*Time*	*Day*	*QNI*	*QTC*	*Sess.*	*Mgr.*
QMN	3663	2300	Dy	929	532	60	W8ELW
WSSB	3935	0000	Dy	1049	88	30	K8AYJ
U.P.N.	3920	2230	Dy				W8OQH
B.R.	3930	2230	M-Fri.	715	86	20	W8ZBT
PON-DAY	3860	1600	M-Sat.	411	255	24	WA8OGR
PON-CW	3645	2330	M-Sat.	167	66	24	3C3DPO
MICH 6	50.7	2400	M-Sat.	308	44	25	WA8LRC
LENAWEE 2	145.35	2300	Dy	358	52	28	WA8AAQ
M.T.N.	3605	0245	Dy	19	11	15	WA8QAF
M.E.N.	3930	1400	Sun.	324	44	6	W8ZBT
S.W. MICH 2	145.26	0100	Mon.	72	00	4	W8CVQ
QCWA	3900	1300	Sun.	—	00	5	W8SAY

Officers: Calhoun ARC—WA8MGO, pres.; WA8RWI, vice-pres.; WA8QBG, secy.; W8NVH, treas. TASYLs—WA8ENW, pres.; WA8CXF, vice-pres.; WA8CTE, secy.; WA8ARJ, treas. B-R and MEN Nets—W8ZBT, Mgr.; W8TIJ asst.; W8FJU, secy.-treas. WSSB Net—K8AYJ, GM, K8OEB, secy.-treas. Chairman Wayne County Mich. week, W8PYW; Oakland County, K8GOU. BPLers: K8KMQ, W8IV. K8CPW is home from Vietnam operating 15 from Austin, Tex. K8YZK and K8MTN have new TR-108s. WA8OOH and WA8LKD are on 2 with homebuilt s.s.b. generators and K1CLL linears, driving with Heath Twoers. K8LYY is on 2 s.s.b. with Gonset Sidewinder and linear. K8YJO is on 2 s.s.b. with HW-32A and homebuilt mixer. Silent Key: K8VLN. The WSSB and B/R Nets picnic will be held at Grayling July 22 and 23. K8IVC/VO2 is in Labrador with the AF. WA8TZZ took first prize in the Sault High Science Fair. The TASYLs still sponsor OH2YL. W8LPA and WA8SIQ are recovering from recent illnesses. WA8EMJ has a "new" 75A-4. W8LPW is back from Nebraska and W8NOH from California. WA8QCV now is out of the hospital. WA8QBS is in Hawaii. WA8NPH is giving up the CB antenna for 80 and 40 vertical. K8PCR's son was wounded in Vietnam but is recovering. WA8RMI made another "friend for ham radio" by helping a broken-down motorist. WN8UIP bought a CB walkie-talkie to convert to 10. Lansing is ARRL section convention city in '68, Apr. 26 and 27. All ECs are urged to also accept RACES officer appointments when possible. Traffic: (Apr.) K8KMQ 432, W8ZGT 366, W8HQL 249, WA8OGR 230, W8IWF 179, WA8IML 178, W8IV 138, K8PBA 108, K8HLR 105, W8FX 103, W8EU 98, W8RTN 93, WA8LRC 90, WA8UVX 90, W8UM 86, WA8MAM 62, W8ELW 60, K8GOU 59, K8JED 59, W8OQH 55, WA8-KME 54, W8QQK 54, WA8LKI 46, K8YGS 44, WA8LXY 43, WA8CQR 42, W8IUC 42, K8QLL 39, K8VDA 39, K8ZJU 38, W8IBB 36, WA8IAQ 34, W8CQB 32, W8YAN 32, WA8PII 31, K3KRX/8 26, WA8BQP 26, W8MRM 26, WA8MCQ 25, WA8ORC 23, W8BEZ 18, W8SWF 16, K8HNN 15, W8TBP 14, K8IRC 13, WA8PZT 13, W8TDA 12, W8UFS 11, K8TYK 10, K8YQC 10, K8MJK 8, WA8-PWF 8, WA8TCY 6, WA8TSB 6, W8WVL 5, W8DSE 4, W8HKT 4, WA8ROJ 4, W8SCW 4, WA8VMZ 3, W8AUD 2. (Mar.) K8HLR 45, K8MJK 29, K8LUY 28, WA8GRI 13.

OHIO—SCM, Wilson E. Weckel, W8AL—Asst. SCM: J. C. Erickson, W8DAE. SEC: W8OUU. RM: W8DAE. PAMs: W8VZ and K8UBK.

Net	*QNI*	*QTC*	*Sess.*	*Ave.*
OSSN	1736	704	55	12.8
OLN		127	30	4.
OSN		30	25	5.

W8PZW joined the Silent Keys. South Shore RC's 1967 officers are WA8SSL, pres.; WA8LOB, vice-pres.; WA8-LMY, secy.-treas.; Richard Ingraham, secy. The club meets in the East Cleveland YMCA. W8WEG reports a representative of Champion Spark Plugs showed pictures of mobile QRN from ignition and W8JBS moved to Lima. W8BZX reports he gave a talk on traffic to the Piqua RC and that K8GWK is now WA4BYB. Inter-City's *IRC News Bulletin* tells us the club visited the shack of K8ERV to watch a demonstration of radio-teletype reception and transmission and the club held an Old Timers' night. Canton ARC's *Feedline* informs us that K8RSC joined the Silent Keys. WA8MGI has been elected pres. of the Case Institute of Technology ARC and the club held antenna parties for W8GNL and K8DQV. The South Shore RC's bulletin, *Mike Talk*, was received for the first time. Your Great Lakes Director W8UPB and your SCM attended the Dayton Hamvention with 3328 in attendance along with W1LVQ, ARRL General Manager, and W1HDQ, ARRL V.H.F. Editor. W8JDV was elected the Amateur of the Year. Speaker at the banquet was Col. Philip G. Cobb, USAF. K8BXT reports he gave a talk on amateur radio to the Howland High School club; K8KFS is in Vietnam; WA8FBF has a new SB-200; K8DTA has a new R4A and T4X; K8NCV vacationed in Calif.; W8HSP vacationed in Fla.; WA8SIB has a new Swan 350 and W8-TTQ is home from the service and has a new SB-101. W8DDG has a Communicator 3. Ohio State U. ARC's officers are WA8TRE, pres.; K8RGI, vice-pres.; WA8-HYQ, secy.-treas. Director W8UPB and your SCM attended the Cleveland Hamfest, sponsored by the Indian Hills RC, at which 340 amateurs were present with over 150 at the banquet. Parma RC's *P.R.C. Bulletin* tells us a movie, Chocolate Town USA, was shown and WA8SVX was in the hospital. According to Massillon ARC's *MARC Newsheet* the club heard Richard Crossman speak on Space Stations and Extra-terrestrial Bases. Tusco RC's *The Beam* reports that ex-W8FWB is now W2CZP and K8GID is working for his Masters' Degree. Toledo's *Ham Shack Gossip* says K8GVI joined the Silent Keys; WN8WAL, WN8VVB and WN8VVF are new Novices; WA8NSH completed his basic training at

Fort Knox; Toledo RC's 1967 officers are K8KYB, pres.; WA8GEL, vice-pres.; K8GOP, treas.; K8DTL, corr. secy.; W8WHA, rec. secy.; WA8RWK has a new 65-ft. tower-Hornet TB500 beam turned by TR44 rotor. W8EQ has a new TA33 beam. Ashtabula ARC's 1967 officers are Ted Laurie, pres.; W8DAT, vice-pres.; WN8TPK, secy.; K8IMX, treas.; K8HRS, K8UKV, K8NSM, trustees. A new bulletin called *The Monitor* was received from the Miami County ARC. Greater Cincinnati ARA's *The Mike & Key* has a page in memoriam to W8IVE, who joined the Silent Keys; W8CZ and W8TYI also have joined the Silent Keys. W8NAL and K8LRK made the BPL in Apr. Appointments made in Apr. were WA8EGG and WA8OVC as ECs; W8TV and W8QXQ as ORSs; W8TV as OPS. Springfield ARC's *Q-Fire* tells us the club held its annual banquet with WIHDQ as its main speaker; WA8AEY and WA8LXZ have a new baby boy; W8ENS joined the Silent Keys and the club toured WKEF studios. Southeast ARC's *Ham-Fax* informs us K8TOL has a new SB-101; WA8MXU has a new Communicator 3 transceiver; K8ZBL spoke to the club on Medical Interest of Cuyahoga County Civilian Defense. The North Shore RC held its Annual Dinner Dance. From the *Ham-O-Gram* we hear that Westpark Radiops' 1967 officers are K8DZR, pres.; W8AJW, vice-pres.; W9FTK/8, secy.; W8WUO, treas. Traffic: (Apr.) W8UPH 442, WA8CFJ 340, W8NAL 238, W8CHT 189, WA8CXY 185, WA8OCG 165, W8DAE 112, K8LGA 110, K8LRK 106, WA8FSX 101, K8UBK 93, W8GVX 92, WA8NTA 92, W8BZX 86, W8QCU 86, W8GOE 85, WA8PMN 83, W8AUZ 79, W8QZK 73, W8PMJ 72, W8QXQ 59, W8DWL 58, WA8PZA 54, WA8TOD 52, K8FZJ 46, W8RYP 46, WA8KUW 43, WA8SED 43, WA8PQL 38, WA8SHP 37, WA8MHO 36, W8FGD 33, W8OE 33, K8LGB 31, WA8LAM 25, W8LT 25, W8DQD 24, K8DDG 20, W8GRT 18, W8OUU 15, W8LZE 14, W8VVL 12, W8WEG 12, K8BXT 10, WA8KPN 10, WA8ALW 9, WA8LOW 9, W8DVM 7, W8GIU 7, K8QYR 7, WA8AZJ 6, K8PMW 6, W8UIX 6, W8ERD 5, WA8PJK 3, W8EEQ 2. (Mar.) W8ILC 34, W8GRT 11. (Feb.) W8ILC 20.

HUDSON DIVISION

EASTERN NEW YORK—SCM, George W. Tracy, W2EFU—SEC: W2KGC. RM: WA2VYS. PAM: W2IJG. Section nets: NYS on 3670 kc. nightly at 2400 GMT; NYSPTEN on 3925 kc. nightly at 2300 GMT; ESS on 3500 kc. nightly at 2300 GMT. Appointment: WB2SHU as OPS. The RPI Club, W2SZ, sponsored a hidden transmitter hunt in April. WB2EAS spoke on antenna-matching at the Albany Club. At the Westchester Club in White Plains the featured speaker was Director Dannals, W2TUK. Also in White Plains, WB2NZI was chairman of a Boy Scout Exposition. We welcome the Taconic Amateur Radio Club of Jefferson Valley as a new affiliate. New officers of the RPI Club include WA0DEV, pres.; K3YZU, vice-pres.; WA2PJL, secy.; WA2KIZ, treas.; WB2BXP equip. supervisor. Two new General Class licensees in Congers are WB2YIP and WB2YIQ. Congrats. WB2TNB reports a new Extra Class license and acceptance at Carnegie Tech. Again congrats. Wesleyan student WB2UEQ 1 trained two classmates through the Novice Class who now are studying for General. After three years on 2 meters WB2FXB has a new T4X and R4A ready for NYSPTEN traffic work on 75. New officers for the Yorktown H.S. Radio Club are WB2VNF, pres.; WN2YMU, secy.-treas. ORS WB2UHZ enjoyed her first CD Party. Net officers for the NYSPTEN are WB2QAP, mgr.; WB2NGZ, 1st asst.; K2SJN, 2nd asst. and K2AAS, secy.-treas. Meteor scatter and many skeds resulted in a QSO between K2DNR and K4IXC (Fla.). Traffic: WB2UHZ 239, K2SSX/2 148, W2UC 94, WA2VYS 65, K2SJN 54, W2EAF 49, WB2FOA 48, WA2SPL 47, WB2TNB/2 47, WB2FXB 41, WB2JYV 33, W2ANV 20, WA2IWL 20, WB2UUD 20, W2URP 14, K2AJA 12, WA2ZPD 12, W2SZ 6, W2EFU 4, WB2QYZ 4, K2HNW 3, WB2SHU 2.

NEW YORK CITY AND LONG ISLAND—SCM, Blaine S. Johnson, K2IDB—Asst. SCM: Fred J. Brunjes, K2DGI. SEC: K2OVN. PAM: W2EW.

NLI	3630 kc.	1915 Nightly	K2DXV — RM
NLIVHF	148.5 Mc.	2000 TWTh	WB2RQF — PAM
NLIVHF	146.25 Mc.	1900 FSSuM	WB2RQF — PAM
NLIPN	3932 kc.	1600 Daily	WB2SLH — PAM
NLS (Slo)	3715 kc.	1845 Nightly	WB2UGP — RM

K2UBG, of Mike Farad fame, went mobile with s.s.b. on 75 and 40. WB2UQP has discovered that the "Lazy Don" antenna discriminates against CD Party signals so it isn't worth fooling with. W2GKZ, our revered old ORS/AD, recently was appointed to the Trans-Continental Corps and now carries the mail from EAN to CAN. WA2LJS says the 146.52 RTTY Net is on every Sun. at 1030 EDST, so bring your RTTY set and join 'em. WB2QJL has a new TA-33 Jr. with tower, but the s.w.r. is so low he's kinda sorry he laid out those simoleons for the s.w.r. indicator. OVS-type WB2DVK is looking for serious-minded experimenters who would like to form a net on one of the v.h.f.s for the purpose of exchanging serious-minded ideas. All those interested are asked to contact WB2DVK, W2EW, beloved old PAM rascal, recently had an operation and is recovering nicely up in Armonk, N.Y. The v.h.f.s, which don't sound the same without W2EW, are looking for his early return. *Spurious Radiations*, official publication of the Rockaway ARC, reports that two of its venerable officials, W2BJM and K2OVN, "didn't climb no towers" on Field Day. As a matter of fact, they emphatically ruled out everything above a nine-ft. sapling! WB2JJW is putting the telephone-relaying activities to better use these days and as a result he bumped into his old pal W6ECQ, ex-K2ORA. W2BCB started making a half-wave beer-can vertical for 10 meters, but got to enjoying it so much he's all the way down to 40 meters now. Hope he stops by the time he gets to the LORAN band! WB2UGP is planning to go to Stonybrook College next year, while WB2EMJ is planning on Syracuse and WB2SRN is looking at Clarkson. W2PF celebrated his 50 years as a licensed amateur by getting a new 75S3-B receiver! WA2JZX reports that the Nassau 10M AREC Net, which meets every Mon. at 2000 EDST on 28.720 with K2DHC/W2ZAI at the helm, tenders a very gracious welcome to all new stations interested in seeing how an FB AREC net works on 10 meters. WA2RUI is out looking for a 20-ft. roof-mounted tower. WB2BKS is replacing the 2-meter beam stolen by the rat-fink-roof-thief with a Hy Gain. WB2AHK put a new HW-32A and a Hustler in the mobile and reports he's working everything he hears. WA2QJU is holding his own over at Columbia. W2HOU is going over to the W4s come September, according to K2DGI. The guys at Cardinal Hayes HSRC (WA2THR) repaired the antenna and have since worked 20 new countries. WB2EUH, one of our ORS-On-Leave was elected vice-president of the Notre Dame ARC. WA2TAQ recently worked K2IJL/5, a member of the Rockaway ARC now stationed at Biloxi, Miss. Traffic: WA2UWA 495, K2UBG 206, WB2UQP 161, W2GKZ 83, WB2FAJ 71, WA2LJS 65, WB2PTS 65, WB2QIL 63, W2EC 44, WB2DVK 40, W2EW 39, WB2JJW 38, W2BCB 24, WB2RQF 24, WB2TCS 23, WB2NGZ 21, WB2UGP 12, W2DBQ 9, W2PF 9, WB2MZE 5, WA2JZX 4, WB2AWX 2, WA2RUI 2, WB2BKS 1.

NORTHERN NEW JERSEY—SCM, Louis J. Amoroso, W2LQP—Asst. SCM: Edward F. Erickson, W2CVW. SEC: K2ZFI. RM: W2BVE. PAMs: W2PEV, K2VNL, WA2TEK. The AREC Net skeds are available from SEC K2ZFI. New appointments: WA2TEK as PAM for the NJPO Net; WB2QJI as ORS; WB2RKK and WB2VUJ as OPSs. We renewed over 45 appointments in April. Many thanks for the continued interest and keep up the FB job. New officers of the Livingston Amateur RC are W2EO, pres.; W2COT, vice-pres.; WB2AUN, secy. Recent graduates of the Knight Raiders V.H.F. Society School are WB2VLC and WB2ZKV passing the General Class. WN2YNS passing the Tech. Class and four Novices. Both W2APL and K2LRF are recuperating after hospital visits. W2AXJ is off to Idaho on business. WB2VUJ, WB2SUQ and W2NCA are looking for more RTTY activity on 2 meters. WB2SQC and his frequency counter put W2LQP's a.f.s.k. oscillator on frequency for 2-meter operation. K2EQP is now in five traffic nets. WB2FIT is reporting his activity from W8UM. WB2WNH finished his 2-meter receiver. W2CFB assisted WN2ATB in getting his ticket. WB2IYO has a new R-4A. WB2UCS obtained a TX-62. The "NJN Family" met in New Brunswick for a business meeting with 24 net members attending. W2JDH finished his SB-301 and turned his HQ-129X out to pasture. WB2RUM is busy working on a new RTTY converter. The school break gave WB2KTO time to pick up 9 new ones toward DXCC 200. WA2CCF received DXCC phone and mixed, also WAS phone and WAC s.s.b. W2VMX swapped his ARC-5 for a sine wave generator in order to get greater FMT accuracy. WB2UFV slowed down with the T4X burnout, back to the DX-40. WA2ASM reports the TCRA auction was the best in years with over 100 attending. WB2AEJ, QRL school, found time to put up a new antenna. WB2TKQ is now a stock broker in Newark. W2KOG is buying FB DX results with his new 10-meter beam. WN2ZSH passed the General Class exam. W2NVA is conducting code classes on 2 meters for the Union County General Class hopefuls. WB2OQM is set to attend Newark College of Engineering in the fall. W2OPK and WA2ASM operate c.w. in AF MARS. Dir. W2TUK and SCM W2LQP spoke to a large group at the Suburban Amateur Radio Club just prior to the ARRL Board Meeting. W2PEV finished his HW-12. WB2QLF/OA4 is keeping the traffic nets QRL. The SCM will be away on

mobile . . .
roughest . . .
or the smoothest . . .
the answer . . .
BIG-K

Business executive—sportsman—radio amateur, Roe Golsch is one of the many discerning BIG-K users who insist upon the finest equipment and who are satisfied only with an ultimate result that is outstanding. Whether spinning along the highway in his handsome Jaguar XKE—or bouncing over Northern California's rugged terrain on a hunting excursion in his fully equipped International Harvester SCOUT, WA6YDW places his reliance on BIG-K for his mobile sky link.

The same BIG-K capable of handling a full 1 kw p.e.p. is available to you with interchangeable inductors for 80-40-20-15-11(C-B) and 10 meters (and add a 300 watt p.e.p. model for 160). Two column lengths are available, long 93" (shown on the XKE) and **short**, 77" (shown on the SCOUT), each with sturdy, machined-yoke hinged joint for fast lay-down, rapid lockup feature. The adjustable top section is part of the BIG-K assembly.

Sky link! Go BIG-K!

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RAYTHEON

Here's Low-Cost "Transceiver" Performance

- A high-performance CW transceiver for the first 250 kHz of 80, 40, & 15 meters
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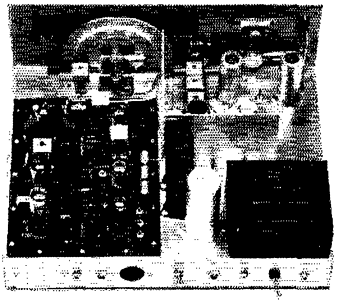
- 75 watts for novice class — 90 watts for general class
- Provisions for VFO transmitter control with HG-10B

New! Heathkit® Novice CW Transceiver.....HW-16 $99.50

Not Just For The Novice, But a High-Performance 3-Band Transceiver For All CW Operators. Use the HW-16 at your beginning code speed — the built-in sidetone lets you hear what you send, helps you build up speed, helps you develop a near-perfect fist. And through the added gain of the dual conversion circuit, plus an RF amplifier stage, the HW-16 has the high sensitivity you need for working DX. That RF amplifier means excellent image rejection for "clean" reception and superior weak signal capability. Crystal controlled first conversion oscillators and a low frequency VFO provide maximum frequency stability. You'll appreciate the sharp (500 Hz) selectivity for peeling through crowded nighttime amateur bands provided by the built-in crystal lattice filter. Better than 1 microvolt sensitivity plus a solid state TR switch for automatic antenna change over and receiver muting means real performance. You'll never outgrow your HW-16. You can work fast "break-in" rag chews and high speed traffic nets with ease. Your HW-16 will even outperform many of the "expensive" rigs on CW.



Circuit board construction and neat, open layout. You'll be proud of your HW-16.

Easy Assembly Gets You On The Air Fast! Layout is open, uncluttered. Solder points are easy to get at. The HW-16 goes together with a combination of circuit board construction and rugged chassis mounting of components that makes simple, straight-forward assembly — assures electrical and mechanical stability. It's a rig you'll be proud of, and want to show to your friends. The assembly manual leads you carefully, step-by-step through the assembly and checkout procedures. Checkout requires only a VTVM, dummy load, and crystals for the bands in which you intend to operate. Headphones, a key, and an antenna are all you need to get on the air. Who said getting a good start in amateur radio is expensive? Order your HW-16 today.

Kit HW-16.....**$99.50**
GD-396, Headphones (not a kit).....**$3.50**
Kit HS-24, Speaker.....**$7.00**
Kit HD-10, Electronic Keyer (for HW-16 or DX-60A)..**$39.95**

HW-16 SPECIFICATIONS — TRANSMITTER: ***RF Power Input:*** *50 to* 90 watts (adjustable). **Frequency control:** 80-meter crystal or VFO on 80-meter band. 80 or 40-meter crystal, or VFO on 40-meter band. 40-meter crystal or VFO on 15-meter band. **Keying:** Grid-block. Break-in with automatic antenna switching and receiver muting. **Output impedance:** 50 ohm unbalanced. **Sidetone:** Neon lamp relaxation oscillator. **RECEIVER: Sensitivity:** Less than 1 microvolt for 10 db signal-plus-noise to noise ratio. **Selectivity:** 500 Hz at 6 db down. **Intermediate frequency:** 3396 kHz. **Antenna impedance:** 50 ohm unbalanced. **External speaker impedance:** 8 ohms. **GENERAL: Frequency coverage:** 3.5 to 3.75 MHz. 7.0 to 7.25 MHz. 21.0 to 21.25 MHz. **Power:** 120 VAC 50-60 Hz. **Transmitter tube complement:** 6CL6 Crystal Oscillator; 6CL6 Driver; 6GE5 Final. **Receiver tube complement:** 6EW6 RF amplifier; 6EA8 Heteroydne mixer-oscillator; 6EA8 VFO mixer-oscillator; 6EW6 IF amplifier; 12AX7 Product detector-oscillator; 6HF8 1st audio and audio output. **Transistor complement:** 2N1274 muting circuit. **Dimensions:** 13¾" W. x 11½" D x 6½" H.

Or "Separates" Versatility In Novice Gear

Heathkit® Novice Combo... HR-10B, $75.00/DX-60B, $79.95

HR-10B Is A Fine Receiver Any Amateur Would Be Proud To Own . . . Now with a scratch resistant two-tone wrinkle finish to match new Heathkit amateur gear. Tunes "amateur bands only" AM, SSB, & CW on 80 — 10 meter bands. The HR-10B has the solid stability you need for copying CW and SSB. Includes an "S" meter, separate RF and AF gain controls, and BFO tuning. There are provisions for an optional 100 kHz crystal calibrator. The RF amplifier for extra sensitivity and crystal lattice filter for optimum selectivity assure excellent all-around performance. If you prefer "separates", here is a dependable low-cost receiver, whatever your test for quality.

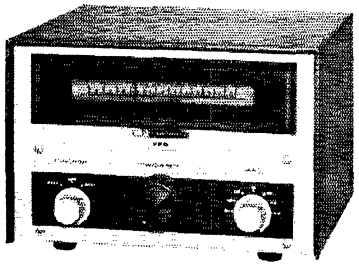
Kit HR-10B.....$75.00
Kit HRA-10-1, plug-in 100 kHz crystal calibrator.....**$8.95**

Heathkit HG-10B VFO — Perfect For The DX-60B or HW-16 . . . calibrated for all bands — takes power from the transmitter. The 28:1 dial drive makes smooth tuning — "spot" switch lets you tune off the air. The perfect addition when you go from novice to general class.

Kit HG-10B.....$34.95

When You Choose "Separates" You Get More For Your Money With The DX-60B . . . run 75 watts CW input for novice class operation — then run the full 90 watts input power on phone or CW (with HG-10B VFO control) when you get your general class license. The DX-60B features the new Heathkit color styling (matches HW-16, HR-10B, HG-10B, and the new Single-Banders). Pi network output circuit permits easy tuneup to any 50-75 ohm load. No other transmitter in this price range can offer you more.

Kit DX-60B.....$79.75



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vacation from July 8 to July 30. W2CVW will be available if needed. Traffic: (Apr.) WB2RKK 451, WA2IGQ 286, WB2IYO 265, WB2WWH 227, WB2SSZ 211, WA2TBS 141, WB2UFV 139, WB2QLF/OA4 114, WB2UCS 57, K2EQP 41, WA2TEK 40, WB2JWB 36, WB2BCS 34, WB2SEZ 34, WB2KSG 33, WB2WNH 32, W2LQP 31, W2CVW 24, W2PEV 24, WB2PXO 24, K2JTU 22, WB2QJ1 18, WB2NZU 16, W2DRV 14, WB2WFO 12, WB2WUT 11, W2EWZ 9, WB2UIR 8, K2MFX 6, WB2RUM 6, WA2ASM 5, WB2VUJ 4, WB2SJH 3, WA2CCF 2, W2JDH 1. (Mar.) WA2IGQ 81, WB2QLF/OA4 35, W2DRV 7, WB2KTO 6, WB2TKQ 1. (Feb.) WB2SSZ 403, WA2CCF 18.

MIDWEST DIVISION

IOWA—SCM, Owen G. Hill, WØBDZ—Asst. SCM: Bertha V. Willits, WØLGG. SEC: KØBRE. PAM: WØNGS. RMs: WØTHU, WØSCA. WØEIT has a new two-element three-band quad on a 60-ft. tower and reports the high-freq. bands are dead. WØLCX received a 35-w.p.m. Code Proficiency certificate. KØJTP has returned from the *Hope*, where he spent from Feb. 15 to Apr. 15 in his medical capacity, *also operating as* HK1AMG. WØSEJ has a new modified twin-city TU for RTTY in operation. WØCRG was host to a fine group of midwest hams Apr. 15. Seems like we all like to go to "The Sheepherders." WNØOJK is secy. of the Pleasant Valley Community High School RC, which is now affiliated with ARRL. On Apr. 30 the Lee Co. WX Net was in session with a tornado watch. WAØATA reports no v.h.f. openings during Apr. WØPAN/KH6 will be back in Iowa for several months and hopes to see old friends. The Iowa 160-Meter Net reports QNI 865, QTC 5, in 30 sessions. The Iowa 75-Meter Phone Net reports QNI 1244, QTC 166, in 25 sessions. Traffic: WØLGG 861, WØLCX 483, WØCZ 75, WAØJEG 29, WAØDYV 27, KØBRE 24, KØKAQ 24, KØQKD 22, WØJPJ 21, WAØAFV 16, WAØJUT 16, WAØBSF 12, WA9RCS/Ø 10, WAØIYH 10, KØTDO 10, WØFDM 6, WØNGS 5, WAØMIT 3, WAØDUB 2. (Mar.) WØFMZ 4.

KANSAS—SCM, Robert M. Summers, KØBXF—SEC: KØEMB. PAM: KØJMF. RM: WAØMLE. V.H.F. PAMs: WAØCCW, WØHAJ, WAØKSK, WAØLSH. WX Net Mgr.: WAØLLC. QKS still meets at 0100 GMT, 8:00 P.M. CDST, on 3610 kc. If you are interested in an OO appointment drop your SCM a line. Hams in North *Central Kansas are bidding farewell to* WØOKH, who is moving to California. The *Kansas PI Net Newsletter* made its first printing in April. This bulletin will be for information to all amateurs interested and checking into 145.35 Mc. at 2105 CDST Sat. at present. WAØHMZ can be contacted on frequency or via mail for more information. The Jayhawk Hamfest was well attended with over 500 registered and 1200 plus attending. The Wheat Belt Radio Club announces its Field Day site as Oberling. The Wichita ARC *picked* WØRCS *as* Field Day chairman. Anyone ever hear an upside down 6-meter signal? Make a sked with KØMXU. The Kansas WX Net reports 2 sessions of emergency weather nature Apr. 16 and Apr. 20. Nothing serious happened.

		Sessions	*QNI*	*QTC*
Zone 7	2 meters	11	32	7
" 7	75 meters	5	63	0
" 10	75 meters	5	69	0
" 13	75 meters	4	61	0
" 15	75 meters	5	67	0
" 15	6 meters	6	17	14
North Central Section PI Net		5	58	1
" "	V.H.F.	11	32	7
QKN			15	4
QKS			251	114
KPN			395	54
KSBN			584	91
Kans EC Net			70	7
KWN		30	858	

Traffic: WAØMLE 287, WØAVX 215, KØVRQ 202, KØGZP 150, KØJMF 145, WØINH 97, WAØLLC 83, KØMRI 69, KØBXF 64, WØCWJ 61, KØUVH 49, KØEMB 45, WAØKHA 41, WAØCCW 34, WAØKDU 31, WAØJOG 29, KØLPE 17, KØKED 15, KØGII 14, WAØKDQ 12, WAØEMQ 8, KØMZZ 3, WAØLSH 1.

MISSOURI—SCM, Alfred E. Schwaneke, WØTPK—SEC: WØBUL. WAØMXF is the new Osage Co. EC. KØORB is a new OO. Appointments renewed: WØBUL as OBS/OPS; WAØFLL as OVS. WAØMXF is Osage Co. RACES Officer. WAØHQR will be operating from Boy Scout Camp at Osceola again this year until July 30. Watch frequency will be 3940 from 1145Z to 0400Z daily. WAØEMS has a new SB-101. KØORB has been active in the Intruder Watch. WAØITU worked 3 tornado alerts as NCS for RACES, Jackson Co. KØJPJ is back in Mo. WØBUL has a new Henry 2K linear on the air. MEN, MTTN and the Hambutchers Net are on Daylight Saving Time. This means that their GMT meeting time is one hour earlier but local time remains the same. QMO is moving to 7075 kc. for the summer. WØRTO is acting mgr. for MoSSB for two months. *KØKRA and WAØPDF are new members of Central* Mo. ARC (Sedalia). Clay Co. RACES has a new tower and antenna system, and with PHD ARC has all-band coverage, 80 through 2 meters including a new Swan 350. K5TEY was operator-of-the-month for HBN. WAØOTS is now Gen. Cl. and WNØOTS has a WAS certificate. WAØDSE, WAØFLL, KØGSV, KØIKZ, KØORB and KØYIP participated in the Feb. FMT. KØYIP was closest with 36.6 p.p.m. average error. Net reports for Apr.:

Net	*Freq.*	*Time*	*Days*	*Sess.*	*QNI*	*QTC*	*Mgr.*
MEN	3885	2230Z	M-W-F	12	170	15	WØBUL
MON	3685	0100Z	Daily	30	217	178	WØTDR
MNN	7063	1900Z	M-Sat.	24	77	28	WØOUD
MoSSB	3963	2400Z	M-Sat.	17	358	120	WØRTO
MoPON	3810	2100Z	M-F	20	304	158	WØHVJ
MTTN	3940	2200Z	M-F	20	277	107	WAØELM
QMO	7075	2200Z	Sun.	5	13	3	WAØFKD
PHD	50.4	0130Z	Tues.(GMT)	4	77	9	WAØFLL
HBN	7280	1705Z	M-F	20	642	195	WAØBHG

Traffic: (Apr.) KØONK 1634, WØEEE 377, KØAEM 322, KØRPH 250, WØZLN 201, WØZBR 131, WØHVJ 106, WAØPYJ 94, WØOUD 89, WAØQOA 85, WAØJIH 73, WAØLOG 52, WAØFMD 48, WØBAZ 40, WAØELM 36, WAØHQR 34, WAØLYE 33, WAØPAN 30, WØBUL 27, WAØQBF 24, KØENH 21, KØORB 18, WØRTO 10, KØGOB 9, WAØITU 7, WØGQR 6, WAØFLL 5, KØJPJ 5, WGØBJ 2. (Mar.) WAØPYJ 136, KØENH 25.

NEBRASKA—SCM, Frank Allen, WGØGP—SEC: KØOAL. New reports for Apr.: Dead End Net, WAØMCX, QNI 273, QTC 48. West Nebr. Phone Net, WØNIK, QNI 691, QTC 30, Wx QTC 136. Neb. AREC C.W. Net, WAØEEI, QNI 12, QTC 2. Nebr. Storm Net, WAØKGD, WAØLOY reporting, 1st session, QNI 1077, QTC 129; 2nd session QNI 1108, QTC 121. Nebr. Morning Phone Net, WAØJUF, QNI 1066, QTC 86. Nebr. AREC Phone Net, WØIRZ, QNI 179, QTC 2. Nebr. C.W Net, WAØGHZ, 1st session QNI 94, QTC 162; 2nd session QNI 122. Nebr. Emergency Phone Net, WAØGHZ, QNI 1443, QTC 121. A new teen-age net has been started at 2230 GMT on 3982 kc. WAØORO is net manager. A Novice net has been started on 3746 kc. at 2000 CST. The Pine Ridge ARC at Chadron reports 100% AREC membership. Can any other clubs in the state match it? Traffic: WAØGHX 365, KØQIX 242, WØLOD 147, WAØPOC 124, WAØLOY 102, WØNIK 89, KØPTK 88, WAØONO 62, WAØHWR 53, WAØJKN 36, WØGGP 31, WAØGVJ 31, KØJFN 28, WAØIBL 24, KØKJP 24, WAØPCR 24, WAØBOK 22, WØVEA 21, WØGEQ 10, WAØQMZ 18, WØAGK 15, KØIXY 15, WØBFV 12, WØEWZ 12, WAØIBB 12, KØJTW 12, WAØOHO 12, WAØLXF 10, WAØEEI 9, WAØDXY 8, WAØODH 8, KØDGW 7, KØOAL 7, KØUWK 7, KØFJT 6, KØHNT 6, WAØJUF 6, WØPHA 6, WØCXH 4, WAØLRP 4, KØODF 4, WØWKP 4, WAØENY 3, WØFHF 3, WAØIND 3, WAØKHE 2, WØRAM 2, WØEQQ 1.

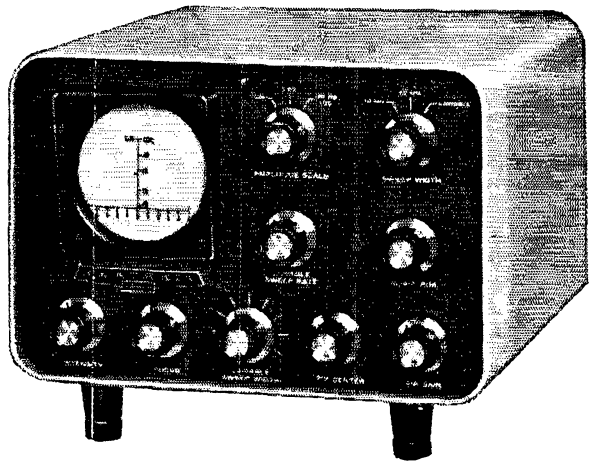
NEW ENGLAND DIVISION

CONNECTICUT—SCM, John J. McNassor, W1GVT—SEC: W1PRT. RM: W1ZFM. PAM: W1YBH. Net reports for Apr.:

Net	*Freq.*	*Days*	*Time*	*Sess.*	*QNI*	*QTC*
CN	3640	Daily	18:45	29	438	448
CPN	3880	M-S	18:00	30	503	229

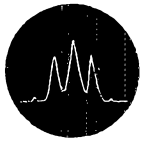
High QNI: CN—W1ZFM, W1BKC, WA1FGN, W1RFJ. CPN—W1GVT 29, W1YU 27, WA1EEJ 24, K1EIC 23, W1LUH 22, W1YBH 21, WA1GBA and K1MBA 18, W1HBH and K1OQG 17, W1MPW 16. The Swampscott ARRL Convention was *the* activity of April. Some of the busiest people included W1PRT, SEC, and XYL K1IIF; also W1QV, N.E. Division Director and the very hard-working staff from ARRL who proved again *QST* is more than just a magazine! The Worked All Conn. Award is now handled by Conn. Council. Contact W1WHQ for details. Willimantic RC's new officers: WA1FXT, pres.; W1NHK, vice-pres.; K1VPF, secy. With sorrow we add the call of K1QAH to the roster of Silent Keys. "Cookie" was pres. of the Meriden Radio Club and an active EC. *IRN Net Bulletins* are provided by W1EFW. Congratulations to WA1FGN and WA9QVU/1 on making the BPL: WA1HSN (ex-WB2PFT) on his Extra Class ticket: WA1GUD, WA1GMF, WA1HCT,

New! The Most Modern Amateur Radio Spectrum Monitor Ever Offered

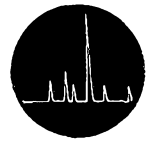


Heathkit SB-620 "Scanalyzer" . . . . Only $119.95

• New narrow fixed sweep function with crystal filter for single signal analysis — 10 kHz, 50 kHz, and variable control to 500 kHz • Increased sweep width capability for monitoring larger band segments — up to 500 kHz for IF's above 455 kHz, and up to 100 kHz for 455 kHz IF's • Matches SB-Series in style and performance • Operates with common receiver IF's up to 6 MHz • Both linear and logarithmic amplitude displays • Long persistance CRT for optimum display • New improved voltage doubler power supply • Mu-metal fully shielded CRT • Simple connection to receiver • Plus all of the versatile performance and operating features already made famous by the HO-13 Spectrum Monitor.



Analyzing Function — 10 kHz preset sweep width — indicate carrier 100% modulated by 2 kHz tone-log scale.



Scanning Function — approximately 250 kHz sweep width — indicates two signals above and three below the received signal, the strongest signal about 30 kHz down the band, down frequency being to the right.

The New Heathkit "Scanalyzer" Boasts Up To A Full 500 kHz Wideband Display — Plus 10 kHz Single-Signal Display. Displays up to 250 kHz either side of receiver tuned frequency (up to 100 kHz for 455 kHz IF's) . . . allows you to easily monitor band activity during contests or openings without going through the tedious hunt-and-tune procedure. The new SB-620 also brings accurate signal analysis to amateur radio . . . allows measurement of carrier, sideband, and distortion product suppression. A quality test instrument. Styled to match the Heath SB-Series equipment, the SB-620 operates with practically all receivers (see specifications). Here is a useful prestige instrument for your amateur station.

Kit SB-620, 15 lbs. **$119.95**

SB-620 SPECIFICATIONS — RF AMPLIFIER: Input frequencies: One of the following; 455 kHz, 1000 kHz, 1600 to 1680 kHz, 2075 kHz, 2215 kHz, 2445 kHz, 3000 kHz, 3055 kHz, 3395 kHz, 5000 to 6000 kHz. **Frequency response:** ±0.5 db at ±50 kHz from receiver IF. **IF frequency:** 350 kHz. **Sensitivity:** Approximately 10 uv input signal provides a visable signal (40 db mark) at full pip gain setting. **Spectrum analyzer:** Test signal input frequencies up to 50 MHz. **HORIZONTAL DEFLECTION: Horizontal sweep generator:** Sawtooth sweep produced by neon lamp relaxation oscillator. **Sweep Rate (Approximate frequencies):** 10 kHz preset: 0.5 Hz. 50 kHz preset; 2 Hz to 2.5 Hz. Variable: 5 Hz to 15 Hz. **Preset sweep width:** 10 kHz preset; 10 kHz. 50 kHz preset; 50 kHz. **Variable sweep width:*** 455 kHz (10 to 100 kHz); 1000 kHz (50 to 100 kHz); 1600 kHz (50 to 500 kHz); 1680 kHz (50 to 500 kHz); 2075 kHz (50 to 500 kHz); 2215 kHz (50 to 500 kHz); 2445 kHz (50 to 500 kHz); 3000 kHz (100 to 500 kHz); 3055 kHz (100 to 500 kHz); 3395 kHz (100 to 500 kHz); 5200 kHz (100 to 500 kHz); 6000 kHz (100 to 500 kHz). **Resolution:** 1 kHz. Note: Resolution is defined as the frequency separation between two equal adjacent signals such that the intersection between their respective pip indications is 30% below the apex amplitude. **Amplitude scales:** Linear: 20 db (10:1) range. Log: 40 db (100:1) range. —20 db Log: (Extends calibrated range to 60 db). **POWER SUPPLY: Type:** Transformer operated; fused at ½ ampere. **Low voltage:** Full-wave voltage doubler circuit, using four silicon diodes. **High voltage:** Full-wave voltage doubler circuit, using two seleium diodes. **Bias voltage:** Full-wave bridge circuit, using four silicon diodes. **Power requirements:** 120 or 240 volts AC, 50/60 Hz, 40 watts. **GENERAL: Tube complement:** (1) 3RP7 CRT, high persistance (yellow trace with screen filter). (1) 6AT6, detector vertical amplifier. (1) 6AU6, IF Log amplifier. (1) 6EA8, sweep oscillator, mixer. (1) 6EW6. RF amplifier. (1) 6EW6, IF amplifier. (1) 12AU7, horizontal, push-pull amplifier. **Diode complement:** (8) Silicon diodes, low voltage rectifier, DC filament rectifier. (2) Selenium diodes, high voltage rectifiers. (1) Silicon diode, voltage-variable capacitor. **Dimensions:** 10" W x 6⅝" H. x 10½" D.

*These sweep widths are minimum values. Actual sweep width ranges will be greater than those listed, depending on the receiver IF frequency for which unit is wired.

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Antenna Standard RS 329

RS 329

FOR LAND-MOBILE BASE STATION COMMUNICATION SERVICE...

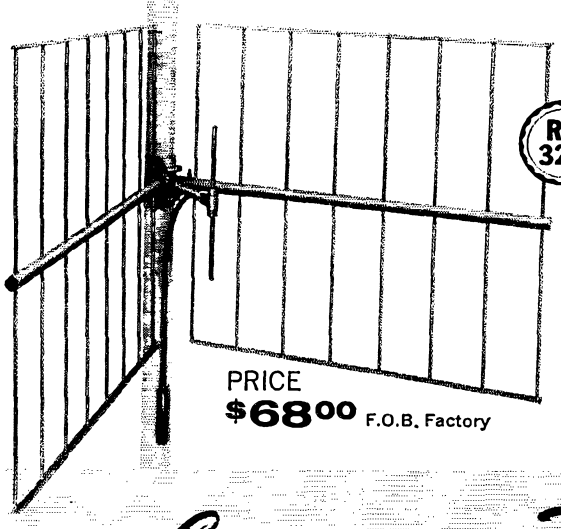
The first industry-wide Standard for Base Station Antennas designed for the land-mobile services, was adopted by the Electronic Industries Association in December 1966.

The Standard specifies methods for gain, pattern and VSWR determination, as well as many other parameters.

The existence of RS 329 provides, for the first time, uniform test methods for all manufacturers and users of Base Station Antennas in the land-mobile services.

CPC is proud to have been a member of the Sub-committee that prepared RS 329, and has adopted its specifications in manufacturing and testing procedures.

All antennas shown here are rated in accordance with this Standard.



RS 329

PRICE
$68.00 F.O.B. Factory

Cat. No. 161-509

8.0 dbd GAIN

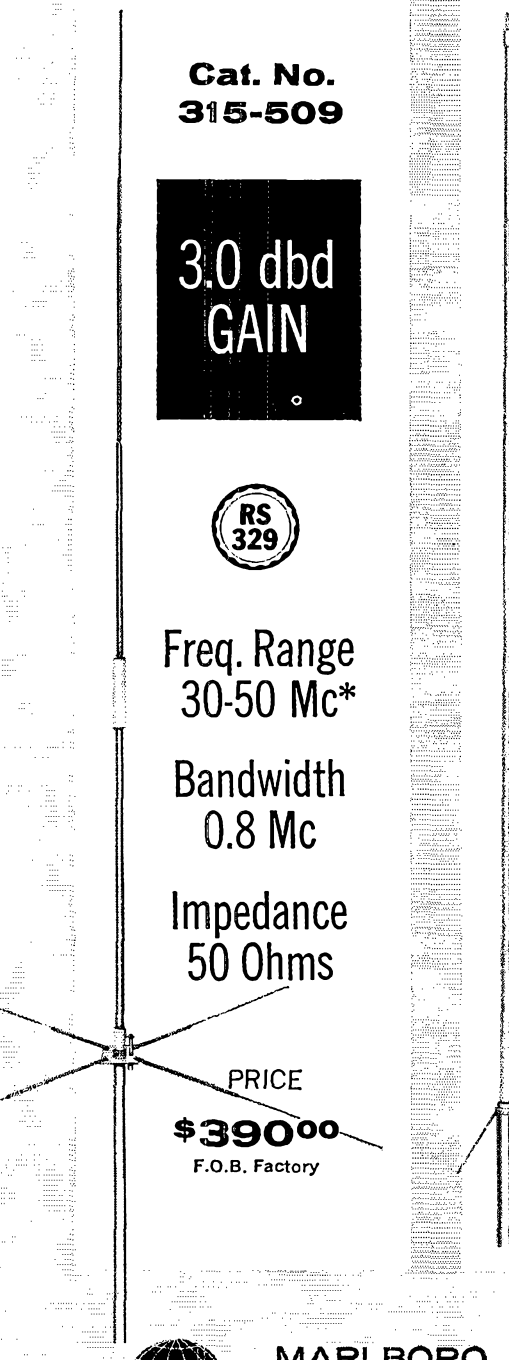
Freq. Range 406-470 Mc*

Bandwidth 20.0 Mc

Impedance 50 Ohms

Communication Products Company
DIVISION OF
PHELPS DODGE ELECTRONIC PRODUCTS
CORPORATION

—what it means to you!



Cat. No. 315-509

3.0 dbd GAIN

RS 329

Freq. Range 30-50 Mc*

Bandwidth 0.8 Mc

Impedance 50 Ohms

PRICE **$390.00** F.O.B. Factory

Cat. No. 220-509

5.25 dbd GAIN

RS 329

Freq. Range 150-174 Mc*

Bandwidth 9.0 Mc

Impedance 50 Ohms

PRICE **$185.00** F.O.B. Factory

Cat. No. 540-509

10.0 dbd GAIN OFFSET
7.0 dbd GAIN OMNI.

RS 329

Freq. Range 450-470 Mc*

Bandwidth 12.0 Mc

Impedance 50 Ohms

PRICE **$140.00** F.O.B. Factory

Exact frequency must be specified

P D ELECTRONICS

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WA1GGN and WA1GSO on passing the General Class exam; K1RWF on earning Penn. Sec. Net Cert.; W1-MEO on being the first visiting amateur to operate from VE2XPO; K1EIC and K1EIR on the picture story in the Sun. *N.H. Register;* W1BDI and W1YBH on being awarded the OOTC Certificate of Achievement. 2-meter activity: WA1DUV worked 12 states; W1BDI has a new Tecratt transverter; W1ULZ and K1BXC report the 2- and 6-meter traffic nets are going well. W1KAM reports the Slow Speed Net (3748 kc. 6 P.M.) had QNI 300, QTC 180 in Apr. W4YAU/1 is now at ARRL and is active on CN. Traffic: (Apr.) W1EFW 394, K1LMS 197, WA1FGN 186, W1AW 179, W1KAM 165, WA1HSN 124, WA9QVU/1 122, K1UDD 107, WA1FNJ 103, W1GVT 95, W1BKC 94, WA1HEW 87, W1LXV 78, W1BDI 76, W1QJM 76, WA1-CYY 73, W1YBH 50, K1RWF 39, W1YU 39, W4YAU/1 34, W1KUO 31, W1CTI 24, K1SXF 23, K2TKS 20, WA1-DUV 19, W1QV 19, WN1HLP 14, K1YGS 12, W1BKI 11, K1SRF 10, K1MBA 9, W1BNB 8, W1CUH 7, WA1GUD 4, W1OBR 4, K1OQG 4, W1ZL 2. (Mar.) W1OBR 18.

EASTERN MASSACHUSETTS—SCM, Frank L. Baker, Jr., W1ALP—W1AOG, our SEC, received reports from W1s RPF, LVK and K1PNB. New appointments: W1BVV Braintree, K1EPL Walpole as ECs; W1AEC as OPS/ORS K1NLQ as OVS. We want to welcome the Harvard Wireless Club, W1AF, as OVS/OBS; K1PAM is trustee. K1DPE is taking over as Radio Officer for Braintree. It is my sad duty to report W1ZSS, W1BIV, W1AR, ex-W1IS as Silent Keys. W1s AYG, BGW, WAJ, HJP, K1s WJD, TTY and K4GGI/1 took part in the Feb. FMT. The OOTC, through W1DFS, presented awards to W1s JMA, OJM, PEX, K1PNB and WA1EYY for their public service work. W1ALP presented the Charter of Affiliation to the Roxbury Y Radio Club, WA1FRI, at the annual meeting of the YMCA. W1SZQ and K1ASG were present. The Capeway Radio Club now is ARRL affiliated. K1VOK is secy. of the So. Eastern Mass. ARA, W1AEC. W1RWC is on many bands. WA1GQT and WA1EKK are on 6 and 2. K1SCQ, in the Navy, is operating KA2KS in Japan. The Quannapowitt RA had a talk on Legal Aspects of Ham Radio by K1SLZ. W1AGR has moved to California. W1AAI is out of the Navy. WA1CSD is on 6 and 2. Marlboro ARA's officers are W1UJF, pres.; K1DRC, vice-pres.; K1ZCU, secy.; K1LNY, treas. W1ITW, Natick HSRC, has the beam up for 10 and a new HW-32 for 20 s.s.b. WA1DIM worked his 35th state. The 6-Meter Cross Band Net had 20 sessions, 234 QNI, 16 traffic. EM2MN had 20 sessions, 178 QNI, 336 traffic. Appointments endorsed: W1EAE as RM for 80 c.w., W1s NZP, EIQ, K1s WFZ and DZG as ECs; W1s EAE and DAL as ORSs; W1ULJ as OBS; W1MX as OPS/ORS. K1VKY got married. W1HKG went to the Dayton Hamfest. W1BHD has a new NC-200. WA1DGH is going to Harvard and K2AJA, ex-K1ZHS, to Brandeis U. in the fall. WA1EOT has over 100 countries. The Norwood ARC has a net on 28.7 Mc. Thurs. at 8. WN1HNS is on 40 c.w. EMCWN had 31 sessions, 318 QNI, 340 traffic. WA1CRT, pres. of B.C. HSARS, says the club will be on 2 soon. New officers are L. Palladino, pres.; J. Drevan, vice-pres.; Joe Rogers, secy.; W. Frank, treas. WN1HES passed the Gen. Cl. exam. W1ELP says the Yankee S.S.B. Net, 50,110 Sun. at 9 A.M., has been on for one year with QNIs from Me. to Va., averaging 25. The South Shore Club meets at the Viking Club in Braintree. W1UIR says the 2-Meter Net meeting at Swampscott was well attended. W1AUQ now is working in Cambridge. W1QXX is on 6 s.s.b. WA1EFN has a new Clegg 22. K1OWM was in Fla. WA1DPX has a new six-element Yagi for 6. K1FJM has an eleven-element beam for 2. W1NJN showed a NASA film, "Universe in March," to the Danvers ARA at W1ZMO's QTH. W1AEC had a booth at the New Bedford "Y" Hobby Show and W1LAZ, W1ATI, WA1CCM and K1VOK did a fine job. WA1FXV built a v.f.o. for 6. WA1GCH had his Tower at the Commonwealth Armory in Boston for the Boy Scouts "Expo 67." W1ULJ has gone Heathkit at his QTH. WA1EYY is secy.-treas. of the Central N.E. Net; K1VHT is mgr. K1DDE, Lowell EC, has W1JIC and WA1FRJ working with him. W1IAU passed the Gen. Cl. exam. EMNN had 12 sessions, 93 QNI, 58 traffic. New stations: WA1s DIU, DTC, WN1s GUE, GJM, HCL. W1DYS and WA1FBH have rigs for 430 Mc. K1EMU has a transceiver for 2. W1OIW did a fine job in designing the Newton C.D. f.m. transmitters, all transistors. Middlesex ARC had a talk on "What are Sidebands" by Prof. Stockham, Jr. Traffic: (Apr.) W1-PEX 1242, W1DOM 530, W1EMG 302, K1PNB 173, W1UIR 128, W1QJM 126, K1CLM 122, K1ZGH 119, WA1-EYY 113, WA1EVY 92, K1WJD 90, K1VOK 89, WA1DPX 76, W1OFK 74, W1DAL 71, W1CTR 68, WA1FKQ 68, WA1EFN 49, W1FJI 49, K1VPJ 47, W1AEC 40, W1HIJ 37, W1TNK 35, W6JCF/1 29, W1OAG 26, WA1GXC 26, W1MX 26, WA1DEC 23, K1LCQ 22, WA1GCH 17, WA1-DED 16, W1KBN 16, W1CT 12, K1DDE 6, W1AKN 5, WN1HEJ 4, K1OKE 4, W1BB 3, WA1DJC 2, WA1FSI 2, W1IAU 2, K1DZG 1, K1YUB 1. (Mar.) K1WJD 31, K1OWM 2, W1IAU 1.

MAINE—SCM, Herbert A. Davis, K1DYG—PAM: K1WQI. RM: W1BJG: Traffic nets: Sea Gull Net, Mon. through Sat. on 3940 kc. at 1700 to 1800. Pine Tree Net, daily on 3596 kc. at 1900, c.w. News from the PAWA is that K1RQE has gone on active duty. K1TEV has a new Drake line. the PAWA entertained the Burns School Amateur Radio Club at the clubhouse, the SB-301 is wired and working in the club station and the club is raising money for the transmitter. The word from Duff this time is that the PTN is going good but still could use a few more stations; and is either 100% or real near on work with the 1 RN. Those earning OOTC awards from up here were K1WQI and K1ZVN. There are quite a number of the fellows on a.m. going on with the familiar roundtable QSO; they can be heard most any day and welcome all who are interested. This is not a net; just old friends in a rag chew. WA1BXM is on the PTN running 15 watts c.w. Traffic: K1TMK 84, W1GU 16, W1BJG 41, W1NND 34, K1WQI 26.

NEW HAMPSHIRE—SCM, Robert C. Mitchell, W1-SWX/K1DSA—SEC: K1YSD. PAM: K1APQ. RM: Open. The GSPN meets on 3842 kc. Mon. through Fri. at 2300Z and Sun. at 1330Z. The VTNH Net meets on 3685 kc. Mon. through Fri. at 2230Z. Greetings from Arizona. Endorsements: W1PYM and W1SWX as OOs. K1RSC and K1YSD received Public Service awards. New hams: WA1HJN, WA1HJO, WA1HJR, WA1HKI, WA1HKL, WA1HKN, WA1HND, WA1HNP, WA1HNV, WA1HMO and WA1HMZ. K1YSD and W1PYM made the top ten in the January Phone CD Party. WA1FSZ, WA1FTX, WA1BSU, W1MKA and W1MAS are going on 420 Mc. K1APQ reports 733 check-ins and 93 traffic for GSPN. K1CTQ, Phillips Exeter Academy Radio Club, made DXCC. K1UZG reports 122 check-ins and 45 traffic for the VTNH Net. K1YSD received the Granite State Award. W7GBL, in Montana, needs N.H. on 160 meters to complete WAS. K1RSC has a new QTH, N.H. QSO Party results in the following order: W1SWX, K1RIX, W1DXB, W1TCR, W1DYE/1, WA1FCN, K1CXP, W1-IQD, K1AC and W1FZ. There was no phone activity reported. A GSPN certificate was issued to WA1HAD. K1SLR is on 6 and 2 meters. W1ARE has a new TR-4. W1KOC is getting his boat ready. Traffic: (Apr.) K1BGI 39, K1PQV 23, W1ALE 19, W1MHX 13, WA1EUJ 11, WN1HGL 4. (Mar.) K1BGI 45, W1MHX 42, K1YSD 32, K1PQV 31, W1ALE 27, K1HFW 2.

RHODE ISLAND—SCM, John E. Johnson, K1AAV—SEC: K1LII. PAM: W1TXL. RM: W1BTV, V.H.F. PAM: K1TPK. New appointment: W1YNP/W6EGP as OO. RISPN reports 30 sessions, 416 QNI, 83 traffic. The NCRC of Newport, W1YRC, is constructing a 6-meter rig and hopes to have it operating at the club in the near future. K1ABR has been very active on 144 Mc. and set up four meteor skeds in April during the "Lyrid" shower. He expects to be on 220 Mc. very shortly. WA1-EEJ made 205 QSOs on c.w. and 21 on phone during the recent CD Party. He is now on s.s.b. with an Elenco 77 transmitter. W1BTV was presented a certificate in the Old Old Timers Club. The W1AQ Club of Rumford reports that K1CZD, who was hospitalized, has recovered and is now at his home QTH. The recent completion of the code classes have been very successful with six new members taking their Novice exams. Pres. W1FNH announced that Field Day plans were complete. Traffic: W1YKQ 186, WA1EEJ 159, K1VYC 48, W1TXL 45, W1BTV 43, K1TPK 25, K1YVN 18, W1CSO 15.

VERMONT—SCM, E. Reginald Murray, K1MPN—SEC: W1VSA. RM: K1UZG. Apr. net reports:

Net	*Freq.*	*Time*	*Days*	*QNI*	*QTC*	*NCS*
Gr. Mt.	3855	2130Z	M-S	596	31	W1VMC
Vt. Fone	3855	1300Z	Sun.	128	—	W1UCL
VTNH	3685	2230Z	M-F	122	45	K1UZG
VTCD	3990½	1400Z	Sun.	35	12	W1AD
VTSB	3909	2130Z	M-S	747	78	W1CBW
		1230Z	Sun.			

New officers of the CVARC are K1OAJ, pres.; W1CBW, vice-pres.; WA1DWQ, secy.; K1MXQ, treas. Congrats to W1FRT and W1NDL on receiving the recognition award from the OOTC. The Vt. Fone Net celebrated its 20th anniversary June 18. International Field Day will be held again at Cliffside Country Club, Burlington, Aug. 13. The CVARC now sponsors a W-Vt. award; W1FPS is custodian. Traffic: (Apr.) K1BQB 340, W1-QZE 46, K1UZG 43, W1FRT 24, K1MPN 13, WA1GUV 8. (Mar.) W1QZE 119.

WESTERN MASSACHUSETTS—SCM, Percy C. Noble, W1BVR—C.W. RM: W1DWA. K1IJU has re-

Whether working a station across the country or around the world, Swan 500 owners know that solid contacts are the rule, not the exception. With its unbeatable combination of high power and crisp, clean audio, the Swan 500 will literally punch holes through the QRM.

At the top of the Swan line, the 500 offers many extra features: Automatic noise limiter, selectable upper and lower sideband, 100 kc crystal calibrator, and provision for installation of an internal speaker.

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Frequency coverage of the five bands is complete: 3.5-4.0 mc, 7.0-7.5 mc, 13.85-14.35 mc, 21-21.5 mc, 28-29.7 mc. (In addition, the 500 covers Mars frequencies with the 405X accessory crystal oscillator.)

If you are a QSL collector, then the new Swan 500 is the item for you. **$495**

ACCESSORIES:

12 Volt DC Supply, for mobile operation. Model 14-117.	$130
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Miniature Phone Band VFO. Model 406B	$ 75
Crystal Controlled Mars Oscillator. Model 405X	$ 45
Dual VFO Adaptor. Model 22	$ 25

SWAN

ELECTRONICS Oceanside, California

signed as SEC and the position is now open. We welcome applications for the position. It's a real challenge, but it's a job that needs doing. Our C.W. RM has now received his CP-35 from ARRL (for those who don't know, that is a certificate certifying that he can copy 35 w.p.m.). Congrats, Don. WN1GTH has received his WAS and also CP-25. W1NY was the guest speaker at the Valley Amateur Radio Club, presenting a very interesting personal history of the pre-World War I spark gap days. CX8DV heard WA1BRU's 5 watter a.m. down in Uruguay. Don't forget the New England Teenage Net seven days a week on 3885 kc. at 4 P.M. local time (7 P.M. during the summer). W1BYH has a new Swan 350. K1JHC's friends are waiting patiently for the "Smoke Test" on his new 6-meter rig. W1MDS is a DXer with his Swan 350. W1UDT was guest speaker at the Hampden County ARA, covering the subject of capacitors from A to Z. K1WXU and W1HUB are on 2. K1PMK is NCS of the 10-meter net. W1ALL and W1HUB are heading up a ham radio course for Southwick Civil Defense. K1LDT is moving to a new QTH. Our C.W. RM reports the following for WMN: 30 sessions with a total traffic of 84 messages. W1BKG and W1DWA received award certificates from the Old Old Timers Club for outstanding amateur radio accomplishments. Congrats. My apologies to any who tried to get traffic reports to me this month via radio and did not succeed. I've been plenty busy here near the end of the school year, and I've missed some skeds. Traffic: W1DWA 134, W1OEB 72, W1DVW 57, W1BVR 42, K1WZY 17, WN1GJM 11, W1YK 8, W1ZPB 6, WN1GTH 5.

NORTHWESTERN DIVISION

IDAHO—SCM, Donald A. Crisp, W7ZNN—The FARM Net convenes at 1900 MDT on 3935 kc. Mon. through Fri. WA7GSM is the new Asst. Net Control. WN7GYL and W7YRX are on 2-meter f.m. and several other Lewiston area hams plan to install 2-meter f.m. mobiles and a repeater station. W7VPS passed away. WA7ETO is converting an ART-13. K7ZMP is reporting river readings to the Columbia Basin Net. W7GXM is installing a beam. Help justify the existence of amateur radio; join the EC or organize one in your area. FARM Net report Apr.: 19 sessions, 62 traffic handled, 626 check-ins. Traffic: K7HLR 204, WA7ETO 41, WA7EWV 11, W7GGV 10, K7OAB 10, K7OQZ 6, W7ZNN 5.

MONTANA—SCM, Joseph A. D'Arcy, W7TYN—Asst. SCM/SEC: Harry Roylance, W7RZY. K7FPQ is the new EC for the Helena area. If you have a League appointment and have not sent in your certificate for endorsement please do so. The Butte Amateur Radio Club has gotten a new TR-4 transceiver for the club station. WA7BPY has a new vertical up. Ralph, at Butte, is a new station on the 2-meter band. W7RZY, our SEC, is putting out a very fine newsletter to all of the ECs throughout the state. What can you do to get a copy? It's easy. Write Harry for an EC application form and he will be glad to sign you up. W7CJN is working on a 432-Mc. rig using a variactor. Montana PON traffic total was 37. Don't forget the hamfests at Glacier Park and at Mac's Inn. See you all there. Traffic: K7PWY 63, K7EGJ 38, W7FL 10.

OREGON—SCM, Everett H. France, W7AJN—RM: W7ZFH. The new Emerald Amateur Radio Society is now affiliated with ARRL and WA7AXK, act. chairman reports code and theory classes covering trainees for Novice to Extra Class amateur and commercial licenses are being held; an education program offers two study groups weekly conducted by WA7ELP, in Springfield; the code practice net is conducted by WA7GCE on 3743 kc. at 9 P.M. Tue., Wed., Fri., text and drill sent at 8 to 25 w.p.m.; code classes are conducted at Sheldon High School in Eugene by WA7AXK. W7DEM reports Grants Pass activity: K7PMB and WA7ADW are on 2 meters with f.m. rigs. K7PMB has a home-brewed 10-15-meter beam. K7YNO is going RTTY. WA7AHW net mgr. of the AREC Net, reports Apr. sessions 30, maximum number of counties 16, total check-ins 596, QNTs 10, traffic 2, contacts 63. K7IFG, net mgr. of BSN, reports Mar. sessions 62, total check-ins 1056, traffic 233, contacts 205. Silent Key: K7ERY, Navy Lt. (j.g.) was washed overboard from a U.S. submarine in the North Atlantic off the coast of Iceland. His body was found by a fishing boat. Traffic: (Apr.) W7ZB 127, K7IWD 110, WA7BYP 80, W7ZFH 39, WA7GLP 30, K7WWR 26, WA7CPI 16, W7DEM 14, WA7EES 13, W7MLJ 9. (Mar.) K7IFG 205, W7GUH 43.

WASHINGTON—SCM, Everett E. Young, W7HMQ—SEC: W7UWT. RM: W7OEB. PAM: W7LEC. Apr. net reports:

EIMAC

3-400Z's used in prototype 6-meter linear amplifier for 2 kW PEP at 50 MHz

The prototype Swan linear amplifier shown here uses two EIMAC 3-400Z triodes in grounded grid circuitry to achieve two kilowatts PEP input at 50 MHz. Drive power is less than 100 watts PEP. The prototype amplifier features a tuned cathode circuit for low intermodulation distortion, and uses a pi-network plate tank circuit. The new linear may be driven with modern six-meter SSB transceivers, and offers real operational economy at 50 MHz.

Swan chose EIMAC 3-400Z's because these compact, high-mu power triodes are ideal for grounded grid operation. They can provide a power gain as high as 20 in a cathode-driven circuit.

For more information on EIMAC's line of power tubes for advanced transmitters, write Amateur Services Department, or contact your nearest EIMAC distributor.

3-400Z TYPICAL OPERATION
(Minimum IM Distortion Products at 1 kW PEP Input)

DC-DC Plate Voltage	2500 V
Zero-Sig DC Plate Current*	73 mA
Single Tone DC Plate Current	400 mA
Single Tone DC Grid Current	142 mA
Two Tone DC Plate Current	274 mA
Two Tone DC Grid Current	82 mA
Peak Envelope Useful Output Power	560 W
Resonant Load Impedance	3450 ohms
IM Distortion Products	−35 db**

* Approximate

** −35 db or more below one tone of a two tone test signal.

We have a new brochure entitled "Linear Amplifier and Single Sideband Service." Write for your copy.

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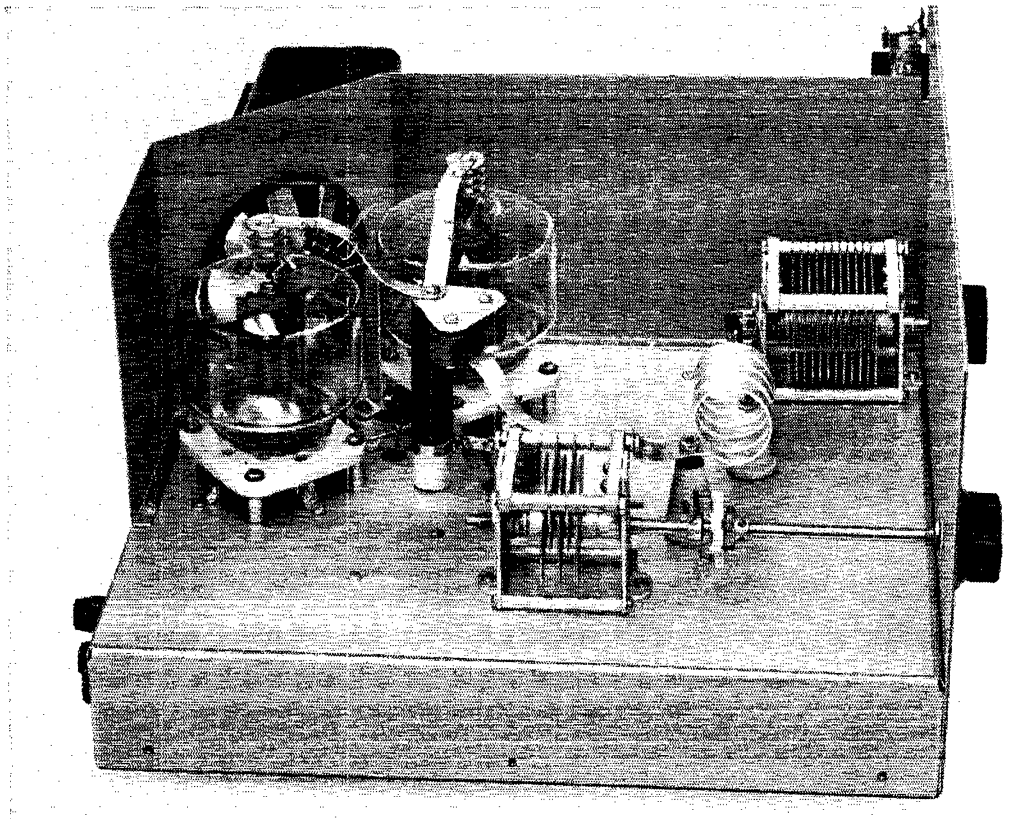


WSN	3535	Daily	QNI	283	QTC	478	Sess.	30
NTN	3970	Daily	QNI	1061	QTC	568	Sess.	30
NSN	3700	Daily	QNI	540	QTC	178	Sess.	30
WARTS	3970	Ex-Sun.	No report					

K7PXA was out of the net because of flu. W7HMA made the report. ORS W7ZIW skeds TCC WA2WBA and K1WJD twice weekly on 14.100 Mc. Also QNB RN7 Mon. and Thurs. ORS-OBS W7DZX swapped the 20A, now smoking HT-37. SCM-ORS K7JHA has started his 3rd year with the Tech. Net. K7VNB has a new TH-6. ORS W7AIB reports his XYL requires further medical attention. ORS-OPS W7AXT has applied for OO appointment. ORS W7GYF is approaching DXCC and working hard; still is NCS WSN Wed. K7KSF/KSE are leaving the Tri-City area. WN7GCW must be General Class by now. W7COG hangs a tri-bander on the tower. W7JII has an NC-300 and is awaiting a new Yagi. WA7DUH now is on 40 with a home-brew 807. W7EDJ, a newcomer to the Richland area, is heard on the phone bands. W7WJR is heard around the clock, he's home with a broken ankle. W7AOQ is on with 40-meter c.w. mobile. W7MCU chairmans the committee for VARC v.h.f. activities. OBS W7WHV, skeds regular Sun. bulletin service on 10, 6 and 2. Active on 6-meter a.m./f.m. are K7VNV, K7NEW, WA7EAQ and W7OEB. RN7 is now 0330Z with a second session planned for 0530Z. OBS K7CHH/7 turned in an FB CD Party score. OO W7UVR has found the frequency-meter reading out 5 places after Dec. WN7FZR is putting H'I pieces together that become Health Twoers. The DX people are having a field day with the following stations reported: ZD5M, 9J2-MX, CR6AI, ZS3XG, ZB2AM, BV2A, TO5KRU, KS4-CC, UJ8AC, UH8DC. How many got 7Q7 and VS9? 6, 2 and even 450 Mc. are showing signs of high activity. W7HMJ heads up the NARCS campout at Indian Creek on White Pass July 15-16. This is one of the good ones. Plan now. W7HMQ and XYL W7WHV plan a long vacation. With over 900 league members voting in a recent election, it is ironic that only 20 amateurs bother to report the news from which this column is written. What's happening in the shacks of the other 880 amateurs? You are urged to report any activity to your SCM, failure to report means your contribution to amateur radio is not recorded for the future. Traffic: (Apr. W7BA 1419, W7HMA 999, K7TCY 787, W7ZIW 769, WA7DXI 603, W7JEY 561, W7DZX 385, K7CTP 300, K7JHA 75, K7VNB 66, W7IEU 63, W7AIB 61, W7HMQ 48, W7WHV 14, W7AXT 7, W7GYF 6, W7OEB 3. (Mar.) K7JHA 46, W7AJV 2. (Feb.) K7CTP 217, K7VNB 62.

PACIFIC DIVISION

EAST BAY—SCM, Richard Wilson, K6LRN—W6OJW, currently East Bay's only active OO, took time off for his first plane flight to L.A. WA6TVA is a new QNI to NCN and is a junior at U.C. Steve also operates from W6BB, the U.C. radio club station, and is helping to set up the clubs KWS-1 for RTTY. W6ZF is teaching night school at Napa High School. W6UZX has renewed his membership and is active on NCN, RN6 and NAVMARS. Welcome back, Jim. Congratulations to W6YKS, who was married recently and is looking for a small transmitter already. WB6SCM/6 passed the General Class exam during the Easter vacation and celebrated with some new gear. WB6QNE is QRL school and has just finished a heath tunnel dipper. WA6UFW, ex-W8-KAO, now in Richmond, is a new OBS and transmits Pacific Division bulletins the 1st and 3rd Sun. at 1600 local on 14.300 USB and the 2nd and 4th Thurs. at 2000 local on 3.900 LSB. WA6AGA is a new OO. W6IT, WA6RWM, WA6QVS, K6JPR and WB6GTZ are new AREC members, which brings the current total to 12. WB6PCQ and WB6PCR are new residents of the East Bay section, having moved from Fresno to Fremont. WB6PCQ is an ORS. K6LRN and others from the East Bay section attended a meeting sponsored by the North Bay ARA featuring W6ECS and W2NSD/1. K6UJS was MC. W6IDY is in Japan for about 3 weeks vacation. When filing a message destined for a serviceman make sure you have the zip and APO/FPO number complete and correct. An incomplete address will only get your message as far as RN6 where it will be returned for a better address. Thanks for all the reports. Keep 'em coming and we will make East Bay No. 1 in the Pacific Division for 1967. NCN goes DST June 1 to Nov. 1 and meets at 0200Z on 3635 kc. approximately. Traffic: W6IDY 252, W6UZX 128, WA6TVA 50, K6LRN 32, W6BB 16, WB6QNE 6, W6ZF 4.

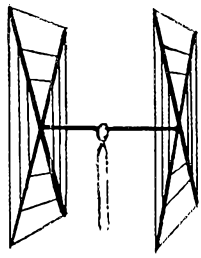
NEVADA—SCM, Leonard M. Norman, W7PBV—SEC: WA7BEU. WA7CES and his XYL have moved to Elko; Phil is the new EC for Elko County. K7HRW received SNARC certificate Nr. 94 and is active in AF MARS. K7VHG is active in MARS and the Nevada Emergency Net. K7NYU is active on 2 meters. K7RBM

GOTHAM'S AMAZING ANTENNA BREAKTHRU!!

How did Gotham drastically cut antenna prices? Mass purchases, mass production, product specialization, and 15 years of antenna manufacturing experience. The result: The kind of antennas you want, at the right price! In QST since '53.

QUADS

Worked 42 countries in two weeks with my Gotham Quad and only 75 watts . . . W3AZR



CUBICAL QUAD ANTENNAS — these two element beams have a full wavelength driven element and a reflector; the gain is equal to that of a three element beam and the directivity appears to us to be exceptional! ALL METAL (except the insulators) — absolutely no bamboo. Complete with boom, aluminum alloy spreaders; sturdy, universal-type beam mount; uses single 52 ohm coaxial feed; no stubs or matching devices needed; full instruction for the simple one-man assembly and installation are included; this is a foolproof beam that always works with exceptional results. The cubical quad is the antenna used by the DX champs, and it will do a wonderful job for you!

10/15/20 CUBICAL QUAD SPECIFICATIONS

Elements: A full wavelength driven element and reflector for each band.

Frequencies: 14-14.4 Mc.; 21-21.45 Mc., 28-29.7 Mc.

Dimensions: About 16′ square.

Power Rating: 5 KW.

Operation Mode: All.

SWR: 1.05:1 at resonance.

Boom: 10′ × 1¼″ OD, 18 gauge steel, double plated, gold color.

Beam Mount: Square aluminum alloy plate, with four steel U-bolt assemblies. Will support 100 lbs.; universal polarization.

Radiating elements: Steel wire, tempered and plated, .064″ diameter.

X Frameworks: Two 12′ × 1″ OD aluminum 'hi-strength' alloy tubing, with telescoping ⅞″ OD tubing and dowel insulator. Plated hose clamps on telescoping sections.

Radiator Terminals: Cinch-Jones two-terminal fittings.

Feedline: (not furnished) Single 52 ohm coaxial cable.

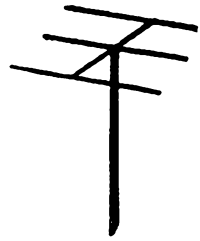
Now check these startling prices — note that they are *much lower* than even the bamboo-type:

10-15-20 CUBICAL QUAD	$35.00
10-15 CUBICAL QUAD	30.00
15-20 CUBICAL QUAD	32.00
TWENTY METER CUBICAL QUAD	25.00
FIFTEEN METER CUBICAL QUAD	24.00
TEN METER CUBICAL QUAD	23.00

(all use single coax feedline)

BEAMS

The first morning I put up my 3 element Gotham beam (20 ft) I worked YO4CT, ON5LW, SP9ADQ, and 4U1ITU. THAT ANTENNA WORKS! WN4DYN



Compare the performance, value, and price of the following beams and you will see that this offer is unprecedented in radio history! Each beam is brand new! full size (36′ of tubing for *each* 20 meter element, for instance); absolutely complete including a boom and all hardware; uses a single 52 or 72 ohm coaxial feedline; the SWR is 1:1; easily handles 5 KW; ⅞″ and 1″ aluminum alloy tubing is employed for maximum strength and low wind loading; all beams are adjustable to any frequency in the band.

2 El 20	$16	4 El 10	$18
3 El 20	22*	7 El 10	32*
4 El 20	32*	4 El 6	15
2 El 15	12	8 El 6	28*
3 El 15	16	12 El 2	25*
4 El 15	25*		
5 El 15	28*		

*20′ boom

ALL-BAND VERTICALS

"All band vertical!" asked one skeptic. "Twenty meters is murder these days. Let's see you make a contact on twenty meter phone with low power!" So K4KXR switched to twenty, using a V80 antenna and 35 watts AM. Here is a small portion of the stations he worked: VE3FAZ, T12FGS, W5KYJ, W1WOZ, W2ODH, WA3DJT, WB2FCB, W2YHH, VE3FOB, WA8CZE, K1SYB, K2RDJ, K1MVV, K8HGY, K3UTL, W8QJC, WA2LVE, YS1MAM, WA8ATS, K2PGS, W2QJP, W4JWJ, K2PSK, WA8CGA, WB2KWY, W2IWJ, VE3KT. Moral: It's the antenna that counts!

FLASH! Switched to 15 c.w. and worked KZ5IKN, KZ5OWN, HC1LC, PY5ASN, FG7XT, XE2I, KP4AQL, SM5BGK, G2AOB, YV5CLK, OZ4II, and over a thousand other stations!

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

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GOTHAM, 1805 Purdy Ave, Miami Beach, Fla. 33139

graduated from Navy Radioman school with top honors and is home on leave active in NCN and TCN. K7ICW is active on v.h.f./u.h.f. K7TKS was honored with a Mexican Dinner; Joe retires from the DW&P with 30 years of service. WA7BEU and W7PBV attended the director's meeting in Oakland and visited with Sixth Army MARS personnel. W7CDS is touring Europe with the Thunderbirds. W7TVF, active on 20, will schedule any DX or stateside needing a Nevada contact. DL3LL was a week-end guest in Nevada visiting W7PBV, W7-TVF and K7RKH. More Nevada check-ins are needed on 3996.5 kc. at 0200Z Mon. and Thurs. The v.h.f. repeater receives on 146.94 Mc. and transmits on 147.5 Mc. on f.m. in the Las Vegas area. Traffic: K7OHX 34, K7HRW 15, WA7BEU 10, W7PBV 10, K7VHG 10.

SACRAMENTO VALLEY—SCM, John F. Minke, III, WA6JDT—SEC: WB6BWB. ECs: WB6MXD, k6RHW, WB6RSY, W6SMU, WA6TQJ. RM: W6LNZ. WB6RSY is our new EC for Shasta County in Redding; the only other counties that are now AREC represented are Del Norte, Nevada, Sacramento and Yolo. W6ZJW finally made WAS after 30 years; Delaware was the holdout and Dick made it with W3HC, the Delaware SCM. K6MQF is interested in forming a North Area V.H.F. Club. If interested contact him. WB6OVI has been appointed Asst. EC for the Yolo C.D. AREC Net. New officers of the Nevada Co. ARC are WA6FWU, pres.; WA6NRD, vice-pres.; WB6RVT, secy.-treas.; WB6-JGK, sgt. at arms. The following stations participated in the Feb. FMT: W6GDO, WB6JXU, W6KDJ, WB6-MPP and W6ZJW. K6ASU (Nevada Co. ARC) is planning expeditions into some of California's rarer counties. W6MWF now has a 100-ft tower replacing the old 80-footer. The Sacramento ARC was the only club represented at the Pacific Division Director's meeting in Oakland from this section. Sacramento Valley members of NCN at a dinner following the Director's meeting with W6LNZ, WB6RSY K,6YZU and WA6JDT. Traffic: (Apr.) WB6RSY 104, W6LNZ 93, WB6MAE 63, K6-YZU 30, K6IKV 25, WB6EAG 24. (Mar.) WA6TQJ 24, W6CMA 22.

SAN FRANCISCO—SCM, Hugh Cassidy, WA6AUD—The K6GWE repeater is putting out code practice Tue. and Wed. at 8 P.M. on 145.1 Mc. WB6FZH has finished building his vintage SB-34 and it works. WA6NDZ is figuring to go 2-meter mobile with a modified ARC-12. W6PTS has his countries worked but is waiting for the cards for DXCC. W6CYO and W6DQZ took 37 years from their first QSO to actually meet at a club meeting. W6EAJ continues active on 160 meters while assembling another broadcast station. W6KVQ and W6WLV continue to be the stations handling most of the traffic in the section. WB6TNC is a new ORS and is handling Northern California Net traffic into Eureka. W6UDL is hoping that a change in working hours will allow more activity. WB6UJO, another Marin DXer, has put up a tower and beam for more punch. WA6ALK reports most of her activity is on 2 meters. W6GQA, W6WLV, W6BIP, W6HSA and K6NCG were active in the recent CD Party. The Marin Club is running transmitter hunts under the direction of W6FVK each 4th Thurs. at 8 P.M. from Red Cross Hq. in San Rafael. W6WLV continues to be active on RN6 and NCS for the Northern Calif. Net. Hal was at the NCN get-together in Oakland in April. The San Francisco, HAMS, Marin, Tamalpais and Humboldt Radio Clubs were at the Pacific Division meeting called by W6HC. WB6GVI reports lots of activity for him on 10 meters. The San Francisco Radio Club held its delayed auction June 2. The recent FMT saw W6SPB, W6GQA and W6MTJ submitting readings with two getting their average error down to .5 parts per million and .1 part per million. WB6PVV is working on some home-brew 2-meter gear. WB6LFT, K6JHR and WN6-VOA are the latest to sign up in the AREC. A simulated emergency in cooperation with the Red Cross was held in Marin recently. WB6AIS has been back in the hospital again to get his leg fixed. K6OJO hosted a meeting for ZD6AR on a visit to the Bay Area. WB6PQE has been testing 2-meter emergency communications from W6SG using the Marin repeater and 146.6 Mc. input and 145.1 output each Sun. Morning at 10:15 A.M. Traffic: W6KVQ 218, W6WLV 213, W6BWV 14, WB6TBC 13, WA6AUD 11, W6CYO 7, WB7FZH 2.

SAN JOAQUIN VALLEY—SCM, Ralph Saroyan, W6JPU—The Fifth Annual U.H.F. Conference was held in Fresno with 75 hams attending. Tapes on the Moon Bounce QSO were played and other subjects of interest were discussed. W6BJI was in charge of the meeting. W6TZJ gave a talk on a 1-kw. klystrom on 1296 Mc. Among those present from Fresno were WA6LRW, W6-DUD, W6YEP and W6JPU. W6YEP is active on 10, 15 and 20 and is getting some 2-meter gear going. WA6-UMU is on 2 meters. W6TRP has moved back to Bakers-

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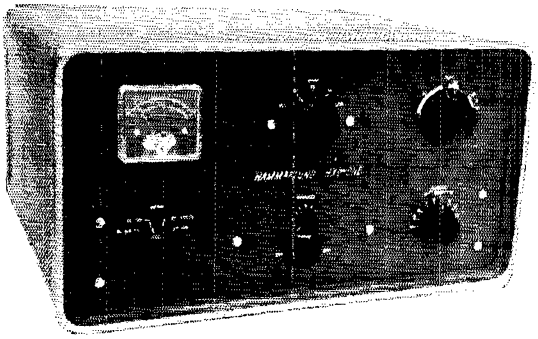

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field. W6AAN is active on 75 s.s.b. WN6KXT had a fire in his ham shack which burned out everything. WB6NLU has an S/Line. WB6JRL has a 75S-3 receiver. WA6YXJ is on the air with an S/Line. W6OHT is on 75 with an antenna that works. W6NKZ reports a better standing wave ratio with his antenna lying on the roof. W6QON and his XYL spent 10 days in Hawaii. W6UBK is thinking of some new s.s.b. gear. W6ILR is building up an HW-12 and will be on 75 s.s.b. WB6PCQ and WB6PCR have moved to Fremont, Calif. K6OZL is out of the Navy and is back on the air with an S/Line. W6FIR is on 75 from Auberry. W6KOK has a new RTTY converter. W6PIX is active on 75 and 2 meters. W6FFJ is on 432 Mc. with ATV. WA6BVR is building up some ATV equipment. K6BGJ is experimenting with radio-controlled model planes. I still would like some news from the Bakersfield, Turlock and Modesto areas and the west side. Traffic: (Apr.) W6ADB 168, WB6PCQ 142, WB6HVA 129, WA6SCE 66, W6ARE 27, WB6VLE 17, K6OZL 7. (Mar.) WB6PCQ 208.

SANTA CLARA VALLEY—SCM, Jean A. Gmelin, W6ZRJ—Asst. SCM: Ed Turner, W6NVO. SEC: W6VZE. RM: W6QMO. It is with regret that we report the passing of Major Allan C. Forbes, K6GK, OBS and OO and an active member of the SCCARA. Allan did much work with the Red Cross in the San Jose area, moving to San Jose from the East Bay section in 1965. He also was active as ORS on the NCN. W6RSY is active on NTS and MARS and made the BPL again this month. W6YBV is active on NCN. W6DEF reports that W6QBY is the new NCN check-in from Atherton. Hal is busy with traffic nets on 80 c.w., 75 phone and 2-meter phone. W6SAW is busy with Navy MARS work on the 2-meter repeater and RTTY. W6PLS reports that he has over 200 for DXCC now. Gene is checking into the Sun. morning AREC Net now. W6QBY works QCWA and SKETO as well as NCN. W6AUC is active on several nets and as OO. Russ is trying to assist with harmonic problems that many amateurs are having, some of which fall outside the band. W6RFF is QRL with job and school, but still finds time to work NCN. WB6IZF reports that v.h.f. activity is down. Ed works phone nets and is busy with DX operation. K6YKC works NCN. Your SCM and SEC attended the Pacific Division Director's meeting in Oakland along with the Asst. SCM and many club representatives from the section. Many points were covered at the meeting. Contact your club representative for a report. We hope to have reports on Field Day activity as soon as possible. Traffic: (Apr.) W6RSY 823, W6YBV 350, W6DEF 112, W6PLS 39, W6QBY 38, WB6IZF 22, W6AUC 15, W6ZRJ 11, W6RFF 10. (Mar.) WB6IZF 22.

ROANOKE DIVISION

NORTH CAROLINA—SCM, Barnett S. Dodd, W4BNU—Asst. SCM: James O. Pullman, WA4FJM. SEC: WA4LWE. RM: K4CWZ. PAM: W4AJT. V.H.F. PAM: W4HJZ. W4RWL now has a brand-new 4RN net certificate. WB4BGL has been appointed asst. mgr. of NCN (E). W4LWZ is now on 2-meter mobile along with seven members of the local (Elizabeth City) radio club. WB4DVO says he finally has obtained a v.f.o. and will have his EICO 753 operational soon. WA4UVH is sporting a new TR-3. W4NAP who is installing an EICO 753 in his new jeep station wagon and will be mobile on both 40 and 80 meters, reports that WN4FRQ and WN4FRR, two of his students at Moorehead High School in Spray, have just received their Novice licenses. WB4DDK reports he now has a DX100-B with full break-in on c.w.

Net	*Freq.*	*Time*	*Days*	*QTC*	*Mgr.*
NCN(E)	3573 kc.	2230Z	Daily	143	W4IRE
THEN	3865 kc.	0030Z	Daily	117	WA4GMC
NCN(L)	3573 kc.	0200Z	Daily	83	WA4CFN
SSBN	3938 kc.	2330Z	Daily	39	WA4LWE
NCNN	3710 kc.	2100Z	M-W-F-S	24	WB4BGL

Traffic: (Apr.) WB4BGL 270, W4IRE 140, WA4CFN 81, WA4ZLK 75, W4LWZ 64, W4EVN 54, W4BNU 41, WA4FJM 41, K4CWZ 37, K4EO 30, K4TTN 30, WB4DVO 24, W4RWL 23, K4ZKQ 17, W4OSG/4 14, WA4VTV 12, W4AJT 7, WA4UVH 6, W4NAP 5, WB4BXQ 3, WB4DDK 2, WN4EQW 2, WA4GMB 2, WA4KWC 1. (Mar.) K4EO 36, WB4DDK 9, WA4GMB 8.

SOUTH CAROLINA—SCM, Clark M. Hubbard, K4LNJ—SEC: WA4ECJ. Asst. SECs: W4WQM and WA4EFP. RM: K4LND. PAM: K4WQA.

SCN	C.W.	NET	3795 kc.	Daily	2300Z/0200Z	Tfc.	168
SCSSBN			3915 kc.	Daily	2300Z	Tfc.	130

The c.w. and s.s.b. nets will be operating on the fast time until Oct. WB4DXX is the first operator to earn

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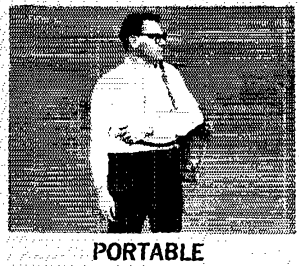

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BPL in a long time. Congratulations, Butch, for the fine work. WB4DXX and W4NTO were awarded 4RN certificates. QNI in the c.w. net looks like old times with the older stations returning and the added new stations. WB4DOT, General Class and WN4FQQ, Novice Class, are on the air in Anderson. We still need more s.s.b. net stations to relay between nets. W4PED and W4CE carried the mail for S.C. to the Greensboro division meeting. Traffic: WB4DXX 501, WA4APD 84, WB4BZA 83, WA4VZQ 64, W4WQM 54, W4JA 48, WA4NWI 37, W4FVV 35, K4LNJ 28, K4VVE 28, W4NTO 27, WA4LDM 12, WA4HFA 6.

VIRGINIA—SCM, H. J. Hopkins, W4SHJ—Old-timers especially were saddened to learn that W4NV/W4SB had joined the Silent Keys. He was well known throughout the state and was influential in securing call letter license plates for amateurs in Virginia. K4BAV will remain at Fort Gordon as an instructor. W4JUJ has qualified for the difficult Swiss award HV-22 and is very active in contests. W4QDY is busy on 20 meters working with the maritime mobiles. With the advent of Daylight Time, there was a general adjustment by nets in Virginia to meet at the same local time. By this time we should have determined if the adjustment was a wise one, and we should keep our findings in mind for next year. There is much to be said for and against such net adjustments; your net manager will appreciate your comments either way. In your summer plans don't forget to include the Winchester Hamfest in early Aug. and the Tidewater Hamfest later that month. Traffic: (Apr.) WA4DXJ 285, WA4EUL 201, W4ZM 177, K4CG 159, W4SZT 151, W4DVT 147, W4RHA 139, WB4DHT 105, W4NLC 98, K4FSS 66, W4OKN 59, WA4SZI 49, K4ASU 38, WA4WFQ 33, WA4QOC 32, W4IA 30, K4ITV 27, W4KFC 27, WA4DAI 23, K4MLC 21, WA4FEY 17, W4SHJ 15, W4BZE 14, W4PTR 14, WA2UFI/4 14, WB4DRB 12, W4JUJ 12, W4MK 10, WA4PBG 8, W4TE 8, WB4FDT 7, W4KX 7, W4MUJ 7, K4VCY 7, W4LK 4, WA4WQG 4, WA4URN 3, W4WG 3, W4OP 2, W4OWE 2, K4KNP 1, K4YEE 1. (Mar.) WB4EAE 193, WA4TNS 39, W4IA 25, WA4WFQ 3, WB4FDT 1.

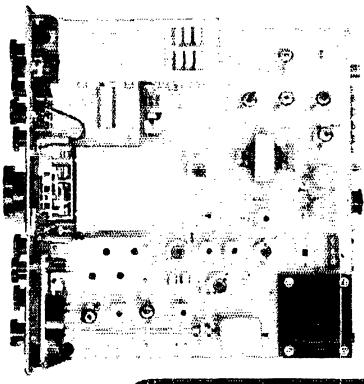
WEST VIRGINIA—SCM, Donald B. Morris, W8JM—SEC: W8SSA. RMs: W8HZA, K8TPF, W8LMF. PAMs: K8CHW, W8IYD.

Net	*Time*		*Freq.*	*Days*	*QTC*	*Net Mgr.*
WVN	0000	GMT	3570	Daily	129	W8HZA
WVN	2230	GMT	3890	Mon.-Fri.	69	WA8RQB

New officers of the Central W. Va. Chapter, QCWA are W8HZA, pres.; W8CLX vice-pres.; W8QR, secy.-treas. The next meeting will be in Charleston in Oct. New ORSs: W8SQO and W8IMX. I regret to report the passing of Harold Denton, WA8WIQ. WA8RDX, W8ETX, W8JDJ and the Northern Panhandle ARC held their Third Annual OM-XYL Dinner in Wheeling. K8GWV again is active after a long illness. W8QR, Marion County EC, received a nice writeup in the local papers. Remember, the Black Diamond ARC Ham Picnic in Bluefield Aug. 27. WB2LBP now is located in the Kingwood area. K8QYG and WA8DOY placed high in the B and O ARC WAS Contest. WA8OVT is planning V.H.F. Moonbounce activity. The following reported activity in recent floods: W8ETF, K8SDH, W8WHQ, WA8FLW, K8BHV, W8JZO, WA8QND, WA8NDY, W8WVM, WA8EKC, WA8DXS, WA8EEL, WA8HSW, W8CZT, K8WEY, W8HZA, W8VYI, WA8CRW, WA8RQB, K8TPF, WA8LAL, WA8PWM, K8DFS, K8PFK, WA8LFZ. To all who contributed to the 9th Annual ARRL West Va. State Convention, our thanks. Traffic: WA8POS 112, W8SQO 106, K8MYU 74, W8HZA 66, W8IMX 48, WA8RQB 43, W8CKX 41, K8BIT 39, WA8PXF 25, K8MQB 22, W8JM 5, W8BOK 3, K8CHW 3, WA8QND 3, WA8QZO 3, W8AEN 2, WA8BSE 2, W8CZT 2, WA8IMY 2, WA8NDY 2, W8QEC 2, K8SJG 2, K8ARA 1, K8EPI 1, WA8FIE 1, W8GQE 1, WA8HGA 1, W8IRN 1, W8VOI 1, K8ZDY 1.

ROCKY MOUNTAIN DIVISION

COLORADO—SCM, Richard Hoppe, KØFDH—Asst. SCM: A. Hankinson, WAØNQL. SEC: WØSIN. PAM: WØCXW. RM: WAØLCM. The Columbine Net finally edged out CCN 318 to 301 in terms of traffic. CCN still maintains a comfortable margin in efficiency, however, showing rate advantage of .394 to .161. With the conversion of NTS to Daylight Saving Time, a new Colorado Sectional Net was formed to speed delivery of incoming traffic. The Colorado Evergreen Net meets daily on 3808 kc. at 0300Z and you are all welcome to participate. H.B. 1570 was proposed in the Colorado State Legislature during April in a form which could have severely restricted amateur operations in the vicinity of federal telecommunications facilities. Thanks to the highly



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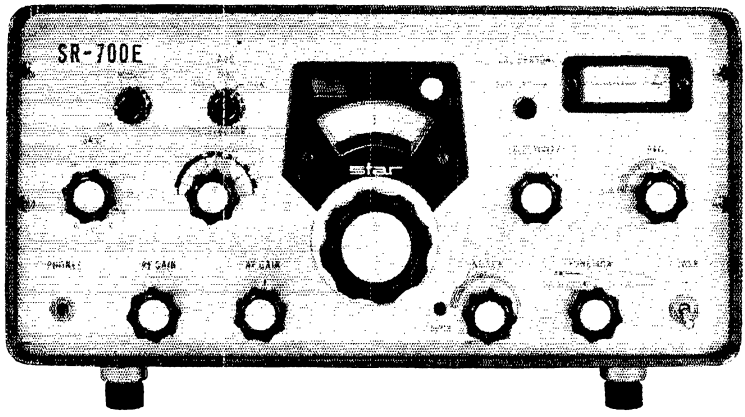

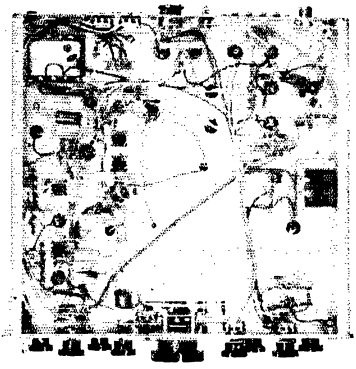

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skilled efforts of WØIC, WØBWJ, WDØZN, WØCXW, WØOWP, WØSIN and others, the proposed bill was successfully amended to exclude amateur radio from its jurisdiction. To avoid in the future what seemed to be a lack of communication with the amateur group in this case, a legislative committee of radio amateurs is being formed. KØWMD, as pres. of this committee, will coordinate communications with the amateur group. Traffic: KØYFK 692, KØZSQ 419, WAØLCM 239, WØWYX 75, KØDCW 74, WØDGM 58, WAØMNL 58, KØCNV 54, WØSIN 31, WAØJJB 26, KØTIV 26, KØDXF 24, KØSPR 22, KØECR 11, WAØCVS 10.

NEW MEXICO—SCM, Bill Farley, WA5FLG—Our SEC, W5ALL, really got in his monthly operating time during the recent forest fires. Fires in the Cloudcroft area caused a state of emergency to be declared by the state civil defense office. Amateurs from Alamorgordo, El Paso and Las Cruces moved into the area at the request of civil defense personnel and performed communications services for the area. Merrell set up and maintained the emergency fire net and acted as relay station to civil defense headquarters. The following week another fire broke out in the Ruidoso area. The Holloman AFB MARS group had already set up its communications truck at the first fire area and when the Forest Service lost contact with the second fire area the MARS group was asked to provide additional help. Individual members set up their own v.h.f. equipment and the Ruidoso repeater was used for the relay link from the fire area. Our thanks to the Roswell fellows who went to the Ruidoso area to operate the equipment. Our special thanks to W5ALL for his outstanding work during and after the fire. Traffic: W8BZY/5 81, WA5FJK 71, WA5RBU 64, W8UBW 44, W5DMG 17, WA5MCX 14, W5BWV 13, WA5JNC 10.

UTAH—SCM, Gerald F. Warner, W7VSS—SEC: W7WKF. RM: W7OCX. Section nets:

BUN	Daily	7272 kc.	1830Z
UARN	Sat.-Sun.	3987.5 kc.	1400Z
URN	Mon. through Fri.	146.2-146.8 Mc.	0030Z

Please note that the above section nets have revised their starting time because of Daylight Saving Time. VE1PQ/W7 and W7OHR have earned Section Net certificates for their work in BUN. Utah DX Assn. members meet each Tue. and Wed. at 0400Z, near 14,240 kc. Utah QSL hunters, take note. New General Class YL: WA7GRD. Many thanks to those who have been reporting traffic. Traffic totals for the month of March were the highest ever. Traffic: W7LQE 186, W7OCX 152, W7OHR 100, K7SLX 31, K7ERR 20, W7FYR 7, W7VTJ 3.

WYOMING—SCM, Wayne M. Moore, W7CQL—SEC: W7YWE. RM: WA7CLF. PAMs: W7TZK, K7SLM. OBSs: W7TZK, K7SLM. Nets: Pony Express, Sun. at 0830 on 3920; YO, daily at 1830 on 3610; Jackalope, Mon. through Sat. at 1215 on 7255. W7BCL of Cheyenne, passed away Apr. 17 at the age of 78. Ollie was one of our very active hams and was well liked by everyone who came in contact with him. He had been in Cheyenne since 1907. When WA7BPO moved to California we lost another of our active ones. The Casper Club has purchased a new transceiver. We have a new ORS, WA7DNZ, who is very active with his new transceiver on c.w. Also, WA7EWC has his new transceiver on the air. Traffic: W7DXV 80, W7TZK 76, WA7EDC 25, K7HHW 25, K7QJW 23, K7KSA 21, K7VWA 21, WA7CLF 17, W7VJI 17, WA7GCG 16, K7SLM 16, K7ITH 7, W7BHH 6, W7ION 6, W7NKR 5, K7WUR 4, W7BKI 2.

SOUTHEASTERN DIVISION

ALABAMA—SCM, Edward L. Stone, K4WHW—SEC: W4FPI. PAM: WA4EEC. RM: WA4EXA. Highlights from the 1967 B'Hamfest: Our Asst. SCM/PAM, WA4EEC, was awarded the Outstanding Amateur Citizen award for Alabama. The SCM award for the top scoring club in the SS went to the Huntsville Club. SS phone and c.w. awards, from the PAM and RM, both were presented to W4USM. The SEC award to the top club in the 1966 FD was presented to the Limestone ARC. The V.H.F. SS Club plaque went to the Huntsville ARC. K4WHW was presented with the Individual V.H.F. SS award. K4KJD, K4YTR, W4YE and K4LQL were presented with the 1967 BARC awards by the Birmingham ARC. WA4EXB and K4HJX are busy in Macon County with the code and theory class. WB4DCR is a new ORS. W4NJI, formerly WA4SBD, has a new 50-ft. tower with a TH6 beam. Six meters is growing in the Tri-Cities area with WA4SCQ and WB4CMK joining in with new

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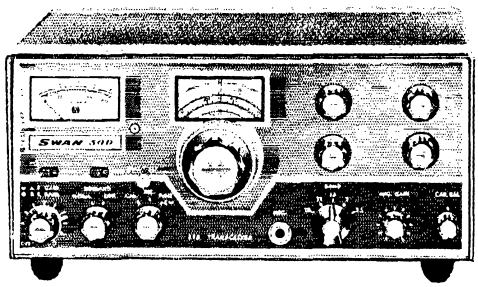

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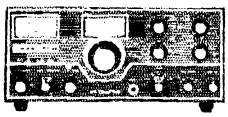

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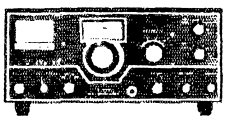

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CANAL ZONE—SCM, Mrs. Lillian C. Smith, KZ5TT—Asst. SCM, Russell Oberholtzer, KZ5OB. SEC: KZ5MV. RM: KZ5FX. Several members of the Canal Zone Amateur Radio Association toured the U.S. Navy Radio Transmitter Site at Summit. A 6-meter transmitter hunt during Apr. came to an abrupt halt when a CE breaker checked in with the group. The CZN has been placed in mothballs for the summer. Field Day plans are under way by the Crossroads Radio Club, Canal Zone Amateur Radio Association and U. S. Army Southern Command MARS. KZ5BC is retiring; he will be operating from a new mobile home as W1APR. New KZ5s are Generals KZ5BJ, KZ5LG and KZ5SF; Novice KZ5RCN. Traffic: KZ5TT 157, KZ5CT 84, KZ5AD 78, KZ5LT 69, KZ5OA 36, KZ5FH 27, KZ5OB 9, KZ5FX 4.

EASTERN FLORIDA—SCM, Jesse H. Morris, W4MVB—SEC: W4IYT. Asst. SEC: W4FP. RM C.W.: W4ILE. RM RTTY: W4RWM. PAM S.S.B.: W4OGX. PAM 40M: W4SDR. PAM 75M: W4TUB. PAM V.H.F.: WA4BMC. The Orlando group did a fine job with the Orlando Hamfest and everyone enjoyed the affair. This station finally got on RTTY this month and joined the fine group on 3704 kc. W4ZAG is net manager and the net meets nightly at 7 P.M. local time. Daylight Saving Time has come to this section of the country for the first time and with it came many problems of what time to have local nets. All of the nets were forced to stay with the same time (local) because their members are geared for local time insofar as other activities are concerned. It is very confusing when you are used to meeting nets and skeds in terms of GMT. W4EXM reports his activities from Bangkok, Thailand. W4GUJ and W4AWS are handling much traffic from Orlando to Jacksonville from MARS circuits via 2-meters. K4BNE reports that "Ham Shack", the weekly column in the St. Petersburg *Independant* is receiving good reader reports. Traffic: (Apr.) W3CUL/4 3311, WA4SCK 886, WA4BMC 520, W3VR/4 502, WA4NEV 418, WA4YIH 206. WA4BGW 179, WA4YII 162, WA4NBT 136, W4AKB 115, WA4TJS 110, WA4PWF 103, W4SDR 99, K4QCG 82, WA4TWD 78, WA4FGH 77, K8LNE/4 76, W4MVB 68, W4EHW 64. WB4DDO 63, WA4HDH 61, W4VDC 57, W4OGX 55, K4SJH 50, W4YPX 44, WA4CIQ 43, W4BKC 41, W4GUJ 41, WA4OHO 40, K4BY 38, K4KDN 37, K4ILB 34, W4TRS 34, W4SMK 31, W4GDK 28, K4BNE 26, WN4DHB 26, K4LPS 26, W4IYT 24, W4NGR 21, WA4IVE 19, W4CBE 18, K4COO 18, W4VPQ 18, W4CWI 17, WA4DEL 17, W4PBK 17, K4DAX 16, WA4WOW 14, W4QBY 12, WA4WZZ 12, WA4YAK 11, K4IEX 10, W4ZAK 9, W4IE 8, W4ILE 8, W4TJM 8, K4EBE 6, W4GM 6, W4LUV 3, WB4CAP 1, WA4LIW 1. (Mar.) W4IE 39, W4IYT 18, WA4YBY 2.

GEORGIA—SCM, Howard L. Schonher, W4RZL—Asst. SCM: James W. Parker, Sr., W4KGP. SEC: W4DDY. RM: W4CZN. PAMs: K4PKK, WA4WDE. K4AJF is active with AENM. W4HYW participated in the Florida and Mo. QSO parties and the CD Party. W4GXU is operating on 160 and would like more power for the band. W4LRR worked Montgomery on 2 and reports 20-meter DX is very good. He reports several stations on 2-meter s.s.b. and is building a linear. K4HQI uses a two-er and 2-meter quad with fine results. He reports good 50-Mc. openings into Texas and Florida during Apr. He contacted CX7AG and CX6BW. WA4IZI is new on 6 with W4OLC back. K4OSE (DL4YI) will relocate in Florida.

Net	*Freq.*	*Time*	*Sess.*	*QNI*	*QTC*
GSN	3595	2400 & 0200 GMT	60	487	153

Activity during April was generally good but reports from several nets and regular stations failed to arrive before the deadline. Are we in the summer slump already? Traffic: W4CZN 158, K4BAI 53, W4RZL 50, WB4APL 34, W4PIM 33, W4FDN 32, W4DDY 27, WA4RAV 24, WA4JES 13, K4AJF 10, K4QPL/4 9, WB4AYP 7, WA4LLI 7, W4GXU 4, W4HYW 4.

WESTERN FLORIDA—SCM, Frank M. Butler, Jr., W4RKH—SEC: W4IKB. PAM: WA4ZGI. RM: W4BVE. Section net reports:

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Net	*Freq.*	*Time*	*Days*	*Sess.*	*QNI*	*QTC*
WFPN	3957 kc.	2200Z	Daily	30	558	126
QFN	3651 kc.	2230/0200Z	"	60	762	520

West Florida has a new SEC—W4IKB. Our sincere thanks to W4MLE who, with W4IYT, spent many years making the Fla. ARPSC what it is today. Tallahassee: The TARC held a banquet May 6. Madison: WA4GHE completed homebrew power supply for the h.f. rig. Cross City: W5AYS/4 is stationed at the AF station here. Perry: K4AVS has an EICO 753 on the air. He and W4YLP are next-door neighbors. Quincy: WN4EAF received his ticket. W4KBE is new in town. W4EKY is heard occasionally from Havana. Chipley: WA4SRR is the new Washington County EC, with WB4FLK as assistant. Defuniak: K4VWE rigged up a squelch for the Twoer and monitors 145.2 Mc. regularly, along with W4JOZ. Panama City: WA4ZGI replaces W4IKB as net mgr. for WFPN. Crestview: K4KHV runs 30 watts on 146.94 f.m.; he reports much better communications with Ft. Walton than on the a.m. rig. Milton: K4HOX and WOFPA/4 are on the air with RTTY on 80-20 meters. Fort Walton: We are sad to report the death of W4NN, a long-time Florida resident. Traffic: K4VFY 321, K4BSS/4 169, W4BVE 80, W2TPV/4 71, WA4JIM 66, WA4EOQ 51, W4IKB 42.

SOUTHWESTERN DIVISION

ARIZONA—SCM, Floyd C. Colyar, W7FKK—SEC: K7NIY. PAM: W7CAF. RM: K7NHL. The Kachina Radio Club of Snowflake has affiliated with ARRL. K7CUY is pres. Welcome, fellows! K7VOR continues to send Official Bulletins. K7OIX and K7RUR are doing fine jobs as OOs. W5EZQ/7 has a new T4X to add to his Swan 350 mobile. W7LID built an electronic keyer and is having fun changing from his old Vibroplex. Congratulations to K7RUR, K7OIX and WA7DUB on their Feb. FMT participation. W7FKK has his new SB-100 operating. W7YRK has completed work on an SB-301 and SB-401. A fine traffic report was received from TWN Mgr. K7NHL. I would like to hear from some of you who would be interested in an EC job. We need more help in this area. How about it? It doesn't take too much time. Traffic: K7NHL 357, W5EZQ 15, W7FKK 12, K7RUR 3.

LOS ANGELES—SCM, H. G. Garman, W6BHG—Asst. SCM/SEC: W. R. Calkins, W1KUX/6. RMs: W6BHG, W6QAE, WB6BBO. PAMs: W6MLZ, W6ORS. ECs: W6LVQ, W6MLZ, WA6TYR, WA6WJT. BPLers for the month of Apr.: K6EPT, W6DSC, W6GYH, W6WPF and WB6BBO. These five stations handled a total of 3298 messages. Traffic total for Apr.: Orig. 837, received 2727, relayed 2150, delivered 275, total 5979, indicating a decrease of 1965 messages on the Mar. total of 7944. W6IVC received an unusual certificate for working five stations in the Vancouver ARC on 40-meter c.w. WB6QXY's traffic was low because of the wind for three weeks. K6IOV's traffic was low because of the same reason as XYL WB6QXY. W6USY is back to work, found a job needing an *old man*. WB6KVA reports that WB6OWS has a new beam, WB6MPH moved (where?), WB6KNK has an Extra Class license. W6AM has 18 rhombic antennas (now instantly available). WB6OUD is constructing an audio compressor for his Galaxy 5; he got a new Turner 454X microphone. April was a slow month for amateur radio for W6ORS. Working on the Boy Scouts Camoree and teaching a scout-aged group about electronics has taken a lot of otherwise "free time." We hope to have W6ORS back on the v.h.f. bands right soon. W6TXJ is trying to get his code speed back up. The gang (traffickers) is not too happy about Daylight Saving Time, changing the schedules, etc. The dear old sun doesn't pay any attention when it comes to effecting our signals, but guess we'll have to live with it. *Support your section level nets.* Summer schedule: SCN, daily at 0200Z and 0430Z on 3600 kc.; SCS, daily at 0130Z and 1900Z on 50,400 kc. Traffic: (Apr.) K6EPT 1225, W6GYH 901, WB6BBO 566, WB6OLD 379, W6WPF 315, W6DSC 291, W6MLF 287, WB6QXY 234, W6QAE 226, K5ANS/6 199, WA6KZI 156, K6CDW 146, WB6KIL 123, W6FD 102, W6BHG 75, W6BTV 70, WB6TMC 67, WA6WKF 64, K6IOV 62, WB6GGL 50, K6ASK 46, WA6TYR 38, W6USY 34, W6OEO 33, W6HUJ 29, WB6KGK 28, WB6QMF 28, WB6AEL 26, WB6KVA 23, W6MLZ 20, W6YRA 18, W6AM 16, W6DQX 16, W6PCP 13, K6EA 10, W6TN 9, WA6WJT 9, WA6TWS 8, WA6UCR 7, W6DGH 6, WB6OUD 6, W1KUX/6 4, WB6UPH 4, WB6SCK 3, W6ORS 2, W6RCV 2, W6TXJ 2, W6SRE 1. (Mar.) WA6WJT 14, WA6UCR 6.

ORANGE—SCM, Roy R. Maxson, W6DEY—WB6TIF now is an ORS. New AREC members: WA6FHT, WN6VWI, WB6TIF, WA6QZA and WA6PTU. EC WA6TAG advises that 3 of these are in his area. The 246 Net reports 650 check-ins, 137 traffic, per K6DLY. OO W6VOZ

has moved into a plush ham shack on a hill over-looking the City of Riverside. Asst. SCM W6JQB says DX is fair now on 20. He worked LA3BG, UN1BR, LA2B, G3SII and others. W6FB advises that WB6QAH entertained at a 246, 2 meter net, meeting at his QTH. The Desert RATS voted $100 to the ARRL Building Fund. W6FB handled traffic from Guam. WB6UTC is getting up some big antennas in a little trailer park. RM WA6ROF skeds WLØCX, Des Moines, Sun. WN2ZNR/6 is back *from his Mexican Safari and heading home for* N.Y. Traffic: WB6UTC 178, K6IME 136, WB6TIF 116, WA6ROF 102, WB6AKR/6 65, WA6KVA 50, W6WRJ 37, WA6OQM 17, WA6TAG 12.

SAN DIEGO—SCM, Don Stansfier, W6LRU/WA6VUI —Ten section stations reported traffic totals this month to their SCM. The San Diego V.H.F. Club spent the week end of the VHF QSO Party on Tecate Mountain; a good time was had by all. EC WA6OSB reports an average of eleven 2-meter check-ins per week in the F.M. net. K8EAP/6 is now active on 6 meters from La Jolla. K6TWO is on 6 with an HA-650. Asst. SCM W6EWU enjoyed a European vacation and met many hams on the trip. The May meeting of the San Diego V.H.F. Club featured a film on RTTY, with K4AFS, club pres.; explaining and officiating. OVS WB6NMT spent two week in KH6-Land *on business recently.* W6NLO, in Escondido, worked LU3DCA on 6-meter s.s.b. in Apr. Section stations active on SCN, 3600 kc. 7 P.M. every evening, include W6BGF, W6LRU, WB6MXA, W6YKF and W6NDH. Active on RN6, PAN and with TCC skeds are W6BGF, W6EOT and W6VNQ. Please check to see that your club sends representatives to the San Diego Council meetings. For further information on the Council check with W6SK or WA6TAD. Traffic: K6BPI 7959, W6VNQ 473, W6EOT 411, W6BGF 370, WB6QMM 240, WA6TAD 27, WB6MXA 22, W6LRU 19, WN6YKU 6, WB6NMT 1.

SANTA BARBARA—SCM, Cecil D. Hinson, WA6OKN—SEC: WB6NDP, WA6UEP and WA6IXP (Bud and Cora) led a group of Lompoc amateurs on a busy week end of antenna removal and erection, dinner dancing, barbeque and fun. K6YHK is now working for Lockheed at the Satellite tracking station. K6BF is taking a vacation via the inland waterways to Alaska. The Santa Barbara ARC needs a new home for the club station. Welcome to W2TPW/6 who, with his KWM-2, has settled down in Santa Barbara to live. WB6DRY has just purchased a lovely ham location but is having trouble getting his wife into the house. The Thousand Oaks High School has a new radio club. WB6SVM has a new SB-400 to go with his SB-300 and is building a linear. Look for *the Thousand Oaks gang on 3723 kc. every night at 7* P.M. WB6UHE also has a linear under construction.

WEST GULF DIVISION

NORTHERN TEXAS—SCM, L. L. Harbin, W5BNG —Asst. SCM: E. C. Pool, W5NFO. SEC: W5PYI. PAM: W5BOO. RM: W5LR. The Arlington ARC held a special dinner meeting at the Holiday Inn Apr. 15. W5UYQ, West Gulf Division Vice-Dir., was the guest speaker. "Amateur Radio Today and What It Means To You" was the subject and the talk was very enlightening. Ray has the ability of presenting this subject so that it was interesting to the newcomer as well as the old-timer in amateur radio. K5MZW, EC for Tarrant County, complimented the club on its activities in cooperation with the City of Arlington. These activities include a storm watch, a traffic count in connection with a civil defense survey and spook patrol for Halloween pranksters. The Irving ARC is in friendly competition with the Arlington Club in the Field Day and other activities. I think this is a good idea as it creates more interest in our hobby. The Irving Club is to be complimented on its custom of opening its meetings with "The Pledge of Allegiance to the Flag." The Kilocycle Club of Ft. Worth has a new meeting place located in the Seminary South Shopping Center and WN5RRI is due much thanks for securing this FB meeting room. W5TOO is doing an FB job printing the KC Club bulletin. Traffic: K5DBJ 114, WA5AGH 85, K4UBR/5 60.

OKLAHOMA—SCM, Daniel B. Prater, K5CAY—Asst. SCM: *Sam Whitley*, W5WAX. SEC: K5ZCJ. RM: W5QMJ. PAM-75: W5PML. PAM-6 meters: K5VFR. PAM 2 meters: WA5LBI. WA5AOB, Oklahoma County EC, has submitted an AREC and RACES net plan which operates every 3rd Sun. of the month at 4 P.M. Primary frequency is 3880. Glad to report that WA5AOB, WA5NYX, WA5GOF, WA5LBI, K5GBN and K5EZG have General Class licenses now. W5LOW is home now after an extended stay in the hospital. W5CZB also is home after a stretch in the hospital following a car accident. The weather net is operating again on 3860. Thanks to all who showed up at the EC meeting in Oklahoma City

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Apr. 23. WA5OHX and W5FIG have taken over as NCSs on STFN. K5DSR, of Mulhall, and WA5QYE, of Hennessey, are using the Tulsa repeater regularly now. K5KHA is home after surgery in the Ponca City Hospital. K5MTC has his 2-meter antenna up and is working out very well. WA5QQW, of Clinton, has a very good signal on 2 meters with an antenna 80 feet up and 500 watts. OPEN reports QNI 251, QTC 17. STFN reports QNI 582, QTC 82. OLZ reports 18 sessions, QTC 87. SSZ reports 13 sessions, QTC 73. Traffic K5TEY 995, WA5IMO 84, W5KNR/5 28, W5PML 13, WA5FVJ 10, K5ZCJ 5, W5EHC 4, W5OCK 4, K5WPP 4, W5FKL 3, WA5MDN 3, WA5OHX 2.

SOUTHERN TEXAS—SCM, G. D. Jerry Sears, W5AIR—SEC: K5QQG. PAM: W5KLV. RM: W5EZY. Summer is here with a wide variety of QRN as well as tornado warnings nearly every day. You fellows with emergency power plants, keep them in good running condition as they may be needed at any time from now on through the hurricane season, which ends with Thanksgiving in this area. K2EIU/5 advises that after completing the wiring of his SB-101 it works great; next project tower and quad. From W5AC, K5HGB reports WA5MOD is the new chairman of the Texas A.&M. University Amateur Radio Committee. WA5QKE is working lots of DX as well as QNI several traffic and emergency nets. The Port Arthur and Orange clubs have coffee and eyeball QSOs at the Jack Tar Motel in Orange 1500 local time Sun. Come on by if you are in the area; EC W5TFW extends a big welcome to all amateurs. W5ABQ advises c.d.-sponsored classes have produced a dozen new Generals in San Antonio. Congrats to W5MIF and K5MZH, instructors. Old-timer W5AZD, inactive since '33 now is back on the air as WA5RST. W5KLV is working on a new quad. K5LUG has a new Swan 350 in a new station wagon with a new house trailer all ready for Field Day. New officers of the Huntsville ARC are WA5NHL (EC), pres.; W5JMH, vice-pres.; W5QPZ secy.-treas.; W5TPZ, W5RYZ and W5SJA, board of directors. K5WYN has returned from a trip through Arkansas, Missouri and Illinois; he worked mobile until his rig cratered. The change to Daylight Saving Time has caused plenty of confusion in this area as this is first time since World War II. A good many net members are either too late or too early. Conditions are very erratic on 75 and 40 meters. Traffic: (Apr.) W5AC 93, W5HWY 76, W5ABQ 36, WA5QKE 31, W5BGE 30, K5HMF 25, WA5IQL 16, W5TFW 15, W5EZY 11, WA5MBC 9, W5KLV 4, W5AIR 3, K2EIU/5 2. (Mar.) W5AC 314, WA5MXY 74.

CANADIAN DIVISION

ALBERTA—SCM, Harry Harrold, VE6TG—SEC: VE6FK. PAM-APN: VE6ADS. PAM-ABSN: VE6ALQ. ECs: VE6SA, VE6SS, VE6XC, VE6AFQ, VE6PL. ORSs: VE6BR, VE6ATH, VE6ATG. OPSs: VE6HM, VE6SS, VE6ADS. OOs: VE6HM, VE6TY, VE6AKV. OBSs: VE6HM, VE6AIF. Centennial projects for VE6s: Highest s.s.b. contacts on any one band, an annual affair with the trophy donated by VE6TP. Highest score for ARRL Field Day, donated by VE6WR annually. For the most originated messages on the net for the year donated by VE6ALQ. So, fellows, try your luck. Southern Alberta was hit by the heaviest snow storm ever for this time of year and nothing moved for two days. The AREC, under the direction of VE6AFQ, did a very fine job. Thanks to all who assisted and stood by. The storm took poor little Emma's antenna down. Don't forget Field Day, the Centennial Hamfest and the International Hamfest. VE6WZ is sporting a new s.s.b. rig. VE6JI looked very good on TV with his collection of driftwood and the things that he has made. Anytime you are around Barons you should drop in on Joe and look them over. APN and ASBN became APSN starting May 67, same time and frequency. Traffic: VE6ATH 142, VE6HM 41, VE6FK 25, VE6XC 25, VE6TG 7, VE6AOO 3, VE6APO 3, VE6PZ 3.

BRITISH COLUMBIA—SCM, H. E. Savage, VE7FB —VE7BFZ and VE7BQV recently were married. East Kootenay ARC's new officers are VE7ASE, pres.; VE7BGN, vice-pres.; VE7BKW, secy. VE7BOS and VE7QF did very well in the recent ARRL FMT. VE7OF now is s.s.b. The North and West ARC had good tours of CBUT and Research Industries. We attended the latter and VE7AIO and VE7QV, our conductors, really made it very interesting. VE7BOA, a victim of "whiplash," is improving slowly. Mr. Borrie, civil defense for North Shore, complimented the North and West ARC on putting into action the communications center at c.d. hq. The BCARA reports that every amateur in B.C. should have his application card for vehicle license call plates by now. They must be returned to the BCARA by August. VE7AC reports radio is second as the planting season is in force. VE7BQA won a class "A" certificate.

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We have been concerned for quite some while at Waters over the inability of many hams to find our products readily available in the general market. Many letters of complaint attest to this.

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It is reported VE7BAF now is married. VE7LL and VE7BCF won the BCARPSC Net award. ARRL Opman's *Handbook*. VE7BKE now is s.s.b. Fly boys out west are VE7FS, VE7TY and VE7MQ and model flyers are VE7BCV and VE7BGF. VE7AHX has a home-brew receiver and s.s.b. transmitter. VE7ASV asked the owner of his apartment if he could put up an antenna. Sure can, all you like. VE7EI and others not active for years are looking for equipment to get back on. VE7QT reports he is improving. VE7AMW and his XYL will attend the Music Festival in Salzburg in July. Traffic: (Apr.) VE7BHH 140, VE7BQA 58, VE7BLO 27, VE7BBB 23, VE7DH 15, VE7AC 10. (Mar.) VE7BHH 205, VE7-BQA 55, VE7FQ 8.

MANITOBA—SCM, John Thomas Stacey, VE4JT—The big affair, the Centennial Mid-Continent Hamfest is being held Labor Day week end, Sept. 2 and 3. All amateurs are invited to participate. VE4GD is active from Guyhill on all bands. VE4FQ is new from Winnipeg and is hunting WAS. Steve also is pres. of VE4GY club station. VE4NE reports that the Dauphin ARC is coming along well and that a 1250-watt generator is on the way for portable work. VE4QF is a new call in Dauphin. VE4LG is using FETs for a homebrew receiver. VE4EI is off to Flin Flon for the summer. The phone net boasts 34 members and our PAM is on the lookout for OPS appointment applications. VE4HI takes over as chairman of UMARS and hopes for renewed activity. The Brandon ARC continues with an enthusiastic group of new-comers, including one YL. Commencing 0100Z Sept. 1 the c.w. net moves to 3615 kc. to get out of the RTTY QRM. A CAN certificate has been earned by VE4LG. We now have four VE4s checking into TEN. Activity reports still are needed. How about a report via one of the nets or by post-card? Reports should reach me by the fifth of the month. Net reports: Phone—Sessions 30. QNI 443, QTC 12. C.W.—Sessions 30. QNI 172. QTC 150. Traffic: VE4LG 117, VE4RW 103, VE4JT 62, VE4NE 51, VE4GN 10, VE4QJ 6, VE4XN 4.

MARITIME—SCM, J. Harley Grimmer, VE1MX—Asst. SCM: R. P. Thorne, VO1EI. SEC: VE1HJ. The Maritime Sparkettes Club has taken as its Centennial project the club station VE1AGF, the N.S. School for Boys, and will operate a coffee and doughnut stand at the Maritime Convention to raise funds for the project. VE1AQU, VE1ASN and VO1IM recently received their Advanced amateur tickets. Deepest sympathy is extended to the family of VE1TT, who passed away recently. VO1AI is the first XYL to receive the WAVO award. VO1FX reports that attendance has been good on the NFLD Net, which meets daily at 2230 on 3785. VO1HY is now a resident of Saint John, N.B., and VO1IB has moved to Ottawa. VEØMY, the Schooner *Bluenose II*, will be in Montreal all summer for Expo 67 and amateurs are invited to come aboard. HARC members now have special Centennial QSLs depicting the Port of Halifax which were supplied through the generosity of the Centennial Commission of the City of Halifax. The 1967-68 executives of SONRA are VO1HI, pres.; VO1-AQ, vice-pres.; VO1CK, treas.; VO1AW, secy. Traffic: (Apr.) VE1AMR 20, VE1ARB 6, VE1OM 4. (Mar.) VO1-FX 30, VEØMD 3, VO1AW 2.

ONTARIO—SCM, Richard W. Roberts, VE3NG—Almost all of the amateur radio clubs in Canada are participating in some form or other in Canada's Centennial Year, whether it be QSL cards or certificates of achievement. We regret to list the passing of VE3DN, of Downsview (Toronto), and VE3QP, of Red Lake. Field Day results may be available at the Ontario Division Convention at Ottawa. The Ottawa group is going to put on one of the finest conventions ever held in this Ontario section. Watch *QST* for information. The Hamilton AREC put on a fine public service effort on the mammoth search for a little girl who was missing from her home at Kilbride near Waterdown. VE3EUM, our SEC, and Hamilton EC VE3GBX are to be commended in this effort. VE3NN was in W4-Land on vacation. VE2TT has returned to Toronto after 13 years in Montreal. Who says "they don't come back"? Look for Ray on 2. The Scarboro ARC has taken over the call VE3CNF. This call formerly was held by your SCM for use during the Sportsman Show and other various events to be held on the grounds of the Canadian National Exhibition. VE3-BBC graciously accepted the call on behalf of the Scarboro Club; it will be used in the same area for the club's events. June 9 saw your SCM visiting the Niagara ARC, a wonderful gang. Congratulations to the Brantford Radio Club on its affiliation with ARRL. Traffic: VE3DPO 121, VE3NG 101, VE3ATI 82, VE3GCE 68, VE3EBC 44, VE3EBH 39, VE3GI 37, VE3DBG 34, VE3-FGV 26, VE3BBQ 25, VE3FHB 24, VE3AFA 20, VE3-BUR 20, VE3ETM 15, VE3AWE 13, VE3DVE 12, VE3-GBX 9, VE3VD 9, VE3EZY 8, VE3HW 4.

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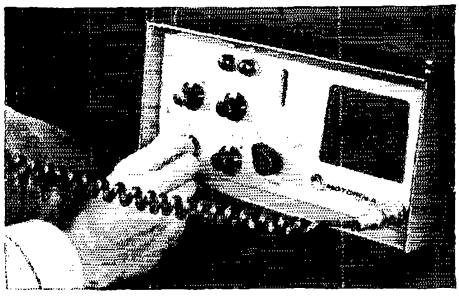

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QUEBEC—SCM, J. W. Ibey, VE2OJ—SEC: VE2ALE. RM: VE2DR. PAMs: VE2BWL, VE2AGQ. Greetings to the great many who have reached us for the National Convention. Summer brings poor band conditions and vacation which means we must work harder to keep the frequencies occupied and events interesting until things return to normal in the fall. VE2PT has left our section for VE3-Land. A pleasant surprise to all came on learning of VE2XPO. This is the station located in the Quebec Youth Pavilion at Expo 67. VE2DEC on 2 meters and VE2AKF on 432 Mc. plus steady reports of VE2EC, keep the Three Rivers gang in front. VE2BZV and VE2DCW are very active also. VE2DCW is a new ORS appointee. We wish to remind new license holders that network operation is good training for all phases (phone of c.w.) of our hobby and you are welcome to check into any section net you choose. We often wonder why we receive no reports from a flourishing part of the fraternity, RTTY. The same could be said of the DX gang. Let us hear from you. Traffic: VE2BWU 93, VE2BRD 74, VE2DR 69, VE2BWL 65, VE2BVY 52, VE2ALE 31, VE2DCW 31, VE2AJD 30, VE2OJ 28, VE2AGQ 23, VE2EC 20, VE2AZQ 11, VE2BGJ 10, VE2WM 5, VE2HW 4, VE2NT 2. QST

Silent Keys

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

W1AR, Leon C. Runey, Belmont, Mass.
W1CS, Harold W. McIntosh, Vineyard Haven, Mass.
K1QAH, Lawrence R. Cook, Yalesville, Conn.
W1UWO, Frederick Barden, Roxbury, Mass.
W2AYC, Milton L. Thompson, Mattituck, N. Y.
W2BTE, Walter F. Walsh, Union, N. J.
K2FR, Henry M. Gabrielson, North Merrick, N. Y.
W2LSG, Henry F. Horvath, Jackson, N. J.
W2VA, Frederick M. Schussel, Seaford, N. Y.
K3DXE, William Geissel, Warminster, Pa.
W3OLF, A. Blake Fee, Coudersport, Pa.
W3QV, Walter Bradley Martin, Abington, Pa.
W3VRJ, William S. Waggener, Baltimore, Md.
W4CGE, Delmar D. Bethurum, Norfolk, Va.
W4DWO, Carl C. Beane, Asheboro, N. C.
WA4LBF, William J. Rogers, Birmingham, Ala.
K4MTL, Ernest Raistrick, Miami, Fla.
W4NN, Raymond Atkinson, Ft. Walton Beach, Fla.
W4NV/W4SB, J. Carroll Melton, Norfolk, Va.
W4SBI, Robert E. Fields, Williamson, W. Va.
W4UYD, Stanley E. Brown, Dunedin, Fla.
K4YLQ, Ralph Williams, Norfolk, Va.
W4YS, Robert R. Creighton, Augusta, Ga.
W5LGI, Boss R. Fries, Jr., Killeen, Texas
ex-5ZF/5GJ, Henry M. Harris, Waco, Tex.
W6HAQ, James A. Bailey, Lomita, Calif.
ex-W6ITS, Homer H. Bidwell, San Leandro, Calif.
WA6ZIJ, Ewell Carter, Granada Hills, Calif.
K7DPA, Eva M. Swensson, Portland, Ore.
K7ERY, Jerry R. Alexander, Portland, Ore.
WA7GKY, Carroll J. Kane, Kent, Wash.
W7RQE, John M. Sullivan, Layton, Utah
W8CJE, Robert L. Libis, Akron, Ohio
K8GVI, Francis M. McNamara, Toledo, Ohio
ex-8LD, Homer D. Rice, Mount Dora, Fla.
W8LKD, Mark I. Curl, Cayahoga Falls, Ohio
W8NZJ, Alfred C. Taylor, Cleveland, Ohio
W8PZW, Robert J. Karas, Uniontown, Ohio
K8RSC, William W. Warner, Kent, Ohio
WA8RWE, Loyal E. Nofziger, Toledo, Ohio
W9FDQ, Robert H. Thayer, Chicago, Ill.
W9HPC, William J. Ingalz, Two Rivers, Wisc.
W9IJK, Joseph C. Champlin, Hardin, Ill.
W9NW, Kenneth R. Caldwell, Chicago, Ill.
ex-WØHQY, Melvin Z. Staebler, Charles City, Iowa
KØRDC, Herman H. Crouch, Platte City, Mo.
EP2AR, Ismael Koutchestahany, Tehran, Iran
HP3RR, Ramon Rodriguez, Chiriqui, Panama
ON4OJ, Georges Demey, St. Michiels, Belgium
VE1TT, M. J. P. Sheridan, Halifax, N. S.
VE3AEV, Leslie M. Spratt, Caledonia, Ont.
ZS6Q, Harry A. Chenik, Johannesburg, South Africa

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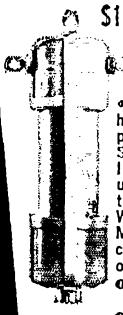

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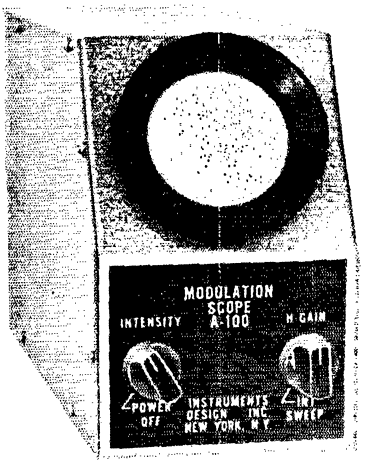

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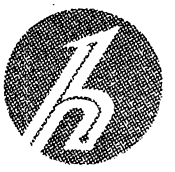

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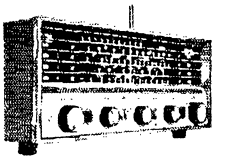

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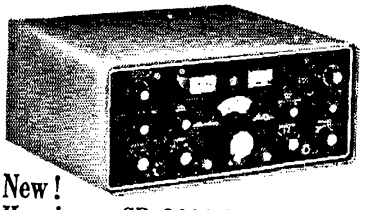

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1967 Novice Roundup Results

(Continued from page 68)

contest was an experience I will never forget! Working W1AW was one of my biggest thrills." — *WN4EKI*. "Concerning the contest, as a whole, I didn't like it. Maybe because I already have WAS and there was nothing to gain. There weren't enough Novices in it. It seemed as if everybody quit at the end of the first week. I liked the SS better (maybe because I won, hi)." — *WN6THT*. "It was a blast. I worked more Generals than Novices, even W1AW and W1BDI." — *WN8TWR*. "A most enjoyable test of skill from start to finish." — *WN2YQH*. "Enjoyed the contest immensely! Got 5 new states for WAS. Glad to work W1AW!" — *WN2WNB*. "I know I'm far from winning but I enjoyed participating. Tnx, W1AW." — *WN2ZJV*. "I received my transmitter on February 8 so I didn't have as much time as I wanted on the air, but I worked 27 new states. I just hope they all QSL, hi." — *WN1HEC*. "I have one statement for the Novice Roundup: It was great!" — *WN4DCW*. "I think the idea of the contest is great and hope you continue to hold it each year for the new crop of Novices. It is an excellent way to get your feet wet in amateur radio." — *WN5PWW*. "I have just finished 27 hours of sheer pleasure. After working HI8XAL it became apparent that I was getting the most out of my dipole." — *WN6TBL*. "My last QSO was with WA9JRR. It was his first!" — *WN6UVH*. "The activity on 40 was great, but what happened to 2 meters?" — *WN8GAR*. "Finally worked W1AW! Those two days when we had a blizzard really helped my score (no school)!" — *WN1GGN*. "Wish we could operate 50 hours." — *WN8FLN*. "It was fun and I upped my WAS to 45. Guess I was lucky. Blew the final 10 minutes after the contest was over." — *WN9STQ* "Thanks for running such a swell event. Great fun." — *WN6UIA* "I was trying to operate both the Novice Roundup and the ARRL DX Contest the last weekend. It ain't easy but I love contests!" — *WN9SUU* "My receiver broke down the first weekend of the contest and had to borrow a friend's. Transmitter quit loading. I shudder to think what will happen on Field Day!" — *WN4DFW*. "Here in Delaware it was a three-way race for first place just on our street — things were pretty crowded. But I'm afraid love got the best of me. I was out with my girlfriend during the best operating time. I only got three new states." — *WN8GKI*. "Please note for the record that W9GXR has a QSL waiting for anyone who is interested in exchanging." — *W9GXR*. "The quality of Novice operators this year seemed excellent, but why do some Novices insist on repeating exchange information five and six times?" — *W3DPR*. "A big NO vote on certificates for Generals. There is a lot of General participation now and awards would only bring in the KWs and the type of operating a lot of contests seem to generate. It's nice to be able to go through 15 minutes of explanation to a new ham on what the NR is and then get his number 1 without worrying how W6XXX is doing. Let's leave this contest for the beginners!" — *WB6IEX*. "Sounds like an extremely fine crop of Novices this year. Had a ball." — *WA9QBM*. "It gives me great pleasure each year to work the NR and receive so many cards stating that I am their first Arkansas QSO. Thanks to all the Novices I made contact with that were not in the contest, because without them, I would never make 10,000 points." — *K5KDG*. "Enjoyed the NR very much. Not nearly as hectic as the SS!" — *W4RLW*. "In reference to a recent letter in *QST* concerning awards for General Class operators in the NR, this is certainly unnecessary for several reasons: 1) this contest is basically not for Generals, 2) enough recognition is given to Generals who participate in the customary listing, 3) it should be sufficient for the General to know he is helping the Novices through his participation by providing additional contacts.' — *W2NEP*. "My second Novice Roundup; one as a Novice and first one as a General — remembering all the good Generals who, last year, took their time to give us Novices a little more participation, it became my turn now. I put in 38 hours in the contest and enjoyed it as much as last year." — *W4RSCZ*. "Sounded like many Novices had a fine time in the Novice Roundup." — *WA5MUF*. "This is my 3rd Novice Roundup. I always enjoy getting in to see who the 'sharp' new operators are. When you get used to the General band contests (SS, CD) this seems awfully slow. I'll QSL anyone who sends me a card (providing I worked them, hi)." — *WA4BSV*. "I enjoyed the NR more than the first weekend of the DX Contest!" — *K4ADT*. QST

ARPSC

(Continued from page 71)

WAØMIVO were the base stations initially and soon mobile units were placed at key locations. Late in the evening health and welfare traffic began to move and continued through Monday, May 1. The Minnesota 6 Meter Traffic Net and the PICONET helped handle the bulk of the traffic. Although power and telephone lines remained in tact, telephone circuits were badly overloaded. Twenty-eight amateurs were known to have participated in the emergency. — *WØUGR.*

— • • • —

On May 5, eleven amateurs provided communications from a Chemical Plant fire at Glens Falls, N.Y., to the American Red Cross Headquarters of Glens Falls. K2AYQ acted as NCS on 51,000 and K2PBE, W2FEM and WB2BZJ operated mobile. — *K2AYQ, EC Glen Falls, N.Y.*

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On May 10, W7MWD reported into the West Coast Amateur Radio Service Net requesting Highway Patrol assistance for an accident involving an overturned car. The driver was unhurt, and appreciated the rapid service that resulted because of amateur radio — *WB6IZF*

— • • • —

On April 17, a nine-year-old boy drowned and the Brazoria County AREC group of seven amateurs provided communications for the Sheriff's Department and the Coast Guard during the search which lasted for nearly two days. WA5IOO was able, via telephone, to deliver messages originating from the mobiles at the scene: *WA5s* IJP GSK and OJE. About fifty messages were handled and the hams were a big help in the operation. — *K5HMF, EC Brazoria County, Texas.*

— • • • —

On April 23, The West Gulf Emergency Net had a simulated tornado drill. A total of 46 amateurs participated and there were simulated station failures to add some spice. Conclusion is that the net will be ready in case of trouble in South Texas. — *K5QQG, SEC STex.*

— • • • —

On April 30, the Red Cross initiated an alert for the Canton Amateur Radio Club station, involving a simulated plane crash. K8ISS, in a C.A.P. plane, called W8RTR on two meters and then the announcement was made on ten meters. Liaison was maintained from the Red Cross building to the simulated crash site. The alert lasted for about three and a half hours. — *K8DHJ, EC Stark County, Ohio.*

— • • • —

On May 2, W8ALL/mobile reported a fire in the woods near Traverse City, Mich. W8JUY answered and notified the authorities. Both hams stood by until help arrived. — *K8GOU.*

— • • • —

On May 7, the Southeastern Conn. AREC crew provided communications for a parade at the request of the police dept. and the VFW. A dry run was held the week prior to the parade. There were 6 mobiles and a base station on 2 meters and 13 mobiles and a base on 10 meters. Rain soaked some of the out-of-town paraders but the efficient communications system enabled many problems to be solved that could have developed into serious ones without the facility. — *K1SRF, EC Gales Ferry, Conn.*

— • • • —

On May 13, five hams of the Monroe County, Mich., AREC provided communications for a boy scout canoe race. The radio units were at three check points and at the start and finish. Communications were excellent and the scout leaders were very pleased with the speedy results that had not been possible before. — *W8NDM, EC Monroe County, Mich.*

— • • • —

Forty SEC reports were received for March, representing, 16,995 AREC members. This is ten fewer reports and over 4000 fewer members than a year ago. Sections reporting: Ala, Alta, Ark, Colo, Conn, Del, EFla, EMass, EPa, Ga, Ill, Ind, Kans, Ky, La, Mar, Mich, Mo, Mont, NC, Nebr, Nev, NH, NNJ, Ohio, Okla, Orange, Que, Sask, SCV, SDak, SDgo, SNJ, STex, Tenn, Utah, Va, Wash WNY, WPa, and NH for Feb. QST

Ideas For The Club Program Chairman

(Continued from page 57)

innovations that he has come up with and a chance to ask for new ideas.

Construction Night: Announce a construction contest. Offer prizes or certificates for several categories of home-built equipment (original, Handbook, kit, etc.) for each class of license. Show the League film on amateur construction methods.

As the membership catches on to the idea and learns that the way to insure coverage of their special area of interest is to pitch in — they will. Then you have a useful, interesting club. At the end of the first year, announce that the program calendar for the next year is being planned. Survey the membership as to which programs they liked best and request new ideas for the future. You'll get more than enough. You will also have developed an appreciation for the great talent resource in your membership. QST

The L-Match

(Continued from page 19)

could bring the s.w.r. down even lower, though checks on many supposedly well-matched 2-meter arrays might show his match to better than most.[1]

The effect of the stub amounts to inductive loading at the center of the dipole, so the end-to-end length must be physically less than that of a driven element fed by other means. The dipole length and the size and position of the balun loop vary with frequency, and with the feed impedance of the array in question, so no one size can be right for all 2-meter Yagis. The dimensions shown in Fig. 2 were optimum for a "store-bought" 15-element Yagi, operated at 145 Mc. The mounting screws of the dipole, which serve as connection points for the coax and balun loop, are 2¼ inches apart. The loop is made of aluminum ground wire, about 9 inches overall, including the "eyes" at each end for slipping over the mounting screws.

Some variation in loop inductance, and thus in impedance matching, can be made by varying the spacing between the upper and lower portions. Balancing effect is related to the position of the loop "toe" with respect to the driven element. Obviously these effects interlock, so a cut-and-try approach is indicated. The array should be set up at least one wavelength above flat ground, with no reflecting objects in the field for many wavelengths out in front. Any appreciable power

(Continued on page 152)

[1] The bridge should be inserted in the transmission line at or near the antenna, if the true degree of mismatch is to be observed. Otherwise losses in the line tend to make it self-terminating, and the s.w.r. indicated is always less than the true value. Readings taken with the average amateur type s.w.r. bridge cannot be taken too seriously, except in a relative manner, and it could be that a "reading" of 1.05:1 could actually mean an s.w.r. of 1.25 — which is still pretty good, as v.h.f. matching goes.

reflected back into the array shows up on the s.w.r. bridge, of course. (It reads *reflected* power, remember?) If you don't have that kind of back yard, point the beam straight up, and put the reflector on the ground or any multiple of a half wavelength above it. This will result in a driven-element impedance close to what you'll have with the beam "up in the clear."

The L-Match should do nicely for 220 or 50 Mc. Suggested lengths of wire for making loops for these bands are 6 and 25 inches, respectively, for 50-ohm feed in Yagis of conventional design.
— E.P.T. QST

The BOA

(Continued from page 41)

The unit was given its baptism under fire in two TVI cases, and came through with flying colors. The first was on a DX-100, using a popular low-pass filter, and still raising cain with Channel 2 on ten meters. With the BOA installed, the TVI vanished completely. In the second case, a 75-watt 2-meter rig was causing a slight but objectionable amount of TVI on Channel 2. Again, with the BOA installed the TVI vanished, and life was pleasant once again.[4]

For other frequencies than those used in the BOA shown in Fig. 4, the length of stub A can be calculated by

$$\text{Length, inches} = \frac{2952\ V}{f_1 \text{ in Mc.}}$$

and the length of stub B by

$$\text{Length, inches} = \frac{2952\ V}{f_2 \text{ in Mc.}} \left(1 - \frac{f_2}{f_1}\right)$$

where f_1 is the undesired frequency, f_2 is the operating frequency, and V is the propagation factor for the type of line used. For ordinary solid-dielectric coax V is 0.66. Some trimming as described earlier will be required to compensate for small variations in the cable and for the loading effect of fittings.

Power-Handling Capacity

The RG-8/U version tried seems capable of handling the output of transmitters in the 250-watt class. The power limit of the BOA is set by the open-end stub, since a voltage maximum exists at the open end. For a matched 52-ohm line and 1-kw. input, the r.m.s. voltage along the line is under 200 volts, but at the open end of Stub A this voltage will jump to a high value. Since RG-8/U is rated at 4000 volts r.m.s. maximum, RG-17/U (11,000 volts r.m.s. maximum) would be safer for high-power applications. One word of caution: make sure the open end of Stub A is well insulated. QST

[4] As no harmonics of 144 Mc. fall in Channel 2, this was probably caused by a spurious radiation from an early multiplier stage getting to the antenna because of inadequate filtering in the transmitter. When this is known to be the case the stub lengths should, of course, be chosen so the actual spurious frequency is suppressed. — *Editor.*

W0EPV Squeeze Keyer

(Continued from page 28)

Key Levers

As with any electronic keyer, but more particularly with a squeeze-type keyer, smooth, effortless operation depends to a large extent on the lever mechanism. Too many electronic keyers are ruined by the use of makeshift levers. The one shown in the photo is a Brown Bros. (see *QST* ads) Model BTL. A new type of double-lever key is being developed by this firm at the suggestion of the author. It should be available by the time this article appears. QST

Note: The author can supply 6 × 6-inch glass epoxy circuit boards, professionally pre-etched, ready for use, with tube sockets mounted, and complete building instructions for $10.00 each. The board accommodates all components except those in the power supply.

Scouting and the Radio Amateur

(Continued from page 53)

will long remember the beautiful evening round table on the high end of 40 when Scouts from the east coast were talking with brother Scouts in Canada, the midwest, and the far west.

1967 is the 60th anniversary of the Scouting movement and it will be commemorated as the 12th World Jamboree convenes August 1–9 at Farragut, Idaho. The World Jamboree will have its own station, K7WSJ, operative during the entire period. Jamboree-On-The-Air will be the weekend of August 5th and 6th. As before, the basic purpose of J.O.T.A. will be to provide a medium for Scouts to talk to other Scouts wherever they may be. If you're interested in serving Scouting, this event is a "must." Make your plans now to have one or more local units at your shack sometime during that period. Or arrange to take your mobile rig into your Council's Scout Camp and string some dipoles from pine trees.

The Boy Scouts World Bureau report on 1966 J.O.T.A. suggests that the aim of the 1967 J.O.T.A. should be "A WORLD-WIDE NETWORK OF SCOUT STATIONS IN 1967." Is this aim too ambitious for amateurs and Scouts and Scouters to accomplish? QST

Audio Selectivity for the HBR

(Continued from page 43)

made metal brackets bolted to the rear wall of the Minibox. Three pieces of 3/16-inch thick sponge rubber wedged in at the inner and outer sides of the two toroids will hold them firmly in place. The leads from the 0.5-μf. capacitors and the toroids are soldered to the pins on the terminal strip, made conveniently accessible by using the 5/8-inch spacer.

Use shielded wire for the four connecting leads between the audio filter and the receiver circuitry proper. These leads are brought out through a 5/16-inch hole, drilled at any convenient place, through the bottom of the Minibox and through the receiver chassis. The Belden flexible shielded "grid" wire specified for use in the HBR-13C again is recommended in this instance. The two

windings on each toroid are series-connected, as described in McCoy's original article. Generally speaking, the wiring of the filter is not critical, other than the use of the shielded wire for the longer connecting leads. By inserting the audio filter between the product detector and the first audio stage the audio voltages will be low, thereby insuring the optimum performance of the filter.

Operating Hints

The three-position control switch allows the filter to be switched in or out at will, as well as giving a choice of filter passband widths. The receiver's audio amplifier and audio gain control function normally when this switch is in the "out" position.

For optimum audio filter performance, the following steps are suggested: With the filter control in the "out" position, set the b.f.o. (C_{12}) to the exact center of the receiver's normal passband. Turn on the 3500-kc. marker oscillator and adjust the r.f., mixer and i.f. gain controls to provide a c.w. signal of moderate level from the marker oscillator. Using the tuning dial of the receiver, zero-beat the receiver with the marker signal. Turn the filter control switch to position No. 2. Without touching the tuning dial of the receiver, adjust the b.f.o. frequency (C_{12}) to coincide with the pass-band frequency of the audio filter, as evidenced by maximum signal strength of the marker c.w. signal. Now turn off the 3500-kc. oscillator and you will be in business.

It is to be understood that in setting up the receiver for c.w. use of the filter, the b.f.o. is not again moved from the above adjustment, all of the tuning being done with the main tuning dial. Position No. 1 will give slightly greater signal strength and a broader pass band as compared to position No. 2.

Endeavor to memorize the tone of the peaking frequency of your filter, to enable you to position the tuning dial to the exact spot which will coincide with the filter's peaking frequency when QRM indicates a need for the filter. Otherwise, when the filter is switched in, you are quite likely to come up with the signal you wish to eliminate rather than the desired signal. Extremely sharp tuning receivers do present *some* problems!

A multitude of HBR receiver owners will be unable to follow these instructions because of insufficient chassis space. An outboard unit is the obvious solution. An even simpler schematic for such a gadget appears in Fig. 2, complete with receiver accessory socket and matching connector plug. Flexible shielded-wire connecting cables up to 30 inches long will be entirely satisfactory. The two toggle switches may be mounted on the front wall of the Minibox and the connecting cables brought out through the rear wall between the two 0.5-μf. capacitors. Constructional procedures will be similar to those for the chassis mounted-filter. QST

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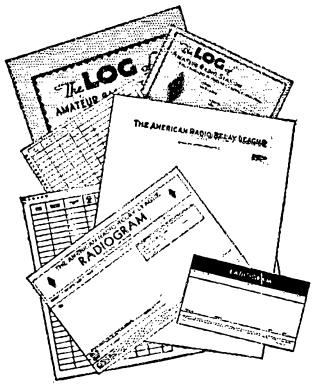

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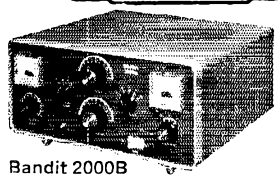

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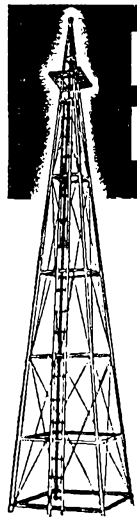

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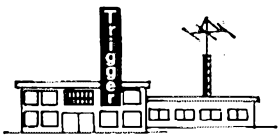

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Having made no investigation of the advertisers in the classified columns except those obviously commercial in character, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

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HAMFESTERS Radio Club, Chicago, Illinois, proudly announces its 33rd Annual Midwestern Hamfest, Sunday, August 13th at Santa Fe Park, 91st and Wolf Road, Willow Springs, Illinois, near Chicago. The Hamfest features manufacturer and distributor exhibits, swappers row, awards and a variety of activities for all. This year Hamfesters salutes the "Armed Forces." Also displays by the military. For complete details and map of the location, write: Gregory Purtock, WA9MRE, 2916 West Marquette Road, Chicago, Illinois 60629.

"SAROC" Sahara Amateur Radio Operators Convention 4-7 January, Third Annual Fun Convention hosted by the Southern Nevada Amateur Radio Club. Designed for exhibitors and participants at Hotel Sahara, Las Vegas, Nevada. MARS seminar, Army Airforce and Navy representatives. Ladies' luncheon with crazy hat contest, hat should convey amateur radio theme. Plus fabulous entertainment only "Las Vegas" can present. Registration fee includes three cocktail parties, Hotel Sahara Show, Hunt Breakfast, technical sessions, admission to leading manufacturers' and sales exhibits. Advance registration closes one January. QSP QSL with zip and telephone number for details to Southern Nevada Amateur Radio Club, Box 73, Boulder City, Nevada 89005.

THE Wood County Amateur Radio Club announces its annual HAM-A-Rama Sunday July 9 at the Fairgrounds, Bowling Green, Ohio. Write to W8PSK, 324 South Grove St., Bowling Green, Ohio 43402 for details.

LOUISVILLE Ham Convention—Sept. 8-9, 1967. Beautiful Executive Inn Motor Hotel, Waterson Expressway at State Fair Grounds, Louisville, Ky. Participate in the technical sessions, forums, banquet and flea market. Bring XYL for day of women's activities. For information write Lousiville Ham Convention, Box 20094, Louisville, Kentucky 40220.

THE Friendly Favorite: Warren, Ohio. A.R.A. Hamfest, August 27, Newton Falls. Follow arrows from Rt. 534 and Turnpike Exit 14. Contests. Swap Shop, XYL-YL program.

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QSLS. See our new "Eye-Binder" cards. Extra high visibility. Samples, 5¢. Dick, W8VXK, 1944 N.M. 18, Gladwin, Mich.

10¢ Brings free samples. Harry R. Sims, 3227 Missouri Ave., St. Louis, Mo. 63118.

CREATIVE QSL Cards. 25¢ for catalog, samples, 50¢ coupon. Personal attention. Imaginative new designs. Wilkins Printing, Box 787-1, Atascadero, California 93422.

RUBBER Stamps $1.15 includes tax and postage. Clints' Radio W2UDO, 32 Cumberland Ave., Verona, N.J. 07044.

SUPERIOR QSLS, samples 10¢. Hamsco, Box 773, Hobbs, New Mexico.

QLS, finest. YLRL's. OMs, samples 10¢. W2DJH Press, Warrensburg, N.Y. 12885.

QSLS, SWLS, XYL-OMS (sample assortment approximately 9¢) covering designing, planning, printing, arranging, mailing, eye-catching, comic, sedate, fabulous, DX-attracting, prototypal snazzy, unparagoned cards (Wow!) Rogers KØAAB, 961 Arcade St., St. Paul, Minn. 55106.

3-D QSL cards add prestige with spectacularly different glittering colors and raised designs. Samples 25¢ (refundable), 3-D QSL Co., Monson 2, Mass.

QSL, SWLS, WPE. Samples 10¢ in adv. Nicholas & Son Printery, P.O. Box 11184, Phoenix 17, Ariz. 85017.

QSLS 300 for $4.35. Samples 10¢. W9SKR, George Vesely Rte. #1, 100 Wilson Road, Ingleside, Ill. 60041.

QSLS 3-color glossy 100, $4.50. Rutgers Vari-Typing Service. Free samples, Thomas St., Riegel Ridge, Milford, N.J.

QSLS-100 3-color glossy $3.00; silver globe on front, report form on back. Free samples. Rusprint, Box 7575, Kansas City, Mo. 64116.

QSLS stamp and call brings samples. Eddie Scott, W3CSX, Fairplay, Md.

ORIGINAL EZ-IN double holders display 20 cards each in plastic. 3 for $1.00 or 10 for $3.00 prepaid and guaranteed. Free sample to dealers or clubs. Tepabco, John K4MNT, Box 1987, Gallatin, Tenn. 37066.

QSL'S: Quality with service. Samples free. R. A. Larson Press, Box 45, Fairport, N.Y. 14450.

QSLS. Fast. Catalog 10¢. Filmcrafters, Box 304, Martins Ferry, Ohio 43935.

COLORFUL QSLS. Samples 10¢ or SASE. K8LNL Print, 510 Riddle Rd., Cincinnati, Ohio 45220.

BEST Quality rubber stamp or 1000 address labels, $1.25 post paid. Joe Harms, 905 Fernald, Edgewater, Fla. 32032.

QSL's. Free samples, attractive designs. Fast return. W7IIZ Press, Box 2387, Eugene, Ore. 97402.

QSLS. Kromkote glossy 2 & 3 colors, attractive, distinctive, different. Choice of colors 100-$3.00 up. Samples 15¢. Agent for Call-D-Cals. K2VOB Press, 31 Argyle Terrace, Irvington, New Jersey 07111.

PICTURE QSL Cards for your shack, etc. Made from your photograph. 1000 $14.50. Also unusual non-picture designs. Samples 20¢. Raum's, 4154 Fifth St., Philadelphia, Penna. 19140.

QSLS. Fast service. Free samples, Bolles, W5OWC. Box 9363, Austin, Texas.

21 QSLS samples free. Ace Printing, 3298 Fulton Road, Cleveland, Ohio 4410.

QSL cards. Free samples. Send stamped envelope to George WA4QKD, Box 282, Vaparaiso, Fla. 32580.

QSLS. Radio Press, Box 17112, San Diego, Calif. 92117

HUNDRED QSLs, $1.00. Samples, dime. Holland R 3, Box 649, Duluth, Minnesota 55803.

QSL, SWL, cards that are different. Quality Card stock. Samples 10¢. Home Print, 2416 Elmo Ave., Hamilton, Ohio.

RUBBER Stamps. 3-line address $1.50. J. P. Maguire Company, 448 Proctor Avenue, Revere, Massachusetts 02151.

CRAZY QSLS. Very attractive. Samples 10¢ or SASE. WA8NYB Print, 645 Reynard Avenue, Cincinnati, Ohio 45231.

CANADIANS: Best used gear list in Canada. Free Etco, c/o Mary, VE2ANN, Box 744, Montreal 3.

CANADIANS: Eico 753 SSB transceiver with power supply. Geloso VFO. Jim, VE2AQI, 5573 Champlain Blvd., Verdun 19, Quebec P., Canada.

FOR Sale: SB-101 and SB-200. Wanted kits to wire. Heath preferred. 12% of cost, some in stock. Professionally wired. Lan Richter, K3SUN, 131 Florence Drive, Harrisburg, Penna. 17112.

TUBES, Diodes and Transistors wanted. Astral Electronics Corp., 150 Miller St., Elizabeth, N.J. 07207.

SELL: Hallicrafters SX-101A, $160.00; HT-32A, $270.00. Both in excellent condition, will deliver within 150 miles radius. Willing to make special consideration on package deal. Richard Roznoy, K1QKQ, 141 North Ave., Westport, Conn. 06880. Tel: (203)-227-4721.

SWAN 350, 117V, AC pwr. supply, xtal calibr. latest factory mods. by Swan Co. One year old, like new condx. Original cartons, $395.00, F.o.b. W6MCS, Rte. 1, Box 666, Arroyo Grande, Calif. 93420.

NATIONAL NC-98 receiver, factory checked and aligned in February 1967, $49.95. You pay REA charge. W. J. Fernan, 499 Wolfel Ave., St. Marys, Penna. 15857.

SELL, swap and buy ancient radio set and parts magazines. Laverty, 118 N. Wycomb, Landsdowne, Penna.

WANTED: Military and commercial laboratory test equipment. Electronicraft, Box 13, Binghamton, N.Y. 13902.

SAVE On all makes of new and used ham equipment. Write or call Bob Grimes, 89 Aspen Road, Swampscott, Massachusetts. 617-598-2530 for the gear u want at the prices u want to pay.

TUBES Wanted. All types higher prices paid. Write or phone Ceco Communications, 120 West 18th St., N.Y. 11, N.Y. Tel: 242-7359.

DUMMY Loads, 1 KW, all-band, kit, $7.95; wired, $12.95. Ham Kits, P.O. Box 175, Cranford, N.J.

WANTED: 2 to 12 304TL tubes. Callanan, W9AU, 118 S. Clinton, Chicago 6, Ill.

MANUALS for surplus electronics. List 10¢. S. Consalvo, 4905 Roanne Drive, Washington, D.C. 20021.

WANTED: Collins Parts, BC-610, GRC-2, Antodyne, Bethpage, L.I., N.Y.

TELETYPE: Buy 28s, sell parts, W4NYF, Schmidt.

MICHIGAN Hams! Amateur supplies, standard brands. Store hours 0830 to 1730 Monday through Saturday. Roy J. Purchase, W8RP. Purchase Radio Supply, 37 E. Hoover St., Ann Arbor, Michigan. Tel. NOrmandy 8-8262.

We Buy all types of tubes for cash, especially Eimac, subject to our test. Maritime International Co., Box 516, Hempstead, N.Y.

RTTY Gear for sale. List issued monthly, 88 or 44 mhy toroids, five for $1.75 postpaid. Elliott Buchanan, W6VVC, 1067 Mancana Blvd., Oakland, Calif. 94610.

TOOOOBES: 6146B, $4.00; 6CW4, $1.40; 417A, $3.95; 6360, $3.45; 6146, $2.55; 5894; $15.50. All new, boxed guaranteed. No pulls, seconds or JAN. Catalog of many other types, free. Vanbar Distr., Box 442, Stirling, N.J. 07980.

CASH Paid for your unused Tubes, and good Ham and Commercial Equipment. Send list to Barry, W2LNI, Barry Electronics, 512 Broadway, NYC 10012. Call 212-WAlker 5-700.

WANTED: Tubes, all types, write or phone Bill Salerno, W2ONV, 243 Harrison Avenue, Garfield, N.J., Tel: GArfield Area code (201)-773-3320.

HAM Discount House Latest amateur equipment. Factory sealed cartons. Send self-addressed stamped envelope for lowest quotation on your needs. H D H Sales Co., 170 Lockwood Ave., Stamford, Conn. 06902.

ESTATE Liquidation offers. Big list. Parad Engineering Service. 284 Rte. 10, Dover, N.J. 07801.

WANTED: Model #28 Teletype equipment. R-388, R-390A. Cash or trade for new amateur equipment. Alltronics-Howard Co., Box 19, Boston, Mass. 02101.

TOROIDS, 88 mh uncased, 5/$2.50. Postpaid. Humphrey, WA6FKN, Box 34, Dixon, Calif.

SELL: CQ, QST, Handbooks, old radio magazines, any quantity. Buy Old radio gear and publications. Erv Rasmussen, 164 Lowell, Redwood City, Calif.

NOVICE Crystals, all bands, $1.30 each. Free list. Nat Stinnette, Umatilla, Fla. 32784.

FREE Catalog. Loads of electronic Bargains, R. W. Electronics, Inc., 2244 South Michigan Ave., Chicago, Illinois 60616.

RTTY Channel filters, octal mounted, specify frequency, $5.95 pair, 88 m.h. toroids, uncased. 5/$2.50. Herman Zachry, WA6JGI, 3232 Selby Avenue, Los Angeles, California 90034.

HT-32B, $325.00; SX-115, $325.00; GSB-201, $250.00, like new. Other equipment. List on request. W4MVC, 10 Carten, Asheville, No. Carolina 28804.

AMATEUR Paradise Vacation. Livingstone Lodge, Mascoma Lake, Enfield, N.H. Cosy cabin for two weekly, $50.00. Swimming, Fishing, Boats, Sports, ham radio, Dartmouth Golf, tennis, hot showers, fireplaces, light-housekeeping, children half. Lake Shore Camp Sites, Literature, Al Q. Livingstone, W2QPN, Livingstone Lodge, RFD Enfield, (Mascoma Lake), N. H. 03748.

KWM-2, PM-2, perfect, $850.00. E. P. Simon, 850 Richmond Road, East Meadow, N.Y. 11554.

INTERESTING Sample copy free! Write: "The Ham Trader," Sycamore, Illinois 60178.

FOR Sale: Paneled hamhack, rig, beam, workshop included with purchase of my spacious eight room ranch. Ideal suburban location. Am offering first to ham fraternity because non-ham family would not appreciate amateur features. This home has all extras and is priced right at $25,000. Can also sell furnished if interested. Phone (516)-344-5135. Marc Felt, W2GYQ, 50 Prince Lane, Westbury, L.I., N.Y. 11590.

FOR Sale: mint condition Collins MPI power supply, 351 D mobile mount, $200.00. Claude M. Phillips, 444 Hammond Ave., San Antonio, Texas 78210.

WANTED: Collins 30K-1 transmitter with 310A exciter and manual. VE3BNV, 555 Princess St., Woodstock, Ont. Canada.

COLLINS 62S1, #11784, 2 months old, never used. First certified check for $525.00. Jack Yeoman, W8VHY, R #4, Washington Court House, Ohio 43160.

ANNIVERSARY Special: Our 17th year in business, 1000 PIV at 1.5 amps epoxy diodes, 10 for $3.75 postpaid USA. Fully guaranteed. East Coast Electronics, 123 St. Boniface Rd., Buffalo, N.Y. 14225.

EASY To Build world's best keyer: WØEPV "Squeeze" Job. It's incomparable. Ask Op who uses one. Printed circuit board, full instructions, $10.00, postpaid. Satisfaction guaranteed. Jimmy Moss, W5GRJ, Box 442, Natchitoches, Louisiana 71457.

SELL: Hallicrafters SX-62A with Q-Multiplier, excellent condition. With 15" speaker in portable cabinet, $300.00. M. Pellegrino, 65 Maspeth Ave., Brooklyn, N.Y. 11211. Tel: ST 2-5830.

WANTED: Good communications receiver, Webster Intercom, Gonset 3156 Aircraft receiver. Good stereo amp. Older supply catalogs. Jack Farrell, 2252 Dixie Hwy., Pontiac, Michigan 48055.

FOR Sale: GSB-100 SSB exciter with 813s linear table-top bandswitching final and separate 25/3000 volt power supply. Worked over 300 countries with this rig. $285.00 F.o.b. W5LCI, Box 592, Wynne, Ark.

WANTED: Military, Commercial, Surplus, Airborne, Ground, Transmitters, receivers, testsets, accessories. Especially Collins. We pay cash and freight. Ritco Electronics, Box 156, Annandale, Va. 703-560-5480 collect.

WANTED: For personal collection: QST, May 1916; Learning the Radiotelegraph Code, 4th Edt.; How to Become a Radio Amateur, Edition 12; The Radio Amateur's License Manual, Edition 10, 11, 12, and 15; List of Stations (1914); Map of Member Stations (1914). W1CUT, 18 Mohawk Dr., Unionville, Conn. 06085.

SX-43 Receiver and matching speaker, Fine condition, $55.00. No shipping, sry. K3DCY, 1044 Highland Ave., Abington, Penna. 19001. Tel: (215)-886-5912.

EXCELLENT Gonset G-50; beam, $175.00. Hallicrafters SR-42, HA-26, beam, $160.00. HR-10, calibrator, $45.00. Barry Altman, 601 Brightwater Court, Brooklyn, N.Y. 11235.

COLLINS KWM-1, $250.00; 516F-1 AC supply, $75.00; 516F-2 AC supply, $75.00; NCL-2000, $450.00; Drake 1A, $105.00. All equipment in mint condx. Don Droege, W8IIT, 3308 Braddock St., Kettering, Ohio 45420.

WANTED: Any YLs interested in cheering up young, lonely hams on the air. Write: WAØJCV, Gerry VanLoh, 22, 421 South Elm St., Lennox, South Dakota 57039, or WAØMCI, Gary Rentz, 18, Rockford, Iowa 50468.

SELL: HQ-170 AC, $245.00; Globe DSB-100, $41.00; Heath VFI, $15.00. In excellent condition. WA9OUX, David Wilhelmus, Rte 3, Boonville, Ind. 47601.

COLLINS 75A1, $150.00; DX-100 with improved loading modifications, $60.00. Both in excellent condition. Garner, 28 Myra Road, Hamden, Conn. Tel: (203)-248-1241. W1RPE.

HARVEY-WELLS R9A receiver, $35.00. WA7DLO, 5103 N.W. Blvd., Spokane, Washington 99205.

HAM'S Spanish-English manual. Gabriel, K4BZY, 1329 N.E. 4th Ave., Fort Lauderdale, Florida 33304.

COLLINS 75A2 receiver, $225.00 and Collins 75A3 receiver with 3 kc. and 800 cycle filters, $295.00. Will sell either or both for any reasonable offer. W8CHT, 1987 Connecticut, Cincinnati, Ohio 45224.

DRAKE 2B, 2BQ and xtal calibr. Perfect. Used very little. First $185.00 takes it. U pay shipping. K1OHZ/2, 1425 Columbia Ave., Plainfield, N.J. 07062.

DRAKE TR-4, perfect condition, with RV3 and AC-3, $500. Heath HO-10 monitor 'scope, $45.00; Clegg 99'er, $70.00; Comaire LM-42 Matchbox, $35.00; Elmac PMR-7, $25.00; WRL Techceiver, $20.00. ATR 150-watt inverter, $30.00. Philip Schwebler, W9GCG, 4536 N. 50 St., Milwaukee, Wis. 53218.

FOR Sale: SBE-34 with Mic. Have too many rigs. Like new, $350.00. W3KRO, RFD 3, Danville, Penna. 17821.

NATIONAL NCX-3 and NCX-A. Mint condx, used less than 25 hours. $280.00. Randy, WA2PPE, 534 W. 114th St., NYC 10025. Tel: 662-0232.

TELREX 536 Super Deluxe 5-el. 20M beam, 12 DB gain, 26 DB, F/B, $200.00. W. G. Frazer, K8NXB, 168 Westwood Ave., Akron, Ohio 44302.

HW-32A and HP-23, mint condition, $140.00. K8HJI.

TRI-EX HZR-47IN rotating, heavy-duty, self-supporting 76 ft. tower. Galvanized, perfect, $995. Want HZ-588N. New Drake T-4X used only a few weeks, perfect, $285. AC4/MS4 matching speaker, supply, $85. Heathkit HD-10 keyer new, perfect, $39. Extremely clean KWM-1 #1121, $260. 516F-1 AC supply, $50. W4ETO, 13315-108th Ave. North, Seminole, Florida 33540.

FOR Sale: Johnson KW desk, $465.00. Doug Ryan, 58-23 185th St., Flushing, L.I., N.Y. 11365. Tel: FL7-8144.

COLLINS VFO, 70E-24 for 75A-4, new, $39.00; 70E-23 for KWS-1, new, $39.00; Hunter Bandit 2000B 300; APR 4Y with CV 253/ALR tunes 38 to 1000 Mc. and TN19 tunes 975 to 2200 Mc. Package deal, $395.00 or will sell separate. Richard E. Mann, 430 Wilmot Rd., Deerfield, Illinois 60015.

VACUUM Variable capacitors, Jennings UCS 10-300 mmfd. 7.5 kv., complete with gear drive train, mounting bracket, brand new, $27.50 postpaid—insured. Supply limited, satisfaction guaranteed. Bill Slep Co., Drawer 178Q, Ellenton, Florida 33532. Phone (813)-722-1843.

SELL: 117-C Swan AC power supply, new condition, $70.00. K4ZBB, 8407 Jenny Lind Dr., Louisville, Ky. 40219.

SELL: QSTs 1923-1966. Some issues missing, some duplicates. CQ: 1948-1954. Over 600 issues. Best offer over $250.00. Ship freight collect. Self-addressed stamped envelope for information. W9LWH, 3315 Badley, Alton, Ill. 62002.

NCX-3, AC supply, TA31 Sr, extras, $275.00. WB2IKI, Box 47, Brooklyn, New York 11226.

WRL's reconditioned transceiver bargains. These prices without trades G-76, $149.94; SR-46, $134.94; HW-12, $99.95; HW-22, $99.95; Swan 240, $179.95; Eico 753, $149.95; NCX-3, $199.95; Utica 650 and VFO, $119.94; Galaxy III, $199.94; Galaxy V, $299.95; Galaxy 300, $169.95. Free list of hundreds more. Write: WRL, Box 919, Council Bluffs, Iowa 51501.

WANTED: Heathkit SB101 in trade on Collins 75S3B. Value: $545.00. Also 32S3, $595.00. Both like new condx. Act fast! Going mobile. WA4LXX, Foy Coble, 251 Collier Ave., Nashville, Tenn. 37211.

SELL: Lysco 600 c.w. transmitter. Crystal or built-in VFO. 160—10 meters. Grid block keying. Excellent condition, $40.00 check. Floor mike stand with adaptor, $5.00. Rod Vlach, WAØQMP, Benson, Minnesota 56215.

FOR Sale: Hallicrafters SR-150 with AC power supply, $400.00; Hallicrafters SX-115, $290.00; Heath Marauder, $190.00; Hallicrafters T-O keyer, $40.00 or best offer. Bob Fidler, WA9ISM, 2301 Eastbrook Dr., Kokomo, Ind. 46901. Tel: (317)-453-3242.

VIKING 500 for sale, 4-250A final, factory wired. D-104 mike. Excellent condition, few hours. First certified check or money order for $350.00 takes it. Can ship but would rather meet buyer and deliver anywhere up to 250 miles from Wheaton. Lawrence Hokanson, WØFYT, Wheaton, Minn. 56296.

EXCELLENT TR-4, AC supply and matching speaker. Make offer. WA7ECY, 495 N.E. Beech, Gresham, Oregon 97030.

OSCILLOSCOPE, Heath IO-12, $60.00. WA4FMC, P.O. Box 10, Falls Church, Va. 22046.

JOHNSON Thunderbolt linear 2 kw. P.E.P. excellent condition, $250.00. Edward Kuligowski, 63 Connecticut Ave., Massapequa, L.I., N.Y. 11758.

HAMMARLUND H Q-110 AC-VHF, excellent condx with S-200 spkr, $300.00. WN2YQL, 332 Beach, 66 Street Avenue, N.Y. 11692.

WANT: Johnson Matchbox Model 250-23, and a SWR bridge. K1DVO.

WRITE, Phone or visit us for the best deal on new or reconditioned Collins, Drake, Swan, National, Galaxy, Gonset, Hallicrafters, Hammarlund, Hy-Gain, Johnson, Millen, Mosley, SBE, Henry linear, and most other equipment. We try to give you the best service, best price, best payment terms, best trade-in. Write for price lists. Your inquiries invited. Henry Radio, Butler, Missouri 64730.

FOR Sale: TA-36 6-element Mosley Tribander, never used, still in original carton, $105.00; Hallicrafters HT-37, brand new condition, used less than 1 hour on air, HT-33A with PL-172 final, also in mint condition. GPR-90 receiver, Elmac AF-67 with PS2V A.C. power supply. All in excellent condition. Will sell to highest bidder 30 days after this ad appears in QST. Merle J. Newton, 64 Bristol Road, Clinton, N.Y. 13323.

HALLICRAFTERS SE-150 transceiver P-150 A.C. supply. New tubes. Perfect. Want to build. Ship prepaid stateside. All reasonable offers considered. R. T. Evans, Box 95, Britt, Iowa 50423.

APACHE $110.00. SB-10 (factory wired), $70.00. Both in mint condx. Sell package $160.00. Manuel Salomon, WA5OTH, 7909 Spruce, New Orleans, Louisiana 70118.

TOWER, 50 ft. self-supporting. $95.00 F.o.b. Fred Mertin, W5YNT, Route 2, Fayetteville, Arkansas 72701.

WANTED: Bud low-pass filter, model LF601. Walt Russell, W2OE, Northville, N.Y. 12134.

NCX3, NCXD in excellent condition. Original cartons, $225.00. WA5CSV, Bill Mitchell, 810 Cleveland Ave., Ocean Springs, Miss. 39564.

CLEGG Interceptor "B" with Allbander converter, like new, $350.00 or trade for 2 PEP linear. WA8HBZ, O'Dell, 4138 Wisner, Saginaw, Michigan 48601.

WANTED: Johnson Viking Invader 200. Must be perfect (electrically and visually). All inquiries answered. WA6JWK, 6951 San Joaquin Circle, Buena Park, Calif. 90620.

SW-3 National receiver wanted, at reasonable cost, clean and unmodified, with book and coils. Art Beahr, W6UKG/3, 6821 Riverdale Rd., A-101, Riverdale, Md. 20840.

HT-32B, HT33B, and SX-101A. Complete Hallicrafters 2 KW PEP matched station housed in beautiful birch console, ready to operate. Like new condx, $825.00. Sry, no shipping. Bob Gagler, WB6FFI, 1794 Larry Dr., Santa Rosa, Calif. 95401. Tel: (707)-545-2326.

ESTATE Liquidation of W2ZVO: SM-10, mint condition. Viking I, Heath VFO, extra 4D32, good condition: SX-71 540khz to 34 mkz, 46 to 56 mkz. See ARRL Handbook 1951, excellent condition. All with manuals. For best offers. Will answer all replies. Mrs. E. W. Hague, c/o Gene Gry, K2CW, 69 Ashlan Road, Summit, N.J. 07901. Tel: (201)-273-7488.

SWAN 350 10-80 crystal calibrator. $315.00: Matching A.C. p/s, $70.00; D.C. p/s, $95.00. All are in mint condition. Will sell separately. Three pieces for $460.00. Will ship. Otis Vaughn, W1AMK, 371 Village St., Medway, Mass. 02053. Tel: (617)-533-6510.

SELL: Heathkit SB-630 and Hy-Gain 18-AVQ. Both are in excellent condition. Best offer accepted. WAØNOS, Greg Vatt, 1527 30th Ave., Greeley, Colo. 80631.

FOR Sale: DX-60A, $65.00 mint condx, Hy-Gain 18-AVQ, $40.00. WA1HCE, David Reeder, Meadowbrook Rd., Carlisle, Mass. 01741, or call 369-4281.

WANT: Collins 500 cycle mechanical filter. Will trade unused 2.1 kc. filter or cash. WB2URU, 2365 East 13th St., Brooklyn, N.Y. 11229.

TRADE: Hammarlund HQ-180AX used only 25 hours for BC reception was $499.00. Wanted mobil rig or make offer. 10I5ZO/W2, P.O. Box D, Pequannock, N.J. 07440.

DRAKE TR-4, used fifteen hours, like new condx, Webster antenna, speaker, microphone, A.C. and D.C. power supply, complete: $650.00 cash. W4MF, 1608 Hixson Pike, Chattanooga, Tenn. 37405.

COLLINS 51J4 wanted. Will consider one needing work if complete. Please write condition and price to Winram, 175 W. 12 St., New York 10011.

SELLING Clegg 22'er with mike, $185.00. Johnson Viking Adventurer c.w. 50 watts transmitter, $50.00. Call ES 2-7927 after 7 P.M. WB2JMD.

SOLA 23-22-150 and Transtenna 102A wanted. W1BKC.

FOR Sale: Complete set UTC, "LS" Series, transformers for broadcast or amateur transmitter including power, bias, audio, and high level modulation. Power adjustable 1 KV to 4 KV at 1.2 amps., continuous duty rating. Perfect condition, and priced to sell. Geo. W. Smith, Jr., W5HIP, Rte. #1 Box 71-Z, Pottsboro, Texas 75076.

WANTED: AC coil box for National H RO-50T1 covering 21-21.5 hz. Write Louis V. Kovi, WB2JBN, r.d. #1, Ringoes, N.J. 08551.

6 M. transceiver, Heath Shawnee w/2 extra 6360, halo and 15 watt P.A. speaker. Mobile mounting bracket and relay not included. In exc. electrical and physical condx. Best offer over $80.00. Bill Adams, K2TGO/1, Middletown, Conn. Tel: 346-4573 evenings.

HEATH Apache, $90.00; National NC-173, $60.00; Heath Q-multiplier, $10.00. All perfect condx. WA7AUW, 544 E. 4800 So., Murray, Utah 84107.

EMERGENCY! Sell Apache, $120.00; HQ-110AC, $160.00. Factory wired Eico 720, $70.00; Amplidyne Labs C-23 two-meter converter and power supply, six-meter I. F., $30.00. All in mint condx. WA8UUR, Louis Laderman, 219 Sixth Street, Findlay, Ohio 45840. Tel: (419)-422-3573.

SALE: SX-100, $125.00; Gonset mobile "Twins" G66B, and G77A, $130.00; Viking II, $90.00. Make an offer. David Hoff, K4NUZ, Rte. 3, Box 315, Durham, N.C. 27707.

VIKING 6N2 and 6N2 VFO, Eico 730 Modulator, $130.00. Good condition. WB2MZZ, 3 Aspinwall Rd., Red Hook, N.Y. 12571.

RANGER I, $60.00; RME 6900, $175.00. M. Bellinger, 129½ Main, Ames, Iowa 50010.

SALE, 60 ft. tilt-over steel tower, balanced on pivot at 25 ft. up. 945 lb. boom, tapered 18 x 18 to 12 x 12. Supports reinforced 4-inch pipe. 1266 lbs. Guy supports only. Assembly drawing, $200.00. W8RFW, Victor Pennington, 1359 Northlawn N. E., Grand Rapids, Michigan 49505.

WANTED: 3-1000Z. Quote price and condition. R. Lloyd Mize, W4HUI, Route 4, Versailles, Kentucky 40383.

DELIGHTFUL Heathkit pair loaded with every available extra. Built for magazine articles, used only for testing. Guaranteed 100% bug-free. SB-301 receiver with SSB/CW/AM filters and built-in 2 and 6 meter converters. SB-401 transmitter, use independently with own extra crystal pack, or transceive with SB-301. Kit cost $657.00. Sell as pair only, $625.00. No shipping, sry. W2JDL, 82 Boston Ave., Massapequa, L.I., N.Y. 11758. Phone (516)-LI1-9355.

BRASS Washers, ¼ #—$1.62; small, large assortments, $1.72. See June Ham-Ad. Write for list. 10 x 32 x 2". Brass screws, limit 18—92¢. Include postage pls. Walt, W8BLR, 29716 Briarbank, Southfield, Mich. 48075.

FOR Sale: 32S-3, $500.00; 75S-3, $600.00; new Henry 4K, $850.00; 120 ft. Jontz tower, all "F" sections, $200.00; 4-el. quad 30 ft. boom, fiberglass spreaders, aluminum spiders and special boom to mast mount, $125.00; 2 Ham-M's, $75.00 each, 4-el. Telrex 150 meter beam on 18 ft. boom, $100.00. 3-el. Telrex 10-meter beam on 14 ft. boom, $50.00. Hallicrafters HA-1 keyer with chrome paddle, $75.00; 250 ft. of RG17AU coax, $75.00, two runs 150 ft. RG17AU, $50.00 ea. Astatic Dynamic mike 10-D, $40.00. First come, first served. John Williams, 103 Midland St., Greenville, S.C. 29607.

TELREX "Triband model TB7E amateur radio antenna, in excellent condition, with spec sheets, priced to sell. 100 ft. CPH Amphenol RG-8/U, $8.00. Jack R. Hildreth, 1 Stonehill Dr., Stoneham, Mass. 02180. Tel: 438-0755.

GOING SSB: Drake 2B, $170.00; DK-60-G2C relay, $10.00; Hammarlund speaker, $10.00, Gotham V-80 vertical, $10.00. Dennis Quinn, WA3EIP, 88 Woodrow Court, Sharon, Penna. 16146.

SSB: Heath HX-10, HR-10 mobile/fixed combination: TA-32Jr, all accessories. Good condition. Joe Spivack, 7 Linden Ave., Belmont, Mass. 02178.

TA-33, Jr. beam, AR-22 rotator, 10 ft. triangular tower. Must sell. Reasonable. WA2SKA, 1361 E. 17th St., Brooklyn, N.Y. 11230. Tel: (212)-DE9-0349. Call after 6 PM pls.

TR-4, $480.00; AC-4, $83.00; DC-3, $123.00; R4-A, $330.00; T4X, $330.00; MS-4, $17.50; RV4- $83.00; L-4, $580.00. Factory-sealed boxes, fully warranted. Mel Palmer, K4LGR, Box 10021, Greensboro, N.C. 27404.

TV Servicemen: Amphenol color Commander 680 color bar and crosshatch generator, in mint condition: $125.00. Jackson CRO2 5" color TV 'scope, $89.00, like new condx. Triplett 630 VOM, $29.00. Hickok 277X sig. gen., $99.00. WØZHJ, 2444 D., Lincoln, Nebr. 68502.

INCENTIVE Licensing? You need Posi-Check, Amateur Extra and General Class FCC type exams, complete in detail and style, even to IBM type answer sheets. A very good aid to learning and a Must in preparation for FCC Amateur exams. General Posi-Check consists of 297 questions and explained answers for only $2.98. Extra Class, 115 questions and diagrams with explained answers, $2.00. 139 questions of the 297 in the General Posi-Check apply directly to Extra Class also. Get both for only $4.50 postpaid. Posi-Check, P.O. Box 3564, Urbandale Station, Des Moines, Iowa 50322.

SELL: G-E I.O. camera w/cc, bin, sync gen, 4 c.c. monitors and 'scopes, reg. power supplies, switcher, many extras. $1500.00. W. Kayler, Rte. 2, Alden, Ill. 60001.

WILL Trade: Radio parts for manufactured or homebrew receiver. For list, write Frederick Struebing, 763½ Nash Road, North Tonowanda, N.Y. 14120.

WANT: BC-312, BC-342, BC-348. Write stating condition, HW, Box 283, Saxonville, Mass. 01701.

DRAKE TR-4 fixed-mobile package—AC-3, DC-3, power, MMK-3 mount 3 new matched 6JB6 spare finals, 7 new spares, other tubes, all cordage ready to go. Cashier's check $565 firm F.o.b. Best call for, but can ship in original cartons as directed. Tom McCann, K2CM, 146 Hillcrest Ave., Morristown, N. J. 07960. Fone 201-538-6329 mornings.

WANTED: Tilt-over tower, Michigan area. Gerald Black, R #1, 563 Center Ave. Rd., Essexville, Mich. 48732.

COLLECTORS: QST 1933-1966 complete, except for three issues. CQ, Radio and others. SASE for list. W8BQV, 138 Hutchinson, St. Clairsville, Ohio 43950.

WANTED: 75S3B receiver and 32S-3 transmitter. State age, condition and price. James Kalasky, K8LDG, 738 Truesdale Rd., Youngstown, Ohio 44511.

MUST Sell: Best offer for NCX-3, AC and DC supplies, TA-33 and Hustler antennas. D-104 and mobile mikes. K3LDV, Jack Scott, 66 W. Chester Rd., Paoli, Penna. 19301.

VALIANT, perfect, $150.00. Toroids: 88 mhy., center-tapped, $1.50 ppd. Brand new TX-62, $120.00; SX-115, $320.00; HQ140XC, $125.00; SX-28, $45.00; 11/16 tape, $3.00/box. Model 26, $50.00, Model 19, $125.00. Stamp for list. Van, W2DLT, 302Z, Passaic, Stirling, N.J. 07980.

KWM-2, 8 months old, $750.00; 312B-J, 2 months old, $275.00. Both like new condx. CC-2, $45.00; PM-2, $90.00. Excellent. Going S/Line. On receipt of money-order or a certified check, will ship air express prepaid. W8HXR, 657 Willabar Drive, Washington Court House, Ohio 43160.

SACRIFICE: No time to operate. Top condx lexal limit SSB station, beautiful signal: Collins 75S-1 receiver with matching Hammarlund spkr, HT-37 exciter, hardly used, with spare tubes. Eldico SSB-1000F linear with built-in 'scope; Heath Multiplier and power meter. New D-104 mike with G stand. All co-axial relays and wiring harness. Price: $699 firm. Consider delivery within 200 miles. Sam Eliner, W2TC, 54 Highwood Rd., Oyseter Bay, L.I., N.Y. 11771. Tel: (516)-WA2-6163 evenings.

COMMUNICATIONS Specialists: transmitters, receivers repaired, kits wired, custom-building, alignment, calibration, Manobander conversions, product detectors added. J & J Electronics, Windham Road, Canterbury, Conn. 06331.

SUMMER Sale: ARC-5 xmtrs, BC-457 4-5.3 mc., BC-458 5.3-7 Mcs. All like new, $6.00 each; 5AP4 CRT's (same electrically as 5BP1) new/cartoned, $1.95 each. RCA mechanical filters (sealed selectivity) center freq. 455 Kc. band width 10.5 or 32 Kc. $2.50 each. T.I. light sensitive diodes LS431 reg. net $14.00. New with spec sheet. $2.00. RCA stereo tape heads reg. $21.00 new, $3.00 each. General Radio variacs 1 kw. O-135V. 60 cyc. used/OK, $10.00. G-E NE-2 neons, $1.00 dz. DuMont 'scope xfrms. Input: 110V, 60 cyc. Output: 1350 V. 5 Ma. 2.5 V. tap for 2X2 rect. $2.25. Send for free surplus catalog. Rex, 759 Tenth Ave., New York 10019. Tel 757-1361.

FOR Sale: Clegg Zeus. Asking $300.00. K2MOO.

NEED Another band for VHF DX and contests? Have no time for Gonset Communicator IV-220. $150.00: Four APX-6 1215-1296MC; Two'er, $35.00; four gain Longjohns, 432 Mc. $15.00 each: 432MC 4X50B cavity amplifier, $50.00; Sideman; megacycle meter, $90.00; Hallicrafters HA-2, HA-6, P-26, $275.00, more, stamp for list. W4API, Box 4095, Arlington, Virginia 22204.

SELL: HT-32A transmitter, $275.00. HQ-170A receiver with speaker, $225.00. HA-1 T.O. keyer with paddle, $55.00. All perfect condition. Richard Koppel, WA2RUB, 210 East Broadway, Long Beach, N.Y. 11561. Tel: 516-GE1-3565.

FOR Sale: HA-650 portable 6m solid-state transceiver with HB-501 AC power supply, w/ctz $110.00. Telex Magna-Twin MRB-30 $20.00. Panasonic tape recorder model RQ-705 $90.00. All like new. Richard J. Zernzach, WA9PLK, 1202 Winnebago Ave., Oshkosh, Wis. 54901.

TELETYPE Model 15, $75.00. 14 TD, $40.00. Both excellent. K6EWM.

T-150A transmitter with relay, excellent, $78.00. WAØQBF, Terry Marshall, 503 Parkade Blvd., Columbia, Mo. 65201.

COLLINS 351-D2 Mount, $60.00; MP-1 P/S $100.00; MM-1 mike, $12.50; excellent condition in original cartons, F.o.b. Lamesa, W5UIJ, Box 739, Lamesa, Texas 79331.

APACHE, Dow Key relay, 100 Kc crystal calibrator, new pair 6146s. All in excellent condition. $100.00. WA4VPK, A. B. Watson, 3606 Skyview SE Huntsville, Ala. 35801. Tel: 205-536-9776.

COLLINS Clean KWS 1, SN 1260, 75A4 SN 2312 with 3.1 filter, 2.1 and 0.5 avail. SCS matching unit homebuilt, package price $985. No shipping, sry. Will deliver to within 150 miles. K6HZU, 10609 Chaney Ave., Downey, Calif. 90241. Tel: PH-213-86-23645.

NATIONAL Rigs: Pay cash and save. Jackalope Engineering, Box 1054, Laramie, Wyoming 82070.

CRYSTALS: C-W Crystals will be closed until July 24th. See ads before June for ordering information. Serving amateurs since 1933. C-W Crystals, Marshfield, Missouri 65706.

HEATHKIT KS-1 kilowatt power supply wanted. Send price and condition. Sell or trade new Clegg 99'er. $85.00. Don Johnson, K6MIM, 76 Laverne Ave., Ventura, Calif. 93003. Tel: 805-642-5338.

NCX-5, Mark II National transceiver. Bought one myself and received one at same time from XYL for birthday April 17 1967. Will sell one in original unopened carton for $360.00. Also NCX-A power supply, $80.00 and XCU-27 calibrator, $20.00. W3NEC, Dick Ache, 707 Barclay Lane, Broomall, Penna. Tel: 215-353-0226.

SELL: Complete station. Moving to apartment. Gear in daily use HT37, HQ-170, 1/2 Kw GG linear, extras. WA2MMN, 169-03 81st Ave., Jamaica, L.I., N.Y. 11432. Tel: OL8-3095.

COLLINS KWS-1 S.N. 1250, matching SC-101 station control, and 68Y-1 antenna selectro unit, $750. Also 75A4 S.N. 4603 with 3 filters, $450.00. Frank Mills, K1FVU, 148 Chalmers St., Springfield, Mass. 01118. Tel: (413)-783-5173.

HEATHKIT HX-30 and HA-20 package professionally wired, $260.00; Heath HO-10 monitor, $50.00; National NC-303 with 6 meter converter, $290.00; Utic 650 with VFO and mike, $170.00; Jones Bendix Micromatch, $25.00. K1SCJ, Richard Ravich, 10 Coolidge Rd., Marblehead, Mass. 01945.

6 MTR converter 3 VHF transistors, 10 Mc output, $8.00; 6 mtr. SSB mixer 2E26 final; 14 Mc. input, $10.00; 6 mtr. SSB mixer/converter 3 6CW4S in converter, mixer 2E26 final, 14 mc input, pwr. and cabinet, $25.00. F.o.b. W6RET, 8831 Sovereign Rd., San Diego, Calif. 92123.

BILL Ogg at Evansville Amateur Radio Supply, 1629 S. Kentucky, Evansville, Indiana 47713, says check these Summer Bonus Savings! Bonus #1: a free, matching AC-Supply with the purchase of a Swan-350 or Galaxy MK II at $420.00 each or Swan 500 at $4.95. Bonus #2: a free, matching, AC supply plus a MS-4 speaker and Turner 454X with the purchase of a Drake TR-4 at $599 or a T4-X, R4-A combo at $799. We prepay most shipping charges. Send us a stamped envelope for a deal you've been looking for.

BACK Issues of QST for sale. 1926 to date, all in pristine condition, complete run of period indicated. Also have complete run of I.R.E. and successor publication, approx. 1926 to date. Make offer. H. D. Hineline, 425 Rich Ave., Mount Vernon, N.Y. 10552.

COLLINS Owners: Now is the time to get that long awaited conversion. If you want the very best in receiving capabilities this upcoming season, a VCZ front end conversion is your answer. 75A4's, $69.95; 75-S series, $34.95 complete. In stock: converted 75A4A's for immediate shipment. Dealers in fine used Collins gear. Write for details. VCZ Sales, 5 Pinetree Rd., Ramsey, N.J. 07446. Tel: (201)-327-9494.

CASH. Want 32S-3 in A-1 condition only. Fifi Lopez, XEØYL, Box 7565, Mexico City.

FOR Sale: Viking Invader 2000, National NC-303, Speaker, Autronic Electric Automatic Keyer, Electro-Voice Model 664 mike, Mosley TA-33 beam. Used less than two months, stored the past four years. Looks like brand new with all manuals. Must sell. M. Clyde Harrell, P.O. Box 678, Bainbridge, Ga. 31717. Tel: (912)-246-3445.

SELL: Eico 720 transmitter, 730 modulator, 722 VFO, $140.00. Gnd condx. WB2EMB, 446 45th St., Brooklyn, N.Y. 11220.

HW-12A and power supply used on MARS for three months. Xclnt condx. $150.00. Will ship. K8OXI, 24131 St. Marys Ct., Farmington, Mich. 48024.

COLLINS complete station: 32S-1, 516F-2, 75S-1 with Q-multiplier, new 30L-1. One owner, package deal only. Guaranteed perfect: $1.000 firm. Seymour Blackman, 3 Horizon Rd., Penthouse #4, Fort Lee, N.J. 07024. Tel: (201)-224-7272.

FOR Sale: Knight T-60 xmtr, $30.00: Heath AT-1 xmtr, $15.00; Heath VF-1, $15.00; Heath antenna tuner, $5.00. 6 meter ground plane, $5.00. WA8JXW.

"HOSS-TRADER" Ed Moory offers limited supply of equipment opened and displayed in our store and at Hamfests with factory warranty. SB-34, $309.00; NCX-5, $439.00; TR-4, $479.00; T4-X, $329.00; R4-A, $335.00; L-4, $559.00; Swan 350, $339.00; Swan 500, $398.00. Sacrifice new Hallicrafters HT-46 and SX-146, regular price $638.95, cash price: $469.00. Package deal: new Mosley TA-33 beam and demo Ham-M rotator, $195.00. "Special": Rohn 50 ft. heavy-duty foldover tower, prepaid, $189.95. Demo Ham-M Rotator, $89.50; new Collins KWM-2, $955.00. New 32S-3, $649.00; new 30L-1, $449.00. Used Swan 500, $375.00. Ham-M rotator, $85.00 used. Used gear: Drake 2-A, $145.00; DX-100 as is, $55.00. Ranger I, $75.00. Ed Moory Wholesale Radio Co., Box 506, DeWitt, Arkansas 72042. Tel: (ta.c.) 501-946-2820.

USED Radio texts wanted: Jasik, Harvey, Jordan, Harper, La-Port, Knowlton, Henney, OSRD, etc. Also back issues BSTJ, Proc. of I.E.E. (British) Part B, AIEE and a set of BCP's. W3AFM.

SELL: Viking 500, $225.00; Viking SSB adapt., $135.00; SX-101A, $175.00. All xclnt condx. W6GES, Alice Brummel, 2620 Aragon Way, San Jose, Calif. 95125.

MID-SUMMER Sale! HT-44, $240.00; SW-250, $255.00; SW-120/w 75 added, $139.00; R-4, $269.00; HW-12, $89.00; Utica 650/with VFO, $95.00; 75A-4 vern. knob, $349.00; 75S-1, $295.00; 32S-1, $395.00; KWM-2, $750.00; 30L-1, $395.00 and 312B-5, $250.00 Free list. Howard Radio, Box 1269, Abilene, Texas 79604.

WANTED: Rheem Califone AR-300 tape recorder with manual. KWM-1 in excellent to mint condition with manual. For sale: Custom-built Heathkit SB-300 receiver. Black crackle panel and cabinet. White lettering. SSB and CW filters. Mounted in 10½" x 19" relay rack panel with oblong speaker above receiver. Panel easily removed. Larry Kleber, K9LKA/W9CPD, 529 South State, Belvidere, Illinois 61008.

WANTED: Rent, buy, loan manual on Collins 310A exciter at once. Please state info at once W9PHE, R. O. Deck, 115 Bates Ave., Roodhouse, Illinois 62082.

CE100V Serial 790, mint condition little used. Original carton, manual and pair spare 6550s. $400.00. W3NKS, 312 West Timonium Rd., Timonium, Md. 21093.

SB-301 -401 -200 -600 -610 mike, key, io-pass, 14AVQ used less than 30 hours; $1100.00. Sold as a lot only. Jack Hills, K8IZM, 2221 Wascana, Cleveland, Ohio 44107.

FOR Sale: Mint hardbound volumes QST 1926 through 1957 and CQ 1945 through 1957. All offers and inquiries answered. Jim Sandberg, K6YPU, 1138 E. Rustic Road, Escondido, Calif. 92025.

HALLICRAFTERS SX-117 and Heath DX-60-A, $225.00. H. Howard, WN9SVO, 38 E. 38th St., Indianapolis, Ind. 46322.

KWM-2 and MP-1 Purchased Dec. 1966. Used only 3 hours. Best offer! WB2TRB, 47 Cecilia Dr., Wayne, N.J. 07470.

VALIANT II, F/W very little use, original carton, accessories, immaculate: $375.00. Richard DiNapoli, 110 Poet Street, North Babylon, L.I., New York 11703.

FOR Sale: Apache TX-1, SB-10, HQ-180AC plus other station goodies. Practically brand new, in perfect condx, $500 or best offer. Jim Churchill, K9HDZ, 2200 East Laurel, Springfield, Illinois 62703.

GSB-100 xmiter, $170.00. Bill Miller, WA4JAY, 207 Palm, Auburndale, Florida 33823.

FOR Sale: Transmitter, Knight T-60, 60-watt 80-6M cw/am, $40.00. Heath VFO #VF-1, $10.00. W3DYL, 1224 McKinley St, Philly, Penna. 19111.

FOR Sale: Going SSB. HQ-110, AF-67 with homebrew AC supply, and Turner 80 xtal Mic. $65 00: Tecraft 2M xtal conv., $7.00: Heath TS-2 generator, $10.00; B&W 424 LP filter, $3.00; Eimac 304THS (Good for hi-pwr. linear), $10.00 each: Viking 75 tape deck and RP61 preamp., $25.00. D. Corsair, W9JLD, RD 2, Box 55, Windfall, Ind. 46076.

FOR Sale: Swan 140 with Sonar D.C. supply, and 40M ant. $175.00. Roger, WB6FJW, 90650. Tel: UN81470.

SHACK Burned out completely! Need manual, control switch and selsyn indicator for Hy-Gain's RBX-1. Rotor not needed but will buy. Call or write Robert N. Crawford, K7AXF, 1095 No. Knott, Coquille, Oregon 97423.

DRAKE 2B, 2AC calibrator, 2BQ Q-multiplier, WWV crystal, perfect condition: $185 00. Phil Gedaly, WN2ZKY, 41-15 50 Ave., Apt. 3P, Long Island City, N.Y. 11104. Tel: (212)-ST-6-9372.

VARACTOR Tripler 144 to 432 Mc., $26.00; Parks 432 Mc. Preamp model 432-2P, $21.00. Postpaid. WA9NKT, 1235 Hillcrest Lane, Freeport, Ill. 61032

WANTED: 30L-1 linear, please state condition and price. Cash deal! Gene O'Brien, WA2QDR, 63 Second St., New Rochelle, N.Y. 10801.

SELL: Waters speech compressor, $15.00: AM-FM car radio, $35.00. HB scope, $10.00. WA2KSD, Box 186, Cold Spring Harbor, N.Y. 11724.

FOR Sale: Hallicrafters SR-150 transceiver, AC supply w/ speaker, DC supply, Astatic 10-D mike w/stand, Turner dynamic mobile mike and Webster Band-Spanner w/fender mount; $550.00. Heath Warrior KW linear amplifier, $140.00; Johnson T-R switch, $10.00. Cesco standing wave CM-52 reflectometer, $10.00; GMT Numechron Tymeter 24-Hour clock, $5.00. All with manuals and in mint condx Max Burch KØVWZ, 342-10th Ave. No., Fort Dodge, Iowa 50501.

NOVICE Or General station: Ranger I, with VFO 75-watts xmtr with relay, $90.00; Hammarlund HQ-110 receiver 6 thru 160 meters, $100.00; SWR Bridge Heath, $15.00; 40 meter dipole 1.5 to 1 SWR, $5.00. WA1GNA, Phone (203)-274-6341, George Abbott, Jr., 217 Williamson Circle, Oakville, Conn. 06779.

HEATHKIT GR-64 General coverage receiver, newly wired, latest model, factory aligned and in perfect condition: $45.00. Al, K8HBR, Marine P.O., Detroit, Mich. 48222 c/o Str. Hillman, Jr.

HAMMARLUND HQ-170 w/speaker, Immaculate, $170.00. 5 Kw 110 VAC regulator, $50.00 Hickok 539A tube-tester, $30.00. K2SYA, 9 Morton Ave., Freeport, L.I., N.Y. 11520.

FOR Sale: S38E, like new, $35.00; RBH2 150 Kc to 18 Mgc, good condition. Make an offer. SB-100 Heath transceiver, like new, $325.00 Wells Chapin, W8GVW, 2775 Seminole Road, Ann Arbor, Mich. 48104. Tel: 971-0629.

KWM-2 by original owner. Serial No. 12971. Waters rejection tuning. Collins AC power supply and speaker. These units absolute mint condition, like-new in every respect. Factory cartons and manuals. Will ship continental USA. Crated $800 firm. Cashier's check. WIICJ, 24 Flower Hill Road, New Milford, Conn. 06776. Tel: (203)-354-2169 nites.

WANTED: HRO-60 coils AC and AD. Chester Kozlowski, 31 Meadow Dr., West Warwick, R.I. 02893.

HALLICRAFTERS HT-44 with PS/150-AC and antenna coupler. Mint condx. $275.00. R. H. LaSalle, Westmoreland Road, Whitesboro, N.Y. 13492.

DRAKE 2A receiver with 2AQ and 2AC, $150.00 mint; also, Ameco CN-144 28-30 Mc. IF, $29.00. Want Swan 120 single bander. Lt. J. L. Sielke, K3HLU/5, 107B Twining, Sherman, Texas 75090.

WANTED: Oscilloscope lab or military type 3 or 5 inch. Signal generator TS-497B/URR 2 to 400 Mc. Back issues of Radio Handbook. Used electronics correspondence courses. Impedance bridge. Bird Watt meter. K8WNT, Pfalzer, 240 Beechwood Dr., Granville, Ohio 43023.

SELL: Viking Valiant transmitter crystal or VFO phone and c.w. In gud shape. Hammarlund HQ-100 wired for receiver mute with use of antenna switch relay. With speaker. Perfect condition. First $150.00 F.o.b. Florala, Alabama, 36442. Ferrel Burgess, K4HFI

SELL: SB-33 transceiver, mint condition. $200.00. WA5OJG, 2002 Evangeline, Bastrop, Louisiana 71220.

IN Vietnam, must sell! DX-60, $55.00; NC-270 w/speaker, $135.00; IO-21 oscilloscope, $44.95; IT-21 tube-tester, $34.95. All with manuals. First check received takes. Shipped from Alabama. W7EOT, Wo. Stephen M. Carson, 114th ASLT, Hel Co, c/o APO San Francisco, Calif. 96357.

SELL: KW components, all new in original cartons. B&W 850A pi-net, $50.00; B&W 800 choke, $4.00; Osborne #8924 plate transformer, dual primary, sec. tap 3500-3000-2500 VCT at .6a, small Hyper-sil construction and #3459 choke 10 h. @ .6a, both per July 1962 CQ, $45.00; 1500 pfd Cardwell 8013 variable, $10.00; Jennings UCS 300 vacuum variable with turning head, used, $55.00; Eimac 4-400 socket, hardware and SK406 chimney, $15.00; 4-400 tube, used, $20.00. Also Akai model M7 3-speed stereo tape recorder, x-field head, matching speakers, microphones, etc. $175.00. F.o.b. W8QXQ, 27241 Markbarry Dr., Euclid, Ohio 44132.

32S-3, not a mark on it; $525 or offer. Tecraft 2M converter, $10.00. Liebl, W9NYS, R2, Medford, Wis. 54451.

HQ-170-A for sale: One owner, used only one year, in mint condx, not a scratch on finish: $290.00. T-150A transmitter, 150 watts 80-6 meters, $85.00. WA4NTK, Box 535, Gretna, Virginia 24557.

NEW Drake R4-A receiver in box, $300.00. HX-500 transmitter new tubes, $250.00. WB2EEU. Tel: (516)-621-3498.

HAMMARLUND HQ-120. $75.00. Bevilacqua, RD #1, Elizabethtown, Penna. 17022.

WANTED: HAX-48 Spaulding tower or its equivalent. B.W. model 425 52 Ω low-pass filter. Laurin Carlson, WA8SPU, 906 Mears Ave., Whitehall, Michigan 49461.

VIKING II with VFO, factory-wired, all modifications. Excellent condition. Best offer. WA9OVL, 112 Jefferson St., Waterford, Wis. 53185.

HT-37 transmitter and Drake 2A receiver, with Drake 2A-Q multiplier. Both in mint condition. Must sell for $350.00. Complete! Will ship. Frank Assante, 12727 Haskell Lane, Bowie, Md. 20715.

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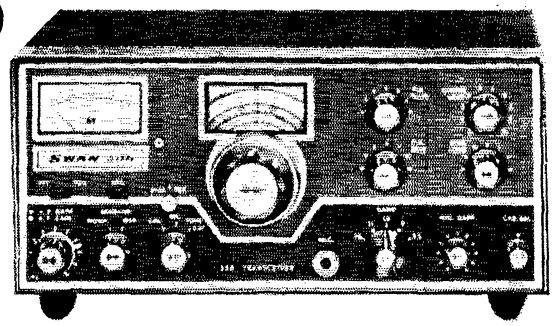

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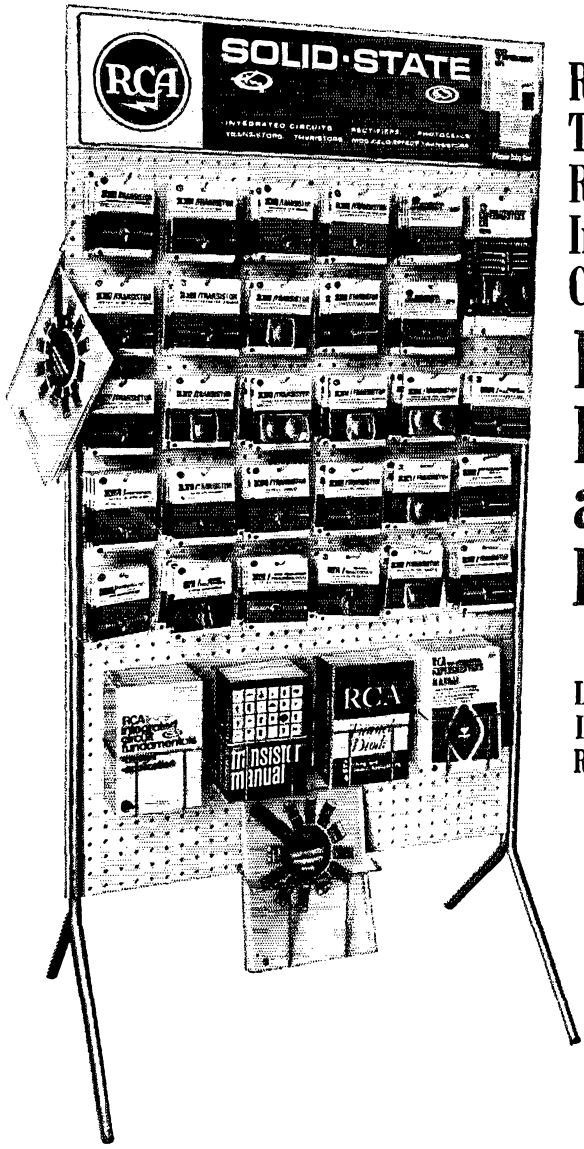

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