

September 1956

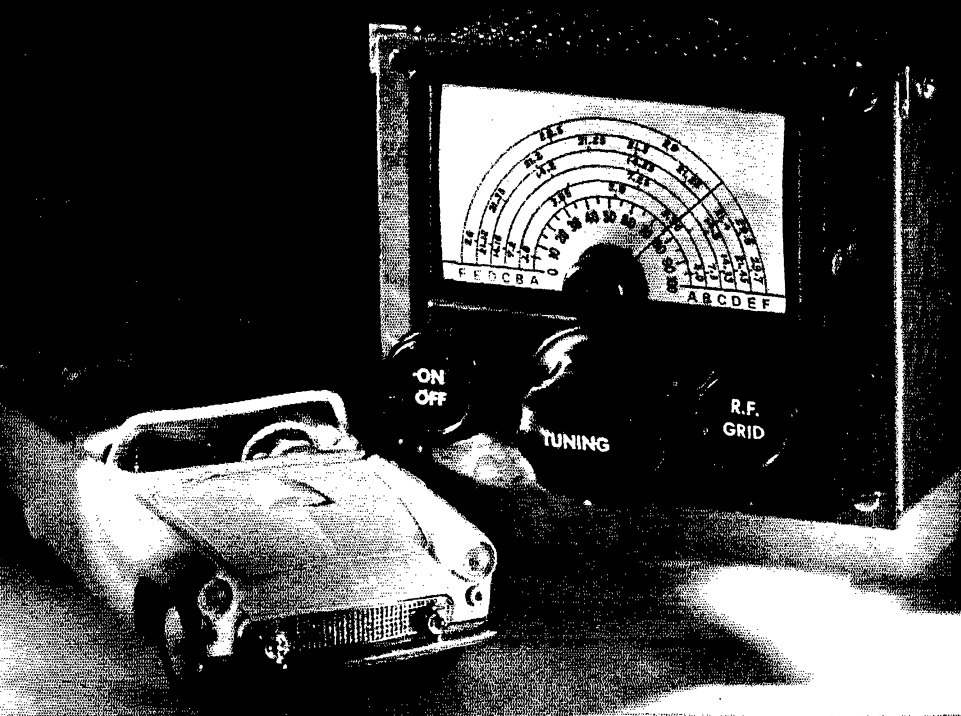
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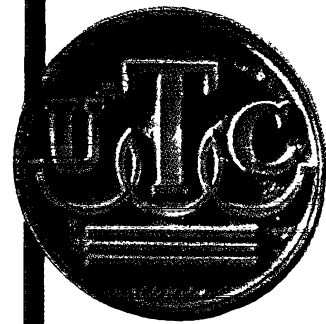
amateur radio



LARGEST PRODUCERS IN THIS FIELD FOR TWO DECADES...

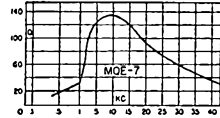
HIGH Q INDUCTORS FOR EVERY APPLICATION

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



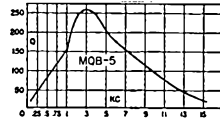
MQ Series Compact Hermetic Toroid Inductors

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.

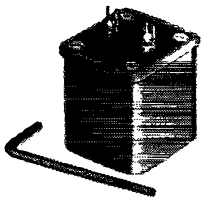
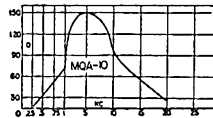


MQE
15 stock values
from 7 Mhy.
to 2.8 Hy.

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



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



VIC case structure
Length 1-1/4 Width 1-11/32 Height 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.

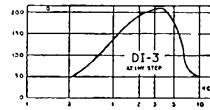
ML Low Frequency High Q Coils

The ML series of high Q coils employ special laminated permalloy cores to provide very high Q at low frequencies with exceptional stability for changes of voltage, frequency, and temperature. Two identical windings permit series, parallel, or transformer type connections.

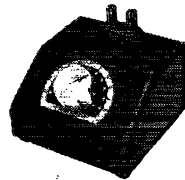


DI Inductance Decades

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.



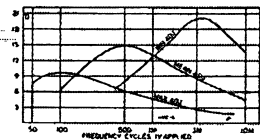
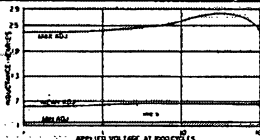
DI-1 Ten 10 Mhy. steps.
DI-2 Ten 100 Mhy. steps.
DI-3 Ten 1 Hy. steps.
DI-4 Ten 10 Hy. steps.



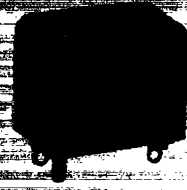
DI DECADE
Length 4 1/2"
Width 4 3/8"
Height 2 3/8"

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	.8	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
Length 1 1/2" Height 1 1/8" Width 1 1/8"

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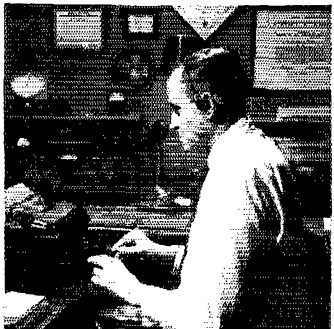
Past Winners



1955: Robert W. Gunderson,
W2JIO



1954: Benjamin S. Hamilton,
W6VFT



1953: J. Stan Surber,
W9NZZ



1952: Don L. Mullican,
W5PHF

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.

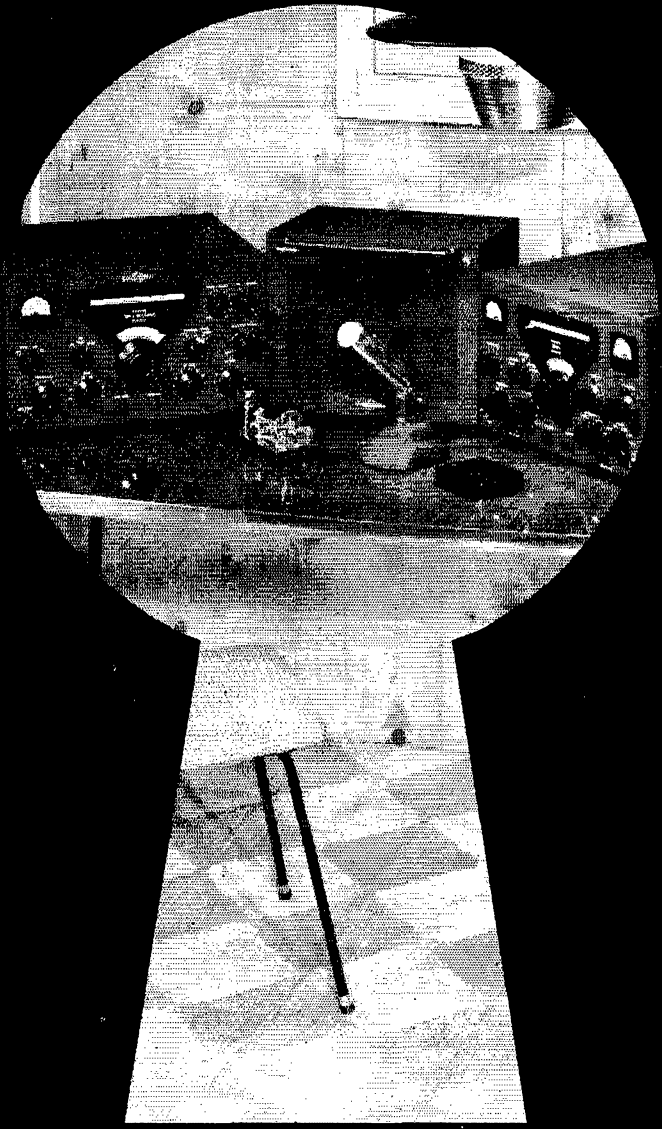
Winner of the Award will be announced on or before Thomas A. Edison's birthday, February 11, 1957.

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

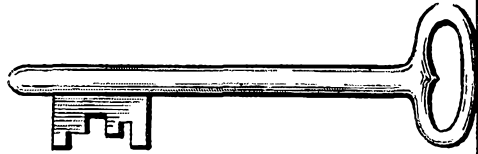
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SEPTEMBER 1956

VOLUME XL • NUMBER 9

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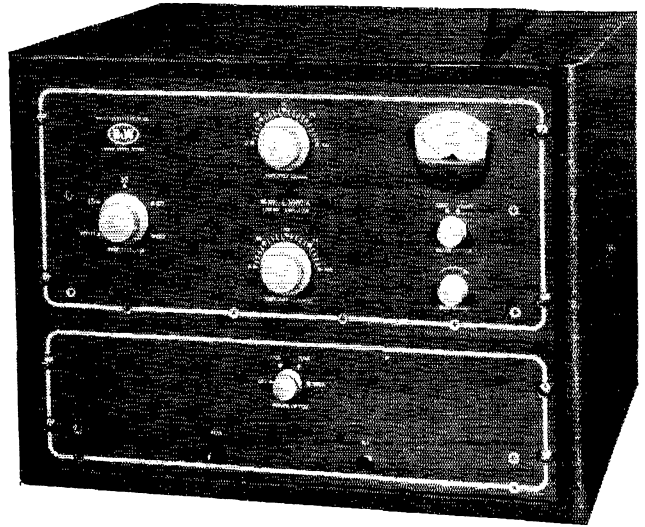
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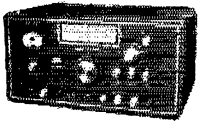
table-top kilowatt amplifier



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.

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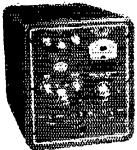
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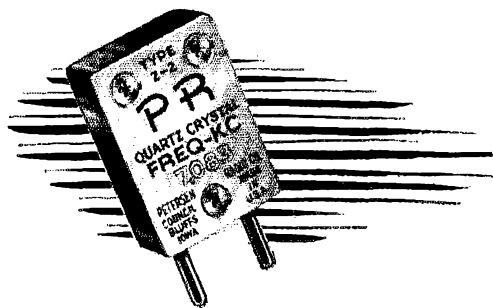
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Section Communications Managers of the ARRL Communications Department

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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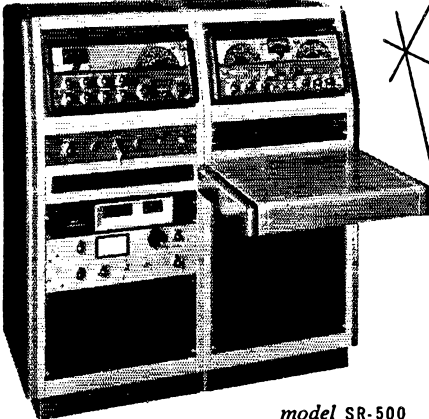
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model SR-500

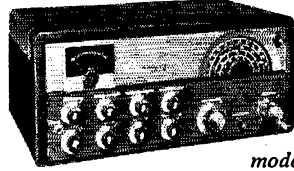


model SR-500

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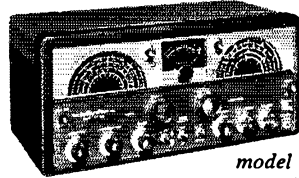
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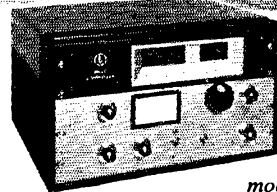
model HT-30
transmitter/exciter

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

"Tee-Notch" Filter provides a stable non-regenerative system for the rejection of unwanted heterodyne in SSB. The "Tee-Notch" also produces an effective steepening of the already excellent 50 mc i-f pass band (made famous in the SX-96). Upper or lower side band selectable by front panel switch. Notch depth control for maximum null adjustment • Antenna trimmer • Plug-in laboratory type evacuated 100 kc quartz crystal calibrator—included in price • Second conversion oscillator crystal controlled—greater stability through crystal control and additional temperature compensation of high frequency oscillator circuits. \$295.00



model HT-31
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is a noncommercial association of radio amateurs, bonded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio art and of the public welfare, for the representation of the radio amateur in legislative matters, and for the maintenance of fraternalism and a high standard of conduct.

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

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

Inquiries regarding membership are solicited. A bona fide interest in amateur radio is the only essential qualification; ownership of a transmitting station and knowledge of the code are not prerequisites, 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.

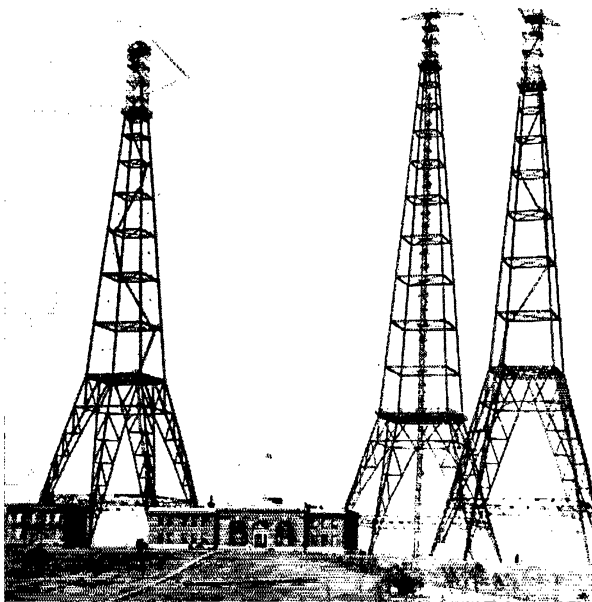
We'd become interested in the ham game a year before NAA came on the scene — and what a year of patient but frustrating and unrewarding listening it was to be. We had the usual slide tuner (tuned where, we weren't quite sure), silicon detector, and a single 75-ohm phone with a headband fashioned of a 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 announce-

ment 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, W0DZG, 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 W9QDF.

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 Fasnigh 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 Kopleng 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 ALVERNANZ,* 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

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

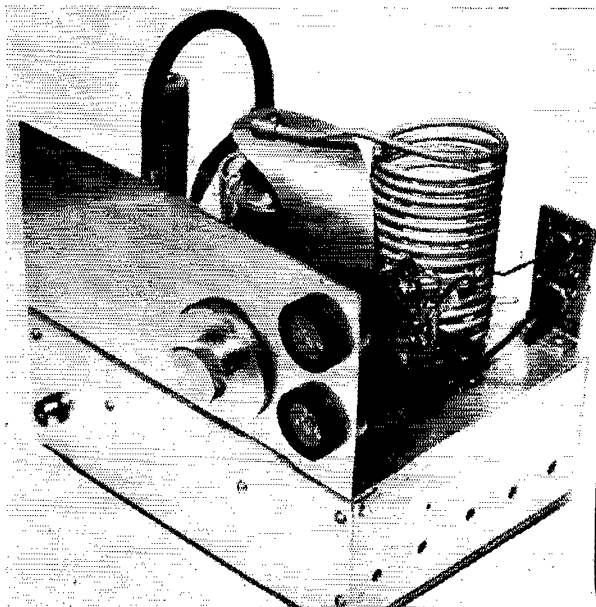
The transistorized exciter is contained in the bottom section of this complete s.s.b. r.f. section. The linear amplifier, using water-cooled tubes (4W300B), uses conventional circuitry and is not described in detail in this article. Miniature meters (shielded behind the panel to protect them from r.f.)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

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, $\frac{1}{4}$ - to $\frac{1}{2}$ -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 S32 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



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 $1\frac{1}{2}$ 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. l.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.

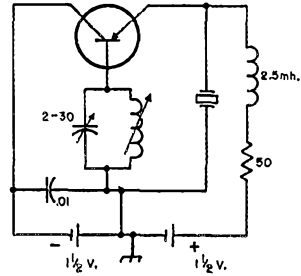
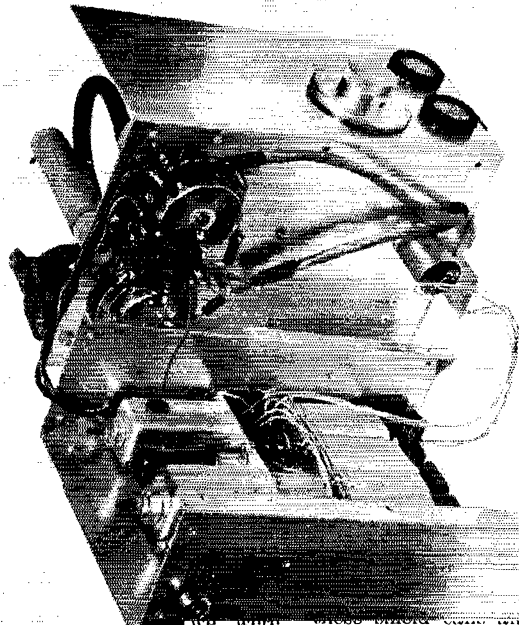


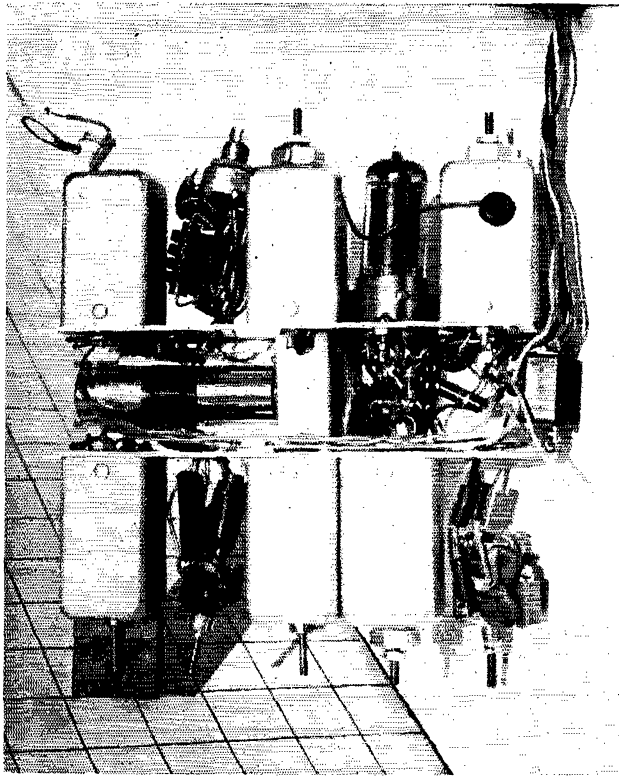
Fig. 2 — Alternative crystal-oscillator circuit.

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

* 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.

fairly common to a good many hams in practical communication, are still incompletely explained theoretically.

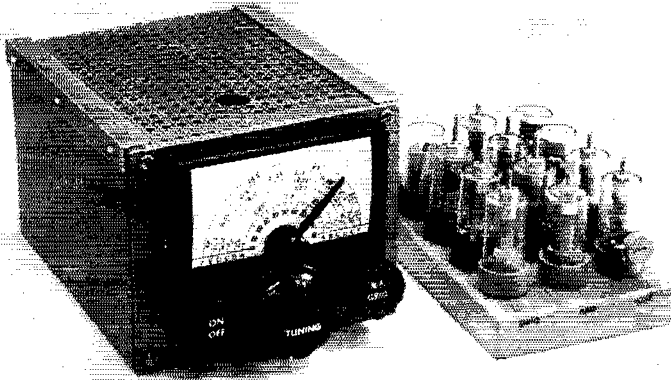
When there is a job to be done, one tries to pick the best means for doing it. Just so in this case. When it comes to gathering data about propagation phenomena, it's hard to beat a large number of reporting stations operating at all hours of the day and night. If a series of observing stations had to 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: trans-equatorial 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)



The mobile converter is 5 inches wide, 4 $\frac{1}{8}$ inches high and 6 inches deep. Strips of $\frac{1}{2}$ -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, WIJEQ

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-hand 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.

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)

• 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.

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 $4\frac{1}{4}$ inches by $5\frac{7}{8}$ inches, has a $\frac{1}{2}$ -inch lip bent at the front edge (for fastening to the panel), and a $1\frac{3}{4}$ -inch skirt at the rear which supports J_1 , J_2 and J_3 . A cutout measuring 1 inch by $1\frac{3}{8}$ 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 $\frac{1}{2}$ -inch hole in the panel (to the upper right I_1 in this view) lines up with another $\frac{1}{2}$ -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.

◆



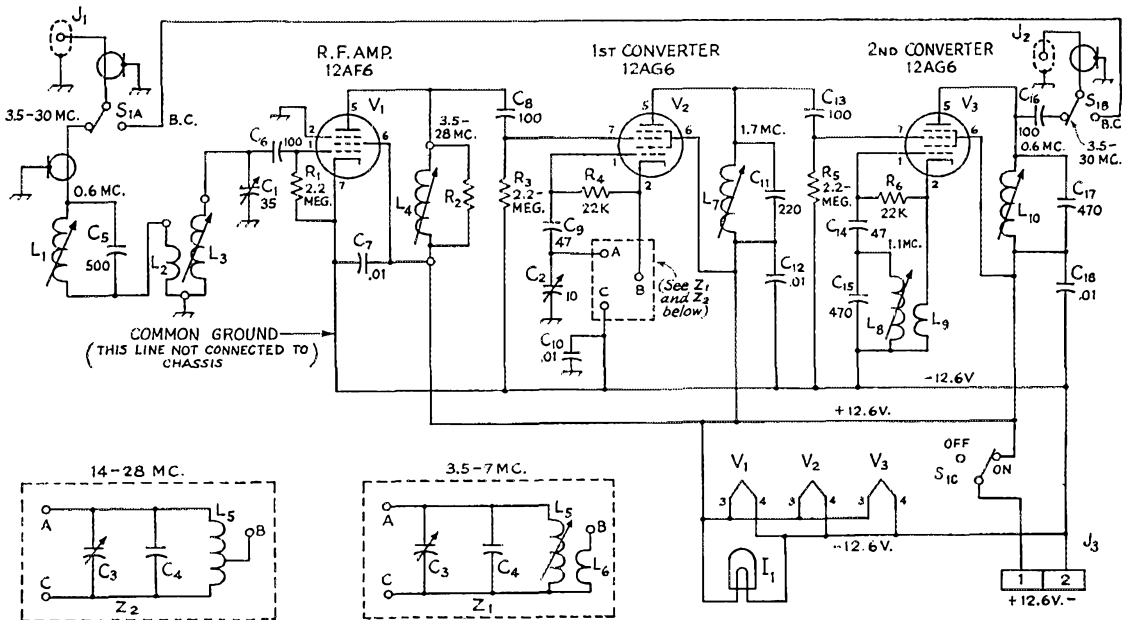


Fig. 1 — Schematic diagram of the mobile converter. Capacitors below 0.01 are in μf . Capacitors not identified below or in Table I may be either mica or disk ceramic. All resistors are $\frac{1}{2}$ watt.

- C_1 — 35- μf . variable (Hammarlund HF-35).
 C_2 — Approx. 3 — 10- μf . (Hammarlund HF-15 with 1 stator and 1 rotor plate removed).
 C_3, C_4 — See Table I.
 $C_9, C_{11}, C_{14}, C_{18}, C_{17}$ — 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 x 5-inch sides. A rectangular opening measuring 3½ by 4½ inches is cut in one of the 4 x 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 4½ 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 1½ 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.

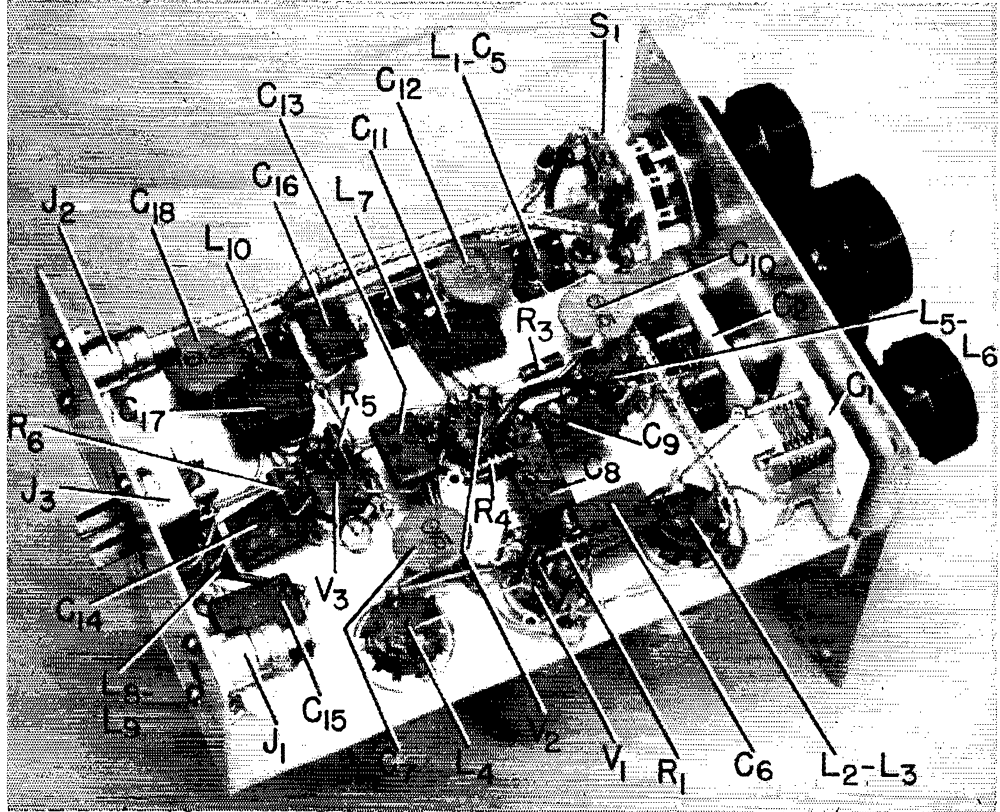
The location of each and every component for the converter is clearly identified in the illustrations. The terminals for the slug-tuned coils (the ones mounted in the shield cans) should be bent out and away from the ends of the forms so that they will project through the square clearance holes with 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 1 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, $\frac{3}{8}$ -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 $\frac{1}{4}$ -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.

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

TABLE I

C, L and R Data for the Mobile Converter

R. F. Stage

Band (Mc.)	L_2 †	L_3 ($\mu\text{h.}$)	L_4 ($\mu\text{h.}$)	R_2
3.5	20	32 — (120-E) ‡	62 — (120-F) ‡	22K †
7	8	9 — (120-C) ‡	23 — (120-E) ‡	33K †
14	4	2.8 — (120-A) ‡	6.4 — (120-C) ‡	47K †
21	3	1.55 — (16 $\frac{1}{4}$ t.) ‡	2.8 — (120-A) ‡	See †
28	3	0.8 — (9 $\frac{1}{4}$ t.) ‡	1.5 — (120-A) ‡, §	See †

Variable Oscillator

Range (Mc.) †	L_8 ($\mu\text{h.}$)	L_6	C_3 ($\mu\text{f.}$)	C_4 ($\mu\text{f.}$)	Osc. (Mc.)
3.5-4 — 7-7.3	10.5 — (120-D) ‡	10 t. †	2.5-7 †	59 †, §	5.2 — 5.7
3.8-4	8.4 — (120-C) ‡	8 t. †	2.5-7 †	75 †	5.5 — 5.7
7.2-7.3	4.15 — (120-B) ‡	8 t. †	See †	220 †	5.5 — 5.6
14-14.35	1.05 — (120-A) ‡, †	6 t. †	See †	150 †	12.3 — 12.65
14.125-14.325	0.58 — (7 $\frac{1}{4}$ t.) ‡	27 $\frac{1}{2}$ t. †	2.5-7 †	295 †, †	12.425 — 12.625
21-21.45	0.36 — (5 $\frac{1}{4}$ t.) ‡	17 $\frac{1}{2}$ t. †	See †	220 †	19.3 — 19.75
21.15-21.45	0.31 — (4 $\frac{1}{4}$ t.) ‡	15 $\frac{1}{2}$ t. †	2.5-7 †	259 †, †	19.45 — 19.75
28-29.7	0.58 — (7 $\frac{1}{4}$ t.) ‡	27 $\frac{1}{2}$ t. †	2.5-7 †	47 †	26.3 — 28.0

† Turns No. 36 d.c.c.

‡ North Hills Electric Co. designation.

§ 16 t.p.i. No. 20. $\frac{1}{2}$ -inch diam. (B&W 3003).

† $\frac{1}{2}$ -watt resistor.

‡ 2 turns removed.

§ Converter tuning range.

† Centralab 827-A.

‡ Silver mica or Centralab type TCZ ceramic.

§ 22, 22 and 15 $\mu\text{f.}$ in parallel.

† 220 and 75 $\mu\text{f.}$ in parallel.

‡ 220 and 39 $\mu\text{f.}$ in parallel.

§ 6 turns removed.

† No L_6 coil used. L_5 tapped (up from ground end) at position listed.

‡ Component not used.

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_3 . 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.

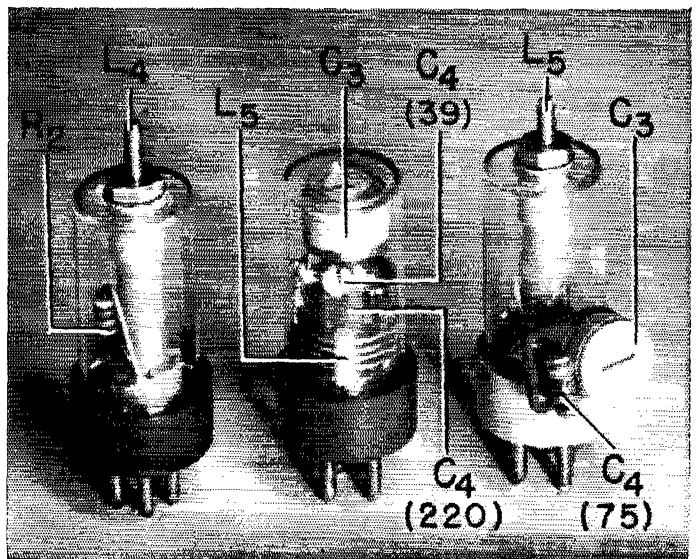
After the oscillator ranges for V_2 have been brought into line for each band, disconnect the signal generator from C_3 and then feed its output to J_1 . Insert V_1 in the socket, allow the tube to warm up, and then adjust the grid and plate circuits of the r.f. amplifier. L_3 for each band should resonate 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.

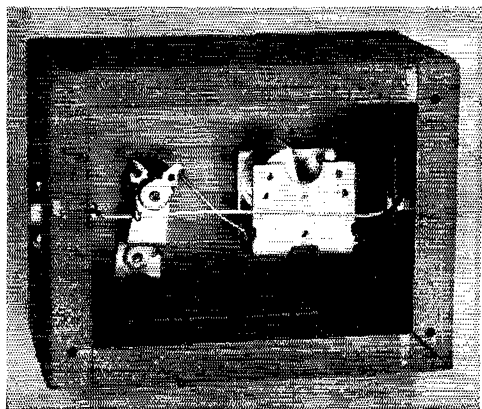


A Very Simple Output Indicator

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



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.

article is an inexpensive and simple device that will permit the user to "see" when he is getting maximum output.

Circuit

Actually, the circuit of the unit is so simple it doesn't need much explanation. The idea is not new¹, 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 indi-

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

• 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.

icator, 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.

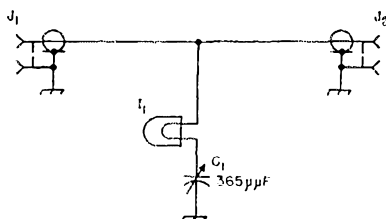


Fig. 1—Circuit diagram of the output indicator. C_1 —365- $\mu\mu\text{f}$. variable capacitor, (broadcast replacement type).

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 $\frac{1}{2}$ -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)

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 $\lambda/2$, $3/4\lambda$, $5/4\lambda$, 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

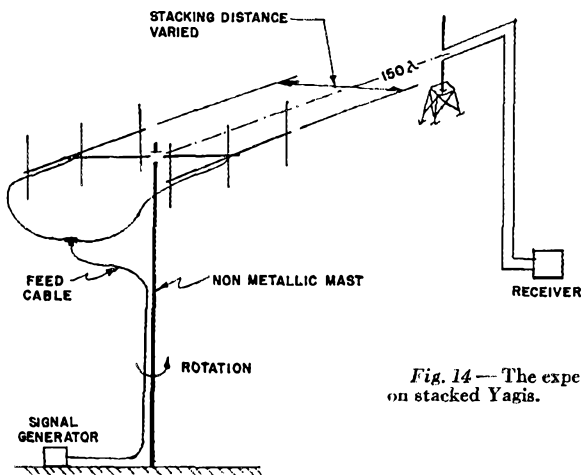


Fig. 14 — The experimental setup for taking the data on stacked Yagis.

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.

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planimeter, and the following interesting results were obtained.

At spacing between $3/4\lambda$ 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 $3/4\lambda$ 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-

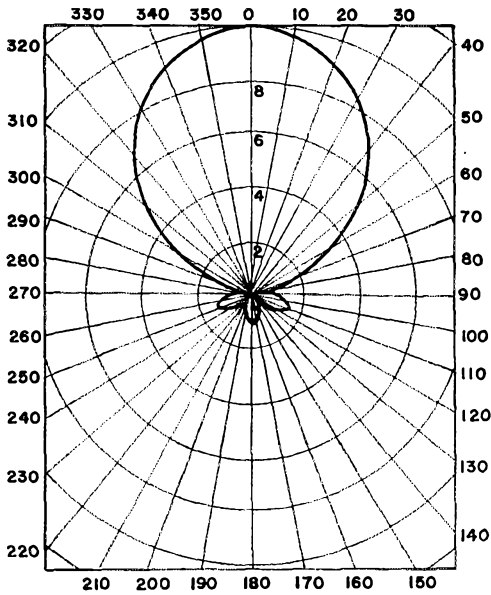


Fig. 15—“H”-plane polar pattern of single 3-element Yagi.

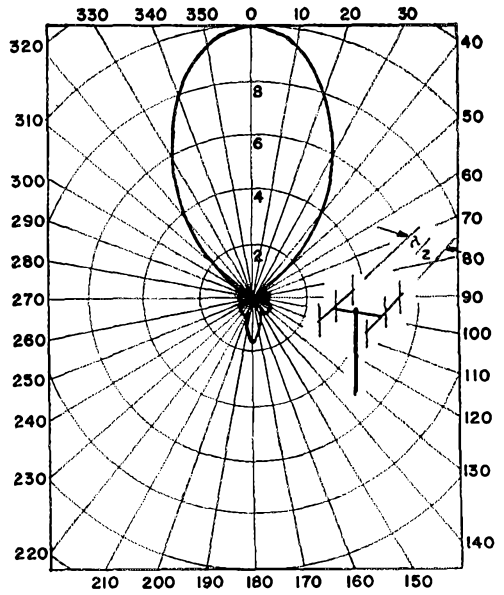


Fig. 16—“H”-plane polar pattern of two 3-element Yagis stacked $\frac{1}{2}$ wavelength apart.

increases 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 $\lambda/2$ 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

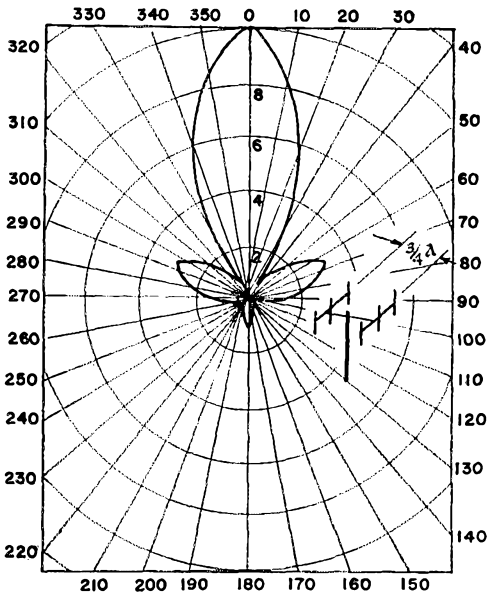


Fig. 17—“H”-plane polar pattern of two 3-element Yagis stacked $\frac{3}{4}$ wavelength apart.

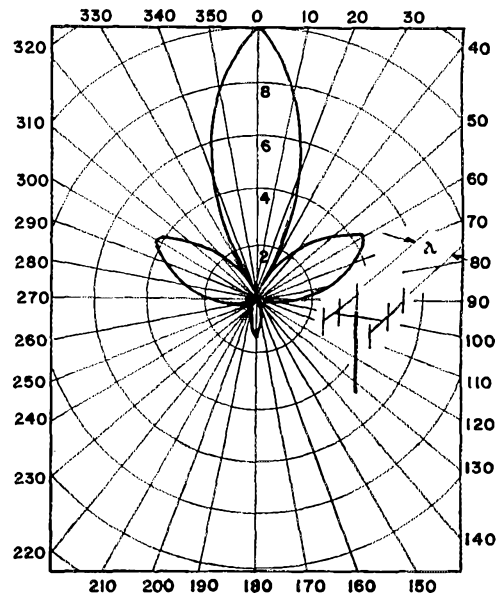


Fig. 18—“H”-plane polar pattern of two 3-element Yagis stacked one wavelength apart.

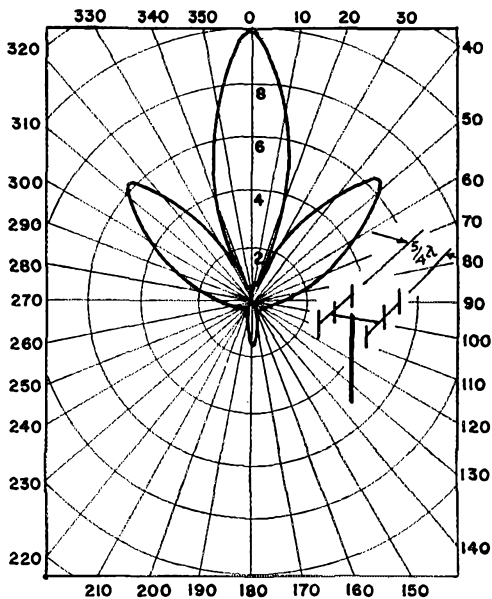


Fig. 19 — "H"-plane polar pattern of two 3-element Yagis stacked $\frac{3}{4}$ wavelength apart.

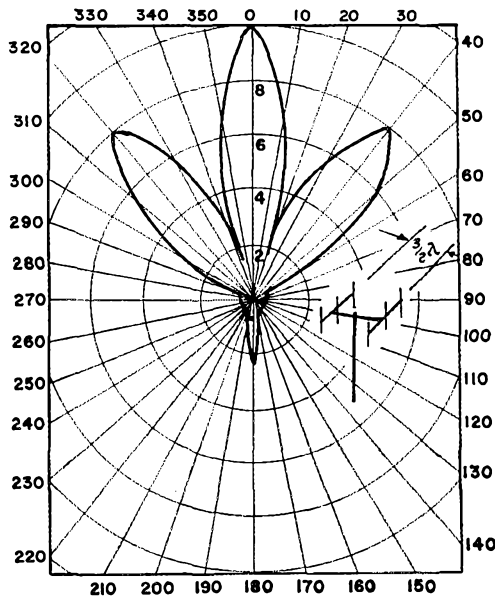


Fig. 20 — "H"-plane polar pattern of two 3-element Yagis stacked $\frac{3}{2}$ wavelengths apart.

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*.

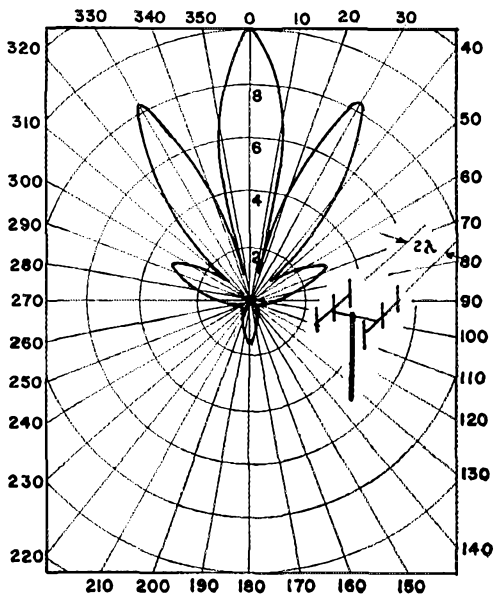


Fig. 21 — "H"-plane polar pattern of two 3-element Yagis stacked 2 wavelengths apart.

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

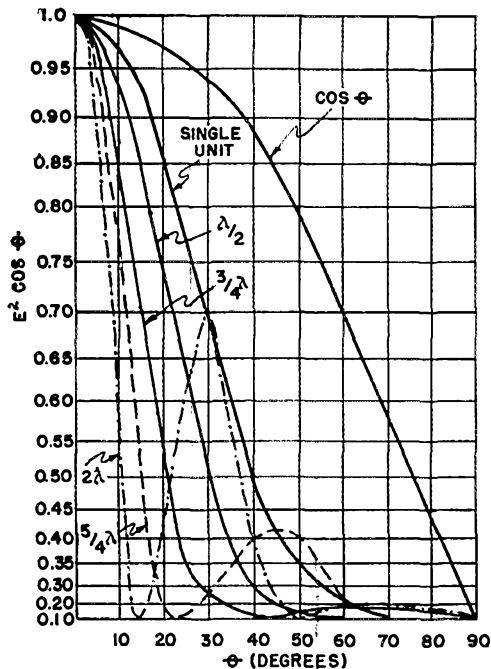


Fig. 22 — Plot of $E^2 \cos \theta$ vs. θ for Figs. 15, 16, 17, 19 and 21.

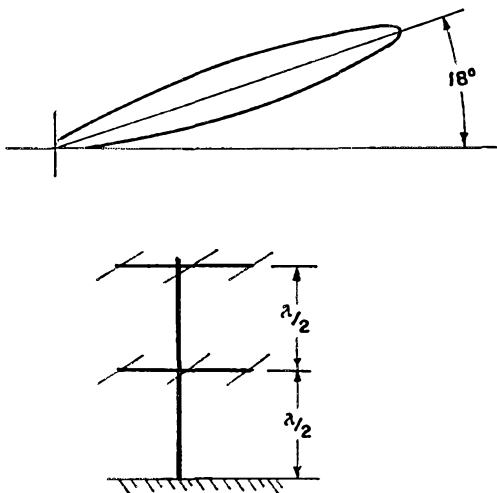


Fig. 23—Vertical-plane polar pattern of two 3-element Yagis arranged as shown.

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 $\lambda/2$ above the ground plane and the spacing between the two arrays is $\lambda/2$ 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 verti-

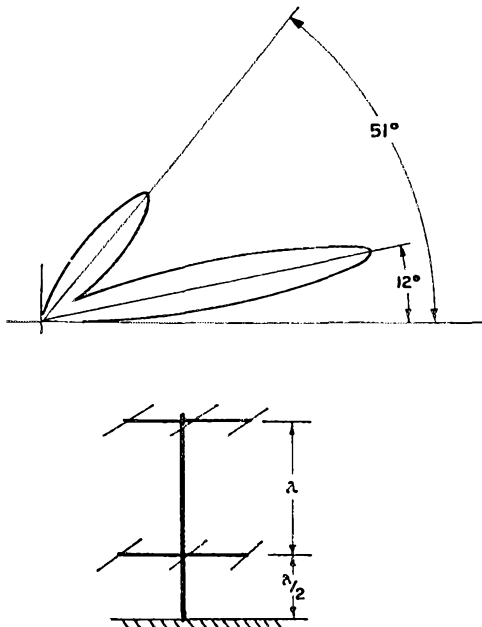


Fig. 24—Vertical-plane polar pattern of two 3-element Yagis stacked as shown.

cal 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

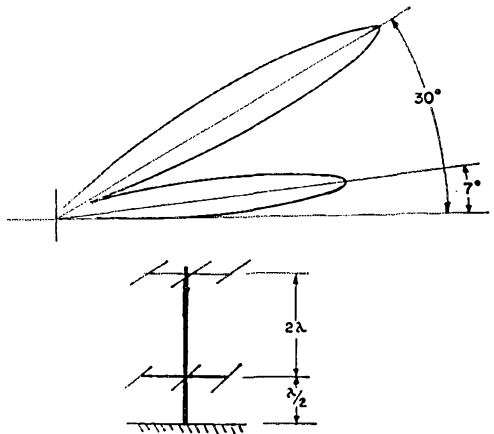


Fig. 25—Vertical-plane polar pattern of two 3-element Yagis stacked as shown.

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

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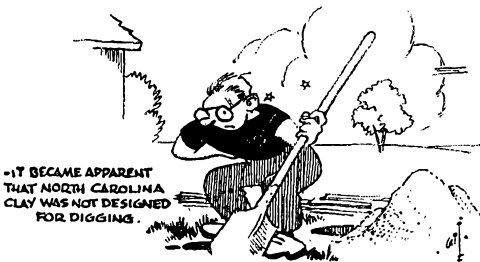
On Erecting Towers

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,



-IT BECAME APPARENT THAT NORTH CAROLINA CLAY WAS NOT DESIGNED FOR DIGGING.

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 south-east 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.

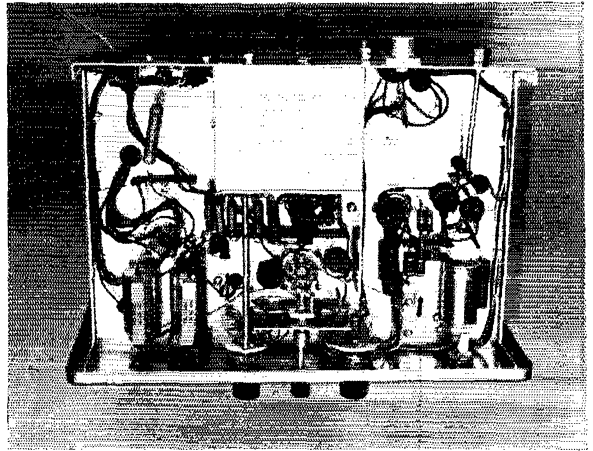


He looked me over carefully. "Hm m m m m" he Hm m m m d. "Don't normally repair these beer bottle cuts this early in the day. That'll be three

(Continued on page 122)

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

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- μf . tank capacitor is shunted by a 68- μf . 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

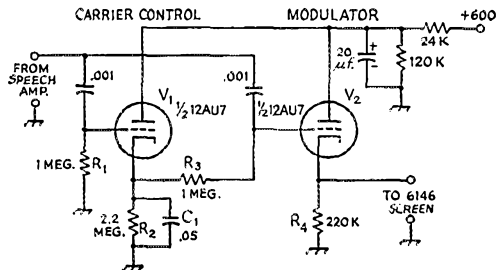


Fig. 2 — The controlled-carrier and modulator circuit.

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 completely.

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.

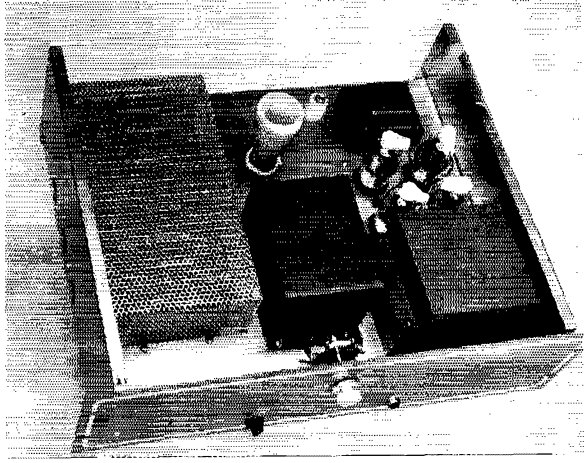
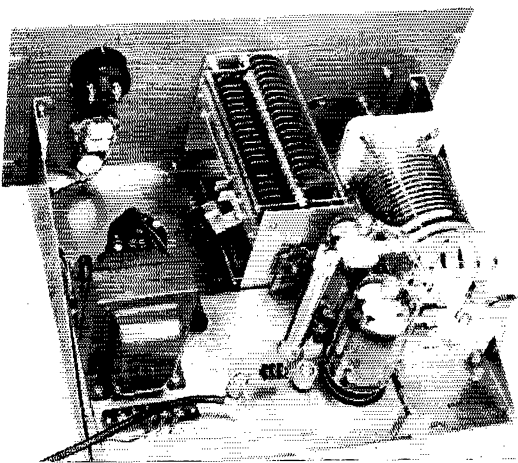
The 813's are operated in parallel, and work into a pi-network tank circuit using the B & W 850 tapped tank inductor. This is tuned by a special tank capacitor having two stator sections: one of relatively low capacitance for ease of tuning on 14, 21 and 28 Mc., and a higher- C section that is switched 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- $\mu\mu\text{f}$. 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 broadband 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.



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.

* c/o WILS, 407-11 N. Washington Ave., Lansing, Mich.

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

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.

Construction

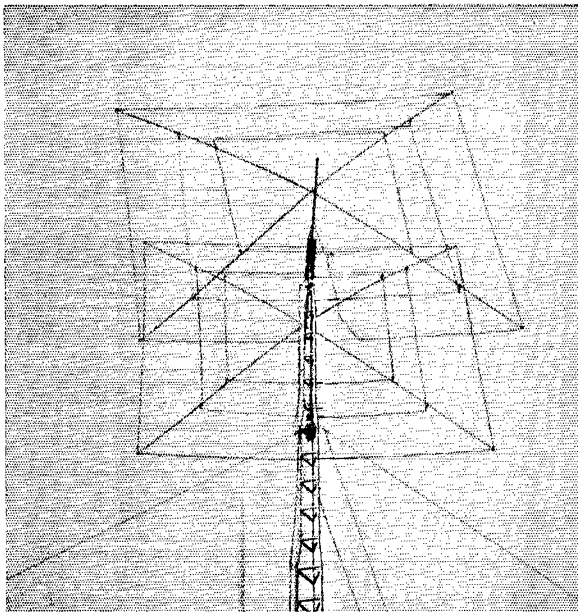
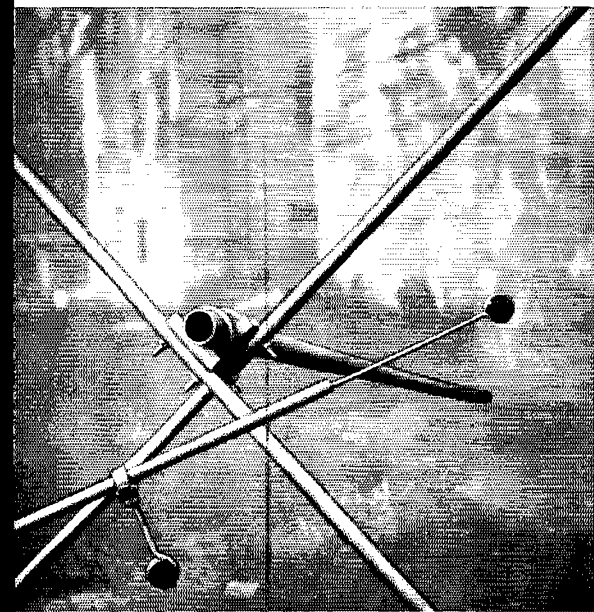
This quad is simple to construct. The frame is made entirely of aluminum tubing in the thought that the appearance would be better than with the bamboo fish poles used in quads described in *QST* recently.¹ The spacing between the elements is 8 feet, corresponding to 0.115 wavelength on 14 Mc., 0.173 wavelength on 21 Mc. and 0.23 wavelength on 28 Mc. The boom is 1 1/4-inch tempered aluminum tubing.

The struts are made of a 12-foot section of 5/8-inch tempered aluminum tubing with two 6-foot sections of 1/2-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-

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 broadband 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

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 = $238 \div \text{frequency in megacycles}$.
— Editor

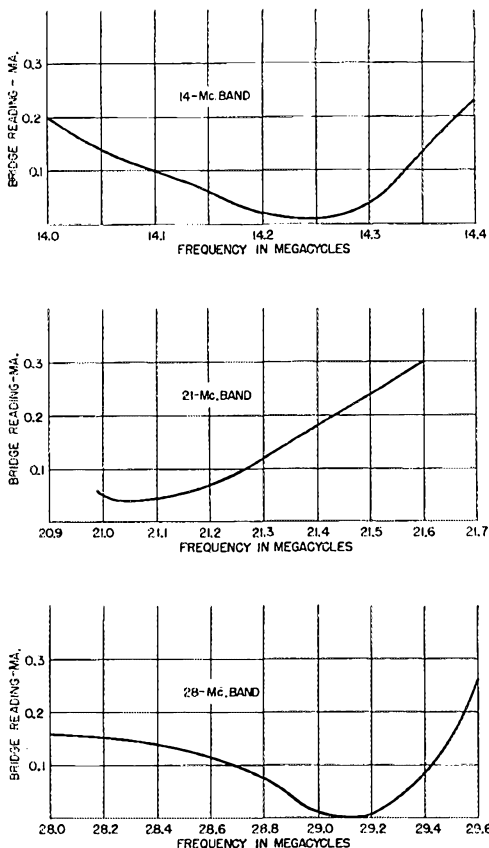


Fig. 1 — Bridge measurements on the three bands. These are in terms of current in a 0-1 ma. meter used in connection with a resistance-type s.w.r. bridge.

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.

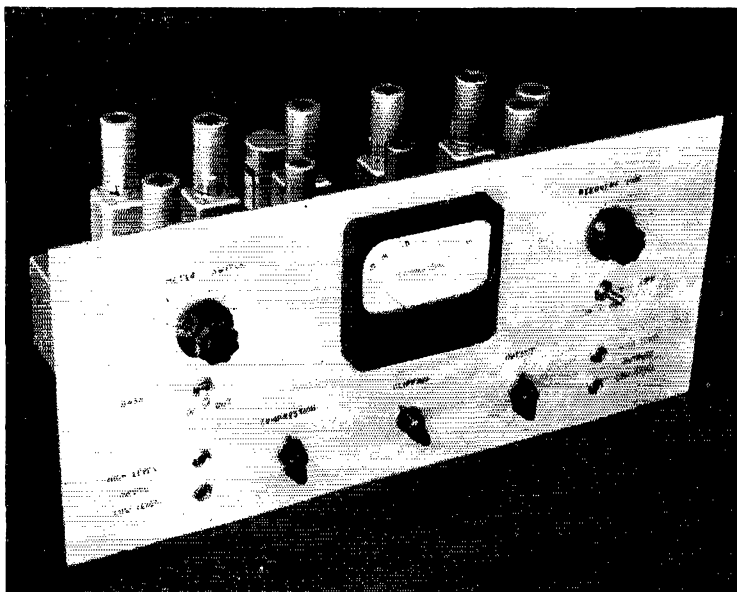
Conclusion

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.

**SWITCH
TO SAFETY!**





The compressor-clipper speech amplifier is built on a 10 × 14 × 3-inch aluminum chassis and has an 8½ 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-

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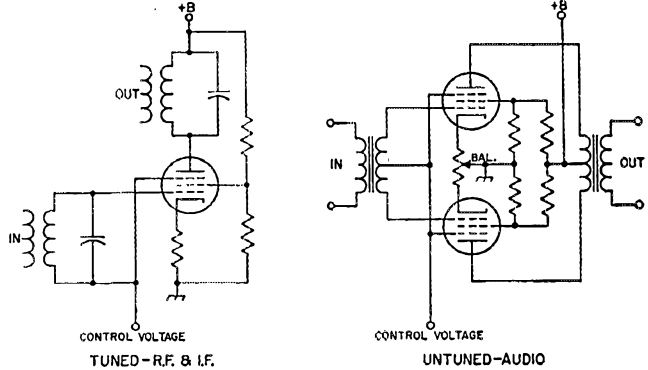
pression) is used, the signal will sound even louder. Unfortunately, this procedure can be carried only so far. The background noise will rise, hum may become a problem, and r.f. feedback may occur. It has been found in practice that compression of the order of 20 db. on peaks is about all that can be 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

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.
 ◆

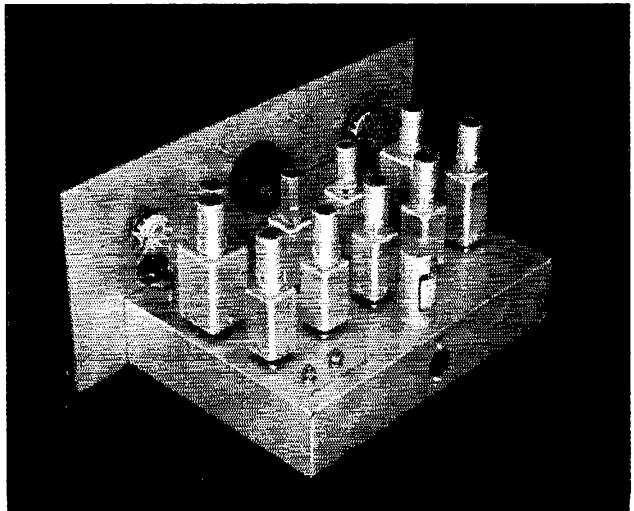


will be noted that the circuit for the audio version is in push-pull. All amplifiers whose gain is controlled by shifting the grid bias will introduce distortion, most of which is second harmonic. This distortion can be eliminated, for practical purposes, by the use of tuned circuits or by using a push-pull 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

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 $2\frac{1}{4} \times 1\frac{3}{4}$ -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.
 ◆



J₁, J₂, J₄ — Open-circuit phone jack.
 J₃ — Closed-circuit phone jack.
 L₁ — 10 h. or more, center-tapped; d.c. ma. approx. 5
 (secondary of UTC 0-2 p.p. microphone trans-
 former used in unit shown in photographs).
 MA — 0-1 d.c. milliammeter.
 S₁ — S.p.s.t. toggle.
 S₂ — Rotary wafer, 1 pole, 4 positions used.
 S₃ — D.p.s.t. toggle.
 S₄ — Rotary wafer, 2 pole, 2 positions used.

T₁ — 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).
 V₁ — 12AX7 or 5751.
 V₂, V₃ — 6BA6.
 V₄ — 12AX7 or 12AT7.
 V₅, V₇, V₈ — 12AU7.
 V₆, V₉ — 6AL5.
 V₁₀ — 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.

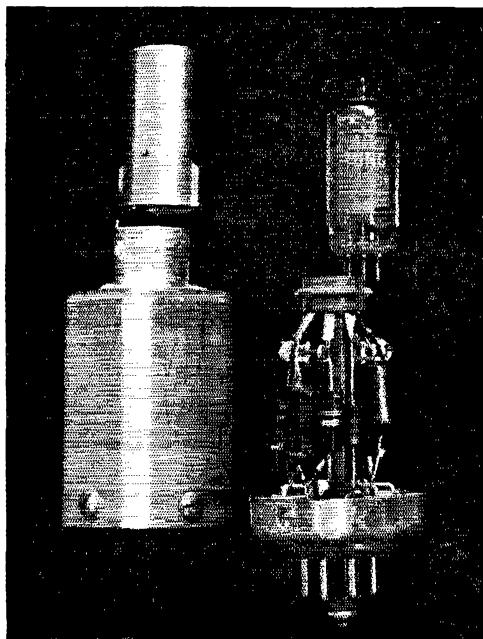
An automatic-gain-control system normally will cause very little distortion of the signal that it controls, but a clipper will cause a considerable amount of distortion. If the audio signal has 10 db. of clipping applied to it, it will contain harmonics of appreciable amplitude to at least the twentieth. 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

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.

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.

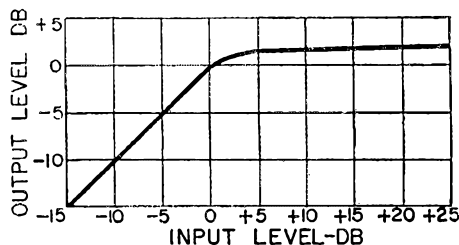
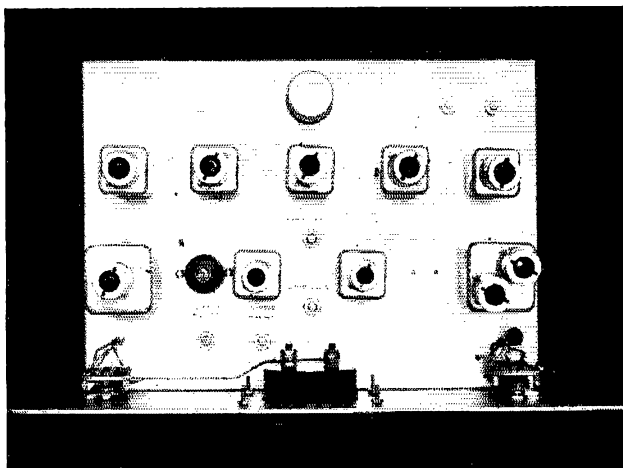


Fig. 3 — Operating characteristic of the compressor. This curve is for steady-state conditions. Transients exceeding the steady-state level are suppressed in the following clipper stage.

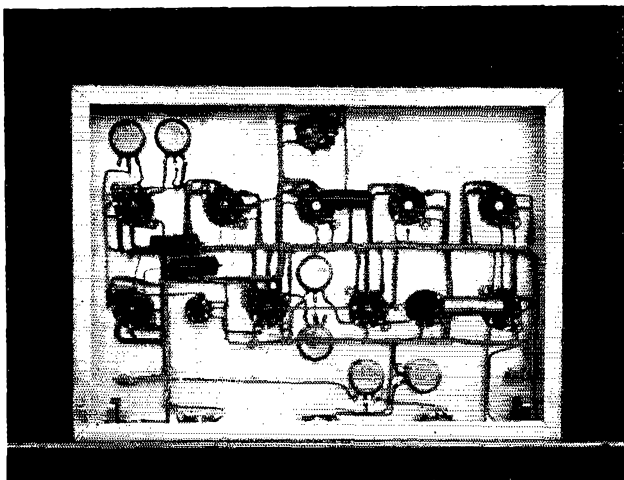
The driver stage, V_5 , also feeds a vacuum-tube voltmeter to indicate the compressor output. This is probably more of a nicety than a necessity.

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-



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

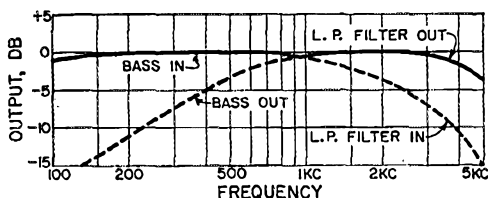


Fig. 4—Over-all frequency response at maximum and minimum settings of the bass control and with the low-pass filter in and out.

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- μ f. 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

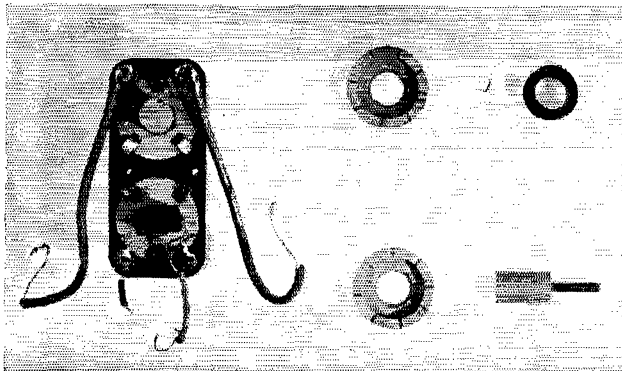
BY L. M. TEMPLE,* WIDI

• Some people have the urge to try things, and WIDI 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 gripping in the world.

EVER SINCE McLaughlin published his article on selectable side band reception¹ 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

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



«
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.
«

crystal filters described by Morrison,⁴ Good⁵, Titt⁶ 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

150-kc. coils to 100 μ 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

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 original 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 ($2\frac{1}{8} \times 10$ inches) $\frac{1}{16}$ -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 Selectoject⁸ 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.

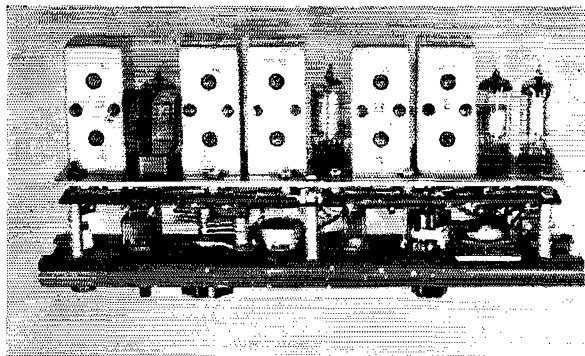
It seemed that I had hardly become accustomed to enjoying the performance of this unit

⁸ Villard, "The Selectoject," *QST*, November, 1949.

⁹ Harris, "Simplified Q Multiplier," *Electronics*, May, 1951.

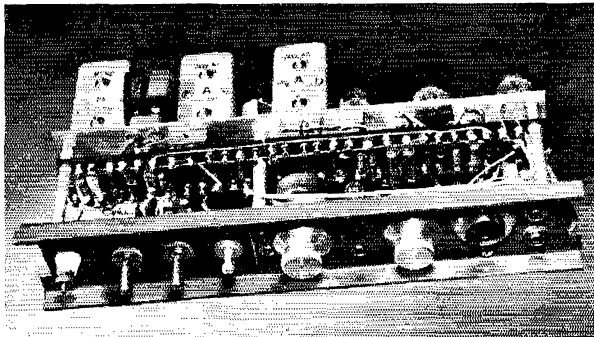
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Fig. 4 — The Q-multiplier tube and circuit are mounted on a miniature subchassis at the left end of the rear panel. The circuit of this unit is given in Fig. 5. The assembly between the second and third tubes counting from the right is a 50-kc. i.f.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

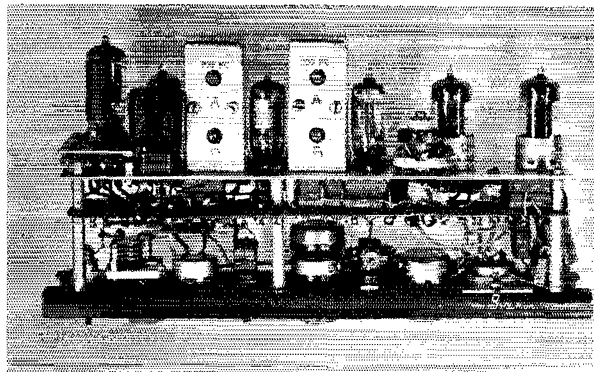


when the Q multiplier came along, with particular emphasis on Harris's circuit.⁹ The deep null and high Q values obtainable from our old friend regeneration constituted a "must" to be incorporated in the McLaughlin unit — but how to do it without rebuilding the whole thing?

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



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. Hallicrafters¹⁰ 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. Collins¹¹ 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.

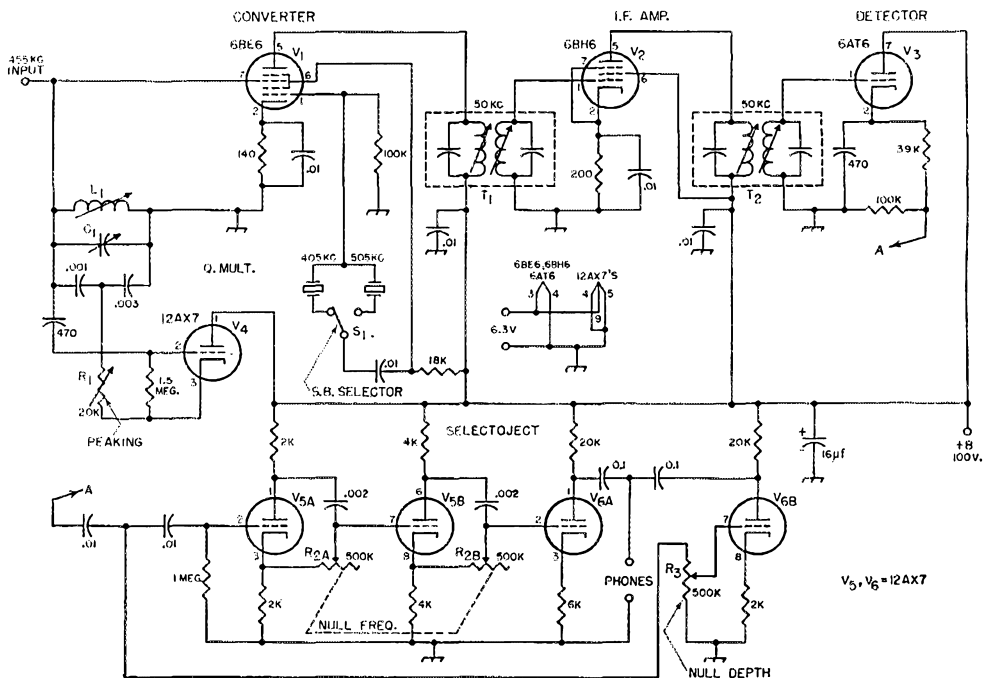


Fig. 5 — Circuit of the a.c.-tube unit, including Q multiplier, 50-kc. i.f., and Selectoject. Capacitances below 0.001 μ f. are in μ f. Fixed resistors are $\frac{1}{2}$ watt unless specified otherwise.

C_1 — Midget variable, 50 to 100 μ f. max.

L_1 — Q -multiplier coil approx. 150 μ h; 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.

A QST-Handbook Rig

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

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 pre-fabricated chassis parts¹ which make it easy to assemble tailor-made shielding compartments. A W3DZZ multiband antenna² 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- μ f. 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-Hand-*

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

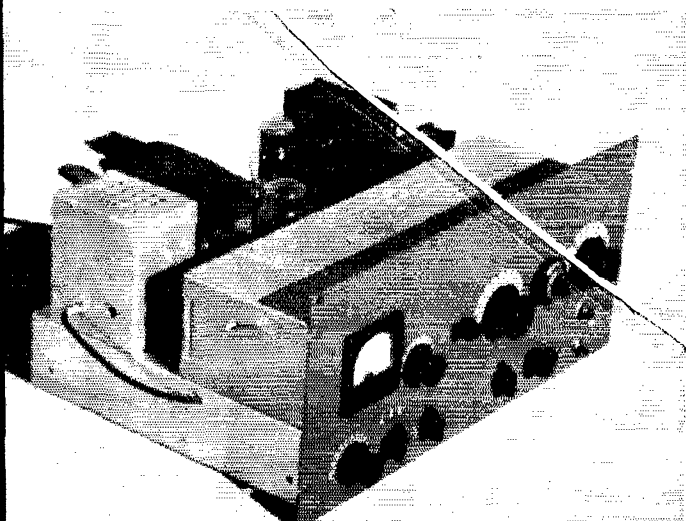
² Buchanan, "The Multimatch Antenna System," *QST*, March, 1955.

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.

• 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.

book 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- μ f. disk ceramic, was substituted. Of course, the crystal and the capacitive feed-back divider (3-30- μ f. trimmer and 100- μ 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.



A front view of W5DWX's *QST-Handbook* rig. The transmitter, complete with power supplies fits into an 8 $\frac{3}{4}$ -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.

QST for

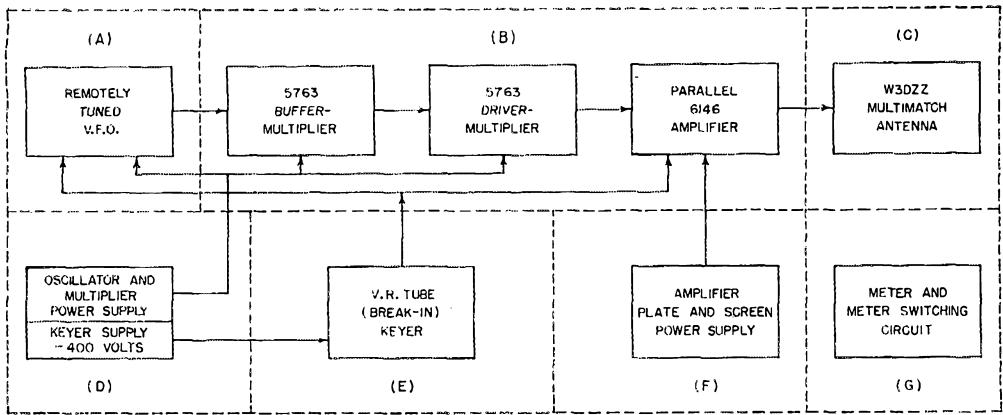


Fig. 1 — Block diagram of the transmitting layout used by W5DWX. Sections A through G of the diagram are individually treated in the text.

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 $\frac{1}{2}$ -watt resistor in parallel with the 100- μ fd. padder capacitor, C_7 .

The driver-multiplier circuit is similar to that used with V_2 of the parallel-6146 job.⁶ 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 transmitter⁵ 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 μ fd. The cathodes of the 6146s are grounded directly, instead of being connected to a key jack as in

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.

the previous model of the amplifier, because grid-block keying of the amplifier (plus VR-tube switching of the oscillator) is now employed.

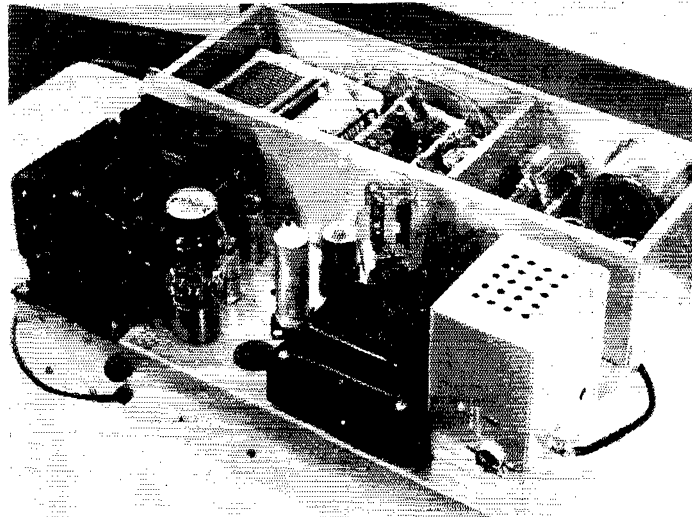
Section C of Fig. 1 represents the antenna used with the transmitter. Details of the antenna were given in a previous *QST* article.²

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 6X5 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*.⁵ 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

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.



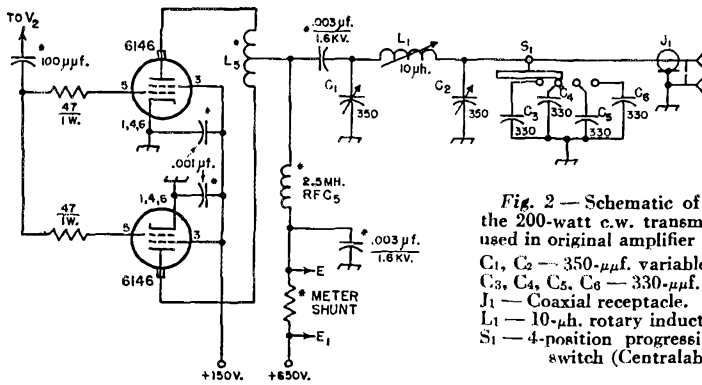


Fig. 2 — Schematic of pi-network output stage for the 200-watt c.w. transmitter. * Indicates components used in original amplifier (see text).

C₁, C₂ — 350- μ f. variable (Johnson 350E20).
 C₃, C₄, C₅, C₆ — 330- μ f. 500-volt silver mica.
 J₁ — Coaxial receptacle.
 L₁ — 10- μ h. rotary inductor (Johnson 229-201).
 S₁ — 4-position progressively-shortening 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 8 $\frac{3}{4}$ inches and the main chassis measures 17 by 10 by 3 inches. SeeZak¹ 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 \times 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 \times 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

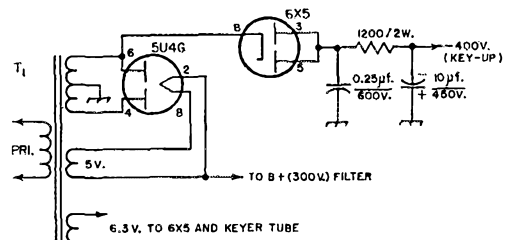


Fig. 3 — Circuit diagram of a negative supply for the QST-Handbook transmitter. T₁ and the 5U4G are parts of a conventional 300-volt (positive) supply used with the exciter tubes for the rig.

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 \times 8-inch SeeZak side rail, and one piece of 3 \times 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.

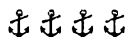
The services rendered by Radio Arlington were many. It sent time signals from the Naval Observatory. It sent weather forecasts covering all of the Atlantic Seaboard from Canada to the Caribbean. It sent news broadcasts. In addition, for many years it was *the* station for the transmittal of messages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

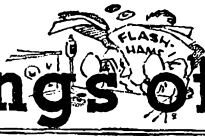
Deactivation ceremonies were held at Radio Arlington on July 14th. Principal speaker at the

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.



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 EDT 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., W0IC, and Walter M. Reed, W0WRO. *Southwestern:* Walter R. Joos, W6EKM, and Robert F. 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 16E)



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 lads 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, W1MGE

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 162)

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 licenses 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 W6ZZZ 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.
W8TIA, Dr. Arthur R. Bryant, Beatrice, Nebr.
W8TWX, Carroll R. Preiss, Iowa City, Iowa
W8WDS, 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 . . ."

◆

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.

◆

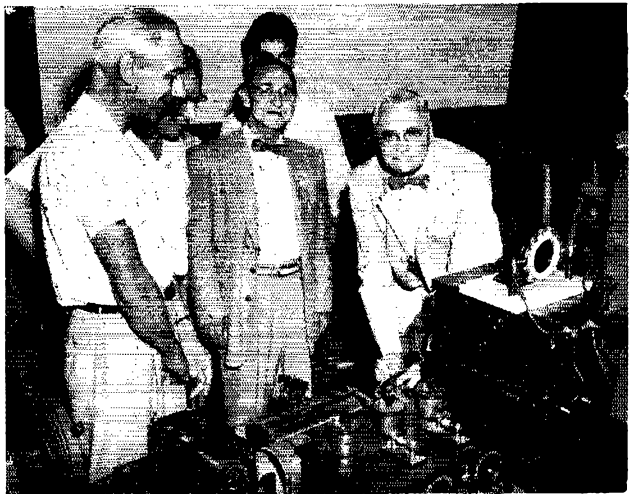
Once again amateurs performed an invaluable public service in an attempt to save the life of a two-year-old boy suffering from hemophilia, an affliction which prevents the clotting of blood. Jean Luc-Poll, of Leopoldville, Belgian Congo, was bleeding from the nose and was being kept alive only by continuous 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 cooperation 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 μ h, and can be obtained from a U. S. Navy transmitter type TBW. From surplus TBWs, that is!



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 diathermics 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



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.

from moral considerations, it's a shame that some allow one slip of the wrist v.f.o.-wise to career 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,"



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 list on 7 bands in the 1956 affair. Final score: a walloping 949,344 points. Welcome back, Juan!

QST for



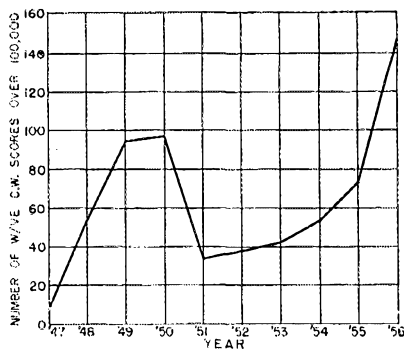
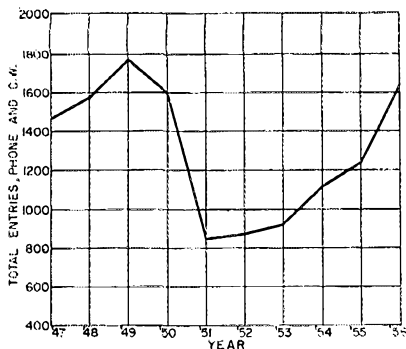


Fig. 1 — Up go entries and scores in recent ARRL International DX Competitions! These curves bear a striking resemblance to sunspot-number curves.

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, W4K VX 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:

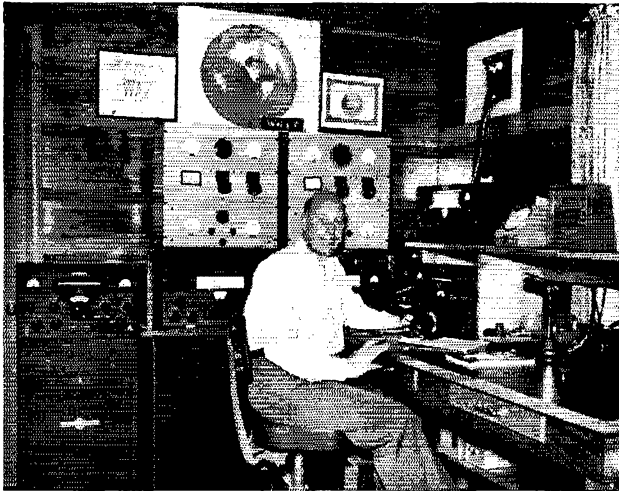
W1BIH	313,110	VE1ZZ	50,049
W2WZ	682,956	VE2YA	123,662
W3DGM/3	771,520	VE3IR	25,200
W4CEN	699,377	VE4RO	225,990
W9APY/5	351,900	VE5VL	11,800
W6AM	581,940	VE6NX	25,110
W6GAL/7	485,121	VE7EH	2520
W8FGX	458,052	VE8WN	39,270
W9FJB	465,908	VO6U	11,016
W0DAE	209,433		

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, W0RSL 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: KTIUX 224,055, EA8BF 204,534, FA9RZ 144,144, ZS5MP 108,634, ZS5U 100,924, ZE5JA 73,704, CT3AB 73,246, CNSAF 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 PA0UN 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, PA0EP 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.

¹The non-W/VE multiplier 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 \times 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 11BNU employed another pair of 807s, a Super Pro plus converter, and a multiband center-fed skyhook.

OK3DG 105,192, G2QT 102,030, 11BNU 101,856.

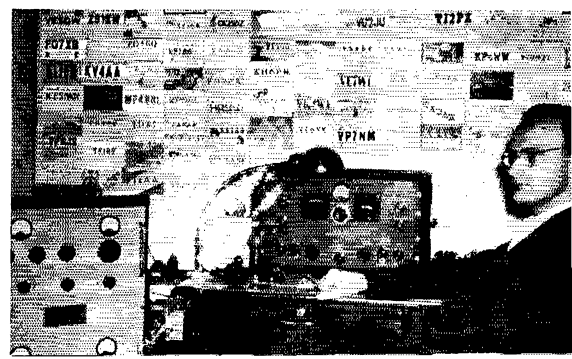
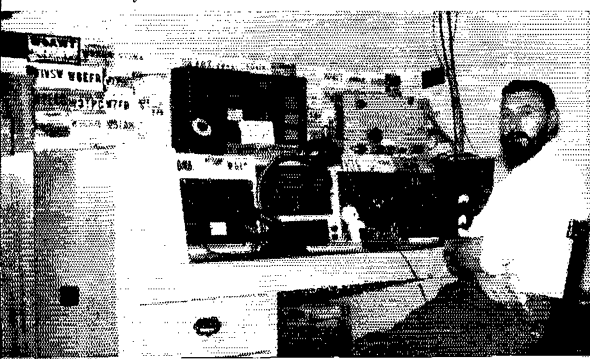
In North America, KV4AA struck with gusto for one million, registering a new global high of 997,036 points. Dick's QSO average of 52 per hour and 3136 W/VE contacts furnish tough marks for future challengers. Second-ranking foreign tally was XE1A's 949,344; especially amazing is Juan's multiplier¹ of 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.



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 CN8Y BQ 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 hands 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, W6AM² 341,432, W6ITA 280,062, W9AVJ² 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, W8NGO² 146,700, VE4RO 145,395, W3CUB 136,186, W5DJH 135,441, W4NHF 126,360, W9DUB 125,256, W4EEE 116,748, W3GHM² 114,759, W9JIP 113,832.

Single-operator call area leaders, for geographical comparisons:

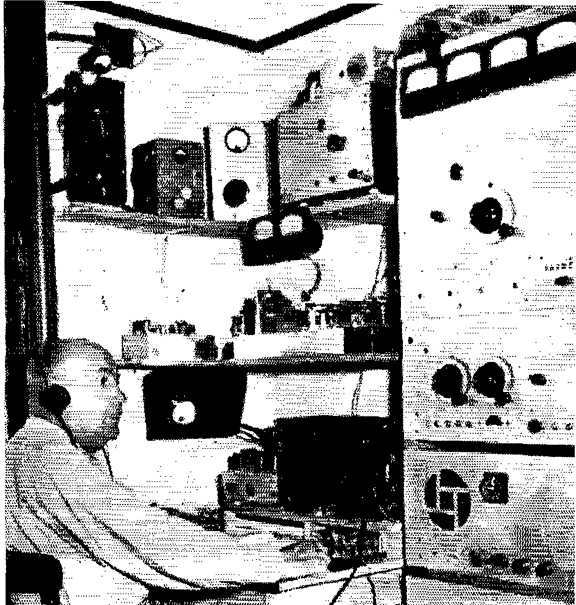
W1ONK	157,437	VE1ZZ	240
W2SKE/2	632,016	VE2JR	45,570
W3MSK	454,725	VE3VO	12,852
W4OM	343,860	VE4RO	145,395
W5DJH	135,441	VE5VL	45,109
W6YY	366,660	VE6NX	24,603
W7HRH	43,560	VE7AIH	19,836
W8BKP	239,760	VE8AB	540
W9EWC	227,457	VO6N	4959
W0GEK	34,983		

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, ON40C 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, P12AF'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, W2QZL, 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.



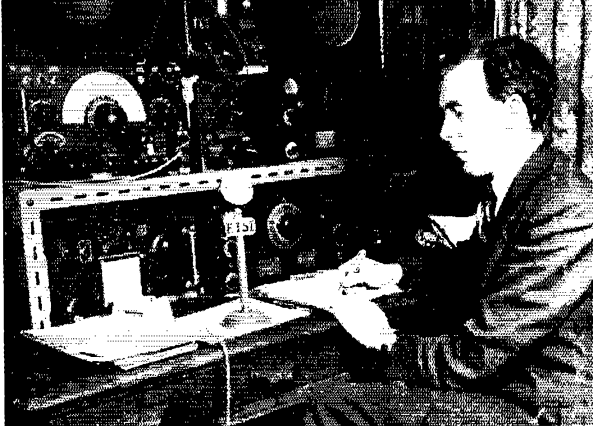
Quoting a weekly news magazine, "We Earthlings can watch the sunspot storms and take comfort that we're 93 million miles removed." True, and we amateurs can take comfort that such goings-on harbinger improving conditions for the next couple of Tests at least. How will you do? How many new countries will 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/3771.520-320-304- C-85	W3MQY...1275- 17- 25- C- 7
W3GHS...440.832-256-574- B-67	W3WHK...18- 2- 3- A-10
W3ADZ...134.532-148-303-BC-48	W3GHM (W3s GHM KDF) 423,612-246-574- C- -
W3CGS...132.561-143-309- C-52	W3KT (W3s JNQ KT) 237,402-198-400- C- -
W3LEZ...33.654-129-242- C- -	W3KFQ (W3s KFQ QMZ) 138,320-140-330- C-96
W3IMV...88.368-112-263- B-40	W3GHD (W3s GHD JNQ) 117,375-125-313- B- -
W3QOR...80.223-121-221- C-43	W3CUB (W3s ALB CUB) 59,946-103-194- C-23
W3EAN...70.203-104-225- C-31	W3LVF (W3s KFK LVF) 35,100- 78-150- C-15
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	
W3GCH...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	
W3EBG...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...9.438- 39- 82- - -	
W3ANZ...8.982- 38- 78- B-32	
W3YTM...7.956- 39- 68- C- -	
W3DYL...7.141- 37- 65- C-10	
W3TJW...5.950- 34- 61- B-30	
W3REU...4.860- 36- 45- A- -	
W3OCU...3.096- 24- 43- C- 4	
W3ADE...2.691- 23- 39- A-12	
W3LAP...1.710- 19- 30- B- 8	

Md.-Del.-D. C.

W3LOB...752,247-333-753- C-84
W3MSK...691,014-318-725-BC-80
W3BYN...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- -
W3JFC...92,208-113-272- C-49
W3DRD...71,656-106-226- B-38
W3KZQ...57,630- 45-226- 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- -	W2QDY...2046- 22- 31- B-15
W3ZQ...5733- 39- 49- C- 8	K2AJD...1596- 19- 28- A- -
W3VKI...5616- 39- 48- B-12	W2EBV...363- 11- 11- A- 4
W3BZB...2530- 23- 38- A-18	W2HAZ...231- 7- 11- A- -
W3BVO...2139- 23- 31- B-19	W2GTN...189- 7- 9- B- 2
W3FY...1296- 18- 24- B- 5	W2EZM...144- 6- 8- B- 7
W3MCG...1080- 18- 20- A- -	K2EWR...3- 1- 1- 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	

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
W2RBU...16,629- 99-157- B-34
K2CDD...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
W2ZCC...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

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
W2BUH...20,160- 56-120- B-40
W2UA...19,323- 57-113- B-45
W2LNL...14,256- 48- 99- B-25
W2ATJ...6737- 43- 53- B-27
K2CWJ...4416- 32- 46- A-16
W2VUM...3812- 28- 43- B-16

CLUB SCORES

	Score	C. I. F. Winner	Phone Winner
Southern California DX Club	7,960,211	W6AM1	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	W9LNA	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 Radios (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	W0DSP	
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- H-
 K2IAE 75-5-5- B-7
 W2QZL 27-3-3- -
 W2VNP 18-2-3- A-15
 K2IAV 18-2-3- B-
 K2JZT (K2s IQH JZT)
 19,140-60-107- B-60

Western Pennsylvania

W3ZAO 104,636-148-236- B-51
 W3PNW 38,052-64-152- A-33
 W3KNC 3276-28-39- A-35
 W3ZKB 1850-22-25- A-16
 W3KOD 1440-15-32- B-
 WN3BWU 1260-18-24- A-15
 W3SLJ 360-10-12- B-
 W3DLL 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
 W9BUZ 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
 W9NLI 117,300-150-261- B-63
 W9FJY 114,600-147-260- B-58
 W9WFS 57,240-106-180- B-42
 W9QY 56,922-106-179- B-60
 W9YZF 44,115-85-173-BC-30
 W9PNE 39,168-96-136- B-39
 W9IDB 29,760-62-160- C-51
 W9KLD 29,568-77-128- B-22
 W9FNR 27,434-86-107- C-46
 W9PIA 25,944-69-126- B-25
 W9UXO 21,900-60-122- C-23
 W9SGB 17,385-61-95- B-55
 W9DWQ 10,434-47-74- A-14
 W9WYB 7524-39-66- B-25
 W9VLL 6788-39-58- B-15
 W9ZRG 6156-36-57-AR-11
 W9FWU 5850-39-50- B-15
 W9CFL 5472-32-57- H-40
 W9FKC 3306-29-38- -
 W9IZL 2908-29-35- C-5
 W9NIZ 2808-26-38- B-12
 W9GHI 2600-26-34- A-32
 W9WIO 2340-26-30- C-6
 W9LEK 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
 K9BJ 396-11-12- A-8
 W9CDE 36-3-7- -
 K9BIV 27-3-3- A-2
 W9REC 12-2-2- A-3
 W9AVJ (W9s GVZ NZM PKV)
 428,706-258-554- C-96
 W9TGB (W9s TGB ZVG)
 17,478-114-209- B-56

Indiana

W9JJP 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 14,472-64-90- B-33
 W9FTL 4032-32-42- B-11
 W9POB 3508-29-41- B-16
 W9AJA 2404-23-36- B-20
 W9EHA 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
 W9TJO 4320-32-45- A-11
 W9VOD 4290-26-55- C-7
 W9WEN 3510-30-39- B-11
 W9HXC 3450-25-46- B-27
 W9UTV 1020-17-20- A-4
 W9DGB 495-11-15- A-6
 W9WVJ 270-9-10- -
 W9UFL 216-8-10- A-3
 W9RBL 214-6-9- -
 W9NYZ 75-5-5- A-7
 W9GOC (W9s SZR VAK ZQA,
 KN9CEK)
 18,408-52-118- A-42
 W9AEM (W9s AEM ZLD)
 5250-35-50-AB-15

DAKOTA DIVISION

North Dakota

W9EOZ 17,325-55-105- B-19

South Dakota

W9BLZ 37,740-85-148- B-25
 W9FOQ 1104-16-23- A-13

Minnesota

W9YCR 77,589-111-233- C-49
 W9JSN 67,968-118-192- B-46
 W9HGH 12,546-51-82- B-32
 W9RXL 6327-37-57- B-21
 W9DGH 4140-30-46- B-21
 W9VPI 4140-30-46- B-18
 W9OTL 3975-25-53- A-15
 W9VBS 1836-18-34- B-
 W9QDP 828-12-23- A-4
 W9WDW 12-2-2- A-2

DELTA DIVISION

Arkansas

W5MY 63,030-110-191- C-35
 W5ASQ 37,829-113-113-BC-50
 W5KZG 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 26,082-69-128- B-52
 W4VKB 1874-18-31- B-8
 K4CLA 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 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-x
 W8FSR 1518-22-23- B-12
 W8IQS 1224-17-24- B-7
 W8HA 1122-17-22- A-25
 W8MCC 936-13-31- A-6
 W8DLZ 450-10-15- B-5
 W8NWH 120-6-7-AB-4
 W8VPC (W8s TJQ VFC)
 40,421-83-163-AB-85

Ohio

W8FGX 458,052-266-574- C-80
 W8EV 235,129-202-388-BC-59
 W8ZJM 198,931-191-347- B-56
 W8PUD 141,375-146-327- C-63
 W8CEG 129,830-149-290- C-30
 W8BTH 89,187-137-217- C-30
 W8JWV 84,816-124-228- C-38
 W8AJV 67,176-108-208- A-28
 W8BOJ 63,840-112-190- C-20
 W8VTE 35,490-70-169- B-35
 W8STL 33,957-77-147- C-35
 W8RTE 27,324-69-132-AB-36
 W8KZT 22,745-57-133- 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
 W8KCC 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
 W8KCV 6264-36-58- A-15
 W8FDC 5766-31-62- B-43
 W8PCS 4914-39-42- B-9
 W8BUM 1644-36-43- 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
 W8AQ 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 48-1-4- B-2
 W8NCGF 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
 K2EHN 51,000-100-170- B-29
 K2EDH 42,315-91-155- B-30
 W2PBS 29,127-73-133-ABC-25
 W2VCB 25,698-69-124- B-40
 W2HUB 12,844-52-83- B-
 K2EJ 1872-24-26- B-9
 W2GRI 485-11-15- B-5
 K2OSY 27-3-3- A-
 W2PCJ (W2s PCJ SUC)
 51,660-82-210- C-42

N. F. C. - L. I.

W2WZ 682,956-311-734-BC-69
 W2RSO 166,496-173-324-ABC-55
 W2GSN 124,488-133-312- C-38
 W2AZS 108,882-138-283- C-39
 W2AMJ 90,354-112-269- 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
W2CUC...25,620-70-122- B-26
W2VDT...17,670-62-95- B-19
W2MDM...9,180-45-68- B-9
W2SUC...8,295-35-79- C-15
W2EEN...7,800-50-52- B-9
W2BOT...7,344-34-72- B-20
W2ICO...5,148-33-52- -
K2BSM...3,588-26-46- C-13
K2CMV...3,564-27-44- B-9
W2BVN...3,375-25-45- B-15
W2JB...3,120-26-40- B-9
K2GMF...3,016-26-36- -
W2WFL...2,109-19-37- A-7
W2EQG...1,938-19-34- B-12
W2DTL...1,863-23-27- A-20
K2JTS...1,827-21-29- A-15
K2DGT...1,197-19-21- 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...188-7-8- 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...661,262-317-696-BC-90
W2AIW...350,460-220-531- C-63
W2JIT...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
W2CQK...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...10,363-51-71- B-14
W2OZU...9,948-48-67- A-20
W2EHN...9,492-42-76-AB-34
W2BXL...7,605-39-65- B-30
K2BJA...7,245-35-69- B-30
W2GKE...6,726-38-59- B-15
W2HTX...6,156-38-54- B-20
W2AZL...5,985-35-57- B-15
W2FXZ...5,775-35-55- A-22
K2CBB...4,030-31-44- A-11
K2GFX...3,483-27-43- A-11
W2GJD...2,736-24-38- B-11
K2IBF...2,580-20-43- A-15
W2SCV...3,900-10-13- B-4
W2HMN...3,300-10-11- B-8
W2OAE...243-9-9- B-4
K2ODA/2...72-4-6- B-2

W2CVW...36-3-4-B-1
K2GHV (K2s GEV KMC)
17,496-54-108-AC-50

MIDWEST DIVISION

Iowa

W0NWX...193,320-179-361- B- -
W0FDL...72,618-133-182- C-33
W0QVZ...57,015-105-181- B-28
W0BFY...51,300-95-180- C-40
W0DSP...23,562-66-119- B-42
W0GXQ...7,437-37-67- B-40
W0DIB...6,513-39-58- B-17
W0VFM...936-13-24- B-11
W0QLJ...240-8-10- B-2
W0YSE...60-4-5- A-3
W0RSL (W0s NCS RSL RYJ
SQO)...215,985-187-385- C-57
W0WDK (W0s WDK Y2E)
4263-29-49- B- -

Kansas

W0DAE...209,432-188-372- C-50
W0VRQ...60,420-106-190-BC-39
W0IUB...25,986-71-122- B- -
W0BCL...7,605-39-65- B-40
W0QPH...7,434-42-59- A-24
W0BYV...6,048-36-56- B-21
W0GAX...4,368-28-52- B- -
W0CTK...2,346-23-34- B-12
W0MVO...663-13-17- B-14

Missouri

W0QDF...117,180-140-279- C-65
W0BMP/0.90,783-131-231- C-80
W0BFA...75,258-113-222- B-70
W0PGL...7,956-39-68- B-25
W0ZSL...7,680-40-64- A-42
W0PWN...3,996-11-12- A-4

Nebraska

W0BUR...27,951-77-121- A-25

NEW ENGLAND DIVISION

Connecticut

W1BIH...313,110-213-490-BC-63
W1AW *...212,940-195-364- C-42
W1ODW...199,048-179-372- B-75
W1TX...197,904-186-356-BC-62
W1ZDP *...158,576-176-303- B-50
W1VG *...158,099-157-337- B- -
W1AB...141,900-173-275- B-45
W1NL...121,535-155-281-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...26,150-67-130-AB-40
W1CJL...8,436-37-76- A-28
W1GVK...6,194-38-55- B-15
W1FEA...4,929-31-53- A- -

Massachusetts

W1WIC...4455-33-45- B-9
W1RFC...3,192-28-38- A-14
W1NJM *...3,042-28-39- B-6
W1YYM *...2,415-23-35- B-4
W1WY...1,914-22-29- A-7
W1YNC...1,860-20-32- B-10
W1NLM...1,701-21-27- B-10
W1PTX...1,425-19-25- B-3
W1RWS...1,290-20-21- B-2
W1NEWS...792-12-22- A-14
W1RST...363-11-11- B-2
W1ICP * (W1s CQS CUT ICP
JZG WPO)
336,384-219-512- C-92
W1DLC...236,880-188-423- C-85



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). FMS winds his own transformers, kicks an 807W at 50 watts, listens on an HRO-5.

W1LHJ...20,886-59-118- C-39
W1NS...13,113-47-94- B-25
W1RSX...12,384-43-96- B-25
W1MXX...8,856-41-72- C-13
W1DE...8,427-53-53- -
W1LQJ...8,256-43-64- A-16
W1AMQ...8,127-43-63- B-18
W1PWX...6,240-40-52- B-10
W1CFE...2,331-23-33- B-7
W1BFA...1,900-20-32- A-14
W1MLG...1,377-17-27- A-7
K1NKK *...969-17-19- C-3
W1CFJ...355-15-19- B-4
W1WMH...120-5-8- A-3
W1MX (W1YFM, W2LSJ,
W6WZD, W0CQL, K1TATZ)
133,272-161-820-BC-70

Western 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...63,993-113-187- B-53
W1OQU...59,292-81-244- B- -
W1JEL...57,750-110-176- C-29
W1PEJ...32,200-70-157-BC- -
W1CTW...25,019-59-147- -

New Hampshire

W1JYH...300,032-188-355- B-52
W1KPV...170,661-163-350-BC- -
W1EOB...80,310-130-206- C-30
W1ZD...33,884-92-159- C-18
W1YQC...14,628-46-106- B-28
W1AZW...3,724-28-46- A-12
W1MVP...1,650-22-25- B-7
W1RWR...672-14-16- A-5
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, K0DPA, W0MGC, K4HTJ, W4DJS and K0ASU, the remainder of the crew, weren't around for the picture-taking. See page 52, February QST, for further KX6AF photos.



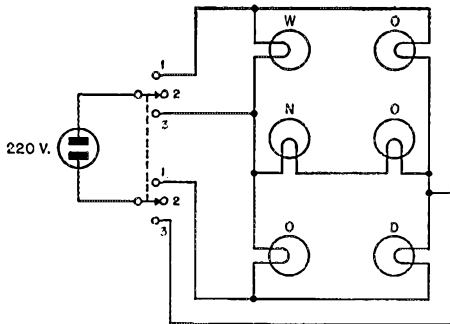
Quist Quiz

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

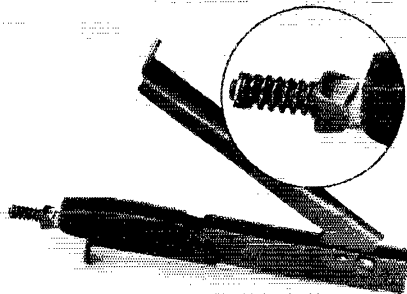


photograph. In both types the cable is inserted in the screw fitting shown at the left, and the braid is turned back over the small end. The piece is then assembled into the part at the center to form the complete plug as shown at the right. The regular adapters can be used with the smaller sizes such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

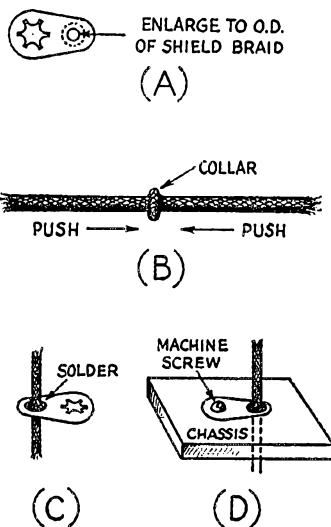


Fig. 1—Illustration of the WØQYJ method of grounding shielded wire at through-chassis points.

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 I-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 the 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

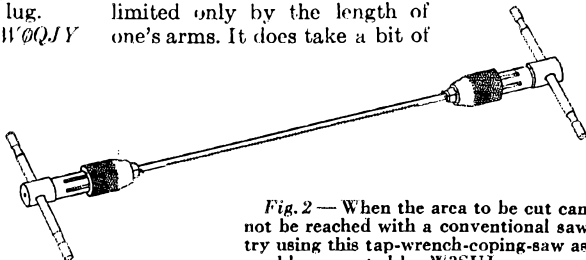


Fig. 2—When the area to be cut cannot be reached with a conventional saw, try using this tap-wrench-coping-saw assembly suggested by W3SUJ.

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.

— Dick Knoth, W3SUJ

The World Above 50 Mc.

1215-1300 2300-2450 3300-3300 5650-5925 10,000-10,500 21,000-22,000 30,000-?

CONDUCTED BY EDWARD P. TILTON, WHDQ

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. Informa-

tion on the equipment used at W6VIX/6 is also lacking. More information on participating operators and stations will appear in the contest summary.

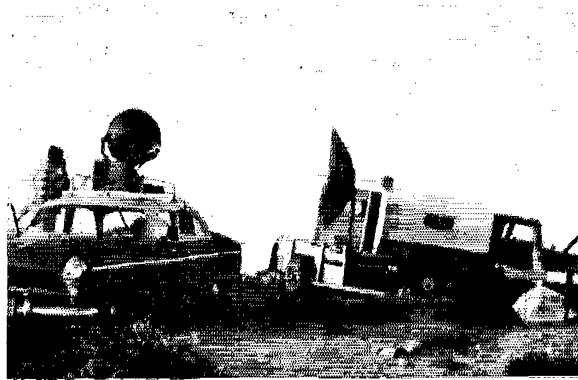
On the same day, June 9th, two other parties set out to break the 1215-Mc. record. Members of the V.H.F. Expeditionary Society, a group of v.h.f. enthusiasts in the Bay Area, cooperated in this venture. Equipment used was perhaps the most technically advanced yet employed in two-way work on 1215-Mc. 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 excitors 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-W0ETJ) 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 WLEE, 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



W0ZJB	48	W4ONC	41	WRLPD	44
W0BJV	48	W4UCH	41	WYLS	41
W0CJS	48	W4MS	40	W8PCK	35
W5AJG	48	W4FNR	39	W0HRN	48
W9ZHL	48	W4LJJ	38	W0ZHB	48
W9OCA	48	W4RF	37	W9QUV	48
W6OB	48	W4IEK	37	W9HGE	47
W0INI	48	W4BEN	35	W9VZP	47
W1HDO	48			W9RQM	47
W5MJD	48	W5VY	48	W9ALU	47
W2IDZ	48	W5FW	47	W9QKM	47
W1LL	48	W5GNQ	46	W9HIA	45
W0DZM	48	W5ONB	45	W9UNS	45
W0HWV	48	W5JTI	44	W9MIF	42
W0WKB	48	W5ML	44		
W0SMJ	48	W5FSC	44	W0QIN	47
		W5JLY	43	W0NFM	47
W1CLS	46	W5JME	43	W0TKX	47
W1CCY	46	W5VV	42	W0KYF	47
W1LSN	46	W5FAL	41	W0MVG	47
W1VNH	46	W5HEZ	41	W0OGV	47
W1DJ	46	W5HLD	40	W0JOL	46
W1RPU	41	W5FXN	38	W0TJF	44
W1FOS	38	W5HFF	33	W0URQ	44
W1SPX	36	W5NSJ	32	W0JHS	43
W1WAS	23	W5ZVP	24	W0IPI	43
				W0GNM	42
W2MEU	47	W6WNN	48	W0PKY	42
W2AMJ	46	W6ANN	45	W0PKD	41
W2BYM	46	W6TML	45	W0ZTW	41
W2RLV	45	W6IWS	41	W0USQ	40
W2FHI	45	K6EDX	41	W0ORE	37
W2RGV	44	W6CAN	40	W0RWT	36
W2GYV	40	W8ABN	35	W0BVK	35
K2JNS	40	W6GGG	35		
K2AXQ	39	W6WGC	33	VE3AET	45
W2QVH	38	W6OJF	31	VE3ALB	35
W2ZUW	36	K6GTG	30	VE1QZ	34
W2ORA	35			VE1QY	32
K2HRB	31	W7HEA	47	VE3DEI	31
K2ITP	30	W7ERA	47	VE1EF	28
		W7GK	47	NE1GE	25
W3OJU	46	W7FDJ	46	C06WW	21
W3TIF	44	W7DYD	45	VE4HS	20
W3NKM	41	W7ACD	45	LU9MA	11
W3MQU	41	W7JRG	44		
W3CTC	40	W7BOC	42		
W3RUE	41	W7JPA	42		
W3KMV	39	W7FIV	41		
W3MXW	38	W7CAM	40		
W3LFC	37				
W3FPH	35	W8N8S	46		
		W8CMS	46		
W4FBH	46	W8QJN	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—1GY program, announced elsewhere in this issue. If we do the 1GY 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 E-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 last!

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 W6MNUU, 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. W4WNNH, 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. W0SMJ, Indianola, Iowa, turned the

2-METER STANDINGS

U. S.			U. S.		
States Areas Miles			States Areas Miles		
W1FZJ..21	6	1120			
W1REZ..21	6	910	W5FEK.. 8	2	580
W1RFU..19	7	1150	W5VY... 7	3	1200
W1HDQ..19	6	1020			
W1KCS..17	6	810	W6WSQ.. 5	3	1280
W1AJR..17	6	810	W6NLE.. 5	2	1010
W1JZY..17	6	750	W6RRZ.. 4	2	360
W1UIZ..17	5	680	W6DNG.. 4	2	350
W1BCN..16	5	650	W6ZL... 3	2	1400
W1AFO..15	5	810	W6AJF.. 3	2	640
W1MMN..13	5	520	W6RAZ.. 3	2	320
			W6MMU.. 3	2	240
W2ORI..26	8	1000	W6ORS.. 2	2	200
W2NLY..23	7	1050	W6LSB.. 2	2	360
W2BLV..22	7	1020			
W2AZL..21	7	1050	W7VMP.. 6	4	1280
W2DWD..21	6	720	W7LEE.. 5	3	1020
W2ZPQ..20	6	670	W7JL... 4	2	358
W2AMJ..20	6	860	W7RMB.. 3	2	1010
K2CEH..20	7	910	W7YZU.. 3	2	240
W2UTH..19	7	880	W7JDO.. 2	2	140
W2AZP..19	7	650			
K21XJ..19	6	925	W8WXV..28	8	1200
W2WFB..19	6	900	W8SPC..26	7	850
W2CMB..19	6	740	W8RMB.. 7	8	800
K21EJ..18	6	745	W8LPD..25	8	750
W2AOC..18	6	660	W8DX.. 25	8	720
W2LHI..18	7	620	W8SRV..27	7	850
W2KIR..18	6	620	W88VI..32	8	725
W2RXG..17	6	675	W8JWV..22	8	710
W2HJQ..17	6	650	W8MBL..16	8	685
W2PCQ..16	5	650	W8WRN..20	8	670
			W8EP...18	7	800
W3BGT..28	8	740	W8ZCV..17	7	970
W3RUE..25	8	950	W8RWW..17	7	630
W3KCA..21	8	800	W8PT...17	6	610
W3KPK..19	7	800			
W3KWL..19	7	740	W9KLB..27	8	850
W3NKM..19	8	660	W9ZHL..25	8	760
W3IBE..19	6	650	W9EQC..24	8	820
W3TDF..19	7	720	W9EHX..24	7	725
W3RNG..18	6	750	W9FVJ..22	8	850
W3FPH..18	7	720	W9BPV..23	7	1000
W3LNA..16	7	720	W9MBD..27	7	850
			W9WOK..22	8	860
W4HHK..29	9	1280	W9UCH..22	8	750
W4AO...23	8	950	W9SPC..22	7	960
W4RFB..20	8	740	W9KPS..19	7	800
W4JCL..20	6	660	W9MUD..19	7	640
W4DWU..19	6	675	W9REM..19	6	---
W4JFY..18	7	830	W9LF...19	6	---
W4OLK..18	6	720	W9ALI..18	7	800
W4UMF..18	6	600	W9JGA..18	6	720
W4HJQ..18	7	650	W9MBL..16	8	680
W4VLL..17	8	825	W9JLY..15	7	560
W4TLV..17	7	1000	W9LEE..15	6	780
W4CLY..15	5	720	W9DSE..15	6	760
W4WNNH..15	7	650	W9DDG..16	6	700
W4ZBU..14	5	800			
W4WCB..14	5	740	W9EMS..27	8	1175
W4TCR..14	5	720	W9GUD..25	7	1065
W4IKZ..13	6	720	W9IHD..25	7	870
W4SOP..13	5	680	W9UOP..18	6	---
W4CPZ..12	5	650	W9ONQ..17	6	1000
W4UDQ..11	5	850	W9BQJ..17	5	830
W4MDA..11	5	680	W9OAC..14	5	725
			W9TJE..13	4	---
W5RCI..21	7	925			
W5JTI..19	7	1000	VE3DIR..26	8	915
W5HEB..15	7	830	VE3ATB..25	8	910
W5AJG..14	5	1280	VE3BN..17	7	790
W5ABY..12	5	780	VE3BEB..16	7	820
W5QNL..10	5	1400	VE3BFB..13	6	715
W5VW...10	5	1180	VE2AOK..12	5	550
W5SWV..10	3	600	VE2AQG..11	7	800
W5MWW..9	4	570	VE1QY..11	4	900
W5ML...9	3	700	VE7FJ...2	1	365

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. W0GOW, Lake Elmo, Minn., also submitted 48 cards at almost the same date as W0SMJ, but one of them was not in order. At this writing a replacement had not been received. Like W0SMJ, 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: W0GOW has now qualified for award No. 17 and W0ORE reports No. 48 worked, but not all cards in as yet.

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 160)

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 UA0, (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 Diomed (U. S.) and Big Diomed (U. S. S. R.) two populated islands in the Bering Strait, put KL7 and UA0 (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) 15, 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) UA0 |

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 atmospheric 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 1X 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, SV0WN (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 1CX (62) 13, 2CR (21) 12, YALAM (48) 3, YJ1RF (66) 12, 4S7s BW (11) 3 and MR (85) 12. . . . K6MHT mentions CR6CK 15, K6GIG (50) 12, KV4AA (80) 23-1, VK9TW 14, VQ6LQ (85) 14, VR3B (45) 4, VS1s GZ HC 14-15 and ZS3VC 15 contacts and decies overzealous CQ-DXing by unrc North Americans. . . . W2HIMJ,



* 5822 West Berteau Avenue, Chicago 41, Illinois.

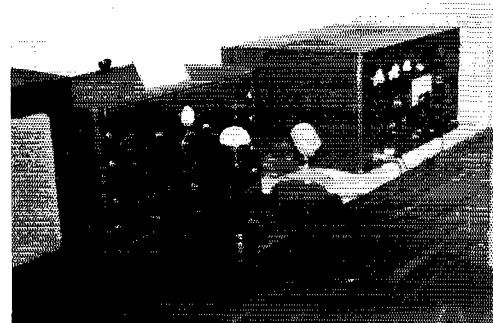
absent from our Bandwagon for some time, roars back with AP2RH (30) 1, EA9DF (76) 23, EL12C (55) 22, FB8BX (88) 3, JA5 5A1 BAA 12-13, KB6BA (72) 7, KR6QW (57) 10, LZ1KSI (48) 1, SM1BVQ (37) 23 on WAE Gotland Isle, YL UA1QT (100) 4, UA9s CM DV VA, UA8s AB AG all 23-2, UC2AA (80) 23, a UJ8, UP2KBC (43) 0, UQ2AE (28 T6) 4, VQ3CF (87) 11, VS9AS (99) 3, VU2s BK (58) (1, JJ (93) 11, VR3 and YJ1 for an impressive 230/230 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 GC3EML (68) 23, GD3HQR (38) 19, HHs 2W 3DL 1-3, HI8FR (188) 1, I5RAM (40) 23, OY1R (35) 22, VK9AU (32) 12, YI2OT (50) 5, ZC4s GT (80) 5, TB (90) 1, 3V8AR (80) 1, 4X4s CJ (28) 5, DF (15) 1, GV (29) 3, HK (87) 1 and elusive ET3AF (60) 5. Hayden's separate listing of U.S.S.R. contacts reads like *Pravda*: UA9s DB DN KYB, UC2EAB, UDG6M, UG6AG, U8KAA (72) 5, UO5KAA (40) 21, UP2AC, UQ2s AH AS, UR2AK, et al. CR9s AH (48) 14, AI (62) 15, DU3DO (62) 9, FK8AE (35) 9, KG6GC (60) 8, UA0KJA (41) 15 and ZD9AE (54) 14 fell prey to K6DNH. K2KDW/2 savored HP1EH (1) 3, SUIIC (58) 23, ZB1s CH ZR 22-23, ZB2R (25) 23 and ZC4FH (40) 21. ZD6BX denotes QSOs with AC5PN (91) 15, BV1US (45) 13, FB8s BI (45) 12 on Juan de Nova Island, BR (5) 13, HZ1HZ (42) 15, ISREX 12, KW6CA (76) 13, OY7ML 20, UD6AL, UH8KAA, UN1AA 18, UO5KBR 19, UR2KAA, VK9s DB RM (58) 12-15, 3W8AA 19 still on the FCC-ITU no-no list and AS7EM (81) 11. CR6AI (43) 0, FQ8AY (78) 1, SPIKAA, SV8WT (12) 23, YJ1AA (91) 4 and ZB2I (58) 0 highlight W5JPC's collection. W8YIN managed OY5S (22) 7, a variety of UAs plus UA9DA (68) 2, UB5DU, VQ8CB (102) 14 and VS6CG, pushing his countries total to a healthy 203. "All Russians contacted at 1330-1630 but they are heard at all hours of the day." EA6AW, FQRY/FC, LZ1KDP, OD5LX, SP6BZ, UB5KBB and 4X4IO pushed W3WPG up to 104/93. W6RLP's 400 watts and ground-plane caught a BVI, HK3PC, KG1AG (73), KJ6BN, KX6NC (57), KR6RR (87), UA1KAF (48) at a Russian antarctic base (Pt. Mirny), UB5UB (50), VSs HIE (82), 6CO (58) and 6DE (100). 51 countries in thirty days. It's a fast 100/81 for W9FGX. Bruce collected HA5s AP GC, IIBNU/Trieste, KG6AFT, KTIU, TF2WBG, VR2BA, ZESJA and 3V8AN to help things along. Brief brownings from points hither and yon, first FI'ANU: CN2AY, UB5WF, F3TYW; LZ1 OD5 4X4, SP6AY, F4HKJ; DU6IV, SP8CR, UB5CJ, F4PVD; FK8AO (84) 6, FO8AO (74) 5, W6GAI: CN8AF, IT1TAL, JA5 5GE 6HK, VQ5GC (30) 13, W5JPC: heard weirdies, FY7YY/FY and TIYR/MM, W6HPB: JA6AA, VS1 VS2, F6RZS: BVI, a Chichi Jima KG6, UA6s OM KBE, VS1s, VS6CT and 200th JA station (JA8BR), F6SUQ: GR10AA (85) 12-13, an antarctic UAI, VK9TW of Nauru (VP2VB/P), K6EBH: VR3 UA0, VS1HE, JA5 in quantity, W7DJU: HA5KKB, KA2KS, KG1AR, VS1HA, heard C2BC working JA5 (Red China?), W8NOH: shipboard "XE51J", heard one CE6SS/0, AP2RH: VU2s AL AM, DL2C: AP2U 18, MIB 14, VS1HB 17, YN1K 5-6, I1ER: XE1MJ, K47BP: XE2LA, F66CD: KV4BK, PJ2s AN AV, UA6UI, VU2s AS HF RA RM, YS10, ZD6BX (8) 5, plus ponderable LU6AC, VE5HR: VS1IJ. West Gulf DX Club's *DX Bulletin*, No. Calif. DX Club's *DXer* and Milwaukee Radio Amateur Club's *DX Notes*

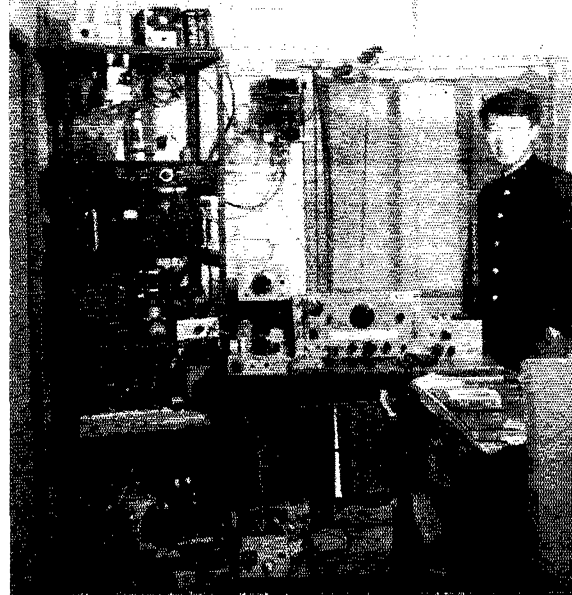
dwelt upon 14-Mc. code items AC3SQ (96) 14, CE0AC (175) 7, CT3AB (40) 1-2, DU9VL, EA5 6AM (15) 5-6, 8BF (40) 7, ETZUS (25) 14, FB8ZZ (28) 3, FF8BT (4) 22, FG7XC (35) 22, FL8AB (38) 21, FO8AK (50) 6, FR77C (84) 2, GD3UB (80) 23, KB6BC (39) 13, KC4USA, KG1BF, KM6FAA (102) 7, KR6SC (36) 13, MP4s KAC (64) 2, OAH (25) 13, OD51J (63) 21, PZIAN, SV8s FY WL WS, TG9CR (74) 16, UJ8KAA, UL7s AB KBK (25) 13, VK1s GA (86) 11, RM (58) 12-13, VP8BY (72) 14, VQs 2GW (50) 14, 4FM 4FV, 5BM (63) 7-8, VSs 1GR (55) 14, 2DZ (85) 15, 2FD (95) 15, 2FD (80) 14, 5NN (43) 1, 6DI (95) 13, XZ2OM (4) 11, YI2AM (92) 14, YK1AC (113) 5, ZBs IZY (42) 4, 2T (23) 3, ZC4s AH GT JJ, ZC5SF (35) 15-16, ZD2BP (64) 2, ZD3s A BFC, ZD6BR (78) 13, ZEZJO (VQ1JO) (30) 13, ZM6As (90) 7, ZP9AY (88) 12, ZSs 2M1 (78) 14, 3Q (65) 15, 7C (50) 13, 7H (83) 17, 3AZG (28) 5, 3V8FA (6) 23, 4S7s AM PT YL 14-15, 4X4s BK BT BX FK FQ GS GU IO all 2-4, 9S4s 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: BVIUS (163) 14, CR7CO (185) 14, DU1s CV 15, VVS (185) 14, JA6HK 15, KAs 2FC 2KC 2LZ 2NA 2WK 5CL 7HH all 13-15, KR6AD 13, KX6BP (290) 14, VSs 1CZ (170) 14 and 6AE 14 were pedestrians overrun. Neighbor K6DNH preferred the same Formosan, HC8GI (140) 3, Pitcairn's VR6AC (143) 5, VS1 VS6, VS2DW (169) 14, XZ2AD (145) 14, YS1MS (195) 19 and ZK1BL (130) 1. A modest 120 watts carried K2CJN to a phone-only record of 155/141. Steve's most recent successes include Sao Thome's CR5SP (140) 6, KC4USA (290 s.s.b.), KJ6BM, KM6s AX FA4 (220), KX6s AF BP, KP6AK, HA5AP, LZ2KN, MP4KDS, SUIAS (137) 4, UB5WF, UQ2AN (113) 13, VKIJJ (130), YK1AC (125) 3, YO5 3VA 3VI, ZC4AH and ZM6As. Russian phones heard but not yet worked are UA3CR, UC2KAB, UB5KAA and UR2KAA. VE5HR gave a rather rare North American prefix to DU7SV (196) 14, UA4FJ, VR3D, ZK1BS and ZM6AT. AP2BP (315) 1 and VQ4EO (295) exchanged a.s.b. salutes with K2GMO. Here and there, at W2DAM: KA8WK, KH6ABH on French Frigate Shoals, K2BZT: EA6AR 5, HI6EC 21, MIB 2; W8BZR: FT2US, HH2Y, KG6NAA, YN1ARM, W4HKJ; KH6BBY/KW6, 4S7YL (105) 12, W6JPC: KC6UZ (230) 3, DL2CZ: HR3HH (170) 6, VP1OLY 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 6AJ (160) 6, 6AU (100), 6BH 9AH (190), CT3AN (135), DU1AF, EA5 6AM (135) 3, 6AS (123) 2, 8AI 8BB (160), 8BC (180) 17, 9AY 9AZ 9BC, F9RY/FC, FB8s BC (115) 4, ZZ (132) 13, FF8AP (116) 17, FM7s WF WN WS, FO8AB, FP8AP (182), FUSAC, GD3UB, HA5KBA, HI8FR (171), HRS 2WC (s.s.b.), 4WA, HZ1AB, I1RC/Trieste, IS1s BV (150), EHM ZFC, IT1s BXX ZCY (176) 6, JA6B, KA9JG, K4AMV/KS4, K6KIN/KW6, KC4USV (280) on sideband, KC6CG, KC6s 4AA 6AFT 6PAE (265), 6CX 6IG of the Bonins, KX6s BT NC, KV4BB, LX1DA (115) 3, LZ1KSI (250), MP4s BBW KAC, OD5s AB (120), AU BO (165), CY DA, OQ5PE, OX3s CP KW, OY2Z, PZ1AD, SP5GC (150), ST2DB, SV6WS, TA3US (198), UAs IRE 2KAW 6KAH, UC2AA, UO5KBR, UP2s KAB (118) 3, KBC, VK9s BW BD (170), RH (145) of Norfolk Isle, RM WG WP (208), VPs 1EK 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-wattter 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 JALAGU (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 inverter to round out a neat self-constructed installation.

(Photos via K6DV)

of Turks, 7NZ, VO2s 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, YS10, 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 unike-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), UO2AN (190), VR2BC (257), VU2JP (240), YU3JN (253), 4X4s BL and FF (210) from his stalk list. . . . CR9AH, JAIANG, KA2KS, KR6AF, KV4BD, KX6ZB, VP5MS, YN1KK, ZP5KA and several ZLs clicked with W6ZZ . . . Miscellaneous DXccepts, 21-Mc. A3 luck at K2BZT: OD5DA 1, MP4 in Kuwait. K2ENO: CN8s JD JR, W4YOK: CN8HO, VPs 10LY 5RR on Turks. K4DAP: YN1BW, K4DRO: HClARE, W5GAI: HR2MC. W7PEG: HR3HH/9. W8YIN: KR6PI (190) 17-18. DL4ZC: VPs 6AM 7NF . . . CRs 6AH 6AJ 7CO 7CR 9AI, CT3AN, DU2s IIV 6IV, EA8s 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 VQ, 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, 0WE 0WK 0WN 0WO, VPs 1JH 8BP 8BS, VO2s 2SB 3DQ 4DS 4FA 4LA 5EK 5GC, VSs 1EB 1FE 2DB 2DS, VU2s JP RC RX, ZBs 1AJX 1AY 2P, 5Ds 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 1K 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 hooks. W1ANU's new DX-100 captured GD3FXN 21, SPIKAA (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, SV0WE 17 of Rhodes and VO2GR . . . Epistolary epitomizing, first W1CTW: KB6BA, UA3BF, 4X4BD. K2BZT: LZ1KZP, K2ENO: DM2ABB, SV0WO, W3BBO: KV4BK, SP8CK, VU2EK, W4YOK: EL2F, VO4RE, K4DAP: CR6AI, EL SP, K4DRO: YL HCWK, VP2GN, W6HPB: HClARE, W6ZZ: HA5BW, K6EBH: OK1MB, K6JTG: KA2MA, KG1KK, KX6NC, VR2CV, W8AYS: UC2, YO3LM, ZB1AY, ZP6CR, W8YIN: VS6DI (37) 15, W9FNX: ZL4MK, 111R: JA8AQ, VS1GV, KL7BPK: KG4AK (20) . . . NCDXC and WGDXC recommend CR9AH (50) 14, OD5AV (37) 23, UA0KQB (65) 14, UH8KAA (25) 14, UB5UB (75) 4, VQ4EO (28) 15, VS1GZ (36) 17-18,

VU2HF (60) 13, YN4IIA (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: ZB21, 21 countries on 5 continents. KN4IFB: KV4BK on 10 watts. WNBEEZ: OH5OT, VO5GC, WNBGEL: WH6BTH, WP4AFH, KV4, KN0CER: 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) 8, W7QNI: heard UA6TAR, W3ZYD: hears W6s after UL7KK, K9AUB: KM6FAA 12-13. . . . Novicewise, KN6RG0/6, KN0CER and KN0EOV respectively worked WH6BUA, WP4AEF and WH6BTW around 7160 kc.

10 phone treated W8YIN to KB6BC (625) and helped W6SUQ to his first Peruvian, OA4FF (606). W1ANU tried the north-south summer path for HI3DL (1000) 18, PJ2AF 23 and then hopped the pond for CN8FK 19. . . . DL7AH credits PV1HQ 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 FR, PJ2s AA AB, SV0WE, VPs 1EE 1EK 1SD 3HG 5RR 7BD, VO2s 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 entity and will be there for several months. All my VP7 QSOs will be QSL'd direct soon." This from wandering W1TBS who also bercoans 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, OM, 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, W9QGI, DL4ZC, TG9AD, ZD6BX, K. Sketheway, ISWL, NCDXC, NNRC, W1A and WGDXC contribute:

- GN8JD Box 30, Navy 214, FPO, New York, N. Y.
 GN8JR Box 40, Navy 214, FPO, New York, N. Y.
 DL4YK E. F. Diehl, jr., 7680th Ordinance Co., APO 19, New York, N. Y.
 DL8UU (via DL6EN).
 EL1FI/MM (via ARJ).
 ET3AF (via SSA).
 ET3AH (via RSGB).
 F9RY/FC P. O. Box 30, Bastia, Corsica.
 FE8AE M. Veber, Box 408, Douala, French Cameroons.
 FE8BT, Box 971, Dakar, French West Africa.
 FC7XC, P. Antenor, Raizet Airport, Guadeloupe, F.W.I.
 FV7YY (via FV7A).
 HB100/V5 (to HB9QO).
 HG1ARE (to ARE).
 HC6KI, L. Ramano, P. O. Box 104, Ambato, Ecuador.
 HD2Y, Box 428, Port-au-Prince, Haiti.
 ex-KB6LT, K6LLT-KA1RW-XU8RW (to W0FUA).
 KH6BBY/KW6, c/o C.A.A., Wake Island.
 ex-KL7AOL (to W8IZS).
 KP4CA, USCG, APO 845, New York, N. Y.
 KX6BT APO 187, San Francisco, Calif.
 LA9PA/P, M. Tilley, Tafford Radio, Spitzbergen (or via NRRL).
 LZ1KSA, Box 547, Sofia, Bulgaria.
 MP4KDS, B. Khantrouiti, Ariliban, Kuwait.
 OA1M, R. Hislop, c/o International Petroleum, Talara, Peru.
 OD5BC, Box 2559, Beirut, Lebanon.
 SM5JK, Spitzbergen (via SSA).
 UA1KAE, U.S.S.R., Antarctic Base (via Box 88, Moscow).
 UP2HW, S. Uzdavynys, 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, K0EXN, RR 2, Webster City, Iowa).
 VP6RV (via RSGB).
 ex-VP7BG Fred Perkins, PAA/RCA, St. Lucia AAFB, via Patrick AFB, Florida.
 VP8BT, O. Connoch, 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.
 YU2RT, P. Padmanabha, Box 2487, Calcutta, India.
 YNIHF, H. Fowler, U. S. Embassy, Managua, Nicaragua.
 ZB1ZY, L/Cpl. Larsonson, COMCAN, Sig. Sgdn., 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 skeeds. 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. . . . WIWPO notes that W2TWC gave XZ20M his first Yank QSO on 21 Mc. . . . W3WPG's tug on the grapevine produced interesting reports on 14-Mc. Manchurian AC0AA. . . . Club Asianians, from WGDXC: VS1GV may sign ZC5 for a year or so. . . . KA7HH ponders KA0 DXpeditionary possibilities. . . . MP4s BBL BBW BBX KAB and KAC maintain a juicy Persian Gulf network Fridays on 40 meters. MP4s BFB 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.); as 1800-1000 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 ST1s 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 DX contest 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, ex 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.

»

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)

Via W3JNN, PA0KOP reports that JZ0AG worked over 500 stations on 20 meters through sporadic on-the-air sessions during the first six months of last year. JZ0 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 Oceanograms: VS4s BO and NW team to make Sarawak less rare on 20 phone, while VS5AT is new in Brunei. CR10AA runs 10-15 watts to a Windom and receives with a home-built 6-tube super. The former CR10AA 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. GB3FSF 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-wattter 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 PA0UN that seven Albanian stations now are licensed. Some calls are ZA 1A IUB IUU and 2CF. They are said to prefer QRP phone in the fashion of native 3A2s (local vocal) but ZAIUB 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. 2000 just wouldn't come back.

Hereabouts — Old-timer UX gourmets doubtless will recall the rapid signals of K6ILT, KB6ILT, KA1RW and XU8RW in years immediately preceding WW-II. Their proprietor now spans a solid sender on 80, 40 and 20 from Pineville, in Missouri's Ozarks, under the call W0FUA. 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)



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 hosted 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 Whitecomb. 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 KN6RDII. 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, K6ELA, (left) and Joyce Harrington, KN6QCL, (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 W6HC, 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 Gillics, W6QPI, Race Chairman, flew the route as an observer not as a participant) was KN6SBC, 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, WIBDI, Communications Mgr.
GEORGE HART, WINJM, Natl. Emerg. Coordinator
PHIL SIMMONS, WIZDP, Asst. Comm. Mgr., C.W.

ROBERT L. WHITE, WIWPO, DXCC Awards
LILLIAN M. SALTER, WIZJE, Administrative Aide
ELLEN WHITE, WIYYM, 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 W0MAO 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. 12.32; (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 XELM,

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 W7s 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 sure that I 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)



With the AREC

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

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, 23,250 kc.

NATIONAL RTTY CALLING AND WORKING FREQUENCIES

3620 kc. 7140 kc.

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



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, W4NVE, K4CTU, W4OJP, K4AZM, K4ANW; back row, l. to r. (omit YLs): W4YCL, W4BTM, K4AZQ, W4PBS, W4OQL, W4VGT, W4HJM, K4HOB.

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

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 LYT/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. — W4LYT, SEC E. Fla.

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.

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.

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.

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.

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.

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 QKL NAI NOC; K2s ACA AMZ BSD CUQ DJN GVM IYP QIX RDB W3WUE.

BRIEF

WIMZE 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 W0QVA. That's Dick, W0QVA, at lower left, long a leading traffic light in TLCN and TEN. Seated at right is W0AUL, the first TEN Manager. Behind him is W0SCA, second TEN Manager and presently TCC Director, NTS Central Area. To his right are W0TTO, third TEN Manager; W0DQL, fourth; and W0KJZ, 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 QNT'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.

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
W3COL	63	787	801	176	1627
W0CPL	8	705	655	50	1418
W2KEB	43	570	386	163	1162
W3CVE	10	573	542	31	1156
W2KFFV	11	568	390	147	1116
KH6QU	64	519	421	62	1066
W0SCA	17	524	519	2	1062
W9EHZ	16	515	472	44	1047
W0GAR	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	842
W6DDF	112	367	357	10	846
W0BDR	22	391	328	9	750
W4UHA	8	355	332	6	701
W9NZZ	215	238	3	234	690
W7QJU	34	61	315	254	664
W5DTA	5	298	336	6	658
W8UPH	18	319	234	76	647
W0BLL	2	319	312	5	638
W9JYO	240	182	160	22	604
W3WG	10	279	242	41	572
W0KQD	42	282	233	2	559
W0LGG	37	274	240	3	554
KR8ME	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
K0FEI	15	281	269	12	577
Late Reports:					
K0FEI (May)	77	469	463	7	1016

BPL for 100 or more originations-plus deliveries:

VE1OC 143	KP6AK 120	Late Report:
W0KJZ 140	W4DDY 116	W7VAZ (May) 120
KP4WT 131	W0NIY 106	

More-Than-One Operator Stations

Late Report:
W2CXM (May) 237

BPL medallions (see Aug. 1954 QST, p. 84) have been awarded to the following amateurs since last month's listing: W5FEC, W9WWJ, W0TVI, W0ZWL.

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	Stations	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.; USN (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 topped 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; A1 is running for Kentucky SCM. W8KJZ 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., 8 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 K0WBB and W2AEE to regular TCC work has put a big hole in the effectiveness of the corps while managers W8KQD and W8UPB struggle to find replacements at the worst time of year. Central Area TCC goes along as usual, with W8BDR and W8SCA holding the fort, and with W0s 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 W60WP 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

W1FH266
 W8HGW265
 W6AM265
 W9NDA260
 W6VFR259
 W6MX258
 W6ENV258

Radiotelephone

PY2CK249
 W1FH240
 VQ4ERR240
 ZS6BW237

KZ5CP201
 W5KUJ200
 G3BKF192
 W4QCW191
 W7EEN191
 W6CTL190
 FASDA188
 W7ADS184
 H1AMU184
 W5MET182
 W1BIL180
 W1BLO180
 W1ZW180
 W6JK180
 QZ3FL180
 W3MFW179
 D17AB179
 W8EV175
 W3VKD174
 W2BYU173
 W8ID173
 W6DBP173
 W8VP170

Radiotelephone

W8GZ222
 CN8MM220
 CT1PE184
 H1AMU181
 W6GVM180
 PY4VX180

W/VE/VO Call Area and Continental Leaders

W4TO130
 W2VYH118

Radiotelephone

W2BXA203
 W4HA201
 W5BGP218
 W7HIA185

NEW MEMBERS

HA5KBA125
 W81DY122
 DL7CX122
 W4EO116
 W7LYI116
 SM5BAF116
 W4CYR112
 W8KAK112
 HB9MC111
 F9MS110
 W6GMF108
 YU1AA108
 HB9OA107

Radiotelephone

E4ZVE124
 W2PUN119
 W81DY114
 I1CBZ114
 W3HLX112

ENDORSEMENTS

W2HUQ251
 W5BGP220

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.

AWORD 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.

ACOUPLING 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

Birdfaller Jr. *W. J. Halcyon 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 Coordinators 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 mobilizing 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, GY 40, ZRQ 38, BNR 27, BFF 18, PYF 18, OCG 17, AXA 16, NQB 15, CNO 13, WUE 12, EAN 9, DUJ 7, BBS 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, HFZ, with ZGN as trustee. ZBR 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 Window 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 "Waylarc" 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: W3CWE 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. K2CWX, K2CPR and VX participated in the recent Frequency Measuring Test. We hope to appoint K2HPV, Penns Grove, 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-ardman 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/PRL, 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 Cataragus 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. K2HWV is active on 20 meters. RMB demonstrated RTTY at the SARA's May meeting. K2QOQ is on 15 meters. Corning has a 6-meter local net. K2s BHP and GWG and W2s YPQ and W2M 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: BJJ, 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 SARA. 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. KIVY 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)

designed...

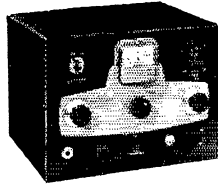
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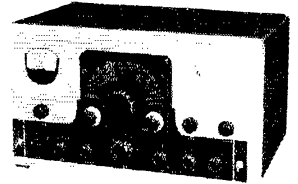


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VIKING "VALIANT"— Built-in VFO or crystal control. Pi-network antenna matching from 50 to 600 ohms — final tank coil silver-plated. Timed sequence, break-in keying... TVI suppressed... high gain push-to-talk audio system... low level audio clipping... 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.

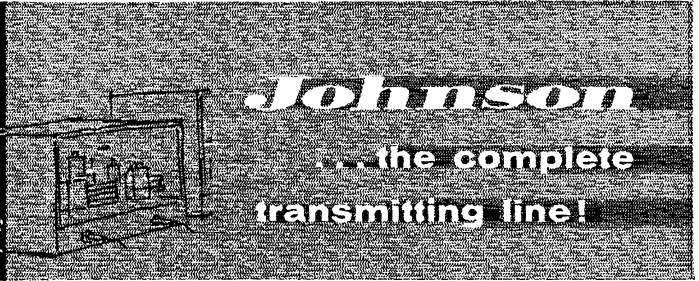
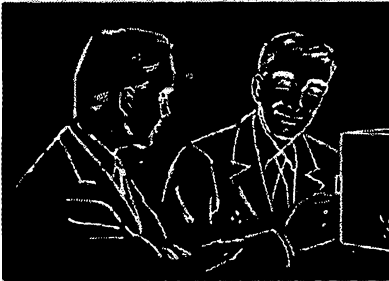
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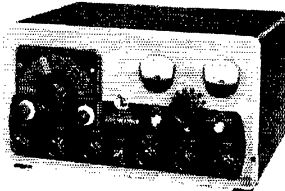
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Amateur radio is lots of fun! And the fortunate amateur who owns Viking equipment enjoys the maximum amount of operating pleasure and performance. Owning a Viking means more than just having the best transmitter... it means more than the DX record 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.



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.

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(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.

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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.

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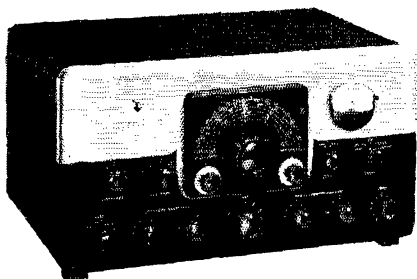
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35 watts AM. Bandswitching
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VIKING "PACEMAKER" — More than just a single sideband exciter . . . a completely self-contained transmitter as well. Extremely stable, temperature compensated built-in VFO. "Fool-proof" 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.

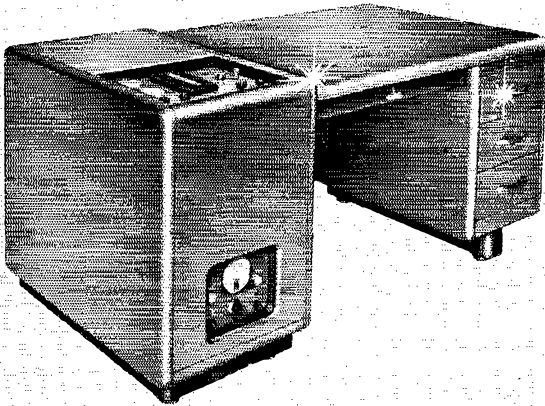
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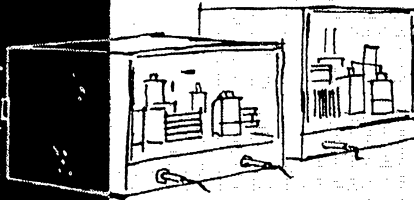
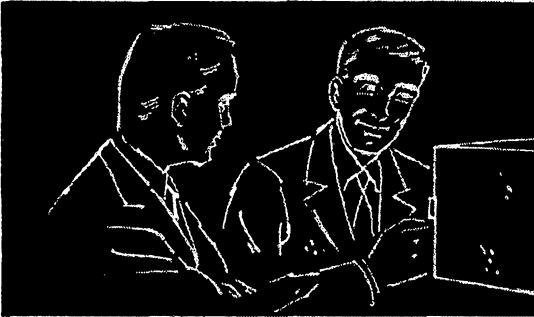
**1,000 watts AM, CW
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VIKING "KILOWATT" — Boldly styled — contains every conceivable feature for safety, operating convenience, and peak performance. Low power or maximum legal input with the flip of a switch. Continuous tuning 3.5 to 30 mc — no coil 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.

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Matching accessory desk top
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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.

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Kit **\$73.50 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 1TK to W3GV, in memory of the late Dawson Biley, 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.; HFB, vice-pres.; LSS, secy.; UQC, treas.; and STK to fill the director's post vacated by TXZ. Ex-9DFFX is now 3HAO and is living in Monessen. Traffic: W3WIO 1965, YUL 67, ZEG 45, YA 12, LSS 10, UTR 3, UEN 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 H&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, OBEY, 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. YLRJ's new officers are MXI, KN9CQF, STR, and KN9BOC. New officers of the IARK 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, 6SIR. 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, VYQ 250, DUA 207, UBI 125, YIX 114, AA 91, BUK 54, YEG 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 Kewanee, 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, YVWF/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 *Baton*, 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, UXQ 165, SVZ 153, DGA 133, SVL 133, JOZ 132, TQC 128, UQP 112, WVD 96, KTX 74, DHJ 61, BKJ 53, NTA 52, LCD 43, VNV 36, ATX 33, PCQ 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, VVS 6, RZS 5, BVR 4, EJW 4, HUF 4, LGZ 4, KN9AVH 3, W9DZC 2, LIT 2, ZSW 2. (May) W9EHE 42, FGX 8, LDB 2, AAW 1, WLY 1. (Apr. W9FGX 10).

WISCONSIN — SCM, René W. Goetsch, W9RQM — SEC: OVO, PAMs: AJU and NRP. RMs: KQB and BVC. 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 mol. and c.d. frequency: 29,620 kc. CXY took part in Armed Forces 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 KLT 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 YV6AA. 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 .0003 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 vacated 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, W9KTZ — 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 K9BEA. Winners of the main prizes were ORU, an NC-300; GWJ, an Elmac transmitter, K9BEA 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, K9CNC the state, and KN9CXJ the Novice. ECG and POT arranged furloughs for the annual event. HNV worked 21 states on 6 meters in less than a month. K9CND is back on phone with a home-brew modulator and Adventurer. Thanks, Kirk and Bruce, for the station activity reports. K9ATK installed a new Gonset G-66 receiver in his new Mercury just in time for his vacation in Michigan. Traffic: (June) W9FVG 42, KTX 9, IHM 1. (May) W9FVG 32, K9ADI 19, W9HGM 12, KTX 11, KLP 8, K9CND 6.

SOUTH DAKOTA — SCM, Les Price, W9FLP — SCM assistants are APL, YKY, HOE, 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 10, average 1.55; 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 KN9CJV. K5EEV stopped at Centerville in June. DTB, of Centerville, was married to Shirley Ebsen, of Bereaford, June 11th. DTB is

(Continued on page 86)

FOUNDATION OF THE FINEST AMATEUR RIGS...



EIMAC 4-250A

Radial-Beam Power Tetrode
Typical Operating Conditions
(Frequencies to 110Mc Per Tube)

	CW	AM	SSB
Plate Voltage	3000v	3000v	3000v
Driving Power*	2.6w	3.2w	0w
Power Input	1000w	675w	630w

*Driving Power Increases Above
40Mc.

The Eimac 4-250A's pictured above are the backbone of a popular and widely duplicated piece of ham equipment—the 4-250A final amplifier.

These tubes are running 1000 watts input AM phone, yet they're still well below their maximum ratings. And, they will continue operating at this high power year after year.

Conservatively, they handle one kilowatt input from 80 to 6 meters, AM, SSB and CW. In addition, low grid-plate capacitance, coupled with low-driving power requirements, mean substantial simplification in associated circuits and driver stages.

Weigh these advantages... you will find that the Eimac 4-250A is a sound investment. It is your assurance of quality and dependability.

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The World's Largest Manufacturer of Transmitting Tubes

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: W0SCT 154, CTZ 17, FLP 12, DVB 9, GWS 2, QKV 2.

MINNESOTA — SCM, Charles M. Bove, W0MIX — Asst. SCM: Vince Smythe, 6GGQ, 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 zood 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 W0PDS 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: W0KJZ 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, K0FCU 7, W0NTV 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 Elmaes 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 W-Land. IIM and QOK 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 Graystone 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 Alou-tain and Memphis Clubs. K4EFV reports he and K4ECZ are now General Class in Madison. LFV is now on 6 meters, and his curiosity is aroused by a still-secret "project" of IIMH 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, W4HMH 123, VJ 59, BQG 57, TZD 50, UVL 34, IV 29, K4BHM 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, W1EWG 5, TIZ 5, UWA 5, W3AKJ 4, K4DSI 4, W4FFB 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, 8AQ4; 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. IYJ has been pushing traffic to the Deep-Freeze gang in K4-Land. MOH now has 34 states on 50 Mc. and 13 working 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 MOCB 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, QOQ 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.

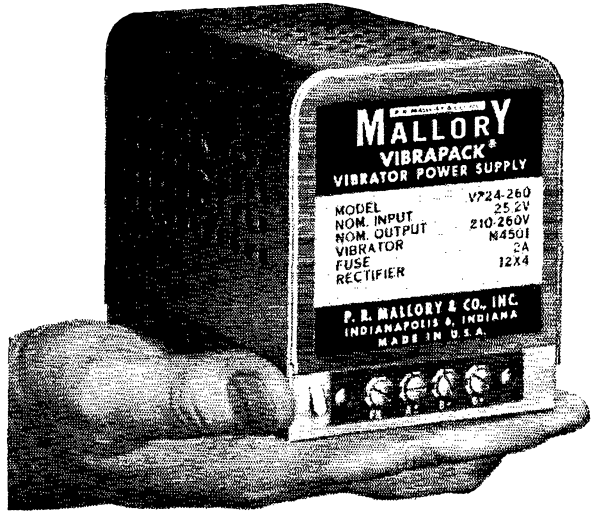
OHIO — SCM, Wilson E. Weckel, W8AL — Asst. SCMs: J. C. Erickson, 8DAE; and E. F. Bonnet, 8OVG, SEC: UPB, RMs: JAE and FYO, PAMs: HPP and HUX. 6WMV (ex-8QFZ) came back to Canton to bury his mother. The Massillon ARC had a speaker from Goodyear Aircraft, RMJ, YAC and JID have new 75A-3 receivers. DSQ passed 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. Q18 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, AR 22, HJZ 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; NYSFETN 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)

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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.

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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, EHT 56, EDH 15, BE 4.

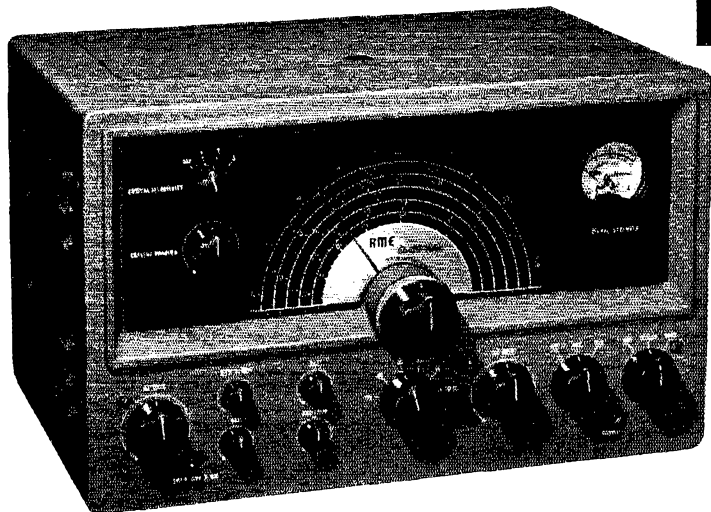
NEW YORK CITY AND LONG ISLAND — SCM. Harry J. Dannels, W2TUK — SEC: ADO. PAM: OBW. RM: WFL. Section Nets: NLI, 3630 kc. nightly at 1930 EDST and Sat. at 1915 EDST. NYC-LIPN, 3908 kc. Mon. through Sat. from 1730 to 1830 EDST. The section was well represented with Field Day activity. Sixteen messages were 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 KJV 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. YHF 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 RYV 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, KVF 1116, JGV 97, K2DEM 2 67, W2AEE 68, TUK 65, WFL 56, ZUM 51, K2AMP 47, KXZ 32, OPJ 31, DVT 27, W2GF 25, K2RJO 23, W2PDU 21, FTY 20, K2LWK 19, W2LPJ 18, LAG 13, K2IHD 12, W2HAC 10, PT 10, DUS 9, K2JZR 8, 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. Manganon, 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)

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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.

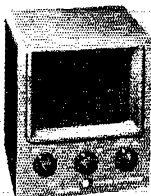
Large, evenly graduated, illuminated dial covers all six amateur bands from 1.76 mc to 29.8 mc (160 thru 10 meters). Unique differential 75:1 or 1:1 ratio tuning control. Plates in tuning condenser are triple-spaced to reduce drift and microphonics. Selectivity control with four positions. IF curve is 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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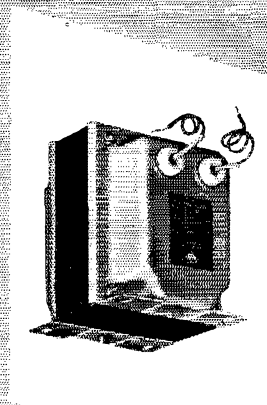
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C-32AL	\$19.65	20/4	35/350	105	5000
C-38AL	\$35.00	25/5	50/500	65	5000

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Type No.	List Price	Ind. Henries	Current Ma.	Res. Ohms	Test V. RMS
C-42AL	\$19.65	8	350	105	5000
C-45AL	\$35.00	10	500	65	5000

Write for Catalog TR-56D, listing Triad's Complete line of transformers for amateur use.



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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 a 12-day cruise aboard the SS *Santa Rosa* on a Caribbean course to South America and the Netherlands Antilles. CVU 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. IIXU 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 230-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

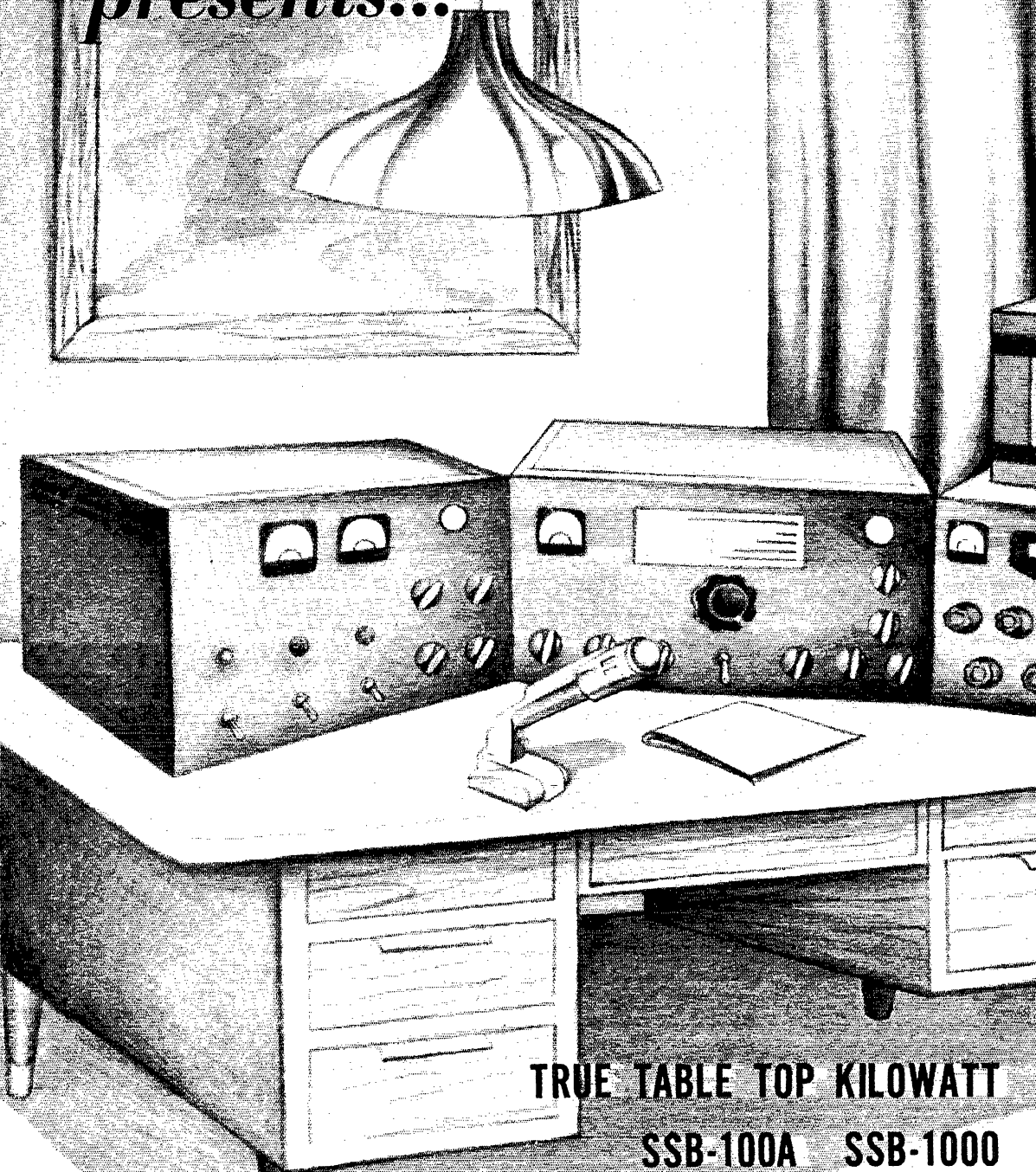
IOWA — SCM, Russell B. Marquis, W8BDR — TWX Iowa City, and WDS, Batavia, have joined Silent Keys. The annual 160-meter Net Picnic was held in Webster City with 167 hams present. NVX, Midwest Division Director, was the featured speaker. New officers of the Council Bluffs Radio Operators Club are LGO, pres.; YXI, vice-pres.; and RQW, secy.-treas. MG has been appointed the new SEC for Iowa. UFD has received an ORS appointment. QVA renewed his RM and ORS appointments. K8DBW received a TLN Section Net certificate. K8X and PIK, Cliff and Mable, are moving to California. EFL is being assigned kitchen duties since his XYL LAG is in line for a medalion with her third BPL. GXQ and RQW are new TLN members. Field Day messages were received from 17 set-ups. K8ANL 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 rotor for his 2-meter beam. PTL vacationed in California and K8AEY 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, IBDI, attended the Des Moines Club meeting and gave a nice talk on ARRL activities. K8GHI is a new ham in Swea City. Traffic: (June) W8SCA 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, VJL 22, VWF 15, K8BEC 11, DBW 11, W8FDM 10, NYX 9, RQW 9, BSG 8, K8VAZ 6, W8ZPM 6, IHC 4, HNE 3, FMZ 2, QQA 1. (May) W8PZO 179.

KANSAS — SCM, Earl N. Johnston, W8ICV — 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/0; the El Dorado Kansas Amateur Radio Club, LUI/0; the Central Kansas Amateur Radio Club, K8AST/0; 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 IIP 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)

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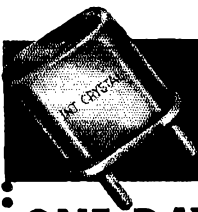


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MISSOURI—SCM, James W. Hoover, W0GEP—The Suburban Radio Club literally "smoked out" some equipment troubles during Field Day—lightning ruined a 10-meter beam and heat, along with humidity, finished some transformers and condensers. The Bandhoppers Radio Club smoked out some difficulties in a 75A-2 and an Elmac AF-67 on the same occasion. WEF 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 K0BBDT, 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 Traffickers 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: W0CPI 1418, GAR 1044, GBJ 352, QMW 84, HUI 81, KIK 51, WFF 3, OUD 44, SAK 23, RTW 26, HR 22, BUL 8, QVV 9, EBE 8, YKC 7, ECE 6, K0AWC 4, W0GEP 4, MFB 4, IIV 4, WAP 3, K0BBDT 2.

NEBRASKA—SCM, Floyd B. Campbell, W0CBH—Asst. SCM: Tom Boydston, 0VYX SEC; 1DJ, 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 auto-mobile. 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. K0CDG 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 ZVG, alternate. Tabulation for the three Nebraska nets are: 75-meter emergency phone net, 1230 CST (3983 kc.), QNIa 635, average 21.2, traffic 39, average 1.3, time in minutes 732, average 24.4. The Morning Net, 0730 CST (3983 kc.), QNIa 461, average 15.4; traffic 74, average 25.7; time in minutes 980, average 32.7. NSS Net QNIa 181, average 6; traffic 25, average 0.8; time in minutes 1134, average 37.8. Traffic: W0ZJF 238, DDT 144, UJK 106, MAO 91, FSX/0 49, ZWG 31, ORW 30, EGQ 24, TIP 20, K0CDG 19, W0DGW 18, SPK 18, ZOU 13, VGH 12, K0BDF 8, W0BYK 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 BILL, 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 PA0, 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)

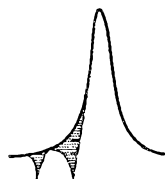
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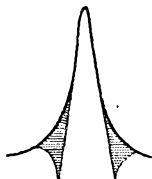
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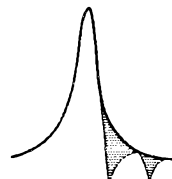
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an average of 8.4 with R6B (23), KYQ (22) and AW (19) leading. QNL, GNS has a new Viking and v.f.o. going at Bristol. Novice KAM is busy on 80 meters at Milford. INP is CAP Director of Communications for Connecticut. CAP Traffic: WYBH 333, AW 232, KYQ 166, EFW 127, YNC 117, RGB 78, DHP 49, ULY 39, CUH 38, IUC 35, TYQ 32, RRE 25, BVB 20, BDI 9, GYJ 9, HYF 6, AVS 4, KV 4.

MAINE — SCM, Allan D. Duntley, WIBPL/VYA — SEC: TVR, 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 Parice, 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: WILKP 90, WTC 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: MKV Dennis, SS Lincoln, LQQ Hamilton as ECs; JNV, QLT, MKW, LQQ and WK as OOs; SRG and LQQ as ORS; 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. WNIWK 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 KIUSA. SSS has a new T-90 transmitter. WGN has a new son. SPE has a TBS-50D with VFO on 3.8 and 7 Me. HBM is on 15 meters with a DX-35. WN1s KBY and LLT, 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 29,000 kc. for QSOS and any information. Area 1 Radio Comm. held a meeting with RTG, TQZ, 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 RAQ. 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 Gosnet 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, FQG, 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. 41RF, who was at KIUSA, 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) WIEMG 287, KIUSA 214, W1AVY 55, GNX 44, LDK 30, AUQ 29, CUW 21, UKO 21, BPW 11, SMO 10, TY 9, WU 9.

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MOBILE TWINS

GONSET

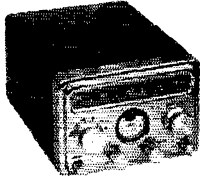
G-77

G-66



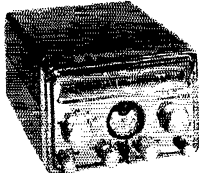
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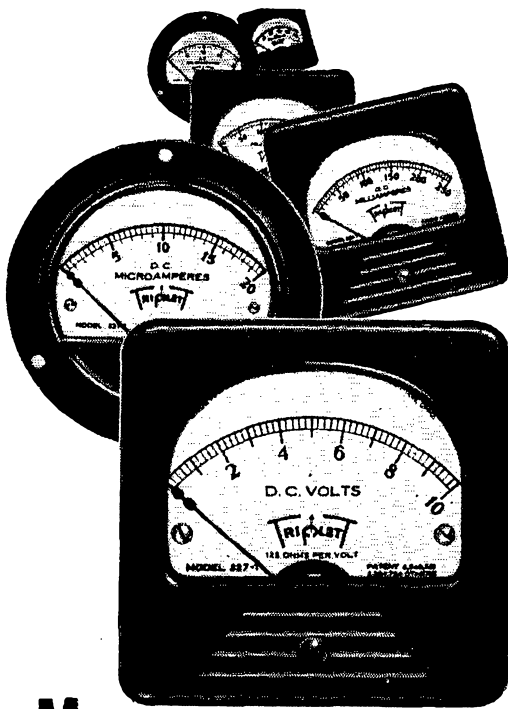
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BGW 8, QLT 5, CAM 2, CGM 2, (May) WIIBE 42, UE 22, NUP 10, AOG 9, AHP 4, ATY 2.

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 Montachusset 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 Brass-pounders 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 AI-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 RFB 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); WTPN, 3860 kc. (Sun. 0930); GMM, 3860 kc. (Mon. through Fri. 1200-1300). OQ, OBS, OPS, and EC endorsements went to AVE. UGW enjoyed the April CD Party from 4KCC 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 GMM 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 work. Jerry now is mobile on 10 meters in a brand-new Plymouth with Vermont license plates 73881. A notch behind on 10-meter phone is EKV 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. K6KVV (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)

FIRST TIME EVER! BUY DIRECT & SAVE!

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1 Transmission Line

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- 38 lbs.
- 52 ohm match
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Radio Specialties Swing-A-Boom permits rotation of the boom and elements in vertical or horizontal planes so tuning adjustments are made possible from the tower.

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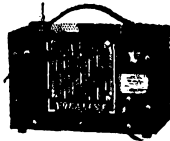
NAME _____

STREET _____

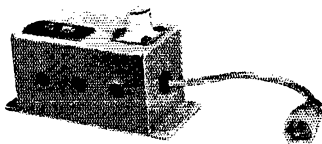
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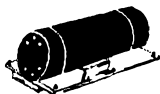


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are back home in St. Johnsbury. VSA is the new Burlington Area EC. Club station TRZ/1 did well in the Field Day on 2 and 6 meters at Hog Back Mt. DCZ left for the Navy. New members of the Tri-Club are FHH and wife Helen, 9BCA, who now are living in 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: W10AK 8t, 1P 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. RKL 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. YIH and YIC 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. JCI is on jury duty, so no hamming there. HDN's garden activity is long, ham activity short. TAF 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. WJW is on the sick list. OEY, 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. YVE 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 hands, 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, HJL 39, GUR 32, OMO 30, YUY 28, HDN 25, VIL 21, TMF 20, KLE 13, WPW 9, BVH 7, VCX 7, CJJ 3, RGS 2, (May) W7TLC 44, VIL 34, KTG 2.

WASHINGTON — SCM, Victor S. Gish, W7FLX — 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 a.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 —

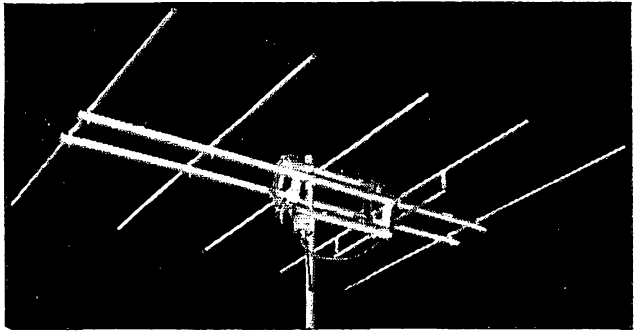
(Continued on page 100)

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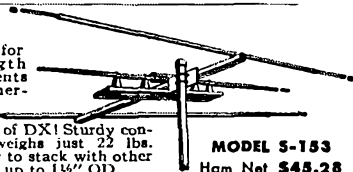
Features full length director and reflector with compensated transformer-coupled driven element. Weighs just 20 lbs. but built to take it! Pre-tuned and color-coded for quick assembly.



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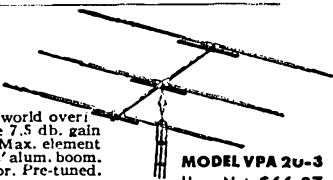
A real hot beam for 151' Full length parasitic elements with transformer-coupled radiator give 7.9 db. gain for lots of DX! Sturdy construction yet weighs just 22 lbs. Pre-tuned. Easy to stack with other beams on masts up to 1 1/2" OD.



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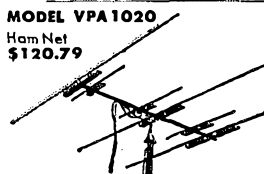
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cheap, he says. HDT signed up the only ham in Garfield County, to work with the Asotin County gang in the AREC. UQY rebuilt the transmitter very successfully. PUA is vacationing in W2-Land. EHHI is laid up with an old knee injury. WN7BEC is building 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, EHHI 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. KGGMU, 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 W6QD. Traffic: K6DYX 331, W6BET 204, HC 155, YHM 154, ZRJ 33, K6JTG 6.

EAST BAY — SCM, Roger Wisnom, W6FDJ — Asst. SCMs: Harry T. Cameron, 6BVC, and Oliver A. Nelson, 6MXQ. PAM: LL, RMA; 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)

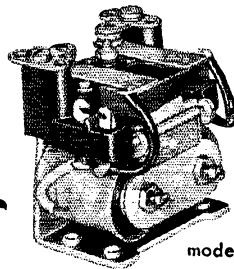
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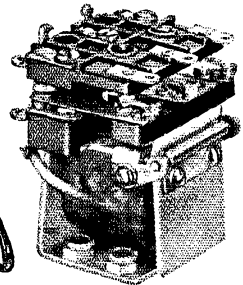
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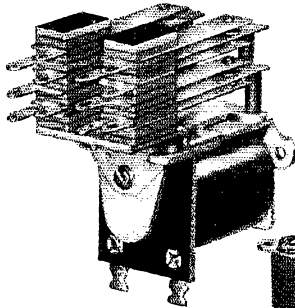
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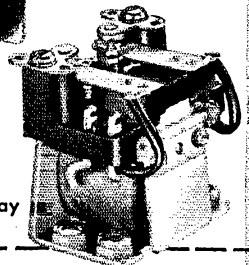
model DOSY relay



model DO relay



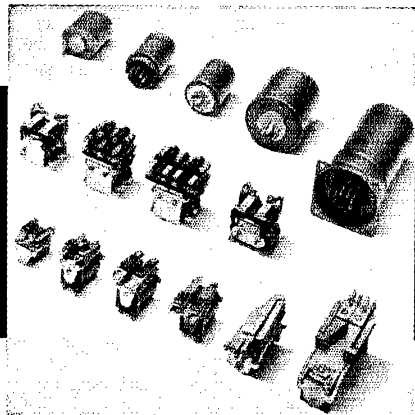
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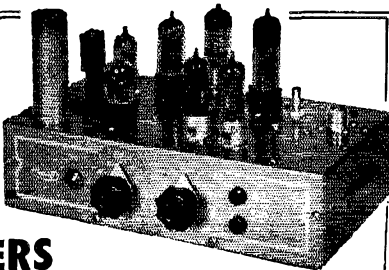
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2

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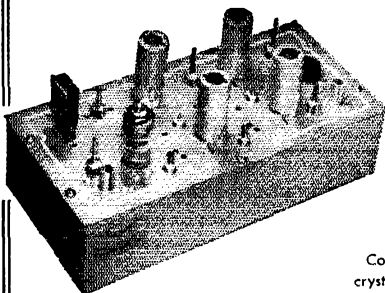
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tion followed by refreshments. The Mt. Diablo Club held an election and chose OHR as its new EC. New officers of the Skyriders include TM, pres.; ACN vice-pres.; MNK, secy.; ANK;XYL, treas.; ANK, N. C.; ELP, A.N.C. Good luck, gang! K6WAY had some equipment trouble but still had a traffic total of 266. Traffic: K6WAY 266, GK 216, W6QDW 15, K6EPC 29, 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 2fers 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, K6QII, K6JRZ, K6QHY, K6ASO, and K6GQJ are all members. K6IHLL, K6JFS, K6IYW 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. K6LIA 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 line 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 YLRs 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 Sanginetti on July 15th. PHT is back on the air busily handling traffic for the Mission Trail Net. Traffic: K6IFM 68, W6GQA 22, GGC 19, GHT 11, PHT 11.

SACRAMENTO VALLEY—SCM, Harold L. Lucero, W6JDN—Traffic and activities have slowed somewhat because of the vacation period. K6FHT 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. Follows, 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, 1BDL of ARRL, President Dosland and Mr. Bullong during the National Convention. Sorry that more of you couldn't have had the same pleasure. Traffic: K6FHT 70.

SAN JOAQUIN VALLEY—SCM, Ralph Saroyan, W6JPU—The Fresno Amateur Radio Club held a very successful Field Day above Auberry. K6GSWO 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.a.b. SSL and his XYL spent two wonderful weeks in Honolulu. ZFN is putting out a nice signal mobilizing, and KMB has an Elmac with a good signal. PPO is back in Fresno and on the air with a Phase-master s.a.b. rig. NTK is back in Fresno and is active on 2 meters.

(Continued on page 104)

HI JIM, HEARD YOU WORKING THAT DX STATION. HOW DO YOU DO IT ON THE LOW POWER YOU RUN?



EASY, BILL. I'VE GOT A GOTHAM BEAM. I'M WORKING STATIONS I NEVER HEARD BEFORE. DX IS A CINCH NOW.



THAT SETTLES IT, JIM. I'M GOING TO GET A GOTHAM BEAM TOO. ARE THEY EASY TO INSTALL AND OPERATE?



VERY EASY, BILL AND THEY'RE FOOL-PROOF AND TROUBLE-FREE. LICKS YOUR NOISE AND QRM PROBLEM TOO. MY GOTHAM BEAM IS THE BEST INVESTMENT I EVER MADE.



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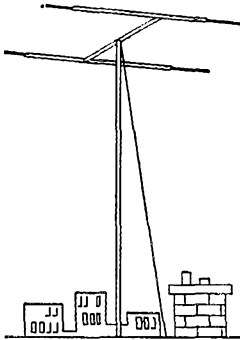
MATCHING. Matching of the transmission line to the beam is extremely simple and quick. Everything is furnished and the matching is automatic. No electronic equipment or measuring devices are required.

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 - Deluxe 4-El Gamma match 27.95 T match 30.95
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 - Deluxe 2-El Gamma match 29.95 T match 32.95
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 - Std. 2-El Gamma match 21.95 T match 24.95
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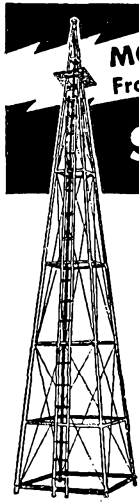
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OWL, UBK, and K6GTI, with XYLs, and K6PEQ, ZYR. JMP, PXP, QON and JPU attended the National Convention in San Francisco. K6FLF blew out a dynamotor. K6GOX has an 80-ft. tower with 400 watts on 6 meters. K6HFA got his WAS certificate and is waiting for WAC and WBE. He has worked 55 counties. 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

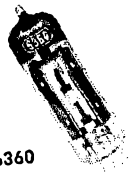
NORTH CAROLINA—SCM, B. Riley Fowler, W4RRH—SEC: ZG, PAM; DRC. The month of June found many clubs out on Field Day. Many have made a report and a good time seems to have been the order of the day. Clubs reporting: Catawba Valley, Charlotte, Kingston, Winston-Salem, Morganton, Fayetteville, Asheville, 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, RRII 10, K4ARP 9, W4VBO 9, ZWF 4.

SOUTH CAROLINA—SCM, Bryson L. McGraw, W4HMG—SEC: ZRH, PAM; FFH, RM; ARC, 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: Colo 565, Shaw-Sumter 530, RH 220, Aiken 225, Greenville (FD) 358, SPTG (DFR) 300. 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 contacts 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.h. 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 e.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 JJJ in second and third place, respectively. High Novice was KN4HQ, with KN4HKL the runner-up. Mr 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 WXEN-TV. K4EIG and KN4ERS entered gear in the Arlington Science Fair, winning first prize in their class. JJJ 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. ADP reports (jokingly?) he's had to change his QTH to escape QRM from KFC

(Continued on page 106)

6360



6252/
AX9910



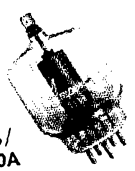
5894



6155/
4-125A



6156/
4-250A



6079/
AX9908



6076/
AX9907R



5924/
AX9904R



AMPEREX TYPE	HEATER VOLTAGE
6360	6.3
6252/AX9910	6.3
5894	6.3
837	6.3
6083/AX9909	6.3
4X-150A	6.3
6155/4-125A	5.0
6156/4-250A	5.0
5868/AX9902	10.0
6079/AX9908	10.0
833A	10.0
6076/AX9907R	6.3
5924/AX9904R	12.6



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5868/AX9902	10.0	9.9	75	0	4000
6079/AX9908	10.0	9.9	30	0	5000 800
833A	10.0	10.0	220	AB AB	5000 800
6076/AX9907R	6.3	32.5	75	B	3000 4000 6000
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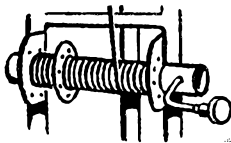
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and YZCI K4EZZL now is General Class. IYC and BJJ participated in the May F.M.T., racking up accuracies of 8.3 and 9.4 parts per million. All OOs should be highly commended for their diligence in helping us to keep ourselves inside the pasture and 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. EIJ is on 75, 10 and 2 meters. Traffic: W8KXD 74, PBO 37, HZA 52, BWK 22.

ROCKY MOUNTAIN DIVISION

COLORADO—SCM, James B. Simpson, W0HEM—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. K0WBB attended the National Convention in San Francisco. June 6th was the last time Mac was heard on K0WBB. KVD did a fine job of running interference. SOG is having a fine these fine days shooting film instead of pounding brass. K0CSW is on his way to Korea; he hopes to get an 1L call and give the gang some DX. LZV was so disgusted with 40 he moved to 20 meters. Mac, the Voice of K0WBB, has advanced so if you hear the call W0MYX, that's him. Traffic: W0KQD 559, EKQ 135, DGP 93, TV 73, KHQ 60, TUT 32, HOP 23, SWK 16, JHI 12.

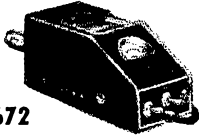
UTAH—SCM, James L. Dixon, W7LQE—VRY has a new 80-meter doublet 60 feet high. LRV is selling out his s.s.b. equipment. VSZ has given up ham radio for the electric organ. A new call is BXY with a Viking rig and Hallicrafters S-85 receiver using a doublet 35-feet up on 75-meter phone. VTA has a vertical on 40 meters, a Window on 35-foot pole, 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 KYL. 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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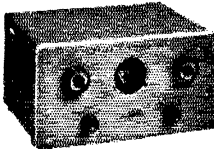
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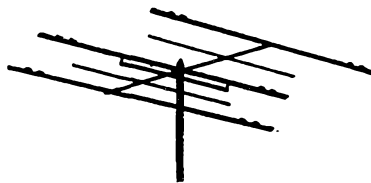
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A compact and sensitive dual instrument for measuring RF power and standing wave ratio in the frequency range from 0.5 to 225 megacycles at power levels up to 1000 watts. The Model 261 coupler unit supplies readings of incident RF power, reflected RF power, net RF power to antenna or load, and VSWR of load, without the necessity of removal from the line and reversing the connections. The Model 262 indicator is of a simplified type for reading relative power. Sensitivity is continuously adjustable from 10 watts full scale to 1000 watts full scale by means of the front-panel potentiometer.

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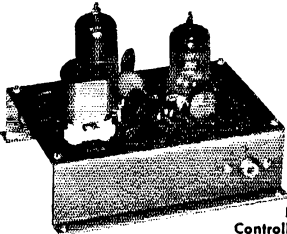


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FO-1L 100 KC OSCILLATOR

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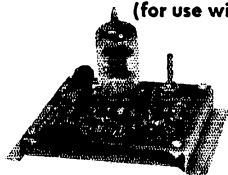
Printed circuit oscillator for band-edge calibrator and frequency standard use.



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Additional requirements: Power 6.3 volts AC @ 150 ma
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Traffic: (June) W4UHA 701, COU 419, RLG 195, KIX 120, K4AOZ 88, W4YXO 73, GUV 69, AVX 48, K4ANB 43, W4EJZ 40, D XB 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. Benzec, 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 ZXX, 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-DLIEZ 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 Streator, Ill. Traffic: (June) W4DVR 86, IYT 74, WS 62, GOG 55, K4AEHW 46, W4PUJ 33. FSS 28, KGJ 25, ZIR 24, WHK 15, BWR 10, EHW 10. (May) W4WHK 50, AZJ 40.

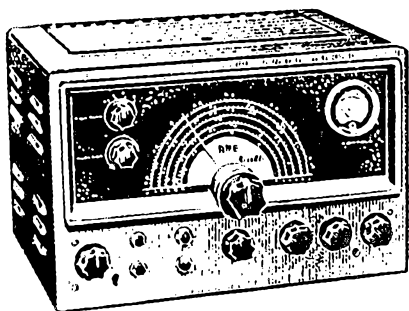
WESTERN FLORIDA — SCM, Edward J. Collins, W4MS/W4RE — SEC: PLE, ECs. MFY and HIZ. RMs: AXP and K4AKP. KN4IVE is pounding out an FB signal. KN4EHI has passed the Tech. Class exam and is after General. The Tallahassee gang has a real live wire club going now with YNA, pres.; K4APE, vice-pres.; YUU, treas. 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. NUB is building a super-receiver. EGN is heard after a long layoff. KN4IYQ is after General Class. W9AS (ex-OMITB) visited the gang, 29,560 kc. is monitored by the PARC in Pensacola for visiting mobile hams. HJA reports into the Pency 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, Pency 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., P1M 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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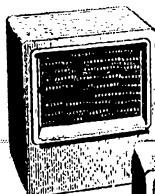
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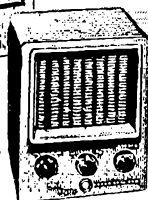


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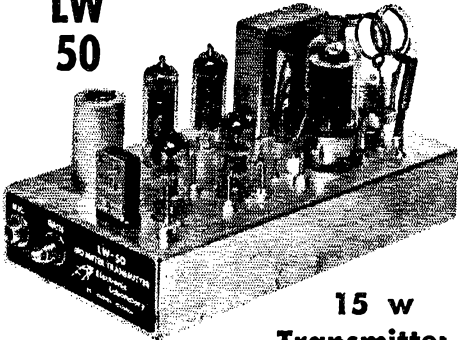
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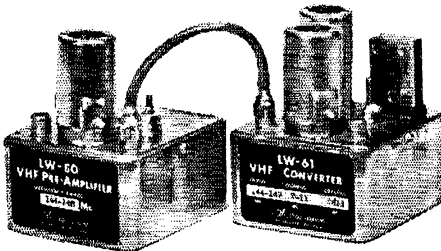
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now has competition at home; his XYL is KN4JWO. EUA has a new DX-100 engineered by NS. NS is losing two hopeful hams, daughter Pat and son-in-law Ralph, to the State of Texas. Our Southeastern Division Director, ZD, is trying to get a BC-669 to work 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, P1M 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 W4KJG, 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 abrieron 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., GJQB; 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. PLV 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, 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, LYF 104, DQA 101, W6DRS 81, USY 74, K6GUZ 69, LVL 59, W6VSH 56, K6EA 51, W6CK 30, K6COP 28, W6LNH 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)

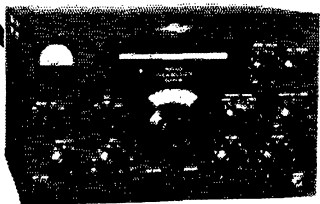
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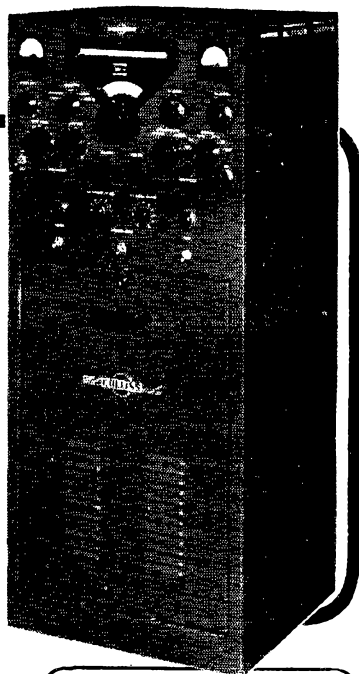
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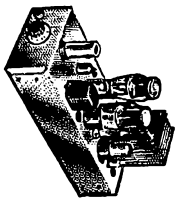
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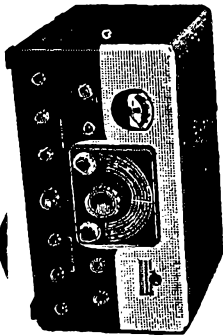


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ASI, RM: PKM. AEN meets for drill Tue. and Thurs. at 7 P.M. MST on 3885 kc. The Grand Canyon Net meets Sun. at 9 A.M. MST on 7210 kc. Over Labor Day week end the big hamfest at Fort Huachuca will be held. Do not miss this as it promises to be the best 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 6PC 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 TUAL 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. K6HAL, 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 K6HAL, 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. V.L. 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 1 OOs in the recent F.M.T. We regret to inform readers of the passing of Vaughn McKenney, IBS, 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 129, W6SK 47, K6DBG 14, W6JVA 2.

SANTA BARBARA—SCM, William B. Farwell, W6QIW—Asst. SCM: Dorothy E. Wilson, 6REF. SEC: K6KPU. Pao 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 Ske 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.a.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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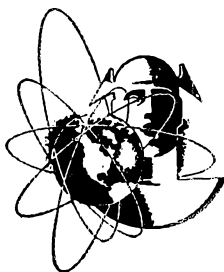
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Day outing. The clubs at Bartlesville, Enid, Oklahoma City, Muskogee, McAlester and Okmulgee had rigs in the field. There may have been others. The Bartlesville Club is showing some phenomenal growth. New General Class licenses there include EKA, K5s AQU, AUX, BBA, BBF, BSU, BSV and EJC. New Novices include KN5s DJI, DYL, ETV, EUG, EVD, and EZZ. Another welcome addition to the Bartlesville gang is RRM, former North Texas SCM, JWA from Lawton and WCWF 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. JKM 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, BIII 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. W3PAL, W5KML, K6CMU and W7RMU have returned to the U.S.A. Congratulations to W1JSH on his promotion to Warrant Officer. Traffic: (June) VE1OC 298, 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, WINJM, 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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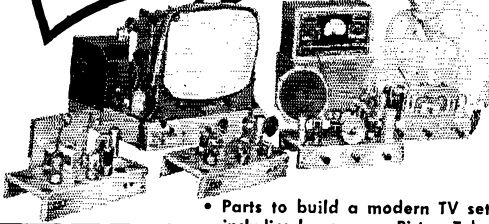
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VETERANS: Give Date of Discharge _____

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 proxy 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, WIDX, 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 WIDX, from ARRL, W8LBM, from FCDA, and Col. Holmes, Canadian Civil Defense, Ottawa. Among other guests were W0GNS/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 WIDX 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. 6HV, 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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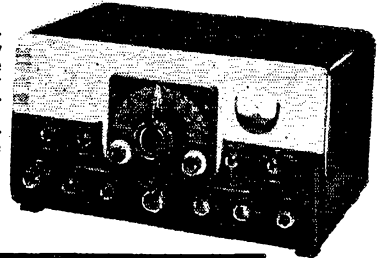


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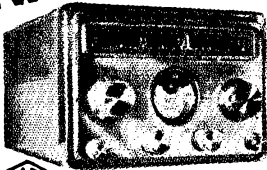
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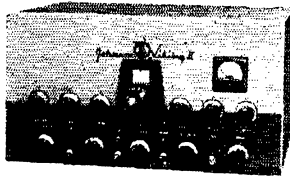
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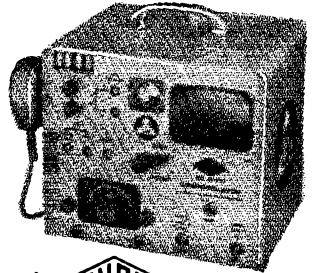


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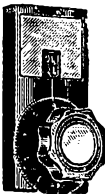
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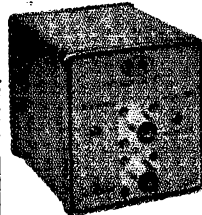
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ARRL — IGY

(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 amateurs 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 occurrence. 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)



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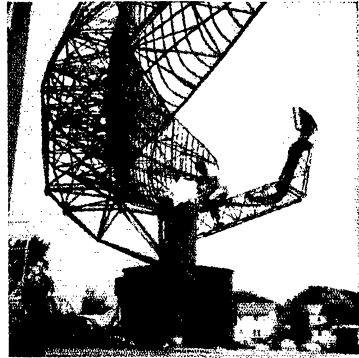
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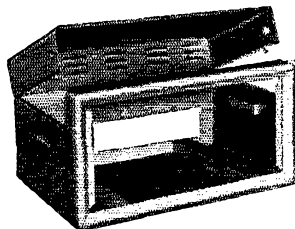
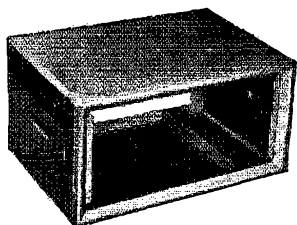
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and probably afterwards when the data from other projects is available. If all this sounds rather involved, remember that all the reporting stations have to do is to operate faithfully and send in suitable data on their contacts.

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 28)

capacitance is needed at C_1 to light the dial lamp on 80 and 40 meters than on 15.

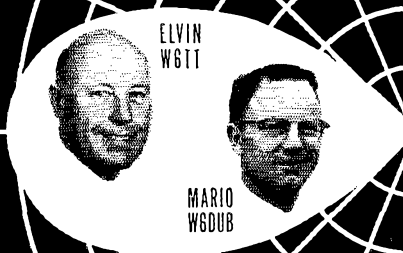
The unit shown in the photograph was built in a 3 x 4 x 5-inch box, but the overall cost could have been reduced by using a coffee can for a chassis. However, the writer recently described a harmonic filter² that used a coffee-can chassis, and it was felt that some readers might think we were being subsidized by the caffeine cartel.

² McCoy, "Eliminating 80-Meter Novice Harmonics," *QST*, July, 1956.

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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

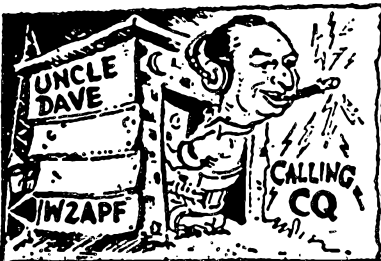
(Continued from page 27)

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. . . .

SWITCH TO SAFETY!





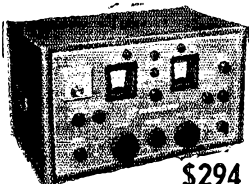
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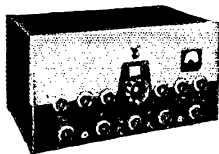
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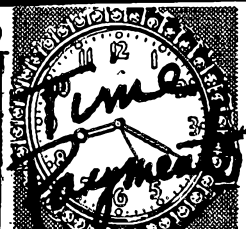
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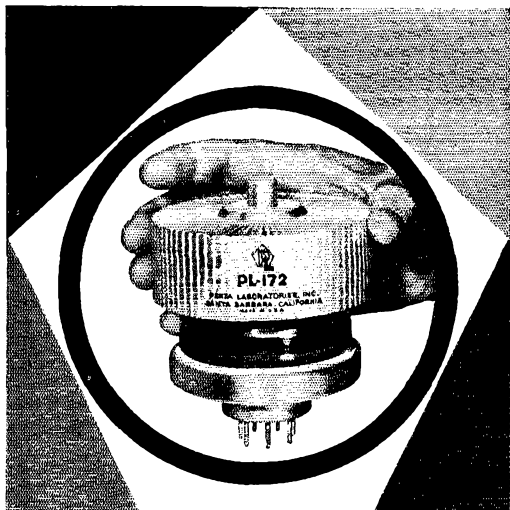
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gives extra-high power
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If it's conservative, stable, cool operation you want at the maximum legal input, here's the answer. The new PL-172 beam pentode will deliver over 1000 watts of Class-AB₁ single-sideband useful output at only 2000 plate volts, over 1500 watts at maximum Class-AB₁ ratings, and over 2 Kw in Class-C. With capabilities like these, the PL-172 loafs while running at 1-Kw input as a Class-AB₁ zero-drive linear, putting 660 watts of clean single-sideband power into the feed line.

Improvements in efficiency and linearity have been made possible by the exclusive Penta vane-type suppressor grid, which channels electrons into beams, gives true beam tube characteristics. Ring-type screen and suppressor grid contact surfaces and low inductance leads give real stability.



RATINGS

Heater Voltage.....6.0 volts
Heater Current.....7.8 amps
Plate Voltage, Max.....3000 volts
Plate Current, Max.....1000 ma.
Screen Voltage, Max.....600 volts
Plate Dissipation, Max.....1000 watts

We'll be glad to send a six-page data sheet on the PL-172, including full ratings, characteristic curves, and information on Class-AB₁ and Class-C operation.



PENTA
laboratories, inc.
314 N. Nopal St., Santa Barbara, Calif.

Q Multiplier . . .

(Continued from page 45)

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 69)

W1TRM.....1802-17-36- B-14	WN7AOZ....1998-18-38- A-13
	W7LBV.....330-10-11- A--
	W7MO.....168-7-8- --
	W7PJK.....36-3-4- B--
<i>Rhode Island</i>	
W1CJH....181,665-165-367- C-66	
W1AWE....19,890-51-130- --	
W1WPN....9240-40-77- --	
W1BEH....546-13-14- A-5	
<i>Washington</i>	
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	
<i>NORTHWESTERN DIVISION</i>	
<i>Idaho</i>	
W7UDG....22,680-70-108- B-29	
<i>Montana</i>	
W7CJB....26,649-63-141- B-40	
W7JLD....1728-18-32- A-12	
<i>Oregon</i>	
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	
<i>PACIFIC DIVISION</i>	
<i>Nevada</i>	
W7KEV....64,071-113-189- B-45	
W7VIU/7...9126-39-78- B-31	
W7YNO/7...4785-29-55- B-30	
<i>Santa Clara Valley</i>	
W6SR....176,295-161-365- B-41	
W6JWT....138,180-141-327- B-67	

(Continued on page 126)

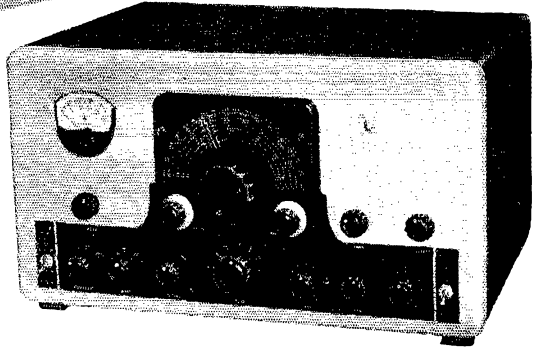
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Valiant

**275 Watts CW and SSB (P.E.P.)*
200 Watts Phone Input**



features: temperature compensated VFO
speech clipping and filtering Pi-network output tuning
"push to talk" relay built in bandswitching
effective TVI suppression 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 11 $\frac{1}{2}$ " x 21 $\frac{1}{2}$ " x 17 $\frac{1}{2}$ ". 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.

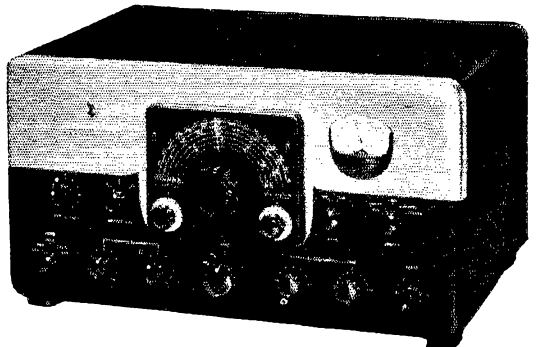
THE JOHNSON VIKING Pacemaker FOR SINGLE SIDEBAND

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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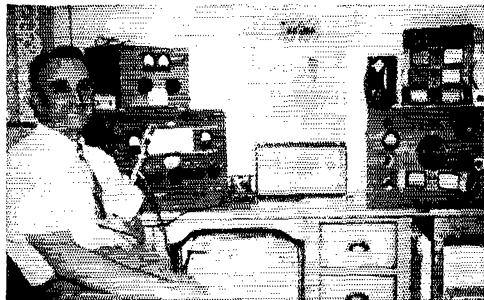
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| W6EPR... 55,044- 99-186-BC-32 | W4KFC... 404,190-270-500-BC-43 |
| W6YBR... 10,090- 42- 80- C-35 | W4PNK... 170,478-154-370- C-52 |
| W6LDO... 2040- 17- 40- B-12 | W4MGD... 142,350-150-317- C-72 |
| W6CLZ... 570- 10- 19- A-13 | K4BZL... 91,565-134-228-BC-69 |
| W6PBV... 561- 11- 17- B- - | W4JAT... 73,616-107-230- C-59 |
| K6IBC... 450- 10- 15- A-11 | W4BFR... 71,722-109-220- B-47 |
| W6BAX (W6s HAX HQN) | W4VZQ... 54,144- 96-188- C-27 |
| 115,866-123-314- - - | W4GFF... 29,925- 75-133- B-28 |
| | W4PRO... 25,728- 67-128- B-49 |
| | W4IF... 21,424- 71-116- B- - |
| | W4NH... 23,217- 71-109- C-11 |
| | W4STM... 16,665- 55-101- A-62 |
| | W4TFX... 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... 7,783- 43- 61- B-25 |
| | W4B1/4... 1323- 21- 21- B- - |
| | W4ZPR... 504- 12- 14- A- - |
| | W4KXV (W4s KXY TKR) |
| | 399,255-239-515-BC-88 |
| | W4NPT (W4s NUS WVN) |
| | 111,792-137-272- B-80 |

East Bay

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| W6TT... 120,240-255-550- C-90 | W6PYH... 284,292-212-447- C-65 |
| W6FOZ/6... 274,290-205-446- C-70 | W6LDD... 252,585-194-134-BC-84 |
| W6IDD... 137,094-146-313- C-48 | W6IDY... 76,464-108-236- C-62 |
| W6RCC... 63,630-105-202-BC-30 | W6KEK... 31,974- 73-146- C-43 |
| W6TL... 30,351- 67-151- B-30 | W6OVO... 22,680- 60-126- C- - |
| W6LPH... 22,146- 58-129- C-43 | W6DUB... 10,707- 43- 83- C-20 |
| W6CTL... 9480- 40- 70- C- 7 | W6EJA... 5664- 32- 59- B- 6 |
| W6LMZ... 2268- 21- 36- A-20 | |

San Francisco

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| 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

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| W6ONZ... 61,206-101-202- C-53 | K6EDE... 43,860- 88-170- B-75 |
| W6DBP... 28,140- 70-134-BC-17 | W6SIA... 14,241- 47-101- C-25 |
| K6AQP... 7627- 41- 62- C-16 | W6HIL... 855- 15- 19- C-18 |
| W6IBP... 261- 9- 10- A-14 | K6KLK... 216- 8- 9- A- 6 |
| K6TLB... 75- 5- 5- A- 5 | |

San Joaquin Valley

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| 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

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| W4CEN... 699,377-343-680- C-65 | W4UXI... 306,150-225-454-BC-75 |
| W4LZF... 297,030-225-440- 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

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| K4CSB... 9988- 44- 77- A-41 | W4GCB... 1248- 16- 26- A-10 |
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Virginia

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| W4OM... 456,120-252-604- C-91 |
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**ROCKY MOUNTAIN
DIVISION**

Colorado

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| W0AZT... 115,446-142-271- C-56 | W0EWH... 42,186- 89-158- C-35 |
| W0KV... 2610- 22- 40- A-12 | W0SG... 2376- 22- 36- A-15 |
| W0CDP... 300- 10- 10- A- 2 | W0IQZ... 270- 9- 10- B-20 |

Utah

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| W7QDJ... 13,416- 52- 86- A- - |
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Wyoming

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| W7PSO... 55,872- 96-194- C-46 |
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**SOUTHEASTERN
DIVISION**

Alabama

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| 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 |
| W4ECL... 300- 10- 10- C- 3 | |

Eastern Florida

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| W4LQN... 206,973-183-377-BC- - | W4LVV... 152,133-157-324-ABC-55 |
| W4WHK... 63,012-118-178- B-61 | W4IEX... 62,715-113-185- C-58 |
| W2DLO/4... 6954- 38- 61- B-12 | W4ZQU... 6660- 36- 62- A- 40 |
| K4CTU... 6528- 34- 64- A-22 | W4MI... 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 |
| W4GL/4... 360- 10- 12- A- 2 | |

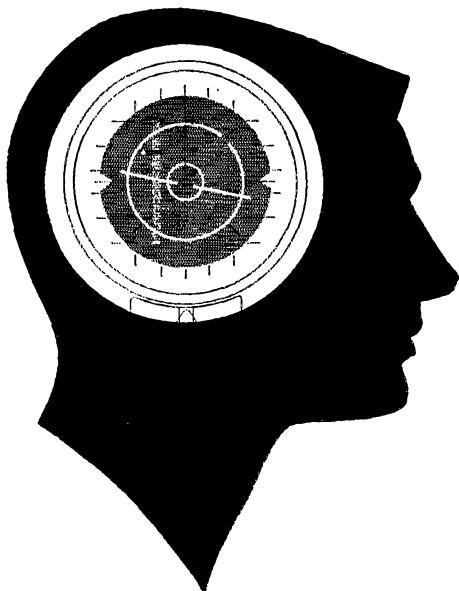
Western Florida

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|--------------------------------|-------------------------------|
| W4BGO... 260,910-223-390- C-70 | W4AFS... 45,136- 91-166- B-48 |
| W4IHZ... 8721- 51- 57- B-25 | W4ICY... 918- 17- 18- B-12 |

(Continued on page 130)

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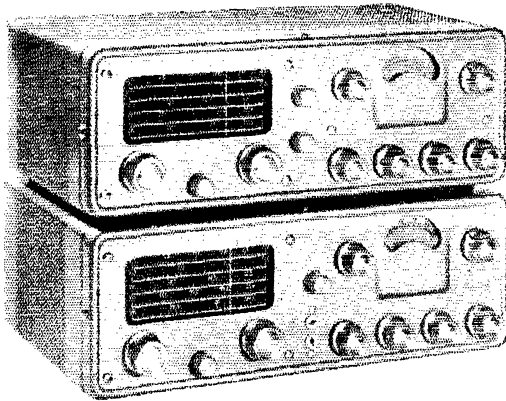
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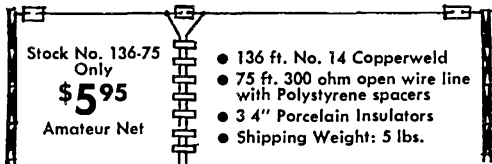
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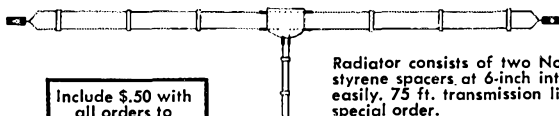


CENTER FED "SIX-BANDER"—Covers all 6 amateur bands 6 through 80 meters. Low loss, high strength. Requires antenna tuner when used with pi-network transmitters. 66 ft. No. 14 Copperweld; 43 ft. 450 ohm open wire line; 3 4" porcelain insulators. Stock No. 66-43. Shipping Weight: 4 lbs. Only **\$3.25** Amateur Net.

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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

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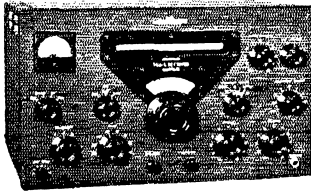
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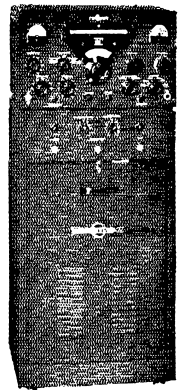
312A-1 SPEAKER CONTROL — Provides space to mount loudspeaker and extra control functions necessary in a complete installation. Unit furnished with removable perforated steel front panel insert with no cut-outs. Operator can remove panel and install beam direction indicators, clocks, switches, etc. 10" speaker sub-mounted behind front panel. Amateur Net \$37.50

270-G MATCHING SPEAKER — Cabinet Assembly and matching 10" speaker. Amateur Net \$20.00

COLLINS KWS-1 TRANSMITTER

Designed for optimum kilowatt performance on AM, CW, or SSB, the KWS-1 is compact but not crowded. Frequency range 10 through 80 meters. Single conversion on 80, dual conversion on higher bands. Output tuning is continuous throughout entire range. Exciter and power amplifier housed in a single "receiver-size" cabinet which may be placed on the operating desk or mounted on top of the power supply cabinet. Permeability tuned, hermetically sealed VFO used to provide stable and accurate signal source. Select upper or lower sideband with two position control. Exciter may be operated by either push-to-talk microphone switch or by the voice-operated relay located within the audio unit. Provision made for voice-operated break-in while using loudspeaker on the receiver. CW operation features excellent wave shaping for smooth keying and the complete elimination of transients. High and low voltage power supplied by the 428-A High Voltage Supply and the 429-A Low Voltage Supply—both contained in a single cabinet. Complete with tubes.

\$199.50 down \$83.70 per month for 24 months



new fine tuning

New ease and accuracy in Sideband tuning are featured in Collins Gear Reduction Tuning Knob for the 75A-4 and KWS-1. Operates on 4 to 1 ratio — eliminates dial drag — no detectable backlash. Installation is simple — also adaptable for earlier models in the 75A series. Amateur Net \$15.00

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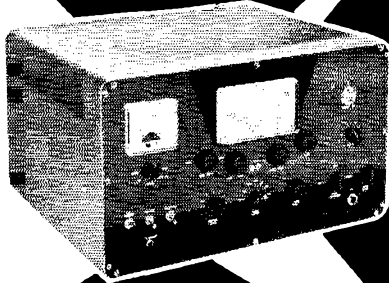
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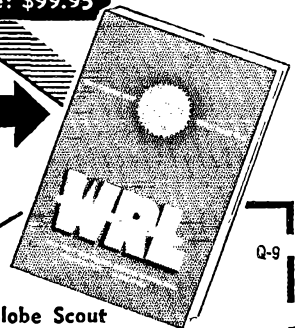
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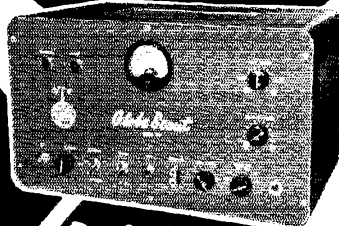
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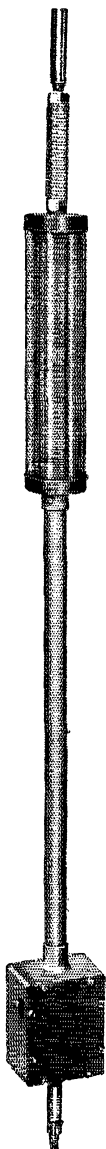
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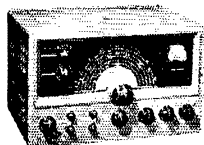
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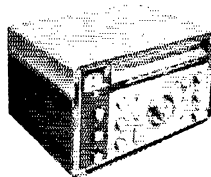
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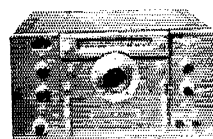
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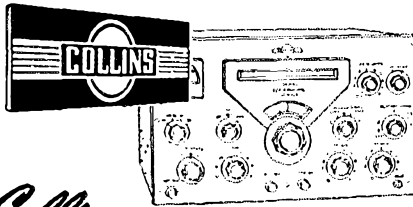
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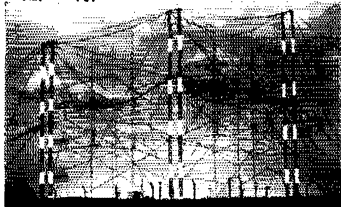
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F9MS	125,620	55-763	A-60
F8VJ	119,474	62-646	A-46
F7ER	97,860	35-942	A-70
F3AT	29,280	40-244	A-1
F8TM	24,531	37-221	A-28
F8TQ	10,341	27-127	A-1
F9CJ	1520	9-57	A-1
F9BB	1390	10-45	A-3
F3HK	1320	12-37	A-12
F9RM	1110	10-37	A-5
F9DW	812	14-20	A-3
F3II	576	12-16	A-1

Germany

DL4ZC	235,578	71-1106	B-80
DJ1BZ	165,472	53-1044	AB-70
DL1JW	131,275	59-754	B-1
DL7AH	98,280	56-588	B-56
DL7AA	80,454	53-506	B-1
DL6MK	71,064	47-504	B-1
DJ1VL	18,321	39-413	A-36
DJ2AE	23,635	29-274	A-29
DJ2LK	20,960	32-227	B-1
DL9RK	17,220	21-275	B-1
DL3JK	14,796	36-137	A-1
DL3OC	10,560	32-110	B-16
DL3AO	4687	13-121	A-16
DL9PJ	3762	11-114	B-1
DL1QT	2314	13-60	A-6
DL1RX	1320	10-44	A-7
DL1YE	1170	13-30	A-1
DL4DX (DL4s DX NL)	2808	18-53	A-18

Greece

SV0WT	54,648	36-506	A-48
SV0WL	9614	11-294	B-1

Hungary

HA5BI	11,310	30-129	A-34
HA5KBC	10,120	20-170	A-98
HA5KBK	9135	21-147	A-96
HA5BL	2640	12-74	A-22
HA5KBA (5 oprs.)	174,105	57-1023	BC-96

HASKWA (2 oprs.)

9900	15-228	A-1
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Iceland

TF3MB	42,441	43-329	A-23
TF3AB	35,123	31-378	A-1

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-1

Italy

I1NT	94,644	44-717	B-40
I1AU	74,538	41-606	A-46
I1AM	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
ZB1GH	1309	7-63	A-6
ZB1ZR	1089	11-53	A-1
ZB1HKO	270	9-10	A-1

Netherlands

PA0UN	267,432	66-1354	A-80
PA0EP	160,430	61-882	AB-30
PA0VB	79,464	56-473	B-39
PA0ULA	38,934	42-308	B-30
PA0FLX	36,039	41-283	A-45
PA0TF	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
PA0EJK	2475	15-55	B-6
PA0NN	888	8-37	A-1
PA0BW	540	10-18	A-5
PA0NV	504	7-24	A-5
PA0BX	432	8-18	B-1
PA0TF	60	4-5	A-1
PA0PLM	10	2-2	A-1

Northern Ireland

GB3AL	26,477	29-312	AB-25
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Norway

LA4K	3185	15-71	A-25
LA9T	1925	11-59	A-9
LA6U	1800	12-50	A-1
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 (LA5 2MB 3HF 70E 7ZC)	10,854	18-204	B-1

(Continued on page 136)



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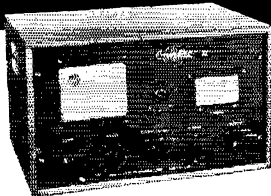
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CT1TT.....81,498- 51-536- A-50		KP4DV...575,652-89-2196-BC-66
CT1ST.....10,836- 28-129- B--		KP4ZW...466,662- 82-1897-A-69
CT1QN.....2112- 11- 64- B--		KP4JE...293,832- 77-1272-B--
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YO3RA.....25,017- 31-269- A-29		FS7AA.....4200- 10-140- A-10
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EA4FO.....1890- 15- 42- B--		VK5BO...1838- 9- 68- A--
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SM2AQQ...4988- 23- 72- A--		Hawaii
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SM5UU...3087- 21- 49- B- 8		KH6MG...567,336-88-2149- C-74
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SM5CCE...2145- 15- 48- A--		W7EMV/KH6
SM5HH...1755- 13- 45- A--		14,601- 31-157- A-14
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SM5ALM...858- 11- 26- A--		KH6AYG (KH6s AYG BCM BHZ BLH)
SM6BDS...774- 9- 29- A- 5		882,560-90-2529-BC-74
SM6CZE...462- 7- 22- B--		Johnston Island
SM5BFR...9- 1- 3- B--		KJ6BN...144- 6- 8- A--
	Switzerland	Marshall Islands
HB9NL...234,304- 64-1221-B-60		KX6AF (7 oprs.) 178,353-57-1046-A-75
HB9IK...14,670- 30-163- B-22		New Caledonia
HB9MU...13,130- 26-171- A-12		FK8AO...37,848- 38-332- A-34
HB9QO...5742- 22- 87- A-12		New Guinea
	Trieste	VK9RM...2360- 10- 79- A--
ILBNU...101,856- 48-711- B-60		New Hebrides
ILBLF...47,554- 31-513- B-40		YJ1DL...612- 6- 34- B- 3
ILCB...20,208- 48-141- A--		New Zealand
Ilycz...1310- 10- 44- A-12		ZL1BY...470,844- 82-1915-A--
	Wales	ZL1MQ...185,544- 72-859- A-32
GW5SL...112,636- 58-648- B--		ZL4CK...33,696- 27-416- A--
GW3BQY...46,080- 30-512- A--		ZL2ARL...16,008- 29-184- A-12
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YU3ABC...2780- 10- 93- A- 1		ZL2AI...9408- 14-224- A-14
	NORTH AMERICA	ZL3AB...8683- 19-153- A- 5
	Alaska	ZL1MT...8208- 24-114- A-11
KL7BPK...55,200- 46-400- B-32		Papua
KL7BGS...22,736- 29-266- A-50		VK9XK...25,137- 27-311- A-39
	Bermuda	Philippine Islands
VP9BM...597,114- 98-2053-A-65		DU7SV...74,349- 33-751- B--
	British Honduras	DUISCS...126- 3- 14- B- 1
VP1SD...226,215- 55-1371-A-33		SOUTH AMERICA
VP1AA...6300- 12-175- A--		Argentina
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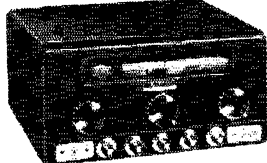
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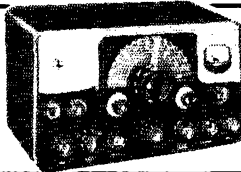
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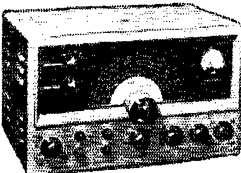
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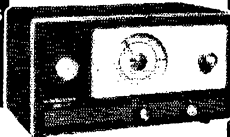


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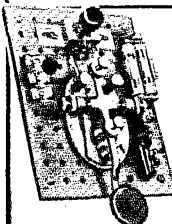
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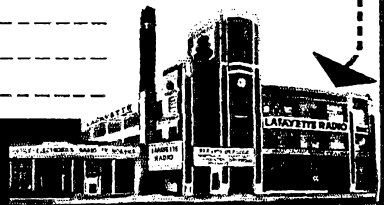
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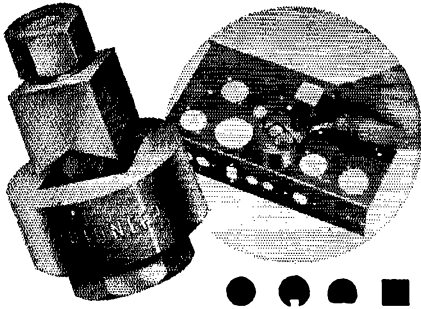


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<i>French Guiana</i>	
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	CX2BP.....945- 9- 35- B- 2
<i>Netherlands West Indies</i>	
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PJ2AJ.....195,920- 62-1066-A-50	YV3BH....6534- 22- 99- A- -

- ¹ W6HLA, 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.

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W3GHS...246,840-187-442- H-83	W8LQF....705- 15- 16- B-10	
W3CUB...136,186-189-305- C-67	W9RID....585- 13- 15- B- 8	
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W3TJW...1008- 16- 21- B- 8	W9JYU....39,884- 88-151- B-35	
W3MDO...952- 17- 19- H-20	W9VUL....19,695- 65-101- C-15	
W3GHD...546- 13- 14- A- 2	W8PXP/9...4092- 31- 44- C-10	
W3LEZ...330- 10- 11- A- 9	W9AJA....2250- 25- 30- B-11	
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W3KT (W3s KT SKQ) 81,213-107-253- C- -		
W3EQA (W3s EQA LEZ) 56,789-109-175- C-45	<i>Wisconsin</i>	
W3EAN (W3s EAN TPC) 30,261- 77-131- C-23	W9EWC...227,457-199-381- C-76	
<i>Md.-Del.-D. C.</i>		W9DUB....125,256-136-309- C-79
W3MSK...454,725-235-645- C-81	W9E2D...67,280-118-190- C-52	
W3GKM...78,421-119-220- C-60	W9RBI....29,670- 86-115- -	
W3YRK...26,100- 75-118- A-25	W9MBF...24,642- 74-111- B-32	
W3JTK...9306- 47- 66- C- 9	W9FDY...7392- 44- 56-BC- -	
W3ZPO...3175- 25- 41- B-11	W9HCX...3741- 25- 43- B-23	
W3NNX...300- 10- 10- B- -	W9KCK...2871- 28- 33- B-19	
<i>Southern New Jersey</i>		W9WLI....2840- 28- 30- R- -
W2SZP.....1596- 19- 28- A-17	W9NLS...1598- 19- 23- A-18	
W2ESG.....1482- 19- 28- B- 8	W9HAT...945- 15- 21- A- 6	
W2ILN.....1411- 17- 28- B- 9	W9RKP....9- 1- 3- B- 1	
W2PAU.....495- 11- 15- B- -	W9AEM....6- 1- 2- A- -	
W2SDB.....27- 3- 3- B- 2	W9GOC (W9s SZR VAK KN9CHK) 1449- 21- 23- A-39	
<i>Western New York</i>		
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

<i>Illinois</i>		
W9WKU...40,044- 94-144-BC-45	Arkansas	
W9NH...9380- 52- 60- B-40	W5ASG...23,232- 89- 88-BC-44	
W9PVA...9009- 39- 77- B-34		
W9WFS...7371- 39- 63- B-15	<i>Louisiana</i>	
W9SD...6519- 41- 53- C-14	W5KC...37,113- 89-139- B-32	
W9ABA...5640- 40- 47- C-10	W5CEW...23,484- 76-103- B- -	
W9MWO...5565- 35- 53- B-19	W5HNS (W5HNS, KSARH) 1539- 19- 27- B- 3	
W9FVU...2520- 28- 30- B-13		

DELTA DIVISION

W9BZL...9306- 47- 66- B-21

(Continued on page 140)

The Only Factory Pre-Tuned Tri-Banders

Guaranteed To Operate as Specified With No Further Adjustments!

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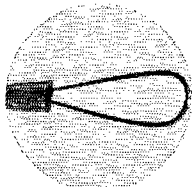
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1 BEAM — 1 FEEDLINE — 3 BANDS

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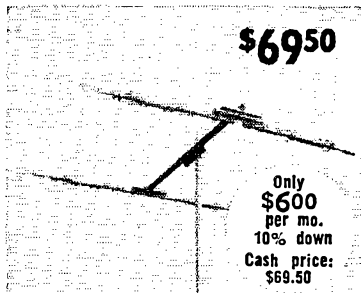
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Specially designed, aluminum wire "carpet beater" ends on all elements to reduce fatigue caused by vibration and increase broad band characteristics.



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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.



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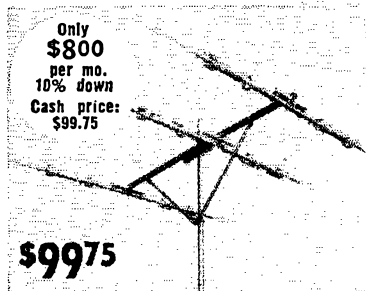
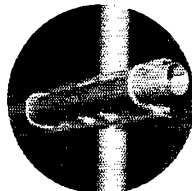
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per mo.
10% down
Cash price:
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BEAM	AVE. GAIN	AVE. F/B RATIO	SWR*	BOOM LENGTH
Two Element	5 db	17 db	less than 1.5-1	8 ft.
Three Element	8 db	22 db	less than 1.5-1	18 ft.
Five Element	12.1 db	25 db	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 3-Element Tri-Bander

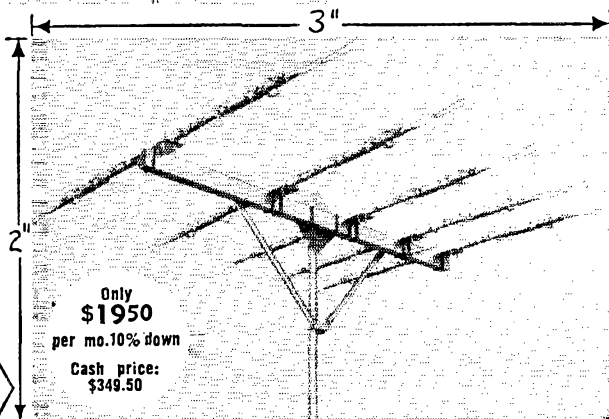
Here's the new standard for amateur radio communications, replacing three stacked beams. Covers 10, 15 and 20M amateur bands. Horizontal beam width, 59°; boom diameter, 1½"; longest element, 30 ft.; spacing .15 director, .1 reflector. Single transmission line for all bands — 52 ohm RG-8U. Approx. net wt., 49 lbs.

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10% down
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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.



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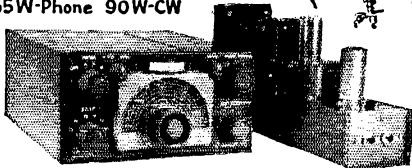
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MOBILE TRANSMITTER with
65W-Phone 90W-CW



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- Provisions for mounting coax relay.
- Separate inputs for high impedance or carbon mikes.
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- Makes an ideal NOVICE transmitter.

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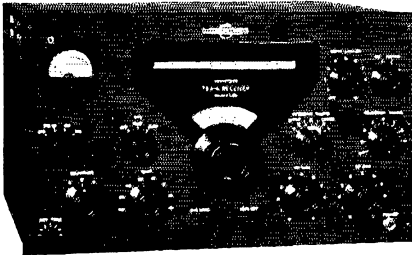
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Mississippi		NEW ENGLAND DIVISION	
W5DQK	30,420-78-130 B-45	<i>Connecticut</i>	
<i>Tennessee</i>		W10DW	33,777-81-139-B-41
W4DQH	210,184-172-408-C-73	W1B1H	32,340-77-140-B-25
W4FKA	49,662-89-186-C-60	K2DLA	1158-33-44-B-36
W4ZMC	16,524-51-108-B-38	W1EJV	4032-32-42-B-19
W4UWC	4050-29-45-A-8	W1YWU	2277-23-33-B-6
GREAT LAKES DIVISION		W1AWL	2090-22-32-BC-10
<i>Kentucky</i>		W1GVK	363-11-11-B-7
W4KZF	24,255-77-105-C-25	<i>Maine</i>	
W4CDO	5600-35-54-B-20	W1DLC	95,368-131-244-C-71
<i>Michigan</i>		<i>Eastern Massachusetts</i>	
W8RLT	190,476-165-407-C-45	W1ONK	157,137-147-357-AB-72
W8NWO	165,120-172-320-C-35	W10GU	22,656-59-128-B-33
W8NOH	728-44-54-B-17	W1QJR	20,412-64-126-B-63
W8TIC	1827-21-29-B-14	W1ZSR	15,042-46-109-A-40
W8QIT	432-12-12-C-9	W1QWF	14,382-51-94-C-44
W8SS	216-8-9-B-4	W1QWL	12,672-48-88-B-9
W8NGO (W8s CLR NGO)	116,700-150-326-AB-86	W1MXX	6996-44-53-C-11
<i>Ohio</i>		W1MGP	1254-19-22-A-15
W8BKP	238,760-185-432-BC-60	W1ABJ	880-16-19-B-7
W8NXP	217,300-205-354-B-70	W1MX	168-7-8-C-5
W8ZOK	99,562-134-240-B-60	W1LQJ	108-6-6-A-5
W8BF	94,360-140-226-C-41	W1VFK	73-5-5-
W8JN	68,796-126-182-C-23	<i>Western Massachusetts</i>	
W8PUD	16,023-87-81-C-54	W1YQC	36,920-65-190-B-40
W8AJW	33,777-81-139-A-28	W1CLX	26,112-64-136-B-20
W8KZT	18,444-58-106-B-23	W1WJW	3663-33-37-C-18
W80IN	12,690-45-94-B-10	W1JYH	360-10-12-
W8FGX	11,628-57-68-C-10	W1MVF	3-1-1-A-
W8ELB	10,950-50-73-B-46	<i>New Hampshire</i>	
W8HQK	10,857-47-78-A-9	W1FZ	67,122-113-199-C-
W8RTP	10,368-48-72-B-22	W1KKT	25,080-80-117-A-51
W8AJH	4680-30-52-B-12	<i>Rhode Island</i>	
W8FBZ	4416-32-46-A-1	W1PPN	1056-16-22-
W8SMC	4224-32-44-C-11	NORTHWESTERN DIVISION	
W8RTL	3969-21-63-B-9	<i>Idaho</i>	
W8LOF	2100-25-28-A-6	W7UDG	2592-27-32-B-8
W8BOJ	1500-20-25-C-3	W7VNO	624-13-16-A-9
W8MXS	864-16-18-A-13	<i>Montana</i>	
W8ROMY	816-16-17-A-16	W7FIN	5152-28-62-B-36
W8KC	798-14-19-B-10	<i>Oregon</i>	
W8QDH	507-13-13-B-6	W7LVB	720-12-20-A-
W8PCS	492-8-8-A-2	W7JLU	510-10-17-A-3
W8BQV	135-5-9-A-10	W7PJK	405-9-15-B-4
W8AEU	90-5-6-C-1	<i>Washington</i>	
W8UMA	63-3-7-	W7HRH	43,560-90-163-C-60
HUDSON DIVISION		W7KTL	1056-16-22-B-10
<i>Eastern New York</i>		W7AEA	720-12-20-A-4
W2VRE	29,748-74-134-B-30	PACIFIC DIVISION	
K2PPB	975-13-25-A-16	<i>Nevada</i>	
<i>N.Y.C.-L.I.</i>		W7YNO/7	759-11-23-B-16
K2AAA	412,550-221-617-C-93	W7JJO	135-5-9-C-2
W2BRV	7920-48-55-B-15	W7VIU	27-3-3-B-1
W2MCO	972-18-18-A-25	<i>Santa Clara Valley</i>	
W2BVN	936-13-24-B-6	W6PBV	27-3-3-B-
W2PTL	624-13-16-B-4	W6BAX (W6s BAX HQN)	26,505-57-155-C-50
W2GNN	72-4-6-B-2	<i>East Bay</i>	
K2DEM	60-4-5-A-1	W61DY	77,199-109-237-C-60
<i>Northern New Jersey</i>		W6LDD	2646-21-42-BC-12
W2SKE/2	632,016-252-842-C-95	W6KCK	528-11-16-B-3
W2GLF	35,742-74-161-B-40	W6OEL	528-11-16-B-16
W2DJT	6495-38-57-B-15	<i>San Francisco</i>	
W2WE	3240-30-36-B-	W6ATO	12-2-2-C-1
K2KFP	1080-18-20-A-8	ROANOKE DIVISION	
MIDWEST DIVISION		<i>North Carolina</i>	
<i>Iowa</i>		W4NHF	126,360-156-270-B-64
W8DIB	9045-45-67-B-31	W4CEN	10,488-46-76-C-12
W8QVZ	3672-34-36-B-11	W4ZWP	5472-32-57-B-15
W8PUR	630-14-15-B-5	W4NYN	5106-37-46-A-10
W8NWX (W8s NWX PKH)	3552-32-37-B-	W4GXB	1242-18-23-C-5
<i>Kansas</i>		K1BVQ	1140-19-20-
W8MVO	3744-32-39-B-15	W4EHL	720-15-16-B-8
W8IUB	1653-19-29-B-	W40XI	675-15-15-B-4
W8QPH	1254-19-22-A-9	K4ARP	533-13-14-B-9
W8QMS	855-15-19-B-5	<i>South Carolina</i>	
K8DRR	504-12-14-	W4TWW	27,621-81-114-B-41
W8GAX	108-6-6-A-	<i>Missouri</i>	
<i>Missouri</i>		W8GEC	34,983-69-(70)-BC-43
W8GEC	34,983-69-(70)-BC-43	W8AJU	5772-37-52-C-26
W8AJU	5772-37-52-C-26	<i>Nebraska</i>	
<i>Nebraska</i>		W8BBS	5145-35-49-C-16

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The Collins 75A-4 receiver retains time-proved features of earlier 75A series, plus AVC on SSB and CW, separate detectors for AM and SSB. Pass band tuning, rejection tuning, superior selectivity. Many other outstanding features.

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(Continued on page 142)

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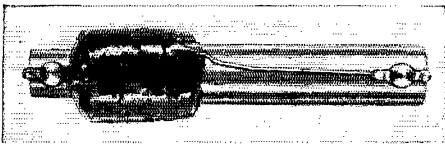
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W4CBQ.....81,432-117-232- C-42	W5OC.....990-15-22- A-16	
W4WSF.....12,152-49-84- B-34	<i>Oklahoma</i>	
W4OFR.....2625-25-35- B-15	W5AOY.....2964-26-38- A-17	W5MCF.....2565-27-33- B-16
W6SDC/4.....2088-24-29- B-20	W5PNG.....27- 3- 3- -	W5WLA.....27- 3- 3- A- 1
W4IA.....380-10-13- B- 2		
W4TFX.....6- 1- 2- B- -		

<i>West Virginia</i>		<i>Southern Texas</i>	
W8PQQ.....19,320-70-92-BC-14	W8UMR.....9246-46-67- B-18	W5NMA.....59,730-110-181- C-34	W5SU.....7410-39-64- B-18

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W8EWH.....2448-24-34- B-14	W8BDQ.....192- 8- 8- B- -			
W8CDF.....48- 4- 4- A- 1				

<i>Utah</i>		CANADIAN DIVISION	
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W7PSO.....798-14-19- B- 8		VO6N.....1959-29-57- B-19	VO6U.....2175-25-29- B-10

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<i>Alabama</i>			
W4NZM.....22,715-59-129- C-10	W4HA.....17,784-52-114- C-19	VE2JR.....45,570-98-155- B-39	VE2APH.....3780-30-44- B-10
W4GUV.....17,068-68-85- A-25	W4YHC.....11,040-46-81- B-44	VE2YA.....28- 3- 3- A- -	
W4FTP.....4356-33-44- C-21	K4CXA.....1638-21-26- B- 8		
K4ECL.....243- 9- 9- C- 2			

<i>Eastern Florida</i>		<i>Quebec</i>	
W4HKJ.....23,580-60-131- B-36	W4LQN.....19,089-63-101- B-46	VE2JR.....45,570-98-155- B-39	VE2APH.....3780-30-44- B-10
W4EEO.....15,045-59-85- B-30	K4CFP.....11,856-52-76- B-46	VE2YA.....28- 3- 3- A- -	
W4FYL.....2925-25-39- A-26	K4CIU.....882-14-21- A- 6		
W4LUV.....216- 8- 9- A- 2	W2DLO/4.....48- 4- 4- B- 2		

<i>Western Florida</i>		<i>Ontario</i>	
W4AFS.....7580-40-63- A-23	W4HIZ.....6669-39-57- B-33	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

<i>Georgia</i>		<i>Manitoba</i>	
W4EEE.....116,748-141-276- C-61	W4ESP.....23,086-62-151- - -	VE4RO.....145,395-135-359- C-68	VE4RP.....3627-31-39- B-27
W4YHF.....11,286-57-66- B- -	W4INO.....3118-41-66- B-16		
W4YK.....7896-47-56- C-12	W4BOI.....546-13-14- B- 7		

<i>Manitoba</i>		<i>Saskatchewan</i>	
VE4RO.....145,395-135-359- C-68	VE4RP.....3627-31-39- B-27	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

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		VE7AMJ.....108- 6- 6- B- 5	

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<i>Los Angeles</i>		OQ5AO.....15,411-33-159- A- -	
W6YY.....366,680-194-630- C-90	W6ITA.....280,062-178-527- C-90		
W6NJJ.....23,064-62-124- A- -	W6EHV.....21,777- 61-119- C- -		
W6MUB.....8322-38-73- C-30	K6FWL.....7068-38-62- C- -		
W6LIM.....5536-32-58- B-35	W6GN.....2160-24-30- C- -		
W6BAG/6.....1242-18-23- A- -	W6BJJ.....648-12-18- C- 6		
W6DNH.....378- 9-14- A- 3	W6NZW.....264- 8-11- - -		
W6SVL/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		

<i>Arizona</i>		<i>Canary Islands</i>	
W7ENA.....1230-30-47- A-28	W7UXS.....27- 3- 3- A-16	EA8AX.....9720-20-164- A- -	EA8BC.....1080- 8-47- A- 4

<i>San Diego</i>		<i>Eritrea</i>	
W6CHV.....50,232-104-161- B-48	W6CTP.....24,840-69-120- C-33	ET2PA.....3460-10-116- B-12	

<i>Santa Barbara</i>		<i>Ethiopia</i>	
W6AGO.....31,623-83-127- C-24		ET3LF.....180- 5-12- A- -	

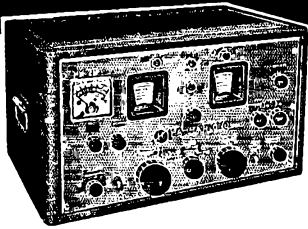
<i>Kenya</i>		<i>Madagascar</i>	
VQ4FK.....12,915-35-123- B-12		CT3AN.....561-11-17- B- -	

<i>Mozambique</i>		<i>Southern Rhodesia</i>	
CR7AF.....1764-12-49- A- 5		ZE2KR.....24,444-36-227- A-36	

<i>Union of South Africa</i>		WEST GULF DIVISION	
ZS6DW.....224,532-77-974- A- -	ZS5JY.....124,431-59-707- A- -	<i>Northern Texas</i>	
ZS5MP.....38,916-46-282- A-17	ZS6AJO.....6489-21-103- A-12	W5DJH.....135,441-149-303- C-70	

(Continued on page 144)

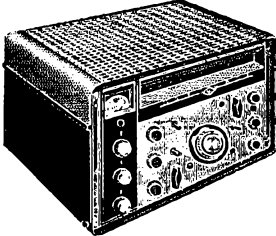
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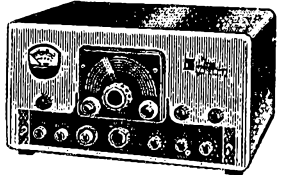
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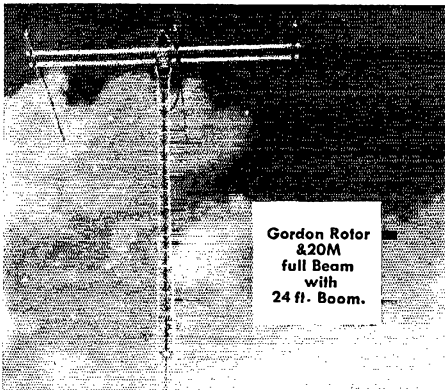


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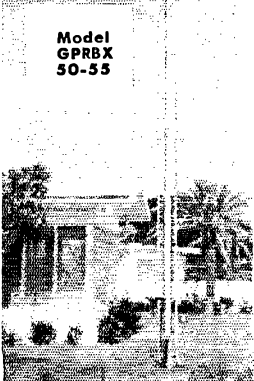
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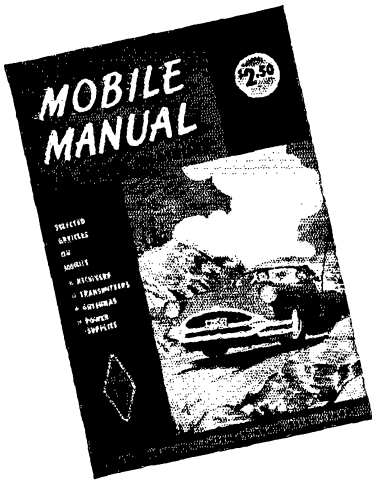
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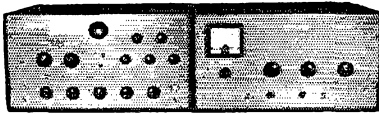
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ASIA		PA0NN.....891- 11- 27- A- -
<i>Hong Kong</i>		PA0XX.....816- 8- 34- A- 4
VS6AE.....1008- 8- 42- A- 5		PA0IF.....218- 8- 9- B- 2
<i>Japan</i>		PA0TV.....18- 2- 3- A- 1
JA3BB.....21,634- 29-250- B-40		<i>Northern Ireland</i>
KA7HH.....1860- 10- 62- B-17		GI3GAL.....1260- 12- 35- A- 6
JA1EF.....504- 4- 42- B-15		<i>Norway</i>
KA2SK.....120- 2- 20- B- 9		LA5YE.....21,720- 40-181- H-17
JA0AA.....108- 3- 12- A- 2		LA9T.....12- 2- 2- A- 3
JA1JW.....15- 1- 5- A-10		LA1K (LAs 2MB 3HF 7OE 7ZC)
JA1AFU.....9- 1- 3- A- -		208- 8- 9- B-12
JA1MN.....3- 1- 1- A- 2		<i>Portugal</i>
KA2KS (6 oprs.)		CT1PK.....8820- 28-105- B- 5
41,148- 36-381- A-40		<i>Saar</i>
<i>Lebanon</i>		9S4AX.....84- 4- 7- A- 1
OD5AV.....12- 2- 2- B- -		<i>Scotland</i>
<i>Ityukyu Islands</i>		GM3EMJ.....21,600- 40-205-AB-36
KR6LJ.....3900- 20- 65- C-11		GM3EOJ.....1196- 13- 31- A- 6
KR5AB.....270- 3- 30- B- -		<i>Spain</i>
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<i>Austria</i>		EA4CX.....5760- 20- 96- A- -
OE5CK.....50,619- 47-359-AB-40		EA3KT.....54- 3- 6- A- 3
<i>Belgium</i>		<i>Sweden</i>
ON4OC.....45,855- 44-340- A-35		SM5FA.....3480- 20- 58- B- -
ON4DB.....2048- 16- 44- A-15		SM2ALU.....36- 3- 4- B- -
ON4LJ.....198- 6- 11- B- -		SM5BFR.....12- 2- 2- B- -
<i>Czechoslovakia</i>		NORTH AMERICA
OK1LM.....1014- 13- 26- A- 3		<i>Bahamas</i>
OK1KAL.....930- 6- 52- A-25		VP7NG.....136,240- 65-706- A-25
OK1JX.....360- 8- 15-AB- 6		<i>Barbados</i>
<i>Denmark</i>		VP6WR.....292,636- 87-1131- A-60
OZ7G.....11,808- 32-123- A- -		<i>Bermuda</i>
OZ3TH.....7176- 24-101- A-20		VP9L.....177,300- 75-788- A-51
OZ5KQ.....2114- 14- 51- B-14		<i>Canal Zone</i>
OZ7BG.....540- 9- 20- B- 3		KZ5VO.....82,137- 57-481- A-30
OZ7SN.....528- 8- 22- A- -		KZ5MW.....6360- 20-107- B- -
<i>England</i>		<i>Cuba</i>
G2PU.....62,463- 47-443- B-49		CO2MG.....3- 1- 1- B- -
G3DO.....42,640- 41-348- B-38		<i>Greenland</i>
G3HJJ.....18,202- 38-160- B-40		OX3KW.....5916- 17-116- A- -
G8KS.....54- 3- 6- A- -		<i>Guadeloupe</i>
GB28M (Gs 3JUL 5CS)		FG7XB.....2142- 9- 81- A- -
285- 5- 19- B- 2		<i>Guantanamo Bay</i>
<i>Finland</i>		KG4AC.....49,749- 23-721- B-47
OH1PN.....1584- 16- 33- A- -		<i>Guatemala</i>
OH4NT.....294- 7- 14- A- -		TG9AD.....441,618- 89-1673- B-61
<i>France</i>		<i>Honduras</i>
F9RM.....6762- 23- 98- A-12		HR3HH.....224,775- 81-925- B-49
F3NG.....756- 14- 18- A- -		<i>Martinique</i>
<i>Germany</i>		FM7WQ ⁴11,151- 21-177- A- 5
DL4AJ.....60,912- 47-432- B- -		FM7WF ⁸2308- 8-104- A- 5
DL1KB.....36,490- 41-297- B-36		FM7WP ⁸2430- 9- 90- A- 4
DL4ZL.....35,160- 40-294- B-60		FM7WN (FM7WN, W3VKD)
DL4ZC.....13,494- 26-173- B-25		40,084- 23-436- A-26
DL1UX.....12,090- 31-130- B-16		<i>Mexico</i>
DJ2YL.....9234- 19-162- B-17		XE1QB.....8075- 19-142- A- 9
DL9SN.....4015- 11-122- A- -		XE1RE.....1104- 19- 72-AB- 3
DL4IU.....2814- 14- 68- B- -		XE2NF (6 oprs.)
DL4SK.....2670- 15- 63- B-12		179,330- 79-762- A-96
DL9GU.....1728- 9- 64- B- -		<i>Nicaragua</i>
DL30G.....210- 8- 10- A- 8		YN4CB.....77,592- 61-427- A- -
DL9PJ.....27- 3- 3- B- -		<i>Turks and Caicos</i>
DL4DX (DL4s DX NL)		VP5DC.....52,256- 32-549- A-23
7224- 24-101- A-28		<i>Virgin Islands</i>
<i>Hungary</i>		KV4BI.....10,275- 25-138- B- 8
HA5KBB.....930- 10- 33- A-96		OCEANIA
HA5KBC.....18- 2- 3- A- 6		<i>Australia</i>
HA5KBA (5 oprs.)		VK5LC.....5460- 20- 91- A-13
14,404- 26-186-BC-96		VK5WO.....4158- 21- 66- A- 9
<i>Ireland</i>		VK3MX.....828- 9- 31- A- -
EI5I.....66,303- 53-419- B-28		<i>Cook Islands</i>
<i>Italy</i>		ZK1BL.....5760- 15-129- A-13
I1CHJ.....3894- 11-118- A- -		
IT1ZGY.....3008- 16- 63- A- 7		
I1CCO.....1716- 13- 44- B- 3		
I1AHW.....216- 6- 12- A- 3		
I1AJJ (I1s AIJ ZSK)		
40,500- 45-300- A-25		
<i>Netherlands</i>		
PA0VB.....11,880- 33-120- B-18		
PA0ALO.....10,545- 19-185- B- -		
PA0ULA.....8400- 20-140- B-16		
PA0JA.....2340- 15- 52- A- 4		

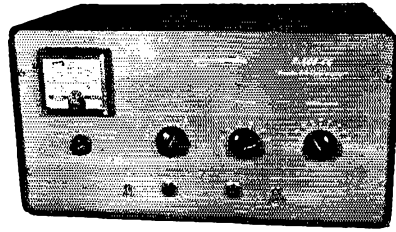
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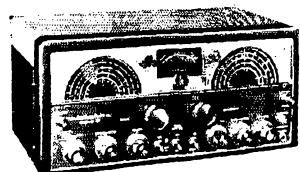
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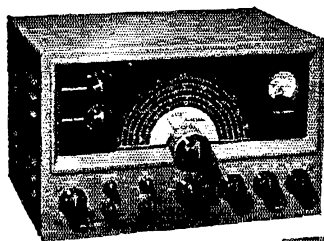


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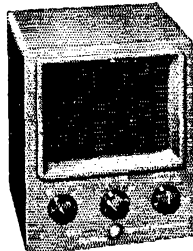


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VR2BC.....2610-15-58- A-5	PY7VG.....459- 9-17- B--
	PY1CK.....3- 1- 1- B--
<i>Hawaii</i>	<i>British Guiana</i>
KH6LJ...349,200-75-1552-BC-68	VP3HAG...\$9,320-58-516- A-64
KH6PM...265,881-77-1151-B-66	<i>Chile</i>
KH6MG...2592-18-48-AC-3	CE3CZ...285,120-64-1489-B--
KH6DE...480- 8-20-AB--	<i>Colombia</i>
KH6AYG (KH6s AUB AYG BCM BHZ)...178,872-58-1041-C--	HK3PC...5100-25-68- A-4
<i>Marshall Islands</i>	<i>Ecuador</i>
KX6AF (7 ops.)	HCIES...391,860-92-1497-B-61
50,336-44-383- A-52	HC20M...37,350-30-415- A--
<i>New Zealand</i>	HC2BL...9348-19-164- B-21
ZL1BY...153,446-73-701- A--	<i>Netherlands West Indies</i>
ZL1MQ...103,464-72-479- A-36	PJ2AF...143,594-61-788- B-43
<i>Philippine Islands</i>	PJ2AB...56,784-42-456- A-30
DU7SV...7200-24-100- B--	<i>Paraguay</i>

SOUTH AMERICA

<i>Argentina</i>	ZP5CF...2592-16-54- A--
LU8DB...12,712-28-152- A- 8	<i>Peru</i>
LU9FAY...10,440-15-232- A--	OA5G (3 ops.)
LU9AW...4704-16-98- A--	152,658-66-772-AC-55
<i>Brazil</i>	<i>Surinam</i>
PY2CK...56,852-48-395-AC-22	PZ1RM...9087-13-233- B-10
PY4KL...7344-18-136- B--	
PY7ADR...6864-26-88- B-19	<i>Uruguay</i>
PY4EM...5302-22-81- A--	CX2CO...31,780-42-250- C--
PY7VBG...1830-15-108- B-16	CX3ZBH...2565-19-45- A-3

1 W1WPR, opr. 2 Hq. staff - not eligible for award.
2 W1UJX, opr. 3 K6CEO, opr. 4 LA5AR, opr. 5 W3VKD,
opr. 7 K2CJN, opr.

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How's DX

(Continued from page 69)

Magallanes province and Tierra del Fuego become CE8s. Chilean Antarctic amateurs will use the prefix CE9. CE0, 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!

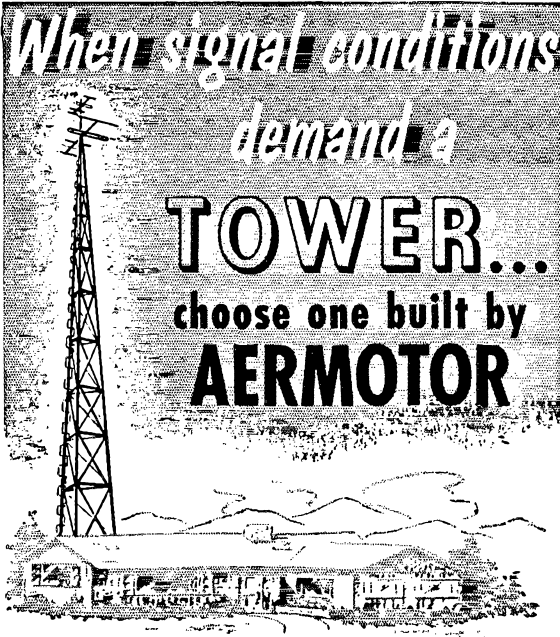
W2WHB joins a Greenland task force at Tuto and is already active as KG1AX. W6ITH, by far the most eminent authority on St. Martin amateur radio, writes W1WPO: "My plans for PJ2NC came along nicely. It took a tremendous lot of paper work, red tape, personal interviews, etc." Reg's concomitant FS8RT encore was a boon to many who missed him on his first trip. W6TTB's 21-Mc. phone contact with PJ2NC 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 officers: W6MUB, pres.; W6VUF, 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 total, four of these phone-only. W8JIN maintains his large lead in club band-countries with a grand total of 1075, followed by W4KVB and W8EV with 604 and 543, respectively.

OT DX'er 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 150/142 total while recuperating. W2BRV desires hints on securing QSLs from F7AXB and former KG6AW/VK9 ('48);

(Continued on page 148)



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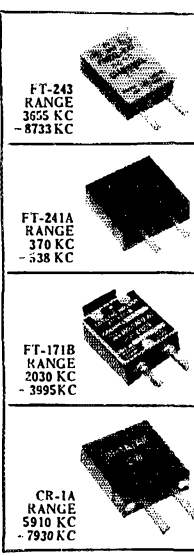
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 Law Frequency — FT-241A for SSB, Lattice Filter etc., .093" Pins, .486" SPC, marked in Channel Nos. 0 to 79, 54th Harmonic and 270 to 389, 72nd Harmonic. Listed below by Fundamental Frequencies, fractions omitted.

49¢ each—10 for \$4.00					79¢ each—10 for \$6.50				
370	393	415	487	509	533	400	462	480	462
372	394	416	488	511	534	440	463	481	463
374	395	418	490	512	536	441	464	482	464
375	396	419	491	513	537	442	465	483	465
376	397	420	492	514	538	444	466	485	466
377	398	422	493	515	540	445	469	486	469
379	401	424	494	516		446	470	487	470
380	402	425	495	518		447	472	488	472
381	403	426	496	519		448	473	489	473
383	404	427	497	520		450	474	490	474
384	405	431	498	522		451	475	491	475
385	406	433	501	523		452	476	492	476
386	407	435	502	525		453	477	493	477
387	408	436	503	526		455	479	495	479
388	409	438	504	527		457	480	497	480
390	411	463	506	529		458			
391	412	464	507	530		459			
392	414	465	508	531		461			

FT-243—.093" Dia.—.486" SPC
49¢ each—10 for \$4.00

4035	5706	6306	7473	7750	8690
4080	5740	6325	7475	7766	
4165	5750	6340	7500	7773	
4190	5773	6350	7506	7775	
4280	5775	6373	7520	7800	
4340	5780	6375	7525	7806	
4397	5806	6400	7540	7825	
4445	5840	6405	7550	7840	
4490	5852	6425	7573	7841	
4495	5873	6673	7575	7850	
4480	5875	6675	7583	7873	
4482	5880	6700	7600	7875	
4930	5892	6706	7606	7900	
4950	5906	6725	7625	7906	
5030	5925	6750	7640	7925	
5327	5940	6775	7641	7940	
5360	5955	6800	7650	7950	
5385	5973	6825	7660	7975	
5397	6206	6850	7673	8250	
5473	6225	6875	7675	8273	
5485	6240	6900	7700	8300	
5500	6250	6925	7706	8310	
5660	6273	6950	7710	8316	
5675	6275	6975	7725	8320	
5700	6300	7450	7740	8630	

79¢ each—10 for only \$6.50
 CR-1A FT-171B—BC-610
 SCR 522- $\frac{1}{2}$ Pin, $\frac{1}{2}$ " SP Bananas Plugs, $\frac{1}{2}$ " SPC

5910	7380	2030	2220	2360	3202
6370	7480	2045	2252	2390	3215
6450	7580	2065	2260	2415	3237
6497	7810	2082	2282	2435	3250
6522	7930	2105	2290	2442	3222
6547		2125	2300	2532	3570
6610		2145	2305	2545	3955
7350		2155	2320	2557	3995

79¢ each—10 for \$6.50

3735	6185	6625	8175	8550
3990	6200	6640	8200	8575
6025	6450	6650	8225	8600
6040	6473	7000	8275	8625
6042	6475	7025	8280	8650
6073	6500	7075	8350	8690
6075	6506	7125	8375	8700
6100	6525	7150	8400	8733
6125	6550	7306	8425	
6140	6573	7300	8450	
6150	6575	7425	8475	
6173	6600	7440	8500	
6175	6606	8173	8525	



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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, reassured 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 IRI 5L K 6TC, TA1DB, UA0KAA, VQ6MI, VS4s JH RM, XZ2GS, YI2BA, ZA2A, ZD8A, all on c.w.; CIs MG PL, CT2FR, EPIC, LXISI, SUIKE 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, W20AA/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 Bb Cb Dg Ec Fd Gi Hj Ia Je. A grade of 50-60 isn't too bad, 60-70 not had 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; W9s BFW, KQD; and WL7BQP.



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- ✓ **WIDE-BAND BALANCER**—affords perfect pattern symmetry with coaxial feed line. No adjustment required.
- ✓ **MAXIMUM GAIN**—over 8-db. gain on 20 and 15 meters, somewhat higher on 10 meters.
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Personnel Mgr.
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Mamaroneck, N. Y.

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

KZDYC, Phelps, N. Y. — About 30 stations now work on 50 Mc. in the Rochester area. Net meets each Wednesday at 2100. Newcomers welcome.

KZITN, Iliou, 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 KIIC, 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 this signal, or any details as to how it came about in this instance, will be appreciated.

W4KKK, Rome, Ga. — 50-Mc. DX heard or worked on 10 consecutive days at end of May, and 13 days in June up to the 2nd. 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 583As, tripler and amplifier, on 432 Mc. Would like to hear from other 432-Mc. stations in range.

W5SWT, 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 W5LXK, 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, W78FO. 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)

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till September

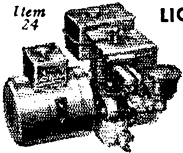


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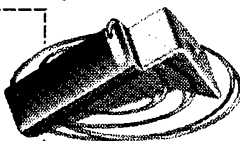
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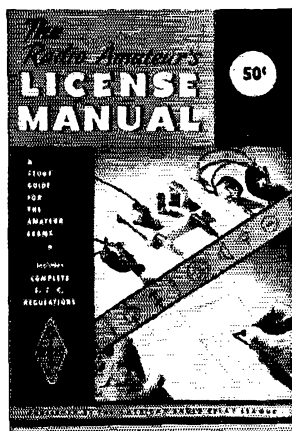
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Q. What are the procedures to be followed in obtaining an amateur station and operator license?

Q. What are the requirements for portable and mobile operation?

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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 W2QCY77 expedition on both 6 and 2; best groundwave worked in this area, 105 miles. Signals 89 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, Kennesaw, Ind. — W1KCS (State No. 27, Rhode Island) worked via aurora June 24th. Aurora signal had superimposed T9 meteor bursts at 89 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, W3FTU
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.



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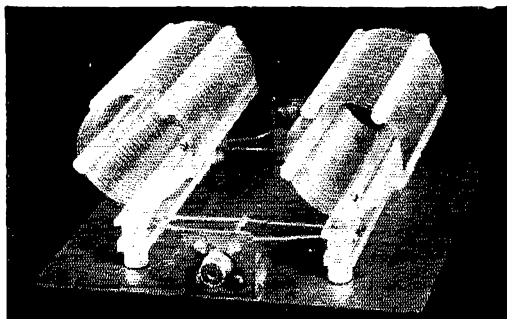
As *QSTs* get older, they become more valuable. Are your 1956 copies scattered sloppily about the shack? If so, it's time to store them neatly as the year end approaches—and the best way to accomplish this is to file them in *QST* Binders.

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air dux BALUN

The Air Dux Balun consists of a pair of bifilar wound coils which are used for impedance matching from transmitter to antenna without adjustment from 10 through 80 meters. A metal mounting plate is available. For further information, brochures, and free inductance calculator, write

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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 $\frac{7}{16}$ -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.



25 Years Ago
this month

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!


OPPORTUNITY!

PROGRESSIVE midwest electronics business looking for practical radio amateur or electronics engineer to assist in creating and developing new products! Possibilities unlimited for the right man. Please send full resume of education, employment, salary requirements, etc. Detail post experience, if any, in designing amateur equipment. Address inquiries to:

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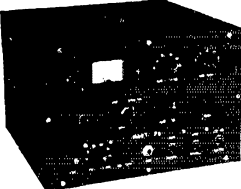
He Tuned it!

The New  and was he surprised!

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HQ.-(Shhhhh, censored till September)


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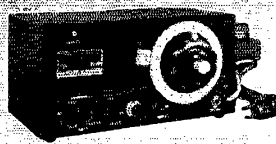
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The function of the ARRL QSL Bureau system is to facilitate delivery to amateurs in the United States, its possessions, and Canada of those QSL cards which arrive from amateur stations in other parts of the world. Its operation is made possible by 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, 114 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, Wis.
- W0, K0 — Alva A. Smith, W0DMA, 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 Namaau Dr., Honolulu, T. H.
- KL7 — Box 73, Douglas, Alaska.
- KZ5 — Catherine Howe, KZ5KA, Box 407, Balboa, C. Z.

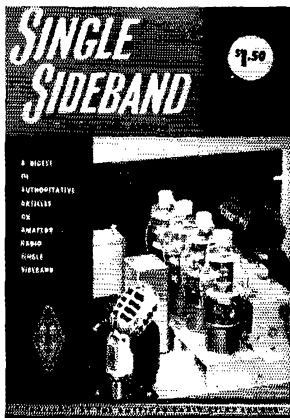
Strays

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.



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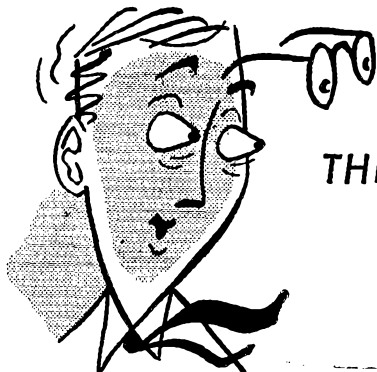
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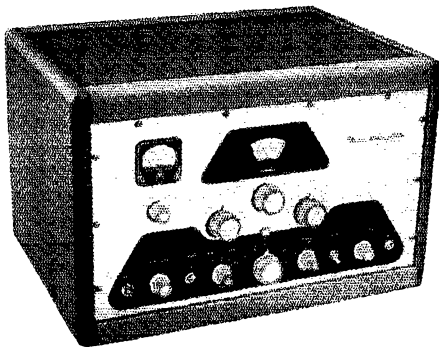
100 watts output on 160, 80, 40, 20, 15, 11, and 10 meters.



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, pre-wound 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

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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.

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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



MODEL AM-1

\$14.50

Shpg. Wt. 2 Lbs.

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.

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BENTON HARBOR 9, MICHIGAN

HEATHKIT

communications-type all band receiver KIT

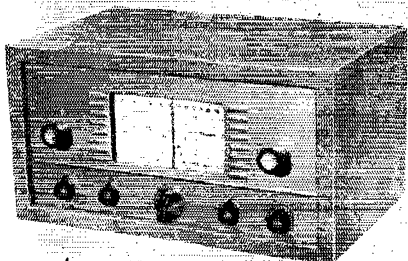
Slide-rule dial
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Slug-tuned coils and
efficient IF trans-
formers for good
sensitivity and
selectivity.

Transformer-
operated power
supply for safety
and high efficiency.

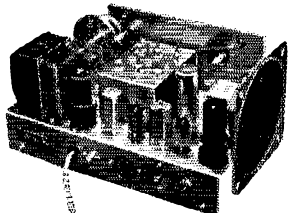
The Model AR-3 receiver features new high-Q slug-tuned coils, new layout, and new-type IF transformers. The result is high sensitivity and selectivity and better image rejection on all bands.

Transformer-type power supply, electrical bandsread, RF and AF gain controls, antenna trimmer, AGC, BFO, headphone jacks, socket for Q multiplier, 5½" PM speaker and illuminated dial.



\$27⁹⁵ (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 7¾" D. No. 91-15. Shpg. Wt. 5 Lbs. **\$4.50.**



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

HEATHKIT

CW amateur transmitter KIT

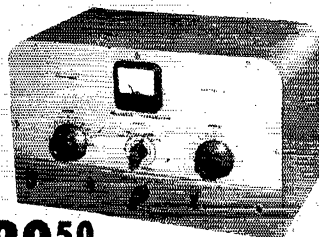
Single-knob
bandswitching
for 80, 40, 20, 15,
11, and 10 meters.

Panel meter monitors
final grid or plate
current.

Plate power
input
25-30 watts.

Best dollar-per-
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market.

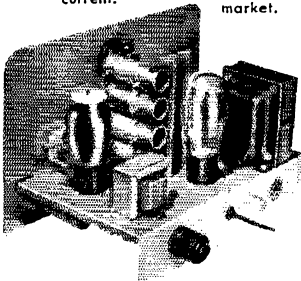
The AT-1 is complete with its own power supply, and covers 80, 40, 20, 15, 11, and 10 meters with single-knob bandswitching. Designed for crystal or external VFO excitation. Incorporates key-click filter, line filter, copper plated chassis, pre-wound coils, 52-ohm coaxial output, panel meter, and high quality components throughout. Easy to build, even for the beginner. Employs 6AG7 oscillator and 6L6 final. Up to 30 watts power input.



\$29⁵⁰
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—Doubling



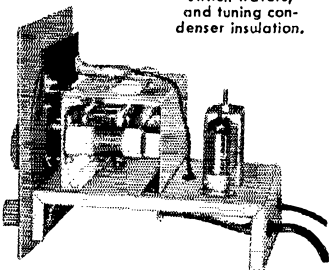
OA2 voltage
regulator tube
for stability.

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
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amic coil forms,
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denser insulation.



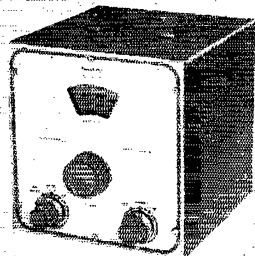
HEATHKIT vfo KIT

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

\$19⁵⁰

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 Complement—6AU6 Oscillator OA2 Voltage Regulator. Power Requirements—250-350 VDC @ 15-20 ma. and 6.3 VAC @ .45 A.

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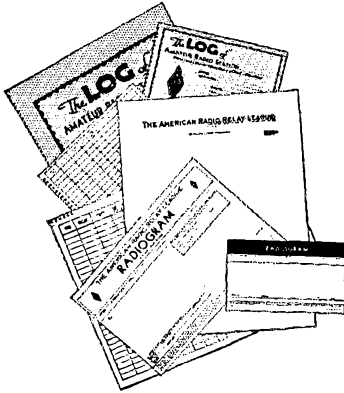


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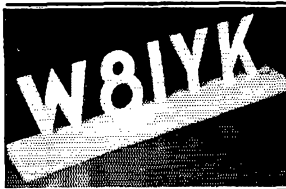
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54th Year



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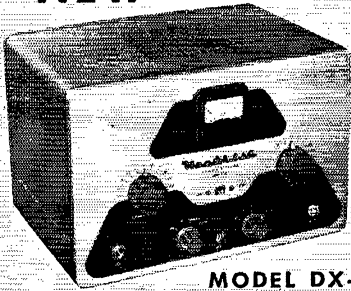
THE NEW HAMMARLUND

HQ.-(Shhhhh—censored till September)

**HEATHKIT
NEW**

DX-35

phone and cw transmitter KIT



MODEL DX-35

\$56.95

Shpg. Wt. 24 Lbs.

- Built-in modulator for phone operation.
- Bandswitching on 80, 40, 20, 15, 11 and 10 meters. Pi network output coupling.
- Switch selection of three crystals—provision for external VFO excitation.
- Attractive and functional physical design.

This brand new transmitter model provides phone and CW operation on 80, 40, 20, 15, 11, and 10 meters. Plate power input to 65 watts on CW and controlled carrier modulation peaks to 50 watts on phone. Completely bandswitching.

Employs two-stage 12AX7 speech amplifier, 12AU7 modulator, 12BY7 oscillator, 12BY7 buffer, and 6146 final. The buffer stage assures plenty of drive to the final on all bands. Pi network output coupling employed for easy antenna loading. Switch selection of crystals. Crystals changed without removing transmitter cabinet. Husky power transformer and choke are potted, and the circuit is well shielded. Meter indicates final grid or plate current.

Truly a remarkable transmitter package for the price. Ideal both for the novice and for the more experienced operator.

Send for free 1956 Heathkit Catalog describing more than 65 interesting "build-it-yourself" projects.

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BENTON HARBOR 9, MICHIGAN

HEATHKIT "Q" multiplier KIT

Provides extra selectivity for separating signals, or will reject one signal to eliminate heterodyne. Effective Q of 4,000 for sharp "peak" or "null." Tunes any signal within receiver IF. Operates with 450 to 460 kc IF. Will not function with AC-DC type receivers. Requires 6.3 VAC at 300 ma, and 150-250 VDC at 2 ma.



MODEL QF-1

\$9.95

Shpg. Wt. 3 lbs.

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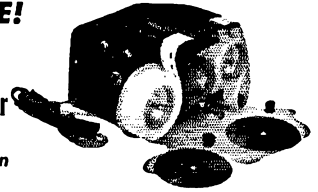
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**SPEED UP Your
RECEIVING
with G-C**

Automatic Sender

Type S
**\$28.00 Postpaid in
U. S. A.**



Housed in Aluminum Case Black Instrument Finished. Small—Compact—Quiet induction type motor. 110 Volts—60 Cycle A.C.

Adjustable speed control, maintains constant speed at any Setting. Complete with ten rolls of double perforated tape. A wide variety of other practice tapes available at 50c per roll.

GARDINER & COMPANY
STRATFORD NEW JERSEY



He Heard it!

the hottest thing
in the business!



the new HAMMARLUND

HQ-(Shhhhh—censored till September)

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 non-commercial in nature. Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, takes the 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 that 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 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.

MOTOKOLA 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.

MICHIGAN Ham! Amateur supplies, standard brands. Store hours 0800 to 1700 Monday through Saturday. Roy Purchase, W8RP, Purchase Radio Supply, 6055 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, W2KUR, 308 Hickory St., Arlington, N. J.

RECEIVERS repaired and aligned by competent engineers, using factory standard instruments. Hallcrafters, Hammarlund, National, Collins authorized service station. Our twentieth year. Douglas Instrument Laboratory, 176 Norfolk Ave., Boston 19, Mass.

ATTENTION Mobile! Lece-Neville 6 bolt 100 amp. system alternator, regulator & rectifier, \$45.00. Also Lece-Neville 12-volt 100 amp. system, alternator, regulator & rectifier, \$85.00. Good condition. H. A. Zimmermann Jr., K2PAT, 750 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, Conset, Hallcrafters, Hammarlund, Johnson, and Master Models, 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 Ham! Swap Burdick EW-27 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, Conset, Hallcrafters, 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, W0BJV, 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 condition for sale: \$180. John M. Pincomb, W2SIM, 2 Great Oaks Road, Roslyn Heights, N. Y. New York City ham please call OK 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-WP, Toledo 12, Ohio.

WANTED: Receiver R5/ARN7, 6N-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.

QSL'S? SWLS? State-maps? Rainbows? Photographic? Cartoons? Samples 25¢ (refunded). Callbooks (Fall), \$4.00. "Rus" Sakkers, W8DED, P.O. Box 218, Holland, Mich.

QSL-SWLS. Meade W9KXL, 1507 Central Avenue, Kansas City, Kans.

QSL-SWLS. 100, \$2.85 up. Samples 10¢. Griffith, W3FSW, 1042 Pine Heights Ave., Baltimore, Md.

QSL 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.

QSL. Nice designs. Samples, Besesparis, W3QCC, 207 S. Balliet St., Frackville, Pa.

QSL Samples. Dime, refundable. Roy Gale, W1BD, Box 154, Waterford, Conn.

DELUXE QSL—Petty, W2HAZ, Box 27, Trenton, N. J. Samples 10¢.

QSL-SWLS. Samples free Bartinoski, W2CVE Press, Williams-town, N. J.

QSL "Brownie," W3CJL, 3110 Lehigh, Allentown, Penna. Samples 10¢; with catalogue, 25¢.

QSL-SWLS. Samples 10¢. Maigo Press, 1937 Glendale Ave., Toledo 14, Ohio.

WOODY's QSL. Box 164, Asher Sta., Little Rock, Ark.

QSL. Western states only. Fast delivery. Samples 10¢. Dauphinc, K6JCN, Box 60009, Mar Vista 66, Calif.

QSL. Taprint, Union, Miss.

QSL. Postcard brings samples. Fred Leyden WINZJ, 454 Proctor Ave., Revere 51, Mass.

QSL. SWLS. High quality. Reasonable prices. Samples. Bob Teachout, W1FSV, 204 Adams St., Rutland, Vt.

QSL's sharp, 200 one color, three bucks. Multi-color samples dime refunded. Edward Green & Sons, 4422 Marquette Drive, Ft. Wayne, Ind.

QSL samples 10¢. Bob Morris, W2IHM, 230 Rose St., Metuchen, N. J.

QSL-SWLS, rubber stamps, letterheads, bargain prices. Craigprint, Newark, Arkansas.

QSL. SWLS, 2-colors. 100 for \$2.00. Bob Garra, W3UQL, Lehigh-ton, Penna.

QSL—All kinds and prices, samples 10¢ fast service. DX Card Co., Kulik St., Clifton, N. J. GR 3-4779.

C. Fritz for better QSL-SWLS! Samples 10¢. 1213 Briargate, Joliet, Ill.

QSL-SWLS two color, \$2.00 hundred. Samples. W4DQK Press, Box 67, Pearson, Ga.

QSL of distinction. Three colors and up. 10¢ brings you samples of distinction. Uncle Fred, Box 86, Lynn, Penna.

QSL-SWLS. Reasonable. Catalog, 25¢. Speedy delivery. Dick, E6GJM, 10558 E. Olive, Temple City, Calif.

QSL. Printed book matches and memo pads. Free samples. Freismuth, W2SUN, Bayville, N. J. P. O. Box 169.

QSL. Lapel pins, samples dime. Kephart, W2SPV, 4309 Willis, Merchantville, N. J.

QSL-SWLS. Samples dime. Backus, 703 Cumberland St., Richmond, Va.

QSL. Samples, dime. Printer, Corwith, Iowa.

QSL. Samples free. W3EHA, Cy Jones, 840 Terrace, North, Hagerstown, Md.

QSL-SWLS. 1¢ each. Letterheads, envelopes. Samples 10¢. Rusprint, Box 7507, North Kansas City 06, Mo.

QSL-SWLS. 2 colors, \$2.00 per 100. Free samples. Caprintco, Box 4142, Columbia, S. C.

QSL: 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 QSL'S? Samples 12 cents. Rogers, K0AAB, 737 Lincoln Ave., Saint Paul 5, Minn.

QSL'S: Mobiles, Novices, DX, YL, YL-OM, Gil Cartoons, Samples dime. Robinson, W9AVH, 12811 Sacramento, Blue Island, Ill.

QSL'S: Glossy. Samples 10¢. WIOLU Press, 30 Magoun, Medford, Mass.

FOR Sale: 500 watt Hallcrafters HT-4, all band xmitter. Professional version of the U.S. Army BC-610-D. Complete with BC-610-D speech amplifier, tubes, coils, manuals, dolly, interconnecting cables. Cabinet is black 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 1958 ARRL Handbook, using Mosley coils; 70 ft. RG8U lead line, TR-2 rotator, control box and 100 ft. controllable 40 ft. Tele-Vue crank-up tower, with ease 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. Latin Radio Laboratories, Owensboro, Ky.

FOR Sale: 32V-2, HQ-129X, R-9er, 10 or 3-el. 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. Convalvo, 4905 Koanne 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/skr \$105; BC454, converted, \$6; Eico #1040 eliminator, \$15; Heath V6, VTVM, \$20. Send stamp for list of parts, tools, resistors, etc. M. J. Marshall, 453 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-666, mobile converters and transmitters, etc. Graham Company, Bob, WIKTJ, 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 603A 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 WJ2ZZ. 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. Tr. emitting \$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. Airmated, C-W Crystals Box 2065, El Monte, Calif.

RECEIVERS, 6.0 to 9.1 Mc. 40-meter Command, without tubes, \$1.75 plus 8 1/2 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 receiver 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. Price 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, KN4EKK, Rte. 2, Box 593-H, Cocoa, Fla.

FOR Sale: Heath AT-1 and home-brew modulator. In good condx: \$35. M. G. Long, Box 543, Wilmuneca, 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 6V00V, 3 A dynamotor, used but good, \$10; Heath AF amplifier, like new condx, \$15. W6KHJ, Geo. W.ildeboor, Savannah, Mo.

GONSET Communicator 1, in exc. condx: \$140. Cash and carry deal, W3BHA, M. Treat, M.D. Tel. HO 8-5768, Philly, Pa.

COLLINS 32V3, \$475; HRO50 low frequency coils. N. Konos, W4MP, 8 1/2 Summit Ave., Salem, Mass.

SELL: Heathkit AT-1 transmitter, modified as per WIICP in October 1955 QST, \$20. Doug MacLaughlin, W1WVV, Box 45, West Dover, Vt.

TRENDENDOUS 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 L1 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, 16304 Berkeley Way, Berkeley, Calif.

COLLINS 75A2 with NBFM adaptor, like new in performance and appearance, \$125. 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 "Diffusio-12", Hi-Fi speaker, new condition, \$20; base reflex cabinet extra, K2BXD, 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. V1's and XV1'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; Milten exciter and power supply; 1195 V.A. c.t. power supply and matching modulator with six tube audio amplifier; needs w/skr. Bias and filament supply. All unused. National HRO7 with complete accessories. I 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. W6SIN, 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, tennis, contests, in-cades 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 systems 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 started one. Sample: two Radiart TV rotators, meter under tubes, one \$12.00, one \$15; Mosley 1Tribander 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. W2CVO, 223 Bird Ave.

DELUXE Mobile rig, Elmac AF-67 trans., Morrow 5BRF and FTR revt, new condx: \$285. 2-meter Communicator, exc. condx, \$185; Master 2-meter coax antenna #214, reg. price \$15.95, only \$8.00. K2BBC, Ray Kreitman, 37 Nagle Ave., N.Y.C. Tel. SW 5-0635.

SALE or Swap: 1st phone communications course, Nilson's, \$22; Electronic Monitor key \$12; pair 4-05A, \$18.00; pair 810's, \$10.00; 4-250A with socket blower, bla. xtrm, \$25.00; K.W. pwr supp., \$50.00; Model "A" slicer with API, \$40. W9TQL, Box 415, 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 original carton with instruction manual, \$350. Robert E. Babb, 1161 Harnar St. Ft. Wayne, Ind.

SELL: HQ-129X with speaker, \$115. Also CRE1 basic and advance Courses, 16 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, 8B, 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, Fingias, 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. \$395. 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. Stiffner, K6CZK, 1712 Austin Way, Santa Rosa, Calif.

BEAM: 15-meter Gonset, brand new, never assembled: \$40. W0DSP, Box 1264, Sioux City, Iowa.

TRIANGULAR steel tower 22 ft. high with rotator mount, 3-el. 10M Hy-Lite ir. beam, less boom, \$25.00. Also 9 lengths MS-53-54 ant. sections with MP-22 base, \$6.50. Cash and carry. J. Pyrry, 192 Norman Way, Paramus, N. J. Tel. COlfax 4-8653.

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, exc. deal, preferred. R. Mills, W2HDV, 150 Prospect Park West, Brooklyn, N. Y.

VIKING Mobile, technician-wired, tested; tubes, 12v. Johnson dynamotor brand, new, \$150; two power transformers, \$200 VCT 30 MVA \$50 VCT \$30 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. WIWXC, 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 bus \$20; Vibroplex deluxe, \$18; BRW mod. 52 low pass, \$18; 200W all band coupler, \$15; four 10 ft. tower sections and base, \$30; Select-O-lect, \$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. xmitter, 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, W3CJU, 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. xtrm \$6; Pr 813's and UDC S02 fila. xtrm, \$17; Pr. 811, \$4; three 837's, \$7; 5/300 choke, \$4; 8/30 @ 250 swinging choke \$4; UDC S-9 Univ. Harver, \$3; or name your own bargain price. Dougherty, W2LEH/B-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, W4WD1, 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 xmitter 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. Oehlein, 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-8J2 \$35.00; S-77 \$69.00; I vaco 600 \$69.00; S-27 \$79.00; 2BA \$149.00; S-7 \$89.00; 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 KR75TV \$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 FMRCR 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, W0GFQ. 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. Harward, 815 E. 1st, Sacramento, Calif. 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 anaphots. 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 SSB, W1EBQ, Bill Nordstrom, 2 Mall St., Lynn, Mass.

SELL: 500 watt SSB, AM, CW linear amplifier made by Hallcrafters, Model RT-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 1074, 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 phone/c.w. amplifier, pwr. supply; Meisner 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, VTM, 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 2 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. Alprodc tower, prop pitch motor, pair of selyns, 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 357Ga \$4; used 4-125A, \$10; Workshop 10-meter beam, \$15. W8VEL, 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. W0VBK, L. M. Divinita, 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" 1/2 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, plus the mobile \$65.00 by 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, W3NSO, 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. Also for Hi-Fi components. Send offers to W. C. Blevater, W3NLM, 1013 East Monroe, Eldorado, Ark.

SELL: Viking II VFO, D-104 mike, Vibroplex bug, \$285, complete. HRO-SOR, Seltco-O-Ject, xtal calibrator, NBFM, \$275 complete. \$500 takes all. W9GJP, Stallman, 633 County Line Rd., Highland Park, Ill.

MOVING South. Must sell Bendix selyns motors, \$2 ea., two PE73 G-E dynamotors, \$4 ea., two G-E 645 transceivers, not used, \$7 ea., Mallory TV. Inducturer, \$5; Tabitron 36v. Ga 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, 222. Contact work with 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 W0UFD, 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. W4KLI, 62 Pine St., Steelton, Penna.

VIKING Ranger with grid lock 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 vcm4000-Silver VTM model 900, in gud shape, \$45. One BC-48B 100 kc. needs new CW VFO. All items now in use. All letters answered. Cliff Bailey, W5BSE, Box 152, Carthage, Miss.

SELL: Collins 32V2 in excellent condx; National MB150 tank amp; parts for 600 watt final and HV power supply. Haynes, 2413 Mallory, 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 1 1/2 meters. Wholesale Supply Co., Lunenburg, Mass.

TAPE Recorded code courses, same system used by U. S. Navy in WW2. Send for particulars. Taped code, Box 57, Langhorne, Pa.

CENTRAL Electronics "A" Slicer \$49.95 "B" Slicer \$74.95, 10-B \$139.95, A-C \$199.95; Collins 32V1 \$95.00, 32V2 \$60.00, 32V3 \$55.00, 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-Ceiver \$79.95, 2m Communicator-1 \$149.95, 2m Communicator-II \$179.95, 2m Linear-Amp \$129.95; Hallcrafters SX-62A \$250.00, S-76 \$139.95, SX-85 \$429.50, SX-96 \$199.95, HT-17 \$34.95, HT-18 \$49.95, Harvey-Wells TBS-50 \$49.95, TBS-50I \$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 \$75. NC-183 with matching speaker, \$189. Prefer local delivery. Quitting ham radio. John Reves, W0ICA, 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 Eimac 4-125A \$20, 24 Peterson 2-2 7 Mc. xtals, 7004 Kc and every 3 Kcs through 7073 Kc, \$30; new Johnson condensers, 100 E30, \$6; 80E20, \$4, used 70B30, \$4; B&W TVL coils 10, 20, 40 with xtal car and three filter tanks \$10; 2 Weston 0-20 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. W4KS2, 3, 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, Hallcrafters, 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. PL 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, Waitnam 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 Kenosia 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. Kaccliff's, 1720 North Countyline, Fostoria, Ohio.

MOBILEERS: Have for sale a complete 12V. rig consisting of Viking Mobile xmitter, Viking VFO, Conset Super-ciever 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 Rexl Write or phone description for immediate action. Bob E. Sanoff, WORKS, 1324 S. Edris Drive, Los Angeles 35, Calif. Phones: RPublic 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 WNIJGU, 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, \$195.00, 50-watt homebuilt band-switching 0146 final, AM/CW/VFO (beautiful job), \$95. Terms arranged. VESVZ, 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 rcvr 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. xtrim. Garrard HC-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; \$425, 16 in. Motorola color TV, very gud condx, \$150. Paul R. Schmidt, W9WFF, 9736 Reeves Ct., Franklin Park, Ill.

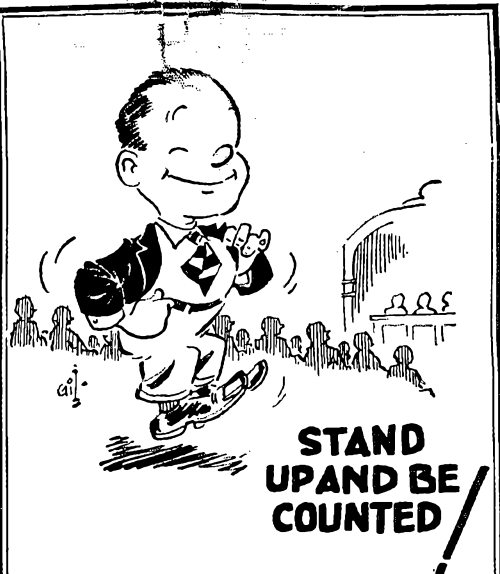
SELL: Panoramic adaptor, Navy model RDP, 30 Mc. input frequency. Best offer. Joseph Ferreira, 55 Vesta Circle, Melbourne, Fla.

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. 1V1 suppressed! \$350. Glenn, W2IQ1, 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.



STAND UP AND BE COUNTED!

Amid all the ballyhoo attending national elections, the League is quietly holding elections of its own. Full members in half of the sixteen ARRL divisions are in the process of nominating and electing their directors for the 1957-1958 term.

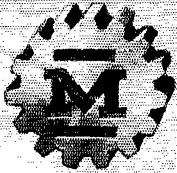
These elections are one of the things that keep the League "of, by and for the radio amateur." It's important that well-qualified amateurs be elected, for the Board of Directors is the policy-making body—the Congress—of the League.

If you're not yet a member, you can still join in time to receive your ballot. If you are already a member, don't let the deadline slip by with your nominating petition or ballot still unmailed.

QST and ARRL Membership
\$4 in the USA \$4.25 in Canada
\$5 elsewhere

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RADIO RELAY LEAGUE
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Designed for



Application



90672

**The No. 90672
ANTENNA BRIDGE**

The Millen 90672 Antenna Bridge is an accurate and sensitive bridge for measuring impedances in the range of 5 to 500 ohms at radio frequencies up to 200 mc. It is entirely different in basic design from previous devices offered for this type service inasmuch as it employs no variable resistors of any sort. The variable element is an especially designed differential variable capacitor capable of high accuracy and permanency of calibration over a wide range of frequencies. A grid dip meter such as the Millen 90651 may be used as the source of RF signal. The bridge may be used to measure antenna radiation resistance, antenna resonance, transmission line impedance, standing wave ratio, receiver input impedance and many other radio frequency impedances. By means of the antenna bridge, an antenna matching unit may be adjusted so as to provide the minimum standing wave ratio on the radiation system at all frequencies.

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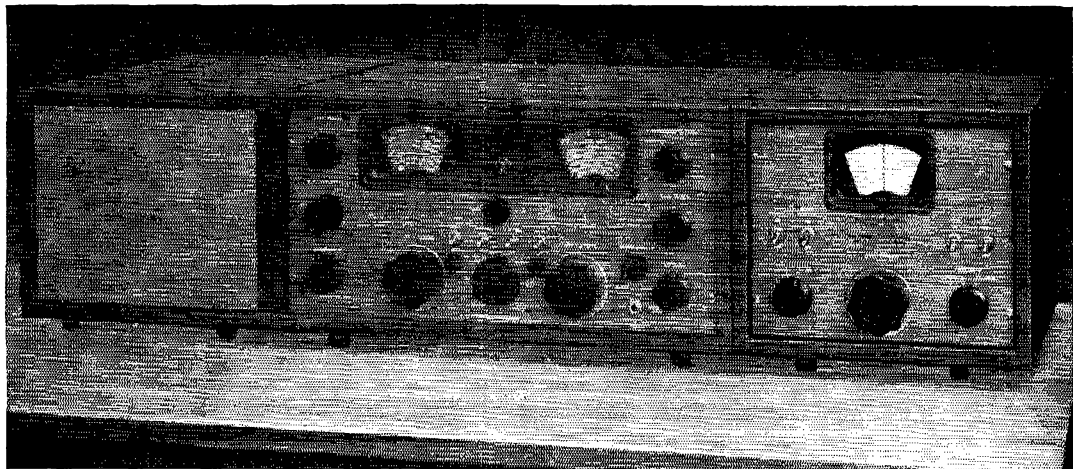
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Single Sideband Adapter- **GSB-1**



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.

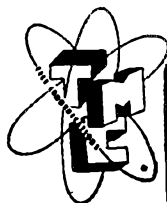
Illustrated with the GSB-1 (right side) is the TMC Receiver GPR-90 (center) and the companion speaker - Bulletin 179Q.

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



The TECHNICAL MATERIEL CORPORATION

TMC Canada, LTD.
OTTAWA, ONTARIO

MAMARONECK, NEW YORK

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(Bulletin 194Q)
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
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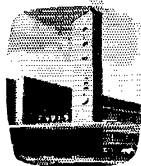
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What makes the NC-300 a "dream receiver"?

SELECTIVITY?

SENSITIVITY?

STABILITY?

PRICE?

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!

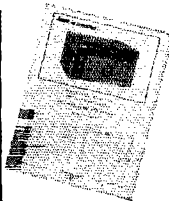
SELECTIVITY is another reason for the NC-300's acceptance as a "dream receiver". In the NC-300's IF system, a pair of switchable double-tuned networks offers a choice of three bandwidths — 500 cycles, 3500 cycles, or 8000 cycles. The second IF at 80 kc permits the use of these three widely different 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

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 carefully 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 — 1 1/4 meters with 10 dial scales (including provision for accessory converters for 6, 2 and 1 1/4 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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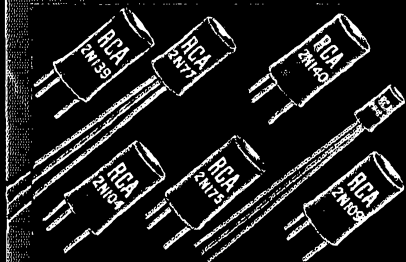


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- RCA-2N105 Small size for low-power
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- RCA-2N139 Class A 455-Kc IF Amplifier
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- RCA-2N175 Class A low-noise AF Amplifier
- RCA-2N215 Flexible-Lead 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

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RCA-23951
2-1/4" speaker



Opening new important applications in lightweight, battery-operated equipment, RCA Transistors are the answer for the amateur who is getting into miniaturized equipment.

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Widely used today in commercial and military equipment, RCA Transistors are available at any RCA Tube Distributor. For technical data on RCA Transistors, write RCA, Commercial Engineering, Dept. I37M, Somerville, N. J.

For full construction details on the transistorized microphone, see Aug. HAM TIPS. Free, from your RCA Tube Distributor.



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