QST

September 1956
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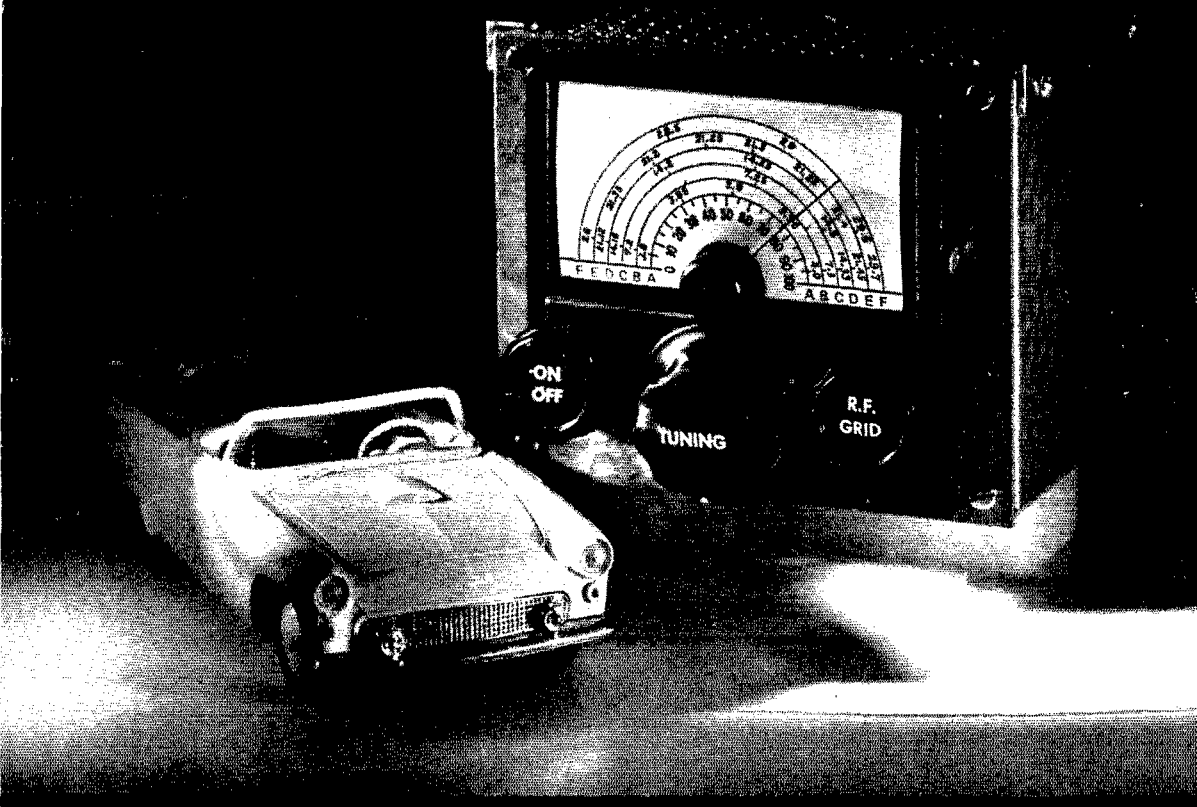


IN THIS ISSUE—SOMETHING NEW IN MOBILE CONVERTERS

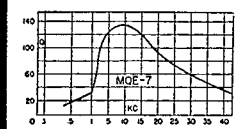
LARGEST PRODUCERS IN THIS FIELD FOR TWO DECADES...

HIGH Q INDUCTORS
FOR EVERY APPLICATION

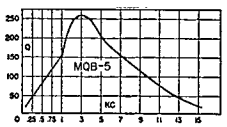
FROM STOCK... ITEMS BELOW AND 650 OTHERS IN OUR CATALOGUE B.

MQ Series Compact Hermetic Toroid Inductors

The MQ permalloy dust toroids combine the highest Q in their class with minimum size. Stability is excellent under varying voltage, temperature, frequency and vibration conditions. High permeability case plus uniform winding affords shielding of approximately 80 db.

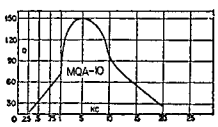


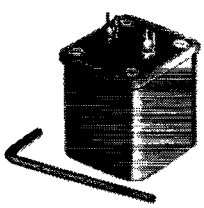
MQE
15 stock values from 7 Mhy. to 2.8 Hy.



MQA
19 stock values from 7 Mhy. to 22 Hy.

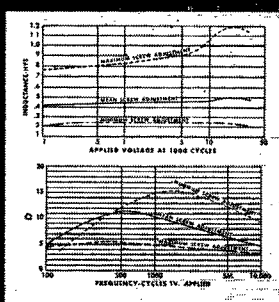
MQB
12 stock values from 10 Mhy. to 25 Hy.





VIC case structure

Length	Width	Height
1-1/4	1-11/32	1-7/16

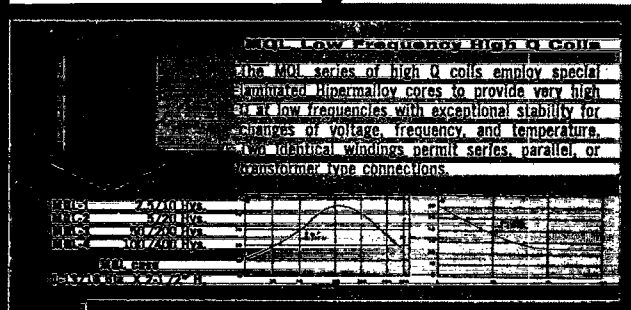


Type	Mean Hys.	Type	Mean Hys.
VIC-1	.0035	VIC-12	1.3
VIC-2	.013	VIC-13	2.2
VIC-3	.021	VIC-14	3.4
VIC-4	.034	VIC-15	5.4
VIC-5	.053	VIC-16	8.5
VIC-6	.084	VIC-17	13.
VIC-7	.13	VIC-18	21.
VIC-8	.21	VIC-19	33.
VIC-9	.34	VIC-20	52.
VIC-10	.54	VIC-21	83.
VIC-11	.85	VIC-22	130.

VIC Variable Inductors

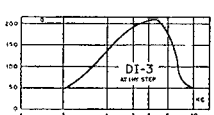
The VIC Inductors have represented an ideal solution to the problem of tuned audio circuits. A set screw in the side of the case permits adjustment of the inductance from +85% to −45% of the mean value. Setting is positive.

Curves shown indicate effective Q and L with varying frequency and applied AC voltage.

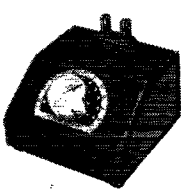


DI Inductance Decades

These decades set new standards of Q, stability, frequency range and convenience. Inductance values laboratory adjusted to better than 1%. Units housed in a compact die cast case with sloping panel ideal for laboratory use.



DI-1 Ten 10 Mhy. steps.
DI-2 Ten 100 Mhy. steps.
DI-3 Ten 1 Hy. steps.
DI-4 Ten 10 Hy. steps.

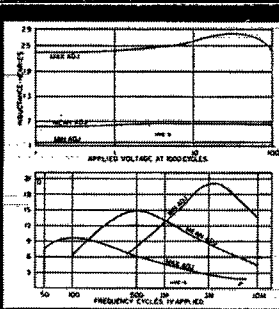


DI DECADE

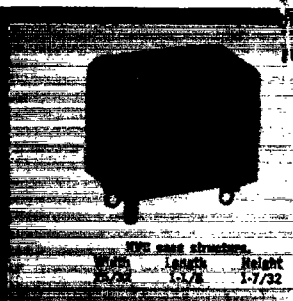
Length	4½"
Width	4⅜"
Height	2⅜"

HVC Hermetic Variable Inductors

A step forward from our long established VIC series. Hermetically sealed to MIL-T-27 . . . extremely compact . . . wider inductance range . . . higher Q . . . lower and higher frequencies . . . superior voltage and temperature stability.



Type No.	Min. Hys.	Mean Hys.	Max. Hys.
HVC-1	.002	.006	.02
HVC-2	.005	.015	.05
HVC-3	.011	.040	.11
HVC-4	.03	.1	.3
HVC-5	.07	.25	.7
HVC-6	.2	.6	2
HVC-7	.5	1.5	5
HVC-8	1.1	4.0	11
HVC-9	3.0	10	30
HVC-10	7.0	25	70
HVC-11	20	60	200
HVC-12	50	150	500



HVC case structure

Width	Length	Height
2-1/32	2-1/8	1-7/32

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UNITED TRANSFORMER CO.

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Past Winners

1955: Robert W. Gunderson, W2JIO

1954: Benjamin S. Hamilton, W6VFT

1953: J. Stan Surber, W9NZZ

1952: Don L. Mullican, W5PHP

NOMINATIONS INVITED FOR FIFTH ANNUAL EDISON AWARD

THE 1956 Edison Radio Amateur Award again will honor an amateur who has rendered important public service. As before, the Award also will serve to acknowledge the generous help which all radio amateurs offer their communities and the nation when need arises.

For 1956, a new Award winner will be added to the four whose pictures, names, and call letters appear at left. He will receive the handsome Edison Award trophy, a $500 check, and nationwide recognition.

A committee of distinguished and impartial judges will select the winner, from candidates who are nominated by letters from you and others.

Since only names submitted in this way will be considered by the judges, your participation is vital. Start now to choose your candidate for the 1956 Edison Award! The rules below will help guide you in preparing your nominating letter. Mail it to *Edison Award Committee, General Electric Company, Schenectady 5, N. Y.*

RULES OF THE AWARD

WHO IS ELIGIBLE. Any man or woman holding a radio amateur's license issued by the F.C.C., Washington, D.C., who in 1956 performed a meritorious public service in behalf of an individual or group. The service must have been performed while the candidate was pursuing his hobby as an amateur within the continental limits of the United States.

WINNER OF THE AWARD will receive the Edison trophy in a public ceremony in Washington, D.C. Expenses of his trip to that city will be paid.

$500 GIFT. Winner will be presented *with a check for this amount in recognition* of the public service he has rendered as a radio amateur.

WHO CAN NOMINATE. Any individual, club, or association familiar with the public service performed.

HOW TO NOMINATE. *Include in a letter* a full description of the service performed, as well as the candidate's name, address, and call letters. Your letter of nomination must be postmarked not later than January 3, 1957.

BASIS FOR JUDGING. All entries will be reviewed by a group of distinguished and impartial judges. Their decisions will be based on (1) the greatest benefit to an individual or group, (2) the amount of ingenuity and sacrifice displayed in performing the service. The judges will be:

E. ROLAND HARRIMAN, President, The American Red Cross.

HERBERT HOOVER, JR., *The Under Secretary,* U.S. Department of State.

ROSEL H. HYDE, Commissioner, Federal Communications Commission.

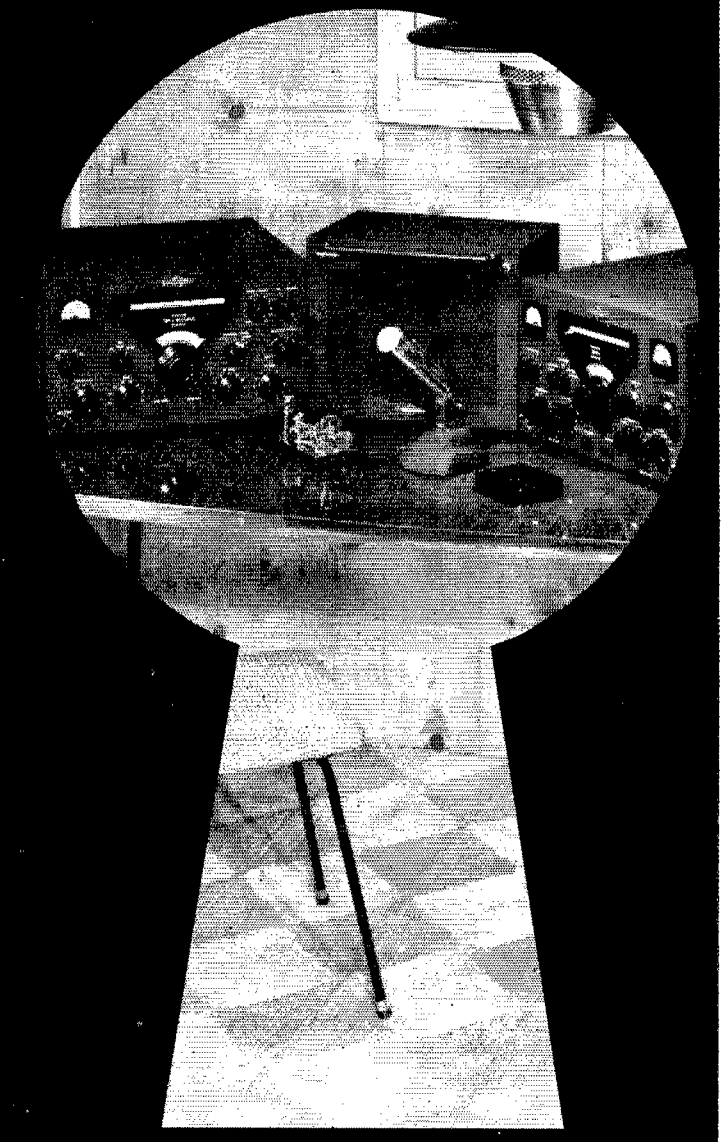
GOODWIN L. DOSLAND, President, American Radio Relay League.

Winner of the Award will be announced on or before Thomas A. Edison's birthday, February 11, 1957.

Employees of the General Electric Company may nominate candidates for the Edison Radio Amateur Award, but are not permitted to receive the Award.

GENERAL ELECTRIC

166-185



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QST

SEPTEMBER 1956

VOLUME XL • NUMBER 9

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

OFFICES

38 La Salle Road
West Hartford 7, Connecticut
TEL.: ADams 3-6268 TWX: HF 88

Subscription rate in United States and Possessions, $4.00 per year, postpaid; $4.25 in the Dominion of Canada, $5.00 in all other countries. Single copies, 50 cents. Foreign remittances should be by international postal or express money order or bank draft negotiable in the U. S. and for an equivalent amount in U. S. funds.

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

INDEXED BY
INDUSTRIAL ARTS INDEX

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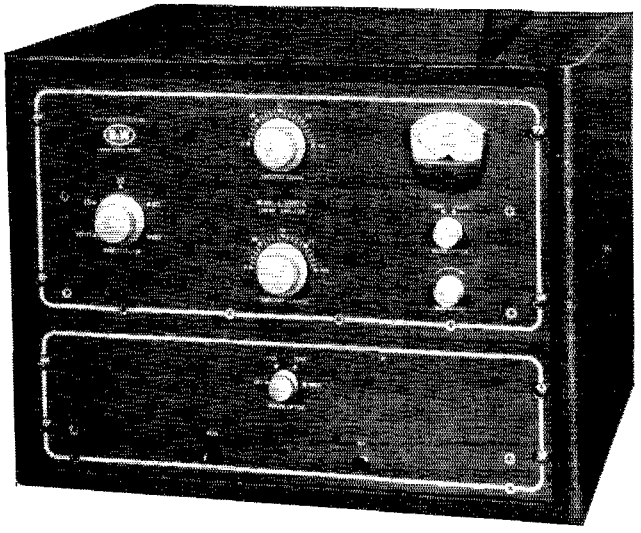
—CONTENTS—

table-top kilowatt amplifier



The B & W Model L-1000-A is a carefully engineered, Grounded Grid Linear Amplifier with a power packing punch which will stand out in signal eloquence whenever the going gets rough. The clean design eliminates unnecessary circuits, yet all essentials have been included to give you long, dependable performance.

Just consider these features: 1000 watts input SSB, 875 watts CW, 375 watts AM . . . completely self-contained including power supply! . . . bandswitching on all amateur bands 80 to 10 meters inclusive . . . pi-network final . . . broadbanded input—requires no tuning . . . all operating controls on front panel . . . controllable bias supply . . . completely shielded for TVI suppression . . . requires only 80 watts excitation . . . ideal for use with any transmitter nominally rated at 100 watts such as B & W 5100 Series, Collins 32V Series, Johnson Viking I & II, etc.

Net Price $460.00

MODEL 5100-B A SUPERLATIVE AM-CW TRANSMITTER

• high level push-to-talk AM telephony . . . 140 watts input • clean CW keying-break-in on all bands . . . 180 watts input • sparkling SSB . . . 180 watts peak envelope input . . . when combined with the 51SB-B single sideband generator • bandswitched throughout • integral VFO or crystal frequency control • coverage of 80 through 10 meter amateur bands • ideally suited to drive L-1000-A Linear Amplifier.

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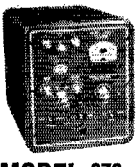

• fully bandswitched
• voice operated control • push-to-talk • speaker deactivating circuit
• powered by 5100-B transmitter
• no wiring required
• TVI suppression • unitized construction.

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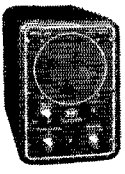
MODEL 370 ADAPTER FOR RECEPTION YOU NEVER DREAMED POSSIBLE



• truly outstanding SSB reception, select upper or lower sideband at the flip of a switch
• true single signal CW operation suppresses unwanted heterodynes by 50db
• selects either sideband of an AM signal
• may be combined with any communications receiver
• normal operation of your receiver is not disturbed in any way.

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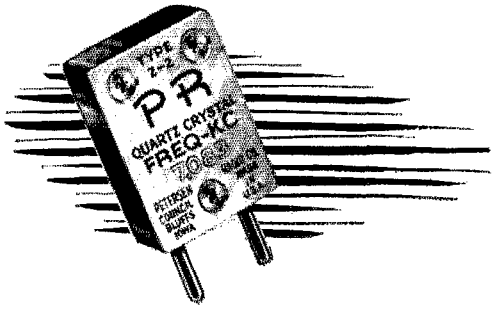

In many respects, Crystals are like "diamonds." You can buy them from six-bits up. It may be difficult to tell quality from a distance, but measured under close-up of performance, accuracy and stability . . . quality stands out. After all, your frequency control is the heart of your transmitter. When you trust your frequency to PR you know where you are . . . today, tomorrow and years from now. This is worth a great deal. In the long run the money you put in a crystal is not important . . . because even quality PRs cost little. When you buy a PR from your jobber you can get the exact frequency you want (integral kilocycle) within amateur bands, at no extra cost. You can be where you want to be . . . not within 5, 10 or 15 KC., but JUST WHERE YOU WANT TO BE! That means a lot.

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Section Communications Managers of the ARRL Communications Department

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

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Yukon				
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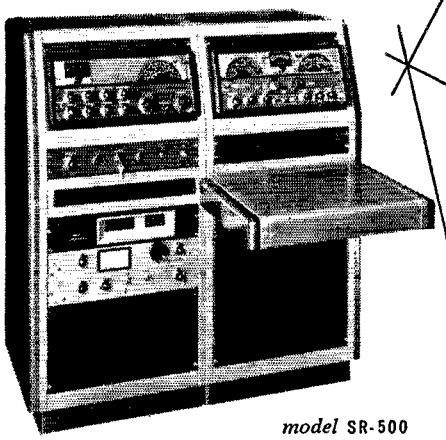
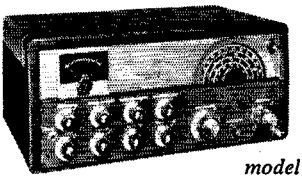


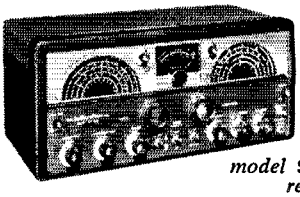
model SR-500

A completely contained unit in a handsome console cabinet—transmitter/exciter, linear power amplifier, receiver—affording the finest in V.F.O. or crystal. SSB, AM and CW transmission and reception. You need supply only the antenna, microphone and AC power. All the wiring is complete, and external connections are provided for antennae and microphone. The transmitting and receiving units are located for maximum efficiency in coordinated operation. A special communications speaker is positioned above the operating shelf directly in front of the operator. Console is mounted on casters and is easily expandable. Three blank panels provided in the basic cabinet for installation of any additional equipment desired. All safety and protective features incorporated. Completely enclosed, fused with the main power relay controlled by a key lock. Entire back of cabinet is enclosed and perforated for maximum ventilation and heat dissipation. $1495.00



model HT-30
transmitter/exciter

Built in V.F.O. reads directly in kilocycles. V.F.O. stability is equal to most crystals—.009%. There are also provisions for 1 crystal for fixed frequency operation. Selective filter system is same used by commercial communications companies for reliable sideband selection to assure continued suppression of unwanted side band energy (down 40 db or more) and distortion products. New 50 db range meter for constant monitoring of r-f output and carrier suppression. Voice control system built in with adjustable delay and anti-trip features. Front panel controls allow selection of AM, CW, and upper or lower side band. $495.00



model SX-100
receiver

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

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

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

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"It Seems to Us..."

THE PASSING OF NAA

It is the first aim of an editor to print in his magazine items which will have as widespread as possible appeal to his readers. For the moment, we're going to violate that principle with a few words on a subject which is of interest to perhaps only a few hundred of the fraternity. Yet to them, as to us, it is an intense interest. No Young Squirt licensed in the last thirty years or so will quite understand our deep sentiments on these "good old days" — the *really* old ones. But we think they deserve to be recorded because they relate to a very important event in the early history and practical development of ham radio.

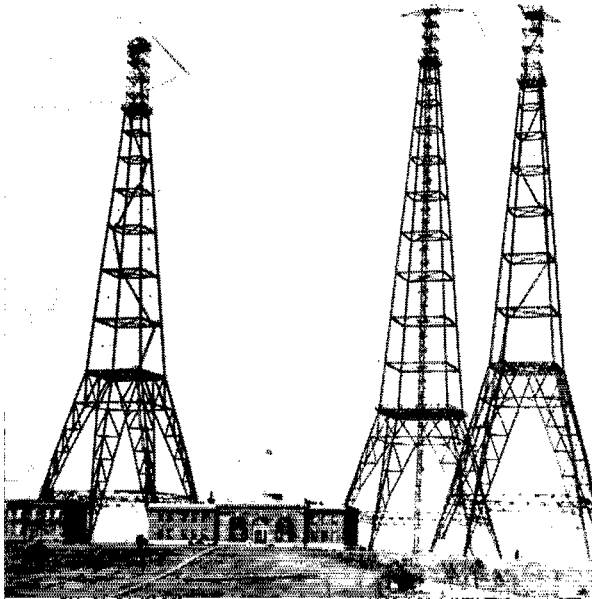
The inspiration, of course, is the decommissioning of the Navy's NAA. On page 47 is a report of the ceremonies. But we can't overlook the opportunity to reminisce a bit, because NAA played a large part in our own wireless career, just as it did for thousands of other hams some forty-three years ago.

We'd become interested in the ham game a year before NAA came on the scene — and what a year of patient but frustrating and unrewarding listening it was to be. We had the usual slide tuner (tuned where, we weren't quite sure), silicon detector, and a single 75-ohm phone with a headband fashioned of a piece of Meccano (for the information of any Young Squirt still reading, that was the 1912 forerunner of today's Erector toy). For an hour or so each evening we'd have the phone clamped over one ear while we did homework; the other ear was kept alert so Mother couldn't surprise us in the act of letting wireless interfere with studies. Occasionally, we'd hear a weak signal, and then tune agonizingly to try to get it better — usually with little success. Stations were far and few between on our little outfit; none was at all reliable.

Today, with such results you'd take up stamp-collecting or bird-watching and, by comparison, get some real action. But in those days, hearing a signal — a real wireless signal — on gear we had hooked up ourselves, was sufficient incentive to keep the fire of enthusiasm burning even if it were stoked only once a week.

And then we read the newspaper announcement that a new Navy radio station was going on the air, just across the river in Arlington. Surely we'd be able to hear *that* one regularly. We watched, waited and listened. And then one fine evening . . . there it was! — a beautiful sound to our ear, steady as a rock . . . loud and clear. The whole year of patient searching was suddenly worth while. Here, at last, was a source of good code practice. Here, at last, was the chance to acquire sufficient Morse experience to be an amateur operator (the license came along several years later!).

NAA became a Gibraltar for hundreds of hams and would-be hams, not only along the whole eastern seaboard, but for hundreds of miles across the country as well. It was always there, with time signals, weather reports, and message traffic for code practice. In the hearts of the early amateurs, it justly won a great deal of affection. Forgive us then, Young Squirts, if we pause a moment to shed a tear, on behalf of early amateur radio, on the occasion of NAA's passing from the "wireless" scene.



HAMFEST CALENDAR

District of Columbia — National Capital Area Hamfest, Sunday, October 7, 12 noon to 9 P.M., at Gaithersburg Fair Grounds, Gaithersburg, Maryland, on old Route 240.

Ladies program, children's program, auction, rummage sale, exhibits of new equipment, free soda pop for children, contests.

Plenty of free parking, plenty of shelter in case of rain. Stations on 75, 10, 6 and 2 to contact mobiles. Picnic tables galore and for those who don't bring their meals, food will be sold on the premises by a special caterer.

Sponsored this year by Washington Mobile Radio Club.

Illinois — On Sunday, September 16, the Egyptian-St. Louis Annual Hamboree and picnic will be held at the Egyptian Radio Club Grounds, one block south of U. S. Highway 66 on the east side of Chain of Rocks canal (just across the Mississippi River from north St. Louis).

There will be contests of all kinds, from code speed to egg throwing. As usual, there will be entertainment for the youngsters by the nationally-known clown and frogman, Charlie "Diver" Delps, W9QMG. Other notables will be ARRL officials and Earl "Lid" Linder, WØDZG, Editor of *Podunk News*.

On display, and manned, will be the new Emergency Communications truck of the U. S. Coast Guard.

Awards will be given for the various contests.

Traffic get-togethers of Illinois and Missouri State nets and s.s.b. meetings will be held during the day. Food and drinks will be served on the grounds. Come early and stay late . . . mobiles work W9AIU on 3940, 3990, and 29640 kc. Oh, yes!! There will be no charge for admission. For more information, write WØQDF.

Illinois — W9-DXCC annual meeting, Sheraton Hotel, Chicago, September 8, commencing at 1:00 P.M. Banquet at 7:00 P.M. Write W9EU, 420 Park Ave., Ottawa, Ill.

Kentucky — The annual Hamfest of the Bluegrass Amateur Radio Club of Lexington, Kentucky, will be held this year on Sunday, September 30, at the Sportsman Club, four miles east of Lexington, Ky., on U. S. 25 (Richmond Road).

Missouri — The annual hamfest of the Southwest Missouri Amateur Radio Club will be held on September 9, at Fassnight Park in Springfield. The program will include a swap table, basket lunch, and special activities for the XYLs. Monitored frequencies are 3.9, 29.62, 50.02 Mc.

New Mexico — The Totah Amateur Radio Club, Inc., of Farmington, New Mexico, will hold its annual dinner and get-together on Sunday, October 7. All the good features of previous dinners, plus additional new activities. Swap department for disposal of your surplus gear. Hidden transmitter hunt on 10 meters. Pre-registration, including dinner, is $2.50 each. Send to Leonard M. Norman, W5CIN, P. O. Box 24, Farmington, New Mexico. Registration after October 1 is $3.00. Further details from W5CIN, W5POI, or W5NSV. Will be expecting the mobiles on 3885 kc.

New York — 12th Annual Hamfest and Ladies Night of Oneida Area Hams on Saturday, September 29, at the Oneida Masonic Temple Dining Room, 230 Main Street, Oneida, N. Y.

Admission is $3.00 per person, by advance reservation only and is limited to 150 persons, the capacity of the dining hall.

Registration starts at 5:00 P.M., and banquet at 7:00 P.M. Make all reservations before September 27 with Walter L. Babcock, W2RXW, 405 Sayles St., Oneida, N. Y.

New York — The Federation of Long Island Radio Clubs will hold its annual outing and dinner, September 23, at Narragansett Inn, Merrick Road, Lindenhurst, Suffolk County, Long Island.

Gates open at 12 noon. Dinner at 6:30 P.M. Price $3.25 per adult (children under 12, $2.00). Games, events, and refreshments. Ample free parking. Two baseball diamonds. Ham gear displays and contests. Facilities available in case of bad weather.

Tickets must be paid for in advance. Tickets available from any of the affiliated clubs, or Lou Roth, W2DKH, 148-31 90th Avenue, Jamaica 35, N. Y.

New York — The New York Radio Club's annual Picnic and Transmitter Hunt will be held on Sunday, September 23, at Bethpage State Park, Bethpage, Long Island. Picnic: 11:00 A.M. Bring your own lunch. Transmitter Hunt: 1:00 P.M. Frequency, 29650 kc. Subscription: $1.00 for OMs, women and children free. W2ASI, Chairman.

New York — Second annual Syracuse VHF Club round-up, Saturday, October 6, at Martin's Restaurant, Liverpool, N. Y. Pre-registration only. $3.75 per person. YLs and XYLs welcome. For tickets, write W2WZR, 103 W. Roswell Ave., Nedrow, N. Y.

Ohio — 19th Annual Stag Hamfest, Sunday, September 9. Biggest bargain hamfest in U. S. A.; over 850 amateurs attended last year. Sponsored by the Greater Cincinnati Amateur Radio Association. The location is Kopling Grove on Winton Road, two miles south of Green Hills, Ohio. Registration $2.50 at the gate — here's what you get: hot dogs all day long, donuts and coffee served 'til noon, beer and pop served all day, full picnic dinner and supper (all you can eat), rain or shine. Lots of games and activities, radio-controlled model airplane show, etc. For additional information, contact Paul R. Wolf, W8IVE, 2005 Dana Avenue, Cincinnati 7, Ohio.

COMING A.R.R.L. CONVENTIONS

Sept. 1-2 — New Brunswick Province, Bathurst, N. B.
Sept. 15-16 — Dakota Division, Watertown, South Dakota
Sept. 30 — New Hampshire State, Concord
Oct. 21 — New England Division, Providence, Rhode Island

A.R.R.L. DAKOTA DIVISION CONVENTION

Watertown, South Dakota — September 15-16

The Howlin' Wind Radio Club of Watertown, S. Dak., is sponsoring the Dakota Division Convention at Watertown, September 15 and 16. The two-day affair will be highlighted by talks and demonstrations by leaders in the fields of single side band, v.h.f. communication, and beam-antenna design and use. Other strictly-ham activities include operator contests, separate events for the mobile enthusiasts, and talks by League officials. For the XYL or YL not interested in amateur radio, a complete program of social activities is planned.

Watertown is centrally located in the Dakota Division, so pack the family in the car and head for a weekend of fun and fellowship. No matter what your interest, you'll find the program entertaining and instructive. Advance registration is $4.00, including ticket to the Sunday afternoon banquet and registration for all activities. YL and XYL tickets for the banquet only are available for $2.00, and the club will be glad to handle hotel or motel reservations. For full program and details, write the Howlin' Wind Radio Club, Box 746, Watertown, S. Dak.

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

Transistorizing the Single-Side-Band Exciter

A Novel and Compact S.S.B. Exciter Design

BY JO EMMETT JENNINGS,* W6EI AND EMANUAL ALVERNAZ,* W6DMN

• Here's another "first" — the first transistorized s.s.b. exciter for amateur use. The only tube used is in the linear-amplifier output stage, where more power is needed than is available from existing transistor types.

We've had transistorized transmitters, receivers, measuring gear, and now s.s.b. There's hardly a field left as the sole property of vacuum tubes!

WHEN IT WAS FIRST SUGGESTED that transistors be used as a replacement for tubes in a single-side-band exciter we were uncertain as to the outcome, but nevertheless eager to tackle the problem. The first design tried used the phasing system, and after testing and evaluating this method it was concluded that first, a larger audio system, physically and electrically, was required than should be used in a miniaturized exciter; second, it was felt that the unwanted side-band rejection was inadequate, in view of continuing advances in s.s.b. standards. Consequently, although the phasing system worked as well with transistors as it did with tubes, it was decided to begin a new design using the filter method, always keeping in mind that physical size and rejection of the undesired side band were of paramount importance.

When we started out the simplest element, the audio system, was approached first, using low-frequency transistors. It was found that practically any high- or low-frequency transistor would function in the speech amplifier and modulator, providing the correct polarities were observed when changing from P-N-P to N-P-N units. Miniaturization raises the problem of audio components; small capacitors were necessary, ¼- to ½-watt carbon resistors were the largest possible, and miniaturized audio transformers such as are used in hearing aids became mandatory.

After rebuilding the speech amplifier several times we finally developed a two-transistor unit, as shown in Fig. 1, that would fit inside a type 832 Miller shield can. Each stage of the entire exciter could be conveniently mounted in one of these shield cans and complete isolation could be expected. The decision to use this type of construction was found to be a wise one since the outputs of the various circuits are usually measured in the range of one or five volts on a vacuum-tube voltmeter.

R.F. Section

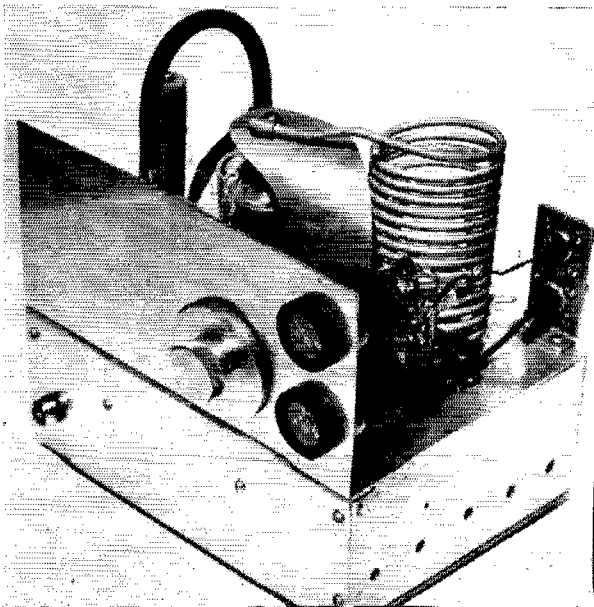
After completing the speech amplifier and modulator stage, several crystal oscillator circuits on 456 kc. were tried, using many available types of transistors. At this frequency there is a wide selection of usable transistors; in fact, almost as many were suitable as in the audio and modulator stages. (It was considerably less difficult to get oscillation on 456 kc. than on 3350 kc., the frequency used for heterodyning to the 75-meter phone band.) The particular oscillator circuit shown in Fig. 1 was used because we could vary the frequency slightly by adjusting the slug in

* Jennings Radio Mfg. Corp., San Jose, Cal.

♦

The transistorized exciter is contained in the bottom section of this complete s.s.b. r.f. section. The linear amplifier, using water-cooled tubes (4W300B), uses conventional circuitry and is not described in detail in this article. Miniature meters (shielded behind the panel to protect them from r.f.) are used for measuring plate and screen currents. The plate tank is tuned by a 5-450-$\mu\mu$f. vacuum capacitor. The vacuum relay between the meters and tank coil is for send-receive switching in the coax line.

♦



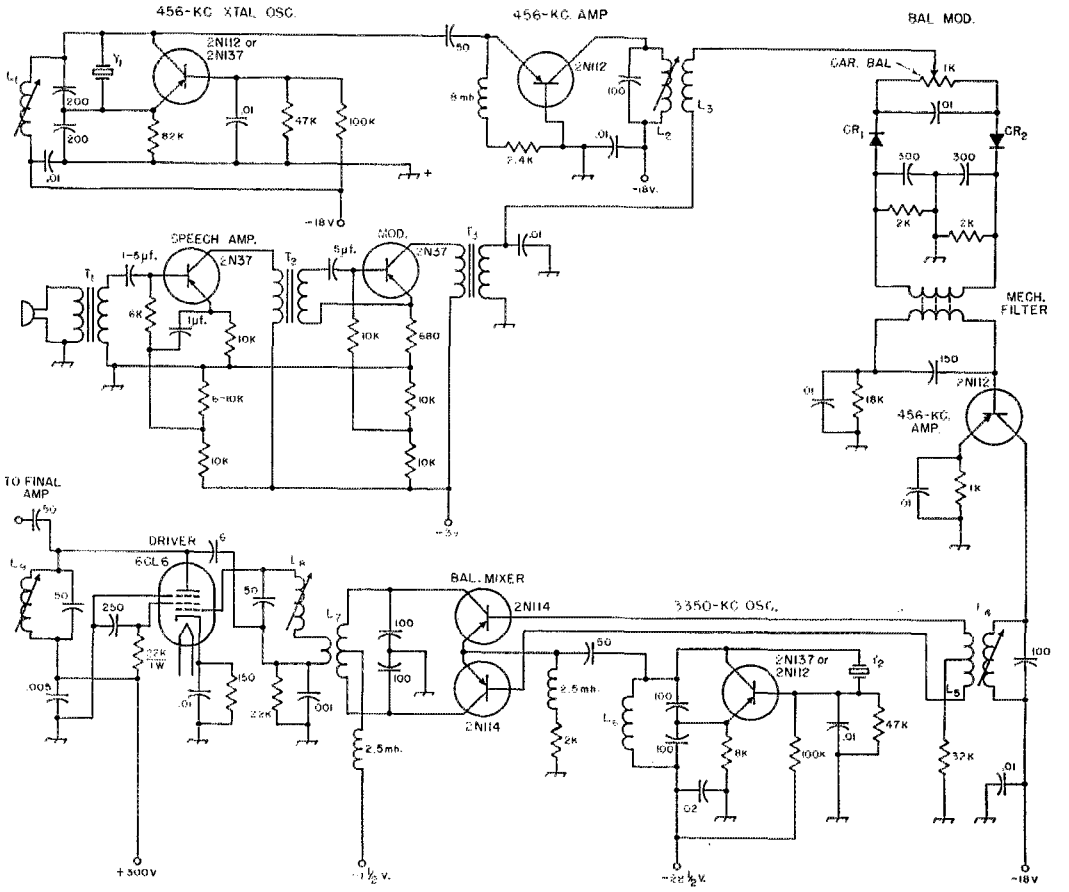


Fig. 1 — Circuit of the transistorized s.s.b. exciter. Resistors are ½-watt composition except where otherwise specified. Capacitors in tuned circuits are mica; others are ceramic except for 1 μf. and larger units, which may be either paper or electrolytic, miniature type.

CR1 — 1N34 or other type crystal diode.
L_1 — Approx. 1 mh., slug tuned (Miller 6318 with 75 turns removed).
L_2, L_4 — Same as L_1.
L_3 — 30 turns No. 30 enam., scramble-wound close to L_2.
L_5 — 30 turns No. 30 enam., tapped at center.
L_6 — 60 turns No. 26 enam., layer wound.
L_7 — 80 Meter coil. Output of bal. mixer, 50 turns No. 26 enam., wire tapped at center. Coupling link 2 turns wound over L_7 at center.
L_8 — Same as L_7; no center tap.
L_9 — Same as L_7; no center tap.
T_1 — High impedance mic. input trans. (Stancor UM-112).
T_2 — Interstage trans. (Stancor UM-113).
T_3 — Output trans. (Thordarson TZ26).

the coil. After making several different types of coils the Miller type 6318 peak coil for TV receivers was chosen. However, this coil has too much inductance, since the range is 0.2 to 3 mh., and subsequent experiments showed it was necessary to remove approximately 75 turns from each coil and use the Colpitts oscillator circuit with the crystal connected between the collector and emitter. If greater stability is required the oscillator circuit shown in Fig. 2 gives the better results, although both circuits seem to be satisfactory. The low-frequency oscillator employs an FT-241 surplus crystal. The transistors, resistors and bypasses of the oscillator assembly are all supported from the slug-tuned coil and mounted from the center hole of the S32 Miller rectangular shield. Similar construction is used for the 456-kc. amplifier.

The balanced modulator is mounted in a shield can also, and the output of the balanced diodes drives the mechanical filter, a Collins type 455-J31 (the type used in the 75A4 receiver). It was necessary to put a shield on the mechanical filter socket between the primary and secondary terminals to eliminate leak through around the filter, and to use a shielded line from the mechanical filter to the base of the following transistor.

Fig. 1 shows the 3350-kc. crystal oscillator connected in a Colpitts circuit. We later found that this circuit gave considerable frequency shift when the slug was adjusted in the coil, so that a certain amount of v.f.o. action was available. As in the case of the 456-kc. oscillator, if higher stability is required the alternate circuit of Fig. 2 gives excellent crystal stability, but without provision for any shift in frequency.

The balanced mixer seemed to give the best results with a high-frequency transistor, and it, too, is mounted in a shield can. Because of the extremely low output we found the shielding was highly advantageous, a point which was borne out when we found it necessary to neutralize the 6CL6 linear amplifier. The 6CL6 drives the final amplifier, a miniaturized 1-kilowatt unit using a pair of our favorite water-cooled tubes, the 4W300B's.

Tune-Up Procedures

Starting with the speech amplifier, we found we could get good voice output with 1½ volts of battery power, but 3 volts gave a level that more nearly matched the operation of the other stages. The low-frequency oscillator was tuned next, then the low-frequency amplifier. Various small adjustments in capacitance and inductance were made to get the maximum output voltage into the balanced modulator. The basic difference observed between transistors and tubes was that the transistor stages gave very low output. In the speech amplifier, with 3 volts, we were getting almost enough gain for hearing-aid purposes. In radio frequency circuits, however, only a very low voltage is delivered. We used 18 volts maximum on the 456-kc. i.f. oscillator and amplifier, but because individual transistors exhibit different characteristics it was possible in some cases to operate with as little as 12 volts and get good results.

The surplus-type crystals, Channels 326 or 329, may be used. If these channels are not available, Channels 45 or 46 are close enough in frequency. With all of these crystals we have found it necessary to make an adjustment in the crystal frequency by the silver-plating method. In this method a small amount of d.c. is required with a cyanide plating solution; a small piece of silver anode will allow the crystal to be plated to lower the frequency, or by reversing the d.c. polarity some of the silver can be removed to increase the frequency. This is necessary in order to place the crystal frequency on the proper portion of the mechanical-filter slope to obtain maximum side-band rejection and a suitable voice pass-band. If Channel 326 or 329 crystals are used, divide the channel number by .72 to find the fundamental crystal frequency for example, $\frac{329}{.72} = 457$ kc. In the case of Channels 45 or 46, divide by .45. It is possible to move these surplus crystals a maximum of 5 to 6 kc. by the plating method. Side bands are changed by shifting crystal frequencies higher or lower than the mechanical filter base frequency.

The output of the balanced modulator is highly attenuated through the mechanical filter.

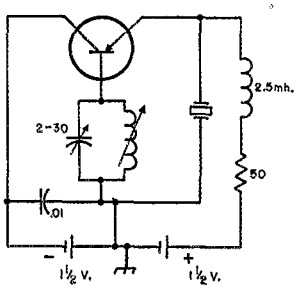
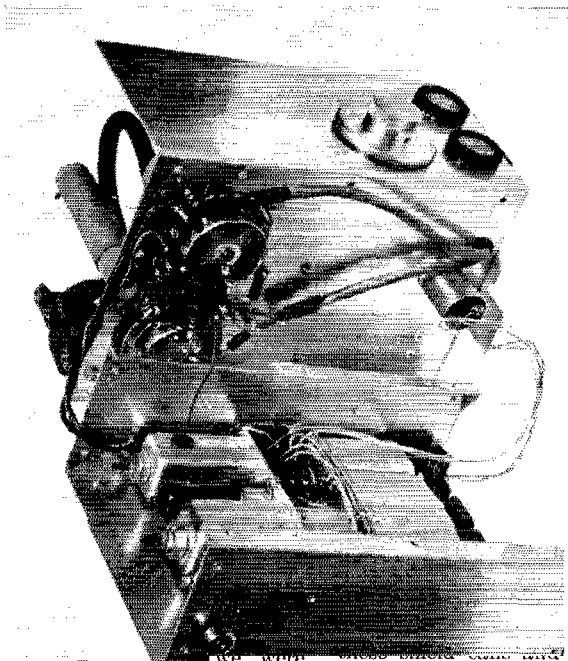


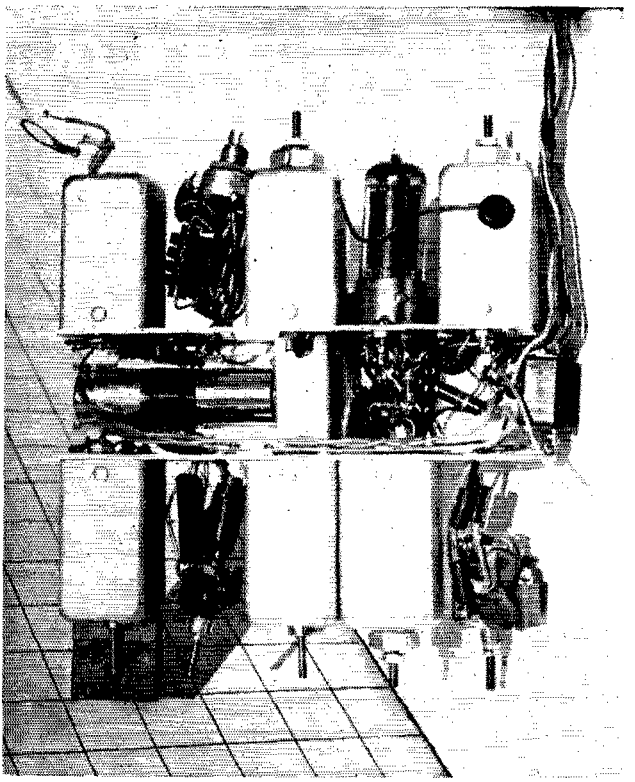
Fig. 2 — Alternative crystal-oscillator circuit.

There has been some discussion as to the possibility of using a lower-impedance filter. However, at this time we do not have any information as to a more satisfactory type than the Model 455J-31.

In testing the output of the balanced modulator we first adjusted the carrier-balancing potentiometer to give complete unbalance, so the actual carrier could be measured in terms of r.f. voltage on a vacuum-tube voltmeter with r.f. probe. After tuning the following circuits for maximum output, the potentiometer was adjusted so it would give us the maximum carrier attenuation



The view at the right shows how the exciter fits into the compartment on top of which the 1-kw. amplifier is mounted. The chassis for the latter is an L-shaped piece of aluminum. The sockets for the two 4W300B water-cooled tubes are at the left in this unit.



The exciter is built on a small aluminum channel with most of the circuit components contained in individual shield cans for each stage. In this view three of the shields have been removed to show the internal construction.

In the top row, from left to right, the first shield contains the speech amplifier and modulator, followed by the balanced modulator (not in can), grid circuit for the 6CL6, the 6CL6 linear amplifier, and in the last can the 6CL6 plate circuit. The mechanical filter is inside the channel at the left center. In the lower row, left to right, are the 456-kc. crystal oscillator, 456-kc. amplifier (out of shield can), 456-kc. amplifier following the mechanical filter, balanced mixer and (out of can) the 3350-kc. crystal oscillator.

for s.s.b. operation. The balanced mixer circuit gave us a little difficulty with self-oscillation until we used the circuit as shown. Again, the use of shielding, isolation and proper bypassing resulted in stable operation. It will be observed in Fig. 1 that the circuit is a linked connection to the input circuit of the 6CL6; this use of inductive coupling permitted use of capacitance-bridge neutralizing on the 6CL6. This helped to stabilize the balanced mixer and reduce spurious signals.

Various values were tried for all the components through the r.f. section. It was found that adjustments could be made to increase efficiency if the transistors were specially selected for each job. After many substitutions, the optimum values of Fig. 1 were determined, permitting stable operation and interchangeability of transistors.

All voltages indicated for transistor operation were taken from dry batteries. The current drain being extremely small, the output likewise was small. Since most of these transistors have a rated dissipation of 50 milliwatts maximum, one cannot expect to get a great deal of output. Nevertheless, there is enough drive from the balanced mixer to operate the 6CL6 satisfactorily, and the 6CL6 in turn has sufficient power output to drive the 1-kw. final amplifier.

Since we are using a mixer system, different mixer frequencies would obviously give us the output frequencies necessary for multiband operation. In such a case a complete high-frequency oscillator circuit, as shown in Fig. 2, would be necessary to change to another frequency, but so far it has been quite difficult to make more than a two-to-one frequency change in the transistor oscillator circuit. Some of the recent disclosures of v.f.o.s have indicated the feasibility of transistorized oscillators of the self-controlled type. These should give satisfactory results in this application.

Conclusion

In the over-all design of this miniaturized transistor exciter several basic features are worth consideration. Each circuit is a segment of the total. Unitized construction of each circuit points toward good mechanical layout and design. Tests for component functioning are simplified.

Our intention in choosing the components was to design a simplified type of s.s.b. exciter, using inexpensive parts. The one exception on the latter score is the mechanical filter.

Compactness and low current drain were the reward for the effort involved. With this circuit as a basic model, it is expected that this compact type of construction can be duplicated and the results will be equal to or better than those with the model described. In most cases the transistor will do the job of a vacuum tube, except that the power-output level is lower. Since we began experimenting, new high-frequency transistors which operate to 100 Mc. have been made available. These should help solve the problems of high-frequency transistorized operation.

The ARRL–IGY Propagation Research Project

V.h.f. Contact Data to Be Collected on a Worldwide Scale

BY MASON P. SOUTHWORTH,* W1VLH

• Since the accompanying article introduces a new ARRL program, perhaps a few words of introduction for its author are also in order. Although W1VLH is officially a newcomer to the Headquarters staff, many of you already know him for his *QST* articles on "things v.h.f." during recent years. These have been turned out while spending his college vacations working in the ARRL laboratories.

Mason graduated from Trinity College, Hartford, in 1955 and from Rensselaer Polytechnic Institute in 1956. He is a member of Phi Beta Kappa, Sigma XI, Tau Beta Pi, Eta Kappa Nu, and Sigma Pi Sigma honorary societies as well as the IRE and their Professional Group on Antennas and Propagation. With this background plus several years of v.h.f. hamming experience it was only natural that W1VLH should go to work on the project announced in this article. He will be in charge of a special ARRL office which will collect and analyze the reports to be sent in by v.h.f. amateurs.

THE WORTH of amateur observations is recognized in many scientific fields, and amateur workers of many kinds will participate in the coming International Geophysical Year. Therefore it was only natural that a place be made for hams in the course of planning the radio-propagation aspects of IGY.

The IGY itself and the reasons for its being were discussed by Dr. Berkner in the July issue of *QST*, and anyone who has not read this background article by now should certainly do so. The possibilities for amateur participation in connection with tracking the satellite of Project Vanguard, and setting up communications networks to furnish moral support to the Antarctic groups and help give notice of special events were mentioned in the same issue. Another amateur project, whose purpose is to gather radio propagation data is, perhaps, to be the most important and worthwhile of all. This involves the reporting of v.h.f. DX contacts made by several means of propagation which, although fairly common to a good many hams in practical communication, are still incompletely explained theoretically.

When there is a job to be done, one tries to pick the best means for doing it. Just so in this case. When it comes to gathering data about propagation phenomena, it's hard to beat a large number of reporting stations operating at all hours of the day and night. If a series of observing stations had to be set up especially for the IGY, the cost of this phase of the program would be enormous, and results would still not be as complete as could be furnished by existing amateur stations with their wide distribution. Therefore, when information on propagation was desired for IGY, hams were a natural for the job.

ARRL and IGY officials got together as early as the fall of 1955 to see what could be done about setting up a program of amateur observations to supplement the more exact — but of necessity limited — information obtained from scatter soundings and the like. The program which evolved from these talks has now taken on a definite form. The work will be done by ARRL under an Air Force contract. Dr. Wolfgang Pfister of the Air Force Cambridge Research Center will be the consulting scientist on the program. The writer will be in charge of collecting and analyzing the data for ARRL.

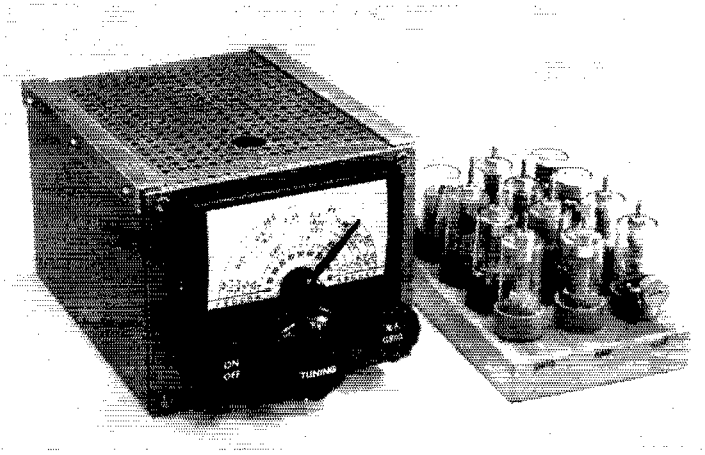
The program will be concerned with v.h.f. propagation in three main categories: transequatorial scatter on 50 Mc., auroral communication on any amateur frequency above 50 Mc., and sporadic-*E* skip. In order that no interesting phenomena may be missed, details of any amateur v.h.f. work over unusual distances will be solicited. It will then be up to the special ARRL IGY Staff to sort them out, if the reporting amateur is unable to do so himself.[1]

The first work in the three fields mentioned above was done by amateurs using the v.h.f. bands. Transequatorial scatter was turned up when amateurs in Mexico began working South American stations on 50 Mc., at times when communication should not have been possible, according to any means of propagation then known. Later 50-Mc. operators in many parts of this country and Canada made similar contacts at "wrong" times, and the medium by which these came about is still far from completely understood. It was for the purpose of gathering more data on this phenomenon that scientists working out the scope of the IGY program first conceived the idea of enlisting the aid of radio amateurs.

(*Continued on page 118*)

* ARRL-IGY Project Coordinator

[1] — Basic details of v.h.f. propagation may be found in any recent edition of the ARRL *Handbook*. 50-Mc. DX was described in May, 1955, *QST*, Page 22. V.h.f. dx phenomena were discussed in detail in *QST* for February, 1951, p. 46.



The mobile converter is 5 inches wide, 4⅛ inches high and 6 inches deep. Strips of ½-inch aluminum angle, attached to the top sides of the cabinet, provide clamp-type runners for a removable perforated aluminum cover. The cover supplied with the Premier type PAC-564 utility case is cut down in size and then used as the panel for the unit. The Millen type 10039 dial used with the variable-frequency oscillator capacitor, C_2, has 5 blank scales for calibration. Control knobs for C_1 and S_1 are to the left and right of the main tuning control, respectively. A set of "phone-band" coils is shown at the right.

♦

Something New in High-Frequency Mobile Converters

Plate and Screen Power Supplied Directly by the 12.6-Volt Car Battery

BY C. VERNON CHAMBERS, W1JEQ

A SERIES of tubes brought out recently by GE and other manufacturers is bound to excite any mobile fan who owns one of the newer "12.6-volt" cars. This line of tubes is designed so that all power requirements — heater, plate and screen — may be supplied directly by the 12-volt automobile storage battery, and includes the types 12AF6 and 12AG6. The first of these tubes is a pentode developed for use as a r.f. or i.f. amplifier, and the 12AG6 is a heptode intended for pentagrid-converter applications. Both types are primarily intended for operation at broadcast frequencies, but our own work with the tubes proves them to be quite adaptable to converter service at frequencies as high as 28 Mc. No attempt has been made to use them in the v.h.f. range.

Use of these tubes in a ham-band converter offers several advantages. First, they offer a worthwhile reduction in current drain as compared to other tubes. For example, the converter to be described draws *less* than 0.5 ampere from the battery. And remember, that is the *total* load — not just the heater drain. Secondly, the car battery serves as the plate-screen supply. This feature eliminates the need for a separate power pack or the nuisance of digging into the power section of the broadcast receiver. To obtain full power for the unit, it is only necessary to run a pair of wires to some convenient source of 12.6 volts. Usually, there are any number of places under the car dashboard where battery voltage can be easily tapped across.

The mobile converter uses three of these new tubes. A type 12AF5 serves as an r.f. amplifier, and a pair of 12AG6's operate in circuits providing double conversion. The first and the second converters work at 1.7 Mc. and 0.6 Mc., respectively, the latter being the output frequency of the converter. This frequency was chosen so that the i.f. output could be at the low end of the broadcast band where many receivers appear to be most sensitive. Furthermore, the tuning rate of most sets is slower at the low end, making it easier to set the b.c. receiver accurately to a desired frequency. Perhaps the most important point is that there are far fewer broadcast signals to contend with down around 600 kc. than at the high-frequency end of the band. We were hesitant to try a single conversion to 600 kc. because of the image problem that might arise with the converter tuned to the high end of the 28-Mc. band and because of oscillator pulling that would probably result due to the proximity of the signal and the variable-oscillator frequencies.

Other features of the converter are compactness, simplicity and commercial-like appearance, all having been obtained without introducing difficult or tricky constructional practices. Although the converter is basically a *single-control* unit, as far as tuning is concerned (the other circuit requiring tuning during normal operation is handled much like an antenna trimmer), it involves no ganging problems. Most of the tuned circuits can be preset at fixed frequencies during testing of the converter and require no further adjustment. Plug-in coils are used to eliminate the complexity of a band-switching system, and to permit exact duplication of the physical layout by those who have need for only a one- or two-band converter.

As might so very well be expected, there is one small fly in the ointment as far as the new

tubes are concerned. They do overload at signal levels considerably below that handled with ease by conventional high-voltage tube. However, in actual practice, we have run across only one or two ham-band signals that caused the converter to "fold up." All other cases of overload have been effectively treated merely by detuning the input circuit.

• Yes, the subtitle of this article is *correct.* This converter obtains all operating voltages — including those for the plate and screen circuits — directly from the 12.6-volt car battery! In other words, you don't have to "steal" power from the car receiver, nor is a separate plate-screen power pack necessary. The trick, of course, has been made possible by the development of several new tubes designed to operate efficiently with only 12 volts on the screens and plates. Plug-in coils are used to cover the 3.5-, 7-, 14-, 21- and 28-Mc. bands and facilitate duplication of the mechanical layout by those interested in operation on only one or two of the bands for which the unit is intended.

Circuit

The schematic diagram of the converter is shown in Fig. 1. V_1, V_2 and V_3 are the tubes in the r.f. amplifier, and the first and second converters, respectively. The r.f. stage has a slug-tuned plate inductor (L_4) which is loaded by R_2 at some frequencies (see Table I) in the interest of stability. C_1 is the tuning control for the amplifier, L_2 is the input coupling link and L_3 is the grid coil. L_1C_5 form a 600-kc. wavetrap used to attenuate pick-up and resultant feed-through of broadcast signals. Output from the amplifier is coupled to the first converter through C_8.

The first 12AG6, V_2, operates in a conventional pentagrid converter circuit having a slug-tuned plate inductor resonated at 1.7 Mc. C_2 is the tuning control for the oscillator section of the circuit and terminals *A*, *B* and *C* represent a coil socket. The socket accommodates the circuitry identified in the lower left-hand section of Fig. 1 as Z_1 and Z_2. It should be noticed that a tickler winding (L_6 of Z_1) is used with the oscillator coil, L_5, at 3.5 and 7 Mc. The values of inductance required at these frequencies warranted the use of a slug-tuned coil for L_5. However, because a coil of this type is difficult to tap, it was more convenient to use the separate winding (L_6) for oscillator feed-back purposes. At 14 Mc. and above, it was more convenient to use "Miniductor" for the required inductances and, of course, it was no trouble to use the tapped system shown in section Z_2 of the diagram. Values of the padder capacitors, C_3 and C_4 of Z_1 and Z_2, and the oscillator tuning ranges for the five bands of operation are listed in Table I.

The second converter circuit is similar to that of the preceding 1.7-Mc. converter. The output circuit is resonated at 0.6 Mc. by means of C_{17} and L_{10}, and the oscillator section is fixed-tuned at 1.1 Mc. by means of C_{15} and L_8. L_9 is the oscillator feed-back winding. S_1 performs the switching necessary between the converter, the car receiver and the antenna.

The heaters for the three tubes and the fila-

This view of the converter shows the major components arranged in a compact but uncrowded layout. The home-made aluminum chassis measures 4¼ inches by 5⅞ inches, has a ½-inch lip bent at the front edge (for fastening to the panel), and a 1¾-inch skirt at the rear which supports J_1, J_2 and J_3. A cutout measuring 1 inch by 1⅜ inches provides clearance for C_2 at the front center of the chassis. L_1, L_7, L_8-L_9 and L_{10} are mounted in North Hills Electric Co. type S-120 shield cans. The ½-inch hole in the panel (to the upper right I_1 in this view) lines up with another ½-inch hole that has been drilled in the rear plate of the Millen dial. These holes permit I_1 to provide "soft" illumination for the calibrated scales.

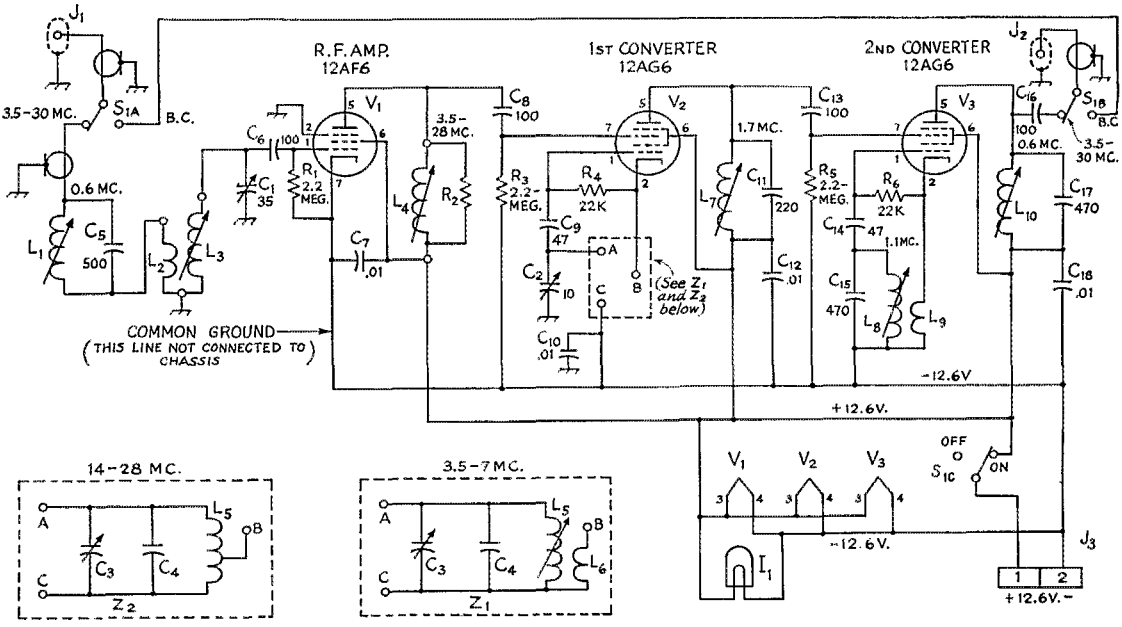


Fig. 1 — Schematic diagram of the mobile converter. Capacitors below 0.01 are in $\mu\mu$f. Capacitors not identified below or in Table I may be either mica or disk ceramic. All resistors are ½ watt.

C_1 — 35-$\mu\mu$f. variable (Hammarlund HF-35).
C_2 — Approx. 3 — 10-$\mu\mu$f. (Hammarlund HF-15 with 1 stator and 1 rotor plate removed).
C_3, C_4 — See Table I.
C_9, C_{11}, C_{14}, C_{15}, C_{17} — Silver mica or Centralab type TCZ ceramic.
C_7, C_{10}, C_{12}, C_{18} — Disk ceramic.
I_1 — 12.6-volt pilot-lamp assembly.
J_1, J_2 — Shielded "Motorola type" jack (ICA No. 2378).
J_3 — 4-contact male connector (Cinch-Jones P-304-AB).
L_1, L_{10} — Approx. 150 μh., slug-tuned (North Hills 120-H).
L_8 — Approx. 45 μh., slug-tuned (North Hills 120-F).
L_9 — 15 turns No. 36 d.c.c. wound at cold end of L_8.
R_2 — See Table I.
S_1 — 3-pole 5-position (used as 3-p.d.t.) selector switch (Centralab PA-2007 or PA-5 wafer mounted on PA-300 index).

ment of I_1 are connected in parallel. S_{1C} is the on-off switch for the converter.

Attention must be called to the fact that the wiring of the circuit involves one of the principles followed in the construction of a.c.-d.c. equipment. Naturally, with the circuit receiving all of its operating voltages from a common source, provision must be made for systems that ground the positive side of the battery as well as those that work with the negative terminal grounded. The converter has been made to work with either system by "floating" all parts of the circuit that carry d.c. In other words, many components are returned to a "common" ground path rather than to the chassis (see identification in Fig. 1). Only the r.f. circuitry that is completely isolated for d.c. may be grounded directly to the chassis.

Construction

The Premier utility case has removable top and bottom covers that measure 5 by 6 inches. But the best layout is obtained with the panel on one of the 4 × 5-inch sides. A rectangular opening measuring 3½ by 4½ inches is cut in one of the 4 × 5-inch ends of the box. This opening will allow the assembly to be easily slipped in place. Round off the corners of the cutout so that there will be adequate metal left at each corner of the front surface to accommodate the sheet-metal screws used to fasten the panel in place. The top cover is used as the panel for the converter and this means that it must be cut down to measure 4⅛ by 5 inches. In the final assembly the top cover is replaced by a piece of Reynolds "do-it-yourself" perforated aluminum.

A rectangle measuring 1⅝ inches high by 4 inches wide should be cut at the rear of the box to provide clearance for the cables that will connect to J_1, J_2 and J_3. The aluminum runners for the top covers (see front view) can now be fastened in place. Some clearance should be left between the angle and the top of the case so that the perforated cover can be slid into position.

Aside from the tuning knob and the pointer, the Millen dial has two basic assemblies — the faceplate that holds the calibration scale and the rear section that contains the drive mechanism. The rear section may be used as a template for marking the panel positions of C_1, C_2, S_1 and the two clearance holes for the screws which will hold the chassis, the panel and the dial together. Before using the dial as a template, drill a ½-inch hole at the top center of the back plate of the dial; this will be used to pass light (from I_1) through to the scale. The mounting or clearance holes referred to above are the ones tapped for 6-32 screws and located at the extreme right and left sides, just a little below the horizon-

tal center line. Holes that will pass the shafts of C_1 and S_1 will be found at the lower left and right corners of the template and, of course, the panel hole for C_2 must line up with the bearing located near the center of the dial. When using the template, center it on the panel with its top edge $\frac{5}{16}$ inch down from the top edge of the panel. And don't forget to mark the panel for the drilling of the $\frac{1}{2}$-inch "illumination" hole and the hole used in the mounting of the pilot-lamp assembly.

The faceplate of the dial must also be marked and drilled to pass the shafts of C_1 and S_1. The rear section of the dial may be used as a template during this operation.

The dimensions of the chassis have been given elsewhere. After it has been fabricated, proceed as follows:

Using the panel as a template, mark and drill the mounting holes in the front lips of the chassis. Now, mount I_1 on the panel. Next, fasten the chassis, the panel and the rear section of the dial (the part used as a template) together with $\frac{3}{8}$-inch machine screws. C_1, C_2 and S_1 should now be mounted in place with their mounting or locking nuts pressing against the rear section of the dial. After this, the faceplate for the dial may be mounted and the dial pointer and the control knobs installed.

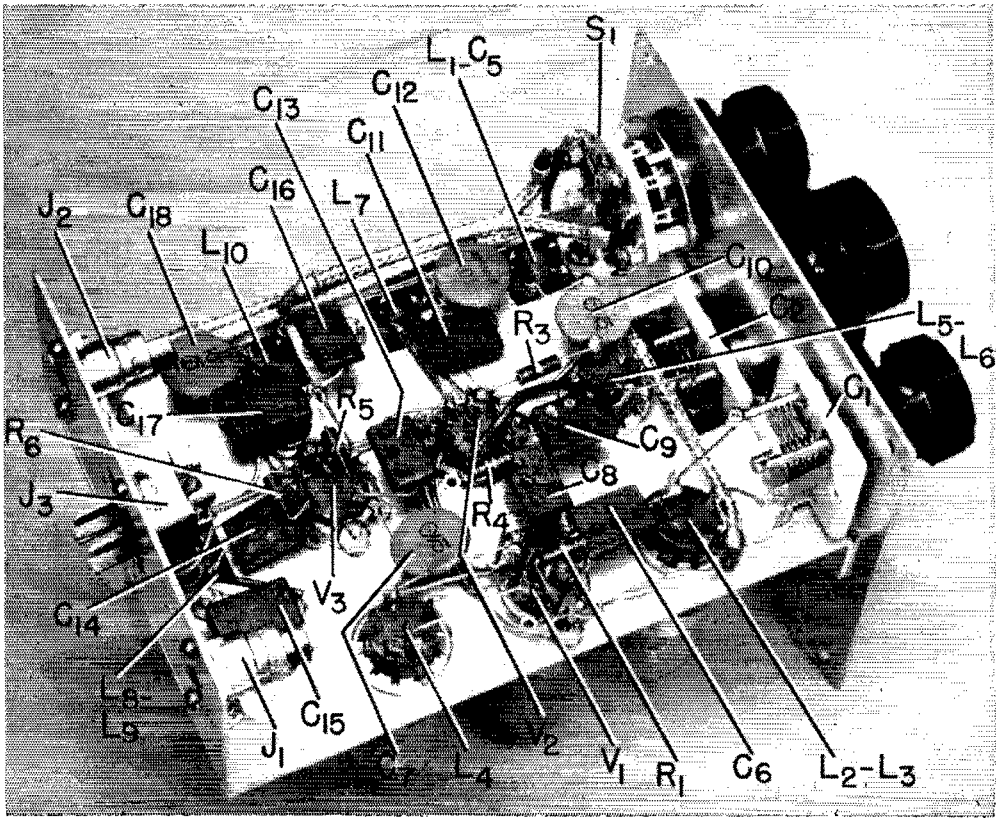
The location of each and every component for the converter is clearly identified in the illustrations. The terminals for the slug-tuned coils (the ones mounted in the shield cans) should be bent out and away from the ends of the forms so that they will project through the square clearance holes with ease. Additional data on the construction of the L_8L_9 assembly will be included in a section to follow. R.f. leads to the coils, coil sockets and variable capacitors should be made with rigid wire such as No. 16 tinned. RG-58/U is used wherever Fig. 1 indicates the use of coaxial cable. Two feet of RG-58/U will do the job with a little to spare.

The Coils

Neither the coil forms nor the slug-tuned coils used with the converter are over-the-counter items at present.[1] The polystyrene forms are each equipped with a 5-prong bakelite base that will

[1] The plug-in coil forms are sold in sets of three (specify color) by Northland Electronics Co., 561 Hillgrove Ave., LaGrange, Ill., at a cost of 75 cents per set, postpaid. Slug-tuned coils specified in Table I are obtained from North Hills Electric Co., Inc., 203-18 35th Ave., Bayside 61, New York. Current price of the coils is 95 cents each, plus postage.

The sockets for L_5-L_6, V_2 and V_3 are in line across the center of the chassis (from right to left, respectively, as seen in this bottom view). Sockets for L_2-L_3, V_1 and L_4 are arranged in that order to the left of C_1. Holes, $\frac{5}{8}$-inch square, punched in the chassis, provide access to the terminals of L_1, L_7, L_8-L_9 and L_{10}. C_{10} is the only fixed capacitor having the grounded terminal returned directly to the chassis; all other by-pass capacitors are returned to *common ground* points.



withstand repeated soldering operations without damage. Five base colors (black, brown, red, green and blue) which permit "color coding" for different frequencies are available. Amphenol type 78-S5S sockets are used with the forms.

When winding the input links (L_2) and the tickler coils (L_6 and L_9), place the windings at the cold ends of the associated inductors. Although the links and ticklers want to be wound reasonably tight, do not make them so tight as to prevent adjustment of coupling during the testing of the converter. Be very certain that the ticklers and the coils to which they are coupled are wound in the same direction. Should it be necessary to mount an oscillator padder or trimmer on the outside of the form, merely drill two ¼-inch holes in the polystyrene form so that stiff wire leads may be used between the terminals of the coil and the capacitor. The large holes prevent melting of the polystyrene by the soldering iron.

During the testing of the converter, it may be necessary to experiment with coupling, values of padder capacitance, loading resistance, etc. Therefore, it is recommended that the polystyrene forms be cemented to the base only after the testing has been finished.

Certainly, some sharp eyes will detect that Table I lists more coils than are shown in the coil rack resting alongside the converter (see front view). The fact is that the coil rack holds only the "phone-band" set of coils. This set of coils includes the oscillator coils which *spread* the phone segments of each band over the full swing of the tuning dial, a feature which should appeal to the operator who does no c.w. work from the car. The oscillator coils for 14 and 21 Mc. include coverage of those parts of the bands occupied by foreign phone stations. The complete 28-Mc. band is covered with a single oscillator coil for obvious reasons.

Power requirements for the converter are 12.6 volts at approximately 0.5 ampere. Because the current drain is so small, it is practical to *borrow* the car battery during the bench testing even though the shack provides no means for supplying a constant charge for the battery. Quite a few hours of testing can be done in this manner without running down the battery appreciably.

TABLE I

C, L and R Data for the Mobile Converter

R. F. Stage

Band (Mc.)	L_2 [1]	L_3 (μh.)	L_4 (μh.)	R_2
3.5	20	32 — (120-E) [2]	62 — (120-F) [2]	22K [4]
7	8	9 — (120-C) [2]	23 — (120-E) [2]	33K [4]
14	4	2.8 — (120-A) [2]	6.4 — (120-C) [2]	47K [4]
21	3	1.55 — (16¼ t.) [3]	2.8 — (120-A) [2]	See [14]
28	3	0.8 — (9¼ t.) [3]	1.5 — (120-A) [2, 5]	See [14]

Variable Oscillator

Range (Mc.) [6]	L_5 (μh.)	L_6	C_3 ($\mu\mu$f.)	C_4 ($\mu\mu$f.)	*Osc. (Mc.)*
3.5–4 — 7–7.3	10.5 — (120-D) [2]	10 t. [1]	2.5–7 [7]	59 [8, 9]	5.2 — 5.7
3.8–4	8.4 — (120-C) [2]	8 t. [1]	2.5–7 [7]	75 [8]	5.5 — 5.7
7.2–7.3	4.15 — (120-B) [2]	8 t. [1]	See [14]	220 [8]	5.5 — 5.6
14–14.35	1.05 — (120-A) [2, 12]	6 t. [1]	See [14]	150 [8]	12.3 — 12.65
14.125–14.325	0.58 — (7½ t.) [3]	2⅞ t. [13]	2.5–7 [7]	295 [8, 10]	12.425 — 12.625
21–21.45	0.36 — (5½ t.) [3]	1⅞ t. [13]	See [14]	220 [8]	19.3 — 19.75
21.15–21.45	0.31 — (4½ t.) [3]	1⅝ t. [13]	2.5–7 [7]	259 [8, 11]	19.45 — 19.75
28–29.7	0.58 — (7½ t.) [3]	2⅞ t. [13]	2.5–7 [7]	47 [8]	26.3 — 28.0

[1] Turns No. 36 d.c.c.
[2] North Hills Electric Co. designation.
[3] 16 t.p.i. No. 20. ½-inch diam. (B&W 3003).
[4] ½-watt resistor.
[5] 2 turns removed.
[6] Converter tuning range.
[7] Centralab 827-A.
[8] Silver mica or Centralab type TCZ ceramic.
[9] 22, 22 and 15 $\mu\mu$f. in parallel.
[10] 220 and 75 $\mu\mu$f. in parallel.
[11] 220 and 39 $\mu\mu$f. in parallel.
[12] 6 turns removed.
[13] No L_6 coil used. L_5 tapped (up from ground end) at position listed.
[14] Component not used.

Adjustment

An r.f. signal generator is a convenience during the testing, and a v.t.v.m. assists considerably with the adjustment of the converter injection voltage. If the signal generator is not on hand, it is possible to do a good alignment job provided that an accurately-calibrated receiver (with b.f.o.) which will tune to the various oscillator ranges is kept warmed up. A rough check on the oscillator tuning ranges can be made with the aid of a grid-dip meter, but the accuracy of such measurements leaves much to be desired. Of course, a broadcast receiver must be available as an i.f.-audio amplifier. It is recommended that the i.f.-audio unit be the car receiver to be used in the actual mobile installation.

The first step after power has been applied is the adjustment of the second-converter oscillator to 1.1 Mc. This is done by adjusting the broadcast receiver — the one serving as the i.f. amplifier will do — to 1.1 Mc. and then slug-tuning L_8 until the oscillator signal is heard. Next, connect the v.t.v.m. to read the grid voltage developed across R_6, remembering that

the voltage is negative and that it appears between the top of R_6 and *common ground*. Adjust the coupling between L_8 and L_9 if the grid voltage is much higher or much lower than 1.5 volts. Retune the i.f. receiver to 0.6 Mc. and proceed with the alignment of the oscillator for V_2.

The alignment of the oscillator for the first converter (V_2) requires that the inductance and capacitance values of each plug-in unit be adjusted for the desired bandspread. If a signal generator is to be used during the tests, remove V_1 from the circuit and couple the output of the generator to the V_1 side of C_8. Set the frequency of the generator to the low edge of the band of frequencies undergoing test, set C_2 at 95 per cent of full capacitance (plates almost closed), and then adjust either C_3 or L_5 until the signal is heard. Next, peak L_7 and L_{10} for maximum output from the converter.

Now, reset C_2 to approximately 5 per cent of full capacitance (plates almost open) and retune the generator upward in frequency until the signal is heard. If the full band, or the portion desired, has not been covered by the rotation of C_2, it indicates that the circuit is too high-C and therefore requires less padder capacitance (C_3) and more inductance (L_5). On the other hand, if the tuning range of the oscillator is too wide (not enough bandspread), it is necessary to decrease inductance and increase padder capacitance. Each time the LC ratio is altered, it is necessary to recheck the tuning range by swinging C_2 through the capacitance range referred to above. Adjustment of the LC ratio is not difficult when a slug-tuned coil is in use, but the job is a bit complicated when the operative coil is made with Miniductor. In the latter case, adjustment can be made only by varying the spacing between the last two turns of the coil. The voltage developed across R_4 should be adjusted to approximately -1.5 volts for each band. The voltage is varied if necessary by adjustment of the coupling between L_5 and L_6 (at 3.5 and 7 Mc.) or by changing the position of the tap on L_5 (14 Mc. and above).

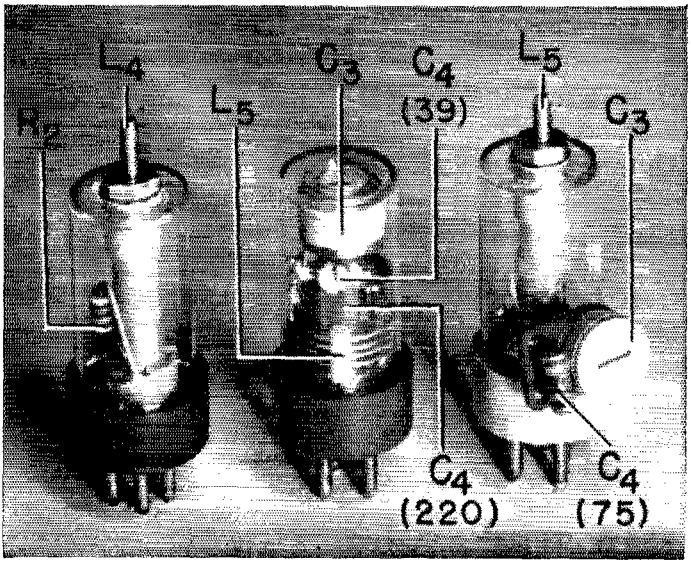
If a calibrated receiver is to be used for alignment of the oscillator, it must tune over the ranges listed under *Osc. Mc.* in Table I. The only difference in the alignment procedure is that the oscillator ranges are "listened to" as the LC circuits are adjusted.

After the oscillator ranges for V_2 have been brought into line for each band, disconnect the signal generator from C_8 and then feed its output to J_1. Insert V_1 in the socket, allow the tube to warm up, and then adjust the grid and plate circuits of the r.f. amplifier. L_3 for each band should resonate at the band midpoint with C_1 set at approximately half capacitance. L_4 should in each case be slug-tuned to the center of the band. Although the foregoing instructions refer to the use of a signal generator during the testing of the r.f. stage, it is possible to make the adjustments by listening to ham signals or with the aid of a grid-dip meter.

The coupling between L_2 and L_3 should be adjusted with the converter installed in the car and coupled to the mobile antenna. And something that we have previously said about mobile antennas bears repeating at this time. With a small antenna, such as a mobile whip, tight coupling to the antenna is essential for best signal response. It is also important in avoiding regeneration in the r.f. amplifier stage. Therefore, especially when the antenna is a small one, it should be resonant. This is usually the case in a mobile installation when the antenna must be made resonant for transmitting.

The loading resistors (R_2) connected across the r.f. amplifier plate coils at 3.5, 7 and 14 Mc. eliminated a regeneration problem at these frequencies and also broadened the frequency

(*Continued on page 120*)



Three types of plug-in coil construction are illustrated in this view. A typical r.f. amplifier plate coil and its loading resistor (R_2) are shown at the left. The 21-Mc. "phone-band" oscillator coil, fixed padder capacitor and Centralab trimmer are mounted in the form located at the center of the group. The 3.8-4-Mc. oscillator assembly at the right has the padders for the slug-tuned coil mounted external to the form. The enlarged portion of each form (the part that normally would slip down into the base) has been removed to reduce the height of the units. Holes drilled in the tops of the forms provide a means of mounting the slug-tuned coils and permit adjustment of the trimmer capacitors.

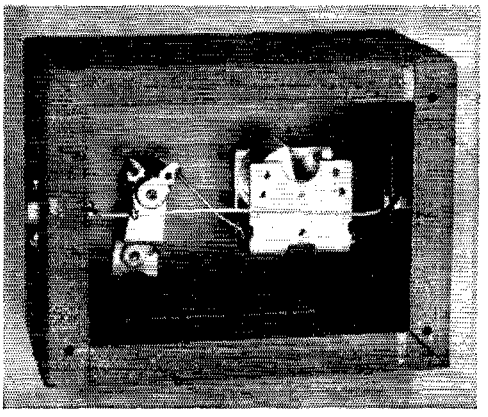
A Very Simple Output Indicator

Getting the Power to the Antenna

BY LEWIS G. McCOY, W1ICP

MOST AMATEURS rely mainly on the plate meter of the final amplifier to tell them what is happening when they tune up their rigs. All adjustments are made to get the plate current (at the resonance dip) up to whatever the book says the final tube will stand. Unfortunately, while the plate meter will indicate when the tank circuit of the final amplifier is in resonance, it doesn't always tell the true story about what is happening to your power *output*. The smart boys know that the best method of determining proper tune-up conditions is with an output indicator. The indicator described in this article is an inexpensive and simple device that will permit the user to "see" when he is getting maximum output.

• We refrained from calling this "The Simplest Output Indicator" out of deference to those open-wire feeder men who can and do use a neon bulb. But for the coax-minded contingent this is as uncomplicated as we can make it.



An RCA phono jack is mounted on each end of the box. These are connected together with a piece of No. 14 or 16 tinned wire. This lead is connected to one terminal of the dial lamp socket. The other terminal of the socket is connected to the stator of the variable capacitor. The rotor or frame of the capacitor is grounded to the box.

Circuit

Actually, the circuit of the unit is so simple it doesn't need much explanation. The idea is not new[1], but will bear repeating for the benefit of the newcomers. Fig. 1 shows the circuit. The indicator consists of a dial lamp shunted across the coax feedline. The brilliance of the lamp is proportional to the power in the line. A variable capacitor, C_1, is used to control the amount of current that flows through the lamp. It is connected in series with the lamp. This control is necessary to take care of various power levels and different frequencies and lines. To use the indicator, insert it in the coax line at the output of the transmitter. This can be either 52- or 75-ohm coax since the unit will work equally well with either type.

Most transmitters these days have pi-network output circuits which are usually connected to an antenna or balun coils with a length of coax. If the antenna is coax-fed directly from the transmitter, then it is only necessary to open the line and install the unit. If a balun is used, the indicator goes in the coax line between the transmitter and the balun coils. Where an antenna coupler is used, the indicator must be connected between the coupler and antenna.

To use the indicator, first set the variable capacitor to minimum capacity, (plates disengaged). Turn on the transmitter and tune it to resonance as indicated by the plate meter.

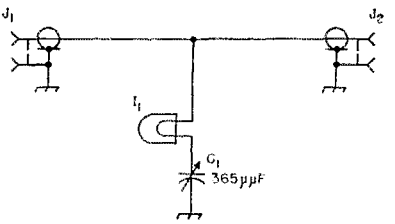


Fig. 1 — Circuit diagram of the output indicator.
C_1 — 365-$\mu\mu$f. variable capacitor, (broadcast replacement type).
J_1, J_2 — RCA type phono jacks.
I_1 — 6.3-v., 0.150 ma. dial lamp No. 47.
In addition to the above parts a ½-inch rubber grommet and a bracket mounted socket are needed for the unit. Total cost of the parts, including chassis, is about $2.00.

Next, slowly increase the capacitance of C_1 until the dial lamp lights. Increase it slowly or you may burn out the lamp. Once the lamp lights dimly, adjust your tuning and loading controls for maximum brilliance of the lamp. Don't worry if you find that maximum output as indicated by the lamp happens to be at a different amplifier dial setting than the plate current dip point. Just as long as the plate current isn't higher than the tube rating there won't be any danger of damaging the transmitter.

You'll find that for a given power level more

(*Continued on page 120*)

[1] Hyde, "Simple, V.H.F. R.F. Output Indicator," *QST*, April, 1955, p. 51.

Notes on the Development of Yagi Arrays

Part II. — Stacking Yagis

By CARL GREENBLUM*

• Part I of this article appeared last month and discussed the effects of element tuning and spacing. This concluding part tells what happens when two beams are stacked one above the other.

Two Yagi antennas are frequently combined for the purpose of increasing the power gain or to obtain increased directivity in the stacking plane. The gain achievable by stacking two units is theoretically 3 db.

In order to determine the variation in gain with stacking distance, two 3-element Yagis were stacked (see Fig. 14) in the vertical plane and the azimuthal directivity was plotted.

Since the pattern in the vertical plane was identical both with the different spacings employed and with the single unit, relative power gain calculations were based upon the total radiated energy being an integrated function of the square of the distant field strength times the cosine of the azimuth angle Θ. Fig. 22 is a plot in which the coordinates are $E^2 \cos\theta$ and θ. The polar plots for the single unstacked unit and for stacked units of spacing $\lambda/2$, $\frac{3}{4}\lambda$, $\frac{5}{4}\lambda$, and 2λ were replotted in Fig. 22 in accordance with the coordinates of $E^2 \cos\theta$ and θ. The relative power integration is represented by the area enclosed by each curve, and the ratio of the area of any of the curves to the area of the curve for an unstacked single unit represents the maximum power gain relative to a single unit. The areas under the different curves were obtained by means of a

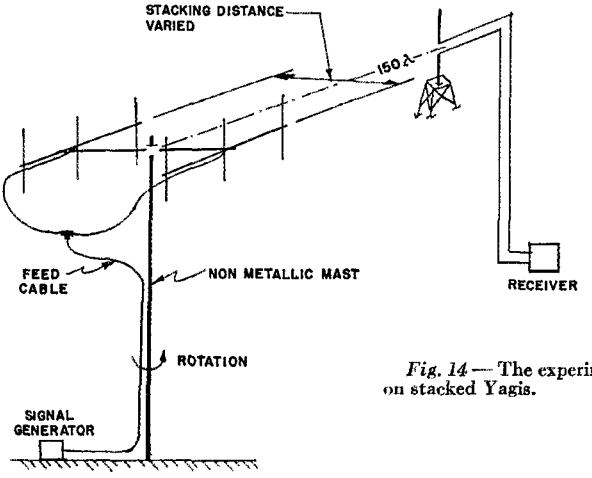


Fig. 14 — The experimental setup for taking the data on stacked Yagis.

A target receiving antenna was used at approximately 150λ from the test antennas at a site free of reflections. The antennas used were two standard Telrex 3-element 2-meter arrays, at a frequency of 145 Mc.

Fig. 15 is a polar plot of the azimuthal plane field intensity pattern ("*H*" plane since the antennas were vertically polarized) of a single unit which was used as a gain reference. Figs. 16 through 21 show the evolution of these field patterns as a function of the spacing used. These figures graphically illustrate the following:

1) The continual narrowing of the major lobe as the spacing is increased.

2) The appearance of increasing secondary lobes with increased spacing.

planimeter, and the following interesting results were obtained.

At spacing between $\frac{3}{4}\lambda$ and 2λ the relative power gain compared to a single unit varied from 2.8 to 2.95 db. The accuracy of the overall measurement is such that we conclude that the gain is approximately constant throughout this spacing region and if any variation exists it is less than 0.2 db.

At spacings of less than approximately $\frac{3}{4}\lambda$ the gain continually decreased, being approximately 2 db. at $\lambda/2$ spacing. The gain at spacings less than $\lambda/2$ decreases rapidly and is scarcely worth the trouble, in addition to the fact that matching problems are incurred.

The polar patterns in Figs. 15 through 20 show that the beamwidth of the major lobe de-

* Telrex, Inc., Asbury Park, N. J.

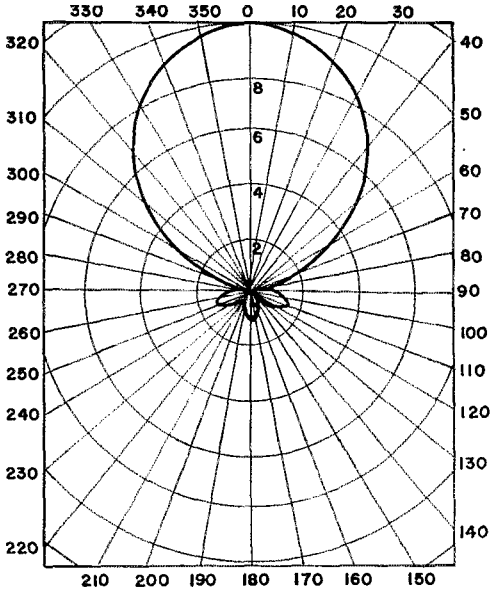


Fig. 15 — "H "-plane polar pattern of single 3-element Yagi.

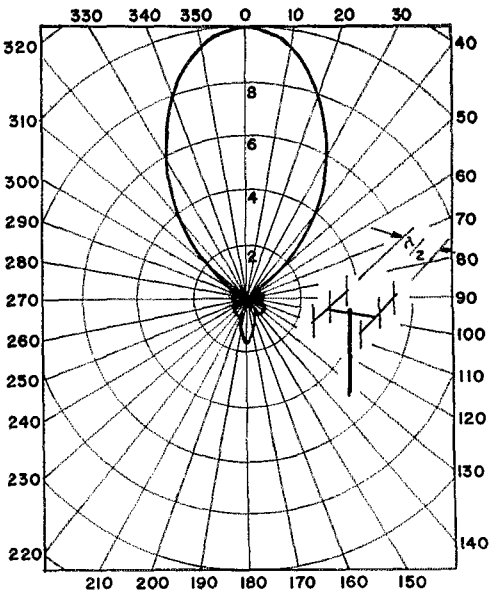


Fig. 16 — "H "-plane polar pattern of two 3-element Yagis stacked ½ wavelength apart.

creases continuously with increased spacing and reaches a value of 16 degrees at 2λ. The magnitude of the secondary lobes reaches a value of 80 per cent of the major lobe at $\frac{3\lambda}{2}$ and stays fairly constant until 2λ. The first zero (deep null between lobes) varies from an angle of 60 degrees for a λ/2 spacing separation to 15 degrees for a 2λ spacing.

Figs. 15-21 were obtained with the two 3-element Yagis vertically polarized. Their azimuthal directivity under these conditions is considered to be that in free space, since the presence of a ground plane does not affect the horizontal pattern under these conditions. For many applications the stacking of two Yagis is accomplished with the arrays horizontally polarized and stacked one above the other in the vertical

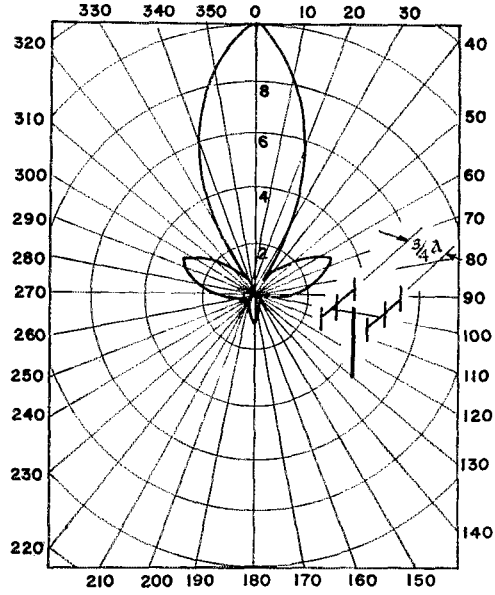


Fig. 17 — "H "-plane polar pattern of two 3-element Yagis stacked ¾ wavelength apart.

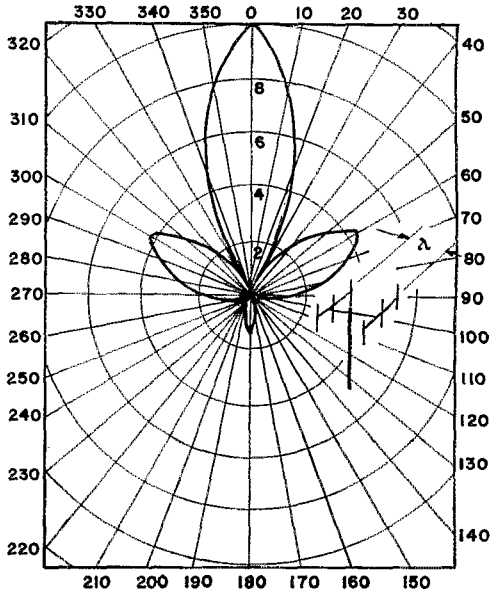


Fig. 18 — "H "-plane polar pattern of two 3-element Yagis stacked one wavelength apart.

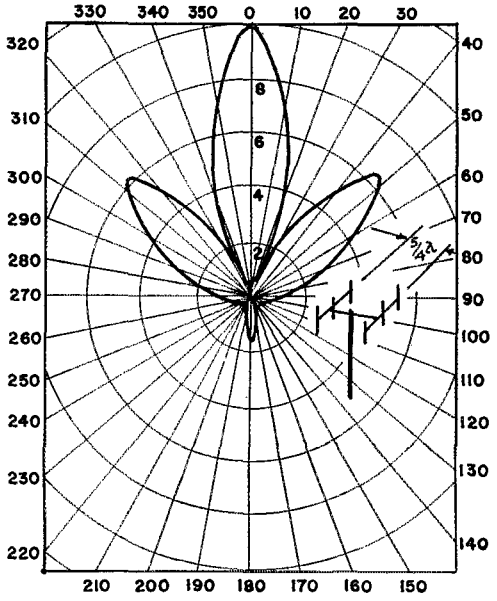


Fig. 19 — "H"-plane polar pattern of two 3-element Yagis stacked 5/4 wavelength apart.

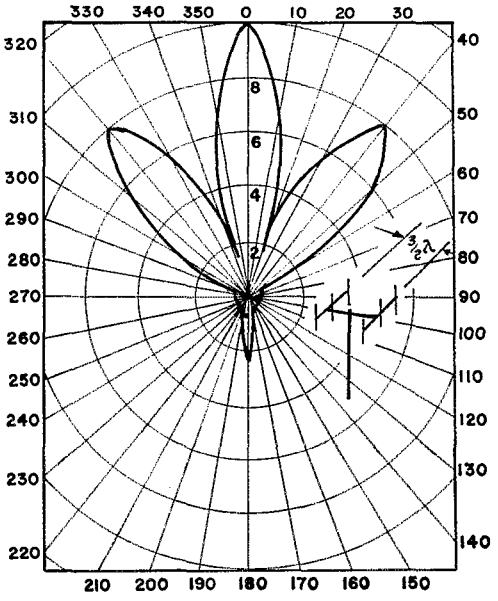


Fig. 20 — "H"-plane polar pattern of two 3-element Yagis tacked 3/2 wavelengths apart.

plane. In free space the patterns in Figs. 15–21 would merely be rotated 90 degrees to describe the directivity in the vertical plane, with the secondary lobes appearing above and below the main forward horizontal lobe. The presence of a ground plane, however, alters the vertical plane pattern in accordance with a multiplying factor.[7]

[7] The ground reflection factors shown in Figs. 2-26 through 2-37 in the *ARRL Antenna Book*.

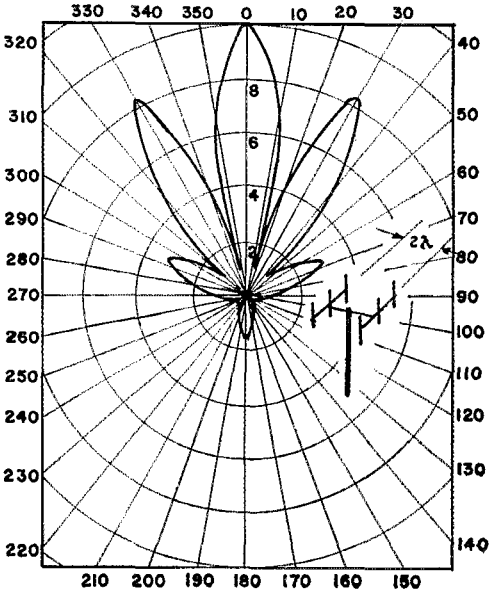


Fig. 21 — "H"-plane polar pattern of two 3-element Yagis stacked 2 wavelengths apart.

For a horizontal dipole above a ground plane the vertical-plane directivity is given directly by this multiplying factor, since the free space directivity of a dipole in a plane perpendicular to the dipole is a constant. For the case of two stacked antennas we multiply the free-space directivity of the array by the multiplying factor

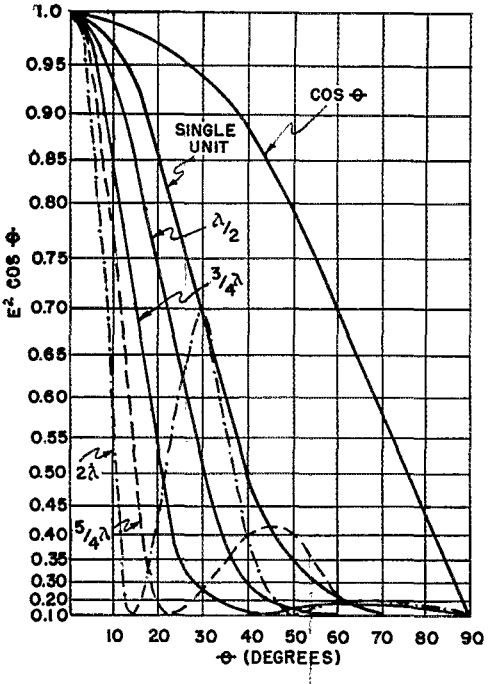


Fig. 22 — Plot of $E^2 \cos\theta$ vs. θ for Figs. 15, 16, 17, 19 and 21.

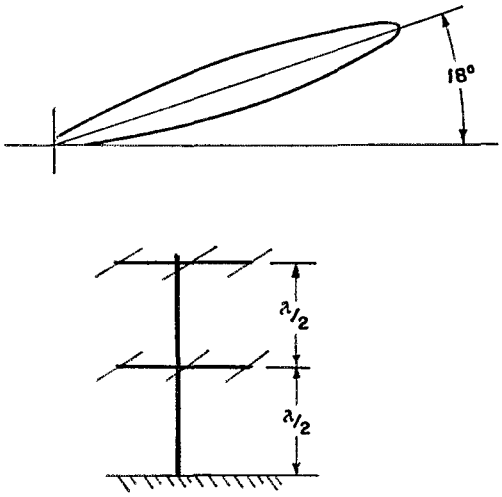


Fig. 23 — Vertical-plane polar pattern of two 3-element Yagis arranged as shown.

for the height above the ground plane of the array center.

Figs. 23, 24 and 25 have been drawn to illustrate three cases where the bottom 3-element array is set λ/2 above the ground plane and the spacing between the two arrays is λ/2 for Fig. 23, λ for Fig. 24 and 2λ for Fig. 25. These figures are derived from a multiplication of the free-space patterns shown in Figs. 15, 17 and 20 by the ground multiplying factors for the heights from the ground plane to the center of the two arrays.

Fig. 23 shows the maximum radiation angle to occur at about 18 degrees and exhibits a single lobe of relatively broad beamwidth in the vertical plane. Fig. 24 exhibits the angle for maximum radiation to occur at about 12 degrees, with a high angle secondary lobe at an angle of about 52 degrees. Fig. 25 shows the angle of maximum radiation to occur at 30 degrees with the secondary lobe at an angle of 7 degrees. These figures graphically illustrate the effect of different stacking spacings on the angle of maximum radiation. The amplitudes of the lobes shown are correct in a relative sense only for a single figure. To compare amplitudes between figures it would be necessary to compute the gain in accordance with the procedure used earlier to derive the gain for different stacking dimensions.

The over-all effect of a combined system in which a pair of Yagis are spaced above a conducting earth is to result in a vertical energy distribution of which Figs. 23, 24 and 25 are only three examples of a very large number of

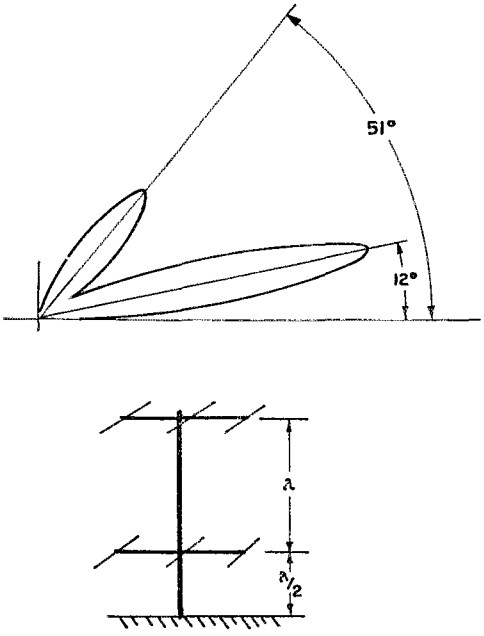


Fig. 24 — Vertical-plane polar pattern of two 3-element Yagis stacked as shown.

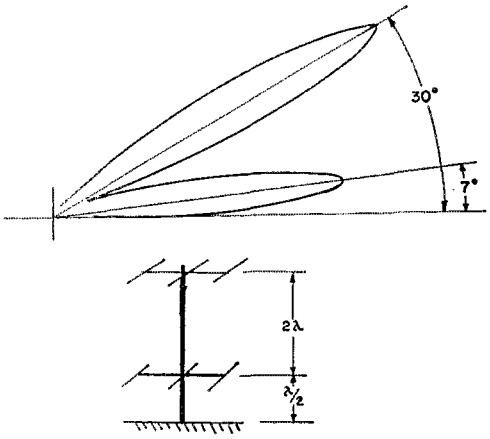


Fig. 25 — Vertical-plane polar pattern of two 3-element Yagis stacked as shown.

possible cases. The use of one vertical energy distribution rather than another depends upon the method by which the communication link is established. Recently a great deal of attention has been focused on the mechanism by which over-the-horizon propagation is achieved, which may indicate some use for methods by which the vertical radiation angle may be controlled.

The use of a particular vertical-plane response for an antenna system depends upon the communication link distance. In general, the greater the distance, the lower the wave angle. The optimum radiation angle varies depending upon the height of the reflecting layer which in turn depends upon season, time of day and other factors such as the sunspot cycle. Most data indicate that the optimum radiation angle for 20 meters, as one example, is approximately 13 degrees, which would be almost ideally met by an antenna system such as shown in Fig. 24. The system shown in Fig. 25 would probably be quite poor, since the lobes are either too low or too high to do much good. An ideal setup from the point of view of a means for maintaining communications by

(Continued on page 122)

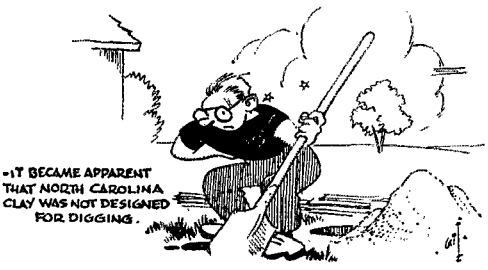
On Erecting Towers

BY R. E. MOREN* W4INL

I HAVE BEEN THE PROUD OWNER of a self-supporting steel tower for several years. Since so many people have asked me how it was erected it appears that this may be the propitious moment to provide the details of the assembly operation. Thus, all those who wish to provide similar support for their rotary beams or a locale for large bird feeders may profit by my efforts.

The construction work began when a large truck backed into my driveway and deposited a modest amount of assorted angle, nuts, bolts, etc., on my early summer Johnson grass. This created much consternation, particularly with my top sergeant who arched her eyebrows and exclaimed, "That's $250.00 worth?" Feeling somewhat miffed by her failure to appreciate the finer things I set to work looking for the assembly instructions, all the while dreaming of those S9 s.s.b. reports in Asia.

Having located the instructions, complete with pictures, I noted they casually mentioned digging holes about 4½ feet deep to anchor the base. This phase of the operation was begun at once. Three hours and two feet of the first hole later it became apparent that North Carolina clay was not designed for digging. Nevertheless,



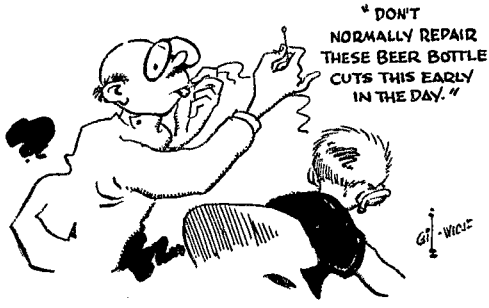
I obviously owned a vast amount of raw material for the manufacture of brick and from this I managed to eke a tiny bit of melancholy satisfaction. The digging also provided a difficult way to while away my idle moments and develop a deeper appreciation of the power of the Almighty who had put the stuff there in the first place.

Some eight days passed. After convalescence from a slipped disc and the mild case of bursitis brought on by the exploration of my mineral rights, the time arrived to begin assembly of the tower. Since all my neighbors are teetotalers, (while living at home) a gin pole was out of the question. Hence, it became mandatory to assemble the tower piece by piece.

The first twenty feet of the tower was assembled with base legs resting in the holes but not anchored. I had planned to level the assembly at this point and then pour the concrete. This section of the tower was made plumb with peaches since no plumbs grow in this area. Sure enough, when a peach was suspended it hung straight down just as the instructions claimed. Unfortunately, the tower did not hang straight up. This led to a number of snide comments from the neighbors who, up to this point, had given freely of advice but nothing in the line of muscle power. After much tugging and pushing, things looked a bit better but a slight list to the southeast persisted which I attributed to earth rotation, the pull of the moon or some other nebulous natural phenomenon.

The assembly work continued. I would hoist the pieces up the tower, bolt them in position and as sections were assembled, climb to the next horizontal member dragging a 1 × 6 behind me. The 1 × 6 was used as a bench of sorts and a platform when it became necessary to stand. At the forty foot level a mishap occurred which frightened me slightly. On second thought, it might be more accurate to say I was terrified because for several days I shook like the rear seat on the crosstown subway. It had its compensations, however. For the first time in sixteen years I managed to get the right number of dots when I thumbed out a five on my old Vibroplex.

The accident occurred after I had bolted one end of a horizontal member in place and had pushed the opposite end on the bolt. While stooping to get the nut the member slipped off the bolt and pivoted on the anchored end. The free end described an arc as it dropped and plowed a furrow across the back of my head. I staggered to the corner of the tower and sat down, clinging tenaciously to the vertical upright. Blood was streaming down my back. I remember that I thought my wife would be mightily perturbed. . . . blood all over that new 69¢ tee shirt. I also recall thinking it was a rather ignominious way to get a "Silent Key" mention. Nothing respectable like a quiet self-electrocution. It was downright humiliating. So humiliating in fact that I climbed down the tower and went to the doctor.



He looked me over carefully. "Hmmmmm" he Hmmmmd. "Don't normally repair these beer bottle cuts this early in the day. That'll be three

(*Continued on page 122*)

* 406 S. Maple St., Graham, N. C.

• Recent Equipment —

The DX-35 Transmitter Kit

THE MOST RECENT addition to the Heath Company line of assemble-it-yourself equipment for amateurs is the DX-35, a transmitter kit in the — broadly speaking — "50-watt" classification. It has a three-stage r.f. section winding up with a 6146, a screen modulator, and a self-contained power supply. It is housed in an aluminum cabinet 13 inches wide, 8½ inches high, and 9 inches deep.

The basic r.f. circuit, omitting switching and other details, is shown in Fig. 1. A 12BY7 is used as a Pierce-type crystal oscillator with an electron-coupled output circuit represented by L_1 in the diagram. For final-amplifier output on the 3.5- and 7-Mc. bands L_1 is an r.f. choke shunted by a 3300-ohm resistor, no special tuning being used. For final output on 14 and 21 Mc. the oscillator plate circuit is resonated on 7 Mc., and for 28-Mc. output it is resonated on 14 Mc. These circuits are not panel-controlled, being broad enough to cover each of the frequency ranges for which they are intended because of the high L/C ratio and the resistance loading.

The 12BY7 buffer-multiplier has a tuned plate circuit on each of the five bands. The 11-$\mu\mu$f. capacitor across L_2 permits resonating the circuit to the actual frequency being used, and serves as an excitation control when detuned to give the desired value of 6146 grid current. This tube is used as a straight-through buffer on 3.5 Mc. when a 3.5-Mc. crystal is used in the oscillator, and in the same way on 7 Mc. when a 7-Mc. crystal is used. If a 3.5-Mc. crystal is used for 7-Mc. final output, the 12BY7 becomes a frequency doubler. If a 3.5-Mc. crystal is used for final output on 14 Mc., the oscillator doubles the frequency, which is again doubled by the 12BY7 multiplier; with a 7-Mc. crystal the oscillator works straight through and the second 12BY7 does all the frequency doubling. It is not recommended that 3.5-Mc. crystals be used for bands

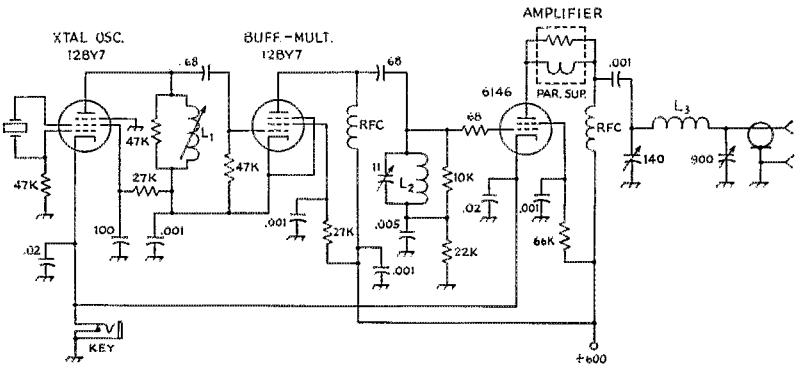
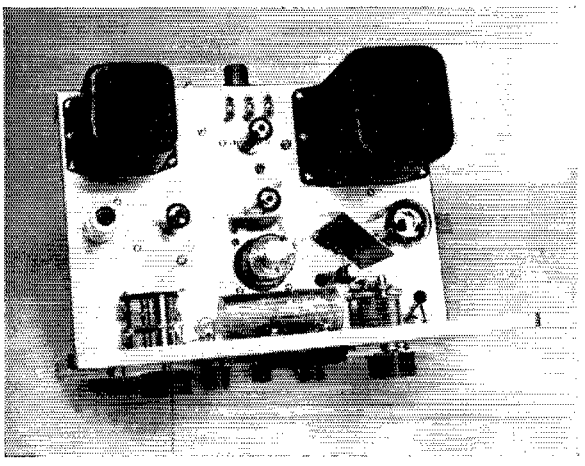
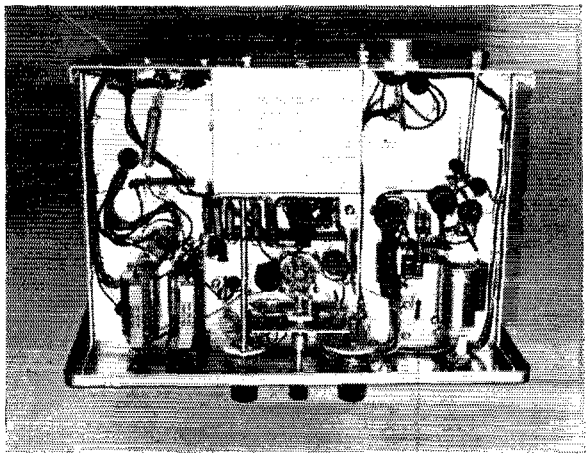


Fig. 1 — Basic r.f. circuit of the DX-35. The final amplifier works straight through on all bands from 3.5 to 28 Mc., inclusive.



Plan view of the DX-35. The 6146 final amplifier is near the front of the chassis, with a shield partition between it and the other tubes. The dual condenser at the left has both sections in parallel to provide 900 $\mu\mu$f. of output capacitance in the pi-network tank. The tapped tank inductor is mounted between the panel and the 6146. The 12BY7 oscillator tube is between the power transformer and filter choke, and the 12BY7 buffer is between the oscillator and 6146 final. The speech amplifier and modulator tubes are at the left.



The oscillator circuit is in the shield compartment at the top center in this view. The band switch, with the buffer tank coils mounted between the sections just adjacent to the oscillator compartment, is at left center. The 6146 socket is mounted on a special bracket at the lower center in this picture. Power-supply components occupy the left-hand section and the speech circuits are at the right. The knob on the rear panel apron is the crystal-selector switch. The socket on the same apron, near the power cord, is for use with a v.f.o., and supplies the proper voltages for the Heathkit VF-1.

higher than 14 Mc. With 7-Mc. crystals the second 12BY7 is a tripler for 21-Mc. output and a doubler for 28-Mc. output, its grid being driven on 7 Mc. in the first case and on 14 Mc. in the second.

The 6146 final amplifier has a pi-network output circuit, with the plate tank coil tapped appropriately for each band. On 3.5 and 7 Mc. the 140-$\mu\mu$f. tank capacitor is shunted by a 68-$\mu\mu$f. fixed capacitor to increase the total tank capacitance. Cutting the fixed capacitor in and out is taken care of automatically by the band switch. The amplifier is stabilized at the operating frequency by "brute force" resistance loading in the grid circuit, represented principally by the 68-ohm resistor in series with the grid. This method is probably used in preference to neutralizing because it requires no critical adjustments on the part of an inexperienced builder.

Modulation

The modulation system used in the DX-35 has some interesting circuit features. Basically it is screen-grid modulation of the 6146, using a cathode-coupled modulator. This is combined with voice-operated carrier control to squeeze out a bit more output than can be obtained with straight screen modulation because of the plate-dissipation limitations of the modulated stage.

The control and modulator circuit is shown in Fig. 2. The grids of V_1 and V_2 are driven in parallel from the speech amplifier. The control tube, V_1, has a large cathode resistor, R_2, and without voice input its cathode is about 30 volts positive. This d.c. voltage is applied to the grid of the modulator, V_2, through the isolating resistor R_3. Under this condition, the plate current flowing through V_2 develops about 40 volts across the cathode resistor, R_4, which in turn is applied to the 6146 screen. At this low screen voltage the plate input to the 6146 is only 40 to 50 ma. at 600 volts. The carrier output is 8 — 10 watts under these conditions.

When a voice signal is applied to the grids the plate current through V_1 increases (since the initial bias is near cut-off), thereby increasing the voltage drop across R_2 and thus driving V_2's grid more positive. V_2's cathode follows right along, raising the screen voltage and thus increasing the 6146 input and the carrier output. The time constant of the R_2C_1 combination is chosen to make these carrier variations occur at a syllabic rate. Simultaneously, the audio signal at the grid of V_2 is amplified and appears across R_4 to modulate the d.c. voltage on the 6146 screen.

With the constants shown in Fig. 2 the d.c. screen voltage increases to about 90 volts with the maximum audio input that gives undistorted

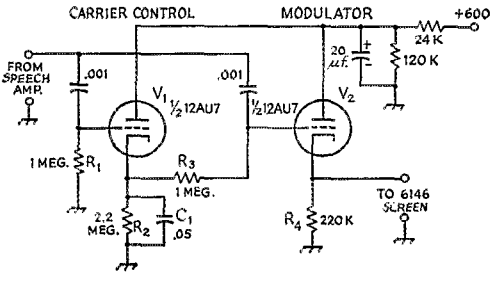


Fig. 2 — The controlled-carrier and modulator circuit.

modulation. The modulation is approximately 60 per cent under this maximum condition. The 6146 plate current swings up to about 90 ma., representing 50 to 60 watts peak input, and the carrier output is 20 — 25 watts.

The modulation percentage can be increased by decreasing the audio voltage applied to the grid of V_1. This decreases the upward swing of d.c. screen voltage on the 6146 but allows the same peak-envelope output during modulation. We found that reducing the a.f. voltage at the grid of V_1 to one-half that applied to V_2 resulted in a maximum d.c. screen voltage of about 75, accompanied by approximately 80 per cent modulation of the carrier. This is about the most that can be hoped for with a direct-coupled system — particularly with the 6146, since the

screen of this tube must be driven negative in order to cut off the output completly.

General

The power supply has a single-section choke-input filter and uses a 5U4GB rectifier. The filter capacitor consists of two 450-volt electrolytic capacitors in series. As shown in Fig. 1, the oscillator and buffer stages are in series across the 600-volt supply, a method which results in considerable simplification of the power-supply circuits. To avoid heater-cathode insulation troubles in the buffer, since its cathode is about 300 volts above chassis, its heater is supplied from a separate filament winding on the power transformer.

A meter is provided for measuring the 6146 grid current (full-scale 6 ma.) and cathode current (full-scale 150 ma.).

At the recommended input — cathode current about 125 ma. — the power output with the kit we assembled was better than 40 watts (c.w.) on 3.5 and 7 Mc. It decreased somewhat, to 35 watts or so, on 14 and 21 Mc. with the same input, and to about 20 watts on 28 Mc. The rather abrupt drop in output on the latter band appeared due to somewhat low grid drive, and the loading for stabilizing the amplifier became suspect. Shorting out the 68-ohm grid resistor resulted in more than ample drive but, as anticipated, the 6146 oscillated. We found that neutralizing would correct this and the over-all result was 28-Mc. output on a par with the other bands. — *G. G.*

The L-1000-A Linear Amplifier

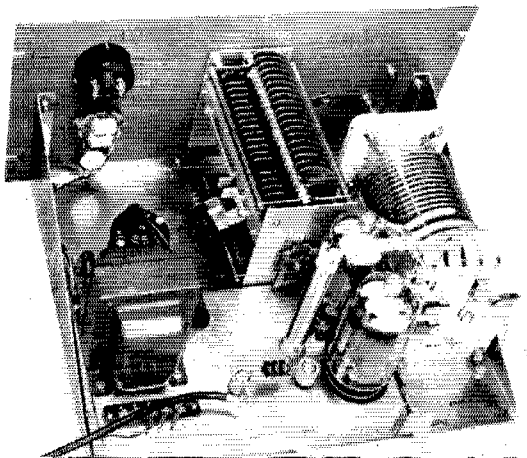
As a great many side banders know, the 813 makes a good high-μ triode when all its grids are tied together to operate as a control grid, and the tube has attained considerable popularity as a grounded-grid linear amplifier. The new Type L-1000-A linear amplifier of Barker and Williamson uses a pair of the tubes operated in this way. The L-1000-A is a band-switching amplifier capable of inputs up to a kilowatt on c.w. or s.s.b. Over-all size is 21 inches wide, 16 inches high, and 15 inches deep — definitely a table-top job.

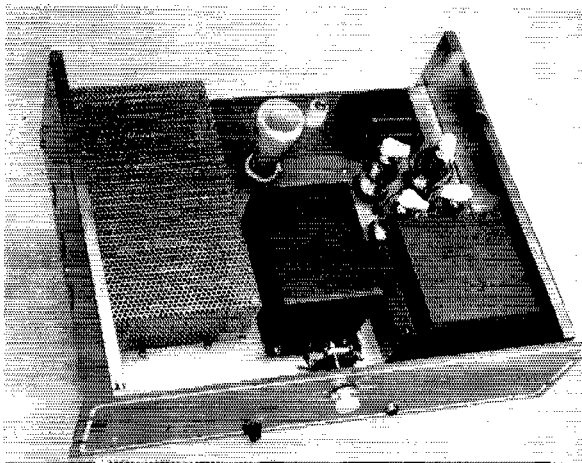
The 813's are operated in parallel, and work into a pi-network tank circuit using the B & W 850 tapped tank inductor. This is tuned by a special tank capacitor having two stator sections: one of relatively low capacitance for ease of tuning on 14, 21 and 28 Mc., and a higher-C section that is switched in to provide the proper L/C ratio on 7 and 3.5 Mc. The switch that does this is ganged with the band switch on the 850. The loading capacitor in the network is a 1500-$\mu\mu$f. variable. The tank has the usual protective choke to give a low-resistance d.c. path from the inner terminal of the output connector to chassis.

The r.f. input circuit is not tuned, since the tubes represent a comparatively low resistance to the driving source and stray reactive effects in the cathode circuit are small enough to be neglected. A short length of coaxial cable between the driver and amplifier provides a satisfactory means of connecting the two. The 813 cathodes are maintained above ground for r.f. by broad-band chokes (T_1 in the circuit diagram, Fig. 1) in the filament-supply leads. A third winding in the choke assembly is used for neutralizing the amplifier — not a critical process, since the neutralizing capacitor, C_N, is simply a small metal pillar mounted on a stand-off insulator between the tubes near enough to the 813 plates to provide a small feed-back capacitance.

A separate winding on the filament transformer is used for a built-in bias supply. This has a selenium rectifier and a resistance-capacitance filter, and a 500-ohm potentiometer is connected across the output of the supply for adjustment of bias.

Left: The r.f. section of the L-1000-A is built on a "pan" formed in one piece with the mounting brackets. The grid-cathode circuits of the 813's are contained in the small chassis in the foreground. The tank-capacitor switch, at the left side of the capacitor in this view, is operated by the arm projecting near the front of the capacitor at the right, when engaged by the arm on the band switch of the type 850 tank inductor. The neutralizing capacitor (C_N in Fig. 1) is the small hexagonal stud between the solenoid plate choke and the tubes. *Right:* The power-supply section. The plate transformer is at the right near the panel. The cage at the left encloses the filter capacitors and bleeders. The heating element is used as series resistor in the plate-transformer primary circuit for reducing power during tune-up.





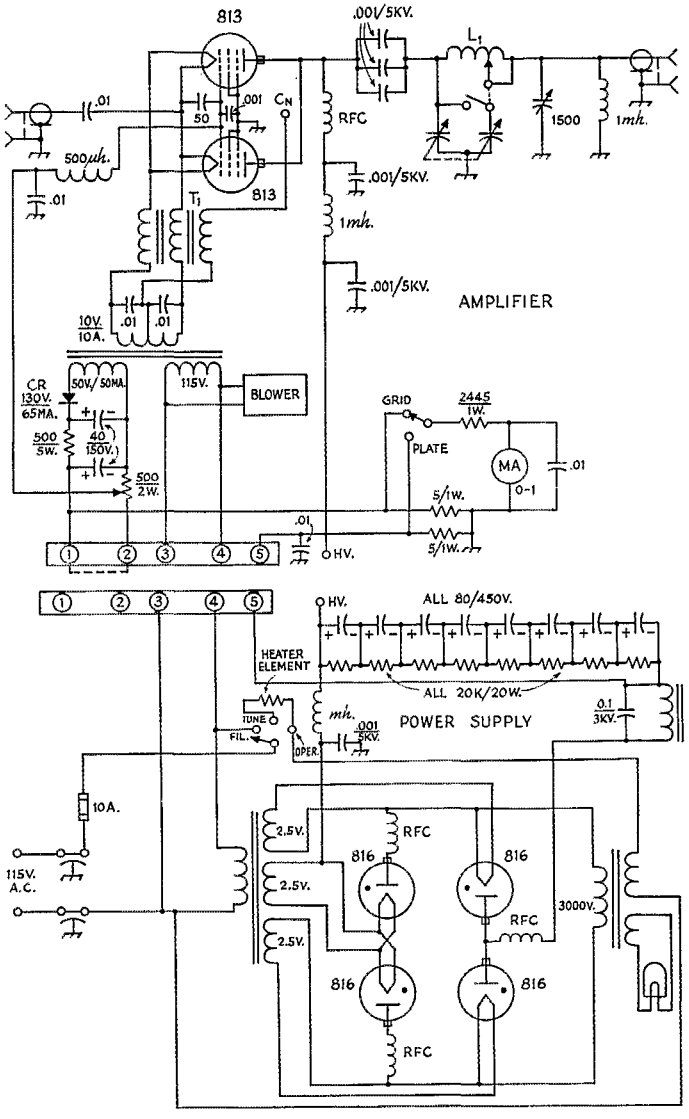


Fig. 1 — Circuit diagram of the L-1000-A linear amplifier. Peak grid-drive requirements run from 50 to 80 watts, depending on frequency. Part of this power is fed through the grounded-grid 813 amplifier to the antenna.

A fan for cooling the tubes goes on automatically when the filaments are switched on.

Power Supply

The plate power supply for the amplifier is a separate assembly, and those who haven't yet got used to the thought of taking advantage of the low duty cycle of s.s.b. (and c.w.) may blink a couple of times at the thought of a kilowatt power supply that fits without crowding behind a 5¼-inch relay-rack panel. (Although there are no figures on this point in the manufacturer's data, it is probable that the supply would be good for 400-500 watts on a continuous-duty basis.) The rectifier is a bridge using 816's, and their output goes to a single-section choke-input filter using a string of eight 80-μf. 450-volt electrolytics in series as the filter capacitor. Each of these has a 20,000-ohm resistor connected across it for dividing the potentials equally and also to serve as a bleeder. The filter choke is tuned to the ripple frequency by the 0.1-μf. capacitor shown in the diagram.

A tuning position is provided on the power-supply control switch so that adjustments can be made without danger of damaging either the tubes or the power-supply components. In this position an electric-heater element is switched in series with the primary of the plate transformer to reduce the output voltage.

The L-1000-A is rated at a peak plate input of 1000 watts on s.s.b. and 875 watts on c.w. Its use for amplitude modulation is not recommended by the manufacturer. We don't quite understand this, except that the power rating has to be comparatively low on a.m. because it is limited by the plate-dissipation ratings of the tubes. In a.m. service the 813's should be good for about 375 watts input and an output in the neighborhood of 125 watts, plus the fed-through output from the driver. The continuous input of 375 watts should not overload the power supply. At any rate, our tests showed that it worked quite well at this input as an a.m. linear, developing about 150 watts carrier output on 75 meters. A 15-watt carrier from the driver gave ample excitation. — *G. G.*

A Tri-Band Quad

Three Beams on One Lightweight Frame

BY JOHN C. POMEROY,* W8TUO

• It was no doubt inevitable that someone would try three quads on one frame. W8TUO did, and has no complaint at all about the results.

WITH GOOD OPENINGS OCCURRING REGULARLY on ten and fifteen meters it is very frustrating for a DX man to have a beam for only 20 meters. This was my situation the last DX contest.

A city lot limits most operators to a single tower and lateral space for only one beam. The three-band quad is an answer, without compromises, for good results on 20, 15 and 10. Using a Viking II with an antenna of this type the writer has had over 400 DX contacts over a three-months period and has worked 75 per cent of all DX stations called.

Originally, a 3-element quad using a director and reflector was constructed but after careful checks and much work it was found that three elements were not worth the extra size and trouble. No more gain was realized by adding the director — in fact, the operation with three elements was erratic — so the quad was cut back to two elements with just the reflector.

* % WILS, 407-11 N. Washington Ave., Lansing, Mich.

[1] Magagna, "A Dual Quad for 15 and 10," *QST*, May, 1956. Leslie, "A Cubical Quad for 20 Meters," *QST*, January, 1955.

Construction

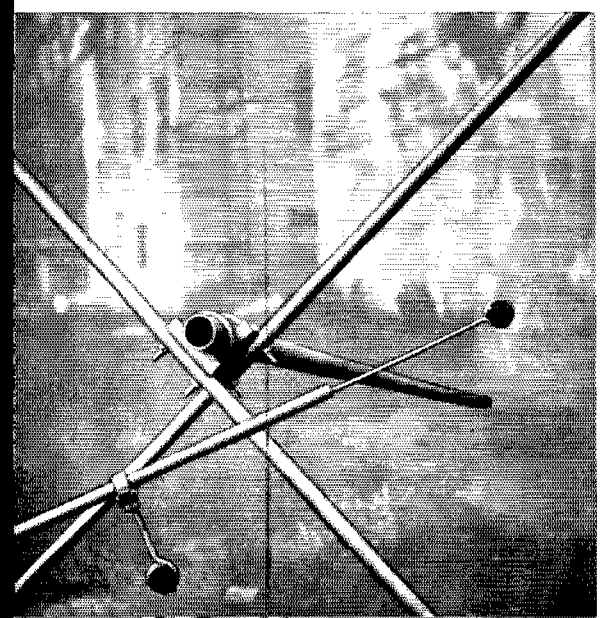
This quad is simple to construct. The frame is made entirely of aluminum tubing in the thought that the appearance would be better than with the bamboo fish poles used in quads described in *QST* recently.[1] The spacing between the elements is 8 feet, corresponding to 0.115 wavelength on 14 Mc., 0.173 wavelength on 21 Mc. and 0.23 wavelength on 28 Mc. The boom is 1¼-inch tempered aluminum tubing.

The struts are made of a 12-foot section of ⅝-inch tempered aluminum tubing with two 6-foot sections of ½-inch tubing telescoped into either end of the 12-foot section. There is an overlap of about 4 inches, giving an over-all strut length of 23 feet, 4 inches. A metal screw is used where the sections overlap, to hold them in place. The struts are attached to the boom with U bolts and saddles.

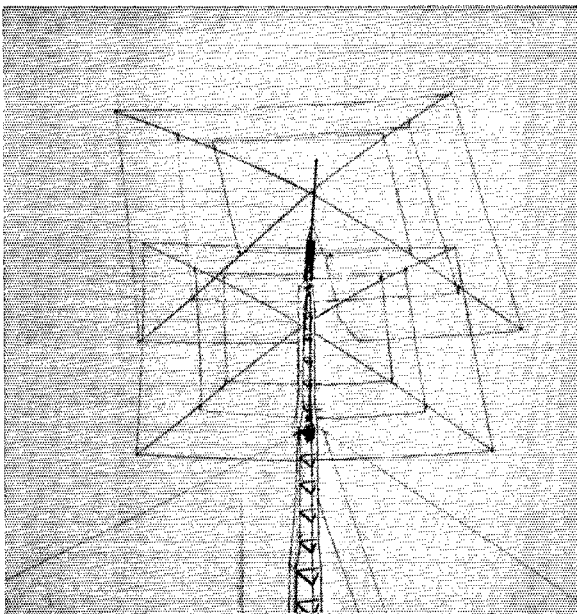
The 20-meter elements are strung at the outer extremities of the struts through television stand-off insulators screwed into wooden-dowel inserts in the ends of the aluminum tubing. Bushings made of Polyethylene cut from coax cable were fitted concentrically and pressed into the television lead-in insulators to make a snug fit for the element wires.

The 15- and 10-meter supports are the threaded type of television lead-in stand-off, attached to the tubing by compression clamps. A small amount of additional separation is obtained by making the ten-meter stand-offs face inward (toward the center of the boom) and the fifteen-

The aluminum struts are fastened to the boom with U-bolts and saddles. This picture also shows the extension piece of one strut with the TV stand-off insulators that hold the quad wires.



A TV-type tower supports the tri-band quad at W8TUO, and TV hardware is used freely in the antenna construction. Metal crosspieces support the wire elements. A separate coax cable is used for each band.



meter insulators face outward. Adding the 10- and 15-meter elements gives more rigidity to the framework, just as the spokes add stiffness to a wheel.

Tuning

The elements should be an electrical quarter wave length on a side at the frequency you use most in each band.[2] The reflectors were made the same size as the driven elements, with 3-foot stubs on all bands. In my case the reflectors were tuned for maximum forward gain while the beam was on the ground. It was found that the gain dropped off sharply when the reflectors were made shorter than optimum but that the drop-off is more gradual when the reflectors are made longer than optimum. It follows, therefore, that it would be desirable to adjust the reflector at the lower-frequency limits of a band and good gain should be achieved over the entire band. It is estimated that forward gains of about 8 db. are obtained on all bands.

Impedance and SWR Measurements

Using an antenna impedance bridge, a half-wave piece of coax was cut for each band. These were attached to the respective driven elements, and the impedance was then measured at the open ends of these coax cables. The cables used were all attached when making measurements, because it was found that when the 20-meter cable was detached the impedance of the 15-meter element changed, while detaching the cables on the 15-meter element changed the standing-wave ratio on 10 and 20 meters.

The impedance as measured by the bridge was 45 ohms on 20 meters and 75 ohms on 10 meters. Distinct nulls were observed in the measurements on these bands. On 15 meters two nulls were observed as the frequency was varied, and the lower-frequency null was selected. The antenna is very broad on 15 meters. The two nulls, with a slight hump in between, along with the broad-band effect are caused by the fact that the struts are nearly resonant at 21 Mc. The measured impedance on 15 meters was 120 ohms.

RG-8/U was used to feed the 20-meter quad and RG-11/U for 10 meters. Originally, some 300-ohm u.h.f. twin-lead that happened to be on hand was used for 15 meters. This has since been replaced with RG-71/U coax, which has a characteristic impedance of 93 ohms.

The standing-wave ratio was measured with the antenna atop the tower in operating position with all of the coax feeders attached. The measurements, shown in Fig. 1, were made with the simple bridge described in the 1955 *Handbook*. The approximate s.w.r. can be determined from the conversion chart in the *Handbook*.

The 15-meter measurements were made with the RG-71/U in use. On this band the aim was to get the lowest s.w.r. in the middle of the c.w. band. However, the s.w.r. is reasonably low at any frequency in any of the three bands.

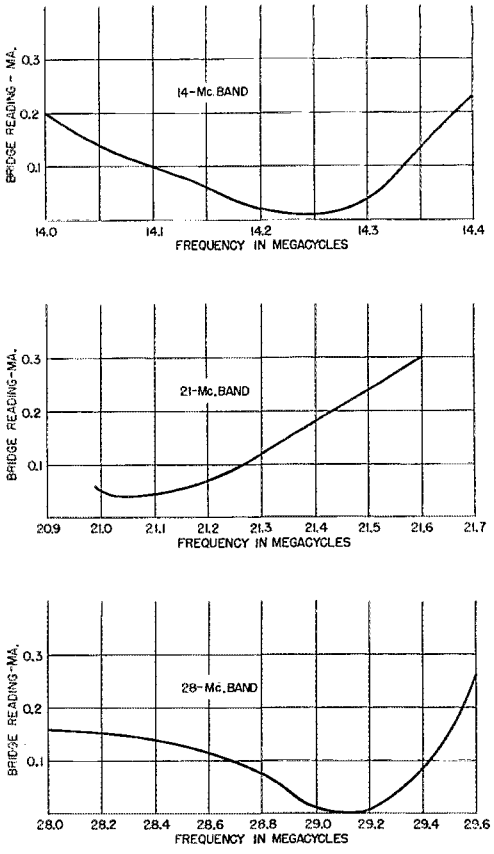


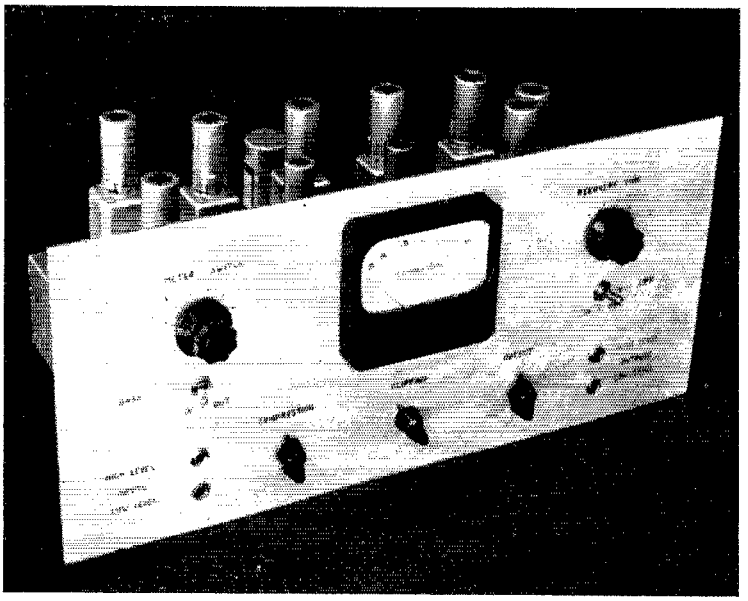
Fig. 1 — **Bridge measurements on the three bands. These are in terms of current in a 0-1 ma. meter used in connection with a resistance-type s.w.r. bridge.**

Conclusion

The beam is rotated by a TV rotator. The struts sway and bow in the wind, but no adverse effects on the signal are apparent. My QTH was on the fringe of the recent Michigan tornado area; high winds with gusts of 70 m.p.h. occurred and the beam withstood all of this punishment. However, I believe that increasing the diameter of the struts slightly would improve the appearance and rigidity.

I am unable to determine which section of the beam performs the best, because it works like a charm on all three bands.

[2] Based on dimensions used by a number of quad owners, the length of one side of the driven element should be about 3 per cent less than a quarter wavelength in space; i.e., length in feet = 238 divided by frequency in megacycles. — *Editor*



The compressor-clipper speech amplifier is built on a 10 × 14 × 3-inch aluminum chassis and has an 8⅜ inch panel. A four-inch meter is used for monitoring the compression. Output of the complete system is 8–9 volts r.m.s. on sine-wave input.

Compression and Clipping

A De Luxe Speech Amplifier for Increasing Modulation Effectiveness

BY JAMES L. TONNE,* W5SUC

• Although adding compression to clipping might seem like carrying coals to Newcastle, the author has some compelling reasons for the combination. A complete speech amplifier circuit is described which will maintain a high average percentage of modulation with minimum distortion.

COUNTLESS DESIGNS for speech amplifiers have been described in the publications available to everyone. Many of them have included some form of automatic gain control. Usually, these a.g.c. systems were lacking in something: they generated distortion, had poor input *vs.* output characteristics, or were subject to severe transient effects, to name a few. And numbers of these designs had clippers in them. Results obtained with clippers were sometimes pretty miserable, primarily because of inadequacies of adjustment.

One characteristic of most of these circuits was that they were oversimplified. This apparently was done with the idea in mind that John Q. Ham was unwilling to go to any lengths at all to get a smoothly-functioning modulator. But take a look for a moment at what John *is* willing to do for his station. He'll think nothing of constructing a 4-tube preselector, a 5-tube transmitter keying and control unit, and perhaps even a 9-tube receiver "tail end." What does he have for a modulator? Three tubes and a Class B stage. Distortion? Plenty! (*The other fellow's receiver will cover that up.*) Splatter? Sure. (*Everybody does that.*) How can he reduce all of this? By backing down on his gain control. (*But then I'll only modulate 100 per cent!*) True, but the trouble is that now his *average* modulation level will be around 30 per cent.

The object of this article is to present a device that will increase the average modulation level tremendously, but will not introduce excessive distortion. The basic idea is that of following a high-quality a.g.c. circuit with a good clipper. The a.g.c. will hold the amount of clipping to a set level, which can actually be zero if desired. The clipper will catch those transients the a.g.c. circuit misses, and can add more voice power. The advantages of both a.g.c. and clipping are realized, and the disadvantages of both are reduced.

Perhaps a little review is in order.

Compression

If a certain amount of gain reduction is used on loud passages of audio, the average modulation level may then be built up and the received signal will sound louder. If more reduction (com-

* Box 803, State College, N. Mex.

pression) is used, the signal will sound even louder. Unfortunately, this procedure can be carried only so far. The background noise will rise, hum may become a problem, and r.f. feedback may occur. It has been found in practice that compression of the order of 20 db. on peaks is about all that can be used ordinarily, although somewhat more can be employed if the entire system is quiet and stable. However, even with very large amounts of compression only a certain amount of apparent increase in loudness may be obtained.

The basic circuits of the most common types of variable-gain amplifiers are shown in Fig. 1. It will be noted that the circuit for the audio version is in push-pull. All amplifiers whose gain is controlled by shifting the grid bias will introduce distortion, most of which is second harmonic. This distortion can be eliminated, for practical purposes, by the use of tuned circuits or by using a push-pull circuit. Of course, tuned circuits are impractical in reasonably wide-band audio work, but the push-pull connection is perfectly satisfactory, cancelling out the even harmonics.

When the gain-reducing bias is applied to the pentode stage, not only does its gain drop, but so does the plate current. As a result, a transient will be generated in the plate circuit. This transient, several times the desired-signal amplitude, will cause a "plop" or thump to carry through the following stages. Hence its name, "thump voltage." Being of high amplitude, the thump must be carefully cancelled out or it will be audible in the final result. This is the second reason for using the push-pull connection.

All amplifiers following the variable-gain stage must be push-pull until the signal arrives at one which uses a center-tapped inductor or transformer for its plate load. It is at this point that the distortion and thump cancel themselves out.

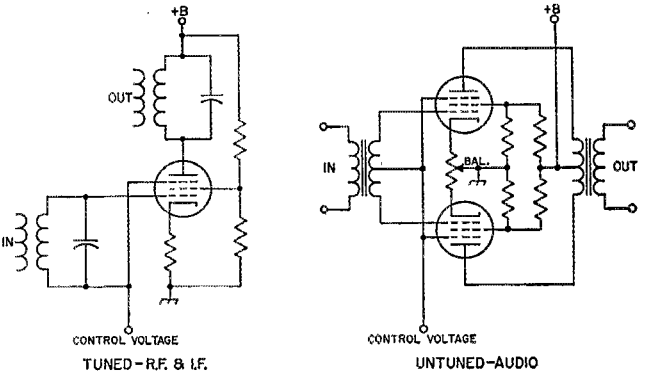
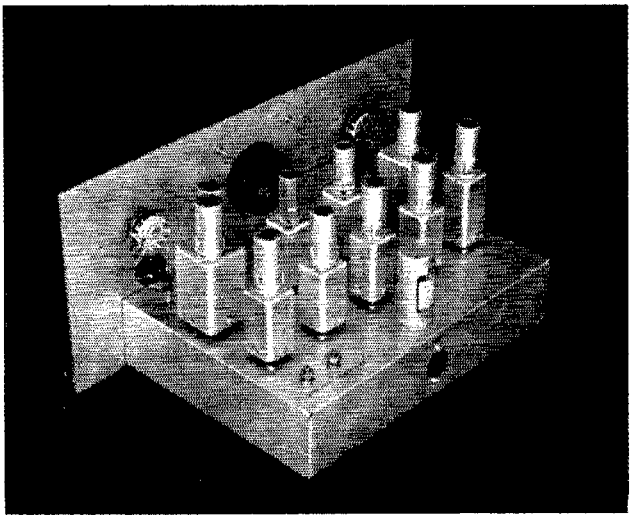


Fig. 1 — Basic circuits of controlled-gain amplifiers. The push-pull arrangement is desirable in audio amplifiers for reasons discussed in the text.

It would appear that the inductor (or transformer) in which cancellation takes place could be *anywhere* after the variable-gain stage. This might even mean that the modulation transformer would do the dirty work. Bear in mind, however, that the thump is always several times the signal amplitude, and that it must be passed without distortion until it is balanced out. If the modulator did the cancellation, its power handling requirements would be increased enormously. So a low-level balance is always used. The inductor may be in the output of the



Each stage is built into a Vector plug-in socket-turret, the 2½ × 1⅜-inch size (B10-M or B10-N) being used for most of the stages. The larger unit at the far upper right is 3 by 2 inches (C10-N) and the two-tube turret at the left of the front row is also 3 by 2 inches (C12-NN). Nonoperating controls — all potentiometers except R_1, R_7 and R_9 — are screwdriver types mounted on the chassis.

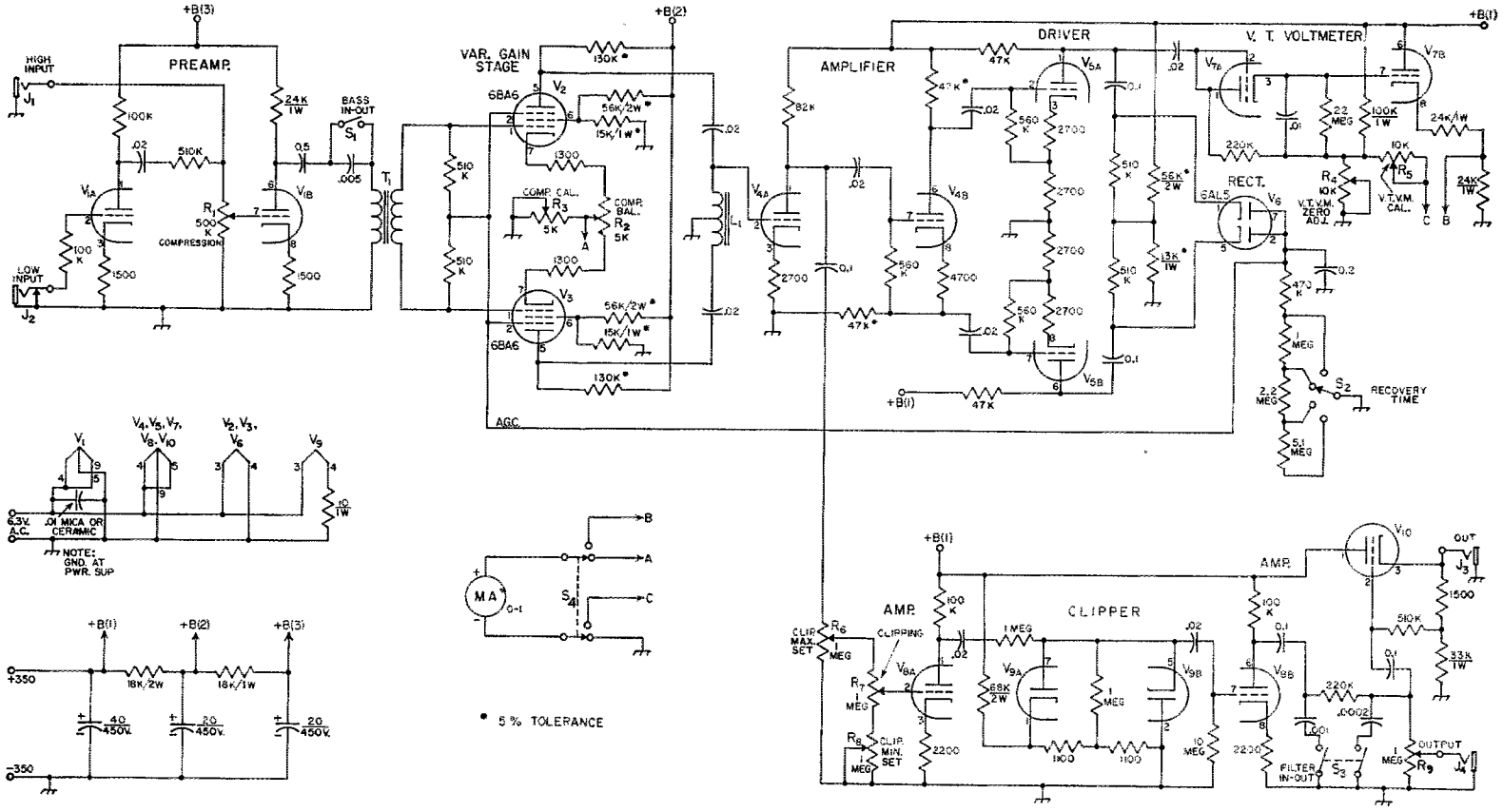


Fig. 2 — Circuit of the complete speech amplifier. Resistors are ½-watt composition, 10% tolerance, except as indicated. All capacitances are in μf. Capacitors with polarization indicated are electrolytic; others are paper except as otherwise specified. Potentiometers except R_1 are linear taper; R_1 is audio taper.

NOTE: In the author's unit V_6 and V_9 are 12AU7's with grid tied to plate in each section to form a diode. The 6AL5's specified should give equivalent results.

J_1, J_3, J_4 — Open-circuit phone jack.
J_2 — Closed-circuit phone jack.
L_1 — 10 h. or more, center-tapped; d.c. ma. approx. 5 (secondary of UTC O-2 p.p. microphone transformer used in unit shown in photographs).
MA — 0-1 d.c. milliammeter.
S_1 — S.p.s.t. toggle.
S_2 — Rotary wafer, 1 pole, 4 positions used.
S_3 — D.p.s.t. toggle.
S_4 — Rotary wafer, 2 pole, 2 positions used.
T_1 — Interstage audio transformer, 2 to 1 step-up (or more). Push-pull type may be used, in which event the two 510K resistors will not be needed. (UTC P-15 used in unit shown in photographs).
V_1 — 12AX7 or 5751.
V_2, V_3 — 6BA6.
V_4 — 12AX7 or 12AT7.
V_5, V_7, V_8 — 12AU7.
V_6, V_9 — 6AL5.
V_{10} — 12AU7 or 12BH7.

variable-gain stage itself, as shown.

The a.g.c. gain-reducing bias is normally negative, and is obtained by means of a rectifier and filter connected to the output of the variable-gain stage. The filter should charge very rapidly since its charge time determines the amount of time required for the compressor to reduce the gain. The necessary gain reduction should take place in the space of only a few cycles of audio. Thus the so-called "attack time" is usually of the order of 1 to 5 milliseconds. There are different opinions as to the length of time that should be allowed to bring the gain back up to normal after a loud passage. If short recovery time is used, then much of the naturalness of the speech will be destroyed. A long recovery time will reduce the effectiveness of the compressor.

Clipping

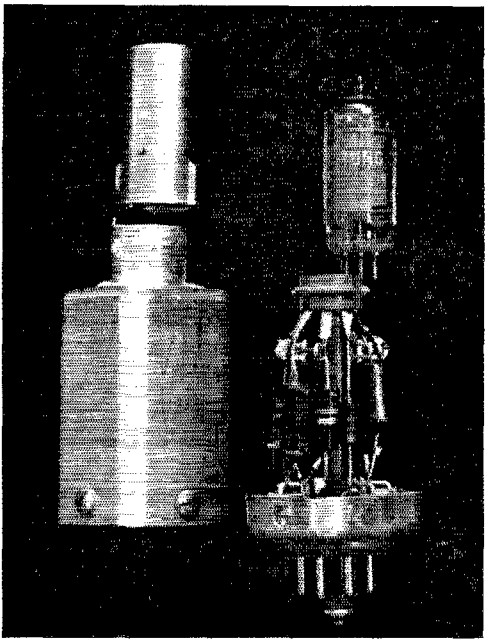
Clipping obtains its advantage by altering the wave form of the audio signal. That is to say, if a voice signal of nearly-constant intensity is fed into a clipper, the clipping will add even more apparent loudness. Additional compression would not do this. However, since the wave form is changed, the signal will not sound as it did originally. With low amounts of clipping, around 3 to 6 db., the only change communications-wise will be an increase in volume and a slight loss of naturalness. At 10 db., distortion will start to become noticeable. At 20 db. or more of clipping, some of the intelligibility is lost. If the clipping is uncontrolled, as it usually is, it may rise to 30 db. or more on peaks, with distortion all out of proportion to the gain in modulation level. At high levels of clipping, the very same problems arise as with a.g.c.: noise, hum and feedback.

An automatic-gain-control system normally will cause very little distortion of the signal that it controls, but a clipper will cause a considerable amount of distortion. If the audio signal has 10 db. of clipping applied to it, it will contain harmonics of appreciable amplitude to at least the twentieth. These will most certainly cause splatter in the same manner as if the rig were being overmodulated. However, if the output of the clipper is fed through a low-pass filter, these spurious signals will be largely suppressed and will cause no harm. Such a filter should have a cut-off frequency of about 3000 c.p.s. It should be stressed that the filter will not remove the distortion; it will only serve to remove the higher-order harmonics.

Whenever clipping is used, the modulation-system requirements are more rigid. If high-level clipping is employed, all of the preceding stages should be clean up to several times the normal signal level. If low-level clipping is used, the low-frequency response following the clipper must be as good as possible — down to 100 c.p.s. or lower if at all practical. If a low-frequency cut is used, it should be ahead of the clipper. Also, distortion in the modulator must be kept at a minimum. The output of the low-pass filter in the clipper will contain no components capable of causing splatter, but if the modulator or modulation system has any nonlinearity, then splatter will result anyway.[1]

Circuit Description

The circuit shown in Fig. 2 employs the principles outlined above. It is the result of about three years of intermittent work, so the bugs have been ironed out and operation is very smooth. Two of the components used in the unit shown in the photographs were obtained on the surplus market and thus may be difficult to duplicate, but substitutions can be made with no really detrimental effect. This particular design illustrates a manner of construction that pro-



One of the plug-in assemblies. Insofar as possible, all components for each stage are mounted inside the turret shield.

[1] Bruene, "Notes on Speech Clipping and Filtering," *QST*, March, 1952.

vides excellent r.f. shielding and makes for good appearance. Simplicity of the chassis wiring can be seen from the photographs.

The first stage is a 12AX7 (or the newer 5751) with the first half, V_{1A}, operating as a high-gain preamplifier. A resistor is in series with the grid lead as an r.f. feedback precautionary measure. The second half, V_{1B}, of this tube is transformer coupled to the push-pull variable-gain stage. Available at this point is a bass rolloff for more effective communications-type frequency response. Do not try to eliminate the transformer and use a phase splitter with capacitive coupling here; the attack time of the compressor will unavoidably be made much longer than permissible and good balance will not be attainable.

The push-pull 6BA6 stage, V_2 and V_3, acts as a variable-gain stage in the manner described earlier, its grid and suppressor bias being shifted to change the gain. The recovery time of the a.g.c. circuit is made variable in steps by using a series of resistors and a switch, S_2. For extended range of control action a relatively well-regulated low-voltage source is used for the 6BA6 screens. Metering of the 6BA6 cathode current provides an indication of compression. The plate load is a center-tapped choke.[2] It feeds a 12AX7 amplifier, V_{4A}, and phase splitter, V_{4B}. The latter goes into a 12AU7 amplifier, V_5, which feeds the 6AL5 rectifier, V_6. The rectifier must have high back resistance, so don't use a germanium diode. It is possible that some of the silicon variety may function properly. The rectifier, operating in conjunction with a delay voltage, provides the gain-reducing bias.

Output from the compressor itself is taken from the stage following the 6BA6's. This drives the first half of a 12AU7, V_{8A}, through a gain control (R_6, R_7 and R_8) which has adjustable minimum and maximum levels. The signal then goes to a 6AL5 double-diode clipper, V_9, and back to the second half of the 12AU7, V_{8B}, for additional amplification. If the diode is operated at reduced heater voltage, as shown, the sharpness of the break in its transfer characteristic will be improved. Do not operate the diode into too low a load resistance. Uneven clipping will surely result, and this is the reason for the large grid resistor in the second half of the 12AU7.

A two-section *RC* filter is available for splatter suppression. This has been found to give adequate attenuation of the harmonics arising from clipping.

Output from the last stage is about 25 volts peak to peak, sufficient to feed the driver for a Class B modulator. The cathode follower, V_{10}, which may be omitted if not needed, will permit feeding a load impedance as low as 5000 ohms.

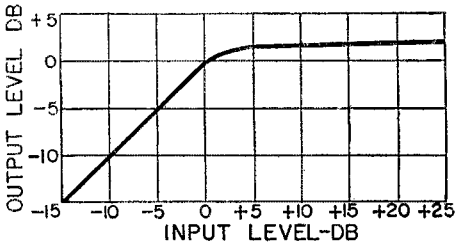
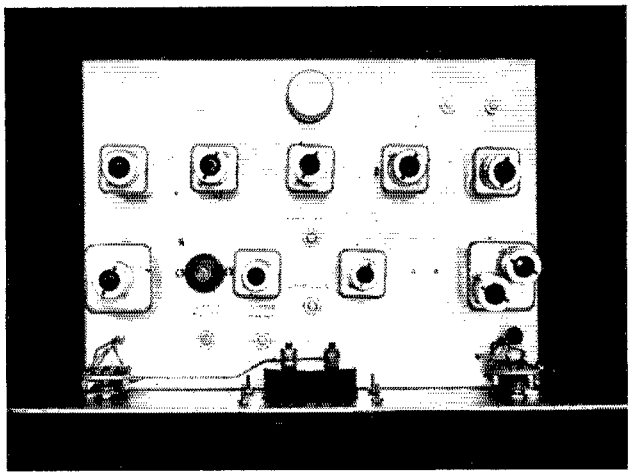


Fig. 3 — **Operating characteristic of the compressor. This curve is for steady-state conditions. Transients exceeding the steady-state level are suppressed in the following clipper stage.**

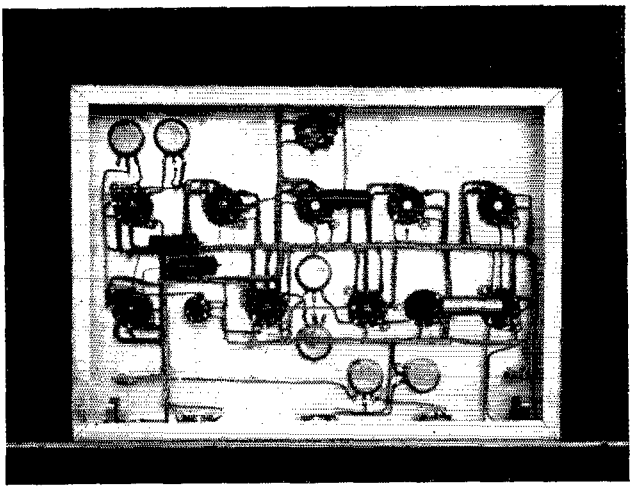
The driver stage, V_5, also feeds a vacuum-tube voltmeter to indicate the compressor output. This is probably more of a nicety than a necessity.

A few words concerning substitutions. In the original model, the audio transformer and choke were of the Ouncer variety. These, among other things, were picked up in surplus and are expensive if obtained new. Fortunately, almost any breed of transformer can be used in these circuits. The frequency response will of course suffer if poor quality transformers are used, but the circuit will still function properly. The inter-

[2] Center-tapped chokes being somewhat rare in the catalogs, a transformer with a center-tapped winding can be used, the other winding being left open. An inexpensive audio transformer should work nicely.



In this plan view, the row of Vector sockets nearest the panel, left to right, are for the following stages: preamplifier, the two variable-gain tubes, and the amplifier/driver. The line-up in the row toward the rear of the chassis is, left to right: clipper, amplifier, cathode-follower output stage, rectifier, and vacuum-tube voltmeter.



Wiring underneath the chassis is mostly for stage-to-stage and power connections.

stage transformer need only have a step-up ratio to provide some gain, and the 6BA6 plate inductor must have a reasonably accurate center-tap. The interstage transformer can have either a resistive center tap, as shown, or an actual tap, but the plate inductor must be tapped.

For a power supply, one putting out 350 volts under the 45-ma. drain of this unit was used. The voltage dividers for the 6BA6 screens should be left as they are with supplies giving moderately different voltages. Likewise, the rectifier

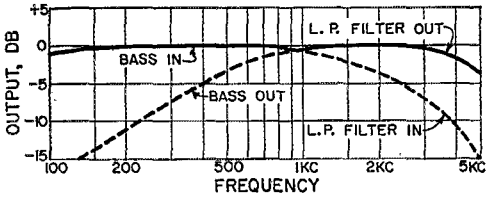


Fig. 4 — Over-all frequency response at maximum and minimum settings of the bass control and with the low-pass filter in and out.

bias has been set up for optimum performance. There are no cathode, screen or bias bypasses anywhere in the unit. These were found to be completely unnecessary. It is worthwhile to put a fairly good meter in the unit, since a poorly-damped one is inviting trouble in the form of a false indication of compression. A tuning-eye tube may be tied across the a.g.c. line instead, but it will be rather hard to calibrate.

Since few people ever duplicate a circuit exactly, there is little sense in giving detailed constructional information. Input and output leads should be kept separated, of course, to prevent feedback. This model did not have any special precautions to reduce hum. It was constructed with the aid of Vector plug-in turret-socket units, one of which is shown in a photograph. They give excellent shielding and provide a most convenient method of mounting small components.

Adjustment

Considering circuit complexity, adjustment is reasonably simple. Connect a 0.02-μf. capacitor from the hot side of the filament line to the a.g.c. bus. Adjust the COMPRESSION BALANCE potentiometer, R_2, for minimum output from the variable-gain stage as observed at the high side of the CLIPPER MAX. SET potentiometer, R_6. Remove the capacitor and adjust the meter shunt, COMPRESSION CALIBRATE, R_3, to give 90 per cent deflection.

To set up the clipper, an audio oscillator should be used. Connect it to the high-level input jack, J_1. Set the compression control, R_1, for 15 db. of compression. An oscilloscope can be used for checking this. With the CLIPPING control, R_7, at maximum and CLIPPER MIN. SET, R_8, at minimum, adjust the CLIPPER MAX. SET control, R_6, to the point where clipping just starts. Turn the CLIPPING control to minimum and adjust the CLIPPER MIN. SET control so that the output is now 25 per cent of the clipping level. Without disturbing CLIPPING, reset CLIPPER MAX. SET so clipping again just begins. Lock all adjustments.

The compressor will now hold the clipping to within a db. or so of the amount represented by the setting of the CLIPPING control. The output level should be set, by means of R_9, to modulate the rig just shy of its modulation capability. Again, a scope should be used for this.

Results

With 15 db. of compression on frequent peaks, and about 5 db. of clipping, the signal transmitted will have sock. Yet the chances are that it will have less distortion and a narrower bandwidth than most other phone signals on the air.

Don't overlook the possibility of using a unit such as this to drive a reactance modulator for more effective f.m. Naturally, side-band rigs can use a gadget like this, too. Modulation systems in general will be enhanced by the addition of a limiting amplifier.

Q Multiplier, S.S.B. Q5-er and SOJ

A Combination for Beating QRM

BY L. M. TEMPLE,* W1DI

• Some people have the urge to try things, and W1DI is a good example. This article is partly an experience story, partly a circuit description, and largely a plea for taking advantage of some or all of the means available today for improving your reception. The results are well worth it, since selectivity is far more effective against QRM than all the griping in the world.

EVER SINCE McLaughlin published his article on selectable side band reception [1] other amateurs have been making notable contributions to the solution of the selectivity problem. Examples are Rand's Q5-er,[2] Goodman's cascaded 50-kc. i.f. amplifiers,[3] and the half-lattice crystal filters described by Morrison,[4] Good[5], Titt [6] and others. The situation today is such that there are available to the ham several means for obtaining high selectivity without too much trouble or expense.

McLaughlin's article on side band switching had so whetted my desire to build a simplified version of his i.f. system that I had obtained surplus 405- and 505-kc. crystals and 50-kc. i.f. transformers before his next article appeared (in April, 1948, *QST*) on "Simple Simon." The surplus transformer had one 50-kc. coil and either a 150-kc. or 200-kc. coil. As they were cheap — 3 for a buck — I bought enough to make up several stages. These transformers were ideal to work with. The two slug-tuned coils are enclosed in powdered-iron covers which fit into recesses in a solid bakelite housing. Turning the tuning slugs all the way in and removing the two retaining screws allowed the assembly to drop out of the shield can. Fig. 1 is a view of one of these i.f. units taken apart.

The capacitor across the 150-kc. coil terminals and the leads from the coil were unsoldered and the retaining spring clips were unlatched, permitting the coil and shield covers to drop out of the recess. Swapping this coil with a 50-kc. coil from one of the other transformers produced one 50-kc. transformer and one 150-kc. transformer. By reducing the shunt capacitance across the 150-kc. coils to 100 $\mu\mu$f. the transformer covered 455 kc. I don't know if these surplus transformers are still around but if not, 50-kc. transformers are available commercially.[7]

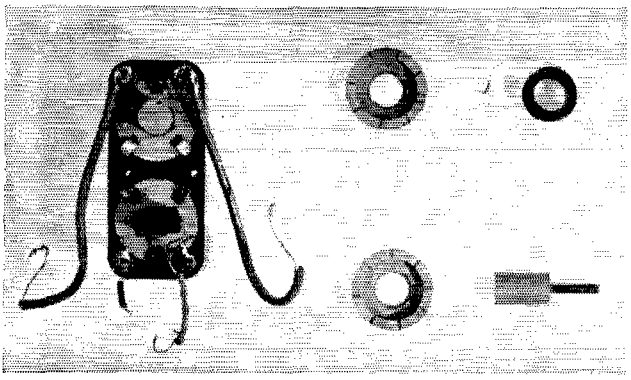


Fig. 1 — View of the surplus i.f. transformer disassembled. These units, originally made up with 50-, 150- and 200-kc. circuits for the Collins "CFI" unit, can be made into 50-kc. transformers by pairing 50-kc. circuits in one shield can. The coupling is just about optimum for good selectivity with the pot cores side by side in the bakelite molding.

Squeezing into the BC-474

Having the most important components for the i.f. system, the next problem was where to put it with respect to the BC-474 transmitter-receiver combination used here. Certainly there was no room in the receiver compartment since it was just about completely filled. The receiver was designed for a dry-battery-pack power supply located in the compartment underneath the front panel. The metal panel for holding the battery pack in place provided the answer as it could be used as the front panel for the new i.f. and the battery compartment was large enough for the assembly if it was designed for the dimensions available. What could be nicer? The battery pack certainly has no place in a QTH with a.c. supply, so the unit would be outboard from the

* 2647 Whitney Ave., Hamden, Conn.

[1] McLaughlin, "Exit Heterodyne QRM," *QST*, October, 1947.

[2] Rand, "The Q5-er," *QST*, December, 1947.

[3] Goodman, "A Sharp I.F. Amplifier for Phone or C.W.," *QST*, December, 1950.

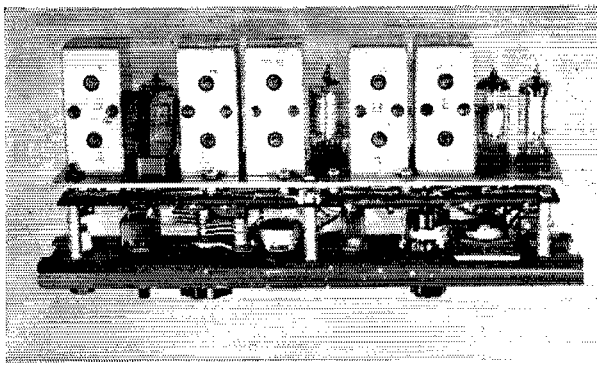
[4] Morrison, "Cascaded Half-Lattice Crystal Filters for Phone and C.W.," *QST*, May, 1954.

[5] Good, "A Crystal Filter for Phone Reception," *QST*, October, 1951.

[6] Titt, "A Dual-Crystal 'Q5-er,' " *QST*, September, 1950.

[7] J. W. Miller Co., Los Angeles, Calif.

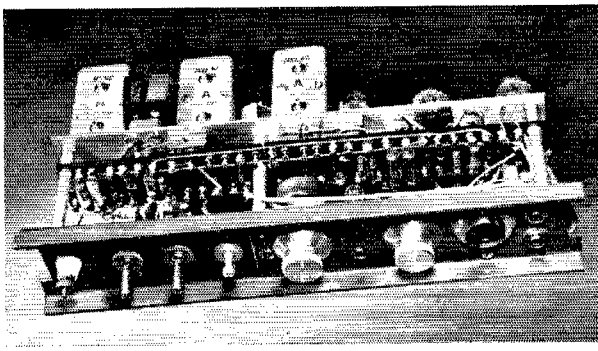
Fig. 2 — The origina model, using dry-battery tubes. Two of the i.f. cans contain rejection traps no longer used, the circuit having been modified to that shown in Fig. 6. The construction fits the battery compartment of the BC-474, but can easily be changed to meet other physical requirements.



receiver but inboard in the cabinet. With a similar-sized (2⅛ × 10 inches) 1/16-inch aluminum subpanel for the tube and crystal sockets and transformers, plus two surplus terminal strips for the resistors and condensers, the unit was built up as shown in Fig. 2.

The first version, with dry-battery tubes, for use with a BC-474 at the summer QTH (no a.c.) had 455-kc. transformer input to the converter tube and 51- and 52-kc. traps in the i.f. stage. The traps could be shorted out by switches on the front panel. The tube line-up is a 1R5 converter, 1T4 i.f., 1S5 detector and 1S4 audio output, overbiased to reduce the plate current. Without the traps the selectivity curve width is 1.6 kc. at 6db.; 3.32 kc. at 20 db.; 5.4 kc. at 40 db., and 6.22 kc. at 60 db. down.

Fig. 3 — This is the first model using a.c. tubes. It includes the Selectoject but not the *Q* multiplier, and uses a 455-kc. input transformer. The modified version is shown in Fig. 4.

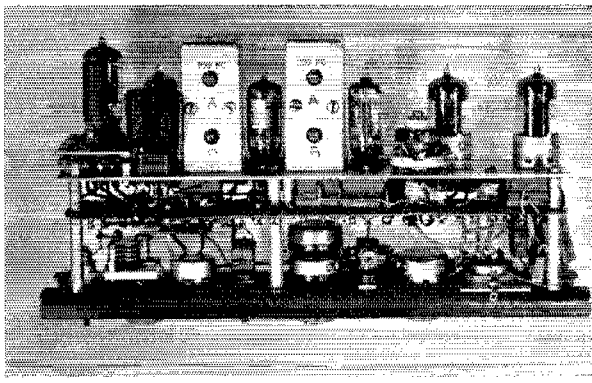


A Second Model

It was not long afterwards that Villard's Selectoject [8] circuit was described in *QST*, and the fact that rejection or boost occurred in the audio-frequency circuit prompted the building of another unit incorporating the SOJ. This is shown in Fig. 3. The parts on the front panel are the input terminal, side band switch, on-off switch, SOJ reject-boost switch, frequency selector, pilot lamp, null control, power supply connector, and phone jacks.

It seemed that I had hardly become accustomed to enjoying the performance of this unit when the *Q* multiplier came along, with particular emphasis on Harris's circuit.[9] The deep null and high *Q* values obtainable from our old friend regeneration constituted a "must" to be incorporated in the McLaughlin unit — but how to do it without rebuilding the whole thing?

Operation with the SOJ had gravitated to its use in the reject circuit more than with the boost circuit, so by removing the boost-reject switch and leaving the wiring for the reject circuit intact, as well as removing the on-off switch (why was it there in the first place, since the power-supply switch turns everything off?) and the 455-kc. input transformer, enough room was left (just barely) for the components of the *Q* multiplier. The *Q*-multiplier tube socket, coil, circuit capacitors and resistors were mounted on a small aluminum panel, bolted to the back



[8] Villard, "The 'Selectoject,'" *QST*, November, 1949.
[9] Harris, "Simplified Q Multiplier," *Electronics*, May, 1951.

Fig. 4 — The Q-multiplier tube and circuit are mounted on a miniature subchassis at the left end of the rear panel. The circuit of this unit is given in Fig. 5. The assembly between the second and third tubes counting from the right is a 50-kc. i.f. trap which, since it contributed nothing significant to the performance of the unit, is not included in Fig. 5.

panel in the space left by the now missing 455-kc. input transformer. Fig. 4 shows how this turned out, and the circuit is given in Fig. 5.

More Changes

Hallicrafters and Collins seem to favor the bridged-T rejection circuit, probably for good reasons. Hallicrafters [10] use it in the 50-kc. i.f. circuit and point out that the *Q* of the coil must not be too high because the rejection notch at this frequency becomes so narrow that it is difficult to control. Used in this manner only the adjustable coil, tuning condenser and circuit components are required — no tube. This is combined with i.f. side band switching. Collins [11] uses a *Q*-multiplier tube and bridged-T following the mechanical filter, the *Q*-multiplier tube being necessary to obtain high *Q* at the 455-kc. intermediate frequency.

In the first (battery-tube) unit described above using i.f. traps a bridged-T circuit was installed by using one of the 50-kc. trap coils. The tuning condenser just did go in the space on the front panel previously occupied by the trap shorting switches. The revised circuit of this unit is shown in Fig. 6. Although at this writing I have not had time to use it on the air, its 40 db. or better rejection of an interfering heterodyne is for sure, based upon listening tests using a BC-221 for the desired signal and a signal generator for the interfering carrier.

Alignment

If you have a 50-kc. generator or test oscillator, alignment is straightforward. If you do not, get some 455-kc. into the front end — from your receiver or BC radio. With the tuning slugs of the i.f. transformers tuned in halfway, start hunting. With a little perseverance you should find the signal and when you do, peak up the i.f.s. Now switch in the other crystal. As pointed out by Goodman,[3] unless you are lucky you will have to do some readjusting due to slight differences of the crystals from the exact values of 405 and 505. Continue adjusting the i.f. transformers with first one crystal and then the other in operation until you have "split the difference"; that is, when you obtain the same i.f. signal frequency output when either crystal is in use.

If you build one of these units to the same dimensions for a BC-474 and use a *Q*-multiplier input, the *Q*-multiplier coil will be detuned when the unit is placed in its compartment because of the metal top and bottom, but one or more adjustments of the coil inductance should put the resonance point in the middle of the tuning capacitor's range. The *Q* of the coil is degraded some but there was no other place for it. This situation was alleviated somewhat here by the use of a powdered-iron sleeve slipped over the

[10] "Recent Equipment," *QST*, December, 1955.
[11] "Recent Equipment," *QST*, April, 1955.

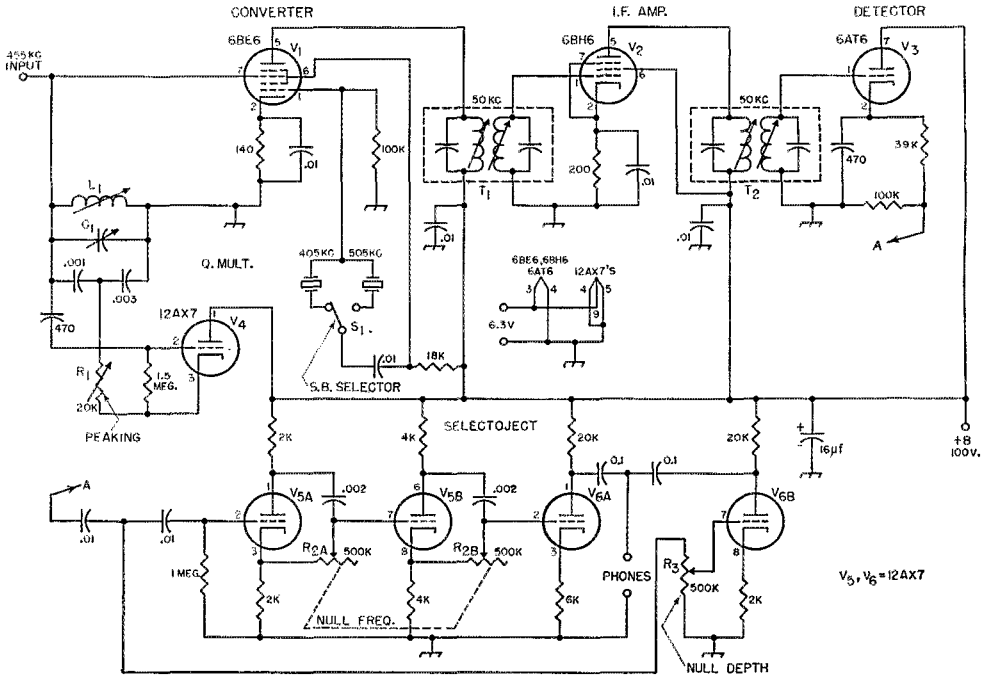


Fig. 5 — Circuit of the a.c.-tube unit, including *Q* multiplier, 50-kc. i.f., and Selectoject. Capacitances below 0.001 µf. are in µµf. Fixed resistors are ½ watt unless specified otherwise.

C_1 — Midget variable, 50 to 100 µµf. max.
L_1 — *Q*-multiplier coil approx. 150 µh; broadcast-type "Loopstick."
R_1 – R_3 inc. — Potentiometers, linear taper.
S_1 — S.p.d.t. toggle.
T_1, T_2 — 50-kc. i.f. transformers (see text).
By-pass capacitors may be ceramic if desired. Mica capacitors should be used in the *Q*-multiplier circuit.

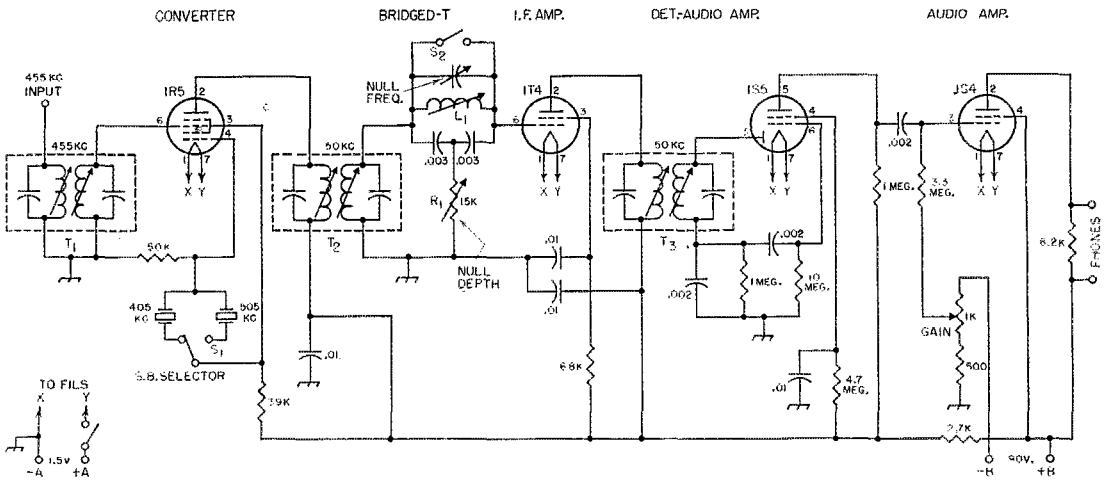


Fig. 6 — The battery-tube circuit, using a bridged-T rejection circuit at 50 kc. Capacitances below 0.001 μf. are in μμf. Fixed resistors are ½ watt unless specified otherwise.

L_1 — 50-kc. coil, slug-tuned, approx. 7 mh. (see text).
R_1, R_2 — Potentiometers, linear taper.
S_1 — S.p.d.t. toggle.
S_2 — S.p.s.t. toggle.
T_1 — 455-kc. interstage transformer (see text).
T_2, T_3 — 50-kc. i.f. transformers (see text).

coil. One other item: the coil and *Q*-multiplier tube should be reversed in position from that shown so that the heat from the tube does not flow up onto the coil.

The 455-kc. input from the receiver is obtained by running a piece of insulated wire from the input terminal of the unit through a hole previously occupied by one of the captive panel-retaining screws and placed near the detector lead from the last i.f. transformer in the receiver. It is secured by a rubber band around the i.f. transformer can. The coupling is weak, but you do not want to overload the 50-kc. unit. Enough 455-kc. signal is obtained this way to bring in a signal with "copiable" strength on the 50-kc. unit when it cannot be heard in the speaker hooked to the regular receiver output.

Operation

The performance of these units is a revelation. In better than nine times out of ten you will hear just one signal in the phones when the output from the speaker (on the "straight" receiver) is a jumble of heterodynes. The *Q*-multiplier is used to boost a signal out in the clear but if an interfering heterodyne gets in, switch to the other side band and retune the *Q*-multiplier. This will usually take the interference out but if it is still there, although at reduced volume, and giving you trouble with copy, tune it out with the SOJ frequency control. Keep the SOJ null-depth control set for maximum rejection at all times. Incidentally, you may feel that the SOJ is not doing its 30-db. rejection stuff, but don't forget it is feeding directly into the phones and is not followed by several db. more audio gain when it is inserted in the audio circuit of a receiver.

As mentioned in the referenced articles, you don't tune the carrier to the center of the pass-band; you put it on one edge so that the carrier and one side band are in the pass-band. Selectable-side-band switching is fast — just as fast as you can move the switch. Other systems require retuning to put the other side band in, with a chance of missing some of the copy.

This dual use of the speaker and phones should satisfy those hams who say that highly selective circuits cause the tuning to be "too sharp." The main receiver circuits are not changed in the least, and normal operation is to use the speaker for your hunting and even when you have a contact. If the signal is in the clear, there is no point in putting on the phones (unless Junior is beating his drum) and you can hear other signals in the background, one of whom might be calling you. After you are in QSO and if QRM is present, put on the phones. If the output from the speaker is giving you acoustic QRM, slip the speaker plug out from making contact; it is never pushed in all the way. You have now pulled the curtain down on all except that strong "key click" neighbor or a nearly-identical carrier frequency.

Other Possibilities

In addition to the above circuits there are half-lattice crystal filters and the very effective Collin's mechanical filter. Altogether they present a glittering array to the ham for astounding improvement in selectivity. The use of any of the circuits, whether it be just a simple 50-kc. Q5-er, *Q*-multiplier, bridged-T, SOJ, or one stage of half-lattice crystal á la Titt or in combination, will result in improved selectivity and better "copiability." The cost of the parts for these va ious devices can be as low as $2.00 for two surplus half-lattice crystals, capacitors and sockets, and $25.00 to $30.00 should cover the parts for a Q5-er and SOJ. If you want to go all out, build Goodman's amplifier with the "stepped"

(Continued on page 124)

A QST-Handbook Rig

Combining Published Designs and Ideas in a Medium-Power C.W. Transmitter

• When Jim Drake, W5DWX, wanted a new homebrew rig he found that most "complete" designs didn't quite meet his own particular specifications. However, he did discover, after a little research, that *QST* and the *Handbook* have described most of the circuits that anyone would care to include in the ideal c.w. transmitter. At this point, he came up with the idea of combining some of the ARRL "recipes." Of course, to the pot, he had to add a good-sized dash of "know-how" and a reasonable pinch of ingenuity, but the finished dish was well worth the effort. The compact 200-watt transmitter illustrated is proof of the pudding that anyone can design his own without working out a whole new set of circuitry. This report is not intended as a complete constructional article, but more in the hope that it will inspire a few more hams to consider cooking up their own gear.

BY COMBINING PARTS OF SEVERAL DESIGNS found in articles in *QST* and in the ARRL *Handbook*, W5DWX has worked up a neat and compact multiband rig that has many features. Running normally at about 200 watts input, it includes a remotely-tuned v.f.o., a convenient system for covering all bands 80 through 10 meters, time-sequence break-in keying and a pi-network output stage using a pair of 6146s. Construction is simplified through the use of prefabricated chassis parts [1] which make it easy to assemble tailor-made shielding compartments. A W3DZZ multiband antenna [2] completes an installation that is hard to beat for convenience.

The Transmitter

A block diagram of the transmitter is shown in Fig. 1. The remotely-tuned v.f.o., section A of the drawing, is almost identical to the one described in the January, 1953 issue of *QST*.[3] A type 6AG7 was substituted for the 5763 because it happened to be on hand, a 0.001-μf. coupling capacitor was added between the plate of the oscillator and the output jack to remove the shock hazard, and 47K grid resistor was split into two sections of 37K and 10K, as required for VR-tube break-in keying.

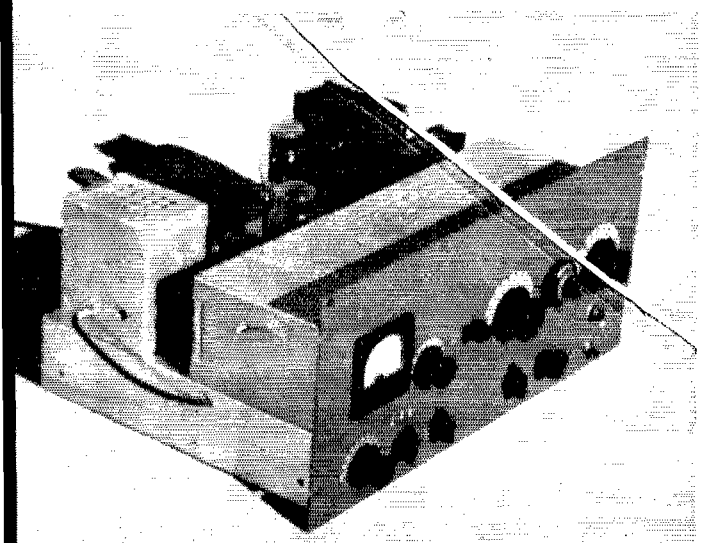
The main part of the transmitter, section B of Fig. 1, is a modified version of a *QST-Handbook* rig originally designed for either fixed-station or mobile work.[4] The buffer-multiplier stage uses most of the parts found in the original crystal oscillator (Fig. 1, page 12, *QST*, October, 1954). The 100K grid resistor is now connected between grid and chassis. C_7, R_7 and the 2.5-mh. cathode choke have been eliminated and a 470-ohm 1-watt resistor, bypassed with a 0.001-μf. disk ceramic, was substituted. Of course, the crystal and the capacitive feed-back divider (3–30-$\mu\mu$f. trimmer and 100-$\mu\mu$f. mica) are not used in the new circuit, and the grid of the tube is connected through a short length of RG-59/U to a phono plug that mates with the output connector of the tube section of the remotely-tuned v.f.o.

[1] SeeZak chassis parts are produced by the U. M. & F. Mfg. Corp. See advertisement on page 112, *QST*, August, 1954 for additional details.

[2] Buchanan, "The Multimatch Antenna System," *QST*, March, 1955.

[3] Mix, "Simple Remote Tuning for the V.F.O.," *QST*, January, 1953. Also recent editions of *The Radio Amateur's Handbook*.

[4] Chambers, "An R.F. Assembly for Mobile or Fixed-Station Work," *QST*, October, 1954. Also "Supplementary Data on the R.F. Assembly for Mobile or Fixed-Station Work," *QST*, February, 1955.



A front view of W5DWX's *QST-Handbook* rig. The transmitter, complete with power supplies fits into an 8¾-inch rack-type cabinet. Controls for buffer-multiplier tuning, buffer-multiplier band switch, meter switch, v.f.o.-c.w. switch, and final plate switch are in line, from left to right, across the bottom of the panel. A pilot-light assembly and the a.c. power switch are located in the lower right-hand corner. The controls for the driver-multiplier tuning, output-capacitor switch, amplifier tank capacitor, amplifier variable inductor and variable loading capacitor are in line in that order to the right of the meter.

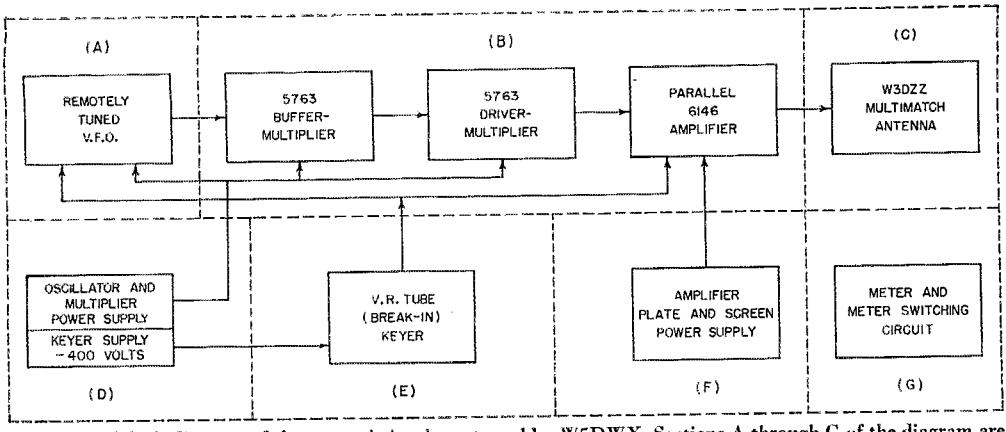


Fig. 1 — **Block diagram of the transmitting layout used by W5DWX. Sections A through G of the diagram are individually treated in the text.**

The plate circuit of the buffer-multiplier is nearly identical to the one used with V_1 for the parallel-6146 model of the r.f. assembly.[5] The circuit appears as Fig. 1, page 15, *QST*, June, 1955. Instability that occurred with the circuit tuned to 7 Mc. was cured by connecting a 10K ½-watt resistor in parallel with the 100-$\mu\mu$f. padder capacitor, C_7.

The driver-multiplier circuit is similar to that used with V_2 of the parallel-6146 job.[5] However, the cathode resistor for the tube (originally 220 ohms) has been increased to 470 ohms.

The circuit of the final amplifier is shown in Fig. 2. The grid side of the circuit is similar to that used with the original transmitter[5] with the exception of the 47-ohm 1-watt resistors that have been inserted to suppress a 90-Mc. parasitic oscillation. Conventional pi-network design (as per ARRL *Handbook*) is used in the plate circuit. S_1 is of the progressively-shorting type. Beginning with position No. 2, each successive position adds a fixed capacitance of 330 $\mu\mu$f. The cathodes of the 6146s are grounded directly, instead of being connected to a key jack as in the previous model of the amplifier, because grid-block keying of the amplifier (plus VR-tube switching of the oscillator) is now employed.

Section C of Fig. 1 represents the antenna used with the transmitter. Details of the antenna were given in a previous *QST* article.[2]

A 300-volt power supply for the multiplier tubes and a negative 400-volt source for the keyer circuit are represented by D of Fig. 1. The positive-output part of the supply is conventional and requires no further description. Fig. 3, however, shows a very simple method of providing minus 400 volts for the keyer circuit. This is obtained through the addition of a type 6 x 5 rectifier and a simple *RC* filter to the 300-volt supply.

The keyer for the transmitter has been described in both *QST* and the *Handbook*.[6] It is identified as block E in Fig. 1. Although Goodman's circuit used a type 6J5 control tube, this one employs a type 6C4 because of its smaller physical size. Furthermore, the plate of the 6C4 is grounded rather than run to positive 100 volts. This last change improved the keying of this particular transmitter.

A straightforward 650-volt supply (F in Fig. 1) is used with the power amplifier. Regulated 150 volts for the screen grids of the 6146s is

[5] Chambers, "Parallel 6146s in the Mobile or Fixed-Station R.F. Assembly," *QST*, June, 1955.
[6] Goodman, "VR Break-In Keying," *QST*, February, 1954.

A rear view of the 200-watt c.w. transmitter. The high-voltage supply is at the left side of the chassis. The dual-purpose supply for the 5763s and the keyer tube is just to the left of the v.f.o. compartment. A fuse holder and a grommet for the a.c. line are mounted on the rear wall of the chassis. In the shielded compartment to the rear of the panel, the roller inductor is flanked by C_1 on the right and C_2 on the left.

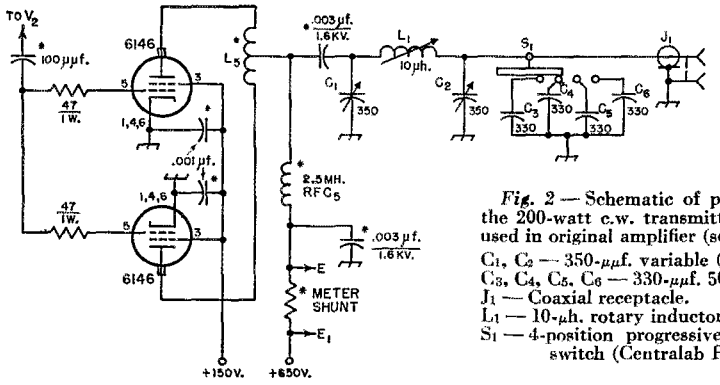


Fig. 2 — Schematic of pi-network output stage for the 200-watt c.w. transmitter. * Indicates components used in original amplifier (see text).

C_1, C_2 — 350-$\mu\mu$f. variable (Johnson 350E20).
C_3, C_4, C_5, C_6 — 330-$\mu\mu$f. 500-volt silver mica.
J_1 — Coaxial receptacle.
L_1 — 10-μh. rotary inductor (Johnson 229-201).
S_1 — 4-position progressively-shorting ceramic rotary switch (Centralab P1S or PA-12 wafer).

obtained by means of a type 0A2 regulator tube, connected in series with a 25K 25-watt slider resistor across the output terminals of the supply.

Plate current for the 5763s (not including the v.f.o. tube) and the 6146s, and grid current of the driver-multiplier and the final, may be checked at will with the aid of a meter-switching circuit (section G of Fig. 1). The meter-switching circuit, including meter shunts, is identical to that used with the "R.F. Assembly." [4,5,6]

Construction

The front and rear views of the transmitter show how W5DWX has combined the various circuits in a single-chassis layout. The panel measures 19 by 8¾ inches and the main chassis measures 17 by 10 by 3 inches. SeeZak [1] chassis parts enclose the tube unit of the remotely-tuned v.f.o. (the tuned circuit for the v.f.o. is in a separate housing) at the upper left-hand corner of the chassis as seen in the front view. The 5763s (buffer and driver) and the 6146s are in the SeeZak compartment at the rear of the panel. A length of coaxial cable is connected between the v.f.o. and the grid of the buffer-amplifier. This cable may be seen at the left side of the photograph.

The rear view of the transmitter shows the power supplies and the keyer components in the foreground to the left of the v.f.o. box. The buffer-multiplier tube is in the lower right-hand corner of the shielded compartment located just to the rear of the panel, and the driver-multiplier tube is next in line to the left. The multiband tuner for the driver plate circuit and the meter are also located in the section occupied by the 5763s. An ordinary tin can — the type used for soup and vegetables — is used as the meter shield.

The 6146s and the pi-network components are mounted in the larger compartment at the upper left-hand corner (rear view) of the chassis. An aluminum partition provides shielding between the driver-multiplier and the final amplifier. The shield is a straight piece of aluminum with lips bent up on all four sides. However, even this part can be purchased ready-made.

[7] "Preventing Radiation from the Transmitter," BCI and TVI Chapter, *The Radio Amateur's Handbook*, recent editions.

The v.f.o. box and the long shielded section are made with SeeZak side rails and panels. The v.f.o. box measures 3 by 4 by 5 inches and is mounted with one of the 3 × 4-inch sides fastened to the main chassis. Side rails measuring 4 by 17 inches are used for the long sides of the large shielded enclosure, and the ends of this section are closed with 4 × 6-inch side rails. These rails are easily fastened to the main chassis with sheet-metal screws. All except the side rail next to the front panel were put on after the mounting and wiring of components had been completed. A perforated cover is used to complete the long shielded compartment.

The bottom side of the chassis (not shown) involves no crowding of parts or other complicated construction. The layout is such that all of the tube sockets (excluding the v.f.o. tube) and the small components associated with

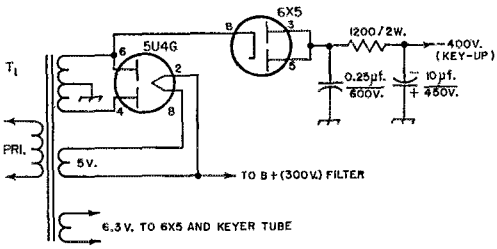


Fig. 3 — Circuit diagram of a negative supply for the *QST-Handbook* transmitter. T_1 and the 5U4G are parts of a conventional 300-volt (positive) supply used with the exciter tubes for the rig.

them, are confined to a relatively small area in the front left-hand corner of the chassis. This makes it easy to shield this area off from the rest of the space underneath the chassis in a simple rectangular box made up of one piece of 3 × 8-inch SeeZak side rail, and one piece of 3 × 6-inch side rail. The chassis walls form the two remaining sides of the enclosure which is covered by a perforated aluminum bottom plate.

To insure a minimum of TVI, the wiring of the transmitter was done in accordance with the practices outlined in *The Radio Amateur's Handbook*.[7]

— *C. V. C.*

THE END of an era came on July 1, 1956, when Radio Arlington — NAA — closed down after 43 years of service. NAA was one of the first modern high power radio stations, and from its 600-foot tower sped many "firsts" in communications. (See the picture on page 9 of this issue.) The first trans-Atlantic radio-telephone conversation in history took place between Radio Arlington and the Eiffel Tower in 1916, and in that same year Radio Arlington worked Radio Honolulu on phone.

The services rendered by Radio Arlington were many. It sent time signals from the Naval Observatory. It sent weather forecasts covering all of the Atlantic Seaboard from Canada to the Caribbean. It sent news broadcasts. In addition, for many years it was *the* station for the transmittal of messages to the Navy's ships at sea.

In cooperation with French scientists, Radio Arlington was used to determine the longitude of two distant geographic points. United States scientists also conducted early important experiments at Radio Arlington. Throughout its existence, Radio Arlington was a pioneer in new and improved methods of communication.

In 1940 the increasing air traffic in the Washington area resulted in the towers at NAA becoming more and more of a hazard to air navigation, and so in 1941 these famous towers were removed to another Navy site. From that time on, NAA's role in Navy Communications was less prominent, and the final decision was that the functions of NAA could best be handled by other facilities.

Deactivation ceremonies were held at Radio Arlington on July 14th. Principal speaker at the occasion was the Director of Naval Communications, RADM H. C. Bruton, W4IH, who discussed the many high lights of Navy Communications during the past 40-odd years. Also participating in the program was Capt. E. W. Taylor, USN, Commanding Officer of the U. S. Naval Communications Station, Washington. On display in the NAA building was radio equipment depicting Navy communications throughout the past 40 years, as well as copies of messages from leaders in the communications industry expressing regret at the passing of NAA. Representing the League and *QST* at the ceremonies was the Managing Editor of *QST*, W1IKE.

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RADM H. C. Bruton, USN
Director of Naval Communications, W4IH

Happenings of the Month

ELECTION NOTICE

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

An election is about to be held in each of the above-mentioned divisions to choose both a director and a vice-director for the 1957–1958 term. These elections constitute an important part of the machinery of self-government of ARRL. They provide the constitutional opportunity for members to put the direction of their association in the hands of representatives of their own choosing. The election procedures are specified in the By-Laws. A copy of the Articles of Association and By-Laws will be mailed to any member upon request.

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

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

We, the undersigned Full Members of the ARRL residing in the ..... Division, hereby nominate ..... of ..... as a candidate for director; and we also nominate ..... of ....., as a candidate for vice-director; from this division for the 1957-1958 term.

(Signatures and addresses)

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

All such petitions must be filed at the headquarters office of the League in West Hartford, Conn., by noon EDST of the 20th day of September, 1956. There is no limit to the number of petitions that may be filed on behalf of a given candidate but no member shall append his signature to more than one petition for the office of director and one petition for the office of vice-director. To be valid, a petition must have the signature of at least ten Full Members in good standing; that is to say, ten or more Full Members must join in executing a single document; a candidate is not nominated by one petition bearing six valid signatures and another bearing four. Petitioners are urged to have an ample number of signatures, since nominators are occasionally found not to be Full Members in good standing. It is not necessary that a petition name candidates both for director and for vice-director but members are urged to interest themselves equally in the two offices.

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

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

Present directors and vice-directors for these divisions are as follows: *Central:* Harry M. Matthews, W9UQT, and George E. Keith, W9QLZ. *Hudson:* George V. Cooke, jr., W2OBU, and Thomas J. Ryan, jr., W2NKD. *New England:* Philip S. Rand, W1DBM, and Clayton C. Gordon, W1HRC. *Northwestern:* R. Rex Roberts, W7CPY, and (no vice-director). *Roanoke:* P. Lanier Anderson, jr., W4MWH, and Theodore P. Mathewson, W4FJ. *Rocky Mountain:* Claude M. Maer, jr., WØIC, and Walter M. Reed, WØWRO. *Southwestern:* Walter R. Joos, W6EKM, and Robert E. Hopper, W6YXU. *West Gulf:* Robert E. Cowan, W5CF, and John F. Shelton, W5MA.

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

For the Board of Directors:

A. L. BUDLONG
Secretary

July 1, 1956

STAFF ANNIVERSARY

The rapid growth of the League in its first postwar year demanded the installation of automatic machine systems to replace handwritten methods in certain of our accounting procedures. We recently had the pleasure, at a June dinner-meeting, of admitting a new member to the ARRL Hq. Ten-Year Club — Charlotte A. Clark,

who joined the staff ten years ago to set up and operate these machine bookkeeping systems. In those ten years, the gross business of the League has doubled; under Charlotte's watchful eyes, the machines have been able to keep up with our

(Continued on page 152)

Correspondence From Members-

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

WELL DONE

United Air Lines
Stapleton Airfield
Denver 7, Colorado

Editor, *QST:*

It will be of interest to you and ARRL that, while United Air Lines was in the process of setting up a communications system for operations incident to our recent unfortunate accident at Grand Canyon, we were contacted by a group of Flagstaff, Arizona, amateurs, who placed their complete facilities at our disposal.

We were most happy to accept their offer until our own gear could be installed and placed in operation. All radio traffic between our Flagstaff communications base and the Grand Canyon airport was handled expeditiously by amateur radio on July 2.

We would like to make special reference to the fine cooperation given us by John Gann, W7HYQ of Flagstaff, who, operating mobile, was able to clear our radio traffic in conjunction with W7KOY, W7OUE, W7LSK, and others.

We wish to thank these hams and amateur radio in general for a fine job well done. This is certainly an example of the outstanding spirit of public service for which ARRL members are noted.

— *J. R. Cunningham*
Director of Communications

JUST AN EXAMPLE

2100 Scott Street
Little Rock, Ark.

Editor, *QST:*

Recently I wrote to the Technical Department of the American Radio Relay League asking if they would refer to their cross-reference and locate the diagram in which a certain transformer was used (I guessed it was a *QST* issue not later than 1945). Back came a letter from Don Mix, W1TS, stating that I was wrong about the date, it being page 54 of *QST* for May, 1940.

This is just another example of how Headquarters is conducting your business. (I work for a big corporation that dotes on being able to produce something from the past post-haste but I never saw them do this good.)

— *Bill Funston, W5JHL*

EASY EXAM

839 Chestnut Street
Indiana, Pennsylvania

Editor, *QST:*

Having held both Second Phone and Technician licenses since 1954 I must take issue with W7WKA rather drastically. For one thing, the commercial exam took me three hours, as compared to about forty-five minutes for the Technician. W7ZFY is absolutely right; we need a General and Technician theory test which can't be memorized the way some lids I know did. I am now seventeen, am neither a "whiz kid" nor an E.E., and am getting tired of hearing people who are afraid advances in radio will push them out, just because they are too lazy to read the *Handbook*.

Incidentally, mentioning the *Handbook*, I find it and the *License Manual* were my main texts in preparing for the Second Phone license and plan to use it for most of my study when I go for First in August. No particular criticism of these two books except that you might include more of the *License Manual's* technical material in the *Handbook*.

Keep up the good work.

— *Peter S. Chamberlain, W3VWN*

KEEN ON KEYING

315 Welch Ave.
Ames, Iowa

Editor, *QST:*

I would like to congratulate W1DX for his excellent article on transmitter keying (p. 27, July *QST*). More articles such as Mr. Goodman's on the basic yet finer points of amateur radio would be a help to all hams. The great majority of us are in the learning stage. It is of no avail to tell us don't do this and don't do that; either by FCC rulings or more experienced amateur's remarks. To learn we must be shown.

— *David G. Parker, W9QVU*

75 Kendall Ave.
Framingham, Mass.

Editor, *QST:*

Congratulations to Byron Goodman, W1DX, for writing such an informative article. . . . With the wealth of information contained in this article it would certainly behoove every man to thoroughly digest it. . . .

— *Gordon E. Hopper, W1MEG*

THE LIGHT THAT FAILED

641 South Friends Ave.
Whittier, Calif.

Editor, *QST:*

In the Technical Correspondence in July *QST*, (p. 34) I came upon the letter about phone QRM, from W6PNW. The writer states that, "s.s.b. effectively creates more interference and splatter than several a.m. stations as a general rule. (*QST* editors do not accept this statement.)"

Brother, you spend a few days in my shack and I'll prove to you that, in this area, W6PNW stated the situation very truthfully. I'll show you that a non-splattering s.s.b. signal is as easy to find as is a genuine diamond at a dime-store jewelry counter. That s.s.b. stinks!

— *Hubert Sherman, W6LEC*

726 Valley Street
Orange, New Jersey

Editor, *QST:*

I'd like to add that although the statement is not accepted by *QST* Editors, quite a sizeable number of amateurs including myself and my three receivers, do think along that line. When s.s.b. came into vogue, I naturally began to curse it along with all my other a.m. friends. Then, applying the old adage " 'Tis better to light a candle than to curse the darkness", I bought up all the literature available on s.s.b., including the ARRL manual, *Single Sideband for the Radio Amateur*. The knowledge thus gained has been helpful and has cultivated personal interest in s.s.b., but I'm sorry to say that the cursing continues!

— *Paul B. Boivin, Jr., K2SKK*

FRIENDLY ASSIST

20 Grosvenor Square
London, W.1.

Editor, *QST:*

During the six months that I have been stationed in Great Britain, it has been my pleasure to meet a number of Gs and to enjoy their hospitality. In keeping posted on local amateur events I have had the occasion to scan their "RSGB Bulletin" (the British *QST*) and found much of its contents of lively interest, particularly its technical articles, DX and v.h.f. notes, contest information and the advertising describing equipment available in Great Britain.

(*Continued on page 152*)

V.H.F. QSO Party

September 15th–16th

An ARRL V.H.F. QSO Party, open to amateurs who can work any band or bands above 50 Mc., will be held from 2:00 P.M. Local Standard Time, Saturday, Sept. 15th, to 11:00 P.M. Local Standard Time, Sunday, Sept. 16th.

Call "CQ Contest" or "CQ V.H.F. QSO Party" to get in touch with other contestants. During contact, operators must exchange names of their ARRL sections for full credit. It's also wise to swap signal reports, although this is not required by the rules.

A certificate will be awarded to the top scorer in each ARRL section. In addition, a certificate will go to the high-scoring Novice, Technician, and multioperator station in each section from which three or more valid entries in these three special categories are received.

Submit your results as soon as the competition is over. A simple tabulation of stations and sections worked, as shown on page 60 of June, 1953, *QST*, is all that is required. Convenient reporting forms are now available from ARRL.

Rules

1) The contest starts at 2:00 P.M. Local Standard Time, Saturday, Sept. 15th, and ends at 11:00 P.M. Local Standard Time, Sunday, Sept. 16th. All claimed contacts must fall within this period and must be on authorized amateur frequencies above 50 Mc., using permitted modes of operation.

2) Name-of-section exchanges must be acknowledged by both operators before either may claim contact point(s). A one-way exchange, confirmed, does not count; there is no fractional breakdown of the 1-, 2- or 3-point units.

3) Fixed-, portable- or mobile-station operation *under one call*, from one location only, is permitted. A transmitter used to contact one or more stations may not be used subsequently under more than one other call during the contest period.

4) Scoring: *1 point* for completed two-way section exchanges on 50 or 144 Mc.; *2 points* for such exchanges on 220 or 420 Mc.; *3 points* for such exchanges on the higher v.h.f. bands. The sum of these points will be multiplied by the number of *different* ARRL sections worked per band; i.e., those with which at least one point has been earned. Reworking sections on additional bands for extra section credits is permitted. Cross-band work does not count. Contacts with aircraft mobile stations cannot be counted for section multipliers.

5) A contact *per band* may be counted for each station worked. Example: W2TBD (S.N.J.) works W1DBM (Conn.) on 50, 144 and 220 Mc. for complete exchanges. This gives W2TBD 4 points (1 + 1 + 2) and also 3 section-multiplier credits. (If W2TBD contacts other Connecticut stations on these bands, they do not add to his section multiplier but they do pay off in additional contact points.)

6) Each section multiplier requires completed exchanges with *at least* one station. The same section can provide another multiplier point only when contacted on a new v.h.f. band.

7) Awards: A certificate will be awarded to the high-scoring single-operator station in each ARRL section. In addition, the high-scoring multiple-operator station will receive a certificate in each section from which three or more valid multiple-operator entries are received. Certificates will also be given to the top Novice and Technician in each section where three or more such licensees submit logs. Award Committee decisions will be final.

8) Reports must be postmarked no later than October 3, 1956, to be eligible for awards. See the box on page 60, June, 1953, *QST*, for correct form, or a message to Headquarters will bring a lithographed blank for your contest report.

W/VE Contest

September 29th–30th

The annual W/VE Contest, sponsored by the Montreal Amateur Radio Club, is scheduled from 6 P.M. EST, Sept. 29th, to 11:59 P.M. EST, Sept. 30th. The rules are the same as those of last year. Amateurs in the U. S. A. will try to trade contest exchanges with as many Canadians in as many provinces and territories as possible; VE/VO stations will search for amateurs in the ARRL sections in the U. S. A. A sample message, as originated by a W6 in Los Angeles section, might appear as follows: NR 1 W6XXX 579 LA. VE2BB, MARC contest chairman, urges participants to read the rules carefully and maintain neat logs so that the results can be presented quickly and accurately.

Rules

1) Any station located in any ARRL section as listed in *QST* (page 6) is eligible to enter.

2) All contacts must be made during the contest period from 6:00 P.M. EST, Sept. 29th, to 11:59 P.M. EST, Sept. 30th, with a total of no more than 20 hours operating time for each entry. Times on and off the air must be clearly shown in the contest log.

3) Exchanges such as the following must be exchanged and be fully recorded in the log entered: (1) number of contact; (2) your call; (3) RST report given; (4) ARRL section. *Example:* NR 1 WØZZZ 579 Kansas.

4) One point may be counted for each exchange sent and acknowledged. One point may be counted for each exchange received. For contest credit a station may be worked once on 'phone and once on c.w. on each band. VE/VO stations will multiply the total points by the number of U.S.A. ARRL sections worked. W/K stations will multiply the total points by the number of VE areas worked and also by 7.11, there being nine Canadian areas (VE1 through 8 plus VO).

A station using a power input of 30 watts or less will receive an additional multiplier of 2, and a station using from 30 watts to 100 watts will receive one of 1.5. The final score consists of "total points" multiplied by "sections" (times 7.11 in case of W/K stations) multiplied by the "power multiplier."

5) Each entry must be accompanied by the following declaration: "I hereby state that my station was operated strictly in accordance with the rules of the contest and governmental radio regulations, and I agree that the decision of the Contest Committee of the Montreal Amateur Radio Club, Inc., shall be final in all cases of dispute."

6) All entries shall be sent to Gordy Webster, VE2BB, 69 Pine Beach, Dorval, Quebec, Canada, and must be postmarked not later than midnight October 18, 1956.

Silent Keys

IT IS WITH DEEP REGRET that we record the passing of these amateurs:

W2QJH, James R. Holley, New Hartford, N. Y.
W4ALV, Lytelle H. Duggan, Birmingham, Ala.
W4DUW, Warren N. Call, North Miami, Fla.
W4GPX, Walter H. Wooten, Greenville, S. C.
W5AKZ, Dr. John T. Porter, Baytown, Texas
W9EAZ, William H. Vallette, Wheaton, Ill.
W9GHX, Raymond W. Myers, Chicago, Ill.
W9PDU, Abe Krassner, Chicago, Ill.
WØTIA, Dr. Arthur R. Bryant, Beatrice, Nebr.
WØTWX, Carroll R. Preiss, Iowa City, Iowa
WØWDS, G. Howard Abernathy, Batavia, Iowa
VE3BMG, William F. White, Hamilton, Ont., Canada

Strays

Thanks to our South African contemporary, *Radio ZS*, for this gem. Author unknown.

FINAL KICK

Full-gallon McGhee was having trouble with his rig, so invited Key-click Mouton over for a short sesh of trouble-shooting, complete with RF as deemed appropriate. Key-click allowed as there were some matters requiring his attention at home, but being naturally more than somewhat interested in ham-radio, also allowed as they could wait.

Therefore, over he comes and they get stuck into Full-gallon's rig, which is now considerably confused. The window of Full-gallon's shack overlooks the local Main Road, and while Key-click is giving out with a test call subsequent to sorting things out, a hearse passes by, followed by various cars, whereupon Key-click says piously:

"QRX OM'S, will continue call later."

Thereupon he rises and stands solemnly, head bowed, facing towards said cortege while it passes.

Hereafter he repositions himself in front of the rig, but before he partakes of any activity, Full-gallon makes speech, and states as follows:

"Key-click," he says, "that was most mannerly. In all my experience with hams, which has extended over quite some period of time, I have never yet encountered such courtesy. Pray accept my hearty felicitations."

" 'Twas no more than natural," replies Key-click, throwing the big switch, and casting a critical eye over the various meters while waiting for the 813's to warm up. "After all, we were married for nigh on twenty years. CQ CQ CQ . . ."

Once again amateurs performed an invaluable public service in an attempt to save the life of a two-year-old boy suffering from hemophilia, an affliction which prevents the clotting of blood. Jean Luc-Poll, of Leopoldville, Belgian Congo, was bleeding from the nose and was being kept alive only by continuous transfusions. His doctor knew that the drug parenogen could stop the bleeding, but he could not locate any in Europe or Africa. OQ5BI got on the air and raised W2PFL, Staten Island, N. Y., at 3:00 P.M., July 14. Through the coöperation of the New York *Daily News*, Cutter Laboratories, Seaview Hospital, Fulton Surgical Co., Civil Defense officials and Pan American Airways, the drug was located and dispatched by the first plane, less than 24 hours after word was received. An interesting footnote: "reading the mail" during the OQ5BI-W2PFL QSO was Capt. Kurt Carlsen, W2ZXM, who had stayed aboard the damaged Flying Enterprise alone for two weeks in 1952 until it finally went down off the English coast. After the emergency traffic was ended, he called in his congratulations from the Flying Enterprise II, near the Azores.

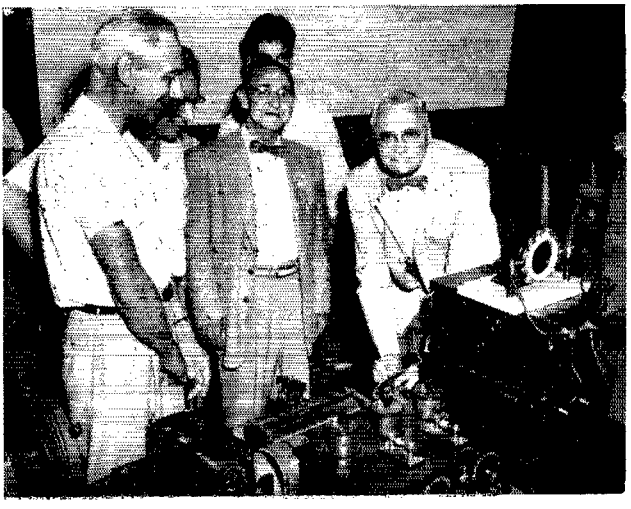
—•••—

Andy Devine, honorary mayor of Van Nuys, Calif., proclaimed the week preceding ARRL Field Day as Amateur Radio Week in Van Nuys, and called upon his constituents "to honor the amateur radio operators who willingly contribute their time and efforts to maintain communications in time of disaster or other emergencies.

—•••—

G8RY reports that the rotary inductor of unknown origin which was used in the 4-65A transmitter by W8ETU (p. 14, October 1955 *QST*) has an inductance of approximately 32 μh, and can be obtained from a U. S. Navy transmitter type TBW. From *surplus* TBWs, that is!

♦



The *South Jersey Radio Association*, which was 40 years old on June 16, lays claim to being the oldest radio club in the States still meeting regularly. Here we see W2UG and W2VX watching W2BQ as he creates some ozone with his original spark transmitter.

♦

Results, 22nd ARRL DX Contest

"TEN IS OPEN," was the cry! For the first time since ARRL's 1950 Contest, the m.u.f. was high enough to favor east-west work. Back with a bang were West Coast-to-Europe QSOs, and hams east of the Rockies found themselves raising Oceania and Asia again. A peek at some of the chubbier c.w. logs reveals W3DGM/3 with 63 countries, while W1ICP, W2HJR, W3BVN, W3LOE, W3MSK, W4BGO, W4CEN, W4KVX, W9AVJ and W9LNM bagged from 50 to 57 on rejuvenated 28 Mc. . . . Multipler-conscious DXers have long cast a wary eye at 11-meter reaches, especially when 28 Mc. is open, and the practice finally paid off. Wonder of wonders, sandwiched in between the diathermies were KG6, KH6, VK, ZL, CE, CX, HK, LU, PY, ZP and many North American prefixes . . . Born during the 1953 Test, 15 meters has improved until it is now a major score factor. With Europe and Africa especially catchable, few could cop a 1956 section award unless some operating time was spent here . . . A 24-hour band again, 14 Mc. became a gold mine where a little digging unearthed rare nuggets. It was capable of producing husky signals from almost anywhere for such long stretches that beam-equipped contestants scarcely knew which way to turn. Some 20-c.w. countries-worked totals: W6MUR and W6RW 118, W4CEN and W6DFY 114, W2AGW 113, W3LOE 112, W4KVX 107, W3JTC W3JTK and W6AM 106, W2WZ and W5ASG 105, W3MSK 103, W6GAL/7 101. No question about it — twenty is still *the* band . . . Forty was plied by all from dusk to dawn, but, with rising sunspot numbers, 80- and 160-meter activity understandably sagged.

Entries climbed 32.6 per cent, marking six straight years of increases, with 1647 logs (1162 c.w., 485 phone) received. Scores, of course, spiraled similarly with new records established in every quarter. Figure 1 tells the story in a nutshell.

One's first reaction upon review of the tabulations may be "Think I'll pack up and move to the East Coast," but closer inspection reveals that tremendous results filtered in from every nook and cranny in the U. S., Canada and world. Remember, it doesn't matter a smidgen how well you did nationally or internationally just so long as you whipped the locals — that is, those vying with you on the same mode in your country, ARRL section or club. In accordance with the rules, Certificates of Performance are being shipped to 336 experts in one-upmanship in these categories of competition:

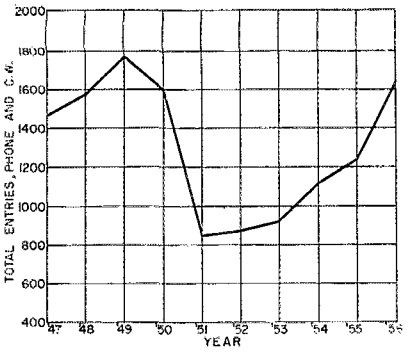
	c.w.	*phone*
Single-operator, W/VE	69	65
Multioperator, W/VE	2	1
Single-operator, non-W/VE	94	64
Multioperator, non-W/VE	1	0
Club	29	11

On the debit side, disqualifications of those caught off-frequency jumped alarmingly. Aside from moral considerations, it's a shame that some allow one slip of the wrist v.f.o.-wise to careen a beautiful score down the drain. An almost amusing case in point: the VQ4 on 7001 kc. who drifted downward and, in Pied Piper fashion, lured the entire pile-up outside the edge. We're not pushing the "panic button,"

The Midwest was getting in resounding licks as evidenced by W9FJB's 465,908 A-1 score, 13th nationally and top W9. Excited by a 32V-2 or a 20-A, the 4-1000 linear amplifier radiated nobly thanks to 5- and 3-element rotaries.

♦

Juan Lobo y Lobo has probably established more firsts in ARRL DX contests than anyone. He was an enthusiastic regular under the calls XE1A, XF1A or XE2N from the thirties until 1950. *Hors de combat* for a spell, XE1A had feared he was "rusty," an opinion not shared by DXers who copied his precision fist on 7 bands in the 1956 affair. Final score: a walloping 949,344 points. Welcome back, Juan!



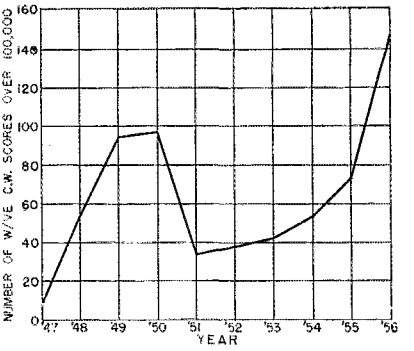


Fig. 1 — Up go entries and scores in recent ARRL International DX Competitions! These curves bear a striking resemblance to sunspot-number curves.

gang. Everyone makes mistakes, but let's watch our P's and Q's, eh?

C.W. Highlights

Fifteen Stateside brass pounders surpassed the previous one-man record of 443,538 points set by W3BES at W2SAI in 1955. New Top Banana, after some fancy broken-field running through the QRM maze, is W3DGM/3 with a colossal 771,520 points, 804 contacts, 320 multiplier. Others who joined in the record-smashing sport: W3LOE 752,247, W4CEN 699,377, W4KVX 691,887, W3MSK 691,014, W2WZ 682,956, W3BVN 681,090, W2HJR 661,262, W3JTK 629,748, W6AM 581,940, W3EIV 487,-613, W6GAL/7 485,121, W9FJB 465,908, W8FGX 458,052, W4OM 456,120.

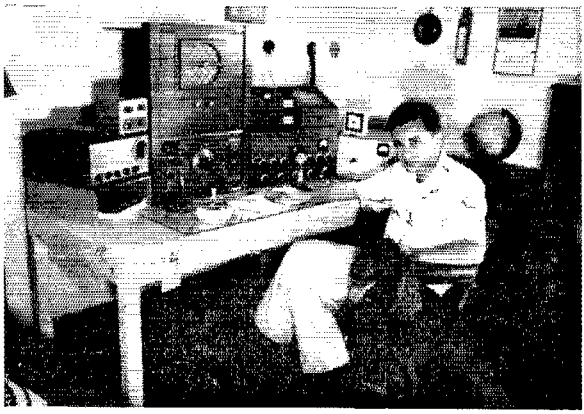
At the second plateau between 450 and 300K were: W3GHS 440,832, W6TT 420,240, W6ITA 416,079, W4KFC 404,190, W9LNM 389,277, W9HUZ 371,952, W9APY/5 351,900, W2AIW 350,460, W3HEC 343,824, W6BPD 326,268, W1BIH 313,110, W1AXA 311,022, W4UXI 306,450, W4DQH 306,230. Turn to the section listings for the *101* remaining single-operators ranking over 100,000. As he is wont to do, VE4RO led Canada with 225,990, while VE2YA's 123,662-pointer confirmed the fact that the boys up north were getting substantial hunks of the DX.

Best solo performances by licensing areas:

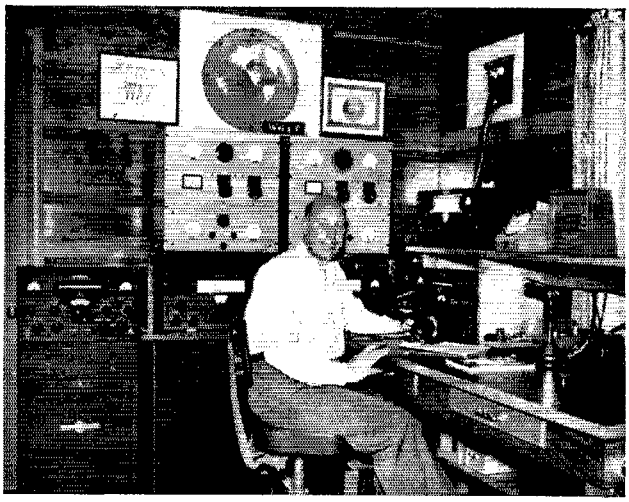
W1BIH	313,110	VE1ZZ	50,049
W2WZ	682,956	VE2YA	123,662
W3DGM/3	771,520	VE3IR	25,200
W4CEN	699,377	VE4RO	225,990
W9APY/5	351,900	VE5VL	11,800
W6AM	581,940	VE6NX	25,110
W6GAL/7	485,121	VE7EH	2520
W8FGX	458,052	VE8WN	39,270
W9FJB	465,908	VO6U	11,016
WØDAE	209,433		

Because they vividly reflect what can be accomplished when an efficient equipment setup is rendered active around the clock, multi-operator scores furnish intriguing study material. W6RW's record 791,460 points, 805 QSOs, 328 multiplier, 129 countries, came about via the sweat and toil of seven tireless Southern California DX Club members. A second Los Angeles team manned W6DFY to the tune of 781,860 points, only a hair off the pace. Other notable several-operator totals: W9AVJ 428,796, W3GHM 423,612, W4KXV 369,255, W6GTI 355,716, W1ICP 336,384, W3KT 237,402, WØRSL 215,985.

With all the r.f. being squirted at them, one might ponder the fate of those outside W/VE. To our knowledge, there were no casualties, no broken bones, not even one punctured eardrum. Indeed, our DX friends relished the fray as much as we did.



Head and shoulders above the foreign radiotelephones was the 441,618-pointer of TG9AD, shown with his furry assistant. A Viking II percolated while the HRO-60. Select-o-ject and Panadaptor handled the reception. Guatemala has been a rarity lately and we hope Bob returns — with bells on — in the 1957 shindig.



Brasspounder W6TT grabbed second-high Sixland score and both Northern California DX Club and East Bay section wallpapers with this business-like lash-up. The 310-Bs pushed three p.p. 4-250A finals (two shown), and a KWS-1 was also available. Elvin does not dilly-dally between Tests — he's on the DXCC Honor Roll with 253 confirmed.

♦

In Africa, for example, an 812 final at 200 watts, a vertical, three beams, and 70 hours on-the-air, helped CR6AI amass a cool 248,036 points, 1403 QSOs, multiplier of 59. More big Dark Continent totals: KT1UX 224,055, EA8BF 204,534, FA9RZ 144,144, ZS5MP 108,634, ZS5U 100,924, ZE5JA 73,704, CT3AB 73,246, CN8AF 60,430.

In Asia, pouring 750 watts into an all-band rhombic, Okinawa's KR6LJ stacked 991 contacts onto a 56 multiplier for 166,488 points. A photo-finish battle for Japan plaudits developed betwixt JA3AF and JA3AB, JA3AF emerging victoriously, 126,050 to 121,338. Other spicy calls gracing the Asia listings include MP4QAL, VS1GX, VS2DZ, VS6AE, YA1AM, 4S7MG and 4S7MR.

In Europe, as elsewhere, results rocketed skyward. Only two Germans broke 100,000 last year, but 22 adept DXers on the continent managed the feat in 1956. Old-liner PAØUN eked out 267,432 points by virtue of 1354 stations worked on five bands, followed by DL4ZC 235,578, HB9NL 234,304, OK1IH 195,286, HA5KBA 174,105, DJ1BZ 165,472, G5RI 163,392, ZB1AY 160,896, PAØEP 160,430, EA4ED 143,360, EA1AB 136,782, EI5C 132,795, DL1JW 131,275, F9MS 125,620, CT1CO 120,816, F8VJ 119,474, GW5SL 112,636, EI9J 111,780, OZ1W 111,628, OK3DG 105,192, G2QT 102,030, I1BNU 101,856.

In North America, KV4AA struck with gusto for one million, registering a new global high of 997,036 points. Dick's QSO average of *52 per hour* and 3136 W/VE contacts furnish tough marks for future challengers. Second-ranking foreign tally was XE1A's 949,344; especially amazing is Juan's multiplier[1] of 116, 17 shy of "perfect." Also faring well in the Caribbean and vicinity were KP4DH 780,828, VP9BM 597,114, XE2NF 576,720, KP4DV 575,652, KP4ZW 466,662, XE2OK 400,158, KP4JE 293,832, VP1SD 226,215, KP4KD 210,924.

In Oceania, KH6IJ retained eminence as a contest ace 908,856 points worth, traded info 2915 times, garnered a 104 multiplier. Other notable Pacific returns: KH6AYG 682,560, KH6MG 567,336, KH6PM 493,554, ZL1BY 470,844, VK2GW 234,816, ZL1MQ 185,544, KX6AF 178,353.

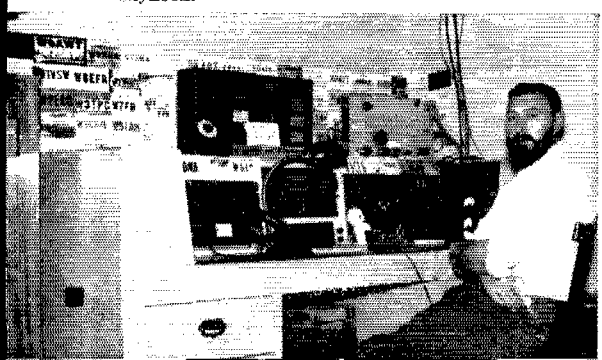
In South America, 35 watts into a 6V6-807 rig into a 7-Mc. doublet was all VP3YG required to run up 1595 contacts and 324,496 points, after which came PY7AN 314,163, CE3AG 285,012, HK3PC 277,648, PJ2AV 230,016, LU8AE 223,713, PJ2AJ 195,920, ZP9AY 136,706, PZ1BS 105,435.

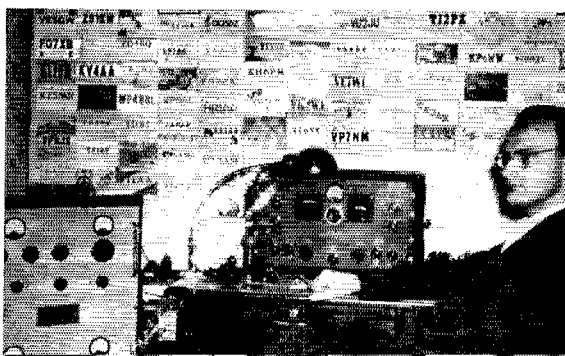
Phone Highlights

Phone records tumbled too. New W/VE champion is W2SKE/2, whose 842 QSOs and 252 multiplier netted an able-bodied 632,016 points.

[1] The non-W/VE multipler is derived from the sum of W/VE/VO licensing areas contacted per band. Maximum possible (unless 50 Mc. gets hot) is 133, i.e. 19 areas × 7 bands. Customary flies in the ointment are VE5, VE6, VE8 and VO.

Perhaps you can locate your card on the QSL-studded bulkheads of these top-scoring European c.w. participants. *Left:* Bewhiskered ZB1AY put Malta on the Test map with two 807s, the HRO and BC-348Q, and a collection of dipoles and ground planes. A navy man, Cyril was able to be active 82 hours only because his ship was in dry dock. *Right:* Trieste's I1BNU employed another pair of 807s, a Super Pro plus converter, and a multiband center-fed skyhook.





The familiar BC-342 is the lone factory item at FA9RZ, who hustled up 144,144 code points from this cozy corner. The tall rack-and-panel shelters two l.f. rigs and a 144-Mc. job. No newcomer by a long shot, Jacques picked up a medal as CN8YBQ in ARRL's 5th International Relay Competition of 1933. Wonder if he stands on tiptoe to read those meters!

♦

Skipping 160, Bill put the remainder of the bands to good service, landing 90 different DXCC items in a marathon 95 hours of vocalizing.

Also reaching the higher echelons: W3MSK 454,725, K2AAA 412,550, W6YY 366,660, W3ECR 363,519, W3DHM 352,506, W4OM 343,860, W6AM[2] 341,432, W6ITA 280,062, W9AVJ[2] 250,740, W3GHS 246,840, W8BKP 239,760, W9EWC 227,457, W8NXF 217,300, W4DQH 210,184, W8RLT 190,476, W8NWO 165,120, W1ONK 157,437, W8NGO[2] 146,700, VE4RO 145,395, W3CUB 136,186, W5DJH 135,441, W4NHF 126,360, W9DUB 125,256, W4EEE 116,748, W3GHM[2] 114,759, W9JIP 113,832.

Single-operator call area leaders, for geographical comparisons:

W1ONK	157,437	VE1ZZ	240
W2SKE/2	632,016	VE2JR	45,570
W3MSK	454,725	VE3VO	12,852
W4OM	343,860	VE4RO	145,395
W5DJH	135,441	VE5VL	45,109
W6YY	366,660	VE6NX	24,603
W7HRH	43,560	VE7AIH	19,836
W8BKP	239,760	VE8AB	540
W9EWC	227,457	VO6N	4959
WØGEK	34,983		

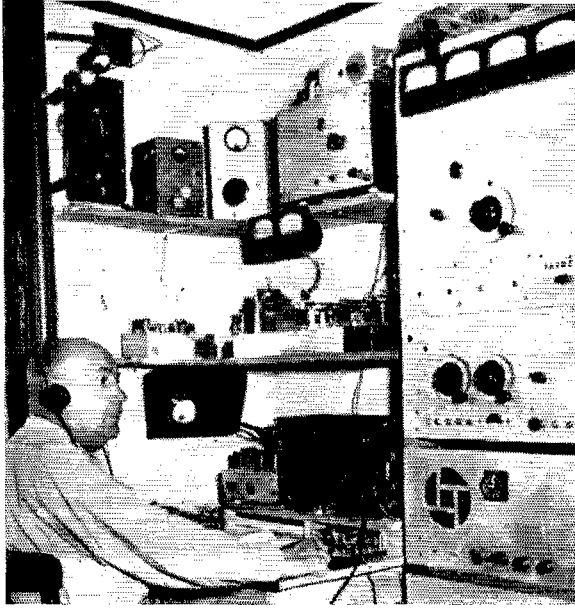
Don't get the idea that sore throats were the exclusive property of W's and VE's, for ZS6DW led Africa with 224,532 points and 974 QSOs, thereby earning his *tenth consecutive* South African phone award. Bill is to be congratulated for almost a decade of consistent winnership (as is G2PU who shares the distinction). Next in Africa: ZS5JY 124,431, ZS9G 58,652, ZS5MP 38,916, ZE2KR 24,444, OQ5AO 15,411, VQ4FK 12,915.

Over in the continent with the most people but the fewest hams, very little transpired. The Far East is quite a haul, however, and KA2KS's multiop 41,148 and single-operator JA3BB's 21,634 points rate upfront mention. The W/VE A3 crowd was getting through, if spottily.

[2] Multiple-operator station.

♦

Such is the plethora of gear at W3MSK that just a fraction can be seen here. A partial listing: three 32V exciters, separate gallon finals for *six* bands, a 200-watt 160-meter rig, two 75As. Ed attached the conglomeration to an impressive antenna system for a twin killing: the U. S. A.'s fifth-high c.w., second high phone.



EA4DL's 66,411 was tops for Europe, followed by EI5I's 66,303, as G2PU ran his streak to *ten straight* Briton triumphs with 62,463 points, number-three score across the pond. After them: DL4AJ 60,912, OE5CK 50,619, ON4OC 45,855, G3DO 42,640, I1AIJ 40,500, DL1KB 36,490, DL4ZL 35,160.

In North America outside U. S. and Canadian borders: TG9AD 441,618, VP6WR 292,636, HR3HH 224,775, XE2NF 179,330, VP9L 177,300, VP7NG 136,240. FM7WQ, KV4BI, KZ5VO, VP5DC and YN4CB didn't do badly either.

In the phone (as well as c.w.) carryings-on over in Oceania, KH6IJ's kw., 4-element twirlers and rhombic played the feature role, bringing home 1552 contacts and 349,200 points for the second-best non-W/VE tally. Strong bids came from these perennial contenders too: KH6PM 265,881, ZL1BY 153,446, ZL1MQ 103,464.

Out in front in *America del Sur* was HC1ES's 391,860-pointer and 1497 contacts, including 294 on "useless" 27 Mc., followed by CE3CZ's 285,120, OA5G's 152,658, PJ2AF's 143,594, VP3HAG's 89,320 and PY2CK's 56,852.

Disqualifications

The following are deemed ineligible for score listings or awards. In each case disqualification is for off-frequency operation as confirmed by a single FCC citation or two accredited Official Observer measurements: *C.w.* — W1YK, W2DAJ,

Furrowed brows and bitten fingernails were in order as anxious Yanks queued up for (top to bottom) 100-watt ZS9G on phone, 400-watt DU7SV on code and voice, 35-watt ZD3A on c.w.

♦

W3BQP, W3ECR, W3EQA, W3YUW, W4INL, W6CUQ, W6EEK, W6WLY/Ø, W6WSV, W7ATV, W8NP, W9BZW, W9ECZ, W9IOP, WØANF, WØGDH; *Phone* — W1CJL, W1KFV, W2CGJ, W2QZI, W2TEX, K2HVN, K2JZT, W3DRD, W3ZQ, W5GAI, W6LWP, W6VUP, K6EVR, W7DAA, W7EYR, W8AGZ, W9LRH, KL7BSR.

The Clubs

Each year ARRL offers a cocobolo gavel with an engraved silver band to the radio club whose members post the largest aggregate. In 1956, Southern California DX Club became proud possessors of the treasured prize with an incredible 7,960,211 points, thereby solidly dispelling the myth that only easterners have a chance. SCDXC rates applause for a victory which was no quirk of fate but the result of months of organizing and planning. The Potomac Valley, Frankford, and Northern California groups, all harboring that inordinate thirst for DX, registered outstanding totals as well. The standings of the 33 clubs participating in the race and the calls of their winners appear in the club tabulation on the facing page.

—•••—

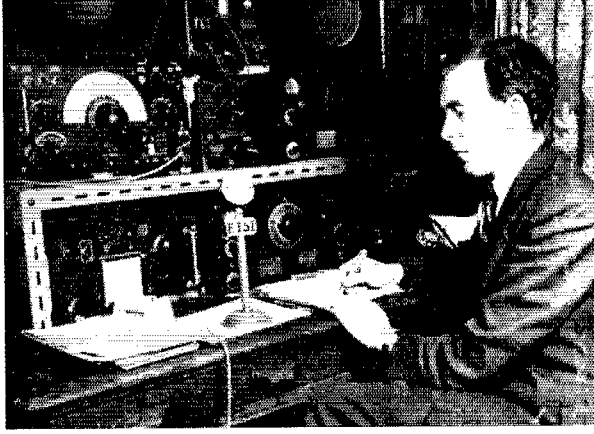
Quoting a weekly news magazine, "We Earthlings can watch the sunspot storms and take comfort that we're 93 million miles removed." True, and we amateurs can take comfort that such goings-on harbinger improving conditions for the next couple of Tests at least. How will *you* do? How many new countries will *you* log? There's no time like the present to set your sights on a country or section award in the 23rd ARRL International DX Competition, dates soon to be announced in *QST*. — *E.W.-P.S.*

C. W. SCORES

Twenty-Second International DX Competition

Operator of the station first-listed in each section and country is winner for that area. . . . The multiplier used by each station in determining score is given with the score — in the case of U. S.-Canada this is the total of the countries worked on each frequency-band used; in the case of non-W/VE/VO entries it is the total of the U. S.-Canada districts worked on each band. . . . The total number of contacts is listed next. . . . The letters A, B, and C approximate the input to the final stage at each station: A indicates power up to and including 100 watts; B indicates over 100 watts, up to and including 500 watts; C indicates over 500 watts. . . . The total operating time to the nearest hour is given for each station and is the last figure following the score. . . . Example of listings: W3DGM/3 771,-520-320-804-C-85, or final score 771,520; multiplier 320; 804 contacts; power over 500 watts; total operating time 85 hours. . . . Stations manned by more than one operator are grouped in order of score following single-operator listings in each section or country tabulation; calls of participants at multi-operator stations are listed in parentheses.

From this source EI5I consummated 66,303 points the leading phone work for Ireland. The band-switched v.f.o.-exciter, an 813 plate and screen modulated by 805s, and even the mike are EI5I-constructed.



♦

. . . Where three or more multiple-operator entries appear, the top-scoring station is being awarded a certificate.

ATLANTIC DIVISION

Eastern Pennsylvania

W3DGM/3 771,520-320-804- C-85
W3GHS...440,832-256-574- B-67
W3ADZ...134,532-148-303-BC-48
W3CGS...132,561-143-309- C-52
W3LEZ....93,654-129-242- C- –
W3IMV....88,368-112-263- B-40
W3QOR....80,223-121-221- C-43
W3EAN....70,200-104-225- C-31
W3HER....61,938- 93-222- B-46
W3WPG....54,153- 99-183- –48
W3MLW....53,311- 89-201- B-59
W3ARK....50,220- 90-186- B-46
W3ALX....49,179- 97-169- B-20
W3CHH...45,630- 90-169-BC- –
W3EVW....38,850- 74-175- C-17
W3TYW....23,517- 67-117- A-35
W3MDE....22,374- 66-113- A-20
W3MDO....22,230- 57-130- B-39
W3DYU....17,334- 54-107- C-24
WN3EBG...17,199- 49-117- A-30
W3QLW....16,830- 51-110- B-37
W3GRS....14,193- 57- 83- A-13
W3ITW....13,200- 50- 88- C-10
W3BIP....12,384- 48- 86- A-33
W3SOH....10,387- 47- 74- A-17
W3RRI.....9438- 39- 82- – –
W3ANZ.....8892- 38- 78- B-32
W3YTM.....7956- 39- 68- C- –
W3DYL.....7141- 37- 65- C-10
W3TJW.....5950- 34- 61- B-32
W3BES.....4860- 36- 45- A- –
W3OCU.....3096- 24- 43- C- 4
W3ADE.....2691- 23- 39- A-12
W3LAP.....1710- 19- 30- B- 8
W3MQY.....1275- 17- 25- C- 7
W3WHK.....18- 2- 3- A-10
W3GHM (W3s GHM KDF) 423,612-246-574- C- –
W3KT (W3s JNQ KT) 237,402-198-400- C- –
W3KFQ (W3s KFQ QMZ) 138,320-140-330- C-96
W3GHD (W3s GHD JNQ) 117,375-125-313- B- –
W3CUB (W3s ALB CUB) 59,946-103-194- C-23
W3LVF (W3s KFK LVF) 35,100- 78-150- C-15

Md.-Del.-D. C.

W3LOE...752,247-333-753- C-84
W3MSK...691,014-318-725-BC-80
W3BVN...681,090-311-730-BC-80
W3JTK...629,748-306-686- C-80
W3EIV....487,613-287-567-BC-88
W3HEC...343,824-232-494- C-78
W3MFJ....240,469-191-420-BC-75
W3EKN...198,800-175-380-BC-70
W3ZAL....173,988-179-324- C-65
W3IYE....151,662-161-314- B-43
W3EIS....149,565-169-295-BC-50
W3CPB....120,360-136-295- B- –
W3JTC....92,208-113-272- C-49
W3DRD...71,656-106-226- B-36
W3KZQ....57,630- 85-226- C-47
W3AEL....55,704- 88-211- C-25
W3EPR....42,486- 97-146- B-32
W3WV.....31,317- 73-143-AB-22
W3YRK....21,384- 66-108- A-25
W3HVM...21,120- 64-110- A-25
W3HXA...19,320- 56-115- B-54
W3WU.....15,408- 48-107- B- –
W3ZQ.....5733- 39- 49- C- 8
W3VKI.....5616- 39- 48- B-12
W3BZB.....2530- 23- 38- A-18
W3BVO.....2139- 23- 31- B-19
W3FY.....1296- 18- 24- B- 5
W3MCG.....1080- 18- 20- A- –
W3PYZ.....867- 17- 17- B- 8
W3VTH.....855- 15- 19- A- –
W3RYV.....12- 2- 2- A- 5
WN3DSA.....3- 1- 1- A- –
W3VOS (W3s TMZ VOS) 137,376-162-283-AC-50

Southern New Jersey

W2GGL...200,382-182-367-BC-67
W2TE....151,364-158-320- B-64
W2SDB....45,390- 89-170-BC-45
W2QKJ....35,577- 67-177- B-65
W2PAU....33,276- 94-118- B-30
K2CPR....31,878- 77-138- A-20
W2BUI....20,160- 56-120- B-40
W2UA.....19,323- 57-113- B-45
W2ILN....14,256- 48- 99- B-25
W2ATJ.....6737- 43- 53- B-27
K2CWJ.....4416- 32- 46- A-16
W2VUM.....3612- 28- 43- B-16
W2QDY.....2046- 22- 31- B-15
K2AJD.....1596- 19- 28- A- –
W2EBV.....363- 11- 11- A- 4
W2HAZ.....231- 7- 11- A- –
W2GTN.....189- 7- 9- B- 2
W2EZM.....144- 6- 8- B- 7
K2EWR.....3- 1- 1- A- –

Western New York

K2QQO...156,519-153-341- C-40
W2SAW...147,315-161-305- C-60
W2UWD...106,860-137-260- C-39
W2BJH....88,808-136-219- B-58
W2ABM....54,858- 82-223- C-52
W2RUJ....16,629- 99-157- B-34
K2CD.....45,969- 77-199- C-37
W2QJM....40,194- 87-154- B-22
K2KID....37,485- 85-147- C-40
W2PTI....24,642- 74-111- B- –
W2REF....23,805- 69-115- B-22
W2ICE....22,152- 71-104- C-12
W2TXB....20,160- 56-120- C-24
W2ZCZ....11,616- 44- 88- B-20
W2DOD....11,319- 49- 77- B-10
W2VXA.....5184- 32- 54- B-30
W2PZI.....2775- 25- 37- B-10
W2UTH.....2025- 25- 27- B- 8

CLUB SCORES

	Score	*C.W. Winner*	*Phone Winner*
Southern California DX Club	7,960,211	W6AM[1]	W6YY
Potomac Valley Radio Club	5,120,854	W3MSK	W3MSK
Frankford Radio Club	4,481,592	W3DGM	W3ECR
Northern California DX Club	2,735,331	W6TT	W6IDY
Ohio Valley Amateur Radio Assn.	2,427,515	W4KVX	W8JIN
Maui Amateur Radio Club	1,338,792	KH6MG	.....
Illinois Ham Club	1,080,314	W9FJB	.....
Northwest Amateur Radio Club (Ill.)	682,344	.....	.....
Connecticut Wireless Assn.	550,941	W1BIH	.....
North Carolina State College Amateur Radio Club	519,621	W4UXI	.....
Four Lakes Amateur Radio Club (Wis.)	457,806	W9LNM	W9RBI
Hampden County Radio Assn. (Mass.)	453,046	W1JYH	.....
Rochester DX Assn.	451,304	W2SAW	W2VQM
Order of Boiled Owls (N. Y.)	391,804	W2HSZ	.....
Milwaukee Radio Amateurs' Club	244,290	W9GIL	.....
Westpark Radiops (Ohio)	231,226	W8AJW	W8BF
Dade Radio Club (Fla.)	215,064	.....	.....
Garden State Amateur Radio Assn. (N. J.)	213,191	W2TQC	.....
Willamette Valley DX Club (Ore.)	190,929	W7DAA	.....
The DX Club (Pa.)	143,877	W3IMV	.....
South Jersey Radio Assn.	116,075	W2SDB	W2SZP
Chelmsford Amateur Radio Assn. (Mass.)	92,306	W1OGU	.....
Tri-County Radio Assn. (N. J.)	91,221	W2TWC	.....
Chicago Suburban Radio Assn.	84,435	W9WFS	W9WFS
Tri-State Amateur Radio Society (Ind.)	55,467	W9PNE	.....
Radio Amateurs of Greater Syracuse	49,119	K2KID	.....
Coronado Radio Club (Calif.)	42,453	W6JVA	.....
Columbus Amateur Radio Assn.	42,060	W8RTF	W8RTF
Central High Radio Club (Iowa)	35,322	WØDSP	.....
Goose Bay Amateur Radio Club	18,690	.....	.....
Lake Success Radio Club (N. Y.)	18,366	W2EEN	.....
Nassau Radio Club (N. Y.)	10,086	W2MDM	.....
Stratford Amateur Radio Club (Conn.)	7349	.....	.....

[1] W6YMD, opr.

The last five Denmark c.w. certificates are the property of OZ1W. Seventy-five watts and a BC-348 with Q5er did the trick. OZ1W also holds WAC, DXCC, WAS, OTC, A-1 Op, WBE and BERTA.

♦

W2KEL.....840- 14- 20- B-10
W2FXA.....432- 9- 16- B- –
K2JAE.....75- 5- 5- B- 7
W2QZI.....27- 3- 3- – –
W2VNP.....18- 2- 3- A-15
K2IAV.....18- 2- 3- B- –
K2JZT (K2s 1QH JZT)
19,140- 60-107- B-60

Western Pennsylvania

W3ZAO...104,636-148-236- B-51
W3PWN...38,052- 84-152- A-33
W3KNQ.....3276- 28- 39- A-35
W3ZKB.....1650- 22- 25- A-16
W3KQD.....1440- 15- 32- B- –
WN3BWU...1260- 18- 24- A-15
W3SIJ.....360- 10- 12- B- –
W3DLI.....147- 7- 7- A- 2
W3BOA.....108- 6- 6- B- 6
W3ZQY.....3- 1- 1- A- –

CENTRAL DIVISION

Illinois

W9FJB...465,908-269-578- C-80
W9HUZ...371,952-246-504- C-78
W9ABA...294,000-210-467- C-85
W9GRV...274,722-217-422- C-76
W9UNG.134,991-159-283-ABC-62
W9ERU...130,214-142-306-BC-72
W9NII...117,300-150-261- B-63
W9FJY...114,660-147-260- C-58
W9WFS...57,240-106-180- B-42
W9QIY...56,922-106-179- B-60
W9VFZ...44,115- 85-173-BC-30
W9PNE...39,168- 96-136- B-39
W9FID...29,760- 62-160- C-51
W9KLD...29,568- 77-128- B-22
W9FNR...27,434- 86-107- C-46
W9PVA...25,944- 69-126- B-25
W9UXO...21,960- 60-122- C-23
W9SGB...17,385- 61- 95- B-55
W9DWQ...10,434- 47- 74- A-14
W9WYB.....7524- 38- 66- B-25
W9VL.....6786- 39- 58- B-15
W9ZRG.....6156- 36- 57-AB-11
W9FVU.....5850- 39- 50- B-15
W9CNF.....5472- 32- 57- B-40
W9FKC.....3306- 29- 38- – –
W9IZ.....3045- 29- 35- C- 5
W9NJZ.....2808- 26- 36- B-12
W9GIH.....2600- 26- 34- A-32
W9WIO.....2340- 26- 30- C- 6
W9LKJ.....2100- 20- 35- B-15
W9IRH.....2079- 21- 33- B-36
W9LQF.....1377- 17- 27- B- 8
W9FNX.....756- 12- 21- A-30
W9CR.....570- 10- 19-BC-10
K9BXJ.....396- 11- 12- A- 8
W9CDE.....63- 3- 7- – –
K9BJV[1].....27- 3- 3- A- 2
W9REC.....12- 2- 2- A- 3
W9AVJ (W9s GVZ NZM PKW)
428,796-258-554- C-96
W9TGB (W9s TGB ZVG)
71,478-114-209- B-56

Indiana

W9JIP....195,978-178-367- C-71
W9VUL...194,435-185-351- C-50
K9CLO....37,966- 82-155- C-30
W9YSX....19,776- 64-103- B-13
W9YFD....14,472- 54- 90- B-33
W9UTL.....4032- 32- 42- B-11
W9POB.....3509- 29- 41- B-16
W9AJA.....2404- 23- 36- B-20
W9FHA.....1827- 21- 29- A- 6
W9EGQ.....828- 12- 23- B- 7
W9ZGB.....288- 8- 12- A- 5

Wisconsin

W9LNM..389,277-259-501- C-78
W9GIL...123,120-152-270- C-35
W9FDX....45,684- 94-162-BC- –
W9RKP....31,710- 70-151- B-60
W9DYG....31,590- 78-135- B-60
W9KXK....27,848- 72-128- B-35
W9GWK.....9936- 48- 69- B-12
W9TJG.....4320- 32- 45- A-11
W9VOD.....4290- 26- 55- C- 7
W9WEN.....3510- 30- 39- B-11
W9HCX.....3450- 25- 46- B-27
W9UTV.....1020- 17- 20- A- 4
W9DGB.....495- 11- 15- A- 6
W9WWJ.....270- 9- 10- – –
W9UFV.....224- 8- 10- A- 3
W9RBI.....216- 8- 9- – –
WN9YZG.....75- 5- 5- A- 7
W9GOC (W9s SZR VAK ZQA, KN9CHK)
18,408- 52-118- A-42
W9AEM (W9s AEM ZLD)
5250- 35- 50-AB-15

DAKOTA DIVISION

North Dakota

WØEOZ....17,325- 55-105- B-19

South Dakota

WØBLZ....37,740- 85-148- B-35
WØFOQ.....1104- 16- 23- A-13

Minnesota

WØYCR....77,589-111-233- C-49
WØJSN....67,968-118-192- B-46
WØHGH....12,546- 51- 82- B-32
WØRXL.....6327- 37- 57- B-21
WØDGH.....4140- 30- 46- B-21
WØVIP.....4140- 30- 46- B-18
WØOTI.....3975- 25- 53- A-15
WØVBS.....1836- 18- 34- B- –
WØQDP.....828- 12- 23- A- 4
WØWDW.....12- 2- 2- A- 2

DELTA DIVISION

Arkansas

W5MY.....63,030-110-191- C-35
W5ASG....37,629-113-113-BC-50
W5QKZ.....3406- 26- 45- B-24
W5BYJ.....1080- 15- 24- A-12

Louisiana

W5KC....190,473-173-367- B-70
W5CEW...85,608-136-210- C- –
W5PYU...21,390- 62-115-AB- –
W5DGV.....9522- 46- 69- C-48
W5GAI.....6156- 36- 57- B-10

Mississippi

W9APY/5.351,900-230-510- C-75
W5CKY...262,080-208-420-BC-61
W5DF....187,340-190-329-BC-70
W5GIF.....210- 7- 10- A- 6

Tennessee

W4DQH...306,230-226-454-AC-75
W4FKA....56,400-100-188- C-76
W4ENR.....2325- 25- 31- A-11
W4UWA.....1242- 18- 23- A- 7
K4APN.....960- 16- 20- A-17

GREAT LAKES DIVISION

Kentucky

W4KVX...691,887-329-701- C-76
W4EPA....66,150-105-210- B-28
W4JBQ....53,544- 92-194- B-45
W4OMW...26,082- 69-126- B-52
W4VKB.....1674- 18- 31- B- 8
K4CIA.....90- 5- 6- A-10

Michigan

W8UPN...249,900-204-409-BC-57
W8RQ.....210,924-189-372- B-61
W8DUS...208,356-194-358- C-80
W8YIN....154,980-164-315- A-41
W8OCK[2]..126,684-138-306- B-80
W8KPL....26,724- 68-131- B-14
W8UVZ.....9417- 43- 73- A-10
W8OCA.....8917- 37- 81- B-22
W8ILG.....4650- 31- 50- A-14
W8IZS.....4416- 32- 46- B-19
W8SS.....1848- 22- 28- B- 8
W8ESR.....1518- 22- 23- B-12
W8IQS.....1224- 17- 24- B- 7
W8HA.....1122- 17- 22- A-25
W8MCC.....936- 13- 24- A-16
W8DLZ.....450- 10- 15- B- 5
W8NWH.....120- 6- 7-AB- 4
W8VPC (W8s TJQ VPC)
40,421- 83-163-AB-85

Ohio

W8FGX...458,052-266-574- C-80
W8EV....235,128-202-388-BC-59
W8ZJM...198,831-191-347- B-56
W8PUD...141,375-145-327- C-63
W8CEG...129,630-149-290- C-30
W8BTI....89,187-137-217- C-30
W8JJW....84,816-124-228- C-28
W8AJW....67,176-108-208- A-38
W8BOJ....63,840-112-190- C-20
W8VTF....35,490- 70-169- B-35
W8STL....33,957- 77-147- C-35
W8RTF....27,324- 69-132-AB-36
W8KZT....22,743- 57-133- B-30
W8SWZ....22,620- 65-116- B-33
W8GJG....22,578- 71-106- B-24
W8SMC....18,720- 65- 96- B-15
W8JIN....16,926- 62- 91- C-10
W8ELB....15,738- 61- 86- B-56
W8SDD....12,744- 59- 72- B-14
W8KC....12,300- 50- 82- B-26
W8KMF...11,316- 46- 82- B-62
W8VOX....8658- 37- 78- B-25
W8LOF....7332- 47- 52- A-15
W8HZR....6834- 34- 67- B-23
W8LPE....6549- 37- 59- C-19
W8BQV....6264- 36- 58- A-15
W8FDC....5766- 31- 62- B-43
W8PCS....4914- 39- 42- B- 9
W8BUM....4644- 36- 43- B-10
W8PM....4554- 33- 46- B- 8
W8VZE....4356- 33- 44- B-22
W8UMA....4200- 28- 50- – –
W8GQD....3192- 28- 38- B-18
W8AAO....2016- 21- 32- B-12
W8DWP....1740- 20- 29- A-25
W8RO....1500- 20- 25- A- –
W8NWR....1404- 18- 26- A-12
W8QDH....1305- 15- 29- B- 5
W8PZD....1260- 15- 26- B- 8
W8BVF....1254- 19- 22- A- 8
W8JAQ....714- 14- 17- B- 8
W8DMD....546- 13- 14- A- 2
W8YPT....363- 11- 11- A- 8
W8BMX....252- 7- 12- A-10
W8BDO....144- 6- 8- A- 6
W8AL....96- 4- 8- A- 4
W8DAE....48- 4- 4- B- 2
WN8CGF....3- 1- 1- A- 2

HUDSON DIVISION

Eastern New York

W2EWD..203,988-178-382- C-80
W2HSZ...131,440-155-283- B-60
W2HO....111,150-130-285- B-69
W2AWF..86,760-120-241-ABC-58
W2BBV....81,408-106-256- B-37
W2CJM....72,102-122-197- B-38
K2HVN....51,000-100-170- B-29
K2EDH....42,315- 91-155- B-30
W2FBS...29,127- 73-133-ABC-25
W2VCB....25,668- 69-124- B-40
W2HUB....12,844- 52- 83- B- –
K2BE....1872- 24- 26- B- 9
W2GRI.....495- 11- 15- B- 5
K2OSY....27- 3- 3- A- –
W2PCJ (W2s PCJ SUC)
51,660- 82-210- C-42

N. Y. C. — L. I.

W2WZ....682,956-311-734-BC-69
W2ESO..166,496-172-324-ABC-55
W2GSN...124,488-133-312- C-38
W2AZS...108,882-138-263- C-39
W2HMJ....90,384-112-269- B-41
K2CF....76,257-111-229- B-60
W2MUM...64,476-108-199- B-28
W2NQZ....41,292- 93-148- B-38
W2KMZ....31,680- 80-132- B-27
W2DKF....28,944- 67-144- C-38

W2HQL....28,050- 85-110- A-15
W2BRV....26,460- 84-105- B-21
W2KTF....26,248- 68-129- B-25
W2CUQ....25,620- 70-122- B-26
W2VDT....17,670- 62- 95- B-19
W2MDM....9180- 45- 68- B- -
W2SUC....8295- 35- 79- C-15
W2EEN....7800- 50- 52- B- 9
W2BOT....7344- 34- 72- B-20
W2ICO....5148- 33- 52- - -
K2BSM....3588- 26- 46- C-13
K2CMV....3564- 27- 44- B- 9
W2BVN....3375- 25- 45- B-15
W2JB....3120- 26- 40- B- 9
K2GMF....3016- 26- 36- - -
W2WFL....2109- 19- 37- A- 7
W2EQG....1938- 19- 34- B-12
W2DTL....1863- 23- 27- A-20
K2JTS....1827- 21- 29- A-15
K2DGT....1197- 19- 21- B- 5
KN2MFY....936- 13- 24- A-23
K2GBH....462- 11- 14- A- 6
K2KXZ....444 -12- 13- A- 6
W2LRJ....351- 9- 13- B-16
K2DEM....168- 7- 8- B- 1
K2CJS....27- 3- 3- A- 7
W2DSC (8 oprs.)
12,787- 49- 87-AB-34
K2WAF (K2s DVT JOA LSP)
12- 2- 2- B- 1

Northern New Jersey

W2HJR[3]..661,262-317-696-BC-90
W2AIW...350,460-220-531- C-63
W2JT....270,630-194-465- C-80
K2DCA...261,356-223-392- C-80
W2AGW...179,098-149-401- C-72
W2EQS...168,388-172-327- B-90
W2TQC...125,504-148-284- B-57
W2CWK..122,157-147-277-AB-40
W2CGJ....99,960-140-238- C-75
W2GNQ....85,560-124-230-BC- -
W2BOK....80,442-109-246-AB-44
W2TWC...72,504-106-228-AB-36
W2DRV....65,436-114-192- B-31
W2DEW...61,200-100-204- B-57
W2DMJ....25,296- 68-124- A-25
W2DJT....24,186- 58-139- B-26
K2KDW...22,494- 69-110- B-25
K2KFP....11,739- 43- 91- A-41
W2AQT....10,863- 51- 71- B-14
W2OZU.....9648- 48- 67- A-20
W2EHN.....9492- 42- 76-AB-34
W2ZXL....7605- 39- 65- B-30
K2BJA....7245- 35- 69- B-30
W2GKE....6726- 38- 59- B-15
W2HTX....6156- 38- 54- B-20
W2AZL....5985- 35- 57- B-15
W2FXZ....5775- 35- 55- A-22
K2CBB....4030- 31- 44- B-11
K2GFX....3483- 27- 43- A-11
W2GJD....2736- 24- 38- B-11
K2IBF....2580- 20- 43- A-15
W2SCV.....390- 10- 13- B- 4
W2HMN....330- 10- 11- B- 8
W2OAE....243- 9- 9- B- 4
K2ODA/2....72- 4- 6- B- 2
W2CVW....36- 3- 4- B- 1
K2GHV (K2s GHV KMC)
17,496- 54-108-AC-50

MIDWEST DIVISION

Iowa

WØNWX..193,320-179-361- B- -
WØFDL....72,618-133-182- C-33
WØQVZ....57,015-105-181- B-28
WØBFY....51,300- 95-180- C-40
WØDSP....23,562- 66-119- B-42
WØCXQ....7437- 37- 67- B-40
WØDIB....6513- 39- 56- B-17
WØVFM....936- 13- 24- B-11
WØQLJ....240- 8- 10- B- 2
WØYSE....60- 4- 5- A- 3
WØRSL (WØs NCS RSL RYJ SQO)....215,985-187-385- C-57
WØWDK (WØs WDK YSE)
4263- 29- 49- B- -

Kansas

WØDAE...209,432-188-372- C-50
WØVBQ....60,420-106-190-BC-39
WØIUB....25,986- 71-122- B- -
WØBCI....7605- 39- 65- B-40
WØQPH....7434- 42- 59- A-24
WØBYV....6048- 36- 56- B-21
WØGAX....4368- 28- 52- B- -
WØCTK....2346- 23- 34- B-12
WØMVO....663- 13- 17- B-14

Missouri

WØQDF...117,180-140-279- C-65
WØBMM/Ø.90,783-131-231- C-80
WØBPA....75,258-113-222- B-70
WØPGI....7956- 39- 68- B-25
WØZSL....7680- 40- 64- A-42
WØPWN....396- 11- 12- A- 4

Nebraska

WØBUR....27,951- 77-121- A-25

NEW ENGLAND DIVISION

Connecticut

W1BIH...313,110-213-490-BC-63
W1AW [4,5]..212,940-195-364- C-42
W1ODW...199,048-179-372- B-75
W1TX....197,904-186-356-BC-62
W1ZDP[5]..158,576-176-303- B-50
W1VG[5]...158,099-157-337- B- -
W1AB....141,900-173-275- B-45
W1NI....121,595-155-261-BC-44
W1NMP..103,806-146-237- C-29
W1FVF....98,604-132-249- B-60
W1IOB....54,840-120-153- B-35
W1DIT....42,300- 94-150-AC-34
W1AJO....41,919- 89-157- B-44
W1DHO....26,130- 67-130-AB-40
W1CJL....8436- 37- 76- A-28
W1GVK....6194- 38- 55- B-15
W1FEA....4929- 31- 53- A- -

In down-to-the-wire combat, F9MS (above) clicked off 125,620 points, narrowly outkeying F8VJ (no mean task since latter had won the previous four French awards). F9MS winds his own transformers, kicks an 807W at 50 watts, listens on an HRO-5.

W1DJC....4455- 33- 45- B- 9
W1RFC....3192- 28- 38- A-14
W1NJM[5]....3042- 26- 39- B- 6
W1YYM[5]....2415- 23- 35- B- 4
W1WY....1914- 22- 29- A- 7
W1YNC....1860- 20- 32- B-10
W1NLM....1701- 21- 27- B-10
W1FTX....1425- 19- 25- B- 3
W1RWS....1260- 20- 21- B- 7
WN1EWS....792- 12- 22- A-14
W1RST....363- 11- 11- B- 2
W1ICP[5] (W1s CQS CUT ICP JZG WPO)
336,384-219-512- C-92

Maine

W1DLC...236,880-188-423- C-85

Eastern Massachusetts

W1AXA...311,022-222-467- C-80
W1ME....153,171-183-279- C-43
W1TW....136,710-147-310-BC-45
W1QJR....69,660- 90-258- C-72
W1NTY....66,744-103-216- B-41
W1GLF....63,393-113-187- B-53
W1OGU....59,292- 81-244- B- -
W1JEL....57,750-110-175- C-29
W1PEO....32,200- 70-157-BC- -
W1CTW...25,019- 59-147- - -

W1LHZ....20,886- 59-118- C-39
W1NS....13,113- 47- 94- B-25
W1ISX....12,384- 43- 96- B-25
W1MXX....8856- 41- 72- C-13
W1JDE....8427- 53- 53- - -
W1LQQ....8256- 43- 64- A-16
W1AMQ....8127- 43- 63- B-18
W1PWK....6240- 40- 52- B-10
W1CFF....2231- 23- 33- B- 7
W1BPA....1900- 20- 32- A-14
W1MLG....1377- 17- 27- A- 7
K1NRK[6]....969- 17- 19- C- 3
W1CPJ....855- 15- 19- B- 7
W1WMH....120- 5- 8- A- 3
W1MX (W1YFM, W2LSJ, W6WZD, W9GQL, KL7ATZ)
153,272-161-320-BC-70

Western Massachusetts

W1JYH...200,032-188-355- B-52
W1KFV...170,661-163-350-BC- -
W1EOB....80,340-130-206- C-30
W1ZD....43,884- 92-159- C-18
W1YQC....14,628- 46-106- B-28
W1AZW....3724- 28- 46- A-12
W1MVF....1650- 22- 25- B- 7
W1RWR....672- 14- 16- A- 5

New Hampshire

W1FZ....138,033-147-313- C- -

(Continued on page 124)

Kwajalein club station KX6AF posted 178,353 c.w. and 50,336 phone points at the hands of seven Servicemen. Sitting are W7VXF and W1YAE; standing, KØDPA, WØMGC, K4HTJ. W4DJS and KØASU, the remainder of the crew, weren't around for the picture-taking. See page 52, February *QST*, for further KX6AF photos.

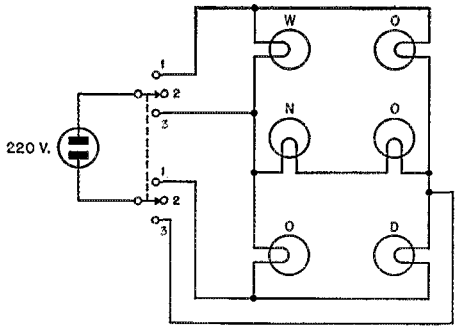
Quist Quiz

This problem will be recognized by many of the old timers, but we think it worth repeating in this series because it is a practical problem with a solution that can be used to advantage in any ham shack.

Problem: Using two switches of your own choice, connect them in the primaries of your power supply so that no matter which switch is thrown first, the filaments will go on first, and then throwing the other switch will turn on the plates. Conversely, no matter which switch is thrown off first, the plates will be turned off, and then throwing the remaining switch will turn off the filaments.

Par for this one should be about 5 minutes, with anything less than 2 minutes dropping you into the genius class.

ABOUT LAST MONTH'S QUIZ



Here is the simple answer to last month's Quist Quiz by F9TV. As you can see from the schematic, all of the lamps will light in switch position *3*, but only four of them will light in switch position *1*.

Strays

KØDCF poses the real puzzler in connection with the above Quist Quiz. He wants to know why F9TV's sign says "NO WOOD" in *English*, seeing as how the French usually speak French.

FEEDBACK

In Fig. 6, page 148, *QST*, July, 1956, K_1 *should be* a s.p.d.t. relay *as shown* — not a s.p.s.t. unit as referred to in the text.

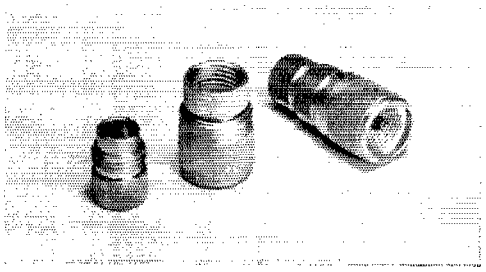
"Antenna Couplers for 50 and 144 Mc.", p. 23 of *QST* for July — coil L_2 for 144 Mc. should be $\frac{1}{2}$" in diameter, so it will mount inside the 1" L_1.

K2KUO calls to our attention the unescapable fact that the v.f.o. circuit on p. 41 of *QST* for June will oscillate more readily if the lead from C_5 is moved from pin 1 of the 6AU6 over to the junction of L_1C_4.

New Apparatus

Solderless Coax Connectors

SOLDERING the shield braid to a coax cable plug is a mean job at best and it is an even meaner job to get the thing apart if the connector is to be salvaged and re-used. A newly-available connector in the "u.h.f." series — the type most familiar in ham gear — has the nice feature that a solderless connection can be made to the cable braid. It comes in two types, both solderless insofar as the braid is concerned, but one having the conventional soldering ferrule for the inner conductor and the other having a solderless inner terminal also. The former is shown in the accompanying

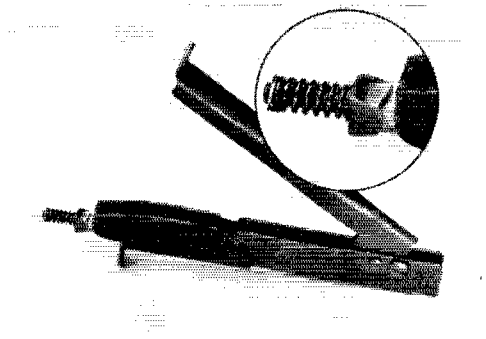


photograph. In both types the cable is inserted in the screw fitting shown at the left, and the braid is turned back over the small end. The piece is then assembled into the part at the center to form the complete plug as shown at the right. The regular adapters can be used with the smaller sizes such as RG-58/U and RG-59/U.

The new Amphenol fittings are designated 83–850 (solderless) and 83–851 (semi-solderless).

Nibbling Tool

CUTTING odd-shaped holes, especially ones with straight sides and square corners, usually calls for a lot of drilling and filing when working on chassis. The new tool shown in the photograph is



designed to do just such jobs with a minimum of effort and noise. It is a small "nibbler" or cutter, hand-operated with a squeezing motion, and having a spring return to set the tool for the next bite. It takes out a section about one-quarter inch wide and a sixteenth or so deep at each

(Continued on page 154)

Hints and Kinks For the Experimenter

GROUNDING SHIELDED LEADS

A NEAT and effective method of anchoring and grounding shielded leads at through-chassis points is shown in Fig. 1. Section A of the drawing shows how a shakeproof washer is drilled or

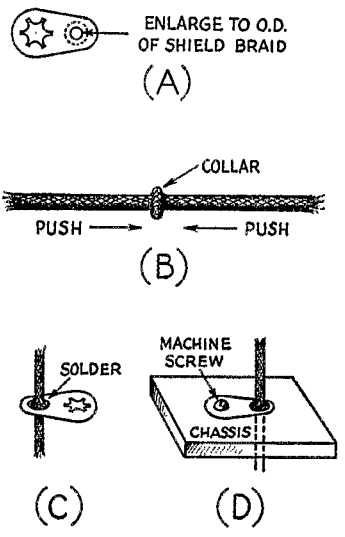


Fig. 1 — Illustration of the WØQYJ method of grounding shielded wire at through-chassis points.

reamed to fit around the shield braid. The braid is fitted with a small collar as indicated in B, and is then slipped into the lug and soldered as shown in C. The wire is then pushed through a chassis hole of appropriate size, and the lug is bolted down with a machine screw and nut as illustrated in section D of the sketch.

If the wire is to be unshielded after it enters the chassis, simply clip the braid at the point of entry and solder it to the top side of the lug.

— *Herbert Wade, WØQJY*

READY-MADE MOUNTING BRACKETS

MINIATURE aluminum chassis and L-shaped chassis decks of commercial design are ideally suited to subassembly or "dish" types of construction. Readily available at little expense, these units may be used as ready-made mounting brackets for tubes, variable capacitors, etc. Many of the stock sizes will fit inside of standard 3-inch deep chassis.

— *Hugh W. Holt, W4TP*

ANOTHER SOURCE OF FEEDER SPREADERS

THE bakelite spools supplied with Polaroid film make very excellent feeder spreaders. The spools are approximately 4 inches long and include a slot which may be used for fastening tie wires securely in place. The light weight of the spools makes them well suited for use as the spreaders for those extra long transmission-line runs.

Incidentally, I have soaked one of these spools in water for two days, wiped it off with a dry cloth, and then found its insulation resistance (between ends) to be over 1000 megohms.

— *Gene Fry, K2CW*

WIRING ASSIST

WHEN doing construction work, make a sketch of the original schematic diagram and run a red pencil over the lines of the circuit as each part and wire is put in place. This will help to prevent wiring mistakes and will simplify the wiring of a complicated circuit. Furthermore, it tells at a glance what wiring has been done and what wiring has yet to be done.

— *Bob Ellis*

USING TAP WRENCHES AS HOLDER FOR COPING SAW BLADES

AS MOST constructors sooner or later find out, many chassis and panel holes are difficult to cut unless a set of fairly expensive punches is on hand. Cuts that can be made with a hacksaw or a regular coping saw assembly are usually confined to the outer edges of a large chassis or panel because of the travel limitation imposed by the frame of the saw.

One dodge around this problem is the use of a coping saw blade clamped between a pair of dime store tap wrenches as shown in Fig. 2. The *distance in* that can be reached with this tool is limited only by the length of one's arms. It does take a bit of practice to learn to keep the blade taut while the cut is being made, but once mastered it is possible to make the most complicated cuts.

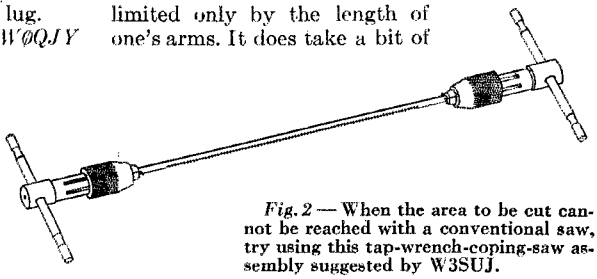


Fig. 2 — When the area to be cut cannot be reached with a conventional saw, try using this tap-wrench-coping-saw assembly suggested by W3SUJ.

— *Dick Knoth, W3SUJ*

The World Above 50 Mc.

CONDUCTED BY EDWARD P. TILTON, W1HDQ

BECAUSE of delays resulting from your conductor's trip to the National Convention, and conflict with other ARRL contest reports, the summary of the June V.H.F. Party will appear a month later than usual this time. There is one aspect of that activity that deserves reporting in these pages, however: the setting of new DX records on 1215 and 3300 Mc.

The expeditions that set the new records rate top billing, for they represent considerable group effort on two of our microwave bands; work that was done with far more in mind than the achievement of extra multipliers in a v.h.f. contest. Four parties were out, two groups of two stations each, apparently working without knowledge of the others' efforts. Both broke the existing 1215-Mc. record, and over distances that make the result dangerously close to a tie.

In the Southern California effort, W6IHK/6 and W6IFE/6 were set up on 1215 and 3300 Mc., respectively, on a site provided by the Point Loma Amateur Radio Club, W6RDF. The two stations are shown in one of the accompanying photographs. Their DX contacts were with W6VIX/6, operating on La Cumbre Peak, near Santa Barbara, a distance of 190 miles. The elevations were about 350 and 4000 feet above sea level, respectively, with an all-water path between. It is of interest to note that the distance, 190 miles, is more than 70 miles beyond the visual horizon for these elevations. It is believed to be the first instance where 3300 Mc. has been used for amateur communication over a path beyond line of sight, and it was farther beyond the horizon than 1215 Mc. has been used heretofore. Signals varied all the way from S9 to lost in the noise.

The transmitter used by W6IHK/6 was an APT-5 feeding the large parabolic antenna shown in the photograph. The type of receiver, and the gear used by W6IFE/6 are not known. Information on the equipment used at W6VIX/6 is also lacking. More information on participating operators and stations will appear in the contest summary.

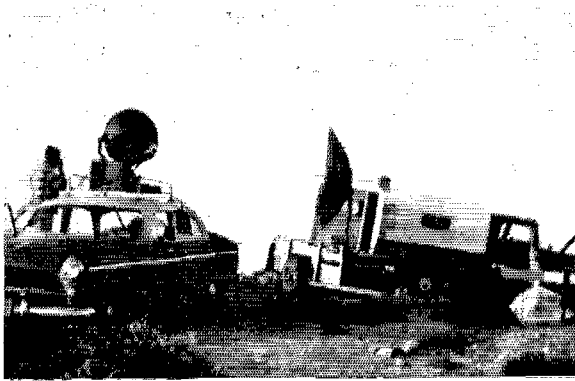
On the same day, June 9th, two other parties set out to break the 1215-Mc. record. Members of the V.H.F. Expeditionary Society, a group of v.h.f. enthusiasts in the Bay Area, cooperated in this venture. Equipment used was perhaps the most technically advanced yet employed in two-way work on 1215-Mc. in this country. The two stations, nearly identical in design, were both crystal controlled, and the receivers used crystal-controlled converters. The final stage of each rig was a 2C39A tripler, and the drivers were 4X150A triplers. The receivers had 416B r.f. amplifiers ahead of crystal mixers. Both had crystal-controlled injection strings, the i.f. in one being 50 Mc. and the other 14 Mc. One transmitter used c.w. exclusively. These splendid rigs were built and operated by K6AXN and K6BAT.

Though the ultimate result of their efforts was just slightly less than the 190-mile work of W6IHK/6 and W6VIX/6, they actually held the record for about four hours. Their first contact was made with K6AXN/6 on Ball Rock, in Northern California, and K6BAT/6 at Hams Station (of all places!) east of Jackson, a distance of about 165 miles.

The following day K6AXN/6 moved to a location on Lookout Peak, near Redding, and contact was made over a 185-mile path. With K6AXN was W6MXQ. The party with K6BAT (see photo) included W6s VSV RLB CDT and GQK. The stations operated at 36 watts input, and the antennas were dipole-reflector systems using 30-inch dishes. Signals over the longer haul were S7 on voice for K6BAT/6 and RST 578 for the c.w. of K6AXN/6.

Otherwise, the June V.H.F. Party was high-

New records on 1215 and 3300 Mc. in the making. W6IHK/6, right, and W6IFE/6, operating from Point Loma, San Diego, worked W6VIX/6, near Santa Barbara on both bands over a 190-mile path. Photo at the left shows one of the two Northern California parties that held the 1215-Mc. record for four hours. Shown is K6BAT/6, with W6CDT, W6VSV, K6BAT and W6RLB getting set to work K6AXN/6. Contact on 1296 Mc. was made over 160 miles on June 9th (4 hours before the W6IHK-IFE-VIX record) and over 185 miles on June 10th.



lighted by erratic and well-scattered sporadic-E skip on 6, extensive mountain-top portable activity, and widespread participation. There are nearly 400 logs in the contest file, and scores are new highs for many areas. More details next month.

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

Some months ago, when W3YHI (Andrews Air Force Base, Md.) heard the improvement in signal-to-noise ratio that the 144-Mc. single side band of W2JJC afforded, Jack decided that s.s.b. was for him, too. This urge was strengthened when W3HWN came on shortly after. In regular schedules with W2JJC since early April, W3YHI has never failed to copy W2JJC solidly, though Jack has had to resort to c.w. frequently to make the return trip over the 200-mile path.

W3YHI had no previous s.s.b. experience, and no ready-made s.s.b. rig from which to heterodyne to 144 Mc. Also, he wanted to build up a completely separate rig for s.s.b. so that direct comparisons could be made with the a.m.-c.w. job. So, with 19 days' accumulated leave and the best wishes and advice of W2JJC and W3HWN, he embarked on the project.

The result was a complete 144-Mc. s.s.b. rig running 100 watts peak input to an 829B — 19 days and some nights and weekends later. The line-up: 12AT7 speech amplifier, 6J6 modulator, 12AT7 crystal oscillator and cathode follower, with 447 kc. coming out of the 6J6. This is fed through half-lattice crystal networks into another 6J6 mixer. A 9002 heterodyne oscillator on 5675 kc. gives 6.1 Mc. out of the second mixer. Then follows a 6AG5 amplifier and another 6J6 mixer, this time with a 12AT7 oscillator-cathode-follower on 8600 kc. The 14.7-Mc. output is fed through another 6AG5 to a third mixer, where a heterodyning frequency of 129.6 Mc. is delivered from two 12AT7s and an 8100-kc. crystal. Output on the final frequency of 144.3 Mc. is built up through a 6AK5 Class A amplifier, a 6360 Class AB1 and the 829B in Class AB2.

If this seems complicated at the first rundown, remember that it is the *complete* s.s.b. rig on 144 Mc., including audio. Except for the last two stages, all the tubes are of the receiving variety, and they run at very low input. The whole works is on a single 13 by 17 chassis, with room left for voice control, sideband switching and other features to be added later. The weird combination of heterodyning frequencies was worked out to fit Jack's private stock of crystals, as well as to avoid troublesome beats.

The first s.s.b. CQ from W3YHI netted the expected well-intentioned "Calling the station near 144.3 Mc. There's something terribly wrong —" response, but wherever fellows have been found who recognize the signal for what it is, and have the facilities and ability to tune it in properly, results have been most gratifying. Jack's experience is probably typical, except that quite a few of the v.h.f. s.s.b. enthusiasts have taken the easier route, using commercial exciters on lower bands to heterodyne to 50 or 144 Mc. They run into trouble with the no-b.f.o. gang, but in general it appears that their lot is not as hard as that of early pioneers with s.s.b. on lower bands.

Most v.h.f. enthusiasts are hot for any system that will extend the reliable range of operation, and s.s.b. is demonstrating nightly that it can do that on 50 and 144 Mc. Wherever checks are made under marginal conditions, s.s.b. shows its worth clearly. More stations are coming on all the time, and some of them are putting on quite a bit of steam. W3HWN now runs a pair of 4-125s on 144 Mc. K2TKN (ex-WØETJ) has 925 watts on 2-meter s.s.b. W3BOL, Temple, Pa., has 5 watts out of an 832A, and K2QCI has 10 watts output. Several other W2s and W3s are getting set for s.s.b. work on 2.

In our recent 7-week swing through all call areas and 24 states, we found s.s.b. interest high among v.h.f. men, with quite a few stations already on or nearly ready to go. The other subject that is hot with v.h.f. men right now is scatter propagation — and the two fields combine nicely. Results being obtained regularly on several 50-Mc. scatter circuits indicate that voice-control s.s.b. could provide the long-sought means of working v.h.f. DX on voice — when the band is *dead*, eliminating the waiting for the band to open before long distances can be spanned.

A recent arrival on 50-Mc. s.s.b. is W6RRZ, Long Beach, Calif. Bob heterodynes from a 20A exciter, and his final stage is a pair of 6146s, running 125 watts peak input. He made his first contacts on July 1st, running promptly into considerable opposition from the owners of Communicators and other b.f.o.-less receivers. He has interested several others in the s.s.b. idea, however, and expects to have Southern California company on 6-meter s.s.b. soon. W6NLZ, Palos Verdes Estates, was getting set for s.s.b. on 144 Mc., and we found many others working on s.s.b. or getting ready to, all through W6-land.

Some odd contacts have been made on both 6 and 2 by W5s, 6s and 7s recently. W6AJF, Sonoma, worked W7LEE, Parker, Ariz., on 144 Mc. June 2nd, with signal characteristics indicative of sporadic-*E* propagation. If such it was, the distance, 540 miles, is by far the shortest that has ever been covered on 144 Mc. by this medium. It would be of interest to know if there was marked thunderstorm activity along that path at the time.

W6NLZ had a crossband QSO with W5LFQ, Lubbock, Texas, 144 to 50 Mc., on June 6th. John changed to 144 Mc. from 50 at 1100 PDT, during a major opening to the east. He was called on 50 Mc. by W5LFQ, and the contact was maintained with W6NLZ on 144 Mc. A 144-Mc. test by W5LFQ produced nothing readable on that band, probably because he had only very low power on the higher frequency.

A third one over an unusual distance was a 50-Mc. QSO involving W6s UOV BAZ and AFC in the Bay Area and W7VMP. The c.w. signal from Phoenix, 650 miles away, had the characteristics of ionospheric scatter, though this

WØZJB	48	W4OXC	41	W8LPD	44
WØBJV	48	W4UCH	41	W8YLS	41
WØCJS	48	W4MS	40	W8PCK	35
W5AJG	48	W4FNR	39		
W9ZHL	48	W4IUJ	38	W9HRN	48
W9OCA	48	W4RFR	37	W9ZHB	48
W6OB	48	W4IKK	37	W9QUV	48
WØINI	48	W4BEN	35	W9HGE	47
W1HDQ	48			W9VZP	47
W5MJD	48	W5VY	48	W9RQM	47
W2IDZ	48	W5SFW	47	W9ALU	47
W1LLL	48	W5GNQ	46	W9QKM	47
WØDZM	48	W5ONS	45	W9UIA	45
WØHVW	48	W5JTI	44	W9UNS	45
WØWKB	48	W5ML	44	W9MFH	42
WØSMJ	48	W5FSC	44		
		W5JLY	44	WØQIN	47
W1CLS	46	W5JME	43	WØNFM	47
W1CGY	46	W5VV	42	WØTKX	47
W1LSN	46	W5FAL	41	WØKYF	47
W1VNH	46	W5HEZ	41	WØMVG	47
W1DJ	41	W5HLD	40	WØOGW	47
W1RFU	41	W5FXN	38	WØJOL	46
W1FOS	38	W5HFF	33	WØTJF	44
W1SPX	36	W5NSJ	32	WØURQ	44
W1WAS	23	W5ZVF	24	WØJHS	43
				WØIPI	43
W2MEU	47	W6WNN	48	WØCNM	42
W2AMJ	46	W6ANN	45	WØFKY	42
W2BYM	46	W6TMI	45	WØPKD	41
W2RLV	45	W6IWS	41	WØZTW	41
W2FHJ	45	K6EDX	41	WØUSQ	40
W2RGV	44	W6CAN	40	WØORE	37
W2GYV	40	W6ABN	35	WØZTW	36
K2JNS	40	W6GGG	35	WØVIK	35
K2AXQ	39	W6BWG	33		
W2QVH	38	W6OJF	31	VE3AET	45
W2ZUW	36	K6GTG	30	VE3AIB	35
W2ORA	35			VE1QZ	34
K2HRB	31	W7HEA	47	VE1QY	32
K2ITP	30	W7ERA	47	VE3DER	31
		W7BQX	47	VE1EF	28
W3OJU	46	W7FDJ	46	XE1GE	25
W3TIF	44	W7DYD	45	CO6WW	21
W3NKM	41	W7ACD	45	VE4HS	20
W3MQU	41	W7JRG	44	LU9MA	11
W3OTC	40	W7BOC	42		
W3RUE	41	W7JPA	42		
W3KMV	39	W7FIV	41		
W3MXW	38	W7CAM	40		
W3LFC	37				
W3FPH	35	W8NSS	46		
		W8CMS	46		
W4FBH	46	W8OJN	46		
W4EQM	46	W8NQD	45		
W4CPZ	45	W8UZ	45		
W4QN	44	W8RFW	45		
W4FLW	43	W8SQU	45		

Calls in bold face are holders of special 50-Mc. WAS certificates listed in order of *award numbers*. Others are based on unverified reports.

is on the near side for that type of propagation. Before the end of the work, W7VMP built up suddenly to S9-plus, and the communication medium appeared to change to sporadic-*E* skip, a more likely possibility at the short distance.

One thing seems certain: with increasing power, better receivers, larger antennas, and more alert operating, things are likely to happen that will change our present concepts of the means by which our v.h.f. DX is worked. Careful observation and complete and accurate reporting of any unusual v.h.f. communication or reception is the heart of the ARRL — IGY program, announced elsewhere in this issue. If we do the IGY job conscientiously we stand a good chance of making a considerable contribution to man's knowledge of v.h.f. wave propagation.

Scatter from the south appears to have more than a little potential for work between U. S. areas that are hard to hook up by more common modes of propagation. The predictions for September and October show areas of *F*-layer m.u.f. as high as 62 Mc. just above and below the Equator. When you're looking for South American DX on 50 Mc. don't overlook the possibility of working other Ws by means of back-scatter from the south. Beams at both ends should be aimed at the area of high m.u.f., not at each other.

Auroral propagation is almost certainly capable of producing more and better v.h.f. DX than we have yet achieved by that mode of operation. Indications point to the possibility of aurora DX to southern and western areas of this country, for instance, where it has so far not been worked. (See W4HHK report in OES section.) Aim north, use c.w. and horizontal polarization, and some new aurora DX barriers may be broken down in the coming months.

The incidence of aurora has increased tremendously in the past year, with the rising solar activity. There are more auroras, stronger signals, and better DX being reported right along. W8DX, Detroit, Mich., has had about 175 QSOs with 22 states on 144-Mc. aurora since January 1st!

We have seen that 220 Mc. is capable of supporting communication via the aurora. How about 420? W2TTU, formerly of the Cornell aurora staff, says that high-power radars have recently obtained auroral echoes at 400 to 500 Mc. for the first time. If we could get that 420-Mc. power limit lifted, the aurora might afford a chance for some new DX records on that band. Let's not give up without a struggle, even with 50 watts input. We can make the antennas very effective at that frequency.

Here's some 432-Mc. DX worked by W6s. W6BUT, Taft, has been working W6MMU, Los Angeles, regularly on both 144 and 432 Mc. This is a 120-mile path over very high mountains. On June 2nd W6BUT got together with W6BYE, San Diego, for an hour QSO beginning at 0130. This is 210 miles, believed to be the longest haul between two home stations on 432 Mc. in the West. The contact was made shortly after the completion by W6BYE of a crystal-controlled converter like the one described by W5NSJ in March *QST*.

How many contacts have you made on a v.h.f. band? W9CT writes that a QSO he had the other night with W9NW represented the 7000th contact that the latter has made on 144 Mc. since he got on the band when it was first opened to amateur use in 1945.

A 2-meter first? On July 15th, W4HJQ, Glendale, Ky., worked W4GIS, Hapeville, Ga. W4WNH, who passed the info along, thinks that this is the first 2-meter QSO between Georgia and Kentucky. We have no record of any other, to date. Tom, W4HJQ, is using a 96-element array, which is doing a bang-up job for him. Both boys expect to be in there pitching during the August Perseid meteor shower. We hope that everyone who kept special skeds during this period will let us have the details of any results.

A "marker beacon" often used by 2-meter men at a distance from Washington, D. C. disappeared with the closing down of the Navy's historic NAA, Arlington, Va. This station was the source of the signals at 143.8 and 148.1 Mc. so often used as indicators of band conditions. W3YHI says that some of the regulars who invariably showed up when the 2-meter band was good have been missing on recent tropospheric openings, and he suspects that they may have been waiting for the two band-edge signals to appear as a sign of good conditions. They will not be there any more

Notice that we have a new addition to the 50-Mc. WAS holders this month. WØSMJ, Indianola, Iowa, turned the trick in just a shade over one year on 50 Mc. His special 50-Mc. certificate No. 16 was issued July 23rd. There probably should be another proud holder of the coveted 50-Mc. WAS award. WØOGW, Lake Elmo, Minn., also submitted 48 cards at almost the same date as WØSMJ, but one of them was not in order. At this writing a replacement had not been received. Like WØSMJ, he had been working on 50 Mc., only a little more than a year. He worked 46 of the 48 in 1956 alone!

Late report: WØOGW has now qualified for award No. 17 and WØORE reports No. 48 worked, but not all cards in as yet.

2-METER STANDINGS

	U. S. States	Areas	Miles
W1FZJ	21	6	1120
W1REZ	21	6	910
W1RFU	19	7	1150
W1HDQ	19	6	1020
W1KCS	17	6	810
W1AJR	17	6	810
W1IZY	17	6	750
W1UIZ	17	5	680
W1BCN	16	5	650
W1AFO	15	5	810
W1MMN	13	5	520
W2ORI	26	8	1000
W2NLY	23	7	1050
W2BLV	22	7	1020
W2AZL	21	7	1050
W2DWJ	21	6	720
W2OPQ	20	6	970
W2AMJ	20	6	960
K2CEH	20	7	910
W2UTH	19	7	880
W2AZP	19	7	650
K2IXJ	19	6	925
W2WFB	19	6	900
W2CBB	19	6	740
K2IEJ	18	6	745
W2AOC	18	6	660
W2LHI	18	7	620
W2KIR	18	6	—
W2RXG	17	6	675
W2PAU	16	6	740
W2PCQ	16	5	650
W3BGT	28	8	740
W3RUE	25	8	950
W3KCA	21	7	—
W3GKP	21	6	800
W3KWL	19	7	740
W3NKM	19	8	660
W3IBH	19	7	650
W3TDF	19	6	720
W3BNC	18	7	750
W3FPH	18	7	—
W3LNA	16	7	720
W4HHK	29	9	1280
W4AO	23	7	950
W4MKJ	20	8	725
W4JCJ	20	6	660
W4DWU	19	6	675
W4JFV	18	7	830
W4OLK	18	6	720
W4UMF	18	6	600
W4HJQ	18	7	650
W4VLA	17	7	825
W4TLV	16	7	1000
W4CLY	15	5	720
W4WNH	15	7	650
W4ZBU	14	5	800
W4WCB	14	5	740
W4TCR	14	5	720
W4IKZ	13	6	720
W4SOP	13	5	680
W4CPZ	12	5	650
W4UDQ	11	5	850
W4MDA	11	5	680
W5RCI	21	7	925
W5JTI	19	7	1000
W5HEH	15	7	830
W5AJG	14	5	1280
W5ABN	12	5	780
W5QNL	10	5	1400
W5VW	10	5	1180
W5SWV	10	3	600
W5MWW	9	4	570
W5ML	9	3	700
W5FEK	8	2	580
W5VY	7	3	1200
W6WSQ	5	3	1280
W6NLZ	5	2	1000
W6RRZ	4	2	360
W6DNG	4	2	350
W6ZL	3	2	1400
W6AJF	3	2	640
W6BAZ	3	2	320
W6MMU	3	2	240
W6ORS	3	2	200
W6LSB	2	2	360
W7VMP	6	4	1280
W7LEE	5	3	1020
W7JU	4	2	353
W7LHL	3	2	1000
W7YZU	3	2	240
W7JUO	2	2	140
W8WXV	28	8	1200
W8SFG	26	7	850
W8RMH	25	8	800
W8LPD	25	8	750
W8DX	25	8	720
W8SRW	22	7	850
W8SVI	22	8	725
W8JWV	22	8	710
W8BAX	21	8	685
W8WRN	20	8	670
W8EP	18	7	800
W8ZCV	17	7	970
W8RWW	17	7	630
W8PT	17	6	610
W9KLR	27	8	850
W9ZHL	25	8	760
W9EQC	24	8	820
W9EHX	24	7	725
W9FVJ	23	8	850
W9BPV	23	7	1000
W9GAB	23	7	850
W9WOK	22	8	860
W9UCH	22	8	750
W9UED	22	7	960
W9KPS	21	7	660
W9MUD	19	7	640
W9REM	19	6	—
W9LF	19	6	—
W9ALU	18	7	800
W9JGA	18	6	720
W9MBI	16	7	660
W9JIY	15	7	560
W9LEE	15	6	780
W9DSP	15	6	760
W9DDG	16	6	700
WØEMS	27	8	1175
WØGUD	25	7	1065
WØIHD	25	7	870
WØUQP	18	6	—
WØONQ	17	6	1000
WØINI	17	5	830
WØOAC	14	5	725
WØTJF	13	4	—
VE3DIR	26	8	915
VE3AIR	25	8	910
VE3BQN	17	7	790
VE3DER	16	7	820
VE3BPB	13	6	715
VE2AOK	12	5	550
VE3AQG	11	7	800
VE1QY	11	4	900
VE7FJ	2	1	365

V.H.F. Callbook

How'd you like to have the operator's name, address, telephone number, and principal operating frequencies, power and antenna polarization of active v.h.f. stations throughout the world? It would be mighty handy reference information for v.h.f. DX men, cross-country travellers and many others. Such a file compiled by W6SBZ is available in printed form, through the cooperation of the Two

(*Continued on page 150*)

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

How:

September again! Cool lengthening nights, receding noise levels, crisply clearer DX signals, our annual fall gamut of overseas DX contests . . . but, for our younger colleagues, it's back to (ugh!) books and classroom discipline. And that isn't all.

Our 1956 summer semester in Amateur Radio Geography II now concluded, it is with pleasure that we accept Prof. D.X. Bugg's offer to give his final exam via *QST*. Old-timers doubtless will breeze right through the following quiz but sprier fry may find it a challenge. It's a closed-map shrouded-globe test. Questions 1 through 14 rate five points apiece; each of Question 15's ten parts is worth three points. So, VK1 for the money, ZB2 for the show, VR3 to get ready, and AC4 to *go:*

DX Geoquiz

1) It's farther from Seattle to Miami than from (*a*) G to VK6, (*b*) W7 to UAØ, (*c*) JA to LU, (*d*) W5 to KH6.

2) The U. S. 2nd, 3rd, 8th, 9th and 10th call areas (*a*) are bounded by rivers, (*b*) are full of lids, (*c*) border on the Great Lakes, (*d*) lie entirely north of the Mason-Dixon Line.

3) In order from east to west, the Guianas of South America are (*a*) VP3-PZ1-FY7, (*b*) PZ1-VP3-FY7, (*c*) 6J5-6V6-807, (*d*) FY7-PZ1-VP3.

4) Pakistan lies roughly adjacent to India's (*a*) eastern border, (*b*) western border, (*c*) eastern and western borders, (*d*) southern tip.

5) Toward WAC, which of these prefixes might count for South America? (*a*) VP4, (*b*) VP5, (*c*) KN2, (*d*) PJ2, (*e*) FM7.

6) Similarly, which of these prefixes might count for Asia? (*a*) UD6, (*b*) KG6, (*c*) FB8, (*d*) UH8, (*e*) VK1.

7) Mexico lies due south from (*a*) Los Angeles, (*b*) Chicago, (*c*) San Diego, (*d*) Betelgeuse, (*e*) Pittsburgh.

8) Little Diomede (U. S.) and Big Diomede (U. S. S. R.) two populated islands in the Bering Strait, put KL7 and UAØ (*a*) 0.2, (*b*) 2, (*c*) 20, (*d*) 200, miles apart.

9) Gilbert is to Ellice as is (*a*) Abyssinia to Ethiopia, (*b*) Tonga to Friendly, (*c*) Turks to Caicos, (*d*) Mantle to Stengel, (*e*) Tokelau to Union.

10) Bermuda is one of the (*a*) Greater Antilles, (*b*) Lesser Antilles, (*c*) British West Indies, (*d*) none of the preceding.

11) About a dozen DXCC countries lie partially or totally within the Arctic Circle; how many likewise within the Antarctic Circle? (*a*) 1, (*b*) 3, (*c*) 6, (*d*) 12, (*e*) 13.

12) In order of greatest-to-least area, arrange the islands upon which operate (*a*) FB8BC, (*b*) OX3KW, (*c*) CM2SW, (*d*) 4S7NG, (*e*) BV1US.

13) I5, VQ4, OQ and FQ8 have something in common in that all four areas are (*a*) in one time zone, (*b*) counties in Texas, (*c*) transversed by the equator, (*d*) nearly equal in area, (*e*) Betelgeuse.

14) FU8 is to YJ1 as is (*a*) CN2 to KT1, (*b*) HH to HI, (*c*) FS7 to PJ2M, (*d*) HST to FDR, (*e*) DM to DJ/DL

15) Correlate each of the following capital cities with one of the accompanying prefixes:

(*A*) Tegucigalpa	(*a*) YK	(*F*) Vilna	(*f*) HR
(*B*) Amman	(*b*) AC5	(*G*) Sana	(*g*) YI
(*C*) Punakha	(*c*) VU7	(*H*) Ulan Bator	(*h*) JY
(*D*) Baghdad	(*d*) UP2	(*I*) Damascus	(*i*) 4W1
(*E*) Katmandu	(*e*) HE	(*J*) Vaduz	(*j*) UAØ

The most-correct answers (we hope) are keyed on page 148. A perfect score wins you a genuine cadmium-plated 32-volt betelgeuse — supply very limited.

What:

Traditionally, September always marks the beginning of another "radio season" in W/K/VE latitudes. Summer's onerous atmospherics and absorptions retreat southward with the sun, and the autumnal equinox coincides with a pronounced propagational shake-out. Almost overnight our 28- and 21-Mc. bands become DX cornucopias, and almost overday our 7- and 3.5 Mc. ranges take on a delicious transoceanic flavor. Get good solid grips on your dial knobs, your keys and you: mikes, men. The '56-'57 season, officially predicted as the hottest in years, is at hand!

Our heaviest "How's" season, too, is at hand. Bear in mind that in the text to follow, frequencies (in number of kc. above the lower band limit) appear within parentheses, times without. E.g., (9) = 14,009 kc. if the paragraph treats 20-meter work. Times are GMT, using the nearest whole-hour figure, such as 7 for 0720, or 0 for 2349. As a space-conserving rule each DX call is mentioned but once per band.

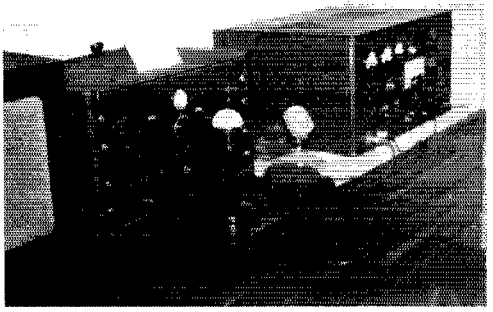
20 C.W., whose DX supremacy will be threatened by 15 and 10 in future weeks, is still top dog in late summer. The Russians vivify the DX scene almost around the clock and, having sated their appetites for the more common U species, Yank DX men dig into the lower strata in hopes of unearthing UL7s, UM8s and Fridtjof Nansen Land UA1s . . . . . K2GMO has worked 200 countries in the past eighteen months. Bob's latest: **FE8AE** (110) 1, **KR6LJ** (75) 14, **KX6AF** (50) 15, **KW6CD** (40) 12, **SVØWN** (7) 1 of Crete, **UD6KAB** (22) 2, **UF6s** FB (72) 2-3, KAF (38) 3, **UJ8AF** (74) 3, **VK9XK** (85) 13, **VQ8AG** (15) 12, **VSs 1GX** (62) 13, 2CR (21) 12, **YA1AM** (48) 3, **YJ1RF** (66) 12, **4S7s** BW (11) 3 and MR (85) 12 . . . . . K6MHT mentions **CR6CK** 15, **KG6IG** (50) 12, **KV4AA** (80) 23-1, **VK9TW** 14, **VQ6LQ** (65) 14, **VR3B** (45) 4, **VS1s** GZ HC 14-15 and **ZS3VC** 15 contacts and decries overzealous CQ-DXing by unrare North Americans W2HMJ,

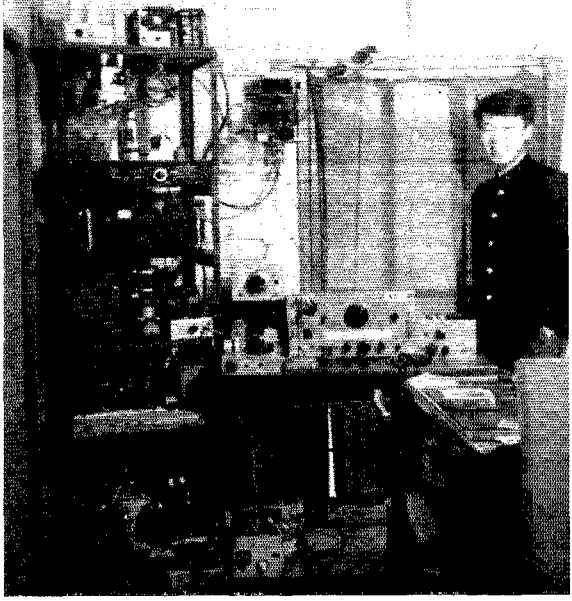
*5822 West Berteau Avenue, Chicago 41, Illinois.

absent from our Bandwagon for some time, roars back with **AP2RH** (30) 1, **EA9**DF (76) 23, **EL**I2C (55) 22, **FB8**BX (88) 3, **JA**s 5AI 8AA 12–13, **KB6**BA (72) 7, **KR6**QW (57) 10, **LZ**1KSI (48) 1, SM1BVQ (37) 23 on WAE Gotland Isle, YL **UA1**QT (100) 4, **UA9**s CM DV VA, **UAØ**s AB AG all 23–2, **UC2**AA (80) 23, a UJ8, **UP2**KBC (43) 0, **UQ2**AE (28 T6) 4, **VQ3**CF (87) 11, **VS9**AS (99) 3, **VU2**s BK (58) 11, JJ (93) 11, VR3 and YJ1 for an impressive 230/220 tally . . . . "The advent of Us surely upset what looked like a quiet summer. I've never heard such a mob of howling W/Ks this time of year!" So saying, K2BZT rattles off **GC3**EML (68) 23, **GD3**HQR (38) 19, **HH**s 2W 3DL 1–3, **HI8**FR (188) 1, **I5**RAM (40) 23, **OY1**R (28) 22, **VK9**AU (32) 12, **YI2**OT (50) 5, **ZC4**s GT (80) 5, TB (90) 1, **3V8**AR (80) 1, **4X4**s CJ (28) 5, DF (15) 1, GV (29) 3, HK (87) 1 and elusive **ET3**AF (60) 5. Hayden's separate listing of U.S.S.R. contacts reads like *Pravda:* **UA9**s DB DN KYB, **UC2**KAB, **UD6**BM, **UG6**AG, **UI8**KAA (72) 5, **UO5**KAA (40) 21, **UP2**AC, **UQ2**s AH AS, **UR2**AK, et al . . . . **CR9**s AH (48) 14, AI (62) 15, **DU3**DO (62) 9, **FK8**AE (35) 9, **KG6**GC (60) 8, **UAØ**KJA (41) 15 and **ZD9**AE (54) 14 fell prey to K6DNH . . . . K2KDW/2 savored **HP1**EH (1) 3, **SU1**IC (58) 23, **ZB1**s CH ZR 22–23, **ZB2**R (25) 23 and **ZC4**FH (40) 21 . . . . ZD6BX denotes QSOs with **AC5**PN (91) 15, **BV1**US (45) 13, **FB8**s BI (45) 12 on Juan de Nova Island, BR (5) 13, **HZ1**HZ (42) 15, **I5**REX 12, **KW6**CA (76) 13, **OY7**ML 20, **UD6**AL, **UH8**KAA, **UN1**AA 18, **UO5**KBR 19, **UR2**KAA, **VK9**s DB RM (58) 12–15, **3W8**AA 19 still on the FCC-ITU no-no list and **4S7**EM (81) 11 . . . . **CR6**AI (43) 0, **FQ8**AY (78) 1, **SP1**KAA, **SVØ**WT (12) 23, **YJ1**AA (91) 4 and **ZB2**I (58) 0 highlight W5JPC's collection . . . . W8YIN managed **OY5**S (22) 7, a variety of UAs plus **UA9**DA (68) 2, **UB5**DU, **VQ8**CB (102) 14 and **VS6**CG, pushing his countries total to a healthy 203. "All Russians contacted at 1330–1630 but they are heard at all hours of the day." . . . . **EA6**AW, F9RY/**FC**, **LZ1**KDP, **OD5**LX, **SP6BZ**, **UB5**KBB and **4X4**IO pushed W3WPG up to 104/93 . . . . W6RLP's 400 watts and ground-plane caught a BVI, **HK3**PC, **KG1**AG (73), **KJ6**BN, **KX6**NC (57), **KR6**RR (67), UA1KAE (48) at a Russian antarctic base (Pt. Mirny), **UB5**UB (50), **VSs 1**HE (82), 6CO (58) and 6DE (100) — 51 countries in thirty days . . . . It's a fast 100/81 for W9FGX. Bruce collected **HA5**s AP GG, **I1**BNU/Trieste, **KG6AFT**, **KT1**UX, **TF2**WBG, **VR2**BA, **ZE5**JA and **3V8**AN to help things along . . . . Brief browsings from points hither and yon, first *W1ANU:* **CN2**AY, **UB5**WF. *W3TYW:* LZ1 OD5 4X4, **SP6**BY. *W4HKJ:* **DU6**IV, **SP8**CR, **UB5**CJ. *W4PVD:* **FK8**AO (84) 6, **FO8**AO (74) 5. *W5GAI:* **CN8**AF, **IT1**TAI, **JAs** 5GE 6HK, **VQ5**GC (30) 13. *W5JPC:* heard weirdies FY7YY/FY and TI1YR/MM. *W6HPB:* **JA6**AA, VS1 VS2. *W6RZS:* BV1, a Chichi Jima KG6, **UAØs** OM KBE, VS1s, **VS6**CT and 200th JA station (**JAØ**BR). *W6SUQ:* **CR1Ø**AA (85) 12–13, an antarctican UA1, **VK9**TW of Nauru (VP2VB/P). *K6EBH:* VR3 UAØ, **VS1**HE, JAs in quantity. *W7DJU:* **HA5**KBK, KA2KS, **KG1**AR, **VS1**HA, heard **C2**BC working JAs (Red China?). *W8NOH:* shipboard "XE5JJ", heard one CEØSS/Ø. *AP2RH:* **VU2**s AL AM. *DL4ZC:* **AP2U** 18, **M1B** 14, **VS1**HB 17, **YN1**KK 5–6. *I1ER:* XE1MJ. *KL7BPK:* XE2LA. *KW6CD:* **KV4**BK, **PJ2**s AN AV, **UA6**UI, **VU2**s AS HF RA RM, **YS1**O, **ZD6**BX (8) 5, plus ponderable LUØAC. *VE5HR:* **VS1**HJ . . . . West Gulf DX Club's *DX Bulletin*, No. Calif. DX Club's *DXer* and Milwaukee Radio Amateur Club's *DX Notes* dwell upon 14-Mc. code items **AC3**SQ (96) 14, **CEØ**AC (175) 7, **CT3**AB (40) 1–2, **DU9**VL, **EAs 6**AM (15) 5–6, 8BF (40) 7, **ET2**US (25) 14, **FB8ZZ** (28) 3, **FF8BT** (4) 22, **FG7**XC (35) 22, **FL8**AB (38) 21, **FO8**AK (50) 6, **FR7**ZC (84) 2, **GD3**UB (80) 23, **KB6**BC (39) 13, **KC4**USA, **KG1**BF, **KM6**FAA (102) 7, **KR6**SC (36) 13, **MP4**s KAC (64) 2, QAH (25) 13, **OD5**LJ (63) 21, **PZ1**AN, **SVØ**s FY WL WS, **TG9**CR (74) 16, **UJ8**KAA, **UL7**s AB KBK (25) 13, **VK1**s GA (86) 11, RM (58) 12–13, **VP8**BY (72) 14, **VQs 2**GW (50) 14, 4FM 4FV, 5BM (63) 7–8, **VSs 1**GR (55) 14, 2DZ (85) 15, 2FB (95) 15, 2FD (80) 14, 5NN (43) 1, 6DI (95) 13, **XZ2**OM (4) 11, **YI2**AM (92) 14, **YK1**AK (113) 5, **ZBs** IZY (42) 4, 2T (23) 3, **ZC4**s AH GT JJ, **ZC5**SF (35) 15–16, **ZD2**BP (64) 2, **ZD3**s A BFC, **ZD6**BR (78) 13, **ZE3**JO (VQ1JO) (30) 13, **ZM6**AS (90) 7, **ZP9**AY (88) 12, **ZSs** 2MI (78) 14, 3Q (65) 15, 7C (50) 13, 7H (83) 17, **3A2**CG (28) 5, **3V8**FA (6) 23, **4S7**s AM PT YL 14–15, **4X4**s BK BT BX FK FQ GS GU IO all 2–4, **9S4**s BN (40), BS (50) 15–18 and dozens of garden-variety U.S.S.R. entries.

20 phone, at the intersection of Kilowatt Alley and Murderers Row, gave the green light to K6MHT: **BV1**US (163) 14, **CR7**CO (185) 14, **DU1**s CV 15, VVS (185) 14, **JA6**HK 15, **KAs** 2FC 2KC 2LZ 2NA 2WK 5CL 7HH all 13–15, **KR6**AD 13, **KX6**BU (290) 14, **VSs 1**CZ (170) 14 and 6AE 14 were pedestrians overrun . . . . Neighbor K6DNH preferred the same Formosan, **HC8**GI (140) 3, Pitcairn's **VR6**AC (143) 5, VS1 VS6, **VS2**DW (169) 14, **XZ2**AD (145) 14, **YS1**MS (195) 19 and **ZK1**BL (130) 4 . . . . A modest 120 watts carried K2CJN to a phone-only record of 155/141. Steve's most recent successes include Sao Thome's **CR5**SP (140) 6, **KC4**USA (290 s.s.b.), **KJ6**BM, **KM6**s AX FAA (220), **KX6**s AF BP, **KP6**AK, HA5AP, **LZ2**KN, MP4KDS, **SU1**AS (137) 4, **UB5**WF, **UQ2**AN (113) 13, **VK1**IJ (130), **YK1**AC (125) 3, **YO**s 3VA 3VI, **ZC4**AH and **ZM6**AS. Russian phones heard but not yet worked are UA3CR, **UC2**KAB, **UB5**KAA and **UR2**KAA . . . . VE5HR gave a rather rare North American prefix to **DU7**SV (196) 14, **UA4**FJ, **VR3**D, **ZK1**BS and **ZM6**AT . . . . **AP2**BP (315) 1 and **VQ4**EO (295) exchanged **s.s.b.** salutes with K2GMO . . . . Here and there, at *W2DMJ:* KA8WK, KH6ABH on French Frigate Shoals. *K2BZT:* **EA6**AR 5, **HI6**EC 21, **M1B** 2. *W8BZR:* **ET2**US, **HH2**Y, **KG6**NAA, YN1ARM. *W4HKJ:* KH6BBY/**KW6**, **4S7**YL (105) 12. *W5JPC:* **KC6**UZ (230) 3. *DL4ZC:* **HR3**HH (170) 6, **VP1**OLY 6. *KL7BPK:* snowman VE8RW (220) . . . . International Short Wave League, *Newark News* Radio Club, WGDXC, NCDXC and MRAC sources direct our 20-meter phone attention to **AP2U** (140) 15, **CPs** 4DM 5AD, **CRs 6**AJ (160) 6, 6AU (100), **6BH 9**AH (190), **CT3**AN (135), **DU1**AP, **EAs 6**AM (135) 3, **6**AS (123) 2, **8**AI 8BB (160), 8BC (180) 17, **9**AY **9**AZ **9**BC, F9RY/**FC**, **FB8**s BC (115) 4, ZZ (132) 13, **FF8**AP (116) 17, **FM7**s WF WN WS, **FO8**AB, **FP8**AP (182), **FU8**AC, **GD3**UB, **HA5**KBA, **HI8**FR (171), **HRs** 2WC (s.s.b.), 4WA, **HZ1**AB, **I1**RC/Trieste, **IS1**s BV (150), EHM ZPG, IT1 is BXX ZGY (176) 6, **JA4**BB, **KA9**JG, K4AMV/**KS4**, K6KNY/**KW6**, **KC4**USV (280) on sideband, **KC6**CG, **KGs** 4AA 6AFT 6FAE (265), 6GX 6IG of the Bonins, **KX6**s BT NC, **KV4**BB, **LX1**DA (115) 3, LZ1KSI (250), **MP4**s BBW KAC, **OD5**s AB (120), AU BO (165), CY DA, **OQ5**PE, **OX3**s CP KW, **OY2Z**, **PZ1**AD, **SP5CC** (150), **ST2**DB, **SVØ**WS, TA3US (198), **UAs** 1BE 2KAW 6KAH, **UC2**AA, **UO5**KBR, **UP2**s KAB (118) 3, KBC, **VK9**s BW DB (170), RH (145) of Norfolk Isle, RM WG WP (208), **VPs 1**EK 1ML 1PS 2DA 2KM 5MS 5RR

Briefly off the air for a bit of birdie-watching, VQ5GC poses overlooking the Uganda shores of Lake Victoria. Neville's layout features that Super Pro and the 150-watter to its right. A Vee beam, angled toward the U.S.A. and Europe, does the radiating. VQ5GC contemplates a DXpedition to the Seychelles and hopes to be signing VQ9 before this year is out. You may have worked Neville previously as VS6AC, VS6CE, VQ4GC and G3IAD.





As we've observed before, the JA gang takes no back seat among the world's ham technicians. Right now Japanese DXperimenters meet the challenge of s.s.b. with typical homebrew attack, 7 Mc. preferred. The side-band signal of Tokyo's JA1AGU (standing), familiar to West Coast early risers on 40, is generated by the exciter unit on the table just to the left of the mike. The 813s near the top of the rack are good for 600 watts, and those 810s halfway up dispense plenty of audio when a.m. is desired. That's a 16-tube double-con superhet just to the right of the microphone, also homegrown (of course!). JA1AEA, in the picture, at the left, has an 807s c.w.-a.m. rig on 3.5 through 28 Mc., plus an 807s linear final and exciter for s.s.b. on 40. Like JA1AGU, he has a 16-tube inhaler to round out a neat self-constructed installation. (*Photos via K6DV*)

of Turks, **7NZ**, **VQs** 2DT (105), **5GC** 6LQ (145), **VR2s** AA BZ, **VSs** 1GR 2CR 2DO 4BO (160) 15, **XW8AC** (100), **XZ2s** AD (155) 16, KN, **YO3GM**, **YI2AM** (190) 2, **YS1O**, **ZB1CA**, **ZC4s** AH KB, **ZDs** 4BF 8SC, **ZK1s** BG BL (120) 6, **ZP5s** CF JP, **3V8s** AS BA BB BF BL, **4X4DR**, **5As** 1TA 1TZ 2TR 2TZ 3TY 4TX, **9S4s** AX (120) 5 and BN. Note that U.S.S.R. entries become less mike-shy day by day.

15 phone DX action, now on the upswing, reached low ebb in early August. W9WHM deleted I1NU/Trieste (200), **KM6AX** (300), **MP4KAC** (190), **TF3MB** (205), **UQ2AN** (190), **VR2BC** (257), **VU2JP** (240), **YU3JN** (253), 4X4s BL and FF (210) from his stalk list . _ . _ . _ **CR9AH**, **JA1ANG**, **KA2KS**, **KR6AF**, **KV4BD**, **KX6ZB**, **VP5MS**, **YN1KK**, **ZP5KA** and several ZLs clicked with W6ZZ . _ . _ . _ Miscellaneous DXcerpts, 21-Mc. A3 luck at *K2BZT:* **OD5DA** 1, MP4 in Kuwait. *K2ENO:* **CN8s** JD JR. *W4YOK:* **CN8HO**, **VPs** 1OLY 5RR on Turks. *K4DAP:* **YN1BW**. *K4DRO:* **HC1ARE**. *W5GAI:* **HR2MC**. *W7PEG:* **HR3HH/9**. *W8YIN:* **KR6PI** (190) 17-18. *DL4ZC:* **VPs** 6AM 7NF . _ . _ . _ **CRs** 6AH 6AJ 7CO 7CR 9A1, **CT3AN**, **DUs** 1IV 6IV, **EAs** 8BO 9AR 9EE, **ELs** 2D 2F 10A 12H, **ET2s** FM PA, **GD2FRV**, **HI6EC**, **FB8BZ**, **FF8s** AK AP BC BP FP, **FQ8AK**, **JA1CO**, **KGs** 1FR 6FAE, **KR6s** RB QV, **KX6BU**, **KW6CA**, **LZs** 1KST 2KAC 2KSP, **MP4s** BBW KK, **OD5BN**, **OQ5s** AG AR BG BQ BU GP GY PU, **ST2DB**, **SVs** 1AD 6FP (211) 22, ØWE ØWK ØWN ØWO, **VPs** 1JH 8BP 8BS, **VQs** 2SB 3DQ 4DS 4FA 4LA 5EK 5GC, **VSs** 1EB 1FE 2DB 2DS, **VU2s** JP RC RX, **ZBs** 1AJX 1AY 2P, **ZDs** 2JHP 3BFC 4AB 4AE 4BO 8SC (128), 9AE, **ZPs** 5AM 5CF 5IB 5JE 5JP 9AY, **ZSs** 3BE 3G 7C 7H 9G, **4S7s** FG MG YL, **4X4s** BO DK DR IE, **5As** 1TA (220) 15-16, 3TV and **9S4AX** are 15-meter radiotelephones reported available by ISWL, NNRC and WGDXC dial manipulators.

15 c.w., with its theoretical 17-db. advantage over the vocal attack, appears more receptive to summer DX hounds. W1ANU's new DX-100 captured **GD3FXN** 21, **SP1KAA** (48) 17, **VP1SD** (100) 22, **ZB1CN** (81) 22, **ZP5HX** (125) 0 and **4X4IE** (19) 20 . _ . _ . _ **LZ1KBD** 15, **SP5KAB** 18, **UC2KAB** 15-16, **VP6DG** and **VS6AE** 14-15 worked ZD6BX . _ . _ . _ DL4ZC has QSLs en route **ET3AF** 16, **JA9BE** 17, **SVØWE** 17 of Rhodes and **VQ2GR** . _ . _ . _ Epistolary epitomizing, first *W1CTW:* **KB6BA**, **UA3BF**, **4X4BD**. *K2BZT:* **LZ1KPZ**. *K2ENO:* **DM2ABB**, **SVØWO**. *W3BBO:* **KV4BK**, **SP8CK**, **VU2EK**. *W4YOK:* **EL2F**, **VQ4RF**. *K4DAP:* **CR6AI**, EL SP. *K4DRO:* YL **HC1CWK**, **VP2GN**. *W6HPB:* **HC1ARE**. *W6ZZ:* **HA5BW**. *K6EBH:* **OK1MB**, *K6JTG:* **KA2MA KG1KK**, **KX6NC**, **VR2CV**. *W8AYS:* UC2, **YO3LM**, **ZB1AY**, **ZP6CR**. *W8YIN:* **VS6DI** (37) 15. *W9FNX:* ZL4MK. *11IR:* **JA8AQ**, **VS1GV**. *KL7BPK:* **KG4AK** (20) . _ . _ . _ NCDXC and WGDXC recommend **CR9AH** (50) 14, **OD5AV** (37) 23, **UAØKQB** (65) 14, **UH8KAA** (25) 14, **UB5UB** (75) 4, **VQ4EO** (28) 15, **VS1GZ** (36) 17-18, **VU2HF** (60) 13, **YN4HA** (80) 20, **ZC3AC**, **ZD4s** BF (98) 16, BQ (69) 18, **4S7s** AM (60) 13, MR (30) 13 and **4X4CJ** (78) 4 . _ . _ . _ Our Novice friends had tough going during the past month but September should bring them 21-Mc. cheer. Successes here and there, at *KN4EJR:* **ZB2I**, 21 countries on 5 continents. *KN4IFB:* **KV4BK** on 10 watts. *WN8EEZ:* **OH5OT**, **VQ5GC**. *WN8GEL:* **WH6BTH**, **WP4AFH**, KV4. *KNØCER:* **KB6BA**. One other Novice named Rod reported QSOs with **WL7BUS** and **UA9KAT** but omitted his call sign.

40 c.w. is a mere shadow of its former self but the new season is just commencing. K4CQA held out for **CT2BO** (1) and **HH2Y** (2). Henry advises to send no French to the latter unless you're prepared for a full lesson in the lingo . _ . _ . _ At this shack and that, first *W2OLU:* **IT1AGA**, **OA3EE** (30) who clouds his status with "Do not QSL yet." *K2PRR:* KH6BHZ, heard **FG7XB**. *K6ILB:* **KJ6BN** (10) S. *W7QNI:* heard **UAØTAR**. *W9ZYD:* hears W6s after **UL7KK**. *K9AUB:* **KM6FAA** 12-13 . _ . _ . _ Novicewise, KN6RGO/6, KNØCER and KNØEOV respectively worked **WH6BUA**, **WP4AEF** and **WH6BTW** around 7160 kc.

10 phone treated W8YIN to **KB6BC** (625) and helped W6SUQ to his first Peruvian, **OA4EP** (606) . _ . _ . _ W1ANU tried the north-south summer path for **HH3DL** (1000) 18, **PJ2AF** 23 and then hopped the pond for **CN8FK** 19 . _ . _ . _ DL7AH credits **PY1HQ** with the most consistent South American signal on 28 Mc. . _ . _ . _ The NNRC and ISWL contingent, mostly tuning north-south paths, alert us for 10-meter radiotelephones **AP2BP**, **CRs** 5AC 6AH 6AO 6BH 7AO 7CO, **CS3AA**, **CT2AG**, **EA8CA**, **EL2D**, **ETs** 2AB 2FM 2MZ 3PE, **GC3EML**, **GD3ENK**, **KA2NA**, **KG4s** AA AV, **LX1s** DC JW, **MP4s** BBW KAC KK, **OD5s** AC AV, **OQ5s** AA AO BI BJ BK BY FV, **PJ2s** AA AB, **SVØWE**, **VPs** 1EE 1EK 1SD 3HAG 5RR 7BD, **VQs** 2AT 2DT 2JW 2RH 4AQ 4EU 4RF, **VSs** 1FE 1FP 2EZ **VU2s** EJ EZ, **ZDs** 3BFC 4BK 8SC, **ZM6AT**, **ZP5s** CQ CR, **ZS3B**, **4S7WM**, **4X4BR** and **5A3TN**.

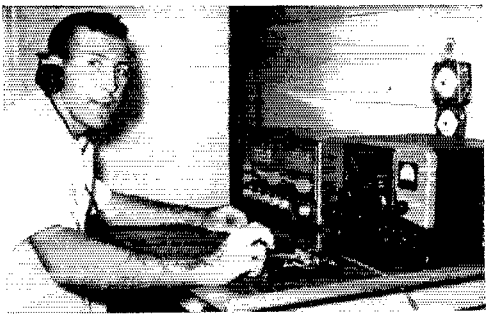
80 c.w., by rights, shouldn't even have its foot in the door among this month's reports. But DX is where you find it. W8NOH and friends, pushing traffic on 3530 kc., found themselves working one **YV5CAA** . _ . _ . _ A note from **F7AQ** further justifies this paragraph: "Pass on to the East Coast boys that we sat here in France all last winter and listened to them yak away on 75 phone and never worked a one. We can only operate on 80 from 3500 to 3800 kc. with an input of 50 watts. There were, for instance, eight **F7s** in one roundtable on 3715 last night. Please try to get them to look below 3.8 Mc. for us as soon as the frost is on the pumpkin this fall!"

Where:

VR3D, QRT after some 900 Fanning Island contacts, vows 100 per cent QSL in due course. "At this time it is

impossible to say whether or not I will be returning to VR3 — certainly not in the immediate future." . _ . _ . _ Writes ST2NG to W8DLZ: "I have no ST2 cards at the moment and am not printing any until we determine our new prefix. This may be '9A7' or such because ST is an Egyptian prefix." . _ . _ . _ W5BNO, valiantly fighting VQ6LQ's QSL battles, wants it reiterated that self-addressed stamped envelopes *must* accompany incoming QSLs . _ . _ . _ Puzzled by those new CE8s and CE9s? See "Whence" . _ . _ . _ "I operated VP7BG from May 13th to June 23, 1956, and wound up with 34 states, 43 countries and 170 QSOs. Expect to be on the air as a VP2 shortly and will be there for several months. All my VP7 QSOs will be QSLd direct soon." This from wandering W1TBS who also bemoans the general lack of consideration given his directional CQs on 20 . _ . _ . _ "From the point of view of foreign hams who might not have up-to-date *Call Books*, would it be possible to give the full QTHs of stations handling rare DX cards instead of just running their calls?" ZS6FN raises a good point but, so far as the majority of "How's" readers is concerned, duplicating addresses already in the *Call Book* is space-wasting superfluity. For those harried by ZS6FN's problem we suggest QSOs with W/Ks who will be glad to supply the necessary information . _ . _ . _ "DL7AH is unable to send or answer QSLs direct unless IRCs accompany the cards." Writing thus, Harry points out that merely purchasing QSLs for his 500-plus 1956 ARRL DX Test QSOs is, by itself, a heavy order . _ . _ . _ From VQ4EG to VE5s DR and HR on the subject of one VQ4QQ: "Sorry, OMs, but the only double-letter calls here now are VQ4s AA BB CC DD and FF. VQ4QQ *was* a notorious pirate who also used II JJ and PP suffixes." The italics are VQ4EG's . _ . _ . _ More bad news: "I am sorry to tell you that VU5BC is a pirate. To date there are no VU5s. There are hundreds of cards for VU5BC from W/K boys just collecting in the QSL bureau at this end." That's the official verdict from VU2BK in lines to W8DLZ . _ . _ . _ Re the individual addresses to follow, bear in mind that in no case are they necessarily official, nor can we guarantee their accuracy. W1s ICP UED WPO YNP YYM ZDP, W2s DMJ HMJ OLU, K2s ENO PIC, W3TYW, W4YOK, W5JPC, W6s RLP SWE, K6MHT, W7PEG, W8s NOH YIN, WØQGI, DL4ZC, TG9AD, ZD6BX, K. Sketheway, ISWL, NCDXC, NNRC, WIA and WGDXC contribute:

CN8JD Box 30, Navy 214, FPO, New York, N. Y.
CN8JR Box 40, Navy 214, FPO, New York, N. Y.
DL4YK E. F. Diehl, jr., 7680th Ordinance Co., APO 19, New York, N. Y.
DLØUU (via DL6EN).
EL1FI/MM (via ARI).
ET3AF (via SSA).
ET3AH (via RSGB).
F9RY/FC P. O. Box 30, Bastia, Corsica.
FE8AE M. Veber, Box 408, Douala, French Cameroons.
FF8BT, Box 971, Dakar, French West Africa.
FG7XC, P. Antenor, Raizet Airport, Guadeloupe, F.W.I.
FY7YY (via FY7YA).
HB1OO/VS (to HB9QO).
HC1ARE (to ARE).
HC6KI, L. Ramano, P. O. Box 104, Ambato, Ecuador.
HH2Y, Box 428, Port-au-Prince, Haiti.
ex-**KB6ILT**-K6ILT-KA1RW-XU8RW (to WØFUA).
KH6BBY/KW6, c/o CAA, Wake Island.
ex-**KL7AOL** (to W8IZS).
KP4CGA, USCG, APO 845, New York, N. Y.
KX6BT, APO 187, San Francisco, Calif.
LA9PA/P, M. Tilley, Tafjord Radio, Spitzbergen (or via NRRL).
LZ1KSA, Box 547, Sofia, Bulgaria.
MP4KDS, B. Khantrounti, Ariliban, Kuwait.
OA1M, R. Hislop, c/o International Petroleum, Talara, Peru.
OD5BC, Box 2559, Beirut, Lebanon.
SM5KV, Spitzbergen (via SSA)
UA1KAE, U.S.S.R. Antarctic Base (via Box 88, Moscow).
UP2HW, S. Uzdavinys, Str. Tvirtoves Nr. 6, Kaunas, Lithuanian S.S.R.
VK1AIL, K. L. Finney, Box 59, Kingston, Australia.
VK1ATR (via VK1AIL).
VK1GU (to VK2GU).
ex-**VK9CR** (to VK3ARN).
ex-**VK9KC** (to VK4KC).
VK9SD, S. D. Sutherland, Box 56, Port Moresby, P.T.
VP5MS (to R. M. Schweppe, KØEXN, RR 2, Webster City, Iowa).
VP6RV (via RSGB).
ex-**VP7BG** Fred Perkins, PAA/RCA, St. Lucia AAFB, via Patrick AFB, Florida.
VP8BT, O. Connochi, Base F, Argentine Island, c/o P. O., Port Stanley, Falklands.
VQ2GR, c/o Rhodesia Railways, Luanshya, No. Rhodesia.
VR2BA, T. Grantham, Box 201, Nadi Airport, Suva, Fiji.
VU2HW, H. Glocker, 3 Hayes Rd. Cross, Bangalore, India.
VU2RT, P. Padmanabha, Box 2487, Calcutta, India.
YN1HF, H. Fowler, U. S. Embassy, Managua, Nicaragua.
ZB1ZY, L/Cpl. Larsonson, COMCAN, Sig. Sqdn., Zokor, BFPO 51, Malta.
ZC4GT, B. Couchman, Box 216, Famagusta, Cyprus.



ZM6AS supplies Western Samoa QSOs to DX addicts with a recently completed Ranger kit and NC-98 on 20, 15 and 10 phone, with a little 20 c.w. thrown in. He's scheduled to become a ZL1 around the end of this month.

ZC4TB, Cpl. Blake, 1st Bn. Par. Regt., BFPO 60, Nicosia, Cyprus.
ex-**ZC5CT**, 15 Western Rd., Brentwood, Essex, England.
ZD6BR, P. Scales, c/o P. O., Zomba, Nyasaland.
ZE6JT, D. Harris, 30 Stanley Ave., Salisbury, So. Rhodesia.
ZS2MI, Secretary of Transportation, Private Bag 193, Pretoria, So. Africa.
4S7AM, A. Scott, P. O. Box 985, Colombo, Ceylon.
4S7EM (via RSGB).
5A1TA, W. L. Schultz, P. O. Box 372, Tripoli, Libya.

Your attention is directed to the "Stray" on page 66 of last month's *QST*. Those International Reply Postcards may be just what you've been looking for. If you do give 'em a try let us know how the rare-DX angle pans out — do they bring home the bacon?

Whence:

Asia — Strong cup of tea served up by AP2RH: "One point I'd like to make very clear about this 'dollar a sked' racket — I'm against it. I've received a few cards enclosing bucks, and also have had offers of magazine subscriptions 'for my trouble' in fixing skeds. I'd like to make it known that I'm a ham for the fun of the game and for the real pleasure I get from it. This dollar-per-schedule business gets my gall — a guy could make a living of it that way. I'm quite certain that the chaps who have the true spirit of ham radio at heart must be against it, too. I don't feel I want to 'cash in' just because I'm lucky enough to have a rare call; I'm just as happy to give a guy his first AP2 QSO as he himself is to get it. This financing a guy for a 'rare DXpedition' isn't my cup of tea, either. If a guy has the right spirit and can afford it he'll finance himself for his expedition and get a real kick out of doing it. . . . Don't let's commercialize the game as far as rare DX goes. I'm busy, myself, on 14,024 kc., giving the guys their first AP2 QSOs, a thing which I consider it my duty to do for the ham world in general." Ray replaces his 25-watter with a 500-watt affair loaned by inactive AP2A . _ . _ . _ VU2BK switches location from Poona to Wellington in South India's Nilgiri Hills, home of sandalwood and more tea. In a letter to W8DLZ Kab mentions all-out attempts to stir up VU5 activity . _ . _ . _ W1WPO notes that W2TWC gave XZ2OM his first Yank QSO on 21 Mc. . _ . _ . _ W3WPG's tug on the grapevine produced interesting reports on 14-Mc. Manchurian ACØAA . _ . _ . _ Club Asianisms, from *WGDXC:* VS1GV may sign ZC5 for a year or so. . . . KA7HH ponders KAØ DXpeditionary possibilities. . . . MP4s BBL BBW BBX KAB and KAC maintain a juicy Persian Gulf network Fridays on 40 meters. MP4s BBF QAP and TAA close down, but TAA's call may be used by a replacement when gear comes to hand. MP4BBL sports a new three-band beam. *NCDXC:* VS1HC and 4S7MR, both attempting VU5 DXcursions, were foiled by licensing taboos and red tape . _ . _ . _ W7PHO has KG6IG's Bonins routine, mostly week ends, as 1100–1200 on 14,050 kc., 1200–1300 on 7175 kc. (c.w.); and 0800–1000 on 14,240 kc. (phone), times GMT. The station runs 700 watts to selectable Vee beams.

Africa — ST2NG paints the DX picture for Sudan in lines to W8DLZ, and Sudanese activity goes like this: ST2AC, occasionally active on c.w. and phone; ST2AR, inactive and busy with astronomical pursuits; ST2DB, 100-per-cent phone; ST2NG, 100-per-cent c.w.; and ST2TC, inactive (no gear). Lee assures us that STIs are n.g., all bona fide STs being ST2s without exception. Reckless DX operating ethics tend to spoil ST2NG's fun but he's holding his own . _ . _ . _ W1TBS, recently VP7BG, moves to St. Lucia VP2 locale with those tantalizing thoughts: "Really enjoyed my first try at DX from 'the other end' and am

There are about a half dozen FM7s who join in spreading the Martinique QSO/QSL wealth and FM7-WN is one of the most active. Occasion for this photo was W3VKD's visit during the 1956 ARRL DX Test, an operational DXcursion recounted as a feature in last month's *QST*.

seriously thinking of several months each of ZD7 and ZD8 operation during the next couple of years." Please QSL! . . . . . W9GTX, ex-EL2C-EL12A, states that most EL stations signing "/MM" do so unofficially . . . . . According to WGDXC, VQ6LQ will be visiting the States this fall, particularly concentrating on W5 hamshacks. Also CR5SP, assisted by emcee CR6AI, is giving unfamiliar 20 c.w. a try . . . . . ZD6RM tells ZD6BX he's rigging up a rhombic to go with his 807s on 15 and 10 phone. ZD6BX meanwhile goes for rarities on 20 c.w. with occasional 15- and 40-meter sallies. A rash of Russian QSOs brought Vic up to 191 worked and he's now sweating out his WAS certification from ARRL . . . . . FD4BD writes W6EAY concerning an intended U. S. A. visit next year.

Oceania — NZART (New Zealand) and WIA (Australia) invite world-wide participation in the 1956 VK/ZL DX Contest to be held (phone) from 1000 GMT, October 6th, to 1000, October 7th; and (c.w.) on October 13th-14th, same hours. The serial exchange is the usual five-digit (A3) or six-digit (A1) figure — RST001, RST002, etc., except that this year everybody starts with 001. Any amateur band(s) can be used. *Scoring:* One point per contact, each station to be worked but once per band, this point total to be multiplied by the combined numbers of VK/ZL call areas worked on all bands (ZL1 through ZL4; VK1 through VK9, excluding VK8). *Logs:* For each contact, record the date, GMT, band, call, and serials sent/received in that order, using a separate sheet for each band, and underline each new band-area as worked. Attach a summary sheet bearing total claimed score, a brief station description and a signed declaration that rules have been observed. Entries must be postmarked on or before January 21, 1957, sent to NZART, Box 489, Wellington, N. Z., in order to be eligible for certifications of performance which will be awarded to the highest scorer in each country and in each U.S.A. call area. ZL2GX, NZART contest and awards manager, calls attention to the VK/ZL Test's enhancement of WAP and WAZL award possibilities, as well as WIA's WAVKCA sheepskin. This annual shindig has become a strong DX tradition and it appears that this year's activity will find conditions between "Down Under" and North America the best in years . . . . . If you missed the pitch last month, note here now that VK2s in the Australian Capital Territory (Canberra vicinity) now use the VK1 prefix. W4YOK reports VK1GU, nee VK2GU, creating fruitless riots on 15 meters . . . . . KH6ABH, on Tern Isle of the French Frigate Shoals some 500 miles from Honolulu, tells W2DMJ that mail arrives but once every three weeks. Frank also finds KJ6BN frantically hunting a WAS-clinching Vermont QSO as QRT-time approaches . . . . . Via W3JNN, PAØKOP reports that JZØAG worked over 500 stations on 20 meters through sporadic on-the-air sessions during the first six months of last year. JZØ customers probably will continue to be rare owing to political ferment in that part of the world . . . . . VK9s DB and RM raced each other right down to the wire for WAS honors. VK7UW is one guy who loves to work Sixes; he's out to contact all California counties and already has over 30 of the 58. W6RLP learns that Lassen, Nevada and Plumas counties are considered especially rare and delectable . . . . . WIA's *Amateur Radio* lists commercials of over a dozen nations regularly trespassing on amateur 7-Mc. frequencies . . . . . W1VG found W2AIS of ZC8PM fame operating aboard ship in Melbourne Harbor as W2AIS/VK3. Pat still gets around! . . . . . WGDXC Oceaniagrams: VS4s BO and NW team to make Sarawak less rare on 20 phone, while VS5AT is new in Brunei. . . . CR1ØAA runs 10-15 watts to a Windom and receives with a home-built 6-tube super. The former CR1ØAA is back in Lisbon.

Europe — A brand new activity joins the fall season's round-up of overseas DX contests. Sponsored by RSGB, this one comes off on November 24th-25th. It will feature a "United Kingdom against the world" plot and only the 21- and 28-Mc. bands will be used. This should be a most interesting 36-hour affair — see the coming November *QST* for details . . . . . By "command performance" HB9QO made a DX visit to Switzerland's Valais canton in late August using 80, 40 and 20 c.w. Valais remains one of the more baffling obstacles en route Helvetia-22 diplomas . . . . . K2ENO reports DL4XT Statesward-bound. DL4YK (W7AMM, ex-W3UYH) changed QTH in Germany . . . . . GB3SFS demonstrated amateur radio at the South Shields (England) Flower Show in August. The transmitter, installed by the South Shields & District Radio Club, was a 50-watter operated on 3.5 through 28 Mc. and special QSLs go to all contacts. Though GBs aren't "new ones" they surely draw attention on DX bands! . . . . . NCDXC is informed by W6DZZ and PAØUN that seven Albanian stations now are licensed. Some calls are ZAs 1A 1UB 1UU and 2CF. They are said to prefer QRP phone in the fashion of native 3A2s (local vocal) but ZA1UB is reported workable around 14,200 kc. . . . . K2BZT collected H-22 certification No. 114, only the sixth such issued to American amateurs . . . . . DL4ZC, along with XYL DL4ZB and YL DL4ZBD, closed station in favor of return to California where W6KG awaits. Lloyd's DL4 DX record features DXCC, WAS, WAC and eighteen other choice wallpapers from radio societies world wide. The DL4ZC archives account for 199 countries worked — No. 200 just *wouldn't* come back.

Hereabouts — Old-timer DX gourmets doubtless will recall the sapid signals of K6ILT, KB6ILT, KA1RW and XU8RW in years immediately preceding WW-II. Their proprietor now spanks a solid sender on 80, 40 and 20 from Pineville, in Missouri's Ozarks, under the call WØFUA. In '41 Rod made a fast exit from XU8RW, leaving his kw. and bug behind, arriving Hawaii just in time for Pearl Harbor Day. Now back among the scenes of his boyhood, ex-KB6ILT does electrical work, raises harmonics, builds a house and does lots of fishin'. DX? Well, Rod's got more gear a-cookin'. Meanwhile he does considerable listening, breaking silence when prospects of an enjoyable QSO are evident. And when the ham bands are electric and the nights are still, we'll bet one old Navy man recalls other days when *he* was rare DX under the palms and stars along the coral strand . . . . . ARE (Ecuador) celebrated its 25th anniversary by activating HC1ARE on 6 through 80 meters during July. The first amateur contacted on each continent won himself a dandy trophy, a miniature of the Ecuadorian Equatorial Monument in silver on a base of native marble, suitably inscribed. ARE also will place a bronze plaque on the monument itself, with the names and call letters of the winners. (That's really putting one's hamming "on record" for posterity!) The site especially selected for HC1ARE was exactly on the equator 16 miles from Quito and some 8100 feet a.s.l. . . . . Effective July 1st Chile's call areas underwent modification. CE1 through CE6 remain essentially as before but CE7s in

(*Continued on page 146*)

»

EI5C, a steady performer on DX bands, is manned by Eire Signal Corps personnel at Collins Barracks, Dublin. Seated is Lt. Col. M. Cosgrave, 34 years in the service, and standing, l. to r., are operators Capt. J. O'Brien, Capt. T. Sheerin (EI9S), Lt. C. Nagle and Sgt. D. Anderson. EI5C transmits with an 813 final, the receiver is an HRO-60, and antennas include a 3-element rotary for 20, cubical quad for 10, Stateside-beamed rhombic for 40, dipole for 80, and ground-planes. Writes Capt. O'Brien: "This station, with Colonel Cosgrave at the key, and with other station personnel feeding him copious draughts of strong tea, racked up a score of some 125,000 points in the recent W/VE DX contest." Good go, OMs! *(Photo via W8DLZ)*

YL NEWS and VIEWS

BY ELEANOR WILSON,* W1QON

Distaff Doings at the Eighth Annual ARRL Convention

Take it from a wide-eyed Easterner who was lucky enough to be able to observe in person, the YLs and XYLs who attended the Eighth National ARRL Convention in San Francisco thoroughly enjoyed life July 6th, 7th, and 8th.

Interest the girls in an event-packed program: exhilarate them with cool, crisp weather; enchant them with a uniquely beautiful city, and the results just have to be superlative. (Of course, a couple of thousand OMs relished the same treatment too.)

Many of the delightful details will be known only by those who were there. We'll try to share the highlights, however.

The Hotel Whitcomb on renowned Market Street provided Convention headquarters. Registration opened at 10:00 A.M. Friday morning, the sixth, and all day hams filled the lobby, greeting old friends and meeting voices heard on the air. An afternoon get-acquainted coffee hour was hostessed by XYLs Mrs. Clayton Bane, Mrs. Elvin Feige, Mrs. Thelma Chirone, Mrs. Arthur Fonseca, and Mrs. Evelyn Zachariah.

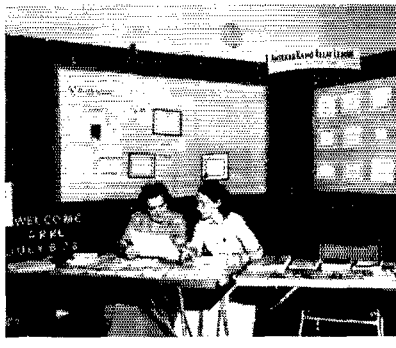
*YL Editor, *QST*. Please send all news notes to W1QON's home address: 318 Fisher St., Walpole, Mass.

At 7:00 P.M. in nearby Civic Auditorium, where various radio exhibits had already been set-up, the gang convened for the big ARRL meeting. Following addresses by ARRL President Mr. Dosland, General Manager Mr. Budlong, Vice-President Mr. Handy, and several other ARRL and *QST* staff members, activities for the women shifted back to the Whitcomb. A party for teenagers only, arranged by Mrs. Roland Smith and the Misses Raymona Buckley and Diane Zachariah, was in lively session. And for those who had outlived their teens and had the mis-or good fortune (depending on how you look at it) of marrying that strange creature, a ham, there was the inauguration of the SWOOP.

Hostess YL club for YL and XYL convention activities was the San Francisco YL Club. Members shown here are seated, left to right: W6s PIR, QMO, POC and KN6RDH. Standing: K6s EEE and HIW; and W6PCN.

The Suffering Wives of Operators Protectorate was created by Esther Given, W6BDE, and Kay MacGillivray, K6HIW, for the single purpose of helping XYLs find their rightful place in a ham's world and have fun while doing it. Some two-hundred and thirty present at the gay ceremony

Left: A Wave Reserve, Ethel Smith, W3MSU, learns about the latest in portable TV equipment from Convention Military Chairman Jack Detsch, W6GCV, and Sergeant Gouin of the Signal Corps. Ethel, an electronics engineer for the Navy, founded the Young Ladies Radio League in 1939. *Center:* A few minutes of rag-chewing and Ellen Garner, K6EIA, (left) and Joyce Harrington, KN6QCI, (right) learned they had something in common — five children apiece. Ellen operates 10, 75, and 160 from Canoga Park, California. Formerly of Shanghai, and now of South San Francisco, Joyce is the XYL of K6JHL. *Right:* Manning the ARRL booth are Rose Buckley and Cynthia De Launey, W6PHT. Mrs. Buckley, wife of W6GGC, SCM of San Francisco, is Assistant ARRL Director to W6IIC, the only XYL serving in that capacity. Cyn is well qualified to talk about ARRL communications activities to booth visitors, for she is an ORS, BPL medallion holder, and member of several traffic nets.



Seated at the head table during the YL Operators' Luncheon were W5RZJ, Louisa Sando, YL Editor of *CQ* magazine; W6PCN, Peggy Detsch, Chairman of Women's Convention Activities; W6CEE, Vada Letcher, Mistress of Ceremonies; W6NZP, Evelyn Scott; and W1QON. W5RZJ reported on the progress she has made in her special project for the YLRL — the compilation of information about the history of the organization and its membership. Louisa expects to publish the information in book form. W6NZP recalled meetings with DX YLs during her recent travels to islands of the Pacific and the Orient. W6s PCN and CEE and W1QON also spoke briefly.

were bestowed with charter member certificates and full power to initiate sister SWOOPS wherever there may be need!

Dancing and special entertainment for all "suffering wives" and weary OMs followed in the Crystal Room; and at the stroke of midnight numbers of them slipped away to participate in the mysterious Wouff Hong ritual.

Early Saturday morning the girls were up for more. For the XYLs there were chartered buses for tours to various scenic points in and around the Golden Gate City. For YLs transportation was provided to the San Mateo County airport for viewing the start of the Tenth Annual All Woman Transcontinental Air Race.

The complete story of the Air Race will be told later, when all details are in. Briefly, for those at the airport it was a thrilling experience to witness 86 women pilots take off in 50 light planes at intervals of roughly 30 seconds. Amateur communications at the airport were under the direction of San Carlos Radio Chairman Gertrude Cassady, W6FEA, and her OM W6WJF, with W6BDE, Esther, and W6QPV, Rose, assisting as operators, and OMs W6s BVM, GRO, and MSW serving as relay stations. With a report of clear weather and little wind through to Prescott, Arizona, local morning ground fog delayed the start of the race one-half hour to 8:30 A.M. PST. The departure time of each plane was relayed immediately on 3900 kcs. to Harryette Barker, W6QGX, Radio Chairman for the first stop-over city, Bakersfield, California. And from the West Coast to Michigan, where the race was to finish at Flint before sundown on July 10th, the amateur network set-up by General Radio Chairman Viola Grossman, W2JZX (see this column June 1956 *QST*), swung into action to lend an added measure of safety to the flight of the Ninety-Niners.

With the exciting race only just under way, it was back to the hotel for the main YL event of the convention — the YL Operators' Luncheon. Eighty YLs represented all but two of the W districts. Chairman of Women's Convention Activities Peggy Detsch, W6PCN, introduced Mistress of Ceremonies Vada Letcher, W6CEE. Seated with Peggy and Vada at the head table were guest speakers Evelyn Scott, W6NZP, who with her OM had returned only two days before from a year's travels in the Pacific and Orient; Louisa Sando, W5RZJ, YL Editor of *CQ* magazine; and W1QON. Needless to add, the chief topic of the hour was YLs.

For the remainder of the afternoon there was a choice of a DX meeting or more sightseeing. At 7:30 P.M. all registrants gathered at the Civic Auditorium again for the banquet and the distribution of awards and "donations." The group then shuttled back to the Hotel for the Grand Ball and the end of a very full day.

For Sunday, various radio events, such as the DX and Mobile breakfasts, were scheduled. And gradually the Eighth National Convention of the ARRL came to a close.

It seems to us that conventions and hamfests are well worth the work they are for the committees who sponsor them if, afterwards, hundreds of people return to their homes near and far recharged with enthusiasm for their hobby. Those who did the "dog work" to make the whole affair possible can then justify the days and months spent in preparation.

Certainly large bouquets are due Peggy Detsch, W6PCN, and Gertrude Cassady, W6FEA, the members of the San Francisco YL Radio Club; and all of the YLs and XYLs who helped make this year's convention the memorable event that it was.

Already plans for the next National ARRL Convention are well in progress. Labor Day weekend 1957 is the big date to remember. The Palmer House in Chicago, Illinois, is the place.

(*Continued on page 148*)

The only licensed YL in this year's AWTAR (Betty Gillies, W6QPI, Race Chairman, flew the route as an observer not as a participant) was KN6SBG, Joyce Failing, of Baker, California. Pilot of entry #30 Joyce (right) and her co-pilot Lauretta Foy were the first to cross the finish line at Flint, Michigan. (They were not the winners, however, inasmuch as the race is a handicap. Mrs. Frances Bera and Mrs. Edna Bower of California were pronounced the winners.)

Operating News

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

Morning Nets. The customary early evening times selected by many section netters in the null of the sun spot cycle have worked out pretty well in recent years. Nets like to clear their traffic early before excessive skip develops in the 3.5-4 Mc. band. Besides the shift to daylight time, a consistently sharp change in radio propagation with the top of the cycle but two years away is making some reconsideration of net operating times necessary.

Later evening times give all-dark instead of daylight conditions for net traffic exchanges. 9RN starting June 1 moved its schedule an hour later, to start at 1730 and run to 1830. We're not going to predict just how it will be this fall but the problem of selecting an optimum time and whether changes are desired will be worth some study.

Morning nets are one solution for those who can meet them. Some ARRL RMs and PAMs as section net managers are setting up extra net sessions in the early morning hours. For example, in Nebraska WØMAO has an 0730 CST session. It is for those whose commitments make other times doubtful; it is especially needed here to get around increasingly poor conditions under which the noontime net operates. 3.5 Mc. signals are *very* good in the early morning hours and RM Cox reports a fine turnout for his new net sessions.

Examination Standards. It is very much to our own best interest to see that every applicant for an amateur license meets the standards we had to meet. Any lowering of standards is first of all no favor to the person examined. He is hardly likely to go far as a communicator by an introduction in which he "gets by" the most rudimentary technique. Should FCC have to resume examining all applicants it would greatly increase the time to get even routine amateur matters handled. Crowding the bands with more operators makes conditions increasingly intolerable and less enjoyable and successful for all.

All operators privileged to conduct exams should be every bit as strict as FCC. Affiliated clubs can maintain high standards by placing experienced and expert operators and technicians in charge of the groups that instruct; it is as important to impart our service traditions, and data on DX and the db advantages and relative merits and widths of c.w. and phone channels as to meet the specific simple examination questions. Keep examination standards high. Drop a line to the ARRL Communications Department for some suggestions on making your test copy (in giving code exam) conform to FCC standards.

It's another subject really, but if anyone who reads these words can impart something of the thrill of *learning by listening* let him do so. Getting those first letters and words to start spelling out the identity of marine, press, government and commercial stations and services can be inspired and interesting in itself. We think this approach may well pay a dividend in the future of the amateur service, too. It makes for amateurs who get the larger picture of communications, even beyond the hobby implications.

In copying set the words received down five to a line. At the end of the message it is easy to arrive at the group count by quickly multiplying the number of lines and adding any words over five at the end of the text. Using a typewriter you can copy ten-to-the-line. A couple of extra spaces put after the first five words will facilitate count.

Operating License Suspensions. This supplements the earlier Operating News items appearing in January, February and July *QST* indicating the types of violations of amateur regulations for which operator license suspensions are being made.

In the matter of the FCC suspension order as concerns Mr. Joseph T. Collins (W9PYM) Thiensville, Wisconsin (page 74 July '56 *QST*), Mr. Collins in the fifteen days provided made application for a hearing on his matter. By further FCC order dated May 1, 1956 Mr. Donohue was assigned as FCC examiner to preside at a hearing in Milwaukee set initially for 17 July '56; subsequently by FCC order the hearing on docket 11681, to determine prospective suspension of Mr. Collins' amateur operator license has been continued to a date and place to be specified by FCC order.

FCC ordered (26 March '56) that the amateur operator license of Louis J. Schneider, Milwaukee, Wisconsin be suspended *for a period of one year*, and that the license be turned in to the office of the Commission in Washington, D. C. *it appearing that* the licensee (1) while operating his station W9BGE failed to properly identify said radio station by transmitting the call sign, a violation of Sec. 12.82; (2) that said licensee in the period November 1–December 31 '55 and particularly on December 8, rebroadcast multiplex transmissions, in violation of Sec. 12.103 of FCC Rules; (3) . . . particularly on December 8 '55 while engaged in the operation of his amateur radio station W9BGE, transmitted an unmodulated carrier in violation of Sec. 12.134; (4) failed to maintain an accurate radio station log for W9BGE, violation of Sec. 12.136; (5) transmitted unidentified radio communications or signals in violation of Sec. 12.159; (6) failed to operate W9BGE in accord with good engineering and good amateur practice, a violation of Sec. 12.151; and (7) that said licensee on these dates, while engaged in the operation of his amateur station W9BGE, *interfered with or caused interference to radio communications or signals transmitted to or from other radio stations in violation of Sec. 12.160 of the Commission's Rules.*

FCC ordered (11 May '56) that the Technician Class amateur operator license of William F. Hug, Chicago, Illinois be suspended *for thirty days* it appearing that said licensee on various occasions, Feb. 8, '56 to Apr. 12, '56 and particularly on Apr. 12, '56 permitted the use of his call

sign W9COJ by Leonard M. Weiss, Lincolnwood, Illinois in the operation of unlicensed transmitting apparatus not under his control, and at a location not specified in said licensee's station authorization, in violation of Sec. 12.64 and 12.66. The order provided that the license be turned in to FCC for the period. Suspension was ended under date of June 27 in this case.

FCC ordered (21 May '56) that the General Class amateur operator license of Thomas R. Macturk (K2IJV) be suspended *for one month*, it appearing that said licensee on various occasions March 1, '56 to Apr. 7, '56 engaged in the operation of Novice Class amateur radio station KN2PMC at Buffalo, New York, using certain frequencies with type A-3 emission not authorized by the license of this station, violation of Sec. 12.28, and *it further appearing*, that said licensee while engaged in this operation improperly identified this station by the call K2IJV, which was not assigned to the station he was operating, a violation of Sec. 12.158. The suspension imposed terminated July 8.

FCC ordered (21 May '56) that the Novice Class amateur operator license of Donald W. Niles (KN2PMC) be suspended for the month ending July 8, it appearing that on April 4 and 5 '56 licensee operated his station KN2PMC in the 40, 75 and 160 meter frequency bands, using A-3 emission contrary to his Novice License and in violation of Sec. 12.23(e).

FCC ordered (28 May '56) that the Novice Class amateur operator license of John B. Hill (KN5BGC) be suspended *for a period of two months*, it appearing that said licensee on December 22, '55, March 18, '56 and on other occasions operated KN5BGC in the 3.8–4 Mc. band using A-3 emission — and that he likewise identified his station by the call sign K5BGC which was not assigned to the station he was operating and in violation of Sec. 12.158 as well as Sec. 12.23(e).

Proper Message Heading and Form. In reporting in to any net be sure to be zero-beat with the NCS (QNZ). Some amateur stations are still not putting proper headings on their messages. Message form is discussed in detail on page 11 of *Operating an Amateur Radio Station*. There's a purpose for every part of the message. Keeping the parts in proper order (number, station-of-origin, check, place of origin, time filed and date, address, text, signature) helps both speed and accuracy. Operators you work *expect* the traffic in this order and newer operators are thrown for a loss if sent in any other way.

All messages should contain some sort of a check or word count to insure correct copy. About the *service message*: Any service traffic sent back to the sender to account for its status, non-deliverability, asking better address or seeking correction for changes should always contain enough information to identify your message. It is recommended amateur practice *not* to use punctuation or seldom-used fractions in the text of messages. For accuracy when numerals are required in a text *spell these out.* — *F. E. H.*

MEXICAN AMATEURS IN THE TAMPICO FLOODS

You may remember having read and seen newsreel pictures of the disastrous floods in the vicinity of Tampico, Mexico, in September of last year. Our Mexican amateur brethren, under the LMRE (Liga Mexicana de Radio Experimentadores), a member society of the International Amateur Radio Union, were quite active in emergency work during this disaster. Here is the chronology of the work of Mexican amateurs at that time, forwarded to us direct from the LMRE:

Sept. 18th: As Hurricane Janet headed for the coast of Tampico, *XE2s* FC MK GK, *XE1s* GA LA and BH put their stations in order to maintain communication as the necessities might dictate.

Sept. 19th: An emergency net was organized with XE1LM, LMRE's headquarters station, as control. By noon there was no communication of any kind with Tampico. First news of the disaster was received from XE2MK of Tampico via XE1MT at Mexico City and transmitted to federal authorities. From this moment on all communication with the affected area was handled by amateur radio.

Sept. 20th: Cerro Azul, Poza Rica, Panuca and Tuxpan were isolated. In Tuxpan a mobile station, XE1PAF, was set up and manned. Panuco called for help via XE3BQF.

Sept. 21st: Amateurs in the entire country were standing by to assist emergency net operations. The press, Red Cross, railroads and others were receiving all their information via amateur radio. Much of the work was concerned with the locating of missing persons, and LMRE headquarters was often the scene of intense drama as a result. Other amateurs active, not already mentioned: *XE1s* AU BJ BU CQ CR GX HM JH LV MT MV N OA OH OJ OK QM VA VS X XH XW Y *XE2s* AD AR D FA FR GY HZ JF KC KO LF M PM *XE3s* AH BD VD. Among foreign amateurs who assisted were *CO2s* AK EG HV LQ NO CM2TT CO5RR CO5CR HR1FM HR2AN HR4WH TI2ACA *W5s* CRA JPV TFO.

Sept. 27th Hurricane Hilda struck the Mexican shore, entering near Chetumal. The amateurs of Yucatan organized for emergency service. An amateur station aboard a merchant ship gave the first word of this disaster. Stations who operated here were *XE1s* KA LM PF *XE3s* AH M.

Sept. 28th: The hurricane crossed the Yucatan peninsula and entered the Gulf of Mexico, gaining in intensity as it headed for Veracruz. Amateurs continued their emergency preparedness and activity.

Sept. 29th and following days: Tampico was again affected and the situation got much worse as the new hurricane hit north of Veracruz causing heavy flooding. XE1LM maintained communication with all of the affected area.

The Federal Government of Mexico requested LMRE to furnish a detailed report of the activities of the Mexican amateurs during the floods, then issued a certificate of honor to each amateur who took part in the emergency work. LMRE has countless letters in its files from persons who were helped during those tragic days.

BRIEF

"Having confirmed my 47th state and lacking only Delaware, I decided to call CQ DEL. Well, I received a number of replies — more than from a normal CQ — but not one from W3-land during seven days of this technique. I began to wonder if Delaware was actually in the W3 area — a *Call Book* check indicated it was. Next I called CQ W3 DEL and there was some improvement. I worked a dozen W3s, my pencil trembling until after each city came Penna. or Md. But nary a Delaware. I am sure that I could have given KN6JQJ a run for his money in earning the first Novice WAC award had I but got on 15 meters and called CQ Delaware." — *Leslie E. Harper jr., WN8CFJ*

A.R.R.L. ACTIVITIES CALENDAR

Sept. 1st: CP Qualifying Run — W6OWP
Sept. 13th: Frequency Measuring Test
Sept. 14th: CP Qualifying Run — W1AW
Sept. 15th–16th: V.H.F. QSO Party
Oct. 5th: CP Qualifying Run — W6OWP
Oct. 13th–14th: Simulated Emergency Test
Oct. 15th: CP Qualifying Run — W1AW
Oct. 20th–21st: CD QSO Party (c.w.)
Oct. 27th–28th: CD QSO Party (phone)
Nov. 3rd: CP Qualifying Run — W6OWP
Nov. 10th–11th, 17th–18th: Sweepstakes
Nov. 13th: CP Qualifying Run — W1AW
Dec. 5th: CP Qualifying Run — W6OWP
Dec. 19th: CP Qualifying Run — W1AW
Jan. 3rd: CP Qualifying Run — W6OWP
Jan. 5th–6th: V.H.F. Sweepstakes
Jan. 12th–13th: CD QSO Party (c.w.)
Jan. 17th: CP Qualifying Run — W1AW
Jan. 19th–20th: CD QSO Party (phone)

Two key factors in the organization of any AREC group are *liaison* and *flexibility*. Without these attributes, your AREC organization is structurally faulty and subject to sudden collapse under pressure. Leave us elaborate:

Liaison. There are two kinds of liaison — that between nets to effect the greatest transfer and delivery of record messages, and that between the AREC organization and the agencies it serves, as well as between the served agencies themselves. Both are essential. A single net that has no liaison with other nets is either so restricted in its coverage as to be only partially effective, or so large as to be unwieldy. Ten stations (or units) in a net is a good maximum for service functions, beyond which it should be broken up and liaison links formed between its parts; otherwise, as additional station units are added, the problem of control becomes acute and the dispatch and delivery of traffic slows down.

An AREC organization that fails to establish liaison with agencies to be served cannot serve, it can only demonstrate. While there is some value in this (but not much), the principal value of the AREC lies in the degree of its liaison with served agencies, be they Civil Defense, Red Cross, the Police Department, the Fire Department, Salvation Army, or what have you. And the *best* service can be rendered where all these agencies are themselves connected into an *integrated community plan for emergency communication.* Read the Emergency Communications Manual; it's all there.

Flexibility: It is axiomatic for our AREC to maintain an "open door" policy toward all agencies, and this requires flexibility to a maximum degree. At the same time, amateur groups will exhibit the greatest cooperation toward that agency which reciprocates the most. This often has the effect of monopoly of an amateur group's services by a single agency to the exclusion of all others. Nothing wrong with this, provided other agencies do not require services, *and* provided the door is left open and the organizational flexibility maintained to the extent that services *can* be given to other agencies if the need is apparent or requested. In a couple cases we know of, AREC groups have gone entirely over to civil defense, the AREC structure dropped and forgotten, the EC appointment allowed to lapse or languish. Came political disruptions and local civil defense collapsed like an accordion, leaving the amateurs high and dry to start all over to build up their AREC, this time with the resolve that never again would they devote themselves exclusively to a single agency.

Our contention is not that they should not have collaborated closely with civil defense in setting up RACES (because we always have urged this on all ECs, and shall continue to do so), or even that they should not have devoted their entire efforts in this direction, but only that the basic AREC structure should have been maintained within the amateur group so that it would have been there to fall back upon; in other words, that the basic organization should have had enough flexibility so that its talents could immediately have been transferred to another type of service, without organizational disruption.

No service can stand on its own entirely independent of outside influences. If it could, it would not be a service, because a service has to have something, or someone, to serve. Our AREC is the product of our own planning, our own evolution in the PICON. It is not a stepping stone to "better" things. It is not an interim "kangaroo" assembly waiting for some agency, government or otherwise, to take it over. It is the radio amateur's own version of emergency communications service, run by amateurs in the public interest. Above all, it is what we amateurs make it; nothing more, nothing less. Can we not find some basis for pride and for responsibility in the above?

—•••—

When a train out of Mobile, Ala., was overdue on July 8th railroad officials, knowing of flood conditions along the route, sent out a call for amateur radio operators to aid in finding it. K4CEM telephoned W4BFX from the depot at 0900 CST and W4BFX immediately went on the air alerting the members of AENP. Net manager K4AOZ activated the net and took charge as NCS. W4OBV/m in Marion telephoned the Marion Police Department, who in turn relayed to the police in Jackson, Ala., and alerted the highway patrol. It was established that the train was missing somewhere between Jackson and Suggsville. W4GJW heard the alert on the AEN frequency and switched over to 40 meters to catch a station in Evergreen, W4FDZ. W4FDZ called the Evergreen police who also relayed the call into the Jackson police.

Within 45 minutes of the time the request was given to K4CEM, a Jackson police squad car found the stranded train trapped between two washouts and unable to move. The information was radioed back through police and amateur channels to the Southern Railway officials. The fine cooperation of hams and local police and railroad officials thus quickly allayed fears of the railroad and relatives of passengers as to the train's safety. Stations

NATIONAL CALLING AND EMERGENCY FREQUENCIES (kc.)

3550	3875	7100	7250
14,050	14,225	21,050	21,400
28,100	29,640	50,550	145,350

During periods of communications emergency these channels will be monitored for emergency traffic. At other times, these frequencies can be used as general calling frequencies to expedite general traffic movement between amateur stations. Emergency traffic has precedence. After contact has been made the frequency should be *vacated immediately* to accommodate other callers.

The following are the National Calling and Emergency Frequencies for Canada: *c.w.* — 3535, 7050, 14,060; *phone* — 3765, 14,160, 28,250 kc.

NATIONAL RTTY CALLING AND WORKING FREQUENCIES

3620 kc. 7140 kc.

♦

Dade County (Miami), Fla., boasts a modern radio-equipped communications bus and a number of two-meter mobiles operated by local amateurs. Sixteen amateurs of the Miami RACES group are shown in the above photo. In front row left, kneeling, is W4ESJ, RACES Radio Officer, and at extreme left standing is Ben Demby, Miami Communications Officer. Other amateurs are, (kneeling, l. to r.): W4IRU, W4JTE, W4NVF, K4CTU, W4OJP, K4AZM, K4ANW; back row, l. to r. (omit YLs): W4YCL, W4BTM, K4AZQ, W4PBS, W4OQL, W4VGT, W4IJM, K4HOB.

♦

assisting were: *K4s* AOZ CEM; *W4s* PXQ HKK GJW BFX OBV FDZ and W5ZLP. — *K4HKD.*

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On July 4 amateur mobile units in Dade County (Miami), Fla., took to the highways throughout the county in cooperation with the sheriff's department in an effort to cut down on holiday accidents. The mobile units patrolled the highways during the rush hours, reporting traffic violations or accidents to W4VCG/AM who was patrolling over the county. The information was then transmitted from the same aircraft over the sheriff's frequency to other county patrol units, which in turn took proper action. Normally a patrol car and amateur were located near each other to expedite coordination between the emergency headquarters (K4AG/4 at Brown's Airport, South Miami), the main highways and the plane. Thirteen patrol planes were in the air throughout the day operating on 158.37 Mc. The following mobiles and fixed stations participated in "Operation Safety": *W4s* BYG/m DNM/m EKZ/m FVW FAJ/4 HGD/m IYT/m KGJ MVR/m NVF NJM DQL/m PJX/m RID/m SDI/m SKC/m TOJ/m VCG/am WYS ZYK ZGL/m ZPT/m ZGM *K4s* AG/4 AHW ATO/m BCP/m ENN/m EKU/m GYJ/m IQG IKY, W8YCN/m, W9AVI/m. The sheriff wrote a very fine letter complimenting the amateurs on this organization and thanking them for their assistance. — *W4IYT, SEC E. Fla.*

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The Alabama Section Teenage Net (AENT) held a simulated emergency test on February 26 from 1530 to 1650 CST. W4HTP of Auburn was NCS, and fourteen stations participated, handling ten formal messages. The operation was unscheduled, the first of its kind by AENT. SCM W4MI states that AENT is doing an excellent job and the net now has 29 members.

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Members of the AREC from the Ogden City-Weber County area took part in the annual Armed Forces Day activities on May 19, 1956. This group set up a display booth with the Weber County Civil Defense Director, at the Utah General Depot, furnishing three 6-meter stations providing communication to and from display points and the UGD Fire Station. Six local AREC members took part. — *W7GPN, EC Weber County, Utah.*

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Nineteen SECs reported on behalf of 5111 AREC members for the month of May. This is two more reports but fewer AREC members than we had in May of last year. The encouraging part is that three of the reporting SECs were new reporters for 1956, bringing our total sections heard from this year to 30. We'll have a mid-year analysis in October *QST*. Reporting sections for May (new ones in italics): S. Texas, Mo., Minn., NYC-LI, Ore., *North Carolina*, N. M., *South Carolina*, Colo., San Joaquin Valley, *Eastern New York*, Mont., Santa Barbara, Ala., Wis., Santa Clara Valley, Md.-Del.-D. C., Nebr., E. Fla.

RACES News

The FCDA boys from Battle Creek are getting around to some of our conventions and hamfests these days. Charlie Dewey, W8LBM, represented FCDA at the Regina, Sask., hamfest on June 30, July 1–2, along with Canadian C. D. Communications Chief Col. K. E. Holmes; and then Charlie went on to attend the ARRL National Convention in San Francisco on July 6–7–8. Jim MacGregor, W8DUA, also of FCDA's Communications Staff, journeyed to Galveston to attend the West Gulf Division Convention on June 15–16–17, where he gave a talk on RACES organization and planning. You convention and hamfest planners who want to make civil defense and RACES one of the subjects on the agenda of your programs might drop a line to FCDA, Warning & Communications Office, Battle Creek, Mich., inviting a representative to attend.

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FCDA has produced a revised version of the "check list" to assist prospective RACES planners, an item which will be most helpful to the many amateurs who wish to get RACES started locally. At the moment space will not permit our reproducing it in full here, but you can get a copy by writing to FCDA Warning & Communications Office, Battle Creek, Mich.

Add to your list of RACES-authorized towns that of Lincoln, R. I., which has just received its RACES authorization. W1UPB is the RO. They are at present negotiating for equipment and setting up training classes for a busy fall season.

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The Honolulu Amateur Radio Mobile Club signed up an additional six RACES applicants with the Honolulu RO during the month of June, according to SCM KH6AED.

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New York State RO W2BGO tells us that the statewide Radiological Information Net is still going strong. This is no little chore for the participating stations, who must each be on the air twice a day, at 1000 and 1700 local time. Each operator has received a letter of thanks and congratulations on a job well done from N. Y. State Civil Defense Director Lt. Gen. C. R. Huebner. Here is a list of the stations doing the work: *W2s* FEM JNM KEB KQL NAI NOC; *K2s* ACA AMZ BSD CUQ DJN GVM IYP QIX RDB W3WUE.

BRIEF

W1MZE writes to stress that "R" means RECEIVED, and *nothing else*. It means the message has been received *as sent*. It does not mean that the receiving operator agrees with what the message said, intends to carry it out, if it is an order, or even acknowledges it. (Acknowledging is the business of the addressee, not the operator.) "R" just means that the operator has *received* the message. "The use of R to mean 'yes' or 'correct' opens the way to misunderstandings. Also confusion is caused by the sloppy use of Q signals . . . QSY and QSW should not be used for the same meaning."

QSW Will you send on . . . kcs.? etc. I will send on . . . kcs. etc.

QSY Shall I change to . . . kcs. without changing the type of wave? Change to . . . kcs. without changing the type of wave.

FREQUENCY MEASURING TEST, SEPTEMBER 13TH

ARRL invites all amateurs to try their hand at frequency measuring. W1AW will transmit signals for the purpose of frequency measurement starting at 9:30 P.M. EDST (6:30 P.M. PDST), Thursday, September 13th. The signals will consist of dashes interspersed with station identification. These will follow a general message sent to help listeners to locate the signals before the measurement transmission starts. The approximate frequencies used will be 3510, 7050 and 14,027 kc. About 4½ minutes will be allowed for measuring each frequency, with long dashes for measurement starting about 9:36 P.M. It is suggested that frequencies be measured *in the order listed*. Transmissions will be found within 5 or 10 kc. of the suggested frequencies.

At 12:30 A.M. EDST, September 14th (9:30 P.M. PDST, September 13th), W1AW will transmit a second series of signals for the Frequency Measuring Test. Approximate frequencies used will be 3576, 7065 and 14,094 kc.

Individual reports on results will be sent to all amateurs who take part and submit entries. When the average accuracy reported shows error of less than 71.43 parts per million, or falls between 71.43 and 357.15 parts per million, participants will become eligible for appointment by SCMs as Class I or Class II OOs respectively.

This ARRL Frequency Measuring Test will be used to aid qualification of ARRL members as Class I and Class II observers. Present observers *not* demonstrating the requisite average accuracy will be reclassified appropriately until they demonstrate the above-stated minimum required accuracy. Class I and Class II OOs must participate in at least two FMTs each year to hold appointments. SCMs (see listing, page 6) invite applications for Class III and IV observer posts, good receiving equipment being the main requirement. *All* observers must make use of cooperative notices, reporting activity monthly through SCMs, to warrant continued holding of appointment.

Any amateur may submit measurements on one or all frequencies listed above. No entry consisting of a single measurement will be eligible for *QST* listing of top results; at least two readings should be submitted to warrant *QST* mention. Listing will be based on over-all *average* accuracy, as compared with readings made by a professional frequency-measuring lab.

TRAFFIC TOPICS

This is the annual call for net registrations and re-registrations. All nets who have not registered or re-registered their net data with ARRL since August 1 are urged to do so, so that their net will appear in the active file in the ARRL Net Directory. We keep a complete card of information on each net registered, filed alphabetically by name of net. There is also a card for each frequency, with nets

At the annual meeting of the Iowa Tall Corn Net (TLCN) in Marshalltown, Iowa, May 19, past and present managers of the NTS Tenth Regional Net, all of whom were present, posed for this group picture, with WØQVA. That's Dick, WØQVA, at lower left, long a leading traffic light in TLCN and TEN. Seated at right is WØAUL, the first TEN Manager. Behind him is WØSCA, second TEN Manager and presently TCC Director, NTS Central Area. To his right are WØITQ, third TEN Manager; WØDQL, fourth; and WØKJZ, present manager.

operating thereon listed, and a card for each state, Canadian province and U. S. possession containing the names of nets operating within state, provincial or possession boundaries.

Net registration cards (CD-85) are available to anyone on request. Use of these standard card forms makes the registration job easier for us, and easier for you too because just by filling in blanks you give us the complete info we need. However, without the card, here is the information we want (and we italicize the basic information we *must* have, without which no net will be registered):

(1) *Name of Net.* Please adopt an *official* name and stick to it, so we won't have to change it every time a new registration is submitted. (2) Net Designation, if any. This is the set of letters by which the net is known — used for net call-up on c.w., usually colloquially by phone nets. (3) *Frequency or frequencies.* If more than one, be sure you line up times and days with the correct frequencies. Give the exact frequency in kc. (4) *Days.* Tell us *which* days, not *how many. Daily* means *every day, including Sunday.* (5) Call of Net Manager. This is the amateur who organizes the net, arranges for NCS, conducts correspondence, etc. If these are not the same person, give us the call of the over-all boss. (6) *Net Starting Time(s).* Net Ending Time(s). Most nets do not have rigid ending times, so please indicate your *approximate* ending time, so we have some idea how long the net lasts. Use standard (not "daylight") time (or use GMT), and be sure to indicate your time zone by AST, EST, CST, MST or PST. If you change time or time zone, don't forget to re-register or otherwise notify us, so your card can be changed. (7) Direct Coverage. This is the extent of coverage provided by regular net participants and does not include coverage of nets with which liaison is conducted. (8) Purpose of Net. Indicate traffic, emergency, or both. If purpose is neither, leave blank. (9) Starting Date. If this is a new net, indicate the date it first went into operation. If a net that has recessed for the summer, indicate its fall starting date. If an old net, indicate the *year* it was founded. (10) NCSs. List them by call. They go on our mailing list to receive certain bulletins. (11) NTS? Indicate by "yes" or "no" if the net is part of the National Traffic System. (12) Liaisons. We'd like to know the names (or designations) of nets with whom regular direct traffic liaison is conducted. (13) Call of the amateur who submitted the information. Include the name if you want to, but be *sure* you indicate the call.

We are sorry we cannot search through bulletins, reports and miscellaneous correspondence for net registration information. If we come across it, we'll include it as possible in our net info, but to be *sure* your net is registered, make a special point to send us the information requested above (or use a form CD-85), and be sure to inform us of changes so our records will be kept up to date and accurate. First *QST* net list will be in the November issue. The annual cross-indexed net directory will be available for distribution on (hah!) December 15th.

— • • • —

For you early birds, we'd like to commend to your attention the Morning Watch, operating on 7080 kc. at 0600 EST daily, a net for traffic hounds, with the rallying call ARF. Chief watch dogs (NCS) are K2EQP, W3ZSX, W4IA and W4PL. Participation is open to all, and in June 52 different stations QNI'd. W4IA puts out a semi-humorous bulletin from time to time.

— • • • —

Transcontinental Relay Net reports 30 June sessions, five stations, traffic total of 2097. Transcontinental Phone Net for June had the following traffic totals: First Call Area, 445; Second Call Area, 717; Fourth, Ninth & Tenth Call Areas, 536; grand total, 1698. The Early Bird Transcon Net reports 520 messages handled in June.

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National Traffic System. As far as NTS is concerned, a section or regional net that meets only once per day is

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for June traffic:

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
W7PGY	20	1057	986	66	2129
W3WIQ	65	892	956	52	1965
W7BA	41	817	768	44	1670
W3CUL	63	787	601	176	1627
WØCPI	8	705	655	50	1418
W2KEB	43	570	386	163	1162
W3CVE	10	573	542	31	1156
W2KFV	11	568	390	147	1116
KH6QU	64	519	421	62	1066
WØSCA	17	524	519	2	1062
W9EHZ	16	515	472	44	1047
WØGAR	4	518	514	8	1044
W9SHR	4	513	509	2	1028
W4PL	10	474	413	37	934
W9DO	13	436	402	47	898
W7VAZ	90	395	231	166	882
W6DDE	112	367	357	10	846
WØBDR	22	391	328	9	750
W4UHA	8	355	332	6	701
W9NZZ	215	238	3	234	690
W7QKU	34	61	315	254	664
W5DTA/5	13	298	336	11	658
W8UPH	18	319	234	76	647
WØBLI	2	319	312	5	638
W9JYO	240	182	160	22	604
W3WG	10	279	242	41	572
WØKQD	42	282	233	2	559
WØLGG	37	274	240	3	554
KR6ME	328	110	26	84	548
W6GYH	270	157	86	33	546
K7FAE	62	233	217	16	528
Late Reports:					
W4COU	14	391	367	24	796
W4UHA	56	315	410	7	788

More-Than-One-Operator Stations

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
K7WAT	34	578	547	25	1184
K5FFB	25	349	335	22	731
KØFEI	15	281	269	12	577
Late Reports:					
KØFEI (May)	77	469	463	7	1016

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

VE1OC	143	KP6AK	120	Late Report:	
WØKJZ	140	W4DDY	116	W7VAZ (May)	120
KP4WT	131	WØNIY	106		

More-Than-One Operator Stations

Late Report:
W2CXM (May) 237

BPL medallions (see Aug. 1954 *QST*, p. 64) have been awarded to the following amateurs since last month's listing: W5FEC, W9WWJ, WØTVI, WØZWL.

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

only half a net. The flow plan is an essential part of the system, which calls for section net meetings at 1900 and 2200, regional meetings at 1945 and 2130. The late meetings are a part of the NTS ideal of having messages arrive at their destinations (or within delivery range therefrom) the same night they are originated.

The late meetings need not call upon the same group who participate in the early meetings. Get some new people, especially those who find 1900 or 1945 too early. Section and regional nets, re-establish your late sessions if they are not now functioning. If you can't do it on c.w., then do it on phone. Section nets, send one person with traffic to the early regional net, designate another to late regional to get traffic for section. Regional nets, send one person to area with traffic, designate another to take traffic out of area to late regional. Let's make a determined effort, as the fall active season approaches, to bring NTS into full bloom for the 1956–57 winter months, when conditions promise improvement over previous years.

June reports:

Net	Sessions	Traffic	Rate	Average	Representation (%)
1RN	25	243	0.55	9.7	86.3*
2RN	25	261	0.73	10.4	98.7*
3RN	36	141	0.80	4.0	61.1
8RN	41	136	—	3.3	80.5
9RN	30	785	1.77	26.2	96.6*
TEN.....	68	1405	—	20.7	57.9
TRN.....	12	45	0.58	4.0	58.3
CAN.....	21	823	0.66	39.1	100
PAN.....	20	696	—	34.8	97.5
Sections **....	468	2579		5.5	
TCC Eastern..	33#	337			
TCC Central..		903			
TCC Pacific...		556			
Summary-Total	746	8960	9RN	9.6	———
Record.....	746	8960	1.77	15.9	100

* Regional Net representation based on one session per night.

** Section nets reporting: Colo. S.S.; GSN (Ga.); SCN (Calif.); KYN (Ky.); MSN, MJN and Minn. Phone; CPN & CN (Conn.); TLCN & Iowa Phone; WVN (W. Va.); AENT, AENB & AENP (Ala.); Tenn. C.W.; QKS, QKN & QKS SS (Kans.); S. Dak. Phone; NTX (N. Texas).

TCC schedules reported, not included as net sessions.

Despite lack of reports from 4RN, RN5, RN6, RN7 and EAN, records again toppled in June; getting to be the rule rather than the exception. We attribute most of this, of course, to increased reporting from section level. June is customarily a poor month for traffic, as traffic men suffer the combined onslaughts of summer conditions and summer weather.

W1BVR has put out a very fine statistical summary of 1RN operation for the past ten months. W4AKW has awarded well-earned 9RN certificates to W9AA and W9UBI; Al is running for Kentucky SCM. WØKJZ has prepared a list of 103 stations who regularly QNI TEN: 27 from Minn., 17 from Iowa, 16 from Mo., 15 each from Kansas and Nebr., 6 from S. Dak., 5 from N. Dak., one from Manitoba. TRN reports discontinuation of late sessions and Saturday sessions for the summer, but is trying to maintain a Monday thru Friday status; VE2DR, VE3AUU and VE3BUR are mainstays for summer operation. CAN continues on its flawless way, with representation 100% and traffic always being cleared; W9YYG will run a Saturday session. W7NH reports for PAN Manager W7APF, who had an operation recently.

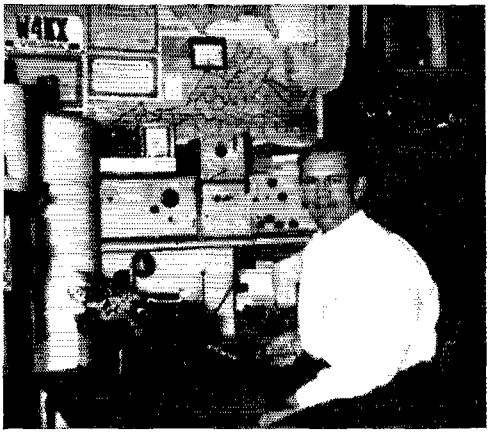
Transcontinental Corps: The loss of KØWBB and W2AEE to regular TCC work has put a big hole in the effectiveness of the corps while managers WØKQD and W8UPB struggle to find replacements at the worst time of year. Central Area TCC goes along as usual, with WØBDR and WØSCA holding the fort, and with *WØs* LGG KJZ DQL and *W9s* DO and CXY assisting. More details next month on the several openings available in Pacific and Eastern Area TCC.

BRIEF

All operators turning in top traffic totals for their latest reported work are credited in the Brass Pounders League. In making an outstanding traffic record they also make it possible for many other operators to upgrade their own traffic count. Teamwork from top to bottom, operators having time and serving as liaisons between the phone and c.w. nets in their sections and in TCC posts to shuttle traffic across time zones and between net systems — all have a part to play in making complete, fast and accurate relays to destination constantly possible. Most messages are relayed a number of times between originating points and destination. Independent nets offer good relay and delivery systems for the particular regions and areas in which they work. The ARRL National Traffic System is designed to tie together all the states and field organization sections.

MEET THE SCMs

John Carl Morgan, W4KX, recently reelected to serve as SCM of Virginia for another two-year term, was first licensed in 1926 with the call W3KU, which subsequently was changed to W4KX with the area reshuffling in 1946. He also formerly held portable call 3AEE. In addition to



W4KX

his Advanced Class amateur license he holds radiotelegraph 1st class and radiotelephone 1st-class tickets.

Seldom a high-scorer, John enters almost every type of contest sponsored by ARRL simply for the fun of it. He is an Assistant Director as well as an Official Relay Station and holds membership in the AREC, the A-1 Operator Club, the Rag Chewers Club, the Old Timers Club, the Rappahannock Valley Radio Club, and the Amalgamated Association of Ozone Sniffers. John also is a former vice-president and secretary of the Shenandoah Valley Radio Club. Several citations have been issued to him for his noteworthy work during hurricane, flood and tornado emergencies.

Transmitting and receiving equipment, in the basement shack, consists of a v.f.o. to a 6AG7 to an 814 p.a. running about 200 watts for operation almost entirely on 75 and 80 meters, and a BC-348Q with a Q5-er.

John does a bit of gardening and swimming (he once held a certificate as a Red Cross Water Safety Instructor) and claims the distinction of being probably the only ham who ever CQed and got a reply while submerged 90 feet under water in a submarine while on training duty in the Florida Straits in 1943. A former radio service man and truck driver and ship operator, serving on some sixteen merchant-ships from 1927 to 1934, SCM Morgan has worked in the broadcasting field in practically every capacity except musician at stations WTAR, WLAC, WSAP, WINC/WRFL (FM), and presently WFVA, where he is general manager and chief engineer.

CODE PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW will be made on September 14th at 2130 EDST. Identical texts will be sent simultaneously by automatic transmitters on 1885, 3555, 7080, 14,100, 21,010, 50,900 and 145,600 kc. The next qualifying run *from W6OWP only* will be transmitted on September 1st at 2100 PDST on 3590 and 7128 kc.

Any person may apply; neither ARRL membership nor an amateur license is required. Send copies of *all* qualifying

runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m., you may try later for endorsement stickers.

Code-practice transmissions are made from W1AW each evening at 2130 EDST. Approximately 10 minutes' practice is given at each speed. References to texts used on several of the transmissions are given below. These make it possible to check your copy. For practice purposes, the order of words in each line of *QST* text sometimes is reversed. To get sending practice, hook up your own key and buzzer and attempt to send in unison with W1AW.

Date	Subject of Practice Text from July *QST*
Sept. 4th:	*The International Geophysical Year*, p. 11
Sept. 7th:	*Twenty-Five Watts for the Beginner*, p. 15
Sept. 10th:	*Antenna Couplers for 50 and 144 Mc.*, p. 22
Sept. 12th:	*Keying the Radiotelegraph Transmitter*, p. 27
Sept. 18th:	*Eliminating 80-Meter Novice Harmonics*, p. 32
Sept. 20th:	*Multiband Operation . . .* , p. 42
Sept. 24th:	*The World Above 50 Mc.*, p. 59
Sept. 27th:	*Saving a Life*, p. 65

BRIEF

Attention code-practice stations: If you have not already filed your code-practice schedule information with ARRL, please do so *before* October, 1956, so that an up-to-date station listing may appear in *QST*. Convenient code-practice information cards may be obtained from the Communications Department upon request.

W1AW SUMMER SCHEDULE

(All times given are Eastern Daylight Saving Time)

Operating-Visiting Hours:

Monday through Friday: 1300–0100 (following day).

Saturday: 1900–0230 (Sunday).

Sunday: 1500–2230.

Exception: W1AW will be closed from 2230 Sept. 2nd to 1300 Sept. 4th in observance of Labor Day.

A local map showing how to get from main highways (or from HQ. office) to W1AW will be sent to amateurs advising their intention to visit the station.

Official ARRL Bulletin Schedule: Bulletins containing latest information on matters of general amateur interest are transmitted on regular schedules.

Frequencies in kc.:

C.w.: 1885, 3555, 7080, 14,100, 21,010, 50,900, 145,600.

Phone: 1885, 3945, 7255, 14,280, 21,330, 50,900, 145,600.

Times:

Sunday through Friday, 2000 by c.w., 2100 by phone.

Monday through Saturday, 2330 by phone, 2400 by c.w.

General Operation: Use the chart on page 87, May *QST* for determining times and frequencies for W1AW general contact with any amateur. Note that since the schedule is organized in EDST, the operation between 0000 and 0100 each day will fall in the evening of the previous day in western time zones.

Code-Proficiency Program: Practice transmissions at 15, 20, 25, 30 and 35 w.p.m. on Monday, Wednesday and Friday, and at 5, 7½, 10 and 13 w.p.m. on Sunday, Tuesday, Thursday and Saturday are made on the above-listed frequencies. Code practice starts at 2130 each day. Approximately 10 minutes' practice is given at each speed. Sept. 13th, Sept. 14th and Oct. 15th, W1AW will transmit certificate qualifying runs and a frequency measuring test instead of the regular code practice.

DXCC NOTES

Announcement is hereby made of the addition of Aves Island to the ARRL Countries List. This island is Venezuelan territory located in the Caribbean Sea approximately 275 miles north of the nearest Venezuelan land (Isla La Blanquilla), and about 330 miles from what could be considered the Venezuelan mainland (Isla de Margarita).

DXCC credit will be given for Aves Island starting November 1, 1956, for confirmations dated on or after November 15, 1945. This will permit foreign amateurs to start receiving credit at the same time as those in the U. S. A.

Do not submit Aves Island confirmations before November 1, 1956. Aves Island confirmations submitted before November 1, 1956 will be returned without credit.

DX CENTURY CLUB AWARDS

HONOR ROLL

W1FH....266
W8HGW...265
W6AM....265
W9NDA....260
W6VFR....259
W6MX....259
W6ENV....258
PY2CK....257
W6SYG....257
W8NBK...256
W3BES....256
W3GHD...256
W6DZZ....255
G2PL.....255
W2AGW...254
W3JTC....253
W8KIA....253
W7AMX...253
W3KT.....253
W6TT.....253

Radiotelephone

PY2CK....249
W1FH.....240
VQ4ERR...240
ZS6BW....237
W8HGW...231
GM3DHD...230
W9NDA...227
W1NWO...226
W9RBI....225
W3JNN....224
W6AM.....223

From June 15, to July 15, 1956, DXCC certificates and endorsements based on postwar contacts with 100-or-more countries have been issued by the ARRL Communications Department to the amateurs listed below.

NEW MEMBERS

HA5KBA..125
W6IDY....122
DL7CX....122
W4EO.....116
W7LVI.....116
SM5BAF...116
W4CYR....112
W8KAK....112
HB9MC....111
F9MS.....110
W6GMF....108
YU1AA....108
HB9OA....107
W2CUQ....105
YV5AO....105
W3ITW....104
K6EVR....104
W6BAG....104
KH6WW...104
W8TLL....103
OH2LX....103
ON4FU....103
W2BUI....102
W5BHV....102
W6WPI....102
W0CKC....102
VE7MD....102
DL6MU....102
JA1CJ.....102
W2FXO....101
K6ENL....101
OH2OJ....101
SV0WT....101
ZE3JL.....101
W1YRO....100
W7GXA....100
CR9AF....100
IT1ZGY....100
VE5GF....100

Radiotelephone

EA7EV....124
W2PUN....118
W6IDY....114
I1CBZ....114
W3HIX....112
W1RIL....109
DL7CX....107
SM5BAF...106
ON4RC....105
W2BYU....101
W4NZM...101
W3JTK....100
W4DCW....100
W4PYX....100
W8KPT....100
SM3EP....100

ENDORSEMENTS

W2HUQ....251
W5BGP....220
W8WZ.....220
W6NNV...217
W0AZT....205
W6EHV....202
KZ5CP....201
W5KUJ....200
G3BKF....192
W4QCW....191
W7ENW...191
W6CTL....190
FA8DA....188
W7ADS....184
I1AMU....184
W5MET...182
W1BIL....180
W1BLO....180
W1ZW.....180
W6JK.....180
OZ3FL....180
W3MFW...179
DL7AH....179
W8EV.....175
W3VKD....174
W2BYU....173
W6ID.....173
W6DBP....173
W9VP.....170
YU1AG....170
HB9MU....163
W8CED....162
W5DGV....161
W9UIG....161
W3MLW...160
W5HDS....160
W6BIL.....160
W9RQM...160
F8EJ.....160
W3VOS....151
PA0ZL.....150
VO3X.....150
OZ7SN....144
W6MUF....142
W5CFG....141
W2TWC....141
W2NOY....140
W4BQY....140
W5VIR....140
W6SIA....140
W0FNN....140
W2NUT....132
W1OJR....130
W8KZT....130
W9JUV....130
KH6ER....130
W6IPH....127
W2AYJ....122
W0VIP....122
G3VA.....122
W4KKG...121
W5ZZR....121
W8PHZ....121
W2STJ....120
W4GQE....120
W6EFR....120
ZL4CK....120
W3ZAL....116
K8CJQ....113
G3COL....112
W3EOB....111
W4JII.....111
W2VYX....110
K6BFC....110

Radiotelephone

W8GZ.....222
CN8MM...220
CT1PK....184
I1AMU....181
W6GVM...180
PY4VX....180
W7ADS....153
G3BID.....151
W3VKD....140
W4FPS....140
W4TO.....133
ON4DH....130
W4DOU....125
W4BA.....121
W4JGO....121
G4JW.....121
W2BRV....120
W2VYH....118

W/VE/VO Call Area and Continental Leaders

W4TO.....246
W5ASG....252
W0YXO....250
VE1HG....159
VE2WW...189
VE3QD....210
VE4XO....118
VE5QZ.....140
VE6VK....139
VE7GI.....212
VE8AW....181
VO6EP....190
ZS6BW....243
4X4RE....218
ZL2GX....252

Radiotelephone

W2BXA....203
W4HA.....201
W5BGP....218
W7HIA....185
W0AIW....201
VE1CB....120
VE2GQ....118
VE3KF....163
VE5YE....140
VE7ZM....163
ZL1HY....205
ZL2GX....205
OD5AB....170

(*No. 20 of a Series*)

An Automatic QNZ

WE HAVE previously discussed receiver improvements which have occurred in the last few years, and this month we present another idea — while not new — that we believe is of interest to most hams.

HOW would you like to have your transmitter V.F.O. automatically operate at zero beat with the station you are receiving? It's really a rather simple circuit arrangement. In all superheterodyne receivers the tunable high frequency oscillator is at a constant difference in frequency from the desired incoming signal, and generally on the higher frequency side.

HENCE, if some of the receiver high frequency oscillator power was brought out and mixed or heterodyned with a second signal source, whose frequency was equal to the first i.f., the resultant new signal would be identical to the incoming signal. Thus, a black box consisting of an oscillator, converter and amplifier, could be added externally to almost any receiver for replacing the V.F.O. of the transmitter.

SINCE in single conversion receivers the oscillator is only about 500 kc. away from the signal frequency, a number of tuned circuits would be required in the black box to select the desired output frequency. However, with a modern dual conversion receiver the black box is somewhat simplified as the beating frequencies are about 1650 kc. apart and thus few tuned circuits would be required to eliminate the unwanted beat.

A WORD of caution is in order at this point. In most manufactured receivers extreme care must be exercised when adding any coupling device to the high frequency oscillator circuit. A slight increase in capacity reflected across the oscillator tank circuit will obviously require a realignment of the receiver so accurate frequency calibration is maintained. The additional capacity may also to some extent degrade the temperature compensation.

CARE must also be used to maintain the original injection voltage to the converter to prevent reduction in sensitivity. However, these points are not unsurmountable for many skilled amateurs to achieve.

A COUPLING tube for the oscillator output voltage is almost mandatory. This tube should be located very close to the oscillator.

THIS is just one of the many ideas devoted to amateur radio which are investigated by our laboratories. Some never get off the ground because of technical defects, or appeal only to a very, very narrow segment of the amateur market. Sometimes we think they are so good we simply build a whole new receiver or product around them.

Why not drop us a line and give us your comments?

73

— CY READ, W9AA

Bill Halligan Jr. W. J. Halligan W9AC for hallicrafters

• All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

ATLANTIC DIVISION

EASTERN PENNSYLVANIA — SCM, Clarence Snyder, W3PYF — SEC: NNT. RM: AXA. PAM: TEJ. Nets: 3610 and 3850 kc. NNT reports that very few Emergency Co-ordinators are sending reports to him at the end of the month. Please advise him of your activity in AREC monthly. If your county has no Emergency Coordinator why not volunteer for the job. There is a big job to be done and only by good organization can it be accomplished. ZRQ is going 2-meter mobile with a Communicator. CUL made BPL again in June and is sporting a new air conditioner in the shack. NF reports he worked his brother, 1NJM/m, while George was mobiling in VE3-Land. 1NJM/m was on c.w. while mobile. WUE has a new QTH. BHC has a new all-band final for u.h.f. with a pair of 4-65As. Two new operators in the Lancaster Area include CMN and FLW. CSP operated portable 2 in Stone Harbor, N. J., during June. EEN has a new SX-100. SMC, ARK and OCG entered the May F.M.T. All OBS appointees are requested to forward their new skeds to the SCM as soon as possible. York County is working on a RACES plan through the cooperation of all York County radio clubs. EAN visited 6KZX in California during June. GZR has a new SX-100. NNT now is mobile with an Elmac transmitter and receiver. MAC now has emergency power to help in his emergency work. 2PT is operating under the call 3BEP from North Bangor for the summer. From the reports received here, Field Day was a big success in all the clubs in the section. Most complained of the heavy thunder storms but as a whole all had a good time. DHJ is now s.s.b. in his mobile. Northampton County now has a RACES plan. PYF is Radio Officer. Traffic: W3CUL 1627, TEJ 203, BHC 105, OK 91, DHJ 82, CSP 48, NF 48, GIY 40, ZRQ 38, BNR 27, BFF 18, PYF 18, OGD 17, AXA 16, NQB 15, CNO 13, WUE 12, EAN 9, DUI 7, BES 2.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA — SCM, John W. Gore, W3PRL — UE reports 3RN still operating 3 sessions Mon. through Fri. despite summer conditions, vacations, etc. CVE had a chance to give his emergency-power unit a good workout on Field Day and it perked O.K. WAF now has a 2-meter Communicator. CDG reports FVK has a new 50-foot crank-up tower for the 2-meter beam, also that DKM's 3-band trap beam works FB. BRS has a 2-meter Communicator. AHC and JOR have new ground-plane antennas for 10 meters. The Boonsboro High School Club now has a club call, HHZ, with ZGN as trustee. ZSR now is on all bands with 75 watts. BWT reports that the Novice portion of the Washington Radio Club Field Day group participated in great style and the fellows are quite enthusiastic as to what they will do next year after their first experience this year. Emzie CDQ stayed throughout the session. K3WCO is the call of the club station of the 69th Signal Battalion, Fort George G. Meade. A BC-610E is QRV on all bands 80 through 10 meters, and a Globe Champion is QRV on 80 and 75 meters. The antenna farm consists of doublets on 75, 40 and 20, a Sterba Curtain for 20 and a vertical on 40 meters. A Windom also works out well on 75, 40 and 20 meters. A two-element 10-meter and a six-element 2-meter beam complete the antenna group. The station participates in the Mike-Farad Net and is NCS for Thurs. The four operators are Mac K2MAX, Ben OBV, Carl W4TCL and Al, who has passed his examination for General Class ticket. The station is open daily from 0700 to 1700 daily and usually 1800 to 2100. Visitors are welcome. Traffic is handled on both the ham and MARS bands. K2MAX is chief operator. The ARA set up its Field Day site at Big Flat, 7 miles southeast of Shippensburg, Pa. Of the 27 members participating, 25 stayed for the full period. 80, 75, 40 and 20 meters, both c.w. and phone, and 15, 10 and 2 meters, phone, were in operation. CVE still is very active in handling traffic to and from Little America. The "Waylare" YL group of the Washington Area, under the guidance of Ethel, MSU, is getting under way in grand style and its calendar indicates a schedule of activities that can only mean a greater acceleration of progress. Traffic: W3CVE 1156, WG 572, KL7BPG/W3 227, W3BUD 171, UE 93, ZGN 57, PRL 54, UCR 51, PKC 40, W5RVI/3 40, W3PQ 27, TN 25, COK 17, OYX 12, ZSR 10, NNX 6, BKE 4, CDG 4, HKS 2.

SOUTHERN NEW JERSEY — SCM, Herbert C. Brooks, K2BG, — SEC: YRW. PAM: ZI. EBW, Julie, had the top score in the section in the recent YL-OM Contest. K2DSL, Bunny, also did very well in the contest. Field Day is now past and plans are being made for next year. Many thanks to the SJRA, BCRC, HTRC and DVRA for their reports from the Field Day sites. SJRA celebrated its fortieth anniversary this month. Many of the original members were present, including the club's first president. The entire program was recorded for future enjoyment. Your SCM visited the Salem County Radio Club recently. RG continues to work DX with his transistor rig. Fifteen states have been worked on 7 Mc., plus VE2 and VE3. K2JGU has TVI troubles which he hopes to eliminate very soon. Hal is doing a fine job on the phone traffic nets. MLW, New Jersey Net Manager (3695 kc.), has issued a very fine bulletin. K2CWJ, K2CPR and VX participated in the recent Frequency Measuring Test. We hope to appoint K2HPV, Pennsgrove, as OBS for Salem County in the near future. K2QXV, Northfield, is stationed at the Naval Air Station, Atlantic City. Many AREC forms are being received and will be forwarded to our new SEC, YRW. PVE, Pleasantville, a new AREC member, is an ex-radioman in the Navy. All appointees are requested to report their activities each month on Form 1. No news was received from the Southern Counties Radio Club or the Tri-City Radio Club. Traffic: W2HDW 147, RG 139, K2EWR 119, JGU 82, W2ZI 26, BZJ 11, K2BG 7, CPR 2.

WESTERN NEW YORK — SCM, Edward G. Graf, W2SJV — SEC: UTH/FRL. RMs: RUF and ZRC. PAMs: TEP and NAL. NYS C.W. meets on 3615 kc. at 6 P.M.; ESS on 3590 kc. at 6 P.M.; NYS Phone on 3825 kc. at 6 P.M.; TAR on 3570 kc. at 4 P.M.; NYS C.D. on 3509.5 and 3993 kc. at 9 A.M. Sun.; TCPN 2nd call area on 3970 kc. at 7 P.M. SRPN on 3980 kc. at 10 A.M.; ISN on 3970 kc. at 3 P.M. Officers elected by the Chautauqua ARS are K2LBS, pres.; K2SPD, vice-pres.; GRB, secy.-treas. CTQ demonstrated RTTY at a meeting. A new jr. operator arrived at the QTH of DUC. PTC is conducting classes in Cataraugus and Randolph High Schools for RACES operators. RACES plans have been approved for the City and County of Oneida and for Ontario County. CXM made BPL in May when a station was set up for "Engineers Day" at Cornell U. K2HWW is active on 20 meters. RMB demonstrated RTTY at the SARA's May meeting. K2QQO is on 15 meters. Corning has a 6-meter local net. K2s BHP and GWG and W2s YPQ and WZM have a round-table QSO on 10 meters while going to work. New officers of the RARA are PFI, pres.; ZS, vice-pres.; and QGL, secy.; ZHB, treas. WUB gave an interesting talk and demonstration to the RARA on the new Harvey-Wells equipment. New officers of the RARA DX Assn. are BJH, pres.; MA, vice-pres.; and QJM, secy. The DX 'Fest was held at MA's cottage. 1NJM, ARRL NEC, addressed the RARA on Emergency Communications. The Ontario and Western New York V.H.F. Convention was held at Lockport with WFB giving a talk on "How to Operate Aurora and What to Expect," with results of meteor tests and scatter effects on 2 and 6 meters. The IPN has suspended operations for the summer. SRPN time is 1100 hours for the duration of Daylight Saving Time. PZJ now is K9DIZ. JZK gave a talk on Transistor V.F.O.'s before the SARS. NWD received an NYS C.W. Net certificate. Traffic: (June) W2RUF 291, K2IYP 164, LSF 164, W2ZRC 146, K2CUQ 71, W2OE 45, COU 10, FEB 10. (May) W2CXM 249, COU 5. (Apr.) W2COU 23. (Mar.) W2COU 4.

WESTERN PENNSYLVANIA — SCM, R. M. Heck, W3NCD — SEC: GEG. RMs: NUG and GEG. PAM: AER. The Steel City ARC reports that AYY and TQK cleaned the club-house windows. Things should be looking brighter at KWH. APN has a 15-meter converter in the car. SDV is getting DX on 15 and 40 meters. UHM moved into the house and is starting an antenna farm. OKU is s.s.b. LOR has a new NC-300. NKM has on order a new 40-foot crank-up tower. The South Hills Brass Pounders and Modulators reported an enjoyable Field Day even though the weather was very trying on the nerves. QNI is about ready to get on s.s.b. YCT has a 2-watt mobile in the car. LDB is building a new rig for the car, and also is going mobile as VKS. SIR has a new T-90 in the shack. WFR was mobile during vacation in Canada. KWY has a new Elmac in the bus. The Breeze Shooters Net, SJK, president, meets Mon. at 9 on 29 Mc. YIT is the first NCS

(*Continued on page 84*)

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Loaded with features . . . packed with plenty of power . . . Viking transmitters are "first choice" for amateurs the world over. Designed strictly for amateurs, the complete Viking transmitter line is sure to contain a unit with the features you want at the price you want to pay!

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Truly professional in appearance, Viking transmitters are styled for beauty as well as functional design. Sturdy steel cabinets are finished in handsome maroon and grey with attractive green nomenclature. Meters are easy to read . . . rugged phenolic knobs are equipped with heavy, integral molded brass inserts.

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Packed with only the highest quality components, Viking transmitters are engineered for outstanding flexibility and performance. Revolutionary circuit designs have often been copied . . . but never equalled for dependability and features.

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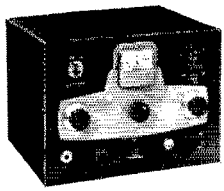
Amateur radio is lots of fun! And the fortunate amateur who owns Viking equipment enjoys the maximum amount of operating pleasure and performance. Owning a Viking means more than just having the best transmitter . . . it means more than the DX record you build; it means that your station has arrived! For effective, practical design and honest dollar value, Viking transmitters stand ahead of all others . . . the big "J" on the front panel tells you beyond a doubt whether you choose the "Adventurer" as your first transmitter, or the fabulous "Kilowatt" as the "last word," that your transmitter dollar is soundly invested.



50 watts CW input . . .band-switching 80 through 10 meters!

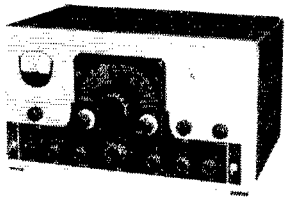
VIKING "ADVENTURER"—An ideal CW transmitter for the beginning amateur . . . the perfect standby transmitter for the experienced amateur. Effectively TVI suppressed . . . built-in power supply! Easy to assemble and operate — packs enough power for world-wide contacts. Wide range pi-network output tuning — no antenna tuner needed. Complete with tubes, less crystal and key.

Cat. No. 240-181
Kit . . . . . **$54.95** Amateur Net

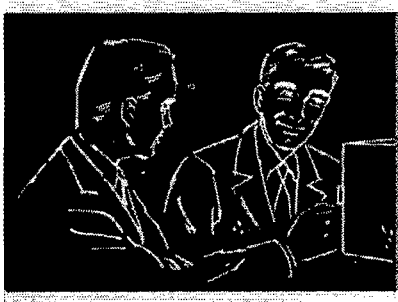
VIKING "VALIANT" — Built-in VFO or crystal control. Pi-network antenna matching from 50 to 600 ohms — final tank coil silver-plated. Timed sequence, break-in keying . . . TVI suppressed . . . high gain push-to-talk audio system . . . low level audio clipping . . . built-in low pass audio filter. As an exciter, will drive any of the popular kilowatt level tubes. Complete with tubes, less crystals, key and mike.

Cat. No. 240-104
Kit . . . . . **$349.50** Amateur Net

Cat. No. 240-104-2
Wired, tested. **439.50** Amateur Net
*P.E.P. input with auxiliary SSB exciter.



275 watts CW and SSB... 200 watts phone! Band-switching 160 through 10 meters!*



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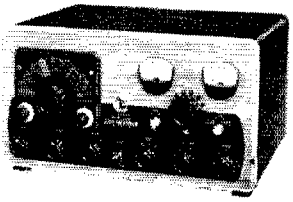
...the complete transmitting line!



600 watts CW . . . 500 watts AM and SSB. Bandswitching 80 through 10 meters!*

VIKING "FIVE HUNDRED" — A complete 500 watt transmitter . . . VFO and all exciter stages gang-tuned! Two compact units: RF unit is small enough to place on your operating desk beside your receiver. Built-in VFO or crystal control . . . effectively TVI suppressed . . . high gain push-to-talk audio . . . timed sequence, break-in keying . . . low level audio clipping. Complete with tubes, less crystals, key and mike.

Cat. No. 240-500
Kit . . . . . **$649.50** Amateur Net

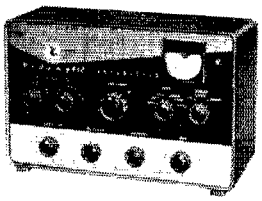
Cat. No. 240-500-2
Wired, tested . **799.50** Amateur Net
*P.E.P input with auxiliary SSB exciter.

(Prices subject to revision at time of delivery)

VIKING "6N2" — New for VHF! Designed for use with the Viking "Ranger," Viking I, Viking II or similar power supply/modulator combinations capable of at least 6.3 VAC at 3.5 amp., 300 VDC at 70 ma., 300 to 750 VDC at 200 ma. and 30 or more watts audio. Operates by external VFO (with 8-9 mc output) or built-in crystal control. All circuits metered. Complete with tubes, less crystals, key and mike.

Cat. No. 240-201
Kit . . . . . **$99.50** Amateur Net

Cat. No. 240-201-2
Wired, tested. **129.50** Amateur Net
(Prices subject to revision at time of delivery)



For 6 and 2 meters! 150 watts CW input . . . 100 watts AM!

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For unusual engineering and technical employment opportunities . . . write to our engineering department.

75 watts CW input . . . 65 watts phone! Bandswitching 160 through 10 meters!

VIKING "RANGER"—Effectively TVI suppressed . . . completely self-contained. Serves as a transmitter or an RF and audio exciter for high power equipment. Extremely stable built-in VFO or crystal control . . . 100% AM modulation . . . high gain audio. Pi-network antenna matching from 50 to 500 ohms. Timed sequence, break-in keying. No internal changes required to switch from transmitter to exciter operation. Complete with tubes, less crystals, key and mike.

Cat. No. 240-161
Kit . . . . . **$214.50** Amateur Net

Cat. No. 240-161-2
Wired, tested . . . . . **293.00** Amateur Net

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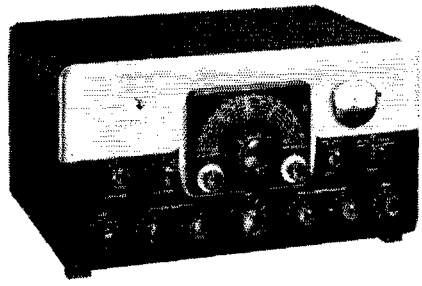
. . . the complete transmitting line!



90 watts CW and SSB* . . . 35 watts AM. Bandswitching 80 through 10 meters!

VIKING "PACEMAKER" — More than just a single sideband exciter . . . a completely self-contained transmitter as well. Extremely stable, temperature compensated built-in VFO. "Foolproof" voice controlled operation . . . effectively TVI suppressed . . . completely self-contained. Pi-network antenna matching from 50 to 600 ohms . . . plenty of power to drive conventional or grounded grid kilowatt power amplifiers. Complete with tubes and crystals, less key and mike.

Cat. No. 240-301-2 Wired, tested
. . . **$495.00** Amateur Net

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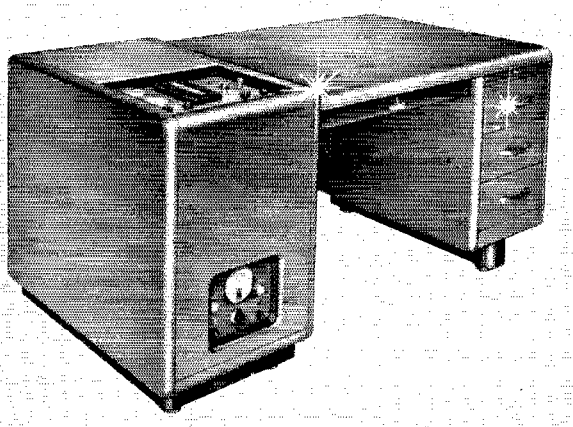
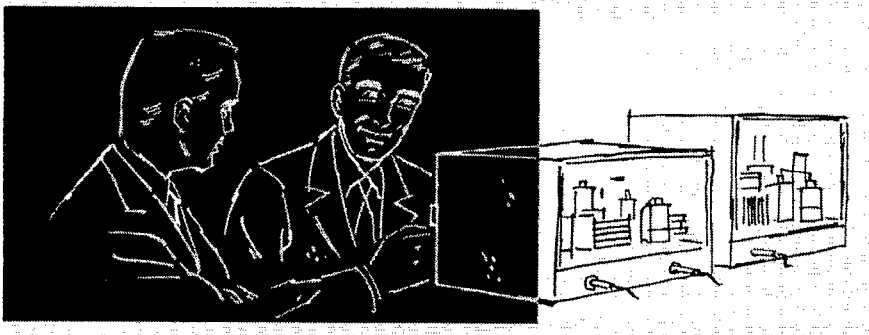
1,000 watts AM, CW and SSB!



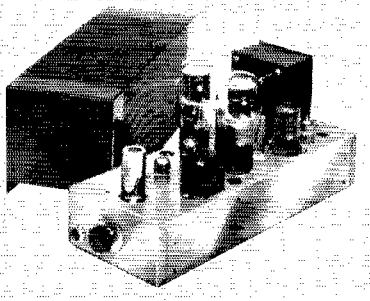
VIKING "KILOWATT" — Boldly styled — contains every conceivable feature for safety, operating convenience, and peak performance. Low power or maximum legal input with the flip of a switch. Continuous tuning 3.5 to 30 mc — no coil change necessary. Compact pedestal contains the complete Kilowatt — rolls out for adjustment and maintenance. Excitation requirements: 30 watts RF and 15 watts audio for AM; 2-3 watts peak for SSB. Completely wired and tested with tubes.

Cat. No. 240-1000
$1595.00 Amateur Net

Cat. No. 240-101-1
Matching accessory desk top and 3 drawer pedestal, F.O.B. Cory, Pa. **$123.50**



For more effective AM power!



JOHNSON AUDIO AMPLIFIER — A self-contained 10 watt speech amplifier, complete with power supply. Speech clipping and filtering designed to raise average modulated carrier level . . . improves the performance and effectiveness of your AM transmitter. Inputs provided for mike or line. Complete with tubes.

Cat. No. 250-33
Kit . . . . . **$73.50** Amateur Net

Cat. No. 250-33-2
Wired, tested . . **99.50** Amateur Net

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(*Continued from page 80*)

at the new time. ZCP is mobile with an ST-203 and a Gonset. RUZ has a 54-H and Super Six. WDUQ/FM gave a boost to ham radio on May 27th with ZSP, UUH and SDV participating. 3BOA/3 participated in Field Day with all teen-agers as operators. EUL used one less rectifier than *QST* in the mystery box. KLP is experimenting with several whips on the car. APN has a 28-Mc. Minibeam. K6LCW is trying for a BSN certificate with 3 watts. Field Day was unsuccessful locally. The Radio Association of Erie has been granted a change in the station call from LTK to W3GV, in memory of the late Dawson Bliley, who was one of the club's founders. VNC reports the c.d. gear is installed in the Comtruk. LKJ is working on the 75-meter antenna for same. New officers of the RAE are VNC, pres.; BFB, vice-pres.; LSS, secy.; UQG, treas.; and STK to fill the director's post vacated by TXZ. Ex-9DFX is now 3HAO and is living in Monessen. Traffic: W3WIQ 1965, YUL 67, ZEG 45, YA 12, LSS 10, UTR 3, UHN 2, BZR 1.

CENTRAL DIVISION

ILLINOIS — SCM, George T. Schreiber, W9YIX — SEC: HOA. Cook County EC: HPG. RM: BUK. PAM: UQT. Section nets: ILN, 3515 kc. Mon. through Fri.; IEN, 3940 kc. K9AMD is proud of her A-1 Operator Club certificate as well as the B&W 5100 and HRO-60 her dad, VEY, gave her. GSB has returned to the air after a long absence with a new Ranger and an old HRO. Field Day messages this year were ahead of last. Messages were received from the following portables: AP, AWE, BA, BQC, CLI, EJP, ERU, FAU, FEX, IAY, ILS, KAL, NGI, OEY, OFR, OUI, PCQ, PCS, SW, TFA and VT. The latter is the new call of the Tri-Town Radio Amateur club. A certificate of merit was awarded to ZRF, who served for more than two years as Radio Officer for the Chicago c.d. set-up. The Chicago Area Radio Club Council recommended SPB to succeed him. YLRL's new officers are MXI, KN9CQF, STR, and KN9BOC. New officers of the LARK are LDK, UON, IWP, YWH, BCB and ULN. Both groups jointly visited with 1QON, on *QST*'s staff, who passed through Chicago recently. JVI, the son of PHE, now is stationed in Alaska. AA has improved his break-in and now has more power on the air. The ILN gang said so long recently to K9CFJ, who left the C.A.A. in Chicago for an airport tower job in Sioux Falls. He has applied for his old call, ØSIR. FNX has a new DX-35 and his first DX contact was a ZL. KJ built a 65-foot wooden tower and now wonders how he is going to raise it. It looks beautiful on the ground. Speaking of new sticks, ZOG now has his 2-meter beam on top of an 85-foot pole. K9AXL writes he is considering a 1000-foot antenna built between two hills and an average of 20 feet above the ground. The following clubs have been awarded affiliation with ARRL: The Montgomery County Amateur Radio Emergency Corps, the Kankakee Area Radio Club, and the Rochelle Township High School RC. ZEN made a yachting trip down the Illinois and Mississippi Rivers, but no ham radio. Officers of the Tri-Town Radio Amateur Club are YVM, CNF, BSF, ABI, KKN and FRZ. The Central Division Convention plans for 1957 are going great guns. QKE has been appointed general manager and is working like a demon. What happened to the news this month, fellows? Weather too hot or vacations? Traffic seems to be off, too, the only ones making BPL this month were SHR and DO. Incidentally, DO lost his crown for the first time when his point total was topped by SHR. (See below.) Traffic: (June) W9SHR 1028, DO 898, MAK 366, YYG 250, DUA 207, UBI 125, YIX 114, AA 91, BUK 54, VEY 50, WJQ 49, K9AMD 46, W9ICF 46, K9AXL 36, W9SXL 36, FAW 22, LL 21, STZ 21, OYL 15, K9AUB 14, W9FRP 8, PCQ 5, PHE 3. (May) W9ICF 259, AA 173, K9AXL 22, AMD 15, W9EHY 11, K9ACH 4, W9VEY 3.

INDIANA — SCM, Seth Lew Baker, W9NTA — Asst. SCM: George H. Graue, 9BKJ. SEC: QYQ. RMs: DGA, JBQ, TQC and UQP. PAMs: CMT, EQO and UXK. Appointments: URQ as EC for Gibson Co., FHA as OES, and EJW as OPS. LFN has an SX-99. New calls: KN9DPN Columbus, KN9DRP Kewanna, KN9DSG Culver. EQO reports IFN evening traffic as 271, morning 420, total 691. UQP gives QIN as 187. RFN had 87 reported by TT for TQC, who is on vacation. EHZ reports 794 for CAEN. YBE has a 1st-class commercial ticket. A picnic was held at Bedford in honor of K9AMD, Carole, who is an A-1 Operator from Illinois and NCS of the net after the net. Her parents are VEY and K9AXS. WHL and his XYL, Mary, were hosts to about 40. Boat rides were given by WHL and QYQ. Those making BPL were EHZ, NZZ (No. 64), and JYO, who has earned the medallion. LDB has a bicycle mobile running 2 watts. LBD has an appointment to the Indiana State Police and will be stationed in the Dunes Park District. WLY has 48 states. UWU won a scholarship to M.I.T. BKJ furnished communications for the Boy Scout Camporee. NZZ comments that 20-meter conditions for Arctic traffic are bad. CMT operated portable while in Chattanooga on vacation. JGS has the 10-meter beam back up after reconstruction and is building a 4-250A final. EJW is Asst. EC for Marion Co. and has a new DX-100 on the air. KN9AVH has 34 states worked and 26 confirmed, plus some DX. YZO has a 75A-3 and a 32V-3, also 10-meter mobile. DKR is installing a PE-104 and an Elmac in the car. KTX has 1- and 5-kw. power units. Field Day messages were received from MYI/M, EZS/M, TWA/M, YWF/M, CZI/M, CSV/M, JP/9, SWC/9, JCF/9, VFW/9, REG/9, ATS/9, DUC/9, LIT, FGF, EHE, K9CQA/9, and K9AVO/9. A letter was received from DPE, who formerly operated K9FCN. Bill is now CN8JO in Morocco with Collins equipment running 100 watts on 15 meters to a rhombic and would like skeds. TGH is building an s.s.b. rig at DePauw. PFO, editor of the *Bison*, would like news as she must have contacts over the entire State for good coverage. Traffic: (June) W9EHZ 1047, NZZ 690, JYO 604, ZYK 478, EGQ 442, EQO 370, TT 216, UKX 165, SVZ 153, DGA 133, SVL 133, JOZ 132, TQC 128, UQP 112, SWD 96, KTX 74, DHJ 61, BKJ 53, NTA 52, LGD 43, VNV 36, AB 33, QYQ 33, PQZ 32, DDT 20, EGV 17, WHL 17, WTY 12, CC 11, WAU 10, DKR 9, JGS 9, BDP 8, DOK 8, QR 7, BUQ 6, CMT 6, YVS 6, RZS 5, BVR 4, EJW 4, HUF 4, IGZ 4, KN9AVH 3, W9DZC 2, LIT 2, ZSW 2. (May) W9EHE 42, FGX 8, LDB 3, AMW 1, WLY 1. (Apr. W9FGX 10).

WISCONSIN — SCM, Reno W. Goetsch, W9RQM — SEC: OVO. PAMs: AJU and NRP. RMs: KQB and BVG Nets: WIN meets on 3535 kc. at 7 P.M. daily; BEN on 3950 kc. at 6 P.M. daily; WPN at 1215 Mon.-Sat., 0930 Sun. Wisconsin mobile and c.d. frequency: 29,620 kc. CXY took part in Armed Forces Day and Field Day operation, and is TCC for CAN/EAN. KQB received a WAC certificate (all on 7 Mc.) and now has 71 worked with 57 confirmed. MCK is active on 9RN, WIN and CAN. SQM worked his first KL7 on 7Mc. NHE has 100 watts to an 829 on 50 Mc. with a 5-over-5 beam. CFN is conducting a code class for the WVRA this summer. A few counties still do not have Emergency Coordinators or RACES representation. Contact OVO, the SEC, for further information. BCC and HQJ handled communications for the American Legion Picnic on July 4th. CFW has a new NC-300. BCC has a new DX-100. K9ASW received his General Class ticket and is keeping the 300-watt 813 rig at Marquette U. (ODD) active. ZKB is trustee of DWR (Wash. Jr. High School) and the rig is a pair of 807s at 75 watts. CQR is looking for DX with his AT-1. UIV has a transistor transmitter. BIH and IDL are active on 75-meter phone. NJB left for W6-Land. KXK picked up a couple of new ones in XE4A and YVØAA. FCF is QRL building a new house and chases DX with what little spare time is left. NUW, SWQ, BMR, 8LON, UDU, DSP, TCH, HDJ and EWC were active in Field Day. CBW had an accuracy of within .00003 per cent in the May F.M.T. AEM found it necessary to relinquish OO activity because of the press of other activity. A certificate (WIN) was issued to MCK. Please note the change in the frequency of WIN to 3535 kc. REQ vacationed at a cottage in JQP's resort near Three Lakes. Traffic: W9CXY 349, KQB 137, MCK 97, SAA 54, EIZ 26, SQM 15, AZN 11, NUW 9, RTP 9, NHE 6, RQM 6, CFN 4, OVO 3.

DAKOTA DIVISION

NORTH DAKOTA — SCM, Elmer J. Gabel, WØKTZ — Another FB hamfest is history. ARRL was well represented with President TSN the main speaker, Dakota Division Director PHR and Iowa SCM BDR in attendance. Russ and his XYL spent a week in our fair State visiting FVG, DTX, ECX, HWD and KØBEA. Winners of the main prizes were ORU, an NC-300; GWJ, an Elmac transmitter, KØBEA a portable TV and VSK, who hit the jack pot, winning the pre-registration prize and fine prizes for each member of the family. TKX won the convention c.w. contest, KØCNC the state, and KNØCXJ the Novice. ECG and POT arranged furloughs for the annual event. HNV worked 21 states on 6 meters in less than a month. KØCND is back on phone with a home-brew modulator and Adventurer. Thanks, Kirk and Bruce, for the station activity reports. KØATK installed a new Gonset G-66 receiver in his new Mercury just in time for his vacation in Michigan. Traffic: (June) WØFVG 42, KTZ 9, IHM 1. (May) WØFVG 12, KØADI 19, WØIHM 12, KTZ 11, KLP 8, KØCND 6.

SOUTH DAKOTA — SCM, Les Price, WØFLP — SCM assistants are APL, YKY, HOH, GQH, FKE, RMK, TI, MZJ, and GDE. PAM: UVL. RM: SMV. The 75-meter Emergency Net, RMK as NCS, had 28 sessions: RMK called 11, OII called 10, SCT called 7; QNI 444, high 24, low 0, average 15.5; QRC 64, high 8, low 0, average 2.285; informals 40, high 7, low 0, average 1.428. ELV reports the PDARC had 24 amateurs, 18 AREC and 3 logging operators on Field Day, with 4 stations on 40, 20, 15 and 75 meters. Father Fededia reports the Huron ARC had 35 members on for Field Day, 11 ECs. BLK reports the Black Hills ARC operated Field Day from a site northwest of Rapid City with 2 transmitters, 20 operators and 20 ECs. EQV reports the Signal Hill ARC worked Field Day from Mt. Roosevelt, near Deadwood, with 10 operators, two transmitters and two receivers with 100 watts, using only one at a time. A new Vermillion licensee is KNØGJV. K5EEV stopped at Centerville in June. DTB, of Centerville, was married to Shirley Ebsen, of Beresford, June 11th. DTB is

(*Continued on page 86*)

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working for IBM Co. of Sioux Falls. On June 4th and 19th the PDARC handled parade traffic with amateur radio. DCG went with Western Electric Co., of Winston-Salem, N. C., as technical representative. Traffic: WØSCT 154, CTZ 17, FLP 12, DVB 9, GWS 2, QKV 2.

MINNESOTA — SCM, Charles M. Bove, WØMXC — Asst. SCM: Vince Smythe, ØGGQ. SEC: GTX. RMs: KLG and DQL. PAMs: JIE and LUX. VBS is working for Univac for the summer. The next Dakota Division Convention will be held in St. Paul May 23, 24 and 25, 1957. This convention is going to top all previous conventions in entertainment and prizes. There also will be an initiation into the Royal Order of the Wouff Hong. VBD was operating portable zero at Lake Washington. The wind wrecked a perfectly good 20-meter beam for MXC during the recent Field Day activities. WDW was the first Minnesota contact in the Vermont QSO Party. DQL has sold his SX-28A and has acquired an HQ-129X. UYJ and BUO flew to the ARRL National Convention in San Francisco. According to KJZ there was an attendance of 25 YLs registered at the recent YLRL Convention. The SCM of Iowa, with his lovely wife, paid a visit to the Minneapolis Radio Club and was made an honorary member of this club. Russ is the leading traffic-handler in Iowa. KLG, of Dassel, also attended the same club meeting and was presented the Minneapolis Radio Club WØFDS Trophy Award. The presentation was made by ITQ. This trophy is presented every year for meritorious contribution to amateur radio. If you know of anyone in the Minnesota section who has made any outstanding contribution to ham radio write in detail what he has accomplished, with his name, call and address and present it to the Minneapolis Radio Club, Inc., for evaluation. The Minnesota Section Net has appointed RLQ as its new net manager. The MSN/MJN held their annual net party at the home of QXA and QXF in Minneapolis. A wonderful time was had by all who attended. Traffic: WØKJZ 402, DQL 350, KLG 177, TUS 168, ALW 87, HGH 51, WDW 51, QRJ 46, GTX 37, WMA 37, UMJ 29, MXC 24, KFN 22, LST 22, QVR 22, RLQ 22, QDZ 13, QXF 13, LUX 12, TCK 12, UMX 12, VJS 12, KNR 11, KXW 9, KØFCU 7, WØNTV 4, OPA 4.

DELTA DIVISION

LOUISIANA — SCM, Thomas J. Morgavi, W5FMO — If you have not sent in your certificates for endorsement, check the expiration date and do so as soon as possible. FKA has been laid up but is back and active on 75 meters. TUL now is mobile. K5BGG and DTL now have Elmacs in their cars. PKY is vacationing in Texas. ZSP reports that in addition to s.s.b. he also operates 2 and 6 meters. His XYL, KN5DEQ, is working for her Tech. Class license. WQX is active again after 13 months of inactivity. TFQ, Jefferson ARC pres., is active on all bands and snagging DX on 20 meters. FTW is on the air again after a 13-year lapse with a Viking Ranger and an SX-25. K5AIE complains that no Field Day was held at Minden. KC spends his time on 20 and 15 meters trying to increase his country list. JFB now is in YV-Land. IIM and QQK are sporting new jr. operators. NDV reports activity in NTS, TXN and MARS with a good traffic count. EA has settled down in Monroe with KNOE. YSN was on a 2-week vacation but his activity report shows 100 per cent traffic. HSM is rebuilding the old rig and expects to start again with the Delta 75 Net and get into some c.w. nets. VIC, YNG, FYZ, FKA, WQX, KRX, USN and KC recently renewed their ARRL appointments. ZNI has finished the new 20A exciter and now is working on a linear amplifier. YCO reports 27 full and 15 supporting AREC members. Get your reports in early and accept an ARRL CD appointment. Traffic: K5AGJ 85, W5NDV 69, YSN 20, FMO 4, EA 3.

MISSISSIPPI — SCM, Julian G. Blakely, W5WZY — K5BKU reports the affiliation of the Tupelo Amateur Radio Club with ARRL. HTA is president. Members to date are K5AYA, EHX, BSJ, FSE, ROB, ROC, HA, AMZ, AVD, LO, BX, WN5ANE and WN5AIC, plus six more waiting for their talking papers. Field Day received good participation in the section and results should be interesting. Eight /5s were contacted direct from this QTH. KN5BKK walked up those long steps at FCC in Washington, D. C., and walked down them with W5BKK. LPG is active again and IGW is on phone but still puts in four or five hours a day on c.w. Plan to attend the big Jackson Hamfest in August. Jackson is working out a cooperative plan with the FCC to police its own complaints. Traffic: W5IGW 74, JHS 60, WZY 3.

TENNESSEE — SCM, Harry C. Simpson, W4SCF — SEC: RRV. PAM: PFP. RM: IV. Congratulations to planners of the Memphis Hamfest, which was an unusually fine event. Field Day messages were received from KH/4, K4DYE/4, NGO/4, SQE/4, EM/4, TM/4, TRC/4 and PFP/4. PVD tested out his new emergency power unit during Field Day. K4DIZ reports operation of the Night Owl Net, 3970 kc. nightly, following the TCPN sessions. All stations are invited to participate. In June, 81 stations from 6 states reported in. NCSs are K4s DIZ, AOW and BEZ. UVU has a "private" 2-meter link to his girl friend's dorm. WQW reports visits from SCF, HUT, BMI, and K5DTO, and he visited K4AOK and HEZ. IV announces the fall C.W. Net meeting will be held at Gatlinburg's Greystone Hotel Sept. 8th. HUT and HSX are serving 6-month stretches at Ft. Jackson. Congrats to UWA, a new Extra-Class ticket holder. He says XYL KN4JNI made RCC on her *first* contact. Unusually nice bulletins were received from the Knoxville, Nashville, Bays Mountain and Memphis Clubs. K4EFV reports he and K4ECZ are now General Class in Madison. EFV is now on 6 meters, and his curiosity is aroused by a still-secret "project" of HMH and K4AMC. PL says he needs a rocking chair, plus another for his feet, but still manages to handle *more* traffic than the rest of the section put together! Traffic: W4PL 934, K4DIZ 244, W4HIH 123, VJ 59, BQG 57, TZD 50, UVL 34, IV 29, K4BMC 28, W4HLR 28, SCF 22, OGG 19, TIE 14, YMB 13, WQT 12, BMI 8, HUT 8, PAH 8, EIN 7, CLM 6, K4GFL 6, W4EWC 5, TIZ 5, UWA 5, W3AKJ 4, K4DSI 4, W4FEB 4, DCH 1, GEN 1, PVD 1, UVU 1, VNE 1, WQW 1, ZJY 1.

GREAT LAKES DIVISION

MICHIGAN — SCM, Thomas G. Mitchell, W8RAE — Asst. SCM (phone): Bob Cooper, 8AQA; Asst. SCM (c.w.): Joe Beljan, 8SCW. SEC: GJH. Hot weather and propagation conditions took their toll in the traffic department during June as was expected. The few Field Day reports that have come in as this report is being written indicate that conditions were not as good as they were during the 1955 week end, but we all had fun with the variety of weather encountered in our section. Some units reported near-emergency conditions because of severe wind and rain while others enjoyed perfect weather. Regardless of scores, it is an excellent opportunity to get out with the gang and develop teamwork while giving our equipment a good shakedown run. JYJ has been pushing traffic to the Deep-Freeze gang in KC4-Land. NOH now has 34 states on 50 Mc. and 13 worked on 144 Mc. FX still is feathering his new nest and spending his "spare time" getting his pp. 813 final ready for the fall traffic season. Via EGI comes word that SOX has been installing equipment in the State MOCD Control Center. This could be an indication that we may be about ready to establish our tie-in with them. Let's be ready when the time comes. TBP is rigging a new 7-Mc. vertical. That's the extent of the news for this month and shortly after this writing I'll be off for the trout waters of Montana. After lashing at them for two weeks I hope to bring back more than stories and pictures. Traffic: (June) W8JYJ 132, NOH 62, RVZ 58, NUL 53, QQO 52, DAP 38, FWQ 34, AUD 22, FX 17, RAE 17, DSE 12, EGI 7, IUJ 6, SRK 4, SYV 2. (May) W8TBP 63, IUJ 14.

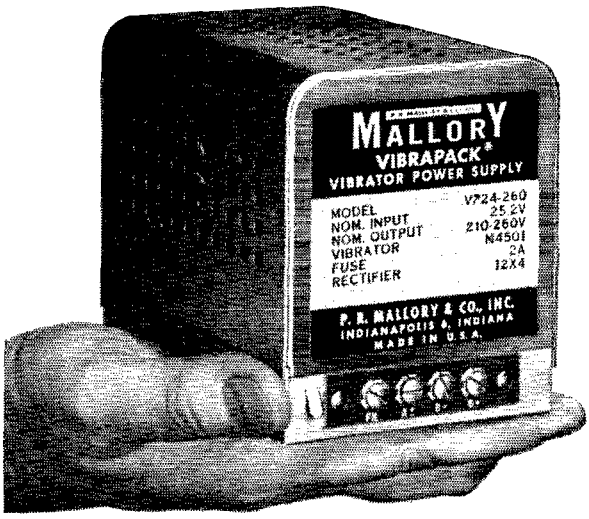
OHIO — SCM, Wilson E. Weckel, W8AL — Asst. SCMs: J. C. Erickson, 8DAE; and E. F. Bonnet, 8OVG. SEC: UPB. RMs: DAE and FYO. PAMs: HPP and HUX. 6WMV (ex-8QFZ) came back to Canton to bury his mother. The Massillon ARC had a speaker from Goodyear Aircraft. RMJ, YAC and JID have new 75A-3 receivers. DSQ passed his General Class exam. AEU is the new Cuyahoga County EC. TZO's XYL is KN8BOF and she gave him a jr. operator, delivered by PNY and under the care of AVB. Several Cincinnati XYLs are awaiting their tickets. PBX built a new four-element beam on 6 meters. QIS moved to New Jersey. JDN is home from college. IZF wired up a Heath DX-35. EEQ's son is Novice HFX. SWZ put up a new 20-meter beam. WRO worked a W6 with 3 watts. VSB is Toledo's "Ham of the Month." DJC is recuperating from another attack of malaria. FMJ has his General Class ticket. ESW has retired after 30 years as a fireman. FVI received his Bachelor of Science in Engineering Physics degree. RYA, Lucas County EC, held a successful mock test with 16 mobiles taking part. OSD, the daughter of QOV and SPU, is going to Ohio State this summer. A tragic plane crash took the lives of SYJ, his XYL and young son. Ohio is taking it easy after the usual Field Day with its rain and wind storms in many parts of the State. OHZ is in the hospital for an operation. PLQ finished a 6-meter rig and now can operate on all bands from 80 through 2 meters. This month starts the lull season with its vacations, so I want to take this opportunity to thank the various clubs for sending me their bulletins, from which I gather most of my news. Traffic: W8UPH 647, VTP 332, HXB 88, DAE 83, PLQ 77, CTZ 64, IIR 64, AL 41, RO 38, ARO 22, HZJ 20, GZ 8, MGC 5, CVZ 4, LMB 4, PBX 4, EEQ 3, QIE 2.

HUDSON DIVISION

EASTERN NEW YORK — SCM, George W. Tracy, W2EFU — SEC: KGC. RM: BXP. PAMs: GDD, IJG and NOC. Section Nets: NYS on 3615 kc. at 1900 EDT; NYSPETN on 3925 kc. at 1800 EDT; SRPN on 3980 kc. at 1100 EDT; ESS on 3590 kc. at 1800 EDT. The Interstate Net (IPN) has suspended operations for the summer and will resume this fall. The following clubs reported activity on Field Day: Albany, Harmonic Hill, IBM and Schenectady. Members of the SRPN held a picnic at Thompson's Lake on July 14th. K2EKE is using a grounded-grid 813 with another to be added soon. Har-

(*Continued on page 88*)

New, Compact Vibrapacks® to Power Your Mobile Rigs...



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So small that it fits into the palm of your hand, this new power supply puts out plenty of wattage. It embodies design principles that Mallory engineers have learned in 25 years' experience in building vibrator operated power supplies for communications equipment. You'll find that our designers have used techniques formerly reserved exclusively for commercial mobile equipment.

Here are some highlights. The same communication-duty, series drive vibrator found in taxi, police and utility two-way transmitters and receivers is used. High stability ceramic capacitors are used in critical parts of the circuit. Heavy gauge steel protective cover and bottom plate snap on and off in an instant, to make replacement of vibrator and rectifier tube a few seconds' work even on field location. When you remove the bottom plate, all wiring is exposed and accessible for trouble-shooting.

Special attention has been given to hash filtering in the "A" and "B" power leads. A separate external connection to the rectifier heater saves your battery during standby, and provides instant return to operation.

The Vibrapack has been designed to let you provide whatever low frequency filtering is necessary for your particular equipment . . . without paying for parts and wiring that you may not need. You can connect the output "as is" to a transmitter or receiver that already has its own filter system. Or, if you want to add a filter to the Vibrapack, the chassis has been punched and space allowed for the installation of a Mallory multi-section FP electrolytic capacitor.

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MALLORY

monic Hill members who were active during the Mt. Vernon Fire Dept. Parade included KGV, K2AEH, DRN, GJC, GZM, LOZ and RUU. AWF was heard from Lake Placid during his vacation. HEF plans 2-meter operation this summer. Your SCM was guest of the IBM Club on July 3rd. KTX has a new 10-meter beam and is enjoying 2-meter mobile. A large turnout attended the NYSPETN picnic at Green Lakes State Park in Syracuse on July 28th. PHX is busy representing Yonkers on both the NLI and NYS with nice traffic totals. New appointments include CYW as OO and K2HPQ as OPS. The Harmonic Hill Club held an auction at Mt. Kisco on July 6th. K2PPB has installed a phone patch to his Viking which uses ultra modulation. All ECs are urged to forward their certificates to the SEC for endorsement so that his AREC records can be brought up to date. Clubs without a news sheet are reminded to keep the SCM posted on their activities so that their members can receive recognition in this column. Instruct your club secretary to send in a letter each month. Traffic: (June) W2BXP 190, PHX 120, EFU 114, K2EKE 48, HPQ 29, W2ATA 24, K2JEQ 13, W2GDD 12, KGC 10, K2QIX 9, EDH 4, HJX 4, BBJ 3, AWA 1, W2UID 1. (May) K2PPB 194, EHI 56, EDH 15, BE 4.

NEW YORK CITY AND LONG ISLAND — SCM, Harry J. Dannals, W2TUK — SEC: ADO. PAM: OBW. RM: WFL. Section Nets: NLI, 3630 kc. nightly at 1930 EDST and Sat. at 1915 EDST. NYC-LIPN, 3908 kc. Mon. through Sat. from 1730 to 1830 EDST. The section was well represented with Field Day activity. Sixteen messages were received by your SCM from groups in the field. WFL reports that NLI handled 140 messages, averaging 10 stations per session. The NYC-LIPN held 26 sessions, with Manager OBW reporting 117 messages handled. KEB and KFV again made BPL with totals over the 1000 mark. ZAI, 10-meter EC for Nassau, reports excellent results with a telephone alerting system. A recent test of the system resulted in 11 mobiles arriving at a central point in the county in less than an hour. Other nets might consider this system. K2MYW received his General Class license. Flat tires plagued some of the Field Day crew, YHP coming up with two and K2HZC three! K2KUM dropped the "N." AEV soon will be heard with a "full gallon." K2CUI writes from Paris, France, and sends his regards to NLI. K2CRK represents the Bronx in NYC-LIPN. JGV now has a four-element beam on 10 meters. Fifty-eight countries have now replied to K2DEM. AEE, with operators PHX, K2s DUT and IKI, and 1SDO, operated Field Day from Camp Columbia, Conn. New Novices are brothers KN2s TBU and TBW. KN2SWI is a new call in Oceanside. A new Viking v.f.o. cleared the chirps at K2OPJ. K2DVT is putting up a new 80-meter Zepp so that the NLI gang can hear him better. The latest member of the NLI is K2LWK. MES and ZPG put up 10-meter ground planes. The Tu-Boro RC has 14 mobiles on 10 meters. K2JZR operated portable from the Boy Scout Camp at Wading River. FY7YF made it 72 for K2GWW, who will join the Marines in October. K2KRJ is mobile on 144 Mc. with a Communicator. BO and his XYL mobiled 7150 miles to the West Coast and return, stopping for the Rocky Mountain Division Convention in Colorado. YBT is now mobile on 75 meters. K2KRC is building a 600-watt rig for 6 meters. K2KSY soon will have 350 watts on 14 Mc. AOD worked WOF and RVY on 420 Mc. during the V.H.F. Contest. BQM hit 139 countries on phone with a KC4USA contact. ENW put up a ten-element horizontal beam for 144 Mc. and an all-band trap antenna. IN soon will be heard from his new QTH in Staten Island where he is now erecting antennas. JCA has a trap antenna for his 80-meter work. K2PAY dropped the "N" and has worked five states on 75 meters with his 8-watter. Recent 6-meter openings were tremendous, your SCM hearing 15 states in as many minutes. Many cases of TVI have resulted from these openings, however, not from amateurs but from DX TV stations fighting for Channels 2, 4 and 5. You are urged to explain this type of interference to TV viewers who might falsely point a finger at the amateur. Ex-DLO signs K4IXG and not IGX, as previously reported. Pete now has his OES appointment in the Eastern Florida section and will be looking for the NLI boys in the CD Parties. All appointees are reminded that monthly reports are due in your SCM's hands by the 5th of each month. If you wish, send your reports by radio on our section's nets. NLI and NYC-LIPN. TUK will report into the nets as often as possible for SCM traffic. MSK, of the Trylon Radio Club, sends code practice for beginners. Traffic: (June) W2KEB 1162, KFV 1116, JGV 97, K2DEM/2 67, W2AEE 66, TUK 65, WFL 56, ZUM 51 K2AMP 47, KXZ 32, OPJ 31, DVT 27, W2GP 25, K2RJO 23, W2PDU 21, FTV 20, K2LWK 19, W2LPJ 18, IAG 13, K2IHD 12, W2HAC 10, PF 10, DUS 9, K2JZR 9, GWW 8, W2OBW 6, K2CRK 5, W2EC 5, K2KRJ 5, ADL 4, W2BO 4, IVS 3, YBT 3, K2KRC 2, W2ELK 1. (May) K2AMP 33. (Apr.) W2JGV 50.

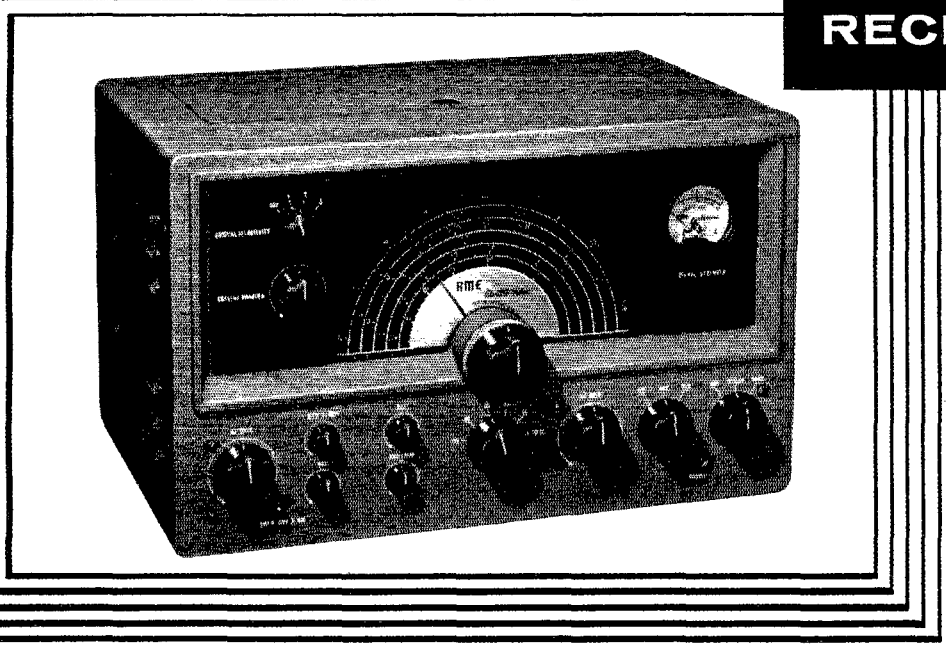
NORTHERN NEW JERSEY — SCM, Lloyd H. Manamon, W2VQR — SEC: IIN. PAM: CCS. RMs: MLW, CGG and NKD. The New Jersey Net meets at 1900 hours Mon. through Sat. on 3695 kc. Net Manager MLW is to be congratulated on his efforts in editing and circulating the first NJN news letter. It is a very excellent paper. The

(*Continued on page 90*)

The features you want are now EASY TO OWN

Completely New

RME Electro-Voice 4300 RECEIVER



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Operator-Designed and Laboratory-Engineered for Amateur Communications

High Selectivity and Rejectivity
Precisely tunes the signals you want, even at high frequencies. Rejects unwanted signals and undesirable noise.

Easy Tuning and Smooth Operation
Unique two-speed control knob provides smoother, accurate tuning and scanning.

Mechanical and Thermal Stability
Highly stable components and construction prevent frequency shift or drift.

Structural Rigidity and Strength
Heavy steel chassis, cast aluminum panel and rugged steel cabinet assure stable, long-life service.

This completely new receiver includes many deluxe features usually found only in higher priced models. It provides injection control of the beat frequency oscillator. Particularly useful for CW and SSB reception.

Large, evenly graduated, illuminated dial covers all six amateur bands from 1.76 mc to 29.8 mc (160 thru 10 meters). Unique differential 75:1 or 1:1 ratio tuning control. Plates in tuning condenser are triple-spaced to reduce drift and microphonics. Selectivity control with four positions. IF curve is 2.8 kc wide without crystal filter, attenuation 60 db down at 7 kc above or below the desired frequency. Crystal filter has phasing control for variable rejection of unwanted adjacent signals. Excellent image rejection. High sensitivity of 2 microvolts for 10 db signal-to-noise ratio. Temperature-compensated. Drift is negligible after 20-minute warm-up. Extreme stability permits single sideband reception with or without adapter. ANL. Antenna trimmer permits peak adjustment. 4-position function switch. Two coaxial jacks for SSB adapter. 4-ohm speaker terminals. Transmitter relay control.

Controls include: Dual-speed tuning, AF gain, BFO pitch, BFO injection, antenna trimmer, calibration adjust, band selector, RF gain on-off, function switch, 3-position receive—standby—transmit switch, 4-position crystal selectivity control, crystal phasing-rejector control, ANL. Size: 10 in. high, 16½ in. wide, 10 in. deep. Finished in attractive instrument-gray. 117 volts, 50-60 cycle AC.

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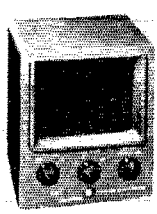

New RME 4301 provides easy-to-tune, stable SSB reception of both carrier present and carrier suppressed types. Plugs directly into the RME Model 4300 receiver or easily connects between IF and audio stages in any other communications receiver. Built-in power supply. Size: 10 in. high, 8½ in. wide, 10 in. deep. **Net $75.00**

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New Jersey Civil Defense Net meets at 0930 hours each Sun. on 3505.5 kc. Net Manager is RG, who has been doing a terrific service for amateur radio by his constant plugging of network activities. Hot weather and summer vacations are no deterrent to the volume of traffic handled by NJN. The records show a steady increase since last February. We hope that the Bloomfield RACES group will continue to publish its monthly news letter, *The Signal*, after the departure of ZPD, editor-in-chief, who has moved to a new QTH in Union County. K2GFX is on 144 Mc. with a new rig. K2EMJ has installed a new three-element 28-Mc. beam. The Penn-Jersey Radio Club was heard working s.s.b. during Field Day. ZVW is on the air frequently from 3NF, his alternate QTH. K2BWQ has returned from a 12-day cruise aboard the SS *Santa Rosa* on a Caribbean course to South America and the Netherlands Antilles. GVU operated from W6-Land during his recent vacation. The portable rig ran 7/10 of a watt input. Net results, one contact but E for effort, all of this of course crystal control on 7010 kc. Welcome to K2BHQ, the first of the former Southern New Jersey boys to send in his traffic report. K2GVZ is leaving for W4-Land. HXU has receiver trouble. TLW is moving his QTH to Oakland. K2GBP has entered the U. S. Naval Academy. COT was active during Field Day from atop High Point Park, the highest elevation in New Jersey. The group consisted of the Maplewood C.D. Communications Unit. GUM and AWL are very active in the Long Branch RACES Communications Unit. K2ICE is planning on 220-Mc. operation this fall. K2IPR is plugging RTTY on 144 Mc. Rumor has it that HJL has given up and is going horizontal on 144 Mc. NIE has turned to repairing his TV set after a six-week black-out. That is one way to eliminate TVI. K2DHE, County RACES Officer, is hard at work completing the radio installation at County Control. New Jersey now has 21 completely-equipped all-band RACES County Control Centers. All equipment has been supplied by the New Jersey State C.D. officials. K2DO has done an exceptional job in Morris County in his official capacity as RO. The same goes for SJB in Somerset County, and GNQ in Bergen. K2DUZ is the new County RACES RO in Hudson. NJN traffic summary shows 26 sessions held for June with an attendance of 350 and a traffic count of 186. Traffic: W2MLW 287, K2EB 142, EQP 79, W2BRC 50, K2BHQ 31, W2ZVW 31, K2GFX 19, W2OXL 13, K2EMJ 10, W2DRV 8, CFB 4, NIY 2, CVW 1.

MIDWEST DIVISION

IOWA — SCM, Russell B. Marquis, WØBDR — TWX Iowa City, and WDS, Batavia, have joined Silent Keys. The annual 160-meter Net Picnic was held in Webster City with 167 hams present. NWX, Midwest Division Director, was the featured speaker. New officers of the Council Bluffs Radio Operators Club are LGO, pres.; YXI, vice-pres.; and RQW, secy.-treas. MG has been appointed the new SEC for Iowa. UTD has received an ORS appointment. QVA renewed his RM and ORS appointments. KØDBW received a TLCN Section Net certificate. KGX and PIK, Cliff and Mable, are moving to California. EFL is being assigned kitchen duties since his XYL, LGG, is in line for a medallion with her third BPL. GXQ and RQW are new TLCN members. Field Day messages were received from 17 set-ups. KØANL has a new sideband rig. USQ is going great on 6 meters, working an LU and an XE and several new states. AEH has a new rotator for his 2-meter beam. PTL vacationed in California and KØAEY went to Colorado for his. The Cedar Rapids gang supplied mobiles to help locate numerous stray model airplanes at a local meet. F. E. Handy, 1BDI, attended the Des Moines Club meeting and gave a nice talk on ARRL activities. KØGHH is a new ham in Swea City. Traffic: (June) WØSCA 1062, BDR 750, LGG 554, BJP 489, PZO 439, LCX 369, CZ 213, QVA 95, SQE 82, LJW 66, EHH 56, PKT 44, KVJ 35, UTD 34, NGS 22, YCL 22, VWF 15, KØBEC 11, DBW 11, WØFDM 10, NYX 9, RQW 9, BSG 8, KØAVZ 6, WØZPM 6, IHC 4, HNE 3, FMZ 2, QQA 1. (May) WØPZO 179.

KANSAS — SCM, Earl N. Johnston, WØICV — SEC: PAH. PAM: FNS. RM: QGG. Eleven radio clubs were known to have participated in Field Day this year. Messages were received from the Ottawa Radio Emergency Club, using KFU/Ø; the El Dorado Kansas Amateur Radio Club, LUI/Ø; the Central Kansas Amateur Radio Club, KØAST/Ø; the Johnson County Radio Amateur Club; the Dodge City Amateur Radio Club; the Kaw Valley Radio Club; the Lawrence Amateur Radio Club; the Hutchinson Amateur Radio Club, and many other groups which did not state their names. On June 17th the amateurs in Ft. Scott held a picnic at Gunn Park with 17 amateurs attending. Plans for another get-together later in the summer were formulated. MVG sent in a very fine log of stations worked in the V.H.F. Party. JAS had just finished a new rig which was used and worked very FB. MVG passes along information that the new TV HP Drake filter keeps out even 6-meter TVI from sets, so give 6 meters a whirl. TOL/M now has such de luxe mobile equipment as a G-66 receiver and an AF-67 transmitter in his car. MXG also has a new G-66 in his new Chevvie. CJI is the new EC for Harper, Sumner and Cowley Counties. Traffic: (June)

(*Continued on page 92*)

WØBLI 638, KØFEI 577, WØNIY 188, YVM 111, TOL 89, ABJ 61, QGG 60, FNS 46, FDJ 39, ONF 25, MXG 20, WWR 15, FCE 13, IHN 10, TNA 9, KØAHW 8, WØRXM 8, KØBIX 7, WØVZM 7, ECD 6, DEL 5, LQX 5, LIX 3, UAT 2, LOW 1. (May) KØFEI 1016, WØWWR 24, VZM 21, LIX 14, DEL 3, KØAOQ 1.

MISSOURI — SCM, James W. Hoover, WØGEP — The Suburban Radio Club literally "smoked out" some equipment troubles during Field Day—lightning ruined a 10-meter beam and heat, along with humidity, finished some transformers and condensers. The Bandhoppers Radio Club smoked out some difficulties in a 75A-2 and an Elmac AF-67 on the same occasion. WFF is operating fixed portable in Ferguson for the summer. SAK has a new 150-watt transmitter. Incorporation papers have been approved by the Circuit Court for the Southwest Missouri Amateur Radio Club. The hamfest sponsored by the North Missouri Amateur Radio Club in Moberly on June 24th was attended by 105. Vandals broke into the home of KØBDT, and the house and rig were extensively damaged by fire and water. WIC has taken a position with Southwestern Bell Telephone in Oklahoma City. JHY has a new Gonset Commander and is building a ham shack in the basement. QFD has moved to Denver. WAP and BVL have received 5000 and 10,000 Traffikers Certificates, respectively. A number of 10-meter mobiles operating under RACES authorization furnished communications during an evacuation test in Webster Groves. The Bandhoppers Radio Club furnished four 6-meter stations operating under RACES authorization to assist Auxiliary CD Police with traffic control at the St. Charles Bridge during the McDonnell Aircraft Corp. picnic in St. Charles. Traffic: WØCPI 1418, GAR 1044, GBJ 352, OMM 84, HUI 81, KIK 51, WFF 43, OUD 41, SAK 29, RTW 26, IIR 22, BUL 9, OVV 9, EBE 8, YKC 7, ECE 6, KØAWC 4, WØGEP 4, MFB 4, OIV 4, WAP 3, KØBDT 2.

NEBRASKA — SCM, Floyd B. Campbell, WØCBH — Asst. SCM: Tom Boydston, ØVYX. SEC: JDJ. PAM: MAO. KXD has a new NC-300 and a 5100-B. Lefty traded cars and now has the mobile-installation problem to take care of. LRK sure has plans for the mobile in the new automobile. BOB built a loop that has given fine results at the North Platte hidden transmitter hunts. ERM recently spent his vacation in Florida but mobiling wasn't so good. Field Day reports: Fairbury had 5 operators, Ak-Sar-Ben Club had 24 operators, Crete Amateur Radio Club had 5 operators, Beatrice had 11 operators, the Tri City Radio Club had 15 operators and 4 transmitters. KØCDG found that the hum in his rig could be eliminated by an oil can wedged between two modulation tubes and the power transformer. Seward County operators are rapidly signing up for c.d. Officers are VEY, EC and Radio Officer, and ZWG, alternate. Tabulation for the three Nebraska nets are: 75-meter emergency phone net, 1230 CST (3983 kc.), QNIs 635, average 21.2, traffic 39, average 1.3, time in minutes 732, average 24.4. The Morning Net, 0730 CST (3983 kc.), QNIs 461, average 15.4; traffic 74, average 25.7; time in minutes 980, average 32.7. NSS Net QNIs 181, average 6; traffic 25, average 0.8; time in minutes 1134, average 37.8. Traffic: WØZJF 234, DDT 144, UJK 106, MAO 91, FSX/Ø 49, ZWG 31, ORW 30, EGQ 24, TIP 20, KØCDG 19, WØDGW 18, SPK 18, ZOU 13, VGH 12, KØBDF 8, WØBYK 8, TFZ 5, KFY 4, KLB 4, PDJ 4, ZWF 4, AQQ 2, KVO 2, VZJ 2, FRS 1.

NEW ENGLAND DIVISION

CONNECTICUT — SCM, Milton E. Chaffee, W1EFW — SEC: LKF. RM: KYQ. PAM: YBH. Traffic nets: MCN. Mon.-Fri. 0645 on 3640 kc.; CN, Mon.-Sat. 1845 on 3610 kc.; CPN, Mon.-Sat. 1800 on 3880 kc. and Sun. at 1000 on 3880 kc. There is always room for improved coverage on any of these nets, so why not join the net that suits you best? Every good operator handles traffic now and then just to keep up his skill for emergencies. IOB is enjoying DX on 20 meters with a new GPR-90 receiver. GST and GFL have new Viking II rigs. GAV applied for OES for more fun on 6 meters. V.h.f. and Field Day events brought out the contest spirit in several Connecticut clubs. Appointments: IUC as ORS; DHP as OPS. ORS renewals went to BIH, HYF, YNC and BFS. How about your appointment? Time to renew? CPN report from YBH: 30 sessions, traffic 267, most active YBH (30), DHP (28), and VWL (26); new members FKE, IUC and TVU. YBH rates a BPL medallion, having made BPL 4 times. MCN reports 46 messages handled in 21 sessions, averaging 2.2 per session, with QNI honors to RGB, RFJ and BVB. WHL and HCZ are active on 6 meters in Hamden. BDI reports traffic and other activities were curtailed while he made ARRL field trips to the Midwest and West Coast. ANU gave up his OO appointment for school activities. DL4II/W1RAN sends a nice note telling of meeting with PAØ, OE, HB9 and F hams and hopes for a trip to OH2RY in September. IUC claims the ragchewing record by a QSO on 3636 kc. with K2EWR for 9 hours and 2 minutes. Any challengers? VLH reports a new 144-Mc. antenna, 32 elements, 100 ft. high, for use in spare time from the ARRL Technical Dept. FVV furnished an OES report of activity on 6 meters. The CN report from KYQ shows traffic as 220 in 26 sessions for

(*Continued on page 94*)

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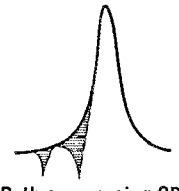
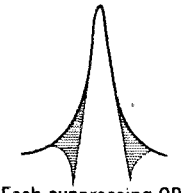
Hammarlund's new HQ-150

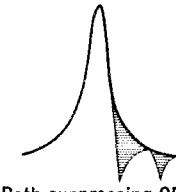
Channelized reception . . . in the new **HQ-150,** the crystal filter can be used to peak a desired signal and suppress an undesired signal. In combination with the Q-multiplier, a maximum of two undesired signals can be suppressed at variable points within either or both sidebands. Three of these endless operational combinations are—



Both suppressing QRM in lower sideband.



Each suppressing QRM in both sidebands.



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an average of 8.4 with RGB (23), KYQ (22) and AW (19) leading QNI. GNS has a new Viking and v.f.o. going at Bristol. Novice KAM is busy on 80 meters at Milford. INP is CAP Director of Communications for Connecticut CAP. Traffic: W1YBH 333, AW 232, KYQ 166, EFW 127, YNC 117, RGB 78, DHP 49, ULY 39, CUH 38, IUC 35, TYQ 32, RRE 25, BVB 20, BDI 9, GVJ 9, HYF 6, AVS 4, KV 4.

MAINE — SCM, Allan D. Duntley, W1BPI/VYA — SEC: TVB. PAM: FCS. RM: EFR. OO: WRZ. The Pine Tree Net meets Mon., Wed., and Fri., on 3596 kc. at 1900; the Barn Yard Net Mon. through Sat. on 3960 kc., 0800-0930; the Sea Gull Net on 3940 kc. Mon. through Sat. at 1700-1800; the Horse Traders Net on 3940 kc. Sun. 1700-1800; the State C.D. Net on 3993 kc. Sun. 1100-1200. We are very happy to announce the appointment of FCS, Harry Parlee, as Phone Activities Manager for Maine. Let's all get together and give him a helping hand where we can. If asked to take the Sea Gull Net, let's do it. How high is JVU's new tower with the stacked 2-meter array on it? NXX and Maynard have a novel way of erecting towers — ask them to give you a lift. Cumberland County's new tower and beam are working out very well. Androscoggin County has a 2-meter vertical beam. Has UZR swapped the "Peach Colored Plymouth" for some other make? We saw some fine Field Day layouts this year, and were pleased to see and hear so much activity on the u.h.f. frequencies. Congrats to KNV in passing her General Class exam. Polly will be a fine addition to the gang on 3960 kc. WSN, from Milton, Mass., has been operating portable at Camp Brunonia, in Casco, and doing a fine job with a group of Novices. VXU has a new car but Anita says "no holes in it, Chummy" — so no mobile as yet. FNT is expected back on with a TVIed rig soon. Traffic: W1LKP 90, WTG 50, CEV 36, EFR 31, UDD 24, JIS 23, ZME 17, ZUL 14, BDP 7.

EASTERN MASSACHUSETTS — SCM, Frank L. Baker, jr., W1ALP — Appointments endorsed: MKW Dennis, SS Lincoln, LQQ Hamilton as ECs; JNV, QLT, MKW, LQQ and WK as OOs; SRG and LQQ as OBSs; LQQ as OPS. DXQ has a new son. ACB and DXQ are Alternate Radio Officers for Quincy. AHA, Wakefield, is on 6 and 80 meters. LES and FMW are on 2 meters. WB is on a trip to Europe. WN1IWK was out on Field Day in Hopkinton. Most of the clubs in this section were out on Field Day. The South Shore Club, IA, was up on Forbes Hill in Quincy. HIX, Hudson, has his General Class license. AUQ, EAE and IRV are in the Eastern Mass. Traffic Net. EAE plays chess on the air. The following took part in ARRL's May F.M.T.: BGW, TVZ, LQQ, AUQ, THO and K1USA. SSS has a new T-90 transmitter. WGN has a new son. SPE has a TBS-50D with VFO on 3.8 and 7 Mc. HBM is on 15 meters with a DX-35. WN1s KSY and ILT, father and son, are working for General Class tickets. TZU is active, fixed and mobile. MUM is coming along after an auto accident. The Cornell-Dubilier plant in New Bedford has a ham in almost every department. DIR moved into the suburbs so he can have more room. AVY asks mobile hams touring the area to look on 29,060 kc. for QSOS and any information. Area 1 Radio Comm. held a meeting with KTG, TQP, ZYX, ALP and AWA present. ACL moved to Braintree. UG has a new 42-ft. Matthews cruiser. UH is improving his DX-100. DYS is replacing his 6-meter dipole. CFU is putting in a hot front end in his RAO. CGU is boating. LVN is painting his house. RM is in New Hampshire with a 2-meter rig. SXD is putting a 2F26 on 6 meters. NAV is busy with cook-outs. LHV is mobile on 2 meters. EK is making weather instruments. JOW is working with the Newton Police. BL has a coupe from which to work portable. LMU visited HXP and JGA in New Hampshire. NEM and MJA are doing lots of flying. JNV was top OO for 1955-56, and has 172 confirmed countries, 181 claimed, with 500 to 800 watts with a three-element beam. Sector 2C Hq. at South Dennis has BCN as RO. DPO is building a 15-meter beam. VWZ is on 2 and 75 meters. FZH is on 2 meters. WN1KXE is a new ham in Hyannis on 2 and 80 meters. EUE and UMC are on 2-mobile marine. OH is leaving the area for awhile. TYZ worked him on 10 meters from Florida. PSS is on 2 meters. CFQ has a new QTH with a 60-ft. beam on 2 meters. MKW took a Gonset to sea and had the Coast Guard looking for him because of a tube failure. Cape Cod c.w. frequency is 3615 kc; phone 3910 kc. and 145.26 Mc. GRC is home from the hospital and working again. Active on 6 meters: ADL, BCN, BJ, CQ, DDN, EFL, EGY, GES, HXY, IVF, KBN, KEZ, LKD, QKY/1, UVC, WAC, WHC, YDZ, ZOC, MEG, MMY, BUR, AXA, EMY, FCP, FNQ, JCI, JQA, KKB, LNX, TEC, UAI and WTK. ETB has a DX-35 and a Windom antenna. IHC has two opposed parabolic type v.h.f. antennas. The South Shore Club held its last meeting and annual banquet at the Winfield House in Quincy with the installation of new officers. Radio Open House held its last meeting of the season. EMG is handling hobby show messages. 4URF, who was at K1USA, was discharged June 5th. BPW built a new rig for 80-meter v.f.o. AOG has been on 40-meter c.w. QLT replaced the 807 with a 6146 in the rig and it works better. CCM is building an electronic key. Traffic: (June) W1EMG 287, K1USA 214, W1AVY 55, GNX 44, LDK 30, AUQ 29, CUW 21, UKO 21, BPW 11, SMO 10, TY 9, WU 9,

(*Continued on page 96*)

MOBILE TWINS

GONSET G-77 G-66

Gonset's new Mobile Twins, G-66 Receiver and G-77 transmitter, represent the perfect mobile combination. Outstanding multi-band performance—beauty of appearance—finger-tip control—6 and 12 volt operation—compactness without compromise! Typical Gonset dollar-for-dollar value—real "owner satisfaction".

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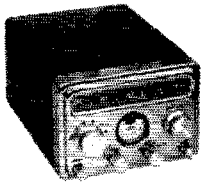

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6 BANDS: 540-2000 kcs. 3500-4000 kcs. 7000-7300 kcs. 14,000,14,350 kcs. 21,000-21,450 kcs. 28,000-29,700 kcs.

AM, CW, SSB RECEPTION. Highly stabilized HF and BF oscillators and xtl controlled 2nd conversion oscillator.

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AVC—Noise limiter—Panel S meter—antenna trimmer—BFO pitch—Audio-RF gain control—slide rule dial—3 watts audio.

G66 RECEIVER...(less power supply).....(#3046).....net 189.50

"3 way" (6V-12V-115V AC) Universal power supply/speaker..net 44.50

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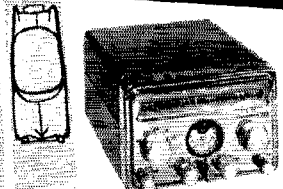

FREQUENCY RANGE: 80-40-20-15-10 meters. VFO or xtal, switchable. Highly stable VFO, each band spread over most of slide rule dial.

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BGW 8, QLT 5, CAM 2, CCM 2. (May) W1IBE 42, UE 22, NUP 10, AOG 9, AHP 4, ATX 2.

WESTERN MASSACHUSETTS — SCM, Osborne R. McKeraghan, W1HRV — SEC: RRX. RM: BVR. PAM: QWJ. The WMCW Net meets on 3560 kc. Mon. through Sat. at 1900 EDST. Vacations and other summertime activities are taking their toll on net attendance. Get on the net as often as possible, fellows. OPS endorsements go to DPY and BYH; ORS endorsement to AJX. New Novices in the section are JQT, JMG, JQU, IVL, and IVK. IDS and KGJ are now General Class ticket holders. DGL has received a WAS certificate. EC SPF, of Worcester, reports organization of the Greater Worcester Phone Net, which will replace the now defunct Worcester C.D. Net. He has received the enthusiastic cooperation of the hams in his area in forming this net. The Pittsfield Radio Club, OSA, had a good Field Day with 572 contacts on 5 rigs. Included were DX contacts with New Zealand and Hawaii. AGM reports working four New England states on 10-meter phone using emergency power at his hilltop location during Field Day activities. SCM HRV, accompanied by STR, formerly of Fitchburg, visited the Montachuset Radio Club of Fitchburg at its regular meeting June 29th. Section activities were discussed and ARRL slides on AREC were shown. Reports on activities in the section are light this month. How about it, fellows, let's hear from you. Traffic: W1BVR 70, AJX 39, HRV 30, SPF 12, TAY 10, AGM 2.

NEW HAMPSHIRE — SCM, Harold J. Preble, W1HS — SEC: BXU. RMs: CRW and COC. PAM: CDX. The New Hampshire State ARRL Convention will be held at the State Armory in Concord on Sept. 30th. Granite State P.N. held a picnic for members and families at Sunapee State Park June 17th. George Urlwin, an old-timer, is back on the air with a new call, KOC. ARR is much pleased with his new HQ-129X. KGV has received her General Class ticket. HS's XYL is WN1KND. COC has a new modulator and more power in the final. The Concord Brasspounders had 9 Field Day set-ups on Oak Hill and early reports indicate a better score than last year in spite of unfavorable operation conditions on most bands. BYS is going mobile with an AF-67 and G-66. ECs for the ten New Hampshire counties are all set up under the State RACES plan and are formulating plans for local emergency operations. Contact your local EC if interested in the RACES program. The State Radio Officer and SEC is BXU. He also will be pleased to give you the dope. WBM stopped in for a visit and his Plymouth is so loaded with mobile equipment there is not much room for passengers in the front seat. Welcome to Novices JFL, JTB, KCY, KCG, KCZ, KIV, KJS, KJW, and KJZ. Traffic: (June) W1HOU 85, ARR 26, QGU 23, COC 12, HS 7, FZ 3. (May) W1COC 16.

RHODE ISLAND — SCM, Walter B. Hanson, jr., W1KKR — The NARRO came through with many items this month. NCX is back on 10 meters snagging DX. IXB is a new member and on the air, together with CDV and Karl Johnson. ICJ is in charge of the new club room with time to work KL7 on 10 meters. KNE and YLH are trout fishing while BFB and CJH are golfing. Both ZPT and HCG are working DX. The PRA is coming along with the new club building, with members hitting nails and thumbs every Tuesday evening. The PRA is sponsoring the ARRL New England Division Convention to be held Oct. 21st and welcomes any suggestions or assistance in conducting the program. FEO has his General Class license and a new Lettine 2-meter transmitter. VXC reports 27 stations in RIIN in the month. Field Day was a big success in the section and received very favorable comment in the press. The SCM regrets his inability to run for office for the next two years after the expiration of his term on Oct. 15th and suggests that all interested groups plan for their candidates. Traffic: W1HTQ 109, UTA 107, VXC 56, K2SKK 17.

VERMONT — Acting SCM, Mrs. Ann L. Chandler, W1OAK — SEC: SIO. RM: OAK. VTN, 3520 kc. (1830 Mon., Wed., Fri., and Sat. summer schedule); VTPN, 3860 kc. (Sun. 0930); GMN, 3860 kc. (Mon. through Sat. 1200-1300). OO, OBS, OPS, and EC endorsements went to AVP. UGW enjoyed the April CD Party from 4KFC with 600 QSOs in 64 sections in 19 hours, and also was on from 3TMZ during the Vermont QSO Party. IT is mobile on 75 meters. VMC, the new GMN net manager, reported 551 stations on during June, clearing 53 messages. MMV's total 15-meter phone DX is 156 countries worked and 147 confirmed, with YV0AA, XE4A, FB8BZ, BV1US and 9S4AK the latest worked. Jerry now is mobile on 10 meters in a brand-new Plymouth with Vermont license plates 7388! A notch behind on 10-meter phone is EKU with 155 countries worked and 143 confirmed. The International Field Day held June 10th at Malletts Bay was enjoyed by all who attended. MMV won the 10-meter treasure hunt. The annual Burlington and Montreal get-together will be held Oct. 6th at Dorval Airport and Edgewater Hotel, Point Claire. Write NLO for details and tickets. K6KVY (ex-W1MLJ) was home for his son's graduation from Norwich U. DFU has a new Windom antenna. ZLH/1 operated Field Day at Ripton using emergency power, two transmitters and six operators. LYD is enjoying the new Johnson Viking Matchbox antenna coupler. JLZ and family

(Continued on page 98)

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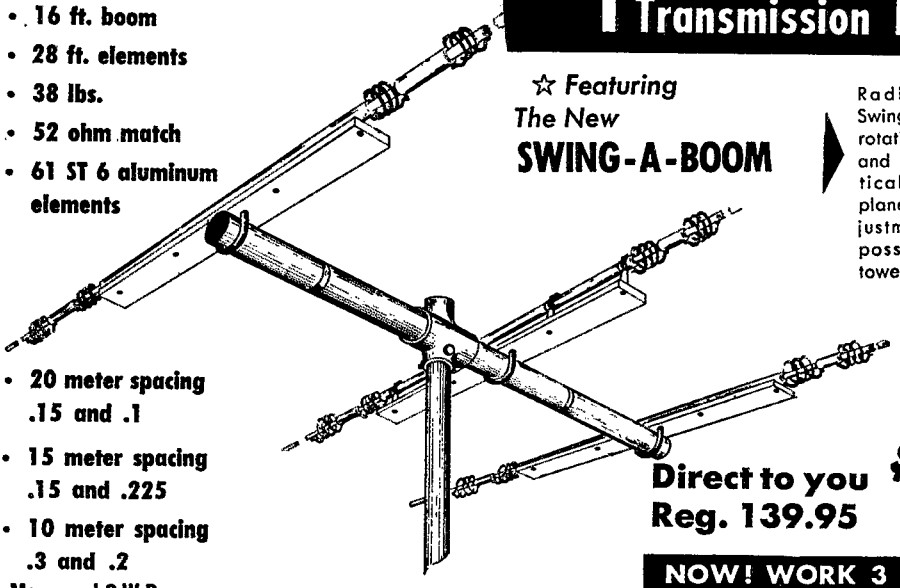

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are back home in St. Johnsbury. VSA is the new Burlington Area EC. Club station TRZ/1 did well in the Field Day on 2 and 6 meters at Hog Back Mt. DCZ left for the Navy. New members of the Tri-Club are FHI and wife Helen, 9BCA, who now are living in Brattleboro. Helen, who has been blind since birth, will be heard on 40 meters. OAK is the newly-appointed RACES State Radio Officer. It is indeed a pleasure for me to serve this section as Acting SCM, and I wish to request all Vermont amateurs to keep me informed with news on your activities. Traffic: W1OAK 84, IT 15, ZNM 7.

NORTHWESTERN DIVISION

IDAHO — SCM, Alan K. Ross, W7IWU — Sorry I missed the report last month but I was busy with a new 4th harmonic, plus adding a new room to the house. It would seem that yours truly had better bow out as SCM, having held the office for ten years. My term was up in June and because of the pressure of house-holding I feel I cannot do the job justice. I have met many fine friends, either in person or by correspondence, through my work as SCM. Send in your nominations to the ARRL and in the meantime I will write a line or two for this section. Everyone has been busy getting ready for "Operation Alert," just concluded. RKI is publishing the *Hobo Ham*, a sequel to the *Hambone*. 6EBK visited IWU overnight with FB skeds on c.w. from his mobile while en route.

MONTANA — SCM, Leslie E. Crouter, W7CT — The Harlo Radio Club took part in Field Day activities with six operators and used one transmitter from a ranch five miles south of Harlowton. WN7ECF is a new call in Harlo. W7CLD, CTM and WN7YTG have taken Conditional Class examinations. YHB and YHC have new DX-100s. OQC of Havre, JHR of Billings and WDE of Winifred attended the Harlo Ham Picnic. The Bozeman Junior Field Day Club operated from an old cow shed three miles south of Bozeman with four operators. The Junior Division of the Butte Amateur Radio Club operated with emergency power from the shack of TYN and had five operators. Three Forks had a Field Day with three operators on Clarks Peak. The Old Faithful Radio Club of Livingston is now an ARRL affiliated club. BPG is a new call in Cut Bank. YZQ has completed Conelrad for his car. Don't forget that Conelrad becomes a requirement next January first. The Bozeman Junior Field Day Club (under 16 years of age) did very fine for its first try at Field Day and promises to do even better next year. Recent appointments: UPR as EC, YHS as OPS, FIS as ORS. Traffic: (June) W7CT 3, (May) W7FIS 18, YHS 2.

OREGON — SCM, Edward F. Conyngham, W7ESJ — ATQ received a gift of a kw. transformer and now is dreaming of kw. rigs. VIL has been on the sick list. APF is hospitalized. JCJ is on jury duty, so no hamming there. HDN's garden activity is long, ham activity short. TMF is making preparations for the OEN Salem picnic. OMO is QRL OSN, RN7, and MARS. ENU participated in the V.H.F. QSO Party and Field Day from home QTH. YUY went on a vacation to Disneyland for the kids, Mexico for the XYL and the San Francisco Convention for himself. VXC is QRL OEN and AF MARS. KTG is QRL outside work. TLC is having receiver troubles. In the last F.M.T. PQJ came within 4, FU within 20 and TAZ within 102 cycles. WFO was elected secretary publicity chairwoman for Portland Roses. SPC was elected treasurer and vice-president for Portland Roses for August. WPW is on the sick list. OEV, JMW and DAE handled Field Day traffic. During Field Day SAA reported the Salem Amateur Radio Club was on with 20 operators, and 5 AREC members, in Eola Hills. YYE reports the Oregon Amateur Radio Society was on at Deardorf Mountain with 5 complete stations and 12 operators. OTC was on at Buxton Mountain Lookout with 18 operators, emergency-power operation all bands, with single transmitters for each. The Tillamook Amateur Radio Club reported from Demolay Camp on the Wilson River. SEQ reported the Central Amateur Radio Club had 10 operators and 20 AREC members 7 miles northwest of Bend. The Portland Amateur Radio Club was at Snow Bunny Lodge, Mount Hood, with 18 operators and 6 AREC members. Traffic: (June) W7QKU 664, ENU 50, HJU 39, GUR 32, OMO 30, YUY 28, HDN 25, VIL 24, TMF 20, KLE 13, WPW 9, BVH 7, VCX 7, JCJ 3, RGS 2, (May) W7TLC 44, VIL 34, KTG 2.

WASHINGTON — SCM, Victor S. Gish, W7FIX — The Spokane Radio Amateurs is sponsoring the call letter license plate bill. Contributions should go to Ken White, treasurer, License Plate Bill Trust Fund, North 102 Monroe, Spokane, Wash. Washington Nets: WSN, 3575 kc. 1900 PST Mon. through Fri.; NTN, 3920 kc. 0630 and 2000 PST Mon. through Sat.; WARTS, 3970 kc. 1830 PST Mon. through Sat. BA is test station with Collins Polar Flights. VAZ is going s.s.b. shortly. K7FAE handled 270 phone patches in June. WAH is coming up in the traffic count. USO is using a Ranger to drive p.p 6146s. AIB finished the antenna projects and now has two transmitters on the air. GVV is rebuilding an exciter. FZB got a QSL from NSS and a "diploma" for copying the Armed Forces Day message. YFJ needs a converter for the mobile rig —

Continued on page 100)

6 & 10 M. BEAMS AT NEW LOW PRICE

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5-Element 6-Meter Beam

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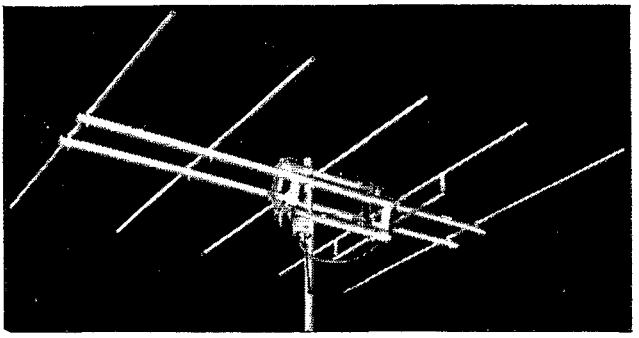

Model HM6-5AK 5-Element 6-Meter Beam

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Long Beach; Scott Radio Supply Co., 266 Alamitos Ave.
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San Diego; Western Radio & TV Sup., 1415 India St.
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(Featuring Skysweeper exclusive Quad-Boom)

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Also available with Baluns at slight extra cost.

2-Meters—Cut to 146 mc. covers 144-148 mc.

Model HM2-3AK	**3-element**	Net, **$ 4.95**
Model HM2-5AK	**5-element**	**8.95**
Model HM2-7AK	**7-element**	**12.60**
Model HM2-10AK	**5-over-5**	**13.95**
Model HM2-14AK	**7-over-7**	**18.95**

NEW—2 meters

Model HCR2-1AK	**Corner Reflector**	Net, **$27.95**

NEW 220 and 440 mc. Yagi Beams

Model HM22-7AK (220 mc.)	**7-element**	Net, **$ 5.10**
Model HM44-7AK (440 mc.)	**7-element**	**4.20**

All prices slightly higher Far West and Southwest

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cheap, he says. HDT signed up the only ham in Garfield County, to work with the Asotin County gang in the AREC. UQY rebuilt the transmitter very successfully. PUA is vacationing in W2-Land. EHH is laid up with an old knee injury. WN7BEC is building a 15-meter beam. CWN is looking over receivers — the XYL said he could get a new one. K7NBN, a new station at Naval Station, Seattle, has a BC-610 and T-350 transmitters. JWE is building a kw. final for 20, 40 and 80 meters and is a regular WARTS check-in. Your SCM would appreciate it if each club in the section would send in a list of officers and any club news, also reports from any and all amateurs in the section are desired. Please get them in right after the first of each month, so that they can be included in this column. Traffic: (June) W7PGY 2129, BA 1670, K7WAT 1184, W7VAZ 882, K7FAE 528, W7WAH 86, USO 62, AIB 52, GVV 35, JEY 29, APS 26, AMC 12, LVB 7, FZB 6, TIQ 4, WQD 4. (May) W7VAZ 337, K7FAE 233, W7WAH 69, USO 65, TH 46, BXH 33, APS 22, EHH 12, EVW 7, WN7BEC 3.

PACIFIC DIVISION

HAWAII — SCM, Samuel H. Lewbel, KH6AED — This year brought out the heaviest Field Day competition ever. Kauai was the only island not participating. Oahu had four groups: HARC (WO) with 13 members, of which seven were in the AREC; Air Force MARS (FAA) 9 members, 2 AREC; Leeward Club (MOP) 8 and 5; Windward Club (BFD) 8 and 0; Hilo Club (AQL) 28 and 20; Maui Club (RS) 21 and 0. We understand it is very close between Hilo, Maui and the HARC for top scores. Watch for the claimed scores and then the finals in *QST*. K6GMU, operating KR6ME, sent in his first traffic report and started right out with BPL. Traffic: KH6QU 1066, KR6ME 548, KP6AK 121.

NEVADA — SCM, Ray T. Warner, W7JU — RSY, of Las Vegas, now is permanently located in Santa Anna, Calif. LHQ, PWE, TKV, NW, RSY and JU attended the National Convention in San Francisco. FEF operated on Field Day from the mountains near Winnemucca. YCY and YJB set up near Angles Peak, in the Charleston Mountains, for Field Day. LHQ now is mobile with an Elmac transmitter. SXD, of Boulder City, has a new Adventurer for portable and low-power work. WN7CXQ has completed his DX-35 kit and is on the air. LBE, of Las Vegas, is enjoying DX on 21-Mc. phone. The members of the SNARC held a nighttime 10-meter hunt after the club meeting at Henderson.

SANTA CLARA VALLEY — SCM, R. Paul Tibbs, W6WGO — SEC: NVO. Field Day was enjoyed by members of the clubs throughout the section. UF/6 was reported to have scored over 2300. This is the highest reported in the section. UW's total is over 1600. VSV gave a talk on v.h.f. work at the SCCARA club meeting in June. CFK and MDY went on a trip to Europe during June. The SCCARAS summer steak barbecue will take place in August. K6JTG is working 21 Mc. with a DX-100 and three-element beam. ZRJ built a Heath grid-dipper and is working on an antenna system. MMG is on a vacation trip to New Hampshire. YHM operated at UW for the first Field Day operation since 1952. Don made a two-week trip to Alaska for field work. HC reports a better total on traffic than usual. Harry has been QRL with director business and National Convention plans. This column cannot report the news of your station and your activity if you do not report to your SCM each month. He has Communications Department appointments for those qualifying. Send in your news items and ask for an appointment. Anyone working c.w. and having a couple of hours in the evenings to operate can be of great help by working in the Transcontinental Corps. These operators relay traffic from one area to another by keeping schedules with top-notch operators in other areas. Anyone interested in this important work should contact HC or WØKQD. Traffic: K6DYX 331, W6BPT 204, HC 155, YHM 134, ZRJ 86, K6JTG 6.

EAST BAY — SCM, Roger Wixson, W6FDJ — Asst. SCMs: Harry T. Cameron, 6RVC, and Oliver A. Nelson, jr., 6MXQ. PAM: LL. RMs: EFD, JOH and IPW. NOTICE!! Your new SEC is J. Wayne Clark, 70 Hoffman Ave., Napa, Calif. I would like to thank Jay Amaro for the FB job he has done in the past. We are sorry to lose Jay but his new house has been keeping him very busy. Thanks again, Jay. The National Convention is past history now and all I can say is it sure was a success. Attendance ran over 2000. Registration at 1600 Fri. went over 1700. I can say it was the best convention I have ever attended. A more detailed commentary will appear in the July column. Field Day around the section seemed to be in full force and from reports received thus far it looks like some records might be set. Around the clubs in the East Bay: The Oakland Radio Club had Ralph Bykirk from Telebeam Co. as a speaker. Ralph gave a very interesting talk on Telebeam "Addaray," an all-band beam 80 through 10 meters. Ralph also demonstrated part of the Addaray beam showing the SWR vs Freq. The East Bay Club discussed the recent "Operation Medic" which was held in Berkeley. AXN gave a talk on his recent contacts on 1296 Mc. Distances of 168 and 185 miles were made. The meeting wound up with a club auc-

(Continued on page 102)

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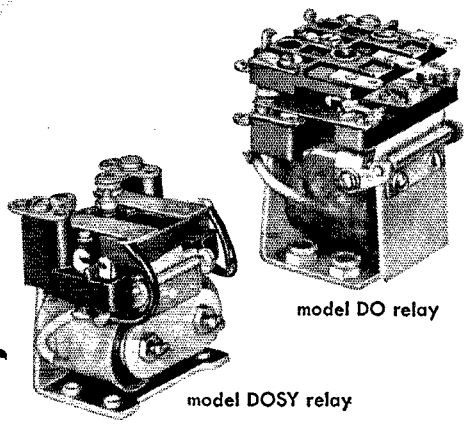

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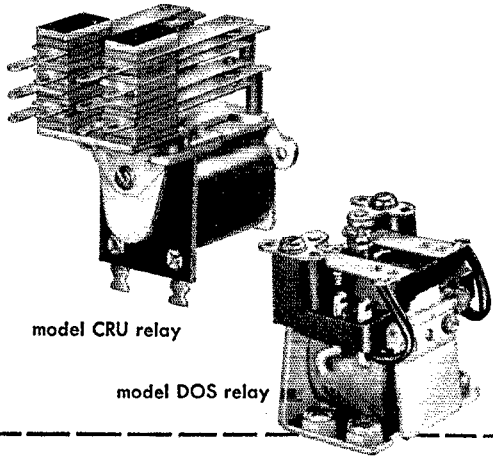

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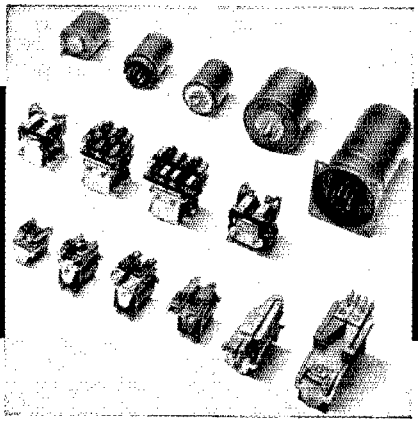

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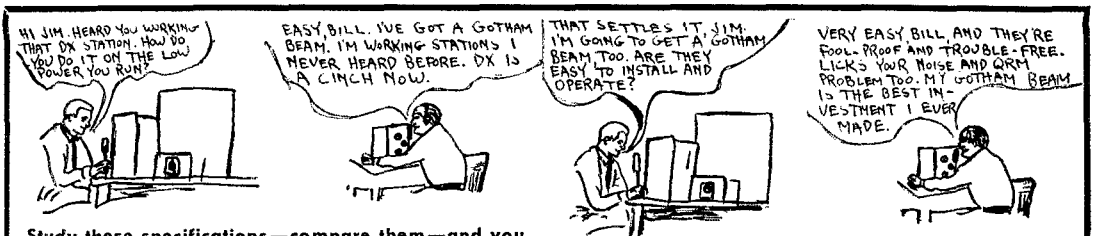
tion followed by refreshments. The Mt. Diablo Club held an election and chose OHR as its new EC. New officers of the Skyriders include TM, pres.; ACN vice-pres.; MNK, secy.; ANK/XYL, treas.; ANK, N. C.; ELP, A.N.C. Good luck, gang! K6WAY had some equipment trouble but still had a traffic total of 266. Traffic: K6WAY 266, GK 246, W6QDW 15, K6EPC 39, W6HBF 22.

SAN FRANCISCO — SCM, Walter A. Buckley, W6GGC — Mac Chapman, of the West Coast Electronics, was guest speaker at the San Francisco Radio Club meeting in June and held everyone's interest with his fine talk. Best of luck to BYB on his new venture. He has opened up an exclusive ham store under the name of No. Calif. Amateur Supply. OST came in first in the 28ers hidden transmitter hunt and had the honor of putting on the 6-meter hunt at the National Convention. The boys in Sharp Park now have a small net on 5250 Mc. K6GKO, K6QIH, K6JRZ, K6QHY, K6ASO, and K6GQJ are all members. K6HHL, K6JFS, K6HYW and W6KFS worked 106 contacts in 9 sections on the QSR H.F. QSO Party. DTV suggested a picnic to be held in August or September by the Sonoma County Radio Amateurs. K6HA made an appeal for help during the c.d. exercise held July 20–26th. CBE reports that DX still is very good. He is up to 106 countries. K6TFM is working on a monitor and antenna for break-in work. The San Francisco Naval Shipyard Club held its Field Day on Mt. Davidson, in San Francisco. The John O'Connell School Ham Club had a good turnout of young fellows for contacts with gear set up on Mt. San Bruno. The San Francisco Radio Club had a big turnout of operators as usual. The Cathay Club had a nice turnout in Marin County and invited its guests to look over the set-up. OPL, the Asst. SCM, checked in on the Marin County Club's Field Day activities and reported that the fellows all had a fine response from the members in the different clubs. The local HAMS (Red Cross) joined forces with the San Francisco Radio Club boys. K6GKQ now is able to use his arms after having both of them injured in an accident several months ago. The boys in the Marin Amateur Radio Club report that QJA is now in W7-Land and that QNB is home on vacation from Princeton. Reports have it that a new 2-meter repeater station, located just east of Fresno, is now on the air. It's mounted on a TV station transmitting tower. The call is K6BNP and it operates on 147.06 Mc. We hear that K6BMW is trying to line up the transmitter so perhaps we'll hear that he contacts K6BNP soon. All the fellows in the San Francisco Naval Shipyard have been invited to join the code classes being held in the yard. However, only shipyard workers are allowed in the shop. Mr. Rykirk, from Tele Beam Company, gave a talk on all-band antennas at the Tamalpais Radio Club's June meeting. The annual summer picnic was a howling success. Ladies in the San Francisco Radio Club of YLRLs went all out on making the program a success for women attending the ARRL National Convention. I know that all in the San Francisco section will join me in congratulations to our former SCM, ATO, on the marriage of his son Richard to Shirley Ann Sanguinetti on July 15th. PHT is back on the air busily handling traffic for the Mission Trail Net. Traffic: K6IFM 68, W6GQA 22, GGC 19, GHI 11, PHT 11.

SACRAMENTO VALLEY — SCM, Harold L. Lucero, W6JDN — Traffic and activities have slowed somewhat because of the vacation period. K6EHT and CMA continue to carry the load. Field Day appeared to be one of the best and was enjoyed by all those who took part. Something for us in this section to think about in the coming year is the Pacific Division Convention. It is hoped that it will be in the Sacramento Valley section. Let's make it that way. The National Convention has come and gone, the new year is ahead, let's all do our best for the betterment of amateur radio and all that it stands for. We will remain on the air as long as we can show good reason why we are a necessity. Fellows, think it over, reason with yourselves. We have a wonderful hobby; let's keep it that way. Be prepared to do a job the correct way whenever an emergency arises. Let's have more information as to the doings of the section. It's the only way I have of finding out just what is going on. I had the pleasure of meeting F. E. Handy, 1BDI, of ARRL, President Dosland and Mr. Budlong during the National Convention. Sorry that more of you couldn't have had the same pleasure. Traffic: K6EHT 70.

SAN JOAQUIN VALLEY — SCM, Ralph Saroyan, W6JPU — The Fresno Amateur Radio Club held a very successful Field Day above Auberry. KN6SWO was host on his ranch and received his ticket the day after Field Day! DVL had his communication bus working very well. Can that thing climb hills! The Novices had a nice set-up and made many contacts. The Turlock Radio Club held its Field Day at Rogge Ridge with six stations and six operators. The Kern County Radio Club had 19 operators and operated Class A. OUX bought a 20-A exciter. PXP also is thinking about s.s.b. SSL and his XYL spent two wonderful weeks in Honolulu. ZFN is putting out a nice signal mobiling, and KMB has an Elmac with a good signal. PPO is back in Fresno and on the air with a Phase-master s.s.b. rig. NTK is back in Fresno and is active on 2 meters.

(Continued on page 104)



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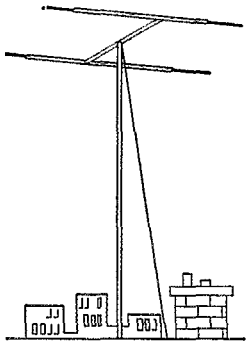

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OWL, UBK, and K6GTI, with XYLs, and K6PEQ, ZYR, JMP, PXP, QON and JPU attended the National Convention in San Francisco. K6IFL blew out a dynamotor. K6GOX has an 80-ft. tower with 400 watts on 6 meters. K6HFA got his WAS certificate and is waiting for WAC and WBE. He has worked 55 countries. SQN had an auto accident and is recovering. K6IMN tied the knot. The Turlock 2-meter gang supplied communications for the election returns. GYN has a super charger on his VW. Don't forget your reports. See you at the next radio club meeting. Traffic: W6ADB 84.

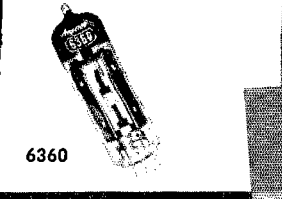
ROANOKE DIVISION

NORTH CAROLINA — SCM, B. Riley Fowler, W4RRH — SEC: ZG. PAM: DRC. The month of June found many clubs out on Field Day. Many have made a report and a good time seems to have been the order of the day. Clubs reporting: Catawba Valley, Charlotte, Kinston, Winston-Salem, Morganton, Fayetteville, Asheville, Lexington, Gaston County, Raleigh, and one operator, K4GTZ, operating from Clingmans Peak. Winston-Salem, Catawba Valley, Raleigh, and Morganton Clubs report that they were on emergency power. The Roanoke Rapids Club also was on Field Day. We need an Emergency Coordinator in District Number 25, comprised of the following counties: Bertie, Gates, Hertford, and Martin. Also District Number 27, with the following counties, needs an EC: Dare, Tyrell, Hyde and Washington. With the exception of these two districts the AREC setup is coming along excellently. Anyone have any suggestions for these two areas? It seems that many plans are in the mill by amateur radio, MARS, CAP, National Guard, Red Cross, Navy, State Highway (patrol and maintenance) and Marines to cover the next communication emergency in the State. There may be others. It pays to make plans in advance. Also I hear of a Hurricane Net affecting the coastal area of the several states. Traffic: K4DJZ 48, W4DRC 48, BCE 41, DSO 20, W9QNI/4 19, W4FDP 16, GXR 14, RRH 10, K4ARP 9, W4VBO 9, ZWF 4.

SOUTH CAROLINA — SCM, Bryson L. McGraw, W4HMG — SEC: ZRH. PAM: FFH. RM: AKC. Congrats to YLT on the new bride. The following c.w. net members received Net certificates: DFR, EKG, KKC/4, ZRH, JCD, DGJ, EGI and TDJ. Following are incomplete Field Day reports with the number of contacts: Cola 565, Shaw-Sumter 530, RH 220, Aiken 225, Greenville (FDT) 358, SPTG (DFR) 360. UUB reports the SPTG gang has the club call K4JLA and DTQ and NTO are now on 6 meters. The *Rock Hill Bulletin* needs the support of all, fellows. Much fine work is being done on tracing the rash of unmodulated carriers on 3930 kc. AUL, for the Florence gang, LLH, reports ZUV, ULH, AUL, DXW and YLX all 75 meters via auto. AUL has 153 countries confirmed. JKT has a new mobile rig and VAM a new gallon. The Shaw-Sumter Club *Newspaper* editor, K4GIF, deserves congrats on an FB job. 2BHS/4 is looking for 2-meter stations. EGI has an FB new s.s.b. rig on 75 meters. GIF is the father of a 4th harmonic. FFH is assisting in a big way on license tag regs in the Charleston Area. TWW has the new secret clipper that is the best yet with a mighty audio wallop. EGI confirms the FB antenna in July *QST* with good results and DX. The shiny new kw. in the shack of K4CTX sounds FB. Most complete ham shack honors go to FFH with three FB rigs and receivers with emergency power for all. COA has one of the top South Carolina mobile signals on 75 meters. We all love to hear TDJ with perfectly-sent c.w. signals with a hand key. TTG is sporting a new DX-100 with FB signals. ANK works like a horse, meeting the phone and c.w. nets, 4RN and MARS NCS. The Rock Hill gang has developed an FB converter for 75 meters. RCY has nice 2-meter signals fixed and mobile. Traffic: W4AKC 123, FFH 112, K6KKC/4 10.

VIRGINIA — SCM, John Carl Morgan, W4KX — Field Day activity was at an all-time high, with practically every club and many separate groups reporting activity. At least 150 were known to have participated in the Virginia QSO Party, but only an even dozen submitted logs! High man was K4BUI, with K4ASU and JUJ in second and third place, respectively. High Novice was KN4IIQ, with KN4HKL the runner-up. Mgr TFZ is gratified to note that ODN attendance is holding up in spite of summer QRN, but TYC bemoans that VN is suffering from the fact that 1900 daylight keeps members pushing lawnmowers instead of keys. K4AET is eager to receive suggestions on speeding up VFN sessions without cutting down attendance. KN4JFE reports formation of the Tidewater C.W. Net. Novices are urged to QNI Mon. through Fri. 1630-1730 on 3720 kc. Club doings: PVARC again won the SS gavel for 1955. Halifax County hams have formed the Old Dominion ARC. Movies of the Petersburg Club's Field Day activity were shown on WXEX-TV. K4EIG and KN4ERS entered gear in the Arlington Science Fair, winning first prize in their class. JUJ bemoans the failure to take the portable rig on his recent trip to VP9-Land. LW is off the air while changing QTH to Arlington. We regret to hear that JMB has sea-duty orders and expects to be off the air for about a year. APM reports (jokingly?) he's had to change his QTH to escape QRM from KFC

(Continued on page 106)



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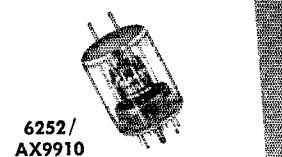

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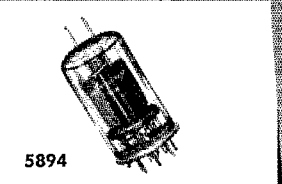

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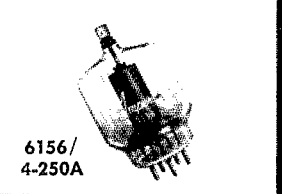

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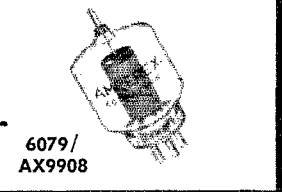

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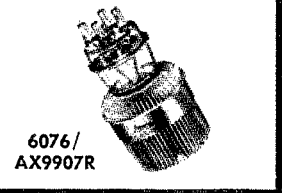

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AX9907R

5924/
AX9904R

AMPEREX TYPE	HEATER VOLTS					
6360	6.3					
6252/AX9910	6.3					
5894	6.3					
807						
6083/AX-9909						
4X-150A						
6155/4-125A	5.0					
6156/4-250A	5.0	14.1				
5868/AX9902	10.0	9.9	100	B	5000	700
6079/AX9908	10.0	9.9	75	B	4000	—
833A	10.0	10.0	30	B	4000	—
6076/AX9907R	6.3	32.5	220	AB$_2$ AB$_2$	5000 5000	800 800
5924/AX9904R	12.6	33	75	B	3000 4000 6000	— — —

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and YZC! K4EZL now is General Class. IYC and BIJ participated in the May F.M.T., racking up accuracies of 8.3 and 9.4 parts per million. All OOs should be highly commended for their diligence in helping us to keep ourselves inside the pasture and out of FCC's hair. Traffic: (June) W4IA 171, K4DBC 67, DKA 63, W4FKP 33, K4AET 32, BUI 21, W4SZT 20, CZB 11, WBC 9, CXQ 7, KX 7, K4CZB 3, W4JMB 2. (May) W4JMB 10.

WEST VIRGINIA — SCM, Albert H. Hix, W8PQQ — SEC: GEP. PAMs: FGL and GCZ. RMs: DFC, GBF, HZA and JWX. UYR renewed his ORS appointment. A new ham at Glasgow is KN8BQV with 50 watts and an S-85 receiver. The Civil Defense Headquarters had to move to the West Virginia Medical Center in South Charleston. The kw. station is being set up now. This is a big project and therefore is taking some time to get things in order. The station should be ready to go before too long. The Stonewall Jackson Club operated a Field Day station and loaded up the local BC tower part of the time. 4VAN, ex-8VAN, will set up a station in Charleston very soon on s.s.b. George will be spending some time in Charleston. RGE is on with high power to a pair of 812s. GCZ, GGC and GEP operated a Field Day station this year at GCZ's summer camp. The Kanawha Radio Club operated a Field Day station and had a good turnout of operators. We are all very sorry to learn of the passing away of MOP. WN8BQU is a new Novice in Princeton. MUJ is active on 15 meters with a beam. GBF averaged 0.6 p.p.m. during the last Frequency Measuring Test. GIU has a new 40-meter vertical. KN8AGA went to National Guard Camp at Ft. Knox. TGF is on with a new 150-watt s.s.b. linear. EUJ is on 75, 10 and 2 meters. Traffic: W8KXD 74, PBO 37, HZA 52, BWK 22.

ROCKY MOUNTAIN DIVISION

COLORADO — SCM, James B. Simpson, WØHEM — SEC: NIT: RMs: KQD and MYX: PAM: IUF. The Denver RC held another successful Rocky Mountain Division Convention with F. E. Handy attending. Yours truly couldn't attend because of doctor's orders. Hope to be with you next year. The boys of the El Paso County RC did their usual bang-up job of furnishing communications for the annual Pike's Peak Hill climb. Unfortunately I don't have all the calls at this writing. Well done, fellows. KØWBB attended the National Convention in San Francisco, June 6th was the last time Mac was heard on KØWBB. KVD did a fine job of running interference. SGG is having a fling these fine days shooting film instead of pounding brass. KØCSW is on his way to Korea; he hopes to get an HL call and give the gang some DX. LZY was so disgusted with 40 he moved to 20 meters. Mac, the Voice of KØWBB, has advanced so if you hear the call WØMYX, that's him. Traffic: WØKQD 559, EKQ 135, DGP 93, TV 73, KHQ 60, TUT 32, HOP 28, SWK 16, JHI 12.

UTAH — SCM, James L. Dixon, W7LQE — VRY has a new 80-meter doublet 60 feet high. LRV is selling out his s.s.b. equipment. VSZ has given up ham radio for the electric organ. A new call is BXY with a Viking rig and Hallicrafters S-85 receiver using a doublet 35-feet up on 75-meter phone. VTA has a vertical on 40 meters, a Windom on 35-foot poles, and 200 watts to an 813. QDJ is converting his new BC-779 Super Pro to include the BC band. ZSX is very happy with the new General Class ticket. DBR, on 75 and 2 meters, is troubled with line noise and high-line voltage. LQE and VTJ attended the Rocky Mountain Division Convention at Estes Park. GPN renewed his EC appointment. NHQ is working 80-, 40-, and 20-meter phone. ZTS is Assistant Communications Officer for Provo CAP. TAE is mobile with a GF-11 on 75-meter phone. OSQ has converted an ARC-5 for 75- and 10-meter mobile and is building a 250-watt phone rig for 75, 40 and 20 meters. QYC is recovering from a burst appendix. Traffic: W7QWH 2, LAB 1, LQE 1.

SOUTHEASTERN DIVISION

ALABAMA — SCM, Joe A. Shannon, W4MI — We would like to hear from those interested in OES appointment. There also is an urgent need for an editor-publisher for the Alabama section bulletin. COU reports progress on the new v.f.o.-exciter for the kw. rig. TOI is working with new frequency measuring gear. FEC has high power on 2 meters. K4GRA is mobile on 75 meters. IHV and KN4HPI have joined forces — married. Congratulations! KN4HQS worked a Hawaiian XYL. GUV has a new 48-ft. tower to hold his beams. AVX is working on high-power linear. TXO has converted a 508 on 11 meters. ZUP has a new SX-100 and JKU weakened and bought a 5100 in an attempt to dodge TVI and keep peace with the neighbors. EWB has finished a new 100-watt rig for 75 meters. Field Day activity was evident in Bessemer, Birmingham, Montgomery, Florence and Tuscaloosa. GJW and WOG still are after confirmations for DXCC and both report that same are slow in coming in. SXS blew the transformer in the Viking but now has it back in shape and perking on 3575 kc. The Teen-Age Net (AENT) invites all teen-agers, especially YLs, to join them on 3910 kc. daily at 1630.

(*Continued on page 108*)

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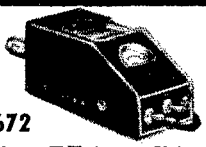

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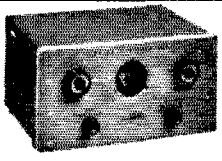

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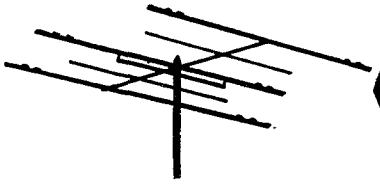

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Traffic: (June) W4UHA 701, COU 419, RLG 195, KIX 120, K4AOZ 88, W4YRO 73, GUV 69, AVX 48, K4ANB 43, W4EJZ 40, DXB 34, TXO 29, ZUP 25, CRY 21, HHG 21, MI 21, K4BFF 16, W4TKL 15, DGH 14, TOI 14, YFN 9, EWB 6, RTQ 6, WAZ 3, TWK 2. (May) W4COU 796, UHA 788, TOI 24, K4BTO 23, W4HTP 10, FEC 8, RYY 8, ZUP 5, FFZ 4.

EASTERN FLORIDA — SCM, Arthur H. Benzee, W4FE — Asst. SCM: John F. Porter, 4KGJ. SEC: IYT. Jacksonville: JARS announces that a certificate will be awarded for working at least ten JARS members. Dade County: We regret the passing of DUW. The MSRC made 539 contacts on Field Day with two transmitters under 70 watts. GGQ and IYT enjoyed the Cocoa Hamfest. LZL has a DX-100. GYF has a new G-66 with an AF-67 that can be used mobile, fixed or portable. GGQ is an OBS. IYT finished code classes on 28.7 Mc. after 40 hours. ZXL and ZXK, from Virginia, now live at Miami Springs. New ECs: TZ, Indian River; GED, No. Brevard; RWM (acting), Flagler County. AREC members in this section now total 597. Everyone is urged to register with his EC. Lake County: Newly-elected officers of the LARA are SXJ, pres.; ADB vice-pres.; K4IZG, secy.; YUT, treas.; YGT, act. mgr. FSS is using an H-W Z match with good results. Columbia County: K4BKV is working DX on 15 meters. BOS put in two weeks with the Navy at Bainbridge, Md. NCS has emergency power. ADU is home from M.I.T. St. Petersburg: Ex-DL1EZ visited the SPARC and gave an interesting talk on life in Venezuela, where he now is living. Five have been graduated from the code class for Novices. COW and his XYL, GXZ, have moved to Streater, Ill. Traffic: (June) W4DVR 86, IYT 74, WS 62, GOG 55, K4AHW 46, W4PJU 33, FSS 28, KGJ 25, ZIR 24, WHK 15, BWR 10, EHW 10. (May) W4WHK 50, AZJ 40.

WESTERN FLORIDA — SCM, Edward J. Collins, W4MS/W4RE — SEC: PLE. ECs. MFY and HIZ. RMs: AXP and K4AKP. KN4IVE is pounding out an FB signal. KN4EHI has passed the Tech. Class exam and is after General. The Tallahassee gang has a real live wire club going now with YNA, pres.; K4APE, vice-pres.; YUU, treas. ACB rebuilt the old 10-meter rig and took part in Field Day activities. ZAE has left for duty in the Navy. CHZ is attending F.S.U. WN4ZHO is trying for General Class. OVO visited Gov. Collins and talked him into declaring June 24-30 Florida Amateur Radio Week. EKW and BPJ are welcome newcomers to the section. PQW is president of the Pensacola Amateur Radio Club. IJK has renewed ORS appointment. JLW is really knocking off the DX with his beam pile. UCY is talking higher power. VR is planning bigger antennas. BGG is QRL junior college. GMS is building beams and beating SWR. HBK is knocking off the DX in fine style. DAO/DEF is keeping 75 meters hot. UUF has TVI from DX TV viewers. FHQ keeps things humming. QU was heard on NCR drill. K4DDD still is improving antennas. ZPN has been sending code practice to Novices. MS is fighting the new tower at the antenna farm. K4AGM has 11 states on 6 meters with 30 watts into an antenna six foot high. K4AH has moved into the new QTH. QK makes the Hurricane Net regularly. NJB is building a super-receiver. EGN is heard after a long layoff. KN4IYQ is after General Class. W9AS (ex-OM1TB) visited the gang. 29,560 kc. is monitored by the PARC in Pensacola for visiting mobile hams. HJA reports into the Pensy Net. 6TOR/4 won an FB fan at the Mobile Hamfest. CDE meets the gang on 75 meters. NN is offering lots of FB gear for sale. KN4IVD has more antennas than transmitters. KN4EEG is after General Class. AXF is supervising the new tower construction for RE. YRF is getting ready for college. ZFL is custodian for K4AFF, Pensy High School Radio Club. PAA, with the best 15-meter signal yet, keeps talking about changing beams. K4DKG/4 is busy phone-patching KZ5 traffic. I would appreciate hearing from all interested in ORS and OBS appointments. Traffic: K4CEF 62, DKG/4 27.

GEORGIA — SCM, William F. Kennedy, W4CFJ — SEC: K4AUM. PAMs: LXE and ACH. RM: W4PIM. Nets: GCEN, 3995 kc. at 1830 EST on Tue. and Thurs., 0800 EST on Sun., ATLCW, 7150 kc., 2100 EST Sun., GSN, Mon. through Fri. 1900 EST on 3590 kc., PIM as NC: 75-meter Phone Mobile Net, each Sun. at 1330 on 3995 kc., UUH as NC; Ten-meter Mobile Net, each Sun. at 2200 on 29.6 Mc., VHW as NC. Georgia is mighty proud of the many clubs which participated in Field Day activities. The Atlanta Radio Club and its members made a nice score. The Atlanta Teen Age Club did an FB job working under many handicaps. Both the Albany and Columbus Radio Clubs turned out in full style for Field Day. The Augusta Club had fine fishing on Field Day. The CSC had approximately 40 members participating with a very high score. FGH and BXV made over 300 contacts on Field Day. FYH is the new president of the Atlanta Radio Club. Tifton now has an amateur radio club with ENC, pres., SHR, vice pres., K4BMD, secy. and treas. Welcome to IBD and K4CRQ, from Savannah, on the GSN. AAY has an antenna for 14 Mc. GDG has been transferred to Akron, Ohio. ZWT is hoping for a special permit to operate from Iran. BWD adds another ham to her family; son Ray, age 12, is now KN4JPB, the youngest ham in Augusta. K4IWN

(*Continued on page 110*)

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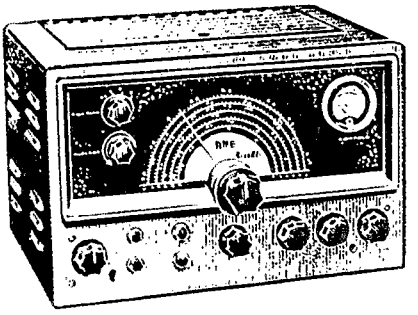

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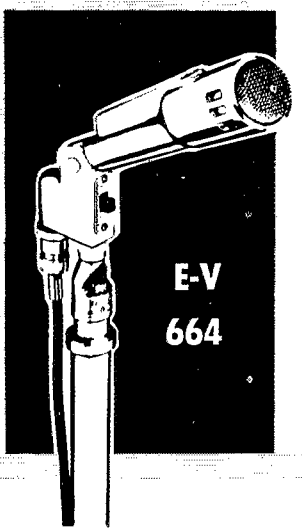

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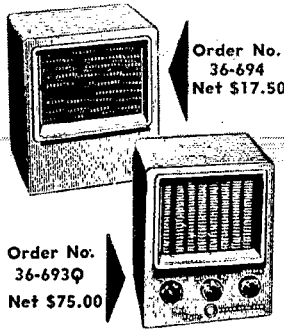

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now has competition at home; his XYL is KN4JWO. EUA has a new DX-100 engineered by NS. NS is losing two hopeful hams, daughter Pat and son-in-law Ralph, to the State of Texas. Our Southeastern Division Director, ZD, is trying to get a BC-669 to work for his XYL Helen and daughter Judy, K4GCT and K4GCF, with the engineering help of TT. YWP expects a new jr. operator soon. Keep sending in those fine station activity reports. Traffic: W4DDY 148, PIM 130, PBK 31, BXV 28, ZD 27, YR 21, CFJ 15, K4AFP 9, CFN 5, IWN 3, W4AAY 2, K4CFO 2.

WEST INDIES — SCM, William Werner, KP4DJ — SEC: HZ, OA, San Juan EC, represented amateurs at the Hurricane Committee meeting called by the USWB June 4th. C.d. had a follow-up communications test on June 13th to double-check all emergency-powered systems, amateur and commercial. HG set up an emergency station at the power company office which was operated by WT. QM also was on with an emergency-powered rig. Telco will include amateur calls alphabetically with telephone numbers in the next directory if the PRARC will submit a list of those who desire to be so listed. PRARC Field Day, held at Isla Cabras, brought out AAM, ABA, ABN, ACH, ACY, CU, DH, DJ, DV, EK, QA and SZ. The score was 936 points. Field Day messages were received from groups at Isla Cabras, Ramey AFB, and Guantanamo Bay, Cuba. HG suggests tests on 7210 kc. for the Emergency Net for better 24-hour coverage with less noise. Several members of the Antilles Net suggested the same idea and actually are operating on 7 Mc. ZK will go on vacation if he can find a commercial operator to relieve him at coastal marine station WPR. W4NQW, Key West, and W4KGJ, Miami, desire a San Juan link for their Coastal Emergency Net for USWB traffic. AAB, ABN, ACH, and CA are on 53 Mc. AAB, with 100 watts on 53 Mc., tests at 11 P.M. daily and 9 A.M. to noon Sun. ACH has a DX-100. WD has returned from Spain. WP4ABW is going up for his General Class license. RM is installing a new modulation transformer in the Globe King. MV deserted phone for 20-meter c.w. SZ takes care of the microwave link San Juan-Ponce for Telco. AZ has a BC-610 on 75 meters using his steel tower as an antenna. AZ bought a Central Electronics 20-A s.s.b. exciter and v.f.o. KP4s are utilizing all bands from 2 to 80 meters. Mayaguez: WP4AFL es ahora Technician. WT en QSO con W4TOW en 20 metros duro dos horas. Domingo, Dia de los Padres, 17 de Junio KP4DC llamo con trafico emergencia y WT recibio y paso todos los traficos de la Policia, Defensa Civil y Bomberos de Mayaguez. Lunes 18 de Junio a las 4:30 P.M. DC daba por terminado el Estado de Alerta. ZC fue el encargado de pasar al trafico a las Autoridades que abririan las compuertas de la Represa del Rio Loiza. W3TEG/KP4 es un nuevo colega en Aibonito, tambien tenemos W4CNS/KP4 carretera Limon y W6MRA/KP4 Cerro las Mesas. Traffic: KP4WT 210, DJ 3, CC 2, W4HZ/KP4 2, KG4AO/KG4 1, KP4ID/KP4 1, ZA/KP4 1.

CANAL ZONE — SCM, Roger M. Howe, KZ5RM — The Canal Zone Amateur Radio Association was privileged at its last meeting to hear a talk by Mr. Ray Jewell, who has been around the world on the famous sailing vessel *Yankee* and is here now on the U.S. Coast Guard Bark *Eagle* making a movie for Walt Disney. Ray gave a very interesting account of his trip around the world. The CZARA gang had an FB Field Day at Gamboa this year with two rigs on the air for the full 24-hour period and both on emergency power. Our SEC, WA, was chairman of the committee and did an excellent job. GB, VP and BK are among the gang who are Stateside this summer. VR, RV, FL and ML are keeping us informed of their activities in the States via amateur radio but we have not heard from BD and DW so far. Traffic: KZ5FA 92, CF 81, LB 41, KA 40, RM 37.

SOUTHWESTERN DIVISION

LOS ANGELES — SCM, William J. Schuch, W6CMN — Asst. SCM: Albert J. Hill, jr., 6JQB: *RMs:* BHG and GJP: PAMs: MEP and PIB. DDE is very QRL traffic. GYH still is holding skeds with MARS and Japan. KN6OZJ had a 100 per cent check-in on the 2x4x6 Net three months in a row. BHG and USY are the only members of the SCN Net holding the GMTHC award. TDO finally is in the new shack. LYG is cleaning the antennas and changing the rigs around. K6IYF closed the station for the summer and expects to reactivate from San Luis Obispo next fall. GUZ is waiting for QSLs looking for DXCC; he has worked 100 with 64 confirmed. K6COP got his WAS certificate and 25-w.p.m. sticker. K6KJN is going into the Army for six months. PLW now has a Matchbox and James power pack. KPR finished the 2-meter rig and is working on 50-Mc. WAS with 24 at present. CMN, on vacation hooking fish and relaxing, left HFA, the writer of this report, a large pair of shoes that are hard to fill. Traffic: W6DDE 846, GYH 546, KN6OZJ 190, W6BHG 178, TDO 144, LYG 142, K6MON 126, IYF 104, DQA 101, W6ORS 81, USY 74. K6GUZ 69, LVL 59, W6VSH 56, K6EA 51, W6CK 30, K6COP 28, W6INH 20, K6KJN 12, KN6RCN 11, K6PLW 6, W6AM 4, K6BEQ 4, HOV 2, KPR 1.

ARIZONA — SCM, Cameron A. Allen, W7OIF — Asst. SCM: Fred W. Wilgus, 7LJN. SEC: JYH. PAM of AEN:

(*Continued on page 112*)

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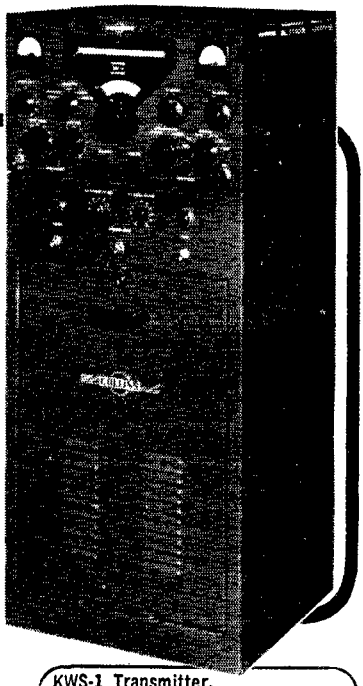

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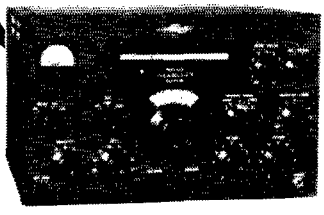

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ASI. RM: PKM. AEN meets for drill Tue. and Thurs. at 7 P.M. MST on 3865 kc. The Grand Canyon Net meets Sun. at 9 A.M. MST on 7210 kc. Over Labor Day week end the big hamfest at Fort Huachuca will be held. Do not miss this as it promises to be the best ever. There will be prizes and lots of entertainment. A swell time was had by all at Montezuma Well this year. There were 76 licensees present, plus the wives and children, a total of 225. A vote of thanks goes to 6PG for the fine job he did in cleaning up the grounds after everybody left. He also saved the wood pile and storage area from a fire that was started from the trash the park ranger was burning. HYQ, LSK and WUX provided communications from Grand Canyon Airport to Flagstaff when the TWA and UAL planes crashed in the Grand Canyon. Traffic: W7OIF 6.

SAN DIEGO — SCM, Don Stansifer, W6LRU — Up north the Orange County gang has been hitting 6 meters hard this summer. OXF has added 20 states, K6JBW 18 and COE 15. K6HAI, the club station for the North Shores Amateur Radio Club, has been given the city c.d. headquarters job with EWU as Radio Officer for the City of San Diego. The Red Cross has named KBT as chairman for communications. The location of K6HAI, on Mt. Soledad, allows a good signal into the Los Angeles Area on both 2 and 10 meters. The station also is active on 80-meter c.w. for the State C.D. Net. All local emergency nets took an active part during the July CPX drills. Seven clubs in the section sent their SCM Field Day messages, an increase over last year. K6CZE is the proud father of a jr. YL. New officers of the Convair Club are K6DBJ, pres.; HME, vice-pres.; K6ITA, secy.; and K6CZF, treas. The Upper-Ten Club hopes to have a 144-Mc. repeater in operation this fall. K6DBG now is back at work after a bout in the hospital. Five San Diego Area hams qualified as Class I OOs in the recent F.M.T. We regret to inform readers of the passing of Vaughn McKenney, 1BS, of a heart attack. He was EC for the 2-meter gang, a member of the Upper-Ten Radio Club and active in AREC activities. His wife, K6CAL, survives him. K6BPK, of all people, had the mumps! The Silvergate Club now has a club call, K6SSQ, and more than doubled last year's Field Day score. LRU needs 3 cards for 200 confirmed. K6CTQ now is in the Navy. UZL made ZAC in 4 hours on 21-Mc. phone, then raised his beam to 55 feet. Traffic: K6BPI 128, W6SK 47, K6DBG 14, W6JVA 2.

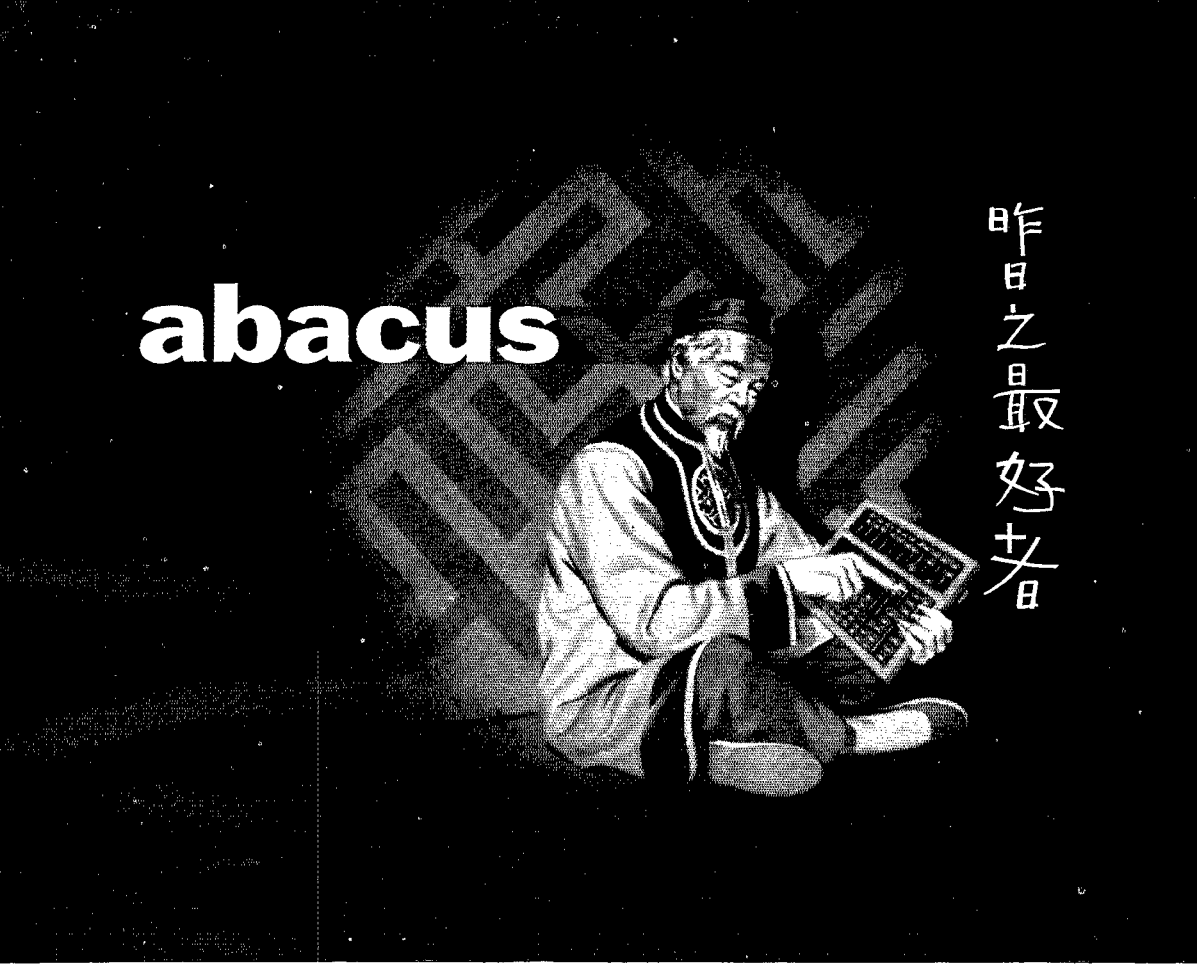
SANTA BARBARA — SCM, William B. Farwell, W6QIW — Asst. SCM: Dorothy E. Wilson, 6REF. SEC: K6KPU. Paso Robles held Field Day in a canyon for test purposes. A record score was not the objective, as only 15 contacts were made. The rig was a Viking Ranger, the receiver a Sky Buddy. BRY furnished a 1500-watt generator. Apparently because of the location no signals were heard above 14 Mc. Santa Barbara spent Field Day on top of Santa Ynez Mt., 4000-ft. elevation. The Ventura Club Field Day was tape-recorded and broadcast over the local broadcasting station. The San Louis Obispo County gang had at least eleven representatives at the ARRL Convention in San Francisco. Our excellent OO, NKT, will be inactive during the summer months. The Ventura Club is putting out a club paper, *Harmonics*. This is very poor news coverage this time, but I can't print news when you don't send me any. Traffic: W6QIW 68, K6KPU 10, JRT 3.

WEST GULF DIVISION

NORTHERN TEXAS — Acting SCM, Ray A. Thacker, W5TFP — SEC: PYI. PAMs: TFP and IWQ. RMs: KPB and PCN. CYL reported Abilene had seven rigs and thirty operators on Field Day. AWT comments that too many NCSs don't "savvy" code anymore. BKH had to QSY to the hospital for a short session. JXU still is going great guns on 6 meters. YPI reports the organization of a new club in Seymour with YPI, pres.; EVQ, vice-pres.; and KN5DNB, secy.-treas. Other charter members include KN5DYJ, DKB, EDI, TMI, CCN and EVQ. A new OO, OBS and OPS in Ft. Worth is DFB. We look for a good job from Ben. This section is in need of sincere amateurs who are willing to serve as OOs and OBSs. K4EBK/5, new in Dallas, is laying out a terrific mobile signal. KAS is now sporting a new Elmac set-up in his chariot. KN5GVN is a new Novice in the Dallas Area. VHF is heard on s.s.b. mobile. TFP finally made it on 2 meters. Most likely this will be the final report sent in as your Acting SCM and we'll take this opportunity to thank all who have made the "pro-tem" period work-load lighter. Don't forget, October 1st is the deadline for applying for call letter license plates. We would remind the few fellow hams who are getting these plates without having an operating rig in the car, that is a SWORN affidavit you sign! Traffic: K5FFB 731, W5DTA/5 658, UBW 139, KPB 122, TFP 42, YKT 22, BKH 20, FCX 16, YPI 10, FIP 8, JFX 3, ZTG 2.

OKLAHOMA — SCM, Ewing Canaday, W5GIQ — Asst. SCM: James R. Booker, 5ADC. SEC: KY. PAM: MFX. RM: GVS. Your SCM, accompanied by GVS and KY, went to Galveston in June to represent Oklahoma at the West Gulf Division Convention. Upon arrival we were happy to find HFX, CXM, JCW, OOM, TOW, KDA, FEC and FIH on hand. JCW won the grand prize of a 75A-4 and now his HQ-129 is for sale cheap, he says. All had a good time. Oklahoma was well represented in the Field

(Continued on page 114)



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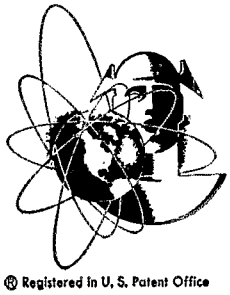

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Day outing. The clubs at Bartlesville, Enid, Oklahoma City, Muskogee, McAlester and Okmulgee had rigs in the field. There may have been others. The Bartlesville Club is showing some phenomenal growth. New General Class licensees there include EKA, K5s AQU, AUX, BBA, BBF, BSU, BSV and EJC. New Novices include KN5s DPJ, DYL, ETV, EUG, EVD, and EZZ. Another welcome addition to the Bartlesville gang is RRM, former North Texas SCM, JWA from Lawton and ØCWF from Kansas. KN5GAW is a new Novice at Cushing. It's nice to have BBI back home from the Army. CFG reports he has had a hitch in the hospital but is back on the air now. JXM is back on the air with a Viking Ranger and new antenna. BSU and BSV are having good results with their new mobiles. BDL and JWA expect to be on 6 meters soon. Traffic: W5GVS 109, K5CAY 71, W5GIQ 44, K5BIG 43, W5ADC 39, PNG 39, FEC 38, CCK 14, RST 14, MFX 11, SWJ 8.

SOUTHERN TEXAS — SCM, Morley Bartholomew, W5QDX — Congratulations to the Galveston gang on putting on an extra special convention. All agree the show was well planned and smoothly run. San Antonio was selected as the convention city next year. OEE and KN5-CBL kept schedules with PRO while he enjoyed a vacation in Hawaii. DFL has his General Class license. AQN is on 80 and 40 meters with a vertical. GIU is mobile with an Elmac. DTJ has worked 40 YLs in Texas. FZA, HHO and DIC made a total of 428 contacts on 20-meter c.w. as their contribution to the San Antonio Field Day effort. EDZ is the proud papa of a baby girl. DKK has WAC on 20-meter phone. The Austin ARC had approximately fifteen operators at Hancock Park during Field Day. RCP has a new Chevrolet. TFY is mobile in a new Ford. K5ALF now has her General Class license. KN5CZZ has 32 states on 40 meters. ANQ has been promoted to transmitter supervisor at KGUL-TV. SM5AOI visited the Houston ARC. HEX has installed a phone patch. Traffic: (June) W5DTJ 15. (May) W5MN 29.

NEW MEXICO — SCM, Einar H. Morterud, W5FPB — SEC: FHP. RM: RKS. PAM: DVA. The NMEPN meets on 3838 kc. Tue. and Thur. at 1800 MST, Sun. at 0730; the NM Breakfast Club meets on 3838 kc. daily except Sun. at 0700–0800. No interest has been shown in reactivating the C.W. Net, according to the RM. It seems a shame that there is so little interest. RZJ had a very interesting story published in the magazine section of the *Denver Post*. QNT is on 40-meter c.w. GVB is planning high-power mobile for the new car. POI is building a new home rig. CIN has an NC-300. PBV is working on the electronic ignition system for his car. WKW vacationed in the Midwest. BNZ got a three-element beam from the XYL. SGC installed mobile under the watchful eye of the XYL, and vacationed in VE-Land. NSV installed a Johnson mobile. K5EDD moved to W6-Land and JWC to W7-Land. The Totah ARC will hold its annual dinner and get-together Sun., Oct. 7th. Mesilla Valley EPN meets Tue. at 1800 on 29.6 Mc. Traffic: (June) W5GRI 12, LEF 5, BIH 1, FPB 1, ROH 1. (May) W5CIN 19, FHP 19.

CANADIAN DIVISION

MARITIME — SCM, D. E. Weeks, VE1WB — Asst. SCMs: Fritz Webb, 1DB; Aaron Solomon, 1OC. SEC: RR. Best wishes to GU and his XYL on their recent marriage. UT attended the North Bay Hamfest and reports a wonderful time. AEB is working 20-meter DX with 1.7 watts and reports good results, while ADH has worked seven U.S. call areas on the same band with 8 watts. PQ and OM report 6 meters is really hot at times. How about more Maritime representation on this band, fellows? Mobile activity has shown a marked increase this past summer with VO1F, VO1Q, VO1AM and VE1PX the latest additions to the mobile list. FP8AP has been helping the DXCC seekers of this section by standing by on 3750 kc. for contacts after nightly schedules with the raft *L'Egare Deux*. Thanks to OC for his fine public relations work in connection with the raft expedition. News from VO-Land: Officers of the Newfoundland Radio Club are VO1D, pres.; VO1AM, vice-pres.; VO1AG, secy.; and VO1J, treas. W3PML, W5KML, KØCMU and W7RMU have returned to the U.S.A. Congratulations to W1JSH on his promotion to Warrant Officer. Traffic: (June) VE1OC 268, PX 32, ADM 28, ME 20, DB 9, GA 7, WK 4, OM 2. (May) VE1DK 7.

ONTARIO — SCM, Richard W. Roberts, VE3NG — The Nortown Club of Toronto was host to George Hart, W1NJM, National Emergency Coordinator, of ARRL, who addressed the meeting on ham radio in general. The Hamilton Radio Club was host the night before. DTO is in VE6-Land. MK is back on after an absence of five years. DSM is the new Toronto EC for 75 meters. The North Bay Hamfest was one of the finest. HE is busy as an OO. AREC members are reminded to watch their cards and the expiration dates and send them to their ECs for endorsement when required. May I thank all of you who were instrumental in the nomination of the writer for this office. I trust that you will give me the support I request from time to time. Thank you one and all. My thanks to all of you who sent congratulations. Thanks to the Metro Radio Club for its fine club paper. I would like to hear from

(Continued on page 116)

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other clubs. BXT is a visitor to EI-Land. DVM is heard from Lake Mazinaw. Field Day scores from this section were poor because of conditions. Civil defense is on the up in Toronto metro. Forest Hill and North York are getting organized. RU is Radio Officer for York Township C.D. AJA is prexy of the Toronto I.B.M. Radio Club. RV will be on 10 meters soon. 3CJ is chairman of the new Southern Ontario TVI Committee. The emergency frequency is 3765 kc. It is requested that this frequency be used only for net and emergency call-up. Please QSY? Traffic: VE3DPO 117, BUR 112, NG 58, DEX 50, APL 39, EAM 29, VZ 28, CJM 27, KM 20, NO 19, AUU 17, AJR 8.

QUEBEC — SCM, Gordon A. Lynn, VE2GL — Congratulations to EC who has been appointed Superior of the Major Seminary at Trois Rivieres. This doesn't cut in on his hamming activities, though. QQ is back on the air at long last with a new rig running the limit. During the week end of June 16th and 17th Abitibi and Temiskaming AREC members were hosts to a group of the Porcupine (Ontario) Club and heard an interesting talk by 3DQL at a meeting at the home of 2AMY. EG (Ethel) with a B&W transmitter and NC-300 receiver, reports handling quite a bit of traffic during June. YU took part in the Frequency Measuring Test. He reports that TVI is now licked and that he is working a little DX. FL reports continued improvement in the attendance of the Northland Net with 33 now on the roll. BK has mobile back on the air and is thinking of the home rig now. XX and FL were among the many VE2s who attended the North Bay Hamfest. Traffic: (June) VE2DR 55, EG 45, EC 21, GL 10, FL 6. (May) VE2DR 116, EC 19, ATQ 16, CP 13, GL 12, FL 7.

BRITISH COLUMBIA — SCM, Peter M. McIntyre, VE7JT — SEC: JT. With the usual summer vacation doldrums activity and reports are about nil. The AREC Net activity also has suffered with the added burden of QRN and skip. The net has been operating under extreme conditions and handicaps but has been regularly held with the help of many throughout the Province. Thanks to those interested enough to pitch in and help when the going gets rough. Those lucky enough to get to the National Convention in San Francisco must have had a good time from what I have heard. As you know DH has resigned as SEC and yours truly has taken over the SEC's job. I am going to try to reorganize districts into a smaller and more compact number of ECs. It will cut down the number of districts to a more workable number, with AECs to help out in the sparse areas, and we hope it will become a more organized, workable group. Any changes made in ECs will be on a strictly area basis and will have no personal significance. As soon as it can be arranged, as many active amateurs as possible will receive a Form 7 and a form letter which will contain instructions and will state the area under which you come. It is hoped you will all cooperate with the requests contained in this letter to better organize the AREC membership in British Columbia. We had a good visit from By Goodman, W1DX, ARRL Headquarters, in Vancouver, July 3rd.

SASKATCHEWAN — SCM, Harold R. Horn, VE5HR — Congratulations to the Regina Club for a first-class hamfest. Special guests were W1DX, from ARRL, W8LBM, from FCDA, and Col. Holmes, Canadian Civil Defense, Ottawa. Among other guests were WØGNS/mobile, W7TPE/mobile, W7OYP, W7ZCF, VE3OU, a number of VE4s and their XYLs, and VE5s and their families. Events and winners were: Hidden Transmitter, KL first, UQ second, JK third. CKBI Trophy, EA. Gus Cox Memorial C.W. Trophy, KJ. Best Mobile, EA. first, DR second, JK third. Furlined button holes (liars contest), DM. Other winners were: Latest licensed YL or XYL, YY; longest licensed ham, EG; tallest ZZ; shortest YF; widest part LV. FI would have won for having the most recent baby, with the arrival of his daughter on opening day, but forgot to register and lost to MK with a six-week-old son. GM was the most recently married; GG the latest licensed; 4GE the longest licensed XYL; and 3OU the furthest visitor, as W1DX and W8LBM declined the honor and prize. ER, EG's XYL and RE's daughter won prizes and YF won the season Rugby tickets. NS provided thrills by flying over and around the Field Day site. XX, Regina Club pres., and his committee did a grand job. HN moved to Regina. LM and GQ and their XYLs holidayed mobile with VE3 and 4 districts. 6BV, 6KM and 4AW were recent visitors. A test of mobiles with a stimulated emergency was worked into the meeting and was well received by civil defense officials.

Strays

Col. Julian Raymond, USA Ret., W4VCY, was recently elected mayor of Bowling Green, Va.

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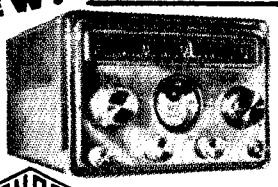

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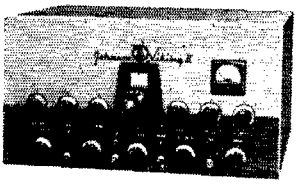

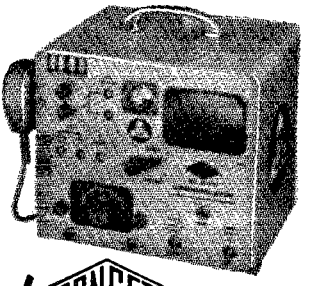

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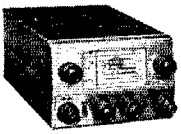

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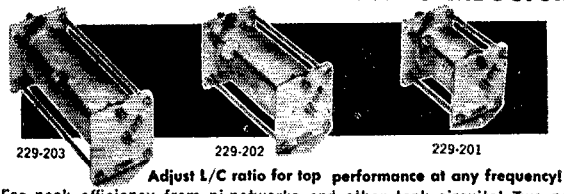

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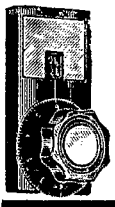

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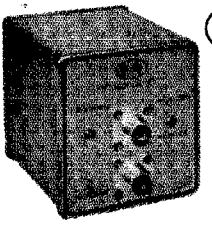

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ARRL — IGY

(Continued from page 15)

Long-distance propagation of v.h.f. waves by means of reflection from the auroral curtain, and from sporadically-ionized patches of the *E*-region of the ionosphere was discovered by amaturs two decades ago, and their observations have been used effectively in studying these phenomena on many occasions. Notable examples are the Cornell University Auroral Project organized with ARRL assistance, and the RASO program conducted by O. P. Ferrell under Air Force contract. Because use of amateur v.h.f. bands is currently at an all-time high, and because the IGY is a worldwide and concentrated scientific effort on many fronts, timed to coincide with the expected peak of a solar activity cycle, the ARRL-IGY program is an unparalleled opportunity for amateurs to contribute to man's knowledge of radio wave propagation.

To make the most of this project, reports from amateurs in all parts of the country will be needed. If you live in one of the less populous sections and make relatively few contacts, don't feel that you can't contribute much. Your reports will be, if anything, more valuable than those from fellows whose areas are well represented. In fact, it isn't necessary to have a v.h.f. transmitter or even an amateur license to help out. Accurate heard reports will be useful supplements to lists of two-way contacts. It goes without saying that this program is made-to-order for the Technician licensee. Many of these fellows have already found out what fun 50-Mc. operation can be, but for those who haven't here's a chance to really make that "ticket" count for something. Not to be overlooked in this project are our brother amateurs from south of the equator. Their cooperation will be essential, of course, in the equatorial-scatter phase of this program. Their help will be solicited through member societies of the International Amateur Radio Union, as well as the pages of *QST*.

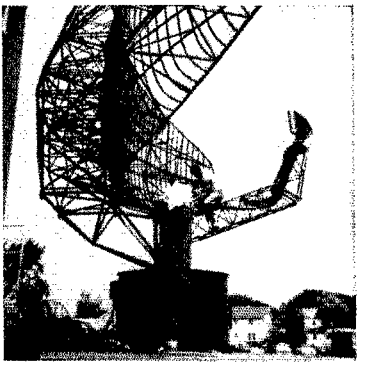
The reporting involved in the program will go something like this: All contacts and heard reports which are suspected to have resulted from one of the propagation types outlined above will be listed on the special forms to be available. These forms will be made up so that the desired information can be taken from the regular station log, insofar as possible. Regular operation will, of course, be encouraged. At bimonthly intervals these report forms will be returned to the ARRL office handling the program.

Then the project staff takes over. First the data will be sorted as to propagation type and time of occurence. Contacts will be selected which are representative of conditions at any given time. From the information furnished about these contacts, calculations of such things as distances and mid-point locations will be made. The resulting data will then be arranged in a form suitable for analysis. At this point the really important job of study and correlation begins. This will go on during the IGY period,

(Continued on page 120)

FIELD ENGINEERING

WITH A FUTURE -AT RAYTHEON



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W1SZ —C. C. Rodimon, Mgr., Field Requirements Dept.
W1GWD—O. L. Dewey, Mgr., Gov't. Service Dept.
W1EEE—E. K. Doherr, Asst. Mgr., Gov't. Service Dept.
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and probably afterwards when the data from other projects is available. If all this sounds rather involved, remember that all the reporting stations have to do is to operate faithfully and send in suitable data on their contacts.

The International Geophysical Year itself will run from July 1, 1957 until December 31, 1958. In almost any new project, certain "bugs" develop. To circumvent this, it has been decided to start collecting data on January 1, 1957, six months early. Thus, we should be in full swing by the actual beginning of the IGY. Do not think that the data collected during this trial period will be wasted — far from it. We can use all the information that we can get. In fact, there has been some talk of the possibility of continuing an investigation of this sort even after the IGY is over. This will depend on the cooperation received from you, the radio amateur.

If you are equipped to operate or listen on any band from 50 Mc. up, and want to take part in what may become one of the major accomplishments of amateur radio, write in and let us know. Send your letter to the writer, in care of ARRL Headquarters. Bear in mind that the program is in a formative state. Aims and procedures may be modified as the need arises or as new ideas come along. In fact, we hope that the program will remain flexible all during its existence, since it can contribute the most only by being adaptable to new concepts. If you have any suggestions as how this work can be made more worthwhile, let us know that too. Further and more detailed information will be coming up shortly through the pages of *QST*. In addition, there will probably be a monthly bulletin which will be sent to contributing stations. It will contain program news, reports sent in which are of special interest, and reports of the project results as information comes in.

Output Indicator

(Continued from page 22)

capacitance is needed at C_1 to light the dial lamp on 80 and 40 meters than on 15.

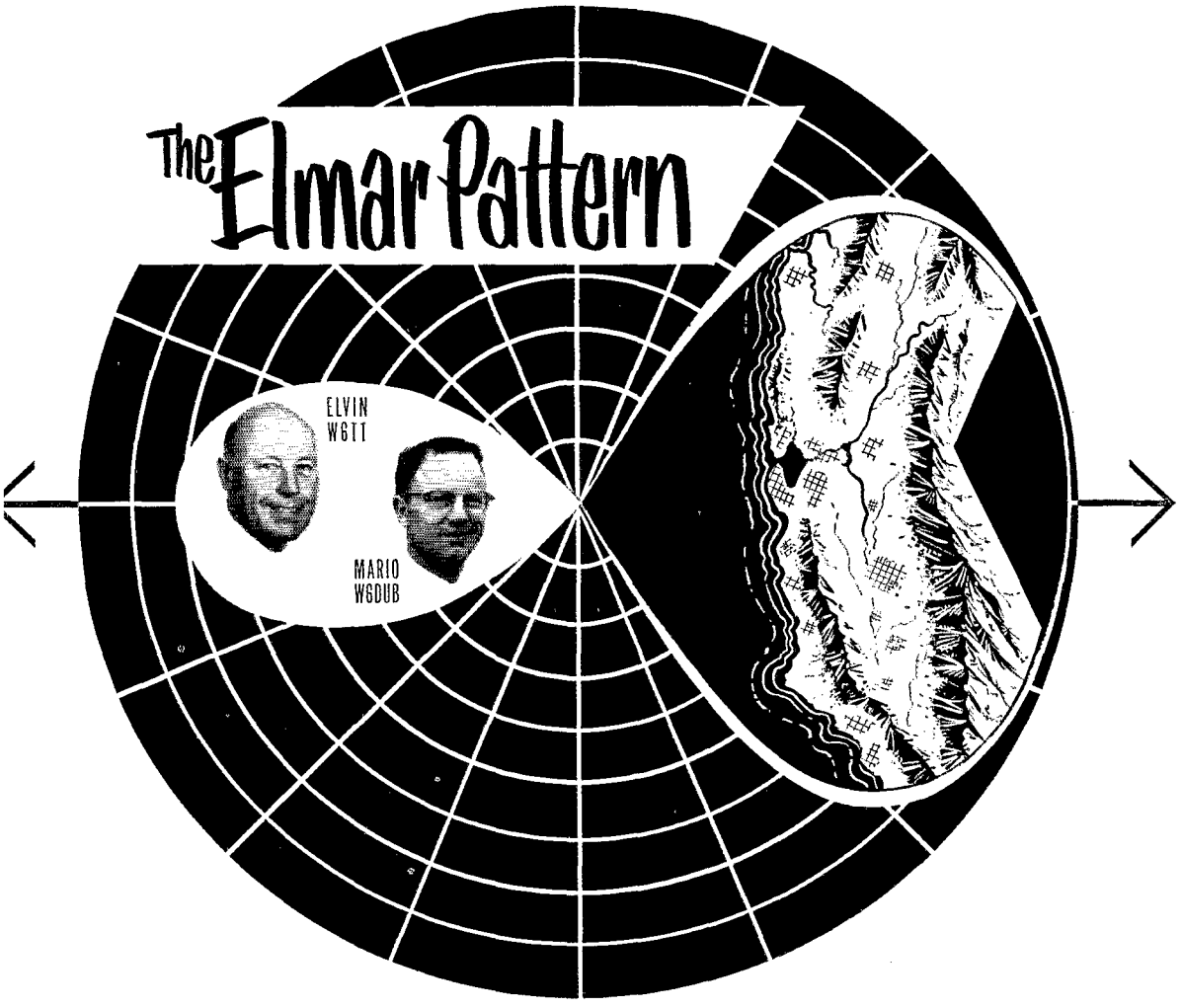
The unit shown in the photograph was built in a 3 × 4 × 5-inch box, but the overall cost could have been reduced by using a coffee can for a chassis. However, the writer recently described a harmonic filter [2] that used a coffee-can chassis, and it was felt that some readers might think we were being subsidized by the caffeine cartel.

[2] McCoy, "Eliminating 80-Meter Novice Harmonics," *QST*, July, 1956.

ARE YOU LICENSED?

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

The Elmar Pattern



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If it's USED . . . don't hesitate . . . TRY ELMAR FIRST. A continuous, big-volume, trade-in turnover makes available, at frequent intervals, almost any standard brand receiver or transmitter model.

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for liberal time-payment plan with easy terms . . .
for generous trade-in allowances.

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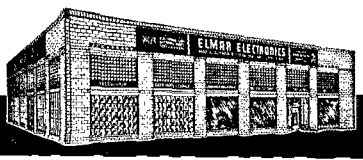
Western Region . . .
Alaska . . . and the
Pacific Area . . .

ELMAR
electronics



140 Eleventh Street, Oakland 7, Calif. HIgate 4-7011

Development of Yagis

(*Continued from page 26*)

varying the vertical polar response could be made by varying the height of the upper antenna. This would enable variation of the radiation angle from 20 to 7 degrees, and might be a useful tool for studying the effect of optimum radiation angle for different communication paths.

Figs. 23, 24 and 25 have been drawn on the basis of a perfectly reflecting ground, which is a rather large assumption in considering the effects of an actual ground. The character of the ground is generally a function of frequency, becoming increasingly like a dielectric as the frequency increases. It is almost impossible to predict the exact location of the ground plane or its reflectivity, so that an accurate paper design to fit a prescribed energy distribution is difficult at the very best. For wavelengths in the region of 2 meters and less, where the antenna system may be removed to many wavelengths above ground and where the ground itself acts as a lossy dielectric, the effect of the ground may be disregarded as a first approximation and the polar response may be estimated as approximately that in free space.

On Erecting Towers

(*Continued from page 27*)

dollars." I paid the three bucks which worked out to 50¢ a stitch and went home.

Festivities continued the next day and in a few hours I was ready to cap the tower and start thinking about building the beam. To my chagrin I couldn't get the cap to line up with the holes. Much tugging and hammering produced no tangible results and I was finally forced to drill a new hole in the tower. This operation entailed the use of a long extension cord for the drill motor which, incidentally, was ungrounded. This latter situation resulted in a teeth-rattling check of my conductivity which I'm forced to report is in the neighborhood of one ohm. Needless to say this is a poor neighborhood. After retrieving the drill motor from a tomato patch three yards and two fences down the street and correcting its deficiencies the tower was completed without further complications. The beam constitutes another story but it's up now and I estimate an approximate gain of 8 db. However, that crack on the head produced a 9 db. hearing loss which likely could be regained by about 30 more feet on the tower. Now let's see. . . . thirty feet. . . .

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Radio Distributing Co. INC.

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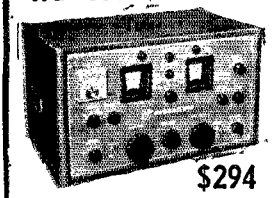
PARTIAL LIST OF USED EQUIPMENT

Hallicrafters SX-88	450.00
Eldico TR-75 From $35 to	50.00
Meissner Signal Shifter EX	35.00
Gonset-Motorola 10 mtr mobile unit 6 volts DC	75.00
National NC-46	50.00
Hallicrafters S-76	125.00
National HR07 complete	175.00
Hallicrafters HT-19	179.00
Hallicrafters S-20R	40.00
National 240D	150.00
Collins 75A3	420.00
Elmac PMR6A, 6 and 12 volts From $85.00 to	115.00
Sylvan 2 meter converter, complete	20.00
Deltronic CD144 Transceiver	125.00
Millen VFO	75.00
Sonar SRT-120P, perfect	175.00
Lysco 600	115.00
Telrex 3 el. 20 meter beam	50.00
Hylite 10 meter beam 3 element	40.00
Hylite 20 meter beam 3 element	50.00
Johnson Viking Adventurer	50.00
BC-906C Frequency meter, new	50.00
Johnson Mobile Transmitter	95.00
PSR6 Elmac power supplies	18.50
Carter 12V AC to 115V AC genemotor	25.00
National power supply 5886	25.00
RME DM30X	22.50
Collins 32V 3, perfect	575.00
Gonset 6V amp. and power supply	25.00
National HR050 w/coils	295.00
Collins 75A3	375.00
Hallicrafters S53A	50.00
National NC173	150.00
RME MC53 Converter (2-6-11)	50.00
Hallicrafters S40B	75.00

HAMMARLUND HQ 150 RCVR —



$294

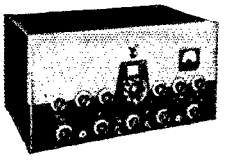
Speaker. $14.50

JOHNSON VIKING PACEMAKER

90 watts—SSB (P.E.P.)

$495.00 w/t

JOHNSON VIKING II



w/t $337.50

COLLINS RCVR

75A4. . . . . $595

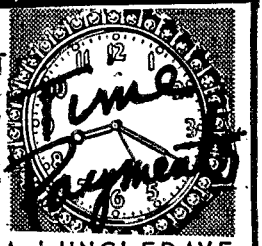
Matching Spkr $20

BASSETT VACUUM COILS

for 75 or 40 meters. . . .*$17.50*

for 20 or 15 meters. . . .*$14.50*

Evacuated and filled with pure helium, these coils are super efficient and impervious to rain, dirt, salt spray and corrosion.



Ask UNCLEDAVE about our easy payment plan that gives you up to 18 months to pay after the down payment. Life insurance included at no extra cost.

JOHNSON VIKING 500

600 watts CW

500 watts Phone

$649.50 kit

$799.50 w/t

JOHNSON VIKING 6N2

VHF xmtr for 6 and 2 meters. Can be used with Ranger, Viking I or II or other xmtr.

$99.50 kit

$129.50 w/t

•

Prices subject to revision at time of delivery.

TECRAFT 2 and 6 METER CONVERTERS, XMTRS and P.S. in STOCK—IMMEDIATE DELIVERY.

RME 4300 RECEIVER

$194.00

Write Uncledave W2APF with your needs and problems.

24 HR. SERVICE on stock items

WE SPECIALIZE IN FOREIGN TRADE

Q Multiplier . . .

(Continued from page 43)

selectivity curve for exalting the carrier, or, if you have the dinero to spend, get one of McLaughlin's sophisticated selectivity "Signal Splitters" [12] which has continuously-variable bandwidth from 6½ kc. to 400 cycles at 75 db. and a shape factor of 1.08 to 1 — essentially perfect selectivity.

George Grammer's excellent article in December, 1955, *QST* on "How To Tune An A.M. Signal" states, among other things, what can be done to improve your receiver. It is very applicable to the BC-474 receiver, particularly in that it needs an a.v.c. on-off switch and separate r.f. and audio gain controls. I hope to get around to incorporating these in the near future. Moreover, I don't think I can stand putting off any longer building another McLaughlin unit which would start out with a 455-kc. half-lattice crystal filter feeding into a second converter, with side band switching, 50-kc. i.f. and bridged-T circuit, etc., just to see how much improvement can be obtained in the limited space to which these units are restricted.

For my money, the two things that have contributed most to the effectiveness and enjoyment of present-day c.w. ham radio are the v.f.o. which places your signal right on top of the station calling and these high-selectivity circuits which enable you to get the desired signal through the din of QRM.

I'll take the Hee and the Hi from the station who asks what kind of a receiver am I using when I tell him BC-474 plus QX-SSB Q5-er and SOJ in preference to *having* to say, "Sorry OM — QRM — QTA."

[12] McLaughlin, J. L. A., Box 519, La Jolla, Calif.

DX Contest Results

(Continued from page 59)

W1TRM.....1802- 17- 36- B-14

Rhode Island

W1CJH...181,665-165-367- C-66
W1AWE...19,890- 51-130- - -
W1PPN.....9240- 40- 77- - -
W1BEH.....546- 13- 14- A- 5

Vermont

W1QMM...34,839- 79-147- B-27
W1RWP.....624- 13- 16- B- 4

NORTHWESTERN DIVISION

Idaho

W7UDG....22,680- 70-108- B-29

Montana

W7CJB....26,649- 63-141- B-40
W7JLD.....1728- 18- 32- A-12

Oregon

W7DAA...130,521-139-313- C-74
W7TML....42,075- 75-187- C-90
W7GHB....18,333- 63- 97- B- -
W7PJC.....18,212- 58-106- B-27
W7JLU....17,160- 52-110- A-24
W7MQY...14,877- 57- 87- B-40

WN7AOZ....1998- 18- 38- A-13
W7LBV.....330- 10- 11- A- -
W7MO.....168- 7- 8- - -
W7PJK.....36- 3- 4- B- -

Washington

W7PQE...149,420-155-323- C-60
W7GWD...70,110- 95-246- B- -
W7CNM...51,507- 97-177- B-66
W7HJC....42,186- 89-158- C-42
W7BGH....20,979- 63-111- B-22
W7BUL....15,729- 49-107- B-49
W7JC.....7722- 33- 78- A-22
W7YAQ.....6816- 32- 71-AB-19
W7FZB.....4293- 27- 53- A-23
W7EW.....2400- 20- 40- B- 9
W7EJD.....546- 13- 14-BC-10
W7WRT.....18- 2- 3- A- 2

PACIFIC DIVISION

Nevada

W7KEV....64,071-113-189- B-45
W7VIU/7....9126- 39- 78- B-31
W7YNO/7...4785- 29- 55- B-30

Santa Clara Valley

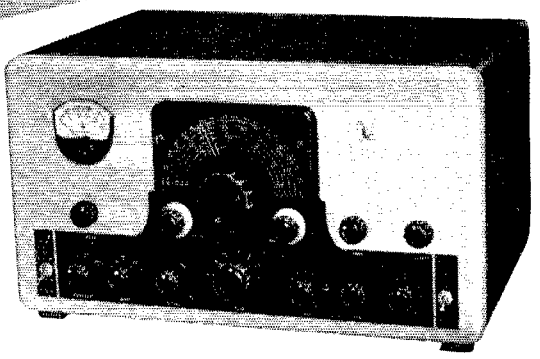
W6SR.....176,295-161-365- B-41
W6JWT...138,180-141-327- B-67

(Continued on page 126)

FOR INCREASED OPERATING *Pleasure!*

THE JOHNSON VIKING
Valiant

275 Watts CW and SSB (P.E.P.)*
200 Watts Phone Input



features: temperature compensated VFO

speech clipping and filtering
"push to talk" relay built in
effective TVI suppression
Pi - network output tuning
bandswitching
time sequence keying

The three 6146s in the final provide power to punch through QRM. Adequate audio power and speech clipping insure a most effective AM phone signal. Timed sequence keying is clean, free of clicks and chirps, permits "break in" operation. Simply turn the "mode" switch and turn on your exciter for SSB operation.

Control features are designed for maximum operating convenience. Single knob bandswitching for operation on 160, 80, 40, 20, 15, 11 and 10 meters, accurately calibrated illuminated VFO dial, single dial exciter tuning, optional crystal control, meeting of all essential stages. Modulator output, filament and plate voltages brought out in the rear for powering a VHF transmitter. RF filtered key leads, antenna relay power and phone patch input are also terminated on the rear of the chassis.

The Viking Valiant is available completely wired and tested or as an easy to assemble kit. The ventilated 18 gauge steel cabinet is finished in attractive maroon and gray, with green nomenclature. Complete kit includes assembly instructions, photographs, diagrams and step by step wiring instructions. Wiring harness and all necessary hardware furnished. Dimensions 11⅝" x 21⅛" x 17⅜". Net weight: 73 lbs. Shipping weight: 83 lbs.

JOHNSON Cat. No. 240-104 Viking Valiant Kit with tubes—**$349.50** ham net. ***with SSB Exciter**

JOHNSON Cat. No. 240-104-2 Viking Valiant wired and tested with tubes—**$439.50** ham net.

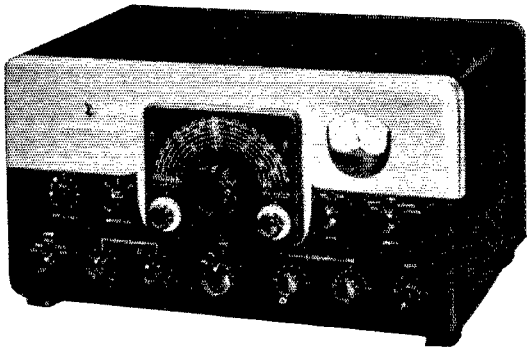
THE JOHNSON VIKING **Pacemaker** *FOR SINGLE SIDEBAND*

90 Watts CW and SSB phone input (P.E.P.) 35 Watts AM

Bandswitching to 80, 40, 20, 15 and 10 meters. Stable accurately calibrated VFO operates in 3-4 MC region at all times, beats with separate crystals for each band (crystals furnished). Thus, drift and calibration errors are not multiplied. Single sideband operation derived through use of "phasing" method. A carrier insertion control permits CW and AM phone operation. VOX threshold and anti-trip circuit are electronically pre-set, adjustable at the rear of the cabinet.

Pi-network output tuning, TVI suppressed. Effective as an SSB transmitter in itself, the Pacemaker may also be used to drive a high powered amplifier such as the Viking KW.

JOHNSON Cat. No. 240-301-2 Viking Pacemaker wired and tested with tubes and crystals—**$495.00** ham net.



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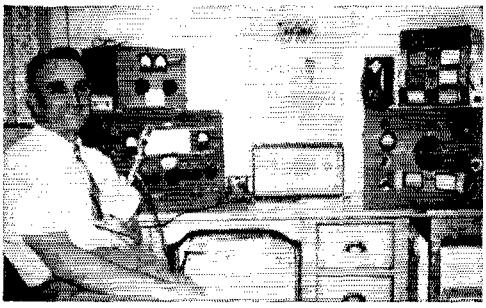


Versatile ZS5MP specializes in fast c.w., earning South American honors with 108,634 points, but Dick netted 38,916 more on voice.

W6EFR....55,044- 99-186-BC-32
W6YBR....10,080- 42- 80- C-35
W6LDO.....2040- 17- 40- B-12
W6CLZ.....570- 10- 19- A-13
W6PBV.....561- 11- 17- B- -
K6IEC.....450- 10- 15- A-11
W6BAX (W6s BAX HQN)
115,866-123-314- - -

East Bay

W6TT....420,240-255-550- C-90
W6PYH...284,292-212-447- C-65
W6FOZ/6 274,290-205-446- C-70
W6LDD...252,585-194-434-BC-84
W6IDY...137,094-146-313- C-48
W6RCC....76,464-108-236- C-62
W6KEK....63,630-105-202-BC-30
W6TI.....31,974- 73-146- C-43
W6IPH....30,351- 67-151- B-30
W6OVO....22,680- 60-126- C- -
W6FLT....22,446- 58-129- C-43
W6DUB....10,707- 43- 83- C-20
W6CTL.....9480- 40- 79- C- 7
W6EJA.....5664- 32- 59- B- 6
W6LMZ.....2268- 21- 36- A-20

San Francisco

W6WB....238,095-195-407- C-84
W6ATO....123,939-141-293- C-87
W6YC.....17,976- 56-111- B-26
W6GWQ...15,288- 52- 98-BC-30
W6RZS.....7770- 37- 70- B-17
W6JB.....264- 8- 11- - -
K6PBX.....120- 5- 8- A- 2

Sacramento Valley

W6ONZ....61,206-101-202- C-53
K6EDE....43,860- 86-170- B-75
W6DBP....28,140- 70-134-BC-17
W6SIA....14,241- 47-101- C-25
K6AQP.....7627- 41- 62- C-16
W6BIL.....855- 15- 19- C-18
W6JBP.....261- 9- 10- A-14
K6KLK.....216- 8- 9- A- 6
K6ILB.....75- 5- 5- A- 5

San Joaquin Valley

W6KEV...258,795-213-405- C-55
W6EFV....14,448- 56- 86- B-18
W6BYH.....4692- 34- 46-BC- 9
K6HFA.....2700- 25- 36-AB-14

ROANOKE DIVISION

North Carolina

W4CEN...699,377-343-680- C-65
W4UXI...306,450-225-454-BC-75
W4LZF...297,000-225-440- C-72
W4MZP...212,493-193-367- C-70
W4GXB....64,578- 94-229- C-42
W4AIX....37,275- 71-175- C- -
W4MR.....20,184- 58-116- B- -
K4ARP.....2574- 26- 33- B-12
W4HER.....756- 14- 18- A-10
W4EJP.....180- 6- 10- A- 3
W4ATC/.....3- 1- 1- A- -

South Carolina

K4CSB.....9988- 44- 77- A-41
W4GCB.....1248- 16- 26- A-10

Virginia

W4OM....456,120-252-604- C-91
W4KFC...404,190-270-500-BC-43
W4PNK...170,478-154-370- C-52
W4MGD..142,350-150-317- C-72
K4BZL....91,565-134-228-BC-69
W4JAT....73,616-107-230- C-59
W4BFR....71,722-109-220- B-47
W4VZQ....54,144- 96-188- C-27
W4GF.....29,925- 75-133- B-28
W4PRO....25,728- 67-128- B-49
W4IF.....24,424- 71-116- B- -
W4NH.....23,217- 71-109- C-11
W4STM....16,665- 55-101- A-62
W4TPX....14,268- 58- 82- B-14
W4QCL....13,035- 55- 79- B- -
W4IA.....12,948- 52- 83- B-11
W4WBC....11,781- 51- 77- B-22
W4WSF.....7783- 43- 61- B-25
W4BIJ/4....1323- 21- 21- B- -
W4ZPR.....504- 12- 14- A- -
W4KXV (W4s KXV TKR)
369,255-239-515-BC-88
W4NPT (W4s NUS WWN)
111,792-137-272- B-80

West Virginia

W8PQQ....94,256-137-230-BC-39
W8UMR....53,781- 91-197- B-22
WN8BZY..... 3- 1- 1- A- 1

ROCKY MOUNTAIN DIVISION

Colorado

WØAZT.. 115,446-142-271- C-56
WØEWH.. 42,186- 89-158- C-35
WØKV.....2640- 22- 40- A-12
WØSGG.....2376- 22- 36- A-15
WØCDP.....300- 10- 10- A- 2
WØIQZ.....270- 9- 10- B-20

Utah

W7QDJ....13,416- 52- 86- A- -

Wyoming

W7PSO....55,872- 96-194- C-46

SOUTHEASTERN DIVISION

Alabama

W4GUV....21,816- 62-101- A-50
W4HA.....15,288- 52- 98- C-21
W4WOG.....1080- 18- 20- B- 8
K4BDJ.....840- 14- 20- B-14
W4ECI.....300- 10- 10- C- 3

Eastern Florida

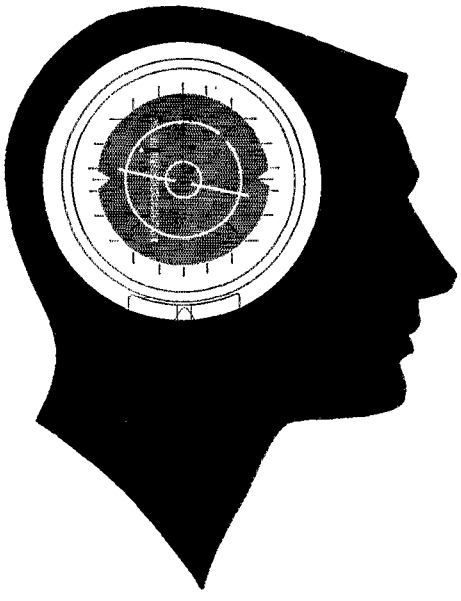
W4LQN...206,973-183-377-BC- -
W4LVV..152,133-157-324-ABC-55
W4WHK...63,012-118-178- B-61
W4IEH....62,715-113-185- C-58
W2DLO/4....6954- 38- 61- B-12
W4ZQK.....6660- 36- 62- A-40
K4CTU.....6528- 34- 64- A-22
W4IMI.....4428- 36- 41- C- 8
W4HKJ.....3808- 26- 36- B- 6
W4DXL.....3432- 26- 44- B- 8
W4EEO.....1440- 20- 24- B- 8
K4AHW.....1320- 20- 22- B- 6
W4GLJ/4.....360- 10- 12- A- 2

Western Florida

W4BGO...260,910-223-390- C-70
W4AFS....45,136- 91-166- B-48
W4HIZ.....8721- 51- 57- B-25
W4LCY.....918- 17- 18- B-12

(*Continued on page 130*)

Systems Career: a laboratory for learning



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As a Field Engineer at Hughes, through training and assignment you will become familiar with the entire systems involved, including the most advanced electronic computers. This knowledge will broaden your experience and learning for future application in either the military or commercial field.

The national respect which Hughes commands in the field of advanced electronics is in no small part due to the technical support provided by the Field Engineers. Other contributors to the success of the Field Service and Support Division are the Technical Manuals Engineer, Training School Engineers, Technical Liaison Engineers, and Field Modification Engineers.

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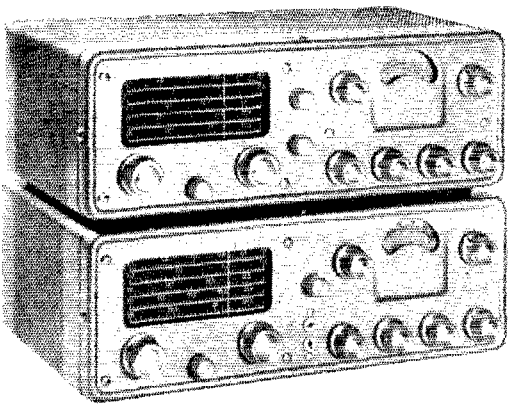

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Perfectly matched in appearance and performance, Morrow's MBR-5 and MB-560 make a terrific combination for mobile operation!

MBR-5 RECEIVER. Exceptionally stable, extremely sensitive. 13 tubes with 20-tube performance. 100 kc crystal calibration; dual conversion; noise-balanced squelch; SSB, CW and AM reception. 80, 40, 20, 15, 10 meters. Amateur net, **$224.50,** less power supply.

MB-560 TRANSMITTER. "More talk power for its size". Crystal or VFO on 80-75, 40, 20, 15 and 10 meters. 65 watts to a 6146, gang tuning, shielded exciter, zero-beat control, full metering, built-in relay, pi-network output. Amateur net, **$214.50,** less power supply.

COMING SOON!

The Morrow

"TRIPLE DUTY"

A new concept for the complete amateur outfit

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Burghardt RADIO SUPPLY

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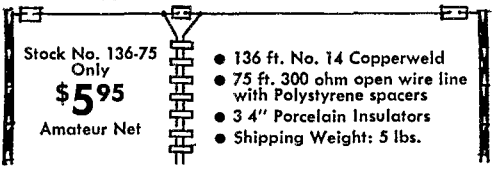
OFF-CENTER FED "FIVE-BANDER"



Stock No. 136-75
Only
$5.95
Amateur Net

- 136 ft. No. 14 Copperweld
- 75 ft. 300 ohm open wire line with Polystyrene spacers
- 3 4" Porcelain Insulators
- Shipping Weight: 5 lbs.

Highly efficient—operates on 10, 20, 40, 75 and 80 meters without mechanical changes or tuning. Complete instructions included. Open wire Copperweld construction guarantees high radiation efficiency and excellent mechanical strength.

OFF-CENTER FED "TWO-BANDER"—Use on either 20-40 meters or 10-20. 66 ft. No. 14 Copperweld wire; 75 ft. 300 ohm open wire line; 3 4" porcelain insulators. Stock No. 66-75. Shipping Weight: 4 lbs. Only **$4.95** Amateur Net.

CENTER FED "SIX-BANDER" — Covers all 6 amateur bands 6 through 80 meters. Low loss, high strength. Requires antenna tuner when used with pi-network transmitters. 66 ft. No. 14 Copperweld; 43 ft. 450 ohm open wire line; 3 4" porcelain insulators. Stock No. 66-43. Shipping Weight: 4 lbs. Only **$3.25** Amateur Net.

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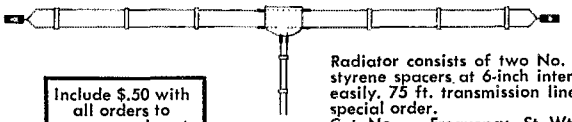

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10-75	10 Meters	2 lbs.	$ 5.25	40-75	40 Meters	4 lbs.	$ 7.10
15-75	15 Meters	2 lbs.	5.50	80-75	75-80 Meters	5 lbs.	9.90
20-75	20 Meters	3 lbs.	6.05	160-75	160 Meters	7 lbs.	12.40

Burghardt RADIO SUPPLY

P. O. Box 746, Watertown, So. Dakota

Phone 5749

(Continued from page 126)

Georgia

W4BBP...118,818-138-287- B-38
W4CYA....85,626-134-213- B-60
W4YK.....51,744-112-154- C-28
K4BAI.....26,909- 71-127-BC- –
K4GSS.....18,240- 60-102- A-45
W4ZKU.....13,674- 53- 86-BC-19
W4BEY.....3967- 49- 61- A-38
W4JII.....5700 -38- 50- B-18
W4BXV.....330- 10- 11- A- 5
W4LDD.....208- 8- 9- A- 4
W4ZSC.....70- 5- 5- A- 1
W4AQL (W3YEK, W4s QEJ TOA) 15,510- 55- 94-AC-19

SOUTHWESTERN DIVISION

Los Angeles

W6AM[8]...581,940-305-637-BC- –
W6ITA[9]...416,079-249-557-BC-90
W6BPD...326,268-228-477- C-72
W6FSJ....280,269-209-447- C-78
W6VUP...263,328-211-416- B-80
W6OYD...248,811-197-421- C-80
W6SWG...247,104-192-429- C-72
W6SRF...182,858-169-361- C- –
W6EHV...180,009-177-339- C-58
W6MUB...106,038-137-258- C-58
W6MUR...81,420-118-230- C-26
K6CJQ....65,508-106-206- C-34
W6NZW...61,500-100-205-AC- –
W6UQQ....36,267- 77-157-AC-40
W61D.....35,550- 75-158- C-33
W6SUQ....33,975- 75-151-BC-80
W6NKR...30,075- 75-137- C- –
W6BJU....23,364- 66-118- C-27
K6EIV....20,178- 59-114-AB-45
K6GUZ....16,587- 57- 97- A-35
K6DNH....14,628- 53- 92-AB-40
W6TEU....14,310- 53- 90- B-18
W6YY.....11,745- 45- 87- C- 5
W7NFE/6..11,139- 47- 79-BC-23
W6CYV...11,016- 54- 68- C-10
K6EYT.....9126- 39- 78- A-15
W6WKE.....8399- 37- 77- C- –
K6EWL.....7884- 36- 73- C-12
K6OIZ.....7872- 32- 82- A-22
W6APH.....7254- 39- 62- A-22
W6JFJ.....6498- 38- 57- B- –
W6UYW.....5952- 32- 62-BC-14
W6ACL.....5643- 33- 57- B-27
W6SAI.....4788- 36- 45- C- 5
W6MJP.....2730- 26- 35- B- 9
W6HPB.....2280- 20- 38- B-12
W6NTR.....1518- 22- 23- A- 5
W6WEG.....1460- 20- 41- B- –
W8SVL/6.....648- 12- 18- A- 4
K6PDA.....332- 12- 12- B- 8
K6IYJ.....126- 7- 7- B-15
W6GN.....27- 3- 3- C- –
W6RW (W6s MBA NJU QJI RW VSS, K6s EVR EWL) 791,464-328-805-BC-95
W6DFY (W6s DFY GHM ILP, K6GOA) 781,860-332-785-BC-96
K6BFC (K6s BFC DNH) 102,570-130-263-BC-48
W6UED (W6UED, K6s BFC EVR) 77,480-104-249-BC-48
W6KFV (W6s HJK KFV) 72,732-116-209- C-64
W6NNV (W6s NNV TSW) 48,400- 88-184- C-40
K6DDO (K6s CEO DDO ELX HBA IDA JHR) 20,709- 59-117-AB-40
K6CYT (K6s CVU CYT EGF) 5292- 28- 63- B-44

Arizona

W6GAL/7.485,121-273-594- C-86
W7CJZ....58,900- 95-207- C-72
W7ENA....23,460- 68-115- A-40

San Diego

W6LRU...152,624-162-314- A-77
W6KSM...106,896-136-262-BC-50
W6BZE....81,039-119-227-BC-42
W6CHV....75,900-115-220- B-65
W6LWP....75,130-110-228- C-33
W6CAE....55,182-102-181-BC-48
W6JVA....32,256- 72-150- B-40
W6CRT....27,126- 66-137- B-15
K6EC.....17,712- 54-110- B-20
W6MCY...17,496- 54-108- B-26
W6OME...16,695- 53-105- C-28
W6BKZ....16,632- 56- 99- B-60
K6EBH....10,062- 43- 78- A- –
W6RAN.....2550- 25- 34- B- 5
KN6LIV.....135- 5- 9- A-15

Santa Barbara

W6ALQ...121,800-140-290- B-55
W6AGO...119,461-147-271- C-70
W6YK....86,376-122-236-BC-80
W6BE.....8556- 46- 62- C-34
W6MSG....5624- 37- 52- B-12
W6GTI (W6s CEM GTI RRR ULS)....355,716-246-482- C-70

WEST GULF DIVISION

Northern Texas

W5ZSX....57,900-100-193- B-40
W5DXW....42,364- 89-160- B-54
W5QF.....26,199- 71-123- B-23
W5KUJ....24,420- 74-110- C-24
W5OLG....13,338- 57- 78- B-35
W5MTL....10,350- 46- 75- B-24
W5RDL....8928- 48- 62- B-30
W5OC.....5508- 34- 54- A-26
W5FTD....2808- 24- 39- A- –
K5AHZ.....1323- 21- 21- B-15

Oklahoma

W5YJS....114,291-153-249-BC-61
W5DQV....20,880- 58-120- C-18
W5WLA.....4212- 27- 52- A-30
W5EFU.....765- 15- 17- A-10
W5DFF (W5s CXU DFF ZXJ) 10,530- 45- 78-AB-50

Southern Texas

W5GEL....231,210-205-376- C-48
W5ZD.....168,642-162-347- C-61
W5LUU....82,800-120-230- B-36
W5BRR....70,246-103-228-BC-41
W5WZQ....18,656- 53-128- B-38
W5WBU....15,340- 52- 99- B-26
W5ZWR....10,512- 48- 73- B-14
W5JPC.....9675- 43- 75-AB-32
W5OEN.....9366- 42- 75- B-29
K5ABV.....5082- 33- 52- A- –
W5FDL.....2952- 24- 41- B- 8
K5CYH.....189- 7- 9- B-20
W5WPL (W5s VOM WPL) 10,062- 43- 78- B-50

New Mexico

K5CAW....32,472- 82-132- B-28
W5FJE....21,912- 66-112- B-34
W5FTP....21,312- 64-111- B-40
W5GCI.....9045- 45- 67- B-21
W5LGS.....7104- 37- 64- B-17

CANADIAN DIVISION

Maritime

VE1ZZ....50,049- 83-201- C-60
VE1EK....26,180- 68-129- A-29
VO6U.....11,016- 51- 72- B-30
VE1KW....6786- 39- 58- B- –
VE1CU.....3690- 30- 41- B-15
VE1YB.....2511- 27- 31- B-10
VO2S.....1560- 20- 26- A-10
VO6N.....540- 10- 18- B- 4
VE1NN (VE1s KM KW) 12,474- 42- 99- B-26

Quebec

VE2YA..123,662-146-283-ABC-54
VE2DR....17,280- 60- 96- A-18
VE2APH....1230- 30- 47- B- 8
VE2RL.....210- 7- 10- A- 4

Ontario

VE3IR.....25,200- 75-112-AB-49
VE3ADV....3990- 35- 38- A- 8
VE3YV.....3978- 26- 51- B-11
VE3AEJ....2496- 26- 32- B-17
VE3GI.....462- 11- 14- A- 6
VE3AUU.....405- 9- 15- B- 3

Manitoba

VE4RO...225,990-186-405- C-67

Saskatchewan

VE5VL.....11,800- 50- 80- B-53
VE5AJ.....5694- 26- 73- B-15
VE5PM.....4650- 31- 50-AB-30
VE5CX.....3146- 26- 41- B-12
VE5DZ.....702- 13- 18- B- 6

(Continued on page 132)

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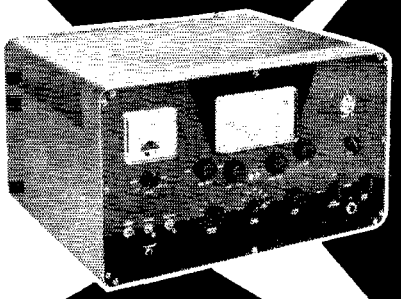

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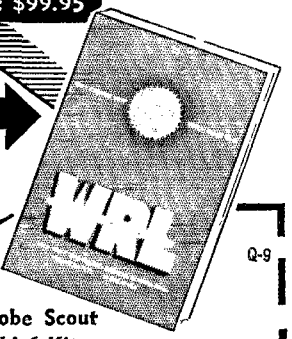

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Alberta
VE6NX....25,110- 54-155- B-52
VE6MN.....5760- 32- 60- C-22

British Columbia
VE7EH.....2520- 21- 40- B- 8

Yukon-N.W.T.
VE8WN....39,270- 70-187- B-37
VE8AB.....2907- 19- 51- B-11

AFRICA

Algeria
FA9RZ....144,144- 56-858- A-42
FA3OA.....17,721- 33-179- A- –
FA9VJ.....8344- 12-248- A- –

Angola
CR6AI....248,036- 59-1403-B- 7

Belgian Congo
OQ5CP.....12,324- 26-158- A-11
OQ5QS.....5520- 16-115- A- 6

Canary Islands
EA8BF....204,534- 66-1033-A-56

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CR4AG.....4920- 10-164- A-15

Ethiopia
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French Morocco
CN8AF....60,430- 43-470- A-34

Gambia
ZD3A.....29,818- 34-293- A-12

Kenya
VQ4FK....28,992- 32-302- B-23
VQ4GF....15,390- 30-171- A- 8
VQ4CC.....1782- 9- 69- A- 9

Madeira
CT3AB....73,246- 53-461- A-23

Mozambique
CR7AF....11,664- 21-162- A-11
CR7CI.....3324- 12- 96- A- –
CR7LU.....10- 2- 2- A- –

Northern Rhodesia
VQ2GW....31,482- 33-318- A-20

Southern Rhodesia
ZE5JA.....73,704- 37-664- A-50
ZE5JE.....11,640- 24-163- A-17
ZE6JV.....2016- 9- 76- A-10
ZE6JX.....693- 9- 26- A- 5

Spanish Morocco
EA9AP....44,659- 37-403- A-23

Sudan
ST2NG.....3552- 16- 74- A- –

Tangier Zone
KT1UX...224,055- 65-1149-B-61

Union of South Africa
ZS5MP....108,634- 58-628- A-26
ZS5U.....100,924- 46-732- A-56
ZS1CL.....31,581- 29-363- A-88
ZS6AJO....27,948- 34-275- A-29
ZS6DZ.....1701- 9- 63- A- –
ZS1O.....610- 10- 21- A- –

ASIA

Afghanistan
YA1AM.....3910- 10-132- A-25

Ceylon
4S7MG.....2299- 11- 71- A-12
4S7MR.....36- 3- 4- A- –

Hong Kong
VS6AE.....13,146- 21-209- A-17

Israel
4X4II.....700- 7- 35- A- –
4X4CK.....396- 6- 22- A- –

Japan
JA3AF....126,050- 50-841-BC-91
JA3AB....121,338- 54-765-AB-78
JA3BB.....94,622- 46-689- B-75
JA1VX.....84,150- 45-629-BC-49
KA2EC....74,784- 38-657- B-34
JA3TT.....56,805- 35-544- C-66
JA1AA.....25,000- 25-340- B-31
KA2SK.....4797- 13-126- B-18
JA1CO.....4576- 11-142- B-12
JA8AQ.....2800- 16- 59- A- 5
JA3JM.....1876- 14- 45- A- 9
JA0AA.....1410- 10- 47- B- 7
JA6AK.....985- 5- 66- B- 5
JA1EC.....320- 4- 27- A- –
JA1ACA.....315- 7- 15- A- 1
JA7BO.....228- 4- 19- A- 4
JA7AD.....115- 5- 8- A- 2
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167,720- 56-1025-B-94
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Lebanon
OD5AV.....7686- 21-122- B-11
OD5BS.....2106- 9- 78- A- –

Malaya
VS2DZ.....1232- 7- 59- A- –

Qatar
MP4QAL....7942- 11-243- B-13

Ryukyu Islands
KR6LJ....166,488- 56-991- C-76
KR6RI.....246- 6- 14- B- –

Singapore
VS1GX.....8502- 13-218- B-11

EUROPE

Austria
OE3RE....40,530- 35-386-AB-38
OE5SD.....19,338- 22-293- A-75
OE1FT.....14,697- 23-213- B-28
OE5BG.....6210- 23- 90- B-35
OE1LM.....540- 10- 18- A- 9

Azores Islands
CT2BO....24,480- 30-272- A-24

Belgium
ON4CK....48,006- 42-381- A-42
ON4TQ....45,006- 39-385- B-32
ON4PA....23,343- 31-251- B- –
ON4DB.....5704- 23- 83- A-12
ON4SH.....4332- 19- 76- A-29

Channel Islands
GC3HFE.....432- 6- 24- A- –

Czechoslovakia
OK1IH...195,286- 58-1125- A-76
OK3DG...105,192- 54-653- B-63
OK1JX....52,038- 42-414-AB-35
OK1AEH...35,280- 42-280-AB-44
OK1LM....25,340- 28-303- A-22
OK3AL....24,300- 27-300- B-29
OK3HM....23,281- 31-252- B-35
OK1DE....13,905- 27-172- A-17
OK3KEE...11,814- 22-179- B-20
OK3EA.....6870- 15-154- B-10
OK3LA.....1152- 8- 48- A- 6
OK2KAU....783- 9- 29- A-16
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51,084- 43-396- A-50
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24,000- 32-254-AB- –
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7794- 18-150- A-35
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510- 10- 17- A-15

Denmark
OZ1W....111,628- 59-639- A- –
OZ5PA....32,019- 39-275- B- –
OZ7G.....15,600- 30-174- A- –
OZ7BG....13,482- 21-214- B-14
OZ7SN.....9460- 20-158- A-18

England
G5RI.....163,392- 64-851- B-55
G2QT.....102,030- 57-598- B-55
G2DC.....99,552- 61-544- B- –
G2HPF....80,454- 53-506- B- –
G3EYN....43,470- 42-345- B-53
G3HJJ....41,764- 53-264- B-57
G2AJB....11,480- 35-110- B-30
G3APN.....8463- 13-217- A- –
G5MN.....7544- 23-111- B-23
G3JWZ.....5040- 20- 84- A-10
G8KS.....105- 5- 7- B- –

(*Continued on page 134*)

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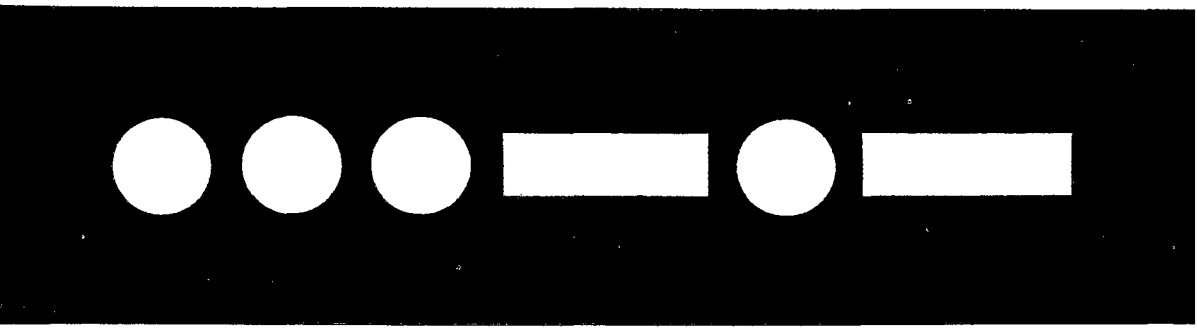

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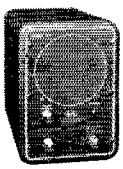
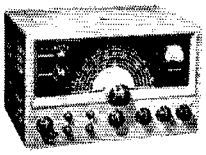
K6PMU **W6LTY** **W6QJI** **W6EBG** **W6KFS**

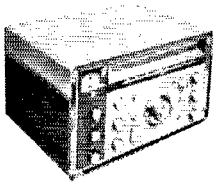
September is Receiver month at Valley!



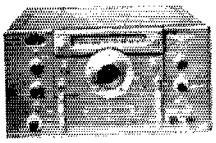
BARKER & WILLIAMSON MODEL 370 SSB ADAPTOR
Amateur net: $131.50 (wired)



RME ELECTRO-VOICE MODEL 4300 RECEIVER
Amateur net: $194.00 (wired)



NATIONAL NC-300 RECEIVER
Amateur net: $399.50



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OH6OB	15,984	24-222-	A-22
OH2TM	13,959	27-173-	A- –
OH4NT	1320	18- 80-	A- –
OH3NY	2652	17- 52-	A- –
OH7NW	2652	13- 68-	A-12
OH1ST	1935	15- 43-	A- 9
OH2VZ	1260	12- 35-	A- –
OH7NF	957	11- 29-	B-15
OH3UN	552	8- 23-	A- –
OH2NQ	231	7- 11-	B- –
OH5OT	216	8- 9-	A- 4
OH3TH	27	3- 3-	A- –

France

F9MS	125,620	55-763-	A-60
F8VJ	119,474	62-646-	A-46
F7ER	97,860	35-942-	A-70
F3AT	29,280	40-244-	A- –
F8TM	24,531	37-221-	A-28
F8TQ	10,341	27-127-	A- –
F9CI	1539	9- 57-	A- –
F9BB	1380	10- 46-	A- 3
F3HK	1320	12- 37-	A-12
F9RM	1110	10- 37-	A- 5
F9DW	812	14- 20-	A- 3
F3II	576	12- 16-	A- –

Germany

DL4ZC	235,578	71-1106-	B-80
DJ1BZ	165,472	53-1044-	AB-70
DL1JW	131,275	59-754-	B- –
DL7AH	98,280	56-588-	B-56
DL7AA	80,454	53-506-	B- –
DL6MK	71,064	47-504-	B- –
DJ1VL	18,321	39-413-	A-36
DJ2AE	23,635	29-274-	A-29
DJ2LK	20,960	32-227-	B- –
DL9RK	17,220	21-275-	B- –
DL3JK	14,796	36-137-	A- –
DL3OC	10,560	32-110-	B-16
DL3AO	4667	13-121-	A-16
DL9PJ	3762	11-114-	B- –
DL1QT	2314	13- 60-	A- 6
DL1RX	1320	10- 44-	A- 7
DL1YE	1170	13- 30-	A- –
DL4DX (DL4s DX NL)	2808	18- 53-	A-18

Greece

SV0WT	54,648	36-506-	A-48
SV0WL	9614	11-294-	B- –

Hungary

HA5BI	11,310	30-129-	A-34
HA5KBC[10]	10,120	20-170-	A-96
HA5KBK	9135	21-147-	A-96
HA5BL	2640	12- 74-	A-22
HA5KBA (5 oprs.)	174,105	57-1023-	BC-96
HA8KWA (2 oprs.)	9900	15-228-	A- –

Iceland

TF3MB	42,441	43-329-	A-23
TF3AB	35,123	31-378-	A- –

Ireland

EI5C	132,795	45-1005-	B-60
EI9J	111,780	60-622-	B-35
EI5G	8140	20-140-	B-15
EI5F	3040	16- 64-	A- –

Italy

I1NT	94,644	44-717-	B-49
I1ALU	74,538	41-606-	A-46
I1AMO	38,700	36-362-	B-33
I1MM	9282	17-183-	A-13
I1ER	7700	25-106-	AB-26
IT1ZGY	3536	13- 93-	A- 8

Malta

ZB1AY	160,896	64-836-	A-82
ZB1CH	1309	7- 63-	A- 6
ZB1ZR	1089	11- 33-	A- –
ZB1HKO	270	9- 10-	A- 1

Netherlands

PA0UN	267,432	66-1354-	A-80
PA0EP	160,430	61-882-	AB-90
PA0VB	79,464	56-473-	B-39
PA0ULA	38,934	42-309-	B-30
PA0FLX	36,039	41-293-	A-45
PA0IF	20,536	34-203-	B-10
PA0VO	13,916	28-167-	A-22
PA0FAB	9405	19-165-	B-13
PA0LOU	8500	17-168-	A-50
PA0HJK	2175	15- 55-	B- 6
PA0NN	888	8- 37-	A- –
PA0BW	540	10- 18-	A- 5
PA0NV	504	7- 24-	A- 5
PA0BX	432	8- 18-	B- –
PA0HP	60	4- 5-	A- –
PA0PLM	10	2- 2-	A- –

Northern Ireland

GI3GAL	26,477	29-312-	AB-25

Norway

LA4K	3195	15- 71-	A-25
LA9T	1925	11- 59-	A- 9
LA6U	1800	12- 50-	A- –
LA2Q	1768	17- 35-	AB-32
LA3HA	957	11- 30-	A- 2
LA4ZB	765	9- 29-	A-15
LA2IE	710	10- 24-	A- 4
LA7Z	312	8- 13-	B- 1
LA1WF	144	4- 12-	A- 3
LA1K (LAs 2MB 3HF 70E 7ZC)	10,854	18-204-	B- –

(Continued on page 136)

CE3CZ talked his way to 285,120 points and place position among South America's *radioaficionados*. Arnold's jam-packed log discloses that 736 of 1489 W/VE QSOs were made on 28 Mc.

Poland

SP5AR.....6600- 20-113- B-29
SP8CK.....3486- 14- 84- A-28

Portugal

CT1CO...120,816- 48-850- B-47
CT1TT....81,498- 51-536- A-50
CT1ST.....10,836- 28-129- B- –
CT1QN.....2112- 11- 64- B- –

Roumania

YO3RF....48,750- 39-419- A-42
YO3RA....25,017- 31-269- A-29

Saar

9S4AX.....49,404- 46-360- A-50

Scotland

GM3EOJ....5187- 19- 92-AB-16

Spain

EA4ED...143,360- 52-919- C- –
EA1AB...136,782- 51-894- A-52
EA1CP.....56,631- 43-439- A-35
EA3GF....18,414- 18-354- B-14
EA3KT....16,140- 30-184- A-40
EA2CR....13,776- 28-164- A-22
EA4CE.....6669- 13-171- A- –
EA5CS.....3528- 12-101- A-11
EA4FO.....1890- 15- 42- B- –

Sweden

SM2VP....38,874- 38-341- B-32
SM3AZV...20,952- 27-262- B- –
SM4BEC....9435- 17-185- B- –
SM7BPO....8712- 24-122- B-35
SM6ID.....6762- 23- 98- A-14
SM2AQQ....4968- 23- 72- A- –
SM2ALU....4320- 15- 96- B- –
SM5UU.....3087- 21- 49- B- 8
SM7AOO....2745- 15- 61- A- –
SM5CCE....2145- 15- 48- A- –
SM5HH.....1755- 13- 45- A- –
SM6AMR....1053- 9- 39- B- –
SM5ALM.....858- 11- 26- A- –
SM6BDS.....774- 9- 29- A- 5
SM6CZE.....462- 7- 22- B- –
SM5BFR.....9- 1- 3- B- –

Switzerland

HB9NL...234,304- 64-1221-B-60
HB9IK.....14,670- 30-163- B-22
HB9MU....13,130- 26-171- A-12
HB9QO.....5742- 22- 87- A-12

Trieste

I1BNU....101,856- 48-711- B-60
I1BLF.....47,554- 31-513- B-40
I1BCB.....20,208- 48-141- A- –
I1YCZ.....1310- 10- 44- A-12

Wales

GW5SL...112,636- 58-648- B- –
GW3BQY..46,080- 30-512- A- –

Yugoslavia

YU3ABC....2780- 10- 93- A- 1

NORTH AMERICA

Alaska

KL7BPK...55,200- 46-400- B-32
KL7BGS...22,736- 29-266- A-50

Bermuda

VP9BM...597,114- 98-2053-A-65

British Honduras

VP1SD[11]..226,215- 55-1371-A-33
VP1AA.....6300- 12-175- A- –

Canal Zone

KZ5KA....37,660- 35-360- B-25
KZ5BC....22,997- 13-596- B- –

Cuba

CO2OM....85,480- 48-595- A- –
CO7PG....62,400- 40-527- A-49
CO2MG.....3- 1- 1- B- –

Greenland

KG1JB.....16,302- 39-141- B- –
KG1AR....11,280- 16-235- B-10

Guadeloupe

FG7XB.....1617- 11- 49- A- –

Mexico

XE1A.....949,344-116-2728-A- –
XE2OK...400,158- 94-1420-A-40
XE2NF (9 oprs.)
576,720- 89-2174-A-96

Puerto Rico

KP4DH...780,828- 93-2812-B-83
KP4DV...575,652-89-2196-BC-66
KP4ZW...466,662- 82-1897-A-69
KP4JE....293,832- 77-1272-B- –
KP4KD...210,924- 62-1134-A-43

St. Martin, French

FS7AA.....4200- 10-140- A-10

Turks and Caicos

VP5DC.....6630- 17-130- A- 2

Virgin Islands

KV4AA..997,036-106-3136-BC-60

OCEANIA

Australia

VK2GW...234,816- 64-1223-A-60
VK3XB....37,908- 26-486- A-34
VK3CX....12,915- 15-287- A- –
VK4CG.....5406- 17-106- A- 7
VK7LJ.....3586- 11-109- A- –
VK5JT.....3120- 10-104- A- –
VK5WO.....2475- 15- 55- A- 5
VK5BO.....1836- 9- 68- A- –
VK3KS.....336- 8- 14- A- 2

Cook Islands

ZK1BS... 109,445- 59-623- A-35

Fiji Islands

VR2BA.....5346- 11-162- A- 9
VR2CV.....455- 7- 22- A- –

Hawaii

KH6IJ...908,856-104-2913-BC-76
KH6MG..567,336-88-2149- C-74
KH6PM...493,554-86-1913- B-67
W7EMY/KH6
14,601- 31-157- A-14
KH6WW....9429- 21-150- B- –
KH6AYG (KH6s AYG BCM BHZ BLH)
682,560-90-2529-BC-74

Johnston Island

KJ6BN.....144- 6- 8- A- –

Marshall Islands

KX6AF (7 oprs.)
178,353- 57-1046-A-75

New Caledonia

FK8AO....37,848- 38-332- A-34

New Guinea

VK9RM.....2360- 10- 79- A- –

New Hebrides

YJ1DL.....612- 6- 34- B- 3

New Zealand

ZL1BY....470,844- 82-1915-A- –
ZL1MQ...185,544- 72-859- A-32
ZL4CK....33,696- 27-416- A- –
ZL2ARL...16,008- 29-184- A-12
ZL1LZ....10,686- 13-274- A- –
ZL2AI.....9408- 14-224- A-14
ZL3AB.....3683- 19-153- A- 5
ZL1MT.....8208- 24-114- A-11

Papua

VK9XK....25,137- 27-311- A-39

Philippine Islands

DU7SV....74,349- 33-751- B- –
DU1SCS.....126- 3- 14- B- 1

SOUTH AMERICA

Argentina

LU8AE...223,713- 67-1113-B-56
LU8FBH...62,586- 27-773- B- –

Brazil

PY7AN...314,163- 67-1563-B-64
PY1ADA...29,403- 33-297- B-11
PY1RW....20,064- 37-418- B-23
PY8GZ....15,964- 13-411- B-11
PY5TH....12,189- 17-239- B-14
PY2BNX...12,005- 35-115- A-16
PY8MO.....9048- 12-255- B- 9
PY1AIU....2849- 11- 87- B- 8
PY8BU.....1917- 9- 72- B- –
PY2AQ.....1512- 18- 28- A- 6

(Continued on page 138)

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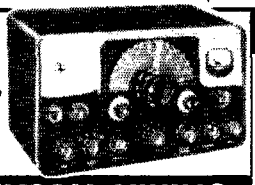

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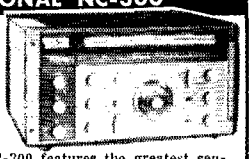

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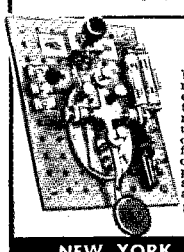

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PY2BEW	96-	4-	8-	A- -
British Guiana				
VP3YG	324,496-	68-	1595-	A-62
Chile				
CE3AG	285,012-	78-	1218-	B-36
CE3AX	32,535-	45-	241-	B-10
Colombia				
HK3PC	277,648-	74-	1253-	A-49
HK4BD	6396-	26-	82-	A- 5
French Guiana				
FY7YE	20,986-	14-	503-	A- -
Netherlands West Indies				
PJ2AV	230,016-	64-	1198-	A-64
PJ2AJ	195,920-	62-	1066-	A-50
Paraguay				
ZP9AY	136,706-	58-	792	B-50
Peru				
OA4J	9177-	19-	167-	B-26
Surinam				
PZ1BS	105,435-	45-	781-	A-41
PZ1RM[11]	52,125-	25-	695-	A-30
Trinidad				
VP4LW	7931-	11-	243-	A- -
Uruguay				
CX1FB	43,788-	41-	356-	A- -
CX2BP	945-	9-	35-	B- 2
Venezuela				
YV5BJ	85,995-	63-	455-	B-23
YV3BH	6534-	22-	99-	A- -

[1] WØHAW, opr. [2] W8DJN, opr. [3] W3GRF, opr. [4] W1WPR, opr. [5] Hq. staff — not eligible for award. [6] W1PWK, opr. [7] W9WSH, opr. [8] W6YMD, opr. [9] W6IBD, opr. [10] HA5AR, opr. [11] W3VKD, opr.

PHONE SCORES

ATLANTIC DIVISION

Eastern Pennsylvania

W3ECR	363,519-	239-	507-	C-72
W3DHM	352,506-	218-	539-	C-85
W3GHS	246,840-	187-	442-	B-63
W3CUB	136,186-	149-	305-	C-67
W3HIX	32,476-	92-	118-	B-41
W3IMV	29,925-	75-	133-	B-25
W3CGS	23,460-	68-	115-	C-35
W3RPG	15,453-	50-	103-	B-32
W3BES	5379-	33-	55-	A- 6
W3CHH	1404-	18-	28-	B- -
W3MDE	1197-	19-	21-	A- 8
W3SOH	1134-	18-	21-	A- -
W3QLW	1056-	16-	22-	B-10
W3TJW	1008-	16-	21-	B- 8
W3MDO	952-	17-	19-	B-20
W3GHD	546-	13-	14-	A- 2
W3LEZ	330-	10-	11-	A- 9
W3GRS	12-	2-	2-	A- 1
W3GHM (W3s GHM KDF)	114,759-	123-	311-	C- -
W3KT (W3s KT SKQ)	81,213-	107-	253-	C- -
W3EQA (W3s EQA LEZ)	56,789-	109-	175-	C-45
W3EAN (W3s EAN TPC)	30,261-	77-	131-	C-23

Md.-Del.-D. C.

W3MSK	454,725-	235-	645-	C-81
W3GKM	78,421-	119-	220-	C-60
W3YRK	26,100-	75-	118-	A-25
W3JTK	9306-	47-	66-	C- 9
W3ZPO	3175-	25-	41-	B-11
W3NNX	300-	10-	10-	B- -

Southern New Jersey

W2SZP	1596-	19-	28-	A-17
W2ESG	1482-	19-	26-	B- 8
W2ILN	1411-	17-	28-	B- 9
W2PAU	495-	11-	15-	B- -
W2SDB	27-	3-	3-	B- 2

Western New York

W2VQM	15,624-	56-	93-	C-25
W2UTH	11,220-	55-	68-	B-18
W2PUN	7482-	43-	58-	A-19
W2RUJ	7134-	41-	58-	B-15
K2BHP	5616-	36-	52-	B-11
W2FBA	2475-	25-	33-	C- 5
W2OTW	2280-	20-	38-	C- 7
K2IAV	1800-	24-	25-	B-19
W2RTX	864-	16-	18-	B- 4

CENTRAL DIVISION

Illinois

W9WKU	40,044-	94-	144-	BC-45
W9NII	9360-	52-	60-	B-40
W9PVA	9009-	39-	77-	B-34
W9WFS	7371-	39-	63-	B-15
W9SD	6519-	41-	53-	C-14
W9ABA	5640-	40-	47-	C-10
W9MWO	5565-	35-	53-	B-19
W9FVU	2520-	28-	30-	B-13
W9DOR	2442-	22-	37-	A-18
K9BXJ	1944-	24-	27-	A-15
W9LQF	705-	15-	16-	B-10
W9RID	585-	13-	15-	B- 8
W9IRH	432-	12-	12-	A- 8
W9ONC	300-	10-	10-	A-13
W9OIY	108-	6-	6-	A- 4
W9IZ	48-	4-	4-	C- 2
W9AVJ (W9s GVZ NZM PKW)	250,740-	199-	420-	C-96
W9LBB (W9s ECY IRH PSP QXO)	32,256-	84-	128-	BC-89

Indiana

W9JIP	113,832-	153-	248-	C-59
W9JYU	39,864-	88-	151-	B-35
W9VUL	19,695-	65-	101-	C-15
W8PXP/9	4092-	31-	44-	C-10
W9AJA	2250-	25-	30-	B-11
W9POB	1320-	20-	22-	B-11
W9EGQ	1176-	14-	28-	B- 8

Wisconsin

W9EWC	227,457-	199-	381-	C-76
W9DUB	125,256-	136-	309-	C-79
W9EZD	67,260-	118-	190-	C-52
W9RBI	29,670-	86-	115-	- -
W9MBF	24,642-	74-	111-	B-32
W9FDX	7392-	44-	56-	BC- -
W9HCX	3741-	29-	43-	B-23
W9KXK	2871-	29-	33-	B-19
W9GIL	2340-	26-	30-	B- -
W9NLJ	1596-	19-	28-	A-18
W9HAT	945-	15-	21-	A- 6
W9RKP	9-	1-	3-	B- 1
W9AEM	6-	1-	2-	A- -
W9GOC (W9s SZR VAK, KN9CHK)	1449-	21-	23-	A-39

DAKOTA DIVISION

North Dakota

WØENK	495-	11-	15-	C- 6
WØEOZ	432-	12-	12-	B- 4

South Dakota

WØBLZ	9306-	47-	66-	B-21

Minnesota

WØCSU	23,625-	63-	125-	B-60
WØTJF	13,908-	57-	82-	B-20
WØZZT	2448-	24-	34-	B-26
WØQDP	855-	15-	19-	A- 5
WØVIP	588-	14-	14-	B- 7
WØNEF	75-	5-	5-	B- 4
WØRXL	36-	3-	4-	A- 4

DELTA DIVISION

Arkansas

W5ASG	23,232-	88-	88-	BC-44

Louisiana

W5KC	37,113-	89-	139-	B-32
W5CEW	23,484-	76-	103-	B- -
W5HNS (W5HNS, K5ARH)	1539-	19-	27-	B- 3

(Continued on page 140)

The Only Factory Pre-Tuned Tri-Banders

Guaranteed To Operate as Specified With No Further Adjustments!

CHECK THESE FEATURES!

- ★ Factory pre-tuned, pre-matched and pre-adjusted
- ★ 1 Beam — 1 Feedline — 3 Bands; SWR less than 1.5-1 at resonance.
- ★ Guaranteed for one year against all defects in material or workmanship
- ★ Easy to put into operation with simplified assembly instructions; no test equipment necessary
- ★ Better-built, better-performing; field-tested on WRL's Beam Range in Lincoln, Nebraska

1 BEAM — 1 FEEDLINE — 3 BANDS

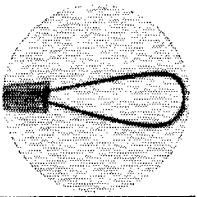
WITH THESE

3 GREAT NEW WRL

Triple Globe Spanners

(FOR 10, 15 and 20 METERS)

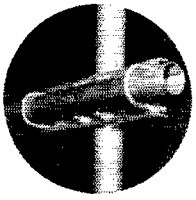
Specially designed, aluminum wire "carpet beater" ends on all elements to reduce fatigue caused by vibration and increase broad band characteristics.



BEAM	AVE. GAIN	AVE. F/B RATIO	SWR*	BOOM LENGTH
Two Element	5 db	17 db	less than 1.5-1	8 ft.
Three Element	8 db	22 db	less than 1.5-1	18 ft.
Five Element	12.1 db	25 db	less than 1.5-1	36 ft.
CERTIFIED FIELD TEST SPECIFICATIONS				

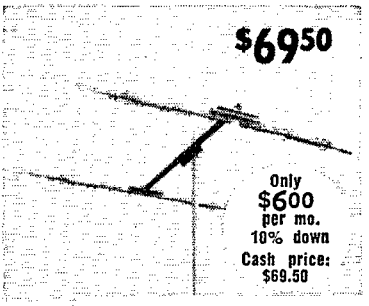
*At resonance

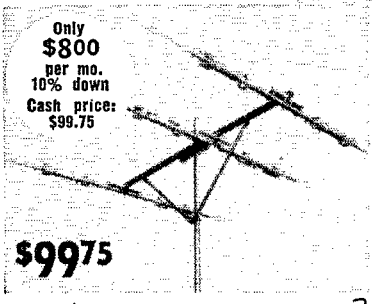
New Boom / Mast clamp, ruggedly designed with 4-way U-Bolt, and galvanized steel channel for positive grip and added strength.



The 2-Element Tri-Bander

Ideal for the ham with limited space, meeting the requirements of maximum gain. Covers 10, 15 and 20M amateur bands. Horizontal beam width, 59°; boom diameter, 1½"; longest element, 30 ft.; spacing, .1 director. Single transmission line for all bands — 52 ohm RG-8U. Approx. net wt., 28 lbs.





The 3-Element Tri-Bander

Here's the new standard for amateur radio communications, replacing three stacked beams. Covers 10, 15 and 20M amateur bands. Horizontal beam width, 59°; boom diameter, 1½"; longest element, 30 ft.; spacing .15 director, .1 reflector. Single transmission line for all bands — 52 ohm RG-8U. Approx. net wt., 49 lbs.

The 5-Element Tri-Bander

Here is the only 5-Element, Tri-Band beam currently in existence; offering the maximum possible gain on a single mast, and without a doubt the champion among amateur radio beams; truly the beam for the ham who wants the best, and a little bit extra. Heavy duty construction uses new type mast/boom clamp and 2x3" rectangular aluminum boom (2.06 times as strong as same area circular boom). For 10, 15 and 20M bands. Horizontal beam width, 47°; longest element, 30 ft.; spacing, .1 all reflectors and directors; single transmission line for all bands — 52 ohm RG-8U. Approx. net wt., 96 lbs.

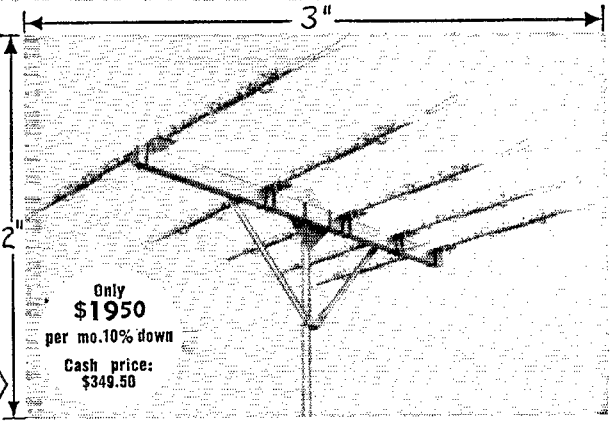


Photo is actual size of the rectangular boom of the 5-element Globe-Spanner Tri-Bander.

Send for Free Brochure on the Complete Globe Spanner Line TODAY! Write to

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3415 WEST BROADWAY **COUNCIL BLUFFS, IOWA**

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Tennessee

W4DQH...210,184-172-408- C-73
W4FKA....49,662- 89-186- C-60
W4ZMC....16,524- 51-108- B-38
W4UWC....4050- 29- 45- A- 8

GREAT LAKES DIVISION

Kentucky

W4KZF....24,255- 77-105- C-25
W4CDO....5600- 35- 54- B-20

Michigan

W8RLT...190,476-156-407- C-45
W8NWO..165,120-172-320- C-85
W8NOH....7128- 44- 54- B-17
W8TIC....1827- 21- 29- B-14
W8QIT....432- 12- 12- C- 9
W8SS....216- 8- 9- B- 4
W8NGO (W8s CLR NGO)
146,700-150-326-AB-86

Ohio

W8BKP...239,760-185-432-BC-60
W8NXF...217,300-205-354- B-70
W8ZOK....99,562-134-249- B-60
W8BF....94,360-140-226- C-43
W8JIN....68,796-126-182- C-21
W8PUD....16,023- 87-181- C-58
W8AJW....33,777- 81-139- A-24
W8KZT....18,444- 58-106- B-23
W8OIN....12,690- 45- 94- B-10
W8FGX....11,628- 57- 68- C-10
W8ELB....10,950- 50- 73- B-46
W8HQK....10,857- 47- 78-AB- -
W8RTF....10,368- 48- 72- B-22
W8AJH....4680- 30- 52- B-12
W8FBZ....4416- 32- 46- A- -
W8SMC....4224- 32- 44- B- 9
W8BTI....3969- 21- 63- C-11
W8LOF....2100- 25- 28- A- 6
W8BOJ....1500- 20- 25- C- 3
W8MXS....864- 16- 18- A-13
W8OMY....816- 16- 17- A-16
W8KC....798- 14- 19- B-10
W8QDH....507- 13- 13- B- 6
W8PCS....192- 8- 8- A- 2
W8BQV....135- 5- 9- A-10
W8AEU....90- 5- 6- C- 1
W8UMA....63- 3- 7- - -

HUDSON DIVISION

Eastern New York

W2VRE....29,748- 74-134- B-30
K2PPB....975- 13- 25- A-16

N.Y.C.-L.I.

K2AAA...412,550-223-617- C-93
W2BRV....7920- 48- 55- B-15
W2MCO....972- 18- 18- A-25
W2BVN....936- 13- 24- B- 6
W2PTL....624- 13- 16- B- 4
W2GSN....72- 4- 6- B- 2
K2DEM....60- 4- 5- A- 1

Northern New Jersey

W2SKE/2..632,016-252-842- C-95
W2GLF....35,742- 74-161- B-40
W2DJT....6495- 38- 57- B-15
W2WE....3240- 30- 36- B- -
K2KFP....1080- 18- 20- A- 8

MIDWEST DIVISION

Iowa

WØDIB....9045- 45- 67- B-31
WØQVZ....3672- 34- 36- B-11
WØPUR....630- 14- 15- B- 5
WØNWX (WØs NWX PKH)
3552- 32- 37- B- -

Kansas

WØMVO....3744- 32- 39- B-15
WØIUB....1653- 19- 29- B- -
WØQPH....1254- 19- 22- A- 9
WØQMS....855- 15- 19- B- 5
KØDRR....504- 12- 14- - -
WØGAX....108- 6- 6- A- -

Missouri

WØGEK....34,983- 69-170-BC-43
WØAJU....5772- 37- 52- C-26

Nebraska

WØBBS....5145- 35- 49- C-16

NEW ENGLAND DIVISION

Connecticut

W1ODW...33,777- 81-139- B-41
W1BIH....32,340- 77-140- B-25
K2DIA/1....4158- 33- 44- B-36
W1EJV....4032- 32- 42- B-19
W1YWU....2277- 23- 33- B- 6
W1AW[12]...2090- 22- 32-BC-10
W1GVK....363- 11- 11- B- 7

Maine

W1DLC....95,368-131-244- C-71

Eastern Massachusetts

W1ONK..157,137-147-357-AB-72
W1OGU....22,656- 59-128- B-33
W1QJR....20,412- 54-126- B-63
W1ZSR....15,042- 46-109- A-40
W1QKF....14,382- 51- 94- C-44
W1QWT....12,672- 48- 88- B- 9
W1MXX....6996- 44- 53- C-11
W1MGP....1254- 19- 22- A-15
W1ABJ....880- 16- 19- B- 7
W1MX[3]....168- 7- 8- C- 5
W1LQQ....108- 6- 6- A- 5
W1VFK....75- 5- 5- - -

Western Massachusetts

W1YQC....36,920- 65-190- B-40
W1CLX....26,112- 64-136- B-20
W1ZD....3663- 33- 37- C-18
W1JYH....360- 10- 12- - -
W1MVF....3- 1- 1- A- -

New Hampshire

W1FZ....67,122-113-199- C- -
W1KKT...28,080- 80-117- A-51

Rhode Island

W1PPN....1056- 16- 22- - -

NORTHWESTERN DIVISION

Idaho

W7UDG....2592- 27- 32- B- 8
W7VNO....624- 13- 16- A- 9

Montana

W7FIN....5152- 28- 62- B-36

Oregon

W7LBV....720- 12- 20- A- -
W7JLU....510- 10- 17- A- 3
W7PJK....405- 9- 15- B- 3

Washington

W7HRH...43,560- 90-163- C-60
W7KTL....1056- 16- 22- B-10
W7AEA....720- 12- 20- A- 4

PACIFIC DIVISION

Nevada

W7YNO/7....759- 11- 23- B-16
W7JUO....135- 5- 9- C- 2
W7VIU....27- 3- 3- B- 1

Santa Clara Valley

W6PBV....27- 3- 3- B- -
W6BAX (W6s BAX HQN)
26,505- 57-155- C-50

East Bay

W6IDY....77,499-109-237- C-60
W6LDD....2646- 21- 42-BC-12
W6KEK....528- 11- 16- B- 3
W6OEI....528- 11- 16- B-16

San Francisco

W6ATO....12- 2- 2- C- 1

ROANOKE DIVISION

North Carolina

W4NHF...126,360-156-270- B-64
W4CEN....10,488- 46- 76- C-12
W4ZWF....5472- 32- 57- B-15
W4NYN....5106- 37- 46- A-10
W4GXB....1242- 18- 23- C- 5
K4BVQ....1140- 19- 20- - -
W4AEH....720- 15- 16- B- 8
W4OXI....675- 15- 15- B- 4
K4ARP....533- 13- 14- B- 9

South Carolina

W4TWW...27,621- 81-114- B-41

(Continued on page 142)

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W4WSF....12,152- 49- 84- B-34
W4OFR.....2625- 25- 35- B-15
W0SDC/4....2088- 24- 29- B-20
W4IA.....380- 10- 13- B- 2
W4TFX.....6- 1- 2- B- -

West Virginia

W8PQQ....19,320- 70- 92-BC-14
W8UMR....9246- 46- 67- B-18

ROCKY MOUNTAIN DIVISION

Colorado

WØEWH.....2448- 24- 34- B-14
WØBDQ.....192- 8- 8- B- -
WØCDP.....48- 4- 4- A- 1

Utah

W7QDJ.....966- 14- 23- A- -

Wyoming

W7PSO.....798- 14- 19- B- 8

SOUTHEASTERN DIVISION

Alabama

W4NZM...22,715- 59-129- C-40
W4HA....17,784- 52-114- C-19
W4GUV....17,068- 68- 85- A-25
W4YHC....11,040- 46- 81- B-44
W4FTP.....4356- 33- 44- C-21
K4CXA.....1638- 21- 26- B- 8
W4ECI.....243- 9- 9- C- 2

Eastern Florida

W4HKJ....23,580- 60-131- B-36
W4LQN....19,089- 63-101- B-46
W4EEO....15,045- 59- 85- B-30
K4CYF....11,856- 52- 76- B-46
W4FYI.....2925- 25- 39- A-26
K4CIU.....882- 14- 21- A- 6
W4LVV.....216- 8- 9- A- 2
W2DLO/4.....48- 4- 4- B- 2

Western Florida

W4AFS.....7580- 40- 63- A-23
W4HIZ.....6669- 39- 57- B-33

Georgia

W4EEE...116,748-141-276- C-61
W4ESP....28,086- 62-151- - -
W4YHF....11,286- 57- 66- B- -
W4INO.....8118- 41- 66- B-16
W4YK.....7896- 47- 56- C-12
W4BOI.....546- 13- 14- B- 7

SOUTHWESTERN DIVISION

Los Angeles

W6YY....366,660-194-630- C-90
W6ITA....280,062-178-527- C-90
W6NJU....23,064- 62-124- A- -
W6EHV....21,777- 61-119- C- -
W6MUB.....8322- 38- 73- C-30
K6EWL.....7068- 38- 62- C- -
W6IIM.....5536- 32- 58- B-35
W6GN.....2160- 24- 30- C- -
K6BAG/6.....1242- 18- 23- A- -
W6BJU.....648- 12- 18- C- 6
K6DNH.....378- 9- 14- A- 3
W6NZW.....264- 8- 11- - -
W8SVL/6.....120- 5- 8- A- 4
K6PDA.....12- 2- 2- B- 2
W6AM (W6s AM BXL VSS YMD)..341,432-196-581-BC-94
K6DDO (K6s DDO IDA) 2109- 19- 37- A-10

Arizona

W7ENA.....1230- 30- 47- A-28
W7UXS.....27- 3- 3- A-16

San Diego

W6CHV....50,232-104-161- B-48
W6CTP....24,840- 69-120- C-33

Santa Barbara

W6AGO....31,623- 83-127- C-24

WEST GULF DIVISION

Northern Texas

W5DJH...135,441-149-303- C-70
K5AHZ.....9900- 44- 75- B-44
W5QF.....9300- 50- 62- B-14
W5DXW....8928- 48- 62- B-39
W5OC.....990- 15- 22- A-16

Oklahoma

W5AOY.....2964- 26- 38- A-17
W5MCF.....2565- 27- 33- B-16
W5PNG.....27- 3- 3- - -
W5WLA.....27- 3- 3- A- 1

Southern Texas

W5NMA...59,730-110-181- C-34
W5SU.....7410- 39- 64- B-18
W5WBU.....3078- 27- 38- A-19
W5ZWR.....2754- 27- 34- B- 6
W5GAH.....882- 14- 21- B-17

New Mexico

W5PQA.....1752- 36- 44- A-16
W5FTP.....1701- 21- 27- B-16

CANADIAN DIVISION

Maritime

VO6N.....1959- 29- 57- B-19
VO6U.....2175- 25- 29- B- -
VE1ZZ.....240- 8- 10- C-12
VO4C (VO4C, W4FOW/VO4) 9143- 41- 77-AB-36

Quebec

VE2JR.....45,570- 98-155- B-39
VE2APH....3780- 30- 44- B-10
VE2YA.....28- 3- 3- A- -

Ontario

VE3VO....12,852- 42-102- B-27
VE3IR.....4644- 36- 43- B-13
VE3DNE.....810- 15- 18- A-12
VE3DJX.....36- 3- 4- A- 1

Manitoba

VE4RO...145,395-135-359- C-68
VE4RP.....3627- 31- 39- B-27

Saskatchewan

VE5VL.....45,109- 79-195- B-67
VE5CX.....9798- 46- 71- B-22
VE5GF.....7938- 42- 63- B-20
VE5VZ.....5508- 36- 51-AB-14

Alberta

VE6NX....24,603- 59-139- B-35

British Columbia

VE7AIH...19,836- 58-114- A-29
VE7EH.....1536- 16- 32- B- 9
VE7AMJ.....108- 6- 6- B- 5

Yukon

VE8AB.....540- 10- 18- A- 5

AFRICA

Bechuanaland

ZS9G.....58,652- 43-455- A-63

Belgian Congo

OQ5AO....15,411- 33-159- A- -

Canary Islands

EA8AX.....9720- 20-164- A- -
EA8BC.....1080- 8- 47- A- 4

Eritrea

ET2PA.....3460- 10-116- B-12

Ethiopia

ET3LF.....180- 5- 12- A- -

Kenya

VQ4FK....12,915- 35-123- B-12

Madeira

CT3AN.....561- 11- 17- B- -

Mozambique

CR7AF.....1764- 12- 49- A- 5

Southern Rhodesia

ZE2KR....24,444- 36-227- A-36

Union of South Africa

ZS6DW...224,532- 77-974- A- -
ZS5JY....124,431- 59-707- A- -
ZS5MP....38,916- 46-282- A-17
ZS6AJO.....6489- 21-103- A-12

(Continued on page 144)

ASIA

Hong Kong

VS6AE.....1008- 8- 42- A- 5

Japan

JA3BB.....21,634- 29-250- B-40
KA7HH.....1860- 10- 62- B-17
JA1EF.....504- 4- 42- B-15
KA2SK.....120- 2- 20- B- 9
JAØAA.....108- 3- 12- A- 2
JA1JW.....15- 1- 5- A-10
JA1AFU.....9- 1- 3- A- –
JA1MN.....3- 1- 1- A- 2
KA2KS (6 oprs.)
41,148- 36-381- A-40

Lebanon

OD5AV.....12- 2- 2- B- –

Ryukyu Islands

KR6LJ.....3900- 20- 65- C-11
KR6AB.....270- 3- 30- B- –

EUROPE

Austria

OE5CK....50.619- 47-359-AB-40

Belgium

ON4OC....45,855- 44-340- A-35
ON4DB.....2048- 16- 44- A-15
ON4LJ.....198- 6- 11- B- –

Czecho-Slovakia

OK1LM.....1014- 13- 26- A- 3
OK1KAI.....930- 6- 52- A-25
OK1JX.....360- 8- 15-AB- 6

Denmark

OZ7G.....11,808- 32-123- A- –
OZ3TH.....7176- 24-101- A-20
OZ5KQ.....2114- 14- 51- B-14
OZ7BG.....540- 9- 20- B- 3
OZ7SN.....528- 8- 22- A- –

England

G2PU.....62,463- 47-443- B-49
G3DO.....42,640- 41-348- B-38
G3HJJ.....18,202- 38-160- B-40
G8KS.....54- 3- 6- A- –
GB2SM (Gs 3JUI, 5CS)
285- 5- 19- B- 2

Finland

OH1PN.....1584- 16- 33- A- –
OH4NT.....294- 7- 14- A- –

France

F9RM.....6762- 23- 98- A-12
F3NG.....756- 14- 18- A- –

Germany

DL4AJ.....60,912- 47-432- B- –
DL1KB....36,490- 41-297- B-36
DL4ZL.....35,160- 40-294- B-60
DL4ZC.....13,494- 26-173- B-25
DL1UX....12,090- 31-130- B-16
DJ2YL.....9234- 19-162- B-17
DL9SN.....4015- 11-122- A- –
DL4IU.....2814- 14- 68- B- –
DL4SK.....2670- 15- 63- B-12
DL9GU.....1728- 9- 64- B- –
DL3OC.....240- 8- 10- A- 8
DL9PJ.....27- 3- 3- B- –
DL4DX (DL4s DX NL)
7224- 24-101- A-28

Hungary

HA5KBK.....930- 10- 33- A-96
HA5KBC[5].....18- 2- 3- A- 6
HA5KBA (5 oprs.)
14,404- 26-186-BC-96

Ireland

EI5I.....66,303- 53-419- B-28

Italy

I1CHJ.....3894- 11-118- A- –
ITIZGY.....3008- 16- 63- A- 7
I1CCO.....1716- 13- 44- B- 3
I1AHW.....216- 6- 12- A- 3
I1AIJ (I1s AIJ ZSK)
40,500- 45-300- A-25

Netherlands

PAØVB.....11,880- 33-120- B-18
PAØALO....10,545- 19-185- B- –
PAØULA.....8400- 20-140- B-16
PAØJA.....2340- 15- 52- A- 4
PAØNN.....891- 11- 27- A- –
PAØXX.....816- 8- 34- A- 4
PAØIF.....216- 8- 9- B- 2
PAØTV.....18- 2- 3- A- 1

Northern Ireland

GI3GAL.....1260- 12- 35- A- 6

Norway

LA5YE....21,720- 40-181- B-17
LA9T.....12- 2- 2- A- 3
LA1K (LAs 2MB 3HF 7OE 7ZC)
208- 8- 9- B-12

Portugal

CT1PK.....8820- 28-105- B- 5

Saar

9S4AX.....84- 4- 7- A- 1

Scotland

GM3EMY..24,600- 40-205-AB-36
GM3EOJ....1196- 13- 31- A- 6

Spain

EA4DL....66,411- 47-471- B-96
EA4CX.....5760- 20- 96- A- –
EA3KT.....54- 3- 6- A- 3

Sweden

SM5FA.....3480- 20- 58- B- –
SM2ALU.....36- 3- 4- B- –
SM5BFR.....12- 2- 2- B- –

NORTH AMERICA

Bahamas

VP7NG...136,240- 65-706- A-25

Barbados

VP6WR...292,636- 87-1131-A-60

Bermuda

VP9L.....177,300- 75-788- A-51

Canal Zone

KZ5VO....82,137- 57-481- A-30
KZ5MW.....6360- 20-107- B- –

Cuba

CO2MG.....3- 1- 1- B- –

Greenland

OX3KW.....5916- 17-116- A- –

Guadeloupe

FG7XB.....2142- 9- 81- A- –

Guantanamo Bay

KG4AC....49,749- 23-721- B-47

Guatemala

TG9AD...441,618- 89-1673- B-61

Honduras

HR3HH...224,775- 81-925- B-49

Martinique

FM7WQ[6]...11,151- 21-177- A- 5
FM7WF[6].....2808- 9-104- A- 5
FM7WP[6].....2430- 9- 90- A- 4
FM7WN (FM7WN, W3VKD)
40,084- 23-436- A-26

Mexico

XE1QB.....8075- 19-142- A- 9
XE1RE.....4104- 19- 72-AB- 3
XE2NF (6 oprs.)
179,330- 79-762- A-96

Nicaragua

YN4CB....77,592- 61-427- A- –

Turks and Caicos

VP5DC....52,256- 32-549- A-23

Virgin Islands

KV4BI.....10,275- 25-138- B- 8

OCEANIA

Australia

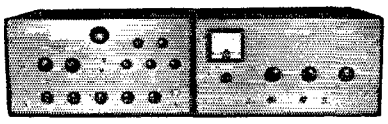
VK5LC.....5460- 20- 91- A-13
VK5WO.....4158- 21- 66- A- 9
VK3MX.....828- 9- 31- A- –

Cook Islands

ZK1BL.....5760- 15-129- A-13

(*Continued on page 146*)

Companion Unit



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W and T $329.50 Kit $279.50

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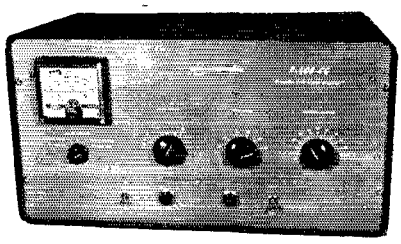
Grounded Grid Linear Amplifier

new new new new new



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- V Exclusive metering circuit reads GRID Ma. PLATE Ma. WATTS Input and WATTS Output directly in WATTS on the meter.
- V Complete built in power supply gives 1250 V DC 380 MA with 30 MFD filter capacity for maximum dynamic plate supply regulation.

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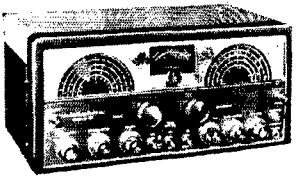

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KH6PM...265,881- 77-1151-B-66
KH6MG.....2592- 18- 48-AC- 3
KH6DE.....480- 8- 20-AB- -
KH6AYG (KH6s AUB AYG BCM BHZ)...178,872- 58-1041-C- -

Marshall Islands

KX6AF (7 oprs.) 50,336- 44-383- A-52

New Zealand

ZL1BY....153,446- 73-701- A- -
ZL1MQ...103,464- 72-479- A-36

Philippine Islands

DU7SV.....7200- 24-100- B- -

SOUTH AMERICA

Argentina

LU8DB....12,712- 28-152- A- 8
LU9FAY...10,440- 15-232- A- -
LU9AW.....4704- 16- 98- A- -

Brazil

PY2CK....56,852- 48-395-AC-22
PY4KL.....7344- 18-136- B- -
PY7ADR....6864- 26- 88- B-19
PY4EM.....5302- 22- 81- A- -
PY7VBG....1830- 15-108- B-16
PY5GA.....3150- 15- 70- A-10
PY7VG.....459- 9- 17- B- -
PY1CK.....3- 1- 1- B- -

British Guiana

VP3HAG...89,320- 58-516- A-64

Chile

CE3CZ....285,120- 64-1489-B- -

Colombia

HK3PC.....5100- 25- 68- A- 4

Ecuador

HC1ES...391,860- 92-1497-B-64
HC2OM[6]...37,350- 30-415- A- -
HC2BH.....9348- 19-164- B-21

Netherlands West Indies

PJ2AF....143,594- 61-788- B-43
PJ2AB.....56,784- 42-456- A-30

Paraguay

ZP5CF.....2592- 16- 54- A- -

Peru

OA5G (3 oprs.) 152,658- 66-772-AC-55

Surinam

PZ1RM[7].....9087- 13-233- B-10

Uruguay

CX2CO....31,500- 42-250- C- -
CX3ZBH....2565- 19- 45- A- 3

[1] W1WPR, opr. [2] Hq. staff — not eligible for award. [3] W1UJX, opr. [4] K6CEO, opr. [5] HA5AR, opr. [6] W3VKD, opr. [7] K2CJN, opr.

ARRL thanks these amateurs for submitting their logs for checking purposes: *C.w.* — *W1s* HV MAN, W2VL, K2EQD, *W3s* FOI HDV NCF NQC QOS VD, K4AWJ, *W5s* DML LPL LRY, *W6s* AF DTJ WSW, *W7s* HYW KGP OAZ, W8LSA, WN8CFJ, *W9s* LNQ LZ QM TAL ZTD, *WØs* GUV SYK, VE5RI, VE6VO, VE7WL, F8FO, F9TK, G3EEM, G5OJ, GI4RY, KV4BK, PAØGG, PAØZL, SM5IZ, SM6XK, VK3HL, VK3PG, VP7NM, ZS6IX; *Phone* — W1LVR, *W2s* AZS HUB WZ, *W3s* PWG RRI UHN, W4IEH, W5SLJ, K5CAW, W6EFV, *W8s* FFN IXG, W9WZI, WØSYK, JA3LN, SM3BIZ, SM5APA, VK3PG, VP7NF, VP7NS, ZS1HJ.

How's DX

(Continued from page 69)

Magallanes province and Tierra del Fuego become CE8s, Chilean Antarctic amateurs will use the prefix CE9, CEØ, as before, goes for Easter Island. CE3AG advises that requirements for RCC's WACE award have been brought into line with these changes. Basically, qualification for W/VE stations is eight QSLs, one from each of any eight of Chile's ten call areas. Write CE3AG for full details . . . . W3DGM, he of the mammoth c.w. score in ARRL's '56 DX Test, moves to Tennessee for a two-year stay. Neighbor W3WPG will miss Mel but there'll be a few more rare ones to spread around among the Philly gang! . . . . W2WHB joins a Greenland task force at Tuto and is already active as KG1AX . . . . W6ITH, by far the most eminent authority on St. Martin amateur radio, writes W1WPO: "My plans for PJ2MC came along nicely. It took a tremendous lot of paper work, red tape, personal interviews, etc." Reg's concomitant FS7RT encore was a boon to many who missed him on his first trip. W6TTB's 21-Mc. phone contact with PJ2MC was a prime first . . . . West Gulf DX Club's new slate of officers, all W5s: FXN, pres.; ADZ, v.p.; GSR, secy.-treas.; ALA CEW BNO KC and VU, policy committee. W5FXN's junior opr., K5ABW, serves as editor of the *DX Bulletin*, succeeding co-editors W5s VAE and ZZR . . . . So. Calif. DX Club's new officeholders: W6MIUB, pres.; W6VUP, v.p.; K6EWL, secy.; W6NJU, treas.; and W6SYG, director . . . . Ohio Valley Amateur Radio Assn.'s *Ether Waves* now lists 32 members with 100-plus countries totals, four of these phone-only. W8JIN maintains his large lead in club band-countries with a grand total of 1076, followed by W4KVX and W8EV with 604 and 543, respectively . . . . OT DXer W6EAY finds his traveling job a bane to his countries total. Eric is on the road almost three weeks of every four or five . . . . KP4JE, back home from hospitalization, expects to add to his 156/142 total while recuperating . . . . W2BRV desires hints on securing QSLs from FG7XB and former KG6AW/VK9 ('48);

(Continued on page 148)

W2HMJ could use a tip on the present whereabouts of former PK2AA and EP1BU; and W3JNN wants the scoop on HS1VR QSL possibilities.

Ten Years Ago in "How's DX?" — The 20-meter band, resurrected for amateur occupancy after a five-year lapse, steals the DX show in September, 1946, W1JPE reports that "ten was dropped like a hot 6L6" in the general stampede toward 14 Mc. . . . . Among early "How's" contributors to shout eureka on 20 were W1KMY, W2ATJ, W3BKZ, W4s BPD BRB, W6s GRL ITH KIP LER PBV TND/4, W7EYS, W8ROX, W9NDA and VE1EP who chorused "Come on in; the water's fine!" They joined in reporting such tidbits as **ACs 3SS 4YN, C3YW, EQ4DC, FK8OSL, PKs 1RI 5LK 6TC, TA1DB, UA0KAA, VQ6MI, VS4s** JH RM, **XZ2GS, YI2BA, ZA2A, ZD8A**, all on c.w.; **CIs** MG PL, **CT2FR, EP1C, LX1SI, SU1KE** and **YR5RW** on phone . . . . With good old 20 back in the fold countries totals begin soaring. A few postwar figures mentioned: XU1YO (W6PBI) 70, W8HGW 69, W2OAA/J8 55, G2PL 53 and G8KP 42.

— • • • —

Key to most-correct answers for DX Geoquiz, p. 65: 1)*b*, 2) *c*, 3) *d*, 4) *c*, 5) *ad*, 6) *bd*, 7) *b*, 8) *b*, 9) *c*, 10) *d*, 11) *a*, 12) *bacde*, 13) *c*, 14) *a*, 15) *Af Bh Cb Dg Ec Fd Gi Hj Ia Je*. A grade of 50-60 isn't too bad, 60-70 not bad at all, 70-80 good work, 80-90 fine business, and 90-100 preposterous.

YL News and Views

(Continued from page 71)

weekend 1957 is the big date to remember. The Palmer House in Chicago, Illinois, is the place. General Chairman is Jordan Kaplin, W9QBE. The President of the YLRL, Cris Bowlin, W9LOY, announces that the Second International YLRL Convention will be held in conjunction with the ARRL convention. The tie-in of the two events should make for a new high in interest in both. More on next year's double convention planning soon.

Your column editor wishes to express her deep gratitude to the YLs of the Ladies Amateur Radio Club; the Chicago Unit of the YLRL; the Los Angeles Young Ladies Radio Club; the San Diego Young Ladies Radio Club; the San Francisco Young Ladies Radio Club and to all of the YLs at the convention for the many kindnesses they extended to a visiting ham. It was a real pleasure to meet so many wonderful YLs and XYLs in person.

The following is a list of the YLs who registered at the YL registration booth during the three day convention period, as submitted by the YL and YLRL Booth Committee Chairman Jeri Bey, W6QMO:

W1QON; W2EEO; W3MSU; W5s DUR and RZJ; W6s ACA, BDE; K6BMQ; W6BIS, CEE; K6s CUV, DEN; W6DXI; K6s EEE, EIA; W6s FEA, FRL, GEV, GQZ; K6HIE; W6HEG; K6s HII, IGA, JRL; W6JZA; K6KCI; W6KER; K6s KJI, KUP, LAF; KN6MJH; W6s NMY, NZP; K6OAI; KN6OHR; K6OWQ; W6s PCN, PCO, PCR, PHT, PIR; K6POC; W6PVV; KN6QCL; K6QFY; W6s QMO, QOG, QVK; KN6s RRG, SAJ, SBP; K6SOQ; KN6SYR; W6s WSV, QPV; K6HIW; KN6RDH; W7s AKY, KOY, NTT, OOK, QGF, RAX, WLX, WTK, ZBQ, ZQG; W9MMO; WØs BFW, KQD; and WL7BQP.

Strays

W4HE sends us the dope sheet on a commercial unit which features an "Automatic Nose Limiter"! Ain't science wonderful?

Mobile Converter

(Continued from page 21)

response of the stage. They could have been added to the 21- and 28-Mc. coils for the latter reason, but we never got around to installing them. Incidentally, the regeneration problem did not develop at these higher frequencies. Perhaps a duplicate of the converter, working with an antenna slightly different than that used here, will be quite stable at all frequencies without resistance loading. In that case, the constructor may select loading-resistance values which broaden the frequency response to some particular bandwidth or he may do away with loading in the interest of increased gain.

Naturally, the converter must be installed in the car in a manner which provides access to the top cover and the coil sockets. This is most conveniently accomplished by mounting the unit with one of the sides facing up toward the underside of the dash. Looking at the dial "off-to-one-side" gets to be quite natural after a while!

World Above 50 Mc.

(Continued from page 64)

Meter and Down Club of Southern California. Cost is $1.50 per copy, from D. K. Goshay, W6MMU, 8352 Westlawn Ave., Los Angeles 45.

O.E.S. Notes

K2DYC, Phelps, N. Y. — About 30 stations now work on 50 Mc. in the Rochester area. Net meets each Wednesday at 2100. Newcomers welcome.

K2ITN, Ilion, N. Y. — Experimenting on 10,000 kc.

W4FEC, Auburn, Ala. — Checks with 826s confirm reports that they can be run far above their ratings, even on 144 Mc. Pair takes 600 watts input on 144 Mc. easily even when operated with less than rated grid drive. Exact balance important in this.

W4HHK, Collierville, Tenn. — Worked W4BUZ, Greensboro, N. C., via aurora May 23rd, for 144-Mc. state No. 29 Also heard 144-Mc. signal from KOK (book listing, Clearwater, Calif.) working KHC, presumably a ship. Signal sounded like a parasitic (drift) but had aurora characteristics and peaked from northwest. Receiver checks indicated that it was actually on 144 Mc., and not a spurious response. If the signal was coming through on 144 Mc. it indicates possibility of auroral communication with Southern California, where auroral signals have not been previously reported, and a potential new record for 2-meter DX. Reports of reception of ths signal, or any details as to how it came about in this instance, will be appreciated.

W4IKK, Rome, Ga. — 50-Mc. DX heard or worked on 10 consecutive days at end of May, and 13 days in June up to the 22nd. Scatter tests less successful during summer than in early spring. May be screening effect of heavy tree foliage. Groundwave communication range also down.

W5PZ, Ponca City, Okla. — Have 5894s, tripler and amplifier, on 432 Mc. Would like to hear from other 432-Mc. stations in range.

W5SWV, Denison, Texas — 144-Mc. QSOs carried on with Ardmore and Ada, Okla., stations during thunderstorms when all lower bands were useless because of noise.

Meteor-scatter tests with W8KAY and W6NLZ both produced identifiable bursts of c.w., but no QSOs as yet. W6NLZ also heard by W5HXK, Watonga, Okla., July 16th.

W7JHX, Gig Harbor, Wash. — Several 432-Mc. stations in Seattle area. W7LRF, Tacoma, has tripler at 50 watts input. Receiver has 416B preamp. W7SFO, Spanaway, runs 832 tripler and uses 6AN4 r.f. amplifier ahead of converter. W7JHX also has 6AN4 preamp, with transmitter running 50 watts input to pair of 2C39As, tripling. Checks are

(Continued on page 152)

He wants to be first in line for a new

HAMMARLUND

HQ- (Shhhhh—censored till September)

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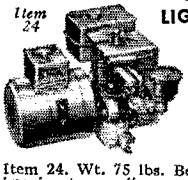

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Item 24. Wt. 75 lbs. Be prepared if war or storms knock out power lines. **$143.50**

700-800 Watt Plant (Item 44) same as above but with larger engine and greater capacity **$169.95**

1000-1200 Watt Plant (Item 45) same as Item 24 but with larger generator and engine — 50% greater output **$199.50**

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Send 10¢ for big 1956 Catalog. Free with order.
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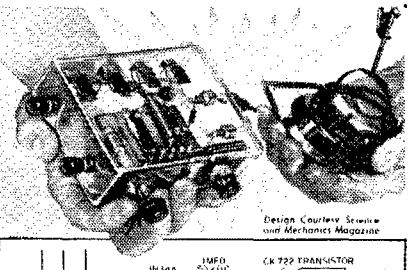

Design Courtesy Science and Mechanics Magazine

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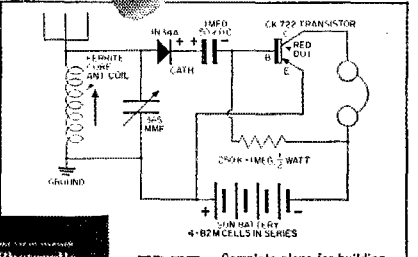

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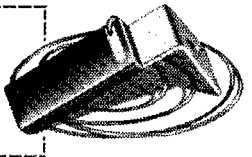

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being made with W70KV, Portland, who has 9903 amplifier at 50 watts input, and 416B preamplifier. All antennas are collinear, horizontal.

W7PUA, Eatonville, Wash. — Recently completed 17-element 144-Mc. Yagi (January *QST*) which results in 1 to 1½ S-units more signal than antennas used previously. This on temporary support. New array resulted in first Oregon home station contact, with W7SEZ at Taggard. W7ERA, Portland, also heard.

W7QDJ, Clearfield, Utah — Worked W2QCY/7 expedition on both 6 and 2; best groundwave worked in this area, 105 miles. Signals S9 and steady, though coming over mountains, great Salt Lake and Salt Desert.

W8URO, Drayton Plains, Mich. — Aurora work *can* be done on 144 Mc. with low power. Worked W2, 3, 4, 8 and 9 with 10 watts input and 16-element beam. Would like 2-meter skeds at 100 miles or more, preferably on c.w. Most-used frequencies 144.14 and 144.46 Mc.

W9KLR, Rensselaer, Ind. — W1KCS (State No. 27, Rhode Island) worked via aurora June 24th. Aurora signal had superimposed T9 meteor bursts at S9 level. W1KCS reported same ear-splitting T9 bursts on W9KLR's signal.

Correspondence

(*Continued from page 49*)

On reading an editorial published in the Bulletin's February issue which pointed out the necessity for a membership drive in order to offset the rising costs of publication, it occurred to me that here was an opportunity to kill two birds with one stone: to subscribe to an interesting amateur periodical and at the same time assist a fellow amateur radio society.

Interested amateurs may get full information by writing to RSGB at 28 Little Russell Street, London, W.C.1

— *F. C. B. Jordan, W3FIU*
Captain, U. S. Navy

Happenings

(*Continued from page 48*)

growth — though admittedly not without a bit of strain (on both her and the machines!) during our busiest months, such as *Handbook* appearance time. We made a wise decision ten years ago to adopt the machine system, and an even wiser one in choosing "CAC" to handle it.

EXAM POINTS CHANGE

FCC continues to reduce the travel of its field engineers by means of less frequent visits to cities where the number of examinations no longer warrants such travel. In accordance therewith, Jackson, Miss., has been dropped as a quarterly examination point; exams will be conducted only semi-annually from now on. Butte, Montana, will henceforth be visited annually, instead of twice yearly. Tallahassee, Florida, is dropped completely from the list.

The case of Jackson is the first instance in many years of the dropping of a quarterly examination point; now, prospective General Class amateurs within 75 miles of that city may take the equivalent Conditional Class exam by mail.

New Apparatus

(*Continued from page 60*)

nibble, and can be used on aluminum chassis up to 16 gauge or steel chassis up to 18 gauge. It requires a $\frac{3}{16}$-inch hole for starting, in order to get the tool into position to operate. It is possible to make curved cuts having an inside radius as small as $\frac{5}{16}$ inch if the chassis is rotated while cutting. With a little practice, cutting is rapid, and can be held accurately to a scribed mark.

The new nibbler is being distributed by Harrison Radio, 225 Greenwich St., New York, and is manufactured by the Adel Tool Co., Chicago.

September 1931

The editorial in *QST* 25 years ago this month is worth special mention, as amateurs were reminded that they ought to do something about increased occupancy of both the band from 1715 to 2000 kc. and the wave lengths in around 5 meters. It was reported that by winter there would be relatively high-powered experimental television transmissions in the vicinity of 70 Mc.

—•••—

The lead technical article is a description of "A Combination A.C. and D.C. Amateur-Band Receiver". The equipment pictured in the article is recognized instantly by anyone active in amateur radio prior to WWII as being the National SW-3, one of the best-known receivers ever offered on the amateur market.

—•••—

K. B. Warner, secretary of the League, presents a report on the meeting of the International Technical Consulting Committee in Copenhagen, at which there were no decisions affecting amateurs.

—•••—

John Dyer, in charge of the installation at W1CCZ, discusses "Practical Electron Transmitters and Receivers," dealing with the Barkhausen-Kurz type oscillator and giving some practical circuits for both receivers and transmitters.

—•••—

In addition to a collection of hints and kinks in the "Experimenters' Section," there were articles on a filament supply for two-volt tubes and the 500-watt power amplifier of the standard frequency transmitter at W1XP.

—•••—

And although the realization that publicity can be of value seems to be just reaching some quarters, in this "25 years ago" issue *QST* carried an article on how to handle amateur radio news.

—•••—

And as a final convincer that our interests don't change so very much through the years, let's repeat a little poem that was sent in by W7VP 25 years ago:

O Lord, suffer me to work
Such long DX, that even I
When talking of it afterwards
Shall have no need to lie!

A.R.R.L. QSL BUREAU

The function of the ARRL QSL Bureau system is to facilitate delivery to amateurs in the United States, its possessions, and Canada of those QSL cards which arrive from amateur stations in other parts of the world. Its operation is made possible by volunteer managers in each W, K and VE call area. All *you* have to do is send your QSL manager (see list below) a stamped self-addressed envelope about 4¼ by 9½ inches in size, with your name and address in the usual place on the front of the envelope and your call printed in capital letters in the upper left-hand corner.

W1, K1 — D. W. Waterman, W1IPQ, 99 Flat Rock Rd., Easton, Conn.
W2, K2 — E. F. Huberman, W2JIL, Box 746, GPO, Brooklyn 1, New York.
W3, K3 — Jesse Bieberman, W3KT, P.O. Box 400, Bala-Cynwyd, Penna.
W4, K4 — Thomas M. Moss, W4HYW, Box 644, Municipal Airport Branch, Atlanta, Ga.
W5, K5 — Robert Stark, W5OLG, P.O. Box 261, Grapevine, Texas.
W6, K6 — Horace R. Greer, W6TI, 414 Fairmount St., Oakland, Calif.
W7, K7 — Joseph P. Vogt, W7ASG, 3599 Karen Ave., Salem, Oreg.
W8, K8 — Walter E. Musgrave, W8NGW, **1245 E. 187th St.**, Cleveland 10, Ohio.
W9, K9 — John F. Schneider, W9CFT, 311 W. Ross Ave., Wausau, Wisc.
WØ, KØ — Alva A. Smith, WØDMA, 238 East Main St., Caledonia, Minn.
VE1 — L. J. Fader, VE1FQ, 125 Henry St., Halifax, N. S.
VE2 — Harry J. Mabson, VE2APH, 122 Regent Ave., Beaconsfield West, Que.
VE3 — Leslie A. Whetham, VE3QE, 32 Sylvia Crescent, Hamilton, Ont.
VE4 — Len Cuff, VE4LC, 286 Rutland St., St. James, Man.
VE5 — Fred Ward, VE5OP, 899 Connaught Ave., Moose Jaw, Sask.
VE6 — W. R. Savage, VE6EO, 883 10th St. N., North Lethbridge, Alta.
VE7 — H. R. Hough, VE7HR, 2316 Trent St., Victoria, B. C.
VE8 — W. L. Geary, VE8AW, Box 534, Whitehorse, Y. T.
VO — Ernest Ash, VO1A, P.O. Box 8, St. John's, Newfoundland.
KP4 — E. W. Mayer, KP4KD, 1061, San Juan, P. R.
KH6 — Andy H. Fuchikami, KH6BA, 2543 Namauu Dr., Honolulu, T. H.
KL7 — Box 73, Douglas, Alaska.
KZ5 — Catherine Howe, KZ5KA, Box 407, Balboa, C. Z.

Strays

A Collins 75A1 receiver, serial No. 32, together with a Simpson model 260 multimeter and a ¼" electric drill, was stolen from W1MX, at the Massachusetts Institute of Technology, on June 20, 1956. Any information concerning this receiver should be addressed to the Dean of Students, MIT, Cambridge, Mass.

HEATHKIT

DX-100

PHONE AND CW

transmitter

KIT

FEATURES

Design proven through actual signal reports.

★

Only top-quality components used throughout.

★

5-point TVI suppression, and pi network output to match 50 to 600 ohms.

★

Detailed construction manual for simplified assembly.

★

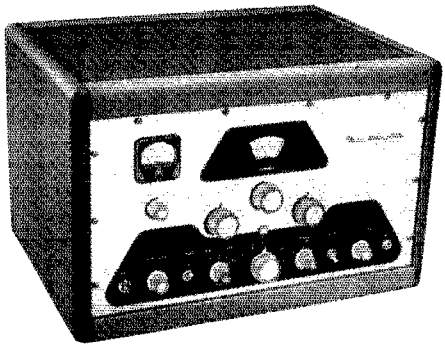
100 watts output on 160, 80, 40, 20, 15, 11, and 10 meters.

★

Attractive and functional physical design.

The Heathkit Model DX-100 Transmitter is rapidly becoming the "standard" ham rig in its power class. The high quality and outstanding performance it offers can be matched only in equipment costing many dollars more. It features a built-in VFO, modulator, and power supplies, and is bandswitching for phone or CW operation on 160, 80, 40, 20, 15, 11, and 10 meters. The kit includes a detailed construction manual, the cabinet, all tubes, prewound coils, and all other parts necessary for construction.

Push-pull 1625 tubes are used to modulate parallel 6164 tubes for RF output in excess of 100 watts on phone, and 120 watts on CW. May be excited from the built-in VFO or from crystals. Features pi network output circuit, illuminated VFO dial and meter face, and 5-point TVI suppression. High grade, well-rated parts supplied. Schematic diagram and technical specifications on request.



MODEL DX-100

$189.50

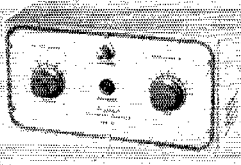
Shpg. Wt. 107 Lbs.

Shipped Motor Freight unless otherwise specified. $50.00 deposit required on all C.O.D. orders.

HEATHKIT

antenna coupler

KIT



MODEL AC-1

$14.50

Shpg. Wt. 4 Lbs.

In addition to matching a low power transmitter to an end-fed long wire antenna, this antenna coupler incorporates a 3-section low-pass filter, to attenuate output above 36 mc and reduce TVI. Handles up to 75 watts, 10 through 80 meters. 52 ohm coaxial input—tapped inductor and variable capacitor—neon RF indicator. Ideal for use with the Heathkit AT-1 Transmitter.

HEATH COMPANY

A Subsidiary of Daystrom, Inc.

BENTON HARBOR 9, MICHIGAN

HEATHKIT

grid dip meter KIT

The Model GD-1B is a time-proven instrument. It will enable you to accomplish literally hundreds of jobs on all types of equipment. Frequency range is from 2 mc to 250 mc. A 500 ua meter is employed for indication, and a sensitivity control and headphone jack are provided. Includes pre-wound coils and rack. Indispensable for the ham, serviceman, and engineer. Extra coils available to extend frequency down to 350 kc.

MODEL GD-1B

$19.50

Shpg. Wt. 4 Lbs.

HEATHKIT

antenna impedance meter KIT

Used with an RF signal source, the AM-1 will enable you to match your antenna-receiver-transmitter system for optimum operation. Will double as a phone monitor or relative field strength meter. Uses 100 ua meter, and covers 0 to 600 ohms. Frequency to 150 mc.

MODEL AM-1

$14.50

Shpg. Wt. 2 Lbs.

HEATHKIT communications-type all band receiver KIT

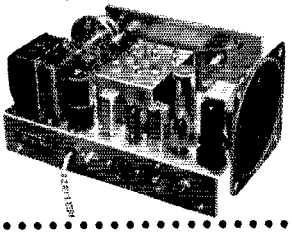
Slide-rule dial —electrical bandspread—ham bands marked.

Slug-tuned coils and efficient IF transformers for good sensitivity and selectivity.

Transformer-operated power supply for safety and high efficiency.

The Model AR-3 receiver features new high-Q slug-tuned coils, new layout, and new-type IF transformers. The result is high sensitivity and selectivity and better image rejection on all bands.

Transformer-type power supply, electrical bandspread, RF and AF gain controls, antenna trimmer, AGC, BFO, headphone jacks, socket for Q multiplier, 5½" PM speaker and illuminated dial.



SPECIFICATIONS:

Frequency Range—550 kc to 30 mc on four bands. **Tube Complement**—1—12BE6 oscillator and mixer • 1—12BA6 IF amplifier • 1—12BA6 second detector, AVC, first audio amplifier and reflex BFO • 1—12A6 beam power output • 1—5Y3 full wave rectifier

$27.95 *(Less Cabinet)* • **MODEL AR-3**
Shpg. Wt. 12 Lbs.

CABINET: Fabric-covered cabinet available. Includes aluminum panel, speaker grille, and protective rubber feet. Measures 12¼" W. x 6¾" H. x 7¼" D. No. 91-15. Shpg. Wt. 5 Lbs. **$4.50.**

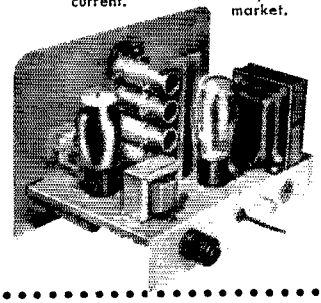
HEATHKIT CW amateur transmitter KIT

Single-knob bandswitching for 80, 40, 20, 15, 11, and 10 meters.

Panel meter monitors final grid or plate current.

Plate power input 25-30 watts.

Best dollar-per-watt buy on the market.



The AT-1 is complete with its own power supply, and covers 80, 40, 20, 15, 11, and 10 meters with single-knob bandswitching. Designed for crystal or external VFO excitation. Incorporates key-click filter, line filter, copper plated chassis, pre-wound coils, 52-ohm coaxial output, panel meter, and high quality components throughout. Easy to build, even for the beginner. Employs 6AG7 oscillator and 6L6 final. Up to 30 watts power input.

$29.50 • **MODEL AT-1**
Shpg. Wt. 15 Lbs.

SPECIFICATIONS:

RF Amplifier Power Input	25-30 watts
Output Connection	52 ohms
Band Coverage	80, 40, 20, 15, 11, 10 Meters
Tube Complement:	
5U4G	Rectifier
6AG7	Oscillator—Multiplier
6L6	Amplifier—Doubler

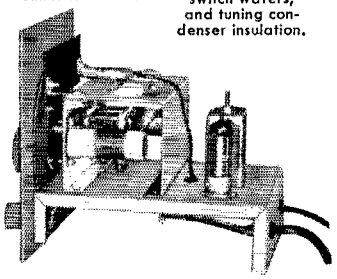
OA2 voltage regulator tube for stability.

Covers 160-80-40-20-15-11-10 meters.

Smooth-acting, illuminated and pre-calibrated dial.

6AU6 electron-coupled Clapp oscillator.

Copper plated chassis—aluminum case—profuse shielding—ceramic coil forms, switch wafers, and tuning condenser insulation.



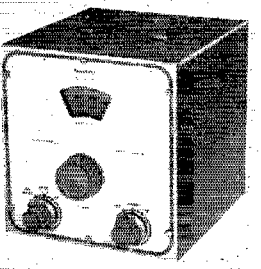
HEATHKIT vfo KIT

The Model VF-1 features illuminated and pre-calibrated dial scale. Cable and plug provided to fit the crystal socket of any modern transmitter. Covers 160-80-40-20-15-11 and 10 meters with 3 basic oscillator frequencies. Better than 10 volt average RF output on fundamentals. Derives operating power from transmitter power supply. Has VR tube for stability. Go VFO for more operating enjoyment.

MODEL VF-1

$19.50

Shpg. Wt. 7 Lbs.



SPECIFICATIONS:

Output Frequencies—1750-2000 kc, 7000-7425 kc, 6740-6808 kc. **Calibrated Bands**—160-80-40-20-15-11-10 meters. **Tube Compliment**—6AU6 Oscillator OA2 Voltage Regulator. **Power Requirements**—250-350 VDC @ 15-20 ma. and 6.3 VAC @ .45A.

ORDER DIRECT FROM THIS AD . . . OR WRITE FOR FREE CATALOG. Describes more than 65 interesting "build-it-yourself" projects. Amateur equipment, hi fi amplifiers, and the complete Heathkit line of test instruments. Get yours today!

HEATH COMPANY
A Subsidiary of Daystrom, Inc.
BENTON HARBOR 9, MICHIGAN

HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others. No Box Reply Service can be maintained in these columns nor may commercial type copy be signed solely with amateur call letters.

(3) The Ham-Ad rate is 30¢ per word, except as noted in paragraph (6) below.

(4) **Remittance in full must accompany copy, since Ham-Ads are not carried on our books. No cash or contract discount or agency commission will be allowed.**

(5) Closing date for Ham-Ads is the 20th of the second month preceding publication date.

(6) **A special rate of 7¢ per word will apply to advertising which, in our judgment, is obviously noncommercial in nature.** Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, takes the 7¢ rate. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising so classified takes the 30¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply.

(7) **Because error is more easily avoided, it is requested signature and address be printed plainly. Typewritten copy preferred but handwritten signature must accompany all authorized insertions.**

(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

Having made no investigation of the advertisers in the classified columns, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

QUARTZ — Direct importers from Brazil of best quality pure quartz suitable for making piezo-electric crystals. Diamond Drill Carbon Co., 248 Madison Ave., New York City 16.

MOTOROLA used FM communication equipment bought and sold. W5BCO, Ralph Hicks, 204 E. Fairview, Tulsa, Okla.

WANTED: Cash or trade, fixed frequency receivers 28/42 Mc. W9YIV, Troy Ill.

MICHIGAN Hams! Amateur supplies, standard brands. Store hours 0800 to 1730 Monday through Saturday. Roy J. Purchase, W8RP, Purchase Radio Supply, 605 Church St., Ann Arbor, Michigan. Tel. NOrmandy 8-8696. NOrmandy 8-8262.

WANTED: Early wireless gear, books, magazines, catalogs before 1922. Send description and prices. W6GH, 1010 Monte Dr., Santa Barbara, Calif.

WANTED: All types aircraft & ground transmitters, receivers, ART-13, RT18/ARC1, R5/ARN7, BC610E, ARN6, BC788C, ARC3, BC342. Highest prices possible paid. Dames, W2KUW, 308 Hickory St., Arlington, N. J.

RECEIVERS repaired and aligned by competent engineers, using factory standard instruments. Hallicrafters, Hammarlund, National. Collins authorized service station. Our twentieth year. Douglas Instrument Laboratory, 176 Norfolk Ave., Boston 19, Mass.

ATTENTION Mobileers! Leece-Neville 6 bolt 100 amp. system alternator, regulator & rectifier, $45.00. Also Leece-Neville 12-volt 100 amp. system, alternator, regulator & rectifier, $85.00. Good condition. H. A. Zimmermann Jr., K2PAT, 570 Jamaica Ave., Brooklyn 8, N. Y. Ulster 2-3473.

CASH for your gear. We buy as well as sell. Write for cash offer or trade. We stock Elmac, Gonset, Hallicrafters, Hammarlund, Johnson, Lysco Master Mobile, Morrow, National and other ham gear. H & H Electronic Supply, Inc., 506 Kishwaukee St., Rockford, Ill.

MIAMI and vicinity: Communications receivers repaired. Bryant Electronics, 13341 N.W. 7th Ave. Phone 84-4001.

URGENTLY need AN/APR-4 items particularly tuning units for important defense contracts. New high prices. Engineering Associates, 434 Patterson Rd., Dayton 9, Ohio.

FLORIDA Bound? Stop at Tamishaw Motel, a Ham's Haven. North Trail, Ft. Myers, Fla. "Eb" Long, K4GEW.

HAM Guest Register Books, $2.00 in U. S. A.; $2.25 in Canada postpaid. Gratton George, W4PJU, Clewiston, Fla.

MEDICAL Hams! Swap Burdick EK-2 for Globe King, 500-A, C. R. Faulkner, M. D., K4AXE, 106 No. Main, Somerset, Ky.

OUTSTANDING ham list revised monthly. Our prices are realistic and attractive. Standout values in used Barker & Williamson, Collins, Central Electronics, Elmac, Gonset, Hallicrafters, Hammarlund, Harvey-Wells, Johnson, Morrow, and National units. We deal easy and offer time payments tailored for you. All leading brands of new equipment always in stock. Write immediately for this month's Bulletin and our new exclusively amateur catalog just out. Stan Burghardt, WØBJV, Burghardt Radio Supply, Inc., Box 746, Watertown, S. Dak.

WANTED: Two-way FM equipment. Ronald Phillips, Communications, 1312 McGee, Kansas City, Mo.

VIKING I, TVI-suppressed transmitter and Viking VFO in excellent condx for sale: $180. John M. Pincomb, W2SIM, 2 Great Oaks Road. Roslyn Heights, N. Y. New York City hams please call RO 3-0574.

PLASTIKASE rubber stamp, your call name and address. Economy with pad $1.00. Top quality with handle, $1.50, pad 35¢. El-Kay Stamps, Box 5-WT, Toledo 12, Ohio.

WANTED: Receiver R5/ARN-7, MN-62A transceivers, RT18/ARC-1, AN/ARC-3, BC-788C, 1-152C, Collins, Bendix equipment test sets, dynamotors, inverters. We pay highest prices. Advise quantity, condition, price in first letter. Aircraft Radio Industries, Inc., 15 East 40th St., New York City. Tel. LExington 2-6254.

QSLS? SWLS? State-maps? Rainbows? Photographic? Cartoons? Samples 25¢ (refunded). Callbooks (Fall), $4.00. "Rus" Sakkers, W8DED, P.O. Box 218, Holland, Mich.

QSLS-SWLS. Meade WØKXL, 1507 Central Avenue, Kansas City, Kans.

QSL-SWLS. 100, $2.85 up. Samples 10¢. Griffeth, W3FSW, 1042 Pine Heights Ave., Baltimore, Md.

QSLS beautiful brand new designs in 3 and 4 colors on glossy stock, special low price $3.00 per 100 or $5.00 for 200. 48 hour service. Satisfaction guaranteed or your money refunded. Constantine Press, Bladensburg, Md.

QSLS. Nice designs. Samples, Besesparis, W3QCC, 207 S. Balliet St., Frackville, Pa.

QSL Samples. Dime, refundable. Roy Gale, W1BD, Box 154, Waterford, Conn.

DELUXE QSLS — Petty, W2HAZ, Box 27, Trenton, N. J. Samples 10¢.

QSLS-SWLS. Samples free Bartinoski, W2CVE Press, Williamstown, N. J.

QSLS "Brownie," W3CJI, 3110 Lehigh, Allentown, Penna. Samples 10¢; with catalogue, 25¢.

QSLS-SWLS. Samples 10¢. Malgo Press, 1937 Glendale Ave., Toledo 14, Ohio.

WOODY's QSLS. Box 164, Asher Sta., Little Rock, Ark.

QSLS, Western states only. Fast delivery. Samples 10¢. Dauphinee, K6JCN, Box 66009, Mar Vista 66, Calif.

QSLS, Taprint, Union, Miss.

QSLS. Postcard brings samples. Fred Leyden W1NZJ, 454 Proctor Ave., Revere 51, Mass.

QSLS, SWLS. High quality. Reasonable prices. Samples. Bob Teachout, W1FSV, 204 Adams St., Rutland, Vt.

QSLS, sharp, 200 one color, three bucks. Multi-color samples dime refunded. Edward Green & Sons, 4422 Marquette Drive, Ft. Wayne, Ind.

QSLS samples 10¢. Bob Morris, W2IHM, 230 Rose St., Metuchen, N. J.

QSLS-SWLS, rubber stamps, letterheads, bargain prices. Craigprint, Newark, Arkansas.

QSLS, SWLS, 2-colors. 100 for $2.00. Bob Garra, W3UQL, Lehighton, Penna.

QSLS — All kinds and prices, samples 10¢ fast service. DX Card Co., Kulik St., Clifton, N. J. GR 3-4779.

C. Fritz for better QSLS-SWLS! Samples 10¢. 1213 Briargate, Joliet, Ill.

QSLS-SWLS two color, $2.00 hundred. Samples. W4DQK Press, Box 67, Pearson, Ga.

QSLS of distinction. Three colors and up. 10¢ brings you samples of distinction. Uncle Fred, Box 86, Lynn, Penna.

QSLS-SWLS. Reasonable. Catalog, 25¢. Speedy delivery. Dick, K6GJM, 10558 E. Olive, Temple City, Calif.

QSLS. Printed book matches and memo pads. Free samples. Freismuth, W2SUN, Bayville, N. J. P. O. Box 169.

QSLS, Lapel pins, samples dime. Kephart, W2SPV, 4309 Willis, Merchantville, N. J.

QSLS-SWLS. Samples dime. Backus, 703 Cumberland St., Richmond, Va.

QSLS. Samples, dime. Printer, Corwith, Iowa.

QSLS. Samples free. W3EHA, Cy Jones, 840 Terrace, North, Hagerstown, Md.

QSLS-SWLS. 1¢ each. Letterheads, envelopes. Samples 10¢. Rusprint, Box 7507, North Kansas City 06, Mo.

QSLS-SWLS, 2 colors, $2.00 per 100. Free samples. Caprintco, Box 4142, Columbia, S. C.

QSLS: Cartoons, colors, others. Reasonable. Samples 15¢. Chris W9PPA, 365 Terra Cotta, Crystal Lake, Ill.

WANT reasonably priced "tacked on wall" type, different, comics, sedate, curious, extraordinary, incomparable, infrequent, odd, peculiar, precious, remarkable, scarce, singular, strange, uncommon, unique, unusual QSLS? Samples 12 cents. Rogers, KØAAB, 737 Lincoln Ave., Saint Paul 5, Minn.

QSLS: Mobiles, Novices, DX, VL, YL-OM, Gil Cartoons, Samples dime. Robinson, W9AYH, 1281 Sacramento, Blue Island, Ill.

QSLS: Glossy. Samples 10¢. W1OLU Press, 30 Magoun, Medford, Mass.

FOR Sale: 500 watt Hallicrafters HT-4, all band xmitter. Professional version of the U.S. Army BC-610. Complete with BC-610-D speech amplifier, tubes, coils, manuals, dolly, interconnecting cables. Cabinet is black wrinkle with chrome strips and power deck is chrome plated. Utilizes six 3-in. meters. In excellent condx and in working order. No reasonable offer refused. W1RMI, John Salsgiver, W1RMI, Box 8, Egypt, Mass. Telephone SCituate 1036-W.

WANTED: ARC-3, ARC-1, BC-610, BC-312, BC-342 and other military or aeronautical surplus. We pay freight and C.o.d. James S. Spivey, Inc. 4908 Hampden Lane, Bethesda, Md.

SALE: HRO-50T, matching speaker, A,B,C,D coil sets, Heathkit "Q" multiplier. $225. Johnson Ranger, crystal mike and stand, change-over relay, Johnson CW modification kit, $200. Complete antenna system; 3-el. beam made to spec's in 1955 ARRL Handbook, using Mosley coils; 70 ft. RG8U feed line, TR-2 rotator, control box and 100 ft. controlcable, 40 ft. Tele-Vue crank-uptower, with eave bracket and 6 guys: $125. W4AVF, 225 Merriman Drive, Savannah, Ga.

WANTED: BC610E transmitters and BC342 or BC312 receiver. Advise price and condx. R. Anderson, 4908 Hampden Lane, Washington 14, D. C.

SELL or Trade: Radio magazines. Bob Farmer, Plainview, Texas.

MULTI-BAND Antenna, 80-40-20-15-10, $19.95. Patented. Send stamp for information. Lattin Radio Laboratories, Owensboro, Ky.

FOR Sale: 32V-2, HQ-129X, R-9er, 10 m 3-ele. w.s. 20-m 3 el. w.s., prop pitch rotator, cable, relays, clipper, mike, key, control box — a complete 150 watt home station: $650 or best offer. Contact Steve Kanne, W9JQJ, 555 Sheridan Rd., Glencoe, Ill.

WANTED: BC-221 frequency meters, ARC-1 and ARC-3 transceivers. Cash or swap against any new National receivers. Lectronic Research, 715 Arch St., Philadelphia 6, Pa.

SELL: Several good clean schematic diagrams of ART-13, BC-610, BC-348, ARC-5, 25¢ each. S. Consalvo, 4905 Roanne Dr., Washington 21, D. C.

COMMUNICATIONS receivers repaired and realigned, using factory methods. *Associated Electronics, 167 So. Livermore Ave.*, Livermore, Calif.

SELL: NC-98 w/spkr. $105; BC454, converted, $6; Eico #1040 eliminator, $15; Heath V6, VTVM, $20. Send stamp for list of parts, xtals, resistors, tools, etc. M. J. Marshall, 455 Washington Ave., Dumont, N. J.

ILLUMINATED "S" Meters for Communicators. No cutting, soldering, or disassembling to attach. Also new and used Gonset Communicators, linear amplifiers, V.F.O.'s, G-60s, mobile converters and transmitters, etc. Graham Company, Bob, W1KTJ, Stoneham, Mass. Tel: ST — 6–1966.

WYOMING DX QSOS: W7HYW, W7PSO, W7UFB monitoring 14050, 21050 daily 1400 and 1915 GMT.

SHORTWAVE converter for car radio. Easily installed on any car radio. Model 500A covers 1600 to 6000 kilocycles, Model 600A covers 16, 19, 25, 31, and 49 meters. Price: $29.95. Write for folder. ABC Radio Laboratories, 3334 N. New Jersey, Indianapolis 5, Ind.

MULTIBAND Antennas. As designed by W3DZZ. See QST March 1955 and Radio & TV News, December 1949. Write for details now! *Frederick Tool & Engineering Corp., 414 Pine Ave., Frederick, Md.*

MARINE Crystals, Transmitting $2.95, Receiving $2.50. Heavy duty units best for marine service. Specify holder pin diameter and spacing. C.A.P. frequencies $1.95. Manufacturers and service agency quantity discounts offered. Crystals since 1933. Airmailed. C-W Crystals Box 2065, El Monte, Calif.

RECEIVERS, 6.0 to 9.1 Mc. 40-meter Command, without tubes, $1.75 plus 8½ lbs. postage. ARC-5 transmitters used, good condx with tubes 4.0 to 5.3 Mc. for VFO, SSB or conversion, $3.75 plus 11 lbs. postage. ARC-5 and Command three recvr racks, $1.95 plus 6 lbs. postage; BC-654-A, 80 meter transmitter receiver with spare final tubes, $23.50. Write for list of other parts and gear. R. E. Woods, W6KEG, 2142 Parkway, El Monte, Calif.

WANTED: 15 meter coil set for HRO Sr. Wm. Jackson, 4719 Telegraph Rd., Los Angeles, Calif.

FOR Sale: 1937 Patterson PR-15 Communications receiver in console, $30. S. R. Sjoberg, 541 Kenilworth Ave., Glen Ellyn, Ill.

FOR Sale: Viking II transmitter, $165; Hallicrafters SX-28A receiver, $45. Priced together, $200. Fred Massena, Crawfordsville, Ind. Tel. K6CVN/9.

TEST Equipment: General Electric CRO-5 Laboratory 'scope, Sprague TO-2 analyzer, Precision E-200 signal generator, Precision 910 tube-tester. All in good appearance and in operation condx. $110 takes the lot. Kilbrith, KN4EKX, Rte. 2, Box 593-H, Cocoa, Fla.

FOR Sale: Heath AT-1 and home-brew modulator. In gud condx: $35. *M. G. Long, Box 543, Winnemucca, Nev.*

SIX Meter: 200 watt c.w. and 150 watt phone transmitter with 120 watt modulator, plus all-band exciter and power supplies, $125. Will deliver in Washington area. W4UCH, Broad Run Dr., Sterling, Va.

MOBILE Complete: Elmac A54, Gonset Super Six, S meter, mike, relays, Palco 6V power, antenna and all. Pick it up: $125. JAN 833A unused, $10; Carter 6v 600V. .3 A dynamotor, used but gud, $10; Heath A7 amplifier, like new condx, $15. WØKHJ, Geo. Wildeboor, Savannah, Mo.

GONSET Communicator I, in exc. condx: $140. Cash and carry deal, W3HRA, M. Treat, M.D. Tel. HO 8–5268. Philly, Pa.

COLLINS 32V3, $475; HRO50 low frequency coils. N. Konos, *WILMP*, 8½ Summit Ave., Salem, Mass.

SELL: Heathkit AT-1 transmitter, modified as per W1ICP in October 1955 QST, $20. Doug MacLaughlin, W1WVV, Box 45, West Dover, Vt.

TREMENDOUS Bargains: New and reconditioned Collins, Hallicrafters, National, Johnson, Elmac, all others. Completely reconditioned with new guarantee. Hallicrafters S38 $29.00; S40A $69.00; S40B $79.00; S85 $89.00; S76 $119.00; SX71 $149.00; SX42 $149.00; SX96; SX100; National SW54 $29.00; NC88 $79.00; NC98 $99.00; NC125 $129.00; NC183 $189.00; Super Pro $99.00; HQ129X; Collins 75A1; 75A2; 75A3; 75A4; 32V3; Viking Ranger; Viking I.I AF-67; mobile receivers, transmitters, converters, many other items. Easy terms. Shipped on approval. Write for list. Henry Radio, Butler, Missouri.

WANTED: 75A4 or better receiver. Cash purchase. W6KG, Lloyd Colvin, 16364½ Berkeley Way, Berkeley, Calif.

COLLINS 75A2 with NBFM adaptor, like new in performance and appearance, $325. Will crate for shipment. First check buys. S. Tucker, W2HLT, 51–10 Little Neck Pkwy, Little Neck 62, N. Y.

SELL: Hallicrafters S-38B, in good condition, $24. University "Diffusiocone 12", Hi-Fi speaker, new condition, $20; bass reflex cabinet extra, K2EXD, 614 Orchard St., Cranford, N. J.

SYRACUSE VHF Round-up. Second annual Syracuse VHF Club round-up being held Saturday, October 6, 1956 at Martin's Restaurant, Liverpool, N. Y. Pre-registration only. $3.75 per person. YL's and XYL's welcome. For tickets write J. V. O'Hern, W2WZR, Nedrow, N. Y.

900 Watt P.P. R.F. final, tuned antenna circuit with 40 meter plug-in coils and c.t. power supply; Millen exciter and power supply; 1195 V.A. c.t. power supply and matching modulator with six tube audio amplifier; needs work. Bias and filament supply. All unused. National HRO7 with complete accessories. Two metal enclosed cabinets 66" and 37" high. Write to H. Okon, 211 E. 9th St., Clifton, N. J.

HAVE numerous parts for Army radio teletype, sale or trade, brush sets, relays, etc. WØSIN, 11075 W. Colfax Ave., Denver 15, Colo.

FOR Sale or trade: Complete surplus 2 meter rig, needs conv. for 110 A.C. Wanted: Receiver or R.F. amplifier that can be driven with AT-1. W. N. Hunt, K8AKE, Lake Odessa, Mich.

TRANSFORMERS, modulation and power, rewound to your specifications. Harry Havill, 9007 Avalon Blvd., Los Angeles 3, Calif.

FOR Sale: DX100 in perfect electrical and mechanical condition, $190; AR-3 Communications type receiver with cabinet, new, $28; one 4D32, new $15; four 813s, $9 each; one 832A, $4. M. B. Chatfield, Col., Ord. Corps, Redstone Arsenal, Huntsville, Ala.

ANNUAL Outing and Dinner, September 23, 1956, Narragansett Inn, Merrick Road, Lindenhurst, Long Island. Adults, $3.25, children under 12, $2. Games, refreshments, parking, baseball, displays, contests. Includes full course "family style" turkey dinner. Held rain or shine. No tickets at door. Tickets available from any of the 11 affiliated clubs of the Federation of Long Island Radio Clubs or from Lou Roth, 148–31 90th Ave., Jamaica, L. I., N. Y.

WANTED: Small prop pitch motor and svlsens in exc. condx. All letters will be answered. Bob Bonham, 1972 AACSRON, APO 131, NYC.

FOR Sale: Wilcox CW3 receiver, $25; Hallicrafters SX-43, $99; QST January 1943 to December 1954, $30. All sent express collect. Wencil Kopecky, 1502 K St., S.W., Cedar Rapids, Iowa.

VIKING Ranger with D-104 mike and stand, perfect condition, $215; Hammarlund HQ-129X, like new, $130. James M. Smith, 1610 Harvard, Midland, Texas.

W9ERU finally moved! Now to move the junk. A new big list for a stamped envelope. Samples: two Radiart TV rotators, meter indicators, one $12.00, one $15; Mosley Tribander 15, 20, 40 meter beam, new coils, $99.50; Johnson low-pass filter, $10; SX-43 with speaker, $99.50. W9ERU, Box 273, R.R. 4, Rockford, Ill.

WANTED: Dynamotors, DM35. Must be new K2AKK, 115 Walnut Lane, Manhasset, L. I., N. Y.

VIKING II, VFO, like new condx: Matchbox, brand new, $275.00. F.o.b. Sidney, N. Y. W2COY, 223 Bird Ave.

DELUXE Mobile rig, Elmac AF-67 trans., Morrow 5BRF and FTR recvr, new condx: $285. 2-meter Communicator, exc. condx, $185; Master 2-meter coax antenna #214, reg. price $15.95, only $8.00. K2BBC, Ray Kreisman, 37 Nagle Ave., N.Y.C. Tel. SW 5–6035.

SALE or Swap: 1st phone communications course, Nilson's, $22; Electronic Monitor key $12; pair 4-65A, $18.00; pair 810s, $10.00; 4–250A with socket, blower, fila. xfrmr, $25.00; KW pwr supp., $50.00; Model "A" slicer with AP1, $40. W9TQL, Box 413, Winfield, Ill.

SELL: Hallicrafters SX-42 and speaker, in excellent condx. Best offer takes it. Kivowitz, 55 Knolls Crescent, Riverdale 63, N. Y.

SELL: Hallicrafters HT-20 transmitter, continuous frequency coverage 1.7 to 31 megacycles, choice of 10 crystals or external VFO, band-switching, TVI suppressed, 180 watts input cw 150 watts fone, matches any antenna 50 to 600 ohms, like new condx, in orginal carton with instruction manual, $350. Robert E. Babb, 1161 Harmar St., Ft. Wayne, Ind.

SELL: HQ-129X with speaker, $115. Also CREI basic and advance Courses, 76 lessons complete, good condition, best offer George Wetmore, W3DPM, 4104 Byrd Court, Kensington, Md.

SALE: QSTS February 1921 through 1951, in binders: $99. Buyer remove. QSTS 1936 through 1944, $30. Excellent copies May and July 1917 QST. Offers wanted. BC-221 Calibration book, power supply, $50. Speech clipper, $8. W2AEB.

SELL Or Trade: Tape Recorder with mike and tape. A. Clarke, Union, Miss.

WANTED: Single Sideband VFO, preferably Central Electronics 458. W2IQS, FR 4-1731W.

WANTED Urgently: Tuner units TN-17 and TN-18 for APR4 receiver. Advise prices to Telecommunications Limited, Finglas, Dublin, Ireland.

SELL: Collins 75A-2A, with xtal cal., $395; Viking II, grid block keying, $219; Viking VFO $25; RME Boomerang, $10; Heath Audio Oscillator, $19.50; Mon-Key $19.95; 10A Exciter $99.50; BC-457, $10; Johnson low-pass filter, $10. W9QCH, Vangsgard, W9QCH, RFD #1, Box 33, Luck, Wis.

JOHNSON Kilowatt Matchbox, brand new, never used: $95. F.o.b. D. Atherton, W6CTP, P.O. Box 85, Fullerton, Calif.

FOR Sale: Viking Adventurer, practically new, 6 xtals covering 80, 40, 15 meters, $50. K2MYW, Dr. Mortimer D. Solomon, 41 Westbrook Lane, Roosevelt, N.Y.

DX'ERS Notice! Save money? Save Time? Free info. DX QSL Coop, Box 5938, Kansas City 11, Mo.

FOR Sale: B & W 51SB, new, with 32V2 with new 4D32 mounted and working perfectly. $595. You pay the shipping charges. R. B. Stewart, Box 266, Yellow Springs, Ohio.

SELL: WRL Globe Scout 40A, $60; Knight VFO, $15; SX42 with spkr, $120. All with manuals. Gotham 4 element 10M beam, standard gamma match, $15. The lot goes for $180. C. H. Stiffler, K6CZK, 1712 Austin Way, Santa Rosa, Calif.

BEAM: 15-meter Gonset, brand new, never assembled: $40. WØDSP, Box 1264, Sioux City, Iowa.

TRIANGULAR steel tower 22 ft. high with rotator mount. 3-el. 10M Hy-Lite jr. beam, less boom, $25.00. Also 9 lengths MS-53-54 ant. sections with MP-22 base, $6.50. Cash and carry. J. Pyryt, 192 Norman Way, Paramus, N. J. Tel. COlfax 1–8655.

SELL: Hallicrafters S-20R, perfect for Novice, $40; Heathkit 09 'scope with probe, excellent, $55; 25-watt modulator with power supply, $25; 6v. vibrator supply with relay and filter, $10; also have tubes and parts. Local deal preferred. R. Mills, W2HDV, 150 Prospect Park West, Brooklyn, N. Y.

VIKING I Mobile, technician-wired, tested; tubes, 12v. Johnson dynamotor brand new, $150; two power transformers, 5200 VCT 550 Mil, 3500 VCT 550 Mil; RCA Kilowatt modulation transformer, 4 each 805's, 813's, condensers, chokes, bleeders. New, $150. Will sell separately. Harold Greene, W1KO, West Hanover, Mass.

SELL: NC-173, National receiver, B.C. band through 6 meters, in perfect condition: $135. *Delivered within 75 miles of Boston.* W1WXC, Teele, 24 Monument St., Concord, Mass. Tel. EM 9–3919 after Sept. 5, 1956.

COLLINS 75A4, $495; 800 cycle filter, $30; TG34 and 12 tapes, $25; electronic bug, $20; Vibroplex deluxe, $18; B&W mod. 52 low pass, $18; 200W all band coupler, $15; four 10 ft. tower sections and base, $30; Select-O-Ject, $10; 0–1 amp. RF ammeter, new, $8; Johnson SWR bridge, $7.00; HRO power supply, $5; Riders Q&Q Manual, $5; Want cheaper receiver, Z match, K4DHG, Young, 1032 Terry Ave., Lakeland, Fla.

SALE! 6 mtr. xmittr, 40 w. 6.3 fil. converted TU-75-B. Can switch 3 xtals. Aluminum case, TVI suppressed. Will pack and ship to 1000 miles for $30, less xtals. Two spare 815's, $3. Walt Clevenstine, W3CUO. 711 Arch St., Spring City, Penna.

WANTED: 2-way radio for Citizen Radio Service band. Bob Hartman, Dakota, Ill.

SELL: Makings of half KW final: sealed 3600 vct/200 Ma, $15; Pr 866A's and fila. xfrmr $6; Pr 813's and UTC S62 fila. xfrmr, $17; Pr. 811, $4; three 837's, $7; 5/300 choke, $4; 8/30 @ 250 swinging choke $4; UTC S-9 univ. driver, $3; or name your own bargain price. Dougherty, W2LHB/1, 35 Hilltop, Newport, R. I.

FL8 audio filters, help eliminate QRM, easily installed on any rcvr, 2 for $2.00 prepaid in USA. Riders manuals, Vol. 9 thru 17, in excellent condx, half price; 40 folders of Sams manuals, write for list, half price. BC794, 1250 Kc to 43 Mc. with heavy-duty power supply and instruction book. Wanted KW modulation transformer, mobile and hi-fi gear. M. D. Haines, W5QCB, 1316 S. W. Military Drive, San Antonio 21, Texas.

SELL: 500 watt AM rig, pp 8005's in final, fully metered, with variac controlled power supply. All enclosed in 6 ft. metal cabinet with dolly. Photo on request. Also Morrow 5BR converter and new BC-459. W4WDI, 1002 Johnson St., High Point, N. C.

PHOTOGRAPHER Hams: Have Nikon S-2 with f/1.4 lens and GE exposure meter, both in excellent condx to trade for gud rcvr or xmittr of recent make. Write, stating full details in your first letter. All inquiries answered. Also need copies of QST and CQ from 1950 on. Write to V. Oehrlein, 153 — 22nd St., Merced, Calif.

CRYSTALS FT-243 for 2, 6, and 40 meters. Guaranteed. 25¢ each, 6 for $1. Send for frequency list. White, 403 Alden Road, Hayward, Calif.

BARGAINS: With New Guarantee: S-38D $35.00; S-77 $69.00; Lysco 600 $69.00; S-27 $79.00; SX 28A $149.00; S-76 $99.00; SX-62 $189.00; HRO-60 $299.00; HQ-129X $139.00; SP400X $169.00; NC-173 $129.00; NC-183 $169.00; NC-183D $269.00; HRO-50T-1 $249.00; SOJ-$9.95; National HRO50 T $199.50; Collins 75A1 $265.00; Sonar VFX 680 $12.50; Eldico TR75TV $35.00; HT-17 $24.50; EX Shifter $29.50; Globe Scout 40A $59.00; Globe Trotter $39.50; HT-18 $39.00; Harvey-Wells SR. $69.00; Elmac PMR6 Recr. $89.00; PSA-500 $19.95; Johnson Matchbox $35.00; Viking VFO $24.95; Viking II $229.00; Globe King 275 $249.00; Globe King 400 $275.00; 32V1 $249.00; Collins 310B $149.00; and many others. Free trial. Terms financed by Leo, WØGFQ. Write for catalog and best deals to World Radio Laboratories, 3415 West Broadway, Council Bluffs, Iowa.

SALE: Collins 32V2, excellent, $400; Johnson Matchbox antenna coupler, excellent, $30; Panadapter PRI, excellent, $135; Navy frequency generator LM, modulation, AC pack, book not calibrated, $30. W4AHG, 203 Valley Brook Drive, Falls Church, Va.

813 Transmitter, exact duplicate by C. V. Chambers, QST, 1954, part for part, complete except for outer shielding, never used. Worth $160. Will sell for $95. F.o.b. Baltimore, Md. Will send snapshots. John Maskol, W3UQR, 6806 Crossway.

WANTED: Sponsor; young unmarried German radio technician, air traffic controller, would like to emigrate to USA. Three languages. Write DL7AH.

SALE: Kilowatt power supply components. Like new condx. $75. Will send details on request. W4SDW, 801 N. Main, Salisbury, N. C.

SELL: Viking Adventurer; Heath VFO, both perfect condx and both $55. W1EBQ, Bill Nordstrom, 23 Mail St., Lynn, Mass.

SELL: 500 watt SSB, AM, CW linear amplifier made by Hallicrafters, Model HT-31, $265. Patterson, K2CIV, 50 Crescent Lane, Roslyn Heights, L. I., N. Y.

SWAP 1 KW xmitter, 3 power supplies, 250TH's with 805's, 7 ft. cabinet; speech amplifier (parts), part of an antenna, and other odds and ends for boating equipment or will sell outright. C. A. Drysdale, Box 1674, Albany, Ga.

FOR Sale or trade: new and used meters, parts, test equipment. Wanted: Used laboratory type parts and equipment. Free list. Clarence Bigelow, 105 North Main, Bluffton, Ohio.

SELL: 150W shielded bandswitching fone/c.w. amplifier, pwr. supply; Meissner EX-signal shifter, TVI suppressed, both $100. Will not ship. W4RWA, 1502 No. 18th Ave., Lake Worth, Fla.

SELL: HT-18 VFO, $40. Wanted: Millen grid dipper, 3" 'scope, VTVM, Antennascope. K6EYB, 760 via Marin, San Lorenzo, Calif.

SWAP: Complete 10 mtr. mobile installation for receiver having RF, Smtr. 550 KCS to 30 Mc with bandspread. W6RET, 862 Elm, Chula Vista, Calif.

GLOBE KING 500A with new WRL Mod. 755 VFO; National NC300 receiver with xtal calibrator; Harvey-Wells Bandmaster Z match, Johnson Signal Sentry; B & W low pass filter, all like new. Also Heath antenna impedance meter, bug, mike, 3-el. Telrex 20-meter full beam, 35 ft. Alprodco tower, prop pitch motor, pair of selsyns, guy wires, coax, etc. Complete station. Come see and you take away the entire rig only for first offer over $1100 cash. Wendell Turner, W3VPU, 742 Hickory Ave., Bel Air, Md.

SELL: Heath AR-2 receiver. In gud operating condx, custom cabinet, $25. Prefer local sale. W9TRI, 2218 Center St., Northbrook, Ill.

COLLINS KWS-1 with 4X250B tubes, $1625; Gonset Triband noise clipper, $22; Mon-Key, $20; Vibroplex Champion, $8; Heathkit signal generator, $10; pair new 35TGs $4; used 4-125A, $10; Workshop 10-meter beam, $15. W8YEL, 829 N. Elizabeth, Dearborn, Mich.

COLLINS 75A3 receiver for sale, including Collins 100 Kc. xtal calibrator, NBFM adaptor and 3 Kc. mechanical filter. Service bulletin improvements have been incorporated. Top condx. $325 cash, no trades. WØVBK, L. M. Divinia, 115 South Battin, Wichita, Kans.

WANTED: TS488 Echo Box. You can ship C.O.D. Write to W1IBY.

MULTIBAND Antennas: Work all bands the quick low-cost way. The "Six Bander", 6 through 80, only $3.25. Open wire folded dipoles, $4.95 up. Many other models. Write for free literature. R. J. Buchan Co., Bricelyn, Minn.

VERTICAL Antenna: 20–40–80 M. $59.50 to $99.50. Information on request. El Cajon Electronic Eng., 720 So. Johnson Ave., El Cajon, Calif.

FOR Sale: Collins 30K-1, 500 watts, 310A exciter, xtal mike, in perf. condx, must be sold: $650, f.o.b. Wheaton, Ill. Harold S. Hart, W9MEL, Rt. 2, Box 45, Weisbrook Rd.

SELL Viking II, $220; Viking VFO, $25; Johnson Matchbox, $35. All in new condition, never used. Also B&W 52 ohm Matchmaster, like new, $35. The whole works for $300 and will deliver within 150 miles. David Harbaugh, W3SNO, 1012 Fairfield St., Scranton, Pa.

FOR Sale or Swap: Complete amateur station: S-72 receiver, 100 watt phone/c.w. xmitter, power supply, antenna tuner, many spare parts. All in like new condx. In cabinets for desk use. Xmitter TVI suppressed. Swap for Hi-Fi components. Send offers to W. C. Blewster, W5NIM, 1013 East Monroe, Eldorado, Ark.

SELL: Viking II, VFO, D-104 mike, Vibroplex bug, $285, complete. HRO-5OR, Selecto-O-Ject, xtal calibrator, NBFM, $275 complete. $500 takes all. W9GJP, Stallman. 633 County Line Rd., Highland Park, Ill.

MOVING South. Must sell! Bendix selsyn motors, $2 ea., two PE73 G-E dynamotors, $4 ea., two G-E 645 transceivers, not used, $7 ea., Mallory 1V. Inductuner, $5; Tabitron 36v. 6a selenium rectifier $8; Webster 78 r.p.m. record-changer $4; Jensen Hi-Fi 12" speaker with tweeter, $4. Local hams please call W2EMV, Ackerman, tel. CALdwell 6-3425 and take them away. R. W. Ackerman, W2EMV, 143 Park, Caldwell, N. J.

BUY Heathkit, Johnson Viking, Tecraft and other equipment wired and tested. Heath DX-35 available for immediate delivery wired and tested, $81.95. New LE-CO 6 meter VFO now available. Free list new and reconditioned equipment. Transmitters, receivers, commercial equipment aligned repaired, etc. Wanted BC-312, 342, 348, 610, 221, etc. Contract work wanted. The J. Lynch Electronic Co., P. O. Box 54, Glen Oaks Branch, Floral Park, N. Y.

SELL: Telrex 2 element 15-meter Super minibeam with 5 ft. mast, $25; Workshop 3-el. 10-meter beam, $12; RME speech clipper, $22; Won't ship beams. K2CJN, Mann, Westbury, Long Island, N. Y. 192 Staab Lane. Tel EDgewood 3-3845.

FOR Sale: Collins 75A3, 32V3, Globe King 500A, Gonset Communicator, also complete mobile and misc. gear from Station WØUFD, J. F. Leeder, 1123 So. 50th St., Omaha, Nebr.

NC183D w/spkr, $259, like new condx; HQ129X w/spkr, $139. Electronic Labs, Station A-21, Lincoln, Nebr.

FOR Sale: Phasing type single sideband exciter, complete $60; linear final, less H.V. supply with 4-250A tube $75. Model B slicer, $70. Send for list of 50 meters and other crystals, and other gear. W3PKI, 625 Pine St., Steelton, Penna.

VIKING Ranger with grid block keying. Used about ten hours. In excellent condx. $200 F.o.b. Sacramento, Calif. A. L. Bachelor, K6GFI, 1815 Venus Dr., Sacramento 21, Calif.

SELL: Navy GO-9 xmitter, 837 VFO, 837 buffer-doubler, 803 PA, 3-18 Mc converted to plate and screen modulation with 1750 V HV and mod. supply 750 V exciter supply. 811's modulators with xtal mike and stand, and one spare 803 but without speech amplifier, $150. One Dodge custom 8 tube auto radio with converter connection, $20. One McMurdo-Silver VTVM model 900, in gud shape, $45. One BC-348R 110VAC, needs new CW switch, $85. All items now in use. All letters answered. Cliff Bailey, W5BSE, Box 152, Carthage, Miss.

SELL: Collins 32V2 in excellent condx; National MB150 tank assembly, parts for 600 watt final and HV power supply. Haynes, 2413 Mallery, Flint 4, Mich.

FOR Sale: DX-35 and WRL factory-wired VFO. Both units are less than six months old. Sell both for $110. Separately for a little more. Ernie Adolph, K2JZT, Box 391, Sherburne, N. Y.

SELL: NC183, 100 watt phone/c.w. rig, ARC-5's, 75-40 meters. Arthur Merdinger W2MEE, 137 Lorraine Ave., Mt. Vernon, N. Y.

FAMOUS 6 meter "Lunenburg" Beams, 5 element, $14.95; 3-element $10.95 postpaid. Arrays for 2 and 1¼ meters. Wholesale Supply Co., Lunenburg, Mass.

TAPE Recorded code courses, same system used by U. S. Navy in WW2. Send for particulars. Tapedcode, Box 31, Langhorne, Pa.

CENTRAL-Electronics "A"-Slicer $49.95, "B"-Slicer $74.95, 10-B $139.95, 20-A $199.95; Collins 32V1 $395.00, 32V2 $450.00, 32V3 $550.00, 75A2 $299.95, 75A3 $395.00; Elenco SS-75 $175.00, PA-400 (new) $199.95; Gonset 10–11 $19.95, Triband $24.95, Super-Six $34.95, Super-Celver $79.95, 2m Communicator-I $149.95, 2m Communicator-II $179.95, 2M Linear-Amp $129.95; Hallicrafters SX-62A $250.00, S-76 $139.95, SX-88 $429.95, SX-96 $199.95, HT-17 $34.95, HT-18 $49.95; Harvey-Wells TBS-50 $49.95, TBS-50Jr. $39.95, TBS-50Sr. $59.95, VFO $29.95; Heath AT-1 $24.95, VFO $19.95, DX-35 $56.95; Johnson Mobile Transmitter $79.95, Viking-II $249.95, Ranger (new model) $219.95, VFO $39.95; many other used items available; write for latest list. Evans Radio, Box 312, Concord, N. H.

FOR Sale: Viking II, Viking VFO, like new; L.P. filter, Advance coax antenna relay, mike and stand, all for $275. NC-183 with matching speaker, $189. Prefer local delivery. Quitting ham radio. John Reves, WØICA, 1411 W. Louise, Grand Island, Nebr.

SALE: HRO-60T receiver w/4 coils, $350 Central Electronics factory-wired SSB 20A exciter, $199; Eldico 300 watt TrITV transmitter, kit complete with modulator and power supplies, $180; all brand new items just purchased. Factory warranty included. Plan change necessitates sale. W9MOT, 4845 N. 64th St., Milwaukee, Wis.

FOR Sale: New Elmac 4-125A $20, 24 Petersen 2-2 7 Mc. xtals, 7004 Kc and every 3 Kcs through 7073 Kc, $30; new Johnson condensers, 100 ED30, $6; 350EZO, $4, used 70ED30, $4; B&W TVL coils 10,20,40 with jack bar and three plug-in links, $10; 2 Weston O-Z RF meters, 2 in., $10. Robert Ehrler, W2CTO, 30 Linden St., Malverne, L. I., N. Y.

QSTS Wanted: February, September 1917; June, August 1919; January, March 1920. Sell: June 1920, $3; November, December 1919, $5 each; July, August 1917 $5 each; July through November 1916, $25 each. Reprints of December 1915; January, February, May, June 1916, $10 each. Pay same prices. Prefer trade for copies needed. W4KS/2, 30 Russel Ave., Ft. Monmouth, N. J.

WANTED: BC-348, BC-342, BC-312, BC-610-E, BC-614-E, BC-939, BC-788C, ARC-1, ARC-3, ARN-7, BC-221, APR-4, APR-9, ART-13, Loran, Aircraft navigation equipment, Teletype, Technical manuals, all types receivers and transmitters. Cash or trade for NEW National, Hammarlund, Hallicrafters, Johnson Viking, Ranger, Pacemaker, Valiant, Five Hundred, Gonset, Elmac, Telrex, Kuehne Towers, Fisher Hi-Fi, Telewriter RTTY Converter, etc. Stores: 44 Canal St., Boston, Mass. 60 Spring St., Newport, R. I. Write or phone: Tom, W1AFN, RIchmond 2-0048. ALLTRONICS, Box 19, Boston 1, Mass.

WANTED: Transmitter, AM or SSB. State condition, power, and price. Limited to 150 watts. B. R. Little, PAØDXE (KØDXE), c/o APO 292, NY, NY.

JOHNSON 3-element 20 meter full size beam. Take it for $50. Used, but in good shape. W2GUR, Wilson, 54 Camden Place, New Hyde Park, N. Y. Tel. PI 2-5297.

FOR Sale: Hallicrafters SX-88, perf. condx, used very little; $475; also RME-45 receiver, $95; RME-HF 10-20 converter, $50; BC-221 freq. meter, a.c. supply, $60; Meissner EX signal shifter including 160 meter coil strip and rack panel; $50. W8SWI, Fred Chevillot, 15105 Tracey Ave., Detroit 27, Mich.

STUDY at home for commercial radio licenses. Free sample lesson, very reasonable fee. Write Radio License Aids, 275 Dayless, Ft. Worth, Texas.

LYSCO 600S transmitter, never used: $75. George Davidson, P. O. Box 247, Waltham 54, Mass.

REAL Bargains in new and used gear. AM, SSB, CW, RTTY. High trades. Bonus for cash. Easy budget terms. Lowest finance rates anywhere. Get the whole story from the Yellow Flyer. Free. Write: Marshall Electronics, 855 Burlington, Frankfort, Ind.

HALLICRAFTERS SX-96 and R-46A speaker, excellent condx: $200. W1PNM, Sherman, 59 Newland Ave., Augusta, Me.

COMPLETE Mobile rig: $75; 420 volt dynamotor, $10; 1000 volt generator, $10; 3000 watt a.c. plant, $175; 2500 watt plant, $150; 10 inch metal lathe. Swap antique cap and ball Colt revolver. Need modern tube tester. E. E. Hampshire, Seymour, Mo.

TRADE! New Polaroid equipment: camera, model 95A, exposure meter, flashgun, carrying case and bulbs. High voltage power supply components, rack cabinet, Meissner shifter, etc. Write needs. W2LPG.

SELL: Link 250 UFS FM xmitter; DX-100, $200; HQ-129X, $140; 3-element 10-meter beam, $15. M. H. Klapp, 17 Kenosha St., Albany 9, N. Y.

IRE Proceedings 1946 to date. Make an offer. W1BGW.

PERFORATED Aluminum Sheet, .051, 5/64" OD holes, 1/8" centers, $1.20 sq. ft., cut to size. Send for listing on Beams, Aluminum Tubing, etc. Radcliff's, 1720 North Countyline, Fostoria, Ohio.

MOBILEERS: Have for sale a complete 12V. rig consisting of Viking Mobile xmitter, Viking VFO, Gonset Super-ceiver and Super Six converter, Electro-Voice 600D dynamic mike, a PE-101C dynamotor, Dow 12V relay and other extras. A $419 value for only $250. All gear in gud condx. W1FGF, c/o ARRL.

FREQUENCY Meter, Navy LM-15 with original calibration book, xtal, and original A.C. power supply. Covers very accurate, 125 to 20,000 Kcs. Condx like new. Sell $150 or trade. New 813's, $7.00; 810's, $7.00; UTC LS/99 choke, $15; new Bogen model 600 intercom one master, five slave stations, ideal for hook-up from shack to house: $65 or will trade for gear. Bill Slep, Box 178, Ellenton, Fla.

SELL: Communicator II, VFO/Audi preamplifier and GP antenna; in perf. condx, two months old and still under guarantee. Mike, K2GMV, 119 E. 38th St., N. Y. C. Tel. LE 2-0085, PL 3-1312. All inquiries answered.

WANTED: Surplus military and commercial aircraft electronics: BC-788, 1-152, ARN-7, ARC-1, ARC-3, transmitters, receivers, test equipment, etc.! Electronic tubes: broadcast, transmitting, receiving, Magnetrons, Klystrons, miniature, sub-miniature, ruggedized, etc. Top prices paid! For fattest checks sell to Rex! Write or phone description for immediate action. Bob E. Sanett, W6REX, 1524 S. Idris Drive, Los Angeles 35, Calif. Phones: REpublic 5-0215, CRestview 1-3856.

FOR Sale: Johnson Viking Ranger in gud condx, used only several weeks. Goes to best offer over $220. W8UBA, Richard Bristol, Almont, Mich.

SELL: New ART-13, power supply, HQ-129X, neat package. Want $450. Offers considered. W2YDO.

WANTED: Xmitter 100 watts or over, with power supply. Contact WN1JGU, J. J. Dugan, jr., 59 Randolph Ave., Milton, Mass.

MODULATOR 120-watt, $40; power supply 800v. @ 500 mil, $50; Master Mobile body mount and whip, $5; bandswitching xtal control mobile converter, $10 (75 & 40). Herman M. Hattaway, W5FJR, 515 West Main, Houma, La.

WANTED: ARC-3, ARC-1, ART-13, BC-312, BC-342, BC-610, BC-788 and other surplus. Advise what you have and price. W4VHG, Box 5878, Bethesda, Md.

BECOME A Radio Amateur! Free information on how to pass Code and Theory FCC examinations. American Electronics, 1203 Bryant Ave., New York 59, N. Y.

CANADIANS: Xmitters for sale: AT1 at $27.50; Eldico TR1-TV, excellent 300 watt AM/CW, $395.00, 50-watt homebuilt bandswitching 6146 final, AM/CW/VFO (beautiful job), $95. Terms arranged. VE5VZ, Box 320, Lloydminster, Sask., Can.

TRADE for light aircraft radio, or will sell the following: BC-221J with AC supply, 7 tuning units, BC-682B FM recvr 27-39 Mc with 6 V supply; BC-603 FM rcvr, 20-28 Mc., 3 ea. BC-1206 rcvrs, 2 each Command rcvrs 200-500 Kc; BC-522 VHF rcvr converted, less power supply, 1000 V, 500 Ma. xfrmr, Garrard RC-80 record-changer, 304TL, 813 and 2 each 803 tubes. Jeff Boyce, Box 331, Bryn Mawr Branch, Seattle 88, Wash.

FOR Sale: Elincor Mod. 200-EA, 5-element 2-meter beam, $5; Hy-Lite 3-element 10-meter beam with Mod. TR-2 rotor and indicator, very gud condx, with all instructions, $30; 75A-2 rcvr, used very little and in a like-nu condx: $325. 16 in. Motorola color TV, very gud condx, $150. Paul R. Schmidt, W9WFH, 9736 Reeves Ct., Franklin Park, Ill.

SELL: Panoramic adaptor, Navy model RDP, 30 Mc. input frequency. Best offer. Joseph Ferreira, 55 Vesta Circle, Melbourne, Fla.

FOR Sale: Premier DR-6119 rack cabinet, gray w/RT-1101 matching rack dolly, $45. Cannot ship. Send for list of used items. Richard Ebeling, 33 Randolph Road, White Plains, N. Y.

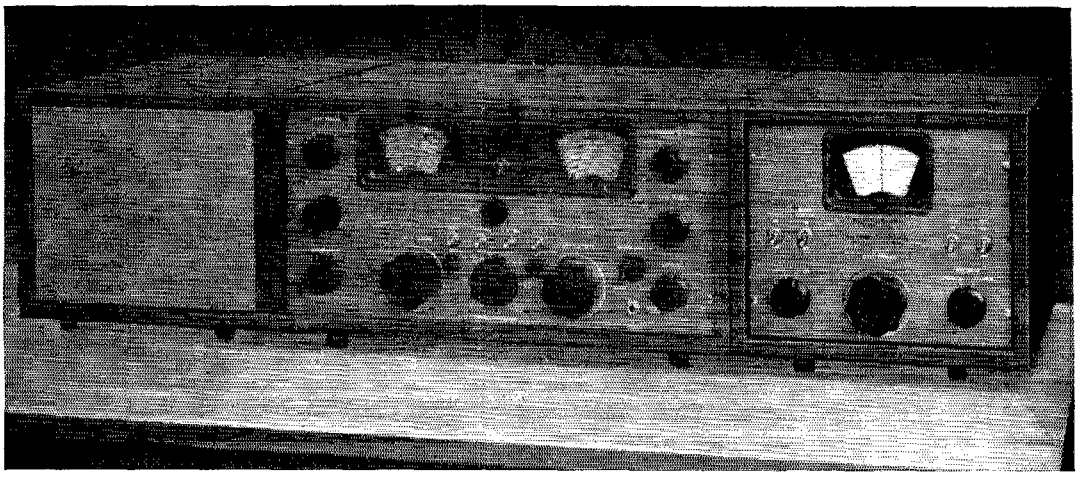
SELL: TBS-50C and APS-50 driving a pair of 813s, separate screen and HV supply (2000, 2500, 3000 v.) in deluxe 5 ft. rack cabinet, complete with meters, etc. TVI suppressed! $350. Glenn, W2IQT, Rte. #4, Bridgeton, N. J.

FOR Sale: Collins 75A1, $250; BC348, $50. Glenn Walters, 7 Rosewood Dr., Atherton, Calif.

WANT: Reasonably priced HQ-129X or equivalent. WØZHJ, 2444 D., Lincoln 2, Nebr.

Index of Advertisers

Single Sideband Adapter- GSB-1



The TMC Model GSB-1, Single Sideband Adapter is a filter type slicer permitting accurate and simple tuning of SSB signals.

The 455 Kc input is converted to a low frequency by means of a mixer and oscillator combination which allows selection of either sideband. The difference frequency is fed to a carefully designed and manufactured bandpass filter, which restricts the band width to 3 Kc at the 6 db points. This filter is so effective that the skirt width 40 db down is only 4.5 Kc. The filter output, in turn, is fed through a second mixer, or product detector, where it is combined with a stable 17 Kc local oscillator. The result is once again passed through a filter having a cutoff at 5 Kc, thus eliminating all unwanted mixer products. The output is a relatively noise and interference free audio signal.

The TMC Model GSB-1 contains a number of features which make it a more useful device. Since single sideband signals require critical frequency adjustment, this unit has been provided with electrical band spread which reduces tuning to the point of greatest simplicity and ease. In addition, AVC is provided within the Model GSB, over and above that which already exists within the receiver, thus serving to further prevent powerful local stations from overloading the slicer. A noise limiter, which reduces impulse peaks, has also been included in this unit.

The Model GSB-1 although originally designed for use with the Model GPR-90 receiver (which already provides the proper terminals) may be used with any receiver which will provide .3 volts (rms) R.F. input at approximately 455 Kc and where access to an audio grid is available.

FRONT PANEL CONTROLS:

- Power ON/OFF Switch
- AVC ON/OFF Switch
- SSB-AM Selector Switch
- Upper or Lower Sideband Selector Switch
- Noise Limiter ON/OFF Switch
- AVC FAST/SLOW Switch
- Main Tuning

SPECIFICATIONS:

FREQUENCY RANGE:
452-458 Kc.

TYPE OF RECEPTION:
AM, SSB (Upper or Lower), CW

IF INPUT VOLTAGE:
0.3 volts rms (normal) for 0.3 volts rms audio output.

IF INPUT VOLTAGE RANGE:
0.1-10 volts rms (with AVC).

AVC CHARACTERISTIC:
With 40 db change in input signal, output remains constant within 9db

INPUT IMPEDANCE:
High-from IF.

OUTPUT IMPEDANCE:
To match audio grid.

INPUT POWER:
115 volts, 50/60 cycles, 46 watts.

CABINET SIZE:
12" wide x 10" high x 15" deep. Matches GPR-90 for height & depth

Illustrated with the GSB-1 (right side) is the TMC Receiver GPR-90 (center) and the companion speaker - Bulletin 179Q.

The TECHNICAL MATERIEL CORPORATION

TMC Canada, LTD.
OTTAWA, ONTARIO

MAMARONECK, NEW YORK

TMC Single Sideband Adapter GSB-1 (Bulletin 194Q) Complete with all instructions
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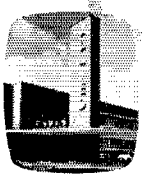
LARGEST STOCKS: Get *everything* from our complete stocks of Ham gear and industrial electronic supplies—*all* the dependable lines.

HAM-TO-HAM HELP: Our staff of 35 Hams goes all-out to give you the straight dope you want—you'll like the personal attention you get at ALLIED.



ALLIED RADIO *Serving the Amateur for 36 Years*

100 N. WESTERN AVE. • CHICAGO 80, ILLINOIS

PRINTED IN U.S.A.
RUMFORD PRESS
CONCORD, N. H.

What makes the NC-300 a "dream receiver"?

First of all, we ran a contest to find out what features hams dream about in receivers. And we got entries from hams all over the world. Then we incorporated a lot of the suggestions in the design of the NC-300. And when we released it to distributors and customers, it was hailed the world over as a true "dream receiver".

There are solid, basic reasons for the NC-300's gaining such an outstanding reputation in so short a time . . . *design plus performance!*

First of all, general coverage has been eliminated. So by concentrating the design on features in the amateur bands, outstanding achievements have been made in sensitivity, selectivity and frequency stability.

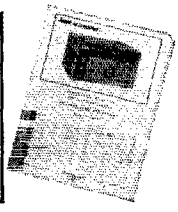
SENSITIVITY is a good example. The sensitivity of the NC-300 exceeds 1.5 microvolts using a 300 ohm dummy antenna for 10 db S/N ratio. And it's as sensitive as most receivers that sell for at least twice the price!

SELECTIVITY is another reason for the NC-300's acceptance as a "dream receiver" In the NC-300's IF system, a pair of switchable double-tuned networks offers a choice of three bandwidths — 500 cycles, 3500 cycles, or 8000 cycles. The second IF at 80 kc permits the use of these three widely different bandwidths, yet maintains a large rejection of the secondary image — a crystal filter is also provided to reject unwanted signals on phone operation . . . so you get the ultimate in selectivity in a receiver at the NC-300's price.

STABILITY is a "dream" feature, too. In the NC-300, an exceptional degree of stability is achieved by a careful design and judicious selection of components. Voltage variation stability is achieved by tapping the tube elements down on the tuned circuit *and* by "swamping" the tuned circuits with a fixed ceramic capacitor of 240 mmf. Temperature coefficients of the capacitors and inductor in the oscillator circuit are carefuly controlled to insure temperature stability of better than .01%. Stability with changes in humidity is a natural result of using a large fixed capacitor across the tuning capacitor. And the NC-300's overall stability eliminates fussy retuning on SSB operation.

PRICE is the most attractive feature of all! You can own an NC-300 for only $399.95 net. (slightly higher West of the Rockies). All these features plus the longest slide rule dial ever (easily readable up to 2 kc without interpolation up to 21.5 mc) . . . coverage of 160 — 1¼ meters with 10 dial scales (including provision for accessory converters for 6, 2 and 1¼ meters) . . . and many other engineering advances incorporated in the NC-300 make it truly a "dream receiver".

SEND TODAY for your copy of the complete NC-300 instruction book! You get a complete schematic, test, procedure, operating instructions and detailed performance specifications . . . and it costs you only 25 cents (for handling and postage). Write to Dept. QST-9 National Co., 61 Sherman St., Malden 48, Mass.



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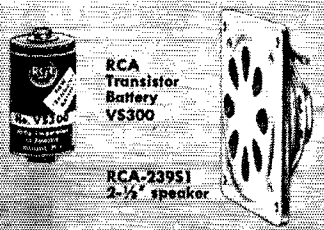
RCA Transistors for Amateurs

RCA-2N77	For low-power af
RCA-2N104	For low-power af
RCA-2N105	Small size for low-power
RCA-2N109	For large-signal af
RCA-2N139	Class A 455-Kc IF Amplifier
RCA-2N140	Converter in 540-1640 Kc Band
RCA-2N175	Class A low-noise AF Amplifier
RCA-2N215	Flexible-Lead Version of 2N104
RCA-2N217	Flexible-Lead Version of 2N109
RCA-2N218	Flexible-Lead Version of 2N139
RCA-2N219	Flexible-Lead Version of 2N140
RCA-2N220	Flexible-Lead Version of 2N175

TRANSISTORS SHOWN ACTUAL SIZE

RCA "Miniaturized" components used in the transistorized microphone



RCA Transistor Battery VS300

RCA-23951 2-½" speaker

Opening new important applications in lightweight, battery-operated equipment, RCA Transistors are the answer for the amateur who is getting into miniaturized equipment.

Take this small "home-built" microphone having extremely low external noise, for example. Designed around a single RCA Transistor, this compact unit can deliver an output of from 0.75 to 1.0 volt with essentially flat response over the normal voice range—*without unwanted electrical pick-up.*

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For full construction details on the transistorized microphone, see Aug. HAM TIPS. Free, from your RCA Tube Distributor.

TRANSISTORS FOR AMATEURS

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