These low frequency band pass filters are held to 1 DB tolerance at the 3 DB crossover...600 ohm...4 filters per 7½" rack panel.

This ultra low frequency filter has a band pass range of one cycle to 10 cycles...50,000 ohms...700 cubic inches.

This 600 ohm miniaturized 1 KC band pass filter is housed in a case only 1" x 1¼" x 2½".

This 600 ohm miniaturized low pass filter is housed in a case only 1" x 1¼" x 2½".

This power line filter provides correct output voltages from sources of 50 to 400 cycles...noise attenuation is from 14 KC to 400 MC...29 cubic inches.

This band pass filter is designed for sharp cut-off at both ends of the range...10,000 ohms...case dimensions 1¼" x 2½" x 3¼".
Announcing THE THIRD ANNUAL EDISON RADIO AMATEUR AWARD

You are invited by the Award Committee to nominate your candidate for 1954

For the third successive year, you have the opportunity to single out for national acclaim someone who has rendered outstanding service while pursuing his hobby, amateur radio.

Only candidates who are nominated by letters from you and others, will be considered by the judges.

Naming the Edison Award winner is a tribute to the efforts of all amateurs in the public interest. By entering a candidate, you help make this tribute possible . . . and can win for yourself an expense-paid trip to the city where the Award will be presented.

Edison Award achievement is exemplified in the work of J. Stan Surber, W9NZZ, last year's winner. Mr. Surber since 1950 has served as a regular message link with hundreds of men on duty at remote Arctic weather stations—has handled, in all, some 20,000 personal communications.

Other new pages of amateur achievement are being written while you read this. Aid in honoring those responsible! Read the rules below . . . select your Edison Award candidate . . . and mail your nominating letter to Edison Award Committee, Tube Department, 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 1954 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 a centrally located metropolitan city. Expenses of his trip to that city will be paid. As a further token of appreciation, G.E. will present him with a precision timepiece to clock DX. In addition, the person responsible for the nomination of the Award-winning candidate will be invited to attend the presentation ceremony, and his expenses also will be paid.

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

HOW TO NOMINATE. Include in a letter the candidate’s name, address, call letters, and a full description of the service performed. Your letter must be postmarked not later than January 3, 1955.

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
VAL PETEYSON, Administrator, Federal Civil Defense Administration
EDWARD M. WEBSTER, Commissioner, Federal Communications Commission
GOODWIN L. DOSLAND, President, American Radio Relay League

WINNER WILL BE ANNOUNCED on or before Thomas A. Edison's birthday, February 11, 1955.

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

GENERAL ELECTRIC
Whether your operating taste runs to dx, traffic or rag-chewing, you’ll like the convenience of these proven performers. With this popular communications system, you QSY from the high end of 10 to the low end of 80 in a few seconds; just pick your band and set the dials to the desired frequency. With this accurately calibrated pair on your operating table, you don’t even have to zero-beat. Want to answer that station on his own frequency? Just set the 32V-3 to the frequency indicated on the 75A-3 — that’s all there is to it!

The Collins 75A-3 double-conversion receiver, with its crystal-controlled front end and highly stable low frequency VFO, is like a high frequency crystal-controlled converter working into a very stable low frequency receiver. The high stability and 3.1 kc bandwidth of the 75A-3 make it ideal for AM or single sideband — and 800 cycle and 6 kc bandwidth filters are available as optional accessories. All coils are permeability tuned and have a straight-line frequency characteristic, allowing linear dial calibration. Only the band in use is visible on the slide-rule dial. On the vernier dial, each division represents one kc except on the 10 and 11 meter bands, where each dial division represents two kc. This accurate calibration is made possible by the highly stable oscillators in the 75A-3.

The 32V-3 is a VFO controlled band-switching gang-tuned transmitter rated at 160 watts input on CW and 140 watts on Phone. It is thoroughly filtered and shielded to minimize the possibility of TVI.

Fully illustrated booklets describing this popular pair are available at your Collins distributor.
CONTENTS

TECHNICAL

The "Tur-Key" in Miniature
Richard H. Turrin, W2IMU

Build Your Own Panoramic Adapter
H. F. Priebe, jr., W2TGP

A Broad-Band Bandswitching Converter/Preselector
Robert F. Larter, W2YFM

A Low-Cost Gallon... A. W. Anthony, jr., W1CTE

A Civil Defense Control-Station
Transmitter — PART II... Philip S. Rand, W1DBM

Extending the Range of the ARRL Lightning Calculator
Yardley Beers, W2AWH, and Walter E. Bradley, W1WH

The Viking Ranger... (Recent Equipment)

BEGINNER

The Tin Can Low-Pass... Lewis G. McCoy, W1ICP

MOBILE

Have You Tried V.H.F. Mobile?... Edward P. Tilton, W1HQD

OPERATING

V.H.F. QSO Party

W/VE Contest

June V.H.F. Party Results

GENERAL

Hamshacks... A. David Middleton, W5CA

"It Seems to Us..."

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Our Cover

In QST 25 Years Ago

Hints and Kinks

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World Above 50 Mc.

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Operating News

With the AREC

Station Activities

Silent Keys

Military Affiliate Radio System

United States Naval Reserve
W9WJV beats last year's Field Day record with hallicrafters

Lawrence T. Fadner, team captain in Chicago's 1954 North Suburban Ham Club ARRL 40 meter CW Field Day bettered the club's last record by nearly 30%.

and Hallicrafters SX-88 is hot news too. More hams are telling each other about this new receiver than about any equipment in years.

Used by 33 governments, sold in 89 countries

MAIL THIS COUPON
FREE—Send me World-wide Time Conversion Disk Calculator and all band frequency allocation chart plus a fund of other handy data.

Name.
Address.
City____________________ State____________________

☐ Ham (call letters____________________) ☐ Listener

Occupation____________________

Hallicrafters equipment I would like to know about:____________________
MARS and CAP
Close Tolerance Crystals

ONLY

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CALIBRATED .003%

Available for all official assigned MARS and CAP transmitter frequencies ... 1500 to 10000 Kc.

All official MARS and CAP spot frequencies are available in closely calibrated Type Z-1 PRs. Because of quantity demand for these channels, we can supply them at a fraction of the cost you would normally pay for a commercial quality crystal of this excellence. With PRs in your transmitter, you can be sure you’re in channel ... and will stay there. Drift characteristics are limited to less than 2 cycles per MC per degree C. Order MARS and CAP frequencies from your jobber-dealer. Immediate shipment for any official channel.

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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 (or preceding month) direct to the 6-M, the administrative SCM of the League. All ARRL Field Organization appointments are now available to qualified League members. These include ORS, OES, OPS, QO and OBS. Also, where vacancies exist SCMs desire applications from BC, BM and FAMs in addition to station and leadership appointments. All amateurs in the United States and Canada are invited to join the Amateur Radio Emergency Corps (see Form 3). All ARRL Field Organization appointments are now available to qualified League members. These include ORS, OES, OPS, QO and OBS. Also, where vacancies exist SCMs desire applications from BC, BM and FAMs in addition to station and leadership appointments. All amateurs in the United States and Canada are invited to join the Amateur Radio Emergency Corps (see Form 3).

### ATLANTIC DIVISION

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<thead>
<tr>
<th>State</th>
<th>SCM Name</th>
<th>Address</th>
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<tbody>
<tr>
<td>Eastern Pennsylvania</td>
<td>W6HP</td>
<td>P.O. Box 143</td>
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<tr>
<td>Maryland-Delaware-D. C.</td>
<td>W3ZDK</td>
<td>309 Royse Road</td>
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<td>New Jersey</td>
<td>W3BD</td>
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<tr>
<td>New York</td>
<td>W3YJ</td>
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<tr>
<td>Wisconsin</td>
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### SOUTH DAKOTA DIVISION

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### KENTUCKY DIVISION

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### PACIFIC DIVISION

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### ROANOKE DIVISION

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### ROCKY MOUNTAIN DIVISION

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<td>Wyoming</td>
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### SOUTHEASTERN DIVISION

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### SOUTHWESTERN DIVISION

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### CANADIAN DIVISION

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<td>Alberta</td>
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<td>Yukon</td>
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<tr>
<td>Saskatchewan</td>
<td>VE6HR</td>
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</table>

* Official appointed to act temporarily in the absence of a regular officer.
MAIL THIS COUPON
FREE—Send me World-wide Time Conversion Dial Calculator and all band frequency allocation chart plus a fund of other handy data.

Name ________________________________
Address ________________________________

City __________________________ State __________

☐ Ham (call letters) ☐ Listener

Occupation ____________________________

Hallicrafter equipment I would like to know about: ____________________________

Used by 33 governments, sold in 89 countries.
THE AMERICAN RADIO RELAY LEAGUE, INC.,
is a noncommercial association of radio amateurs, bonded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio art and of the public welfare, for the representation of the radio amateur in legislative matters, and for the maintenance of fraternity and a high standard of conduct.

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

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

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

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

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GEORGE W. BAILEY, W2KH, 1940-1952

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Vice-Director: "Thomas J. Irwin, Jr. W20KD
1082 Anna St., Elizabeth 4, N. J.

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366 S. Vason, Wichita, Kansas
Vice-Director: James E. McKim W8MVG
1401 W. Tenth, Salina, Kansas

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37 Broad St., Westfield, Mass.
Vice-Director: Frank L. Baker W1ALP
91 Atlantic St., North Quincy 71, Mass.

Northwestern Division
R. BEX ROBERTS ............ W7CPY
837 Park Hill Drive, Billings, Mont.
Vice-Director: Karl W. Welzinart W7BG
3219 N. 24th St., Tacoma 7, Wash.

Pacific Division
RAY H. CORNWELL ........ W6EZ
908 Carthus, Alhambra 3, Calif.
Vice-Director: Harry M. Brunel, W6HC
770 Chapman, Santa Ana 26, Calif.

Roanoke Division
P. LAMIER ANDERSON JR. . W4MWH
128 Maple Lane, Luray, Va.
Vice-Director: Gus M. Brown WM8D
130 Broughton St., N. E. Orangeburg, S. C.

Rocky Mountain Division
CLAUDE M. MAZE JR. ....... W8BG
740 Lafayette St., Denver, Colo.
Vice-Director:

Southeastern Division
JAMES P. BORN JR. ....... W4ZD
25 Find Ave., N.E., Atlanta, Ga.
Vice-Director: Randall R. Smith W4DOA
902 Pines Court, Orlando, Fla.

Southwestern Division
JOHN R. CRIGGS ............. W4KXW
3061 Buckingham Rd., Los Angeles 8, Calif.
Vice-Director: Walter R. Jones W5KRM
1515 N. Uprichard, Lakewood 3, Calif.

West Gulf Division
A. DAVID MIDDLETON ...... W5CIA
9 Kay Road, Tijeras, N. M.
Vice-Director: Carl C. Drumline W5EFC
603 N. W. 58th St., Oklahoma City 12, Okla.
EXAMINATION COMMITTEES

In editorial discussions earlier this year (May and June issues), we expressed the hope that ARRL affiliated clubs would set up procedures making it convenient for newcomers to join the ranks of amateur licensees under the new “mail-examination” rules. With Novice and Technician Class licenses now available only through amateur-supervised examinations, it was our thought that the smoothest transition — and indeed, the best permanent set-up — would come about only if League clubs pitched in to provide examinations on a consistent, organized basis. This is obviously better than a hit-or-miss individual scheme, having the primary advantage of uniformity and capable of being publicized generally among local would-be hams.

We are delighted to learn from an FCC public notice in late June that its Field Engineering & Monitoring Bureau independently had come to the same conclusion. The notice, an invitation to amateur clubs to assist in conducting examinations, reads as follows:

The Commission on June 30, 1954 called attention to the new radio amateur rules which became effective June 10, 1954 and the opportunity presented to Amateur Clubs and Associations to assist new amateurs and the Commission by establishing Examining Committees within their membership to undertake these examinations as an adjunct to their amateur activities.

On and after this date all Novice and Technician class amateur operator examinations must be given, and Conditional examinations will continue to be given, by volunteer examiners. These examiners must be at least 21 years of age to give the amateur theory test and to give the code test must (a) hold Extra, Advanced or General amateur privileges or (b) have, within five years, held a commercial radiotelegraph operator license issued by the FCC or (c) must, within five years of date of application, have been employed in the service of the United States as the operator of a manually operated radiotelegraph station.

The Commission hopes that Amateur Radio Clubs and Associations throughout the country will establish examination committees to assist amateurs of their areas in examinations for Conditional, Novice and Technician class licenses under the provisions of the new Commission Rules Governing Amateur Radio Service and in the interest of amateur assistance.

It was pointed out that Engineers of the Commission’s Field Engineering offices will offer every assistance to Amateur Clubs and Associations desiring to establish examining committees.

Thus the scheme now has an official blessing. It’s a good plan, and a workable one. The Commission has indicated its encouragement and willingness to help local clubs in setting up examining committees. At this writing we have already received notice from several ARRL clubs of the establishment of such committees. By the time you read this, we hope they number into the hundreds. If your club has not yet started, how’s to make it the first order of business at your September meeting opening the new operating season?

LEAGUE ELECTIONS

It’s that time of year again when the Executive Committee issues a notice of upcoming elections and a call to members in half our League divisions to nominate candidates for director and vice-director posts. The current notice is in “Happenings” of this issue.

We’ve said it year after year, we say it again this month in “Haps,” and because it is so important we repeat it here: “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.”

It is obvious that some 45,000 ARRL Full Members cannot all meet in each other’s presence and participate individually in a policy and business meeting. In our representative system, therefore, members in each division in effect grant a proxy to the man they elect, a proxy to speak for them in League policy matters. Each of the sixteen ARRL directors represents, on the average, nearly 3000 amateurs. As the League continues to grow, it becomes even more important that members exercise care and wisdom in selecting directors to represent them on the Board. Right this moment, half of you have the opportunity to appraise your representatives and either renominate them for an additional term or, if you feel the division can do better, file nominating petitions for others of your choice. Which course is followed is strictly up to you and the other members in your division.
COMING A.R.R.L. CONVENTIONS
Sept. 17th-19th — Dakota Division, Rapid City, S. Dak.
Oct. 2nd-3rd — West Gulf Division, Kerrville, Texas
Oct. 12th — New England Division, Manchester, New Hampshire
Oct. 16th-17th — Midwest Division, Des Moines, Iowa
Oct. 30th-31st — Roanoke Division, Richmond, Virginia

A.R.R.L. WEST GULF DIVISION CONVENTION
Kerrville, Texas, will be host to the ARL West Gulf Division Convention on October 2nd-3rd at the Kerr County Auditorium. The Kerrville Radio Club, sponsors of the Convention, are proud of their climate and facilities which can accommodate as many as care to come. Kerrville says anything points to this being the best convention ever held in the division.

Col. Bob Cooper, W5EYV, will be master of ceremonies, and among the many outstanding events will be entertainment, dance, golf tournament, transmitter hunts, and Wouff-Hong initiation.

The ladies program will be headed by Martha Rust, XYL of W5DHE. All licensed YLs and XYLs are invited to a free breakfast at the convention.

Admission: 20 years and over $7.50; 10 years and younger free. Both tickets include dance and banquet. The October 1st pre-convention party will cost $1.50, which includes barbecue, beer, coffee or soft drinks.

Address all communications to Convention Chairman G. R. Toler, W5FNN, P. O. Box 624, Kerrville, Texas.

DAKOTA CONVENTION SITE CHANGED
As a result of a change in arrangements, the September ARRL Dakota Division Convention meetings (p. 50, August QST) will be held at the Alex Johnson Hotel, Rapid City, S. Dak., instead of at the City Auditorium.

HAMFEST CALENDAR
ILLINOIS — The annual Egyptian-St. Louis area "Ham-boree" and Picnic will be held as usual, rain or shine, on Sunday, Sept. 16th, at the Egyptian-St. Louis Radio Club Grounds 1 mile east of the Mississippi River on the south side of U. S. Highway 66.

Signs will mark the spot of the area's largest and oldest annual ham get-together. Attractions: official ARRL code-speed contest, hidden-transmitter hunt, Illinois & Missouri emergency TV meets each other then as "Diver" Delph, W6QMG, nationally known "frog man" and deep-sea diver.

Visit the famous "Podunk Hollow Shack" and W6AJU. Food and drinks available on the grounds. Come early and stay late. Free admission to out-of-town hams. For further information write W6AJU or W6PS, committee chairman.

KANSAS — Annual Hamfest of the Sksan Radio Club will be held at Independence, Kansas, 4-H Club Building, Riverside Park, on September 16th.

KANSAS — Johnson Co. Radio Amateur Club will hold its annual Banquet-Hamfest, Quivira Lake Country Club, October 2nd. For details contact Chairman Jim Gemett, W6GLN.

KANSAS — The Tri-City Radio Club will conduct its Hamfest on Sunday preceding Labor Day. Special 5th. Festivities will be held at Scott City, Kansas. Admission $1, free coffee and doughnuts for those arriving early. Bring a covered dish for noon chuck. This is the annual event staged by Scott City-Garden City-Dodge City ham clubs. Special events for YLs.


MISSOURI — The Southwest Missouri Amateur Radio Club will hold its annual Fall Picnic at Fames' Park, Springfield, on Sunday, September 16th. All hams, YLs and XYLs are invited. For further information contact Roy Nollette, W6ICW, 2528 North Weller, Springfield, Missouri.

NEW JERSEY — The New Jersey Radio Association annual Hamfest and Picnic is to be held on September 12th at National Park, N. J. Follow the S.I.R.A. signs from Rt. 133 to Red Bank Ave. and the Delaware River. Help us celebrate our 88th birthday by breaking last year's record attendance of nearly 600. Bring food, Fine soda, plenty of tables, and pavilions in case of showers. Fun and games for the whole family. Full-size carnival, 50 swings, slides, and wading pool for the kids. Mobile transmitter hunts on 10 and 2 meters; special recognition for the oldest licensed ham present. K2AA will go on the air at 11 a.m. on 3855, 2900 and 145.4 M. to "talk in" the mobiles. Registration is $1.00 per family in advance or $1.50 at the gate. Send check or money order payable to the New Jersey Radio Association, Inc. in care of Bob Barbier, 223 Chestnut St., Haddonfield, N. J.

NEW YORK — The S.I.R.A. (State Island Amateur Radio Association) will hold its first Hamfest and "Ladies' Night" on Saturday, S. I., Sunday, Sept. 12th, noon till ?. Registration must be made in advance to Charles Pandelsky, W2IXY, 103 Bay Terrace, S. I. & N. Y. Admission $1 for adults, 50¢ for children. Lots of good food and liquid refreshment.

NEW YORK — Saturday, September 18th, at the Masonic Dining Room, 239 Main St., Onedia, N. Y., the Onedia area radio amateurs will sponsor the 10th Annual Hamfest and "Ladies' Night." Admissions at $1.50 by advance registration only and is limited to 150, the capacity of the dining room. Registration is at 5 p.m. with the banquet at 7 p.m. Make reservations with Walter L. Babcock, W2BXX, 406 Suyler St., Utica, N. Y., before Sept. 16th.

OHIO — Annual Findlay Hamfest sponsored by the Findlay Radio Club, W8IF, on September 12th at Riverside Park, Findlay, 9 a.m. to 5 p.m. Advance tickets $1, at the gate $1.50. A good time for all.

OHIO — Seventeenth annual "Stag Hamfest" sponsored by the Greater Cincinnati Amateur Radio Association, to be held Sunday, Sept. 12th, at kopf Grove, Vinton Road at Compton Road, "vines south of Greenhills. Registration $2.50 at the gate. Here's what you get: hot dogs served all day, douchette and coffee served until noon, beer and pop served all day, full picnic dinner and supper (if you can eat), rain or shine! plenty of shelter. Games, hidden-transmitter hunt, personalities, display booths, etc. For additional information contact Byrum Henry, W8QBH, 1120 Elberon Ave., Cincinnati, Ohio.

OUR COVER
Vern Chambers’ latest creation — primarily an up-to-5t-watt 6-band mobile rig using ganged multiband tuners — will be just as much at home drawing 90 watts on the operating table of the fixed station. Watch for it in our next issue.

QST for
The miniature version of the Tur-Key is housed in a special case of galvanized sheet iron.

The "Tur-Key" in Miniature
A New Version of a Popular Electronic Key in Compact Form

BY RICHARD H. TURRIN,* W2I MU

* Gillette, N. J.

The original "Tur-Key" described in QST, December, 1952, while adaptable to miniature-tube design, contained several inherent complications which made construction difficult. During the course of various experiments to improve the original design, a new and rather simplified circuit evolved which readily lends itself to miniature-tube construction. The basic theory of operation remains the same as in the original design; however, two major changes in circuitry have been made. The bi-stable multivibrator, previously pulse-triggered, is now directly coupled to the sawtooth generator. Very satisfactory keying characteristics were obtained with a 6BN6 as d.c. amplifier and wave shaper. An 881 was previously used for this purpose. All the virtues of automatic recycling, self-completing action and independent speed and ratio controls are retained.

In addition, an effort was made to work out details for constructing a compact self-contained unit. Key-lever details are included and the photographs should aid in the layout and construction of the complete unit. It is hoped that this article will satisfy those who are interested in constructing an all-electronic keyer devoid of relays.

The Circuit
At first glance the schematic diagram, Fig. 1, might appear confusing since all plate returns are made to common chassis ground. Actually, the arrangement is an inverted conventional circuit. Notice all voltages are negative with respect to chassis ground. The purpose of this arrangement is to secure maximum negative voltage at the keyer-tube grid when the key is

Rear view of the compact electronic key, showing the tubes, output jack, and controls on the sub-assembly sketched in Fig. 3.

September 1954
open. The heavy line in the schematic would normally be chassis ground in a conventional circuit. Description of the circuit will be divided into three parts: the power supply, the timing circuit and the vacuum-tube keyer.

**Power Supply**

The power supply produces two voltages which are added in series to obtain the total maximum of 700 volts. The 320-volt output is obtained by full-wave rectification and a single-section R-C filter, condenser input. This simple filter is sufficient since the maximum current drawn from this supply is about 20 milliamperes. A second

used in the previous design.² $V_3$ and $V_4$ form a hybrid bi-stable multivibrator which produces positive pulses for $V_3$ grid. The timing circuit operates as follows: With the key lever in neutral position, the static condition of each stage is: $V_1$ conducting heavily, $V_2$ is not conducting because of the open cathode; however, its grid is positive with respect to cathode. $V_3$ and $V_4$ are conducting and cut off, respectively. When the key lever is closed, $V_3$ conducts, discharging $C_1$, causing the voltage across $R_2$ to decrease rapidly. Since $V_1$ cathode and $V_3$ grid are d.e. connected, $V_3$ is immediately driven to cut-off. $V_4$ conducts by virtue of the cross-connected grid-to-plate

![Fig. 1 — Circuit of the miniaturized Tur-Key.](image)

$C_1$, $C_2$, $C_3$ — 500-volt mica.
$C_4$ — Electrolytic (Mallory TV-75).
$C_6$ — Dural electrolytic (Acrovox PRS).
$R_s$, $R_s$ — 1RC type W potentiometer.
$S_1$, $S_2$ — Toggle.

negative voltage is obtained by half-wave rectification and a single-condenser filter. This voltage is about 380 and is added in series with the 320-volt output. The current drawn from this second supply is only a few milliamperes.

Standard overload protection for both rectifiers is provided by two 100-ohm resistors $R_{18}$ and $R_{19}$. The 6X4 heaters are purposely connected to the 5-volt winding to avoid overloading the 6.3-volt winding. Although the heater-cathode breakdown voltage may be exceeded, no fatalities have resulted. If substitute components are used it is advisable to correct the supply voltages to within ten volts of the values shown.

Basic control of the key is maintained by $V_2$, $V_3$, $V_4$, the key lever and associated circuit elements. $V_1$ is a cathode-follower charging tube introduced by Brann.¹ $V_2$ is a discharge tube

and return resistors; however, $V_3$ plate voltage does not decrease immediately. $C_2$ couples the rising voltage of $V_3$ plate to $V_4$ plate and holds this voltage constant for a period governed by the discharge time of $C_2$.

In addition, a negative pulse is coupled through $C_2$ to $V_4$ grid, holding $V_2$ cut off momentarily after key is pressed. $C_2$ aids the action of $C_1$, which results in a sharp positive pulse at $V_4$ plate. Since $V_3$ grid is direct-coupled to $V_4$ plate, $V_4$ conducts for the same short period. The duration of this pulse is important since successful operation depends on $C_1$ being discharged to a steady-state condition. This is further illustrated in Fig. 2 by the flat bottom of the sawtooth wave.

At time $t_5$, Fig. 2, $C_1$ is discharged and starts charging in a positive direction through $R_7$, $R_8$, and the cathode follower. As the cathode voltage of $V_1$ increases in a positive direction, $V_4$ grid follows due to the d.e. connection. At time $t_5$, $V_3$ grid becomes sufficiently positive to cause $V_3$

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¹ Brann, "In Search of the Ideal Electronic Key," *QST*, February, 1951.

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to start conducting. The action which follows is a very rapid reversal of static conditions in the multivibrator. This marks the end of one complete cycle. The next cycle starts in much the same way as when the key lever was initially closed. Self-completing action is provided by the fact that the key lever need be closed for only a small fraction of a second at the beginning of each cycle.

Dots are formed by discharging $C_1$ to a less negative voltage, which shortens the charge period or cycle. $R_5$ sets the dot-discharge voltage and is therefore the ratio control. $R_1$ provides speed control and $R_4$ is a current-limiting resistor to prevent damage to the 2-megohm pot.

**Keyer Tube and D.C. Amplifier**

The next part that will be treated separately is the keyer tube and d.c. amplifier, $V_5$ and $V_6$, respectively. $V_5$ is used in a conventional vacuum-tube keyer circuit; however, the available grid-voltage swing will limit the maximum voltage to the keyed stage to about 300 volts. Also, the 12-watt maximum plate dissipation of the 6AQ5 should not be exceeded. The 6BN6 was chosen as d.c. amplifier because of its ability to go from cutoff to saturation with about one volt change at the control grid. The driving voltage for $V_5$ is a sawtooth wave taken from $V_1$ cathode. This voltage is illustrated in Fig. 2, and is of sufficient amplitude to drive $V_1$ well into saturation or cutoff. $R_9$ limits the 6BN6 grid current.

When the key lever is open, the 6BN6 will be conducting saturation plate current of about 0.5 milliamperes. The voltage appearing at the 6BN6 plate provides keyer-tube bias and will depend on the setting of $R_{11}$. Upon closing the key to either dot or dash side, the voltage at $V_1$ grid-block keying is possible by removing the 6AQ5 and using the 6BN6 plate output. A shielded lead may be necessary in this case.

**Construction Notes**

The prime mechanical design consideration was minimum size. Over-all dimensions of the case are 3½ by 3½ by 9 inches. As a result of this design, some unorthodox subassemblies resulted which will need explanation. Three sub-
assemblies are required in addition to the case. Galvanized sheet iron was used for all fabrication. The bottom piece is formed into a channel 3\(\frac{1}{2}\) inches wide by 7 inches long, with 3\(\frac{3}{4}\)-inch sides. A number of large ventilation holes is required in this piece. The transformer is bolted directly to this member, as well as a plastic key base (Fig. 5). The plastic base overlaps the metal bottom by 3\(\frac{1}{4}\) inch and is secured here with three 6-32 screws. \(R_{24}\) and \(R_{7}\) are bolted vertically to the bottom piece, on either side of the transformer. \(C_1\) is directly in front of the transformer and wired in place with stiff wire.

A second subassembly is shown bolted to the transformer, just above the key lever. This piece supports the speed control and two switches, a.c. and "tune-up." It is advisable to insulate the shaft of \(R_T\) thoroughly from the metal mounting and cover. Leakage or intermittent breakdown at this point could easily cause erratic operation. The shape of this piece will depend on the outer case, and should match closely in order that the two will register properly.

The third subassembly is more complicated since it contains the six tube sockets, output jack, ratio and weight controls, and most of the small components. Fig. 3 and the photographs show the details of this piece. A grommeted hole is provided just below the output jack for the a.c. line cord. The rear-view photograph shows the tube-socket arrangement. The order from left to right is as follows: \(V_{1-3}\), \(V_5\), \(V_{3-4}\), top row; \(V_8\), \(V_6\), \(V_7\), bottom row. \(C_4\) and \(C_5\) are located directly in front of \(R_5\) and \(R_{15}\). This assembly may be completely wired before being bolted to the bottom piece at the rear. Small parts are self-supported from the tube sockets. \(R_4\), \(R_{14}\), \(R_{15}\), \(R_{17}\), \(R_{26}\) and \(R_{29}\) are secured to a terminal strip which is bolted to the top of the transformer.

The cover or case was handmade to fit the subassemblies combined. The exact shape may be altered to suit the individual; however, the top surface must be thoroughly perforated for good ventilation. A small pilot jewel is included on top, the pilot-light assembly being secured to the transformer top. The cover serves a very useful purpose as well as being ornamental. Rather high voltages are required, and it is well to cover the entire unit, especially the key-lever mechanism, to avoid hazard to the operator.

All subassemblies are cut, bent and given a spray coat of enamel before mounting parts and wiring. No special precautions are necessary in

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**Fig. 3** — Layout of main subassembly. Right-angle bends are made along the dotted lines. (Refer to photographs for direction of bends.) Small holes are for self-tapping mounting screws. Dimensions are in inches.
wiring; however, suitable insulation should be provided at points of high voltage. Note carefully that the 6.3-volt winding is not grounded, but is connected to the junction of \( R_{15} \) and \( R_7 \). This is done to minimize heater-to-cathode voltage for most tubes. Only good-quality mica capacitors should be used at \( C_1 \), \( C_2 \) and \( C_3 \). The composition resistors of values greater than 200K ohms should be checked for accuracy with an ohmmeter before wiring in the circuit. Tolerance of 10 per cent is allowable, if not cumulative in a group of resistors.

**Key-Lever Detail**

One of the obstacles in electronic-key construction is the key-lever mechanism. The modified "bug" arrangement is definitely not recommended for this circuit. A unique lever is therefore presented to complete the electronic keyer. This mechanism produces the identical feel of a "bug," and is relatively simple to construct. Two views are shown which include sufficient information for construction. Notice the paddle arm is supported from a single pivot. The second pivot is the V-shaped slot. Materials are scrap brass and plastic. Silver contacts were removed from old relays, and soldered to the brass screws correct ratio and weight adjustments be made and maintained. These adjustments are essentially the same for any fully-automatic key, and have been outlined in previous articles.

The keyer will consume about 42 watts, and when operating properly will perform well over a wide range of line voltages. Operation in strong r.f. fields may produce false triggering and should be avoided. The model shown has been used successfully for several months.

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**Final Adjustment**

After the wiring has been carefully checked, the unit is turned on and several voltage checks are made. Those voltages shown in Fig. 1 may be measured with a 20,000-ohm/volt meter and should check within five per cent. The keyer is now connected to a suitable monitor, and tested for operation. If difficulty is encountered in producing either dots or dashes, or in making the correct ratio adjustment, it may be necessary to adjust the value of \( R_4 \) or \( R_5 \) slightly. However, the circuit should function without difficulty if the information given is followed closely. Once the keyer is functioning it is imperative that

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**Fig. 4 — Key-lever details.**

**Fig. 5 — Key-lever assembly (top view). Dimensions are in inches.**
Have You Tried V.H.F. Mobile?

Hints for More Effective Use of 6 and 2 in Mobile Work

BY EDWARD P. TILTON, W1HDQ

Opening of our lower frequencies to mobile work in the summer of 1948 touched off a boom that has as yet shown no signs of tapering off. Coming as it did at a time when we were meeting the TVI problem head on, the privilege of using 20, 30 and 80 in the family car was the means of many hams staying on the air. The break could hardly have come at a more opportune time.

Descriptions of mobile rigs and antenna systems took over many pages of QST, and parking lots near hamfests and conventions sprouted amazing assortments of loops, hats, coils and whips. Mobile hamming on the lower frequencies took hold as have few trends in the history of our hobby, and interest in v.h.f. mobile slumped accordingly. The last few years have seen v.h.f. mobile stage a comeback, however, and today there are perhaps more 2-meter mobiles than ever before. For the first time in some seasons there is interest in mobile operation on 6 as well.

Several factors account for this resurgence of interest. Emphasis on v.h.f. in civilian defense planning probably triggered it off. Available lower frequencies were filled quickly in many areas, once c.d. work began in earnest, and it became obvious that 6 and 2 would have to be used to do the job. Then once these bands were given a real try under modern conditions they were found to have features that sell them to the mobile-for-fun ham as well.

The writer is in the latter category, but he lost interest in mobile operation on his favorite bands some years ago. When we last had extensive mobile use of the frequencies above 30 Mc., most of the gear was woefully inadequate for the job. Home stations were usually low-powered rigs, often of the haywire modulated-oscillator variety. Antennas were simple dipoles, mainly, and receivers were far from effective. The result was that coverage with a mobile rig was limited to a very few miles radius from the fixed station being worked. You had to drive to some high-altitude location if you wanted to cover much territory. It was fun to have a rig in the car for such weekend excursions, but except mobile operation didn't amount to much otherwise.

Under 1954 conditions, however, v.h.f. mobile is quite a different story. Today's home rigs are of good quality, often running considerable power. Most antenna systems are high-gain beams, and the converters and receivers used for fixed-station work approach the ultimate in performance. Result: the v.h.f. mobile station now enjoys a reliable radius of operation that can make users of lower frequencies sit up and take notice. Freedom from QRM is a big factor in this, of course, but the greater refraction and reflection characteristics of v.h.f. waves are important too. For reliable coverage of a "service area" moving higher in frequency is going in the right direction.

75, 10, 6 or 2?

If you live and drive in an area where the nearest ham is 50 miles away, you'll probably be in no hurry to put 6 or 2 in your car. But if you live in one of the many spots where v.h.f. interest is high, you're missing something if you haven't tried the higher bands in the car recently. The 144-Mc. band, particularly, is now occupied to the extent that it is possible to make mobile contacts almost at will in and around most of our larger cities and not a few of the smaller ones.

Considered from the standpoint of their worth in local coverage, 144 Mc. leads, with the bands lower in frequency tapering off in reverse order. The bending and reflection of 2-meter waves give a surprising degree of fill-in, allowing solid communication out to 20 miles or so in average irregular terrain, even with low power. This accounts for the present trend of commercial mobile services to v.h.f. With comparable power, you'll probably find that 2 will give you more solid coverage than 10, with 6 falling somewhere in between. This assumes a quarter-wave whip for each band — and thereby hangs a potent argument for 144 Mc. Compare the well-nigh invisible installation shown in the first photograph with the sort of thing commonly used in 10-meter work!

We can skip 15, 20 and 40 in this discussion, for they are not normally used for local communication. The 75-meter band unquestionably provides more activity and better prospects for round-the-clock operation with a mobile installation than any other amateur band. But this very popularity of the band is also its greatest liability in many cases. It's fine to be able to hear signals any time anywhere when traveling — but how far can you get with a 10-watt 75-meter mobile on a busy week end, or during the evening hours? Not far, unless you have the cooperation of a group of high-powered stations to keep a channel cleared for you.

The reliable range on 144 Mc., on the other band, is just about constant, day or night, depending only on finding stations to work. Several months' experience with our 2-meter mobile installation indicates that there are few cities in the East where it is not possible to make contacts in the evening hours, or over week ends.

V.H.F. Editor, QST.
We've run out of signals a few times in our travels, but we've never been buried by them. The log of W1HDQ/mobile shows page after page of QSOs on 144 Mc. Good solid easy-going ragchews they were, too, unmarred by QRN from distant points.

Equipment? A pocket-sized transmitter with a 2E26 in the final, running about 10 watts input, feeds a 19-inch whip mounted on the rear deck. The receiver used most of the time has been a simple 4-tube job originally described in QST for Novice use. It is operated from two small-sized "B" batteries, so the whole set-up is very easy on the car battery. The installation is as close to an "invisible mobile" as you're likely to come, a factor that helps to keep peace in a family car installation.

Without the call plate on the antenna mount, it's hard to see evidence of amateur radio on our car from more than a few feet away. Not one visible hole was made during installation. There is nothing to interfere with passenger comfort or convenience; no special generators and extra batteries, no unguiny fish poles. And when we come to trading time again, the whole works can be removed without a trace in a few minutes' time.

We had a pleasant experience with no-hole antenna mounts when the car shown in the mobile antenna pictures in October, 1953, QST was tuned in recently. "It's a real beauty," the dealer said, but he looked questioningly at the rooftop antenna. When we peeled the tapped-on mount off the top and showed him that no hole had been made, the deal was on, at top trading price. If you quake at the thought of going after the family chariot with a circle cutter, or if the Little Woman is allergic to 12-foot whips, 2 may be for you! Or 6; the average broadcast whip is just the right length for 6-meter mobile use.

**The Receiver Problem**

The lack of suitable receiving equipment, ready-made, has been one reason for v.h.f. lagging behind in the boom in mobile operation. That condition is being corrected currently by several manufacturers, and some nice 2-meter gear is now available for those who want to go commercial. We hear rumors that some comparable 6-meter receivers will also soon be on the market. Meanwhile, it is quite possible to build your own, and come up with something entirely satisfactory.

The usual tunable converter is probably adequate for 50-Mc. mobile use, but tunable oscillators are tough to build for 144 Mc. The stability problem becomes acute if selectivity of the car radio variety is used. A crystal-controlled converter for 144 Mc. that will work into a tunable converter for lower bands makes a fine 2-meter receiving system if you can take the extra current drain this approach entails. Not to be overlooked for tunable i.f. service are the BC-454 and BC-455, still available on the surplus market at moderate cost.

A mobile receiving system that has had little attention in recent years is the superregenerative detector. Not the squelching broad-tuning abomination of the transceiver days, but a modern version that makes the best use of the extraordinary features this type of detector affords. To see how it would perform under today's 2-meter conditions, we hooked up a coaxial-line superregenerative job we designed for the v.h.f. beginner some years ago.

This was a 3-tube receiver originally. A 6AK5 broadband r.f. stage provides some gain and isolates another 6AK5 that serves as a coaxial-line-tuned detector. A 6AK6 single audio stage was originally used, but a triode audio amplifier was added between the detector and the 6AK6 to build up the audio amplification to a level suitable for use in a car. The total drain from a 90-volt "B" supply is only a little over 10.
milliamperes. No strain on the car battery here!

The superregen has several useful features in addition to its economy and simplicity. It has inherent a.v.c. and noise-limiting action, functions that require extra tubes with other systems. It is unequaled for sensitivity per tube. On the debit side, the superregen tends to tune broadly. It has a generally poor signal-to-noise ratio on very weak signals, and it can radiate a screeching form of interference that is most annoying.

These weaknesses are largely overcome in the coaxial-line job. Radiation is reduced to the point where it is inaudible in our home-station receiver when the mobile job is running in the car parked in the driveway. Selectivity is markedly improved by the combination of the r.f. amplifier and the coaxial tank in the detector. Sensitivity, while well below that of a good receiver of the superhet variety, is adequate to bring in anyone you're likely to work with the power generally used in 2-meter mobile transmitters. Rejection of ignition noise is good enough to permit copying all but the weakest signals while the car is in motion — this in a car that has had no noise-suppression work done on it by the writer.

The receiver is mounted in an inverted position under the dash, in a space reserved for the car broadcast receiver — a device we can live without handily. A small oval-shaped speaker is mounted in back of the car radio grill, and the receiver is powered by two small 45-volt "B" batteries in the rear compartment.

Comparisons have been made between this simple receiver and the well-known Cons.

Antennas — Invisible and Otherwise

Our aim in this mobile installation was to make it as unobtrusive as possible. The transmitter, antenna relay and receiver "B" batteries are in the rear compartment. A 300-volt 175-ma. genemotor and a headlight relay for starting it are mounted under the hood alongside the car battery. The control panel has heater switches for transmitter and receiver and a third switch for actuating the starting and antenna relays. This is mounted in the dash space normally occupied by car radio controls. The main control switch breaks the B-plus lead to the receiver when it is thrown to the "transmit" position. That's all there is to the station.

Details of the antenna mount can be seen in the photographs. It is made of a piece of 3/32-inch aluminum bent so that it makes a tight slip-on fit over the side of the rear deck opening. It is held in place by two self-tapping screws, requiring only two small holes in the interior edge of the compartment, at a point where they
are out of sight when the cover is in its normal position. An Amphenol type 88-1R coaxial fitting is fastened to this mounting bracket, and a short length of coax runs from this fitting to the antenna relay. A small half-round notch was filed in the top edge of the inside wall, allowing the coax to pass under the cover without clamping on it too tightly. The soft rubber weather stripping fits firmly around the coax when the cover is down.

This is a convenient set-up for trying various antennas. Any array that is set up and matched for 50-ohm feed can be connected to the fitting without requiring adjustments at the transmitter. Arrangements we've used include a 3/4-wave whip, the rooftop mounting described in October, 1953, QST, several portable arrays that can be dismantled for easy carrying in the car, and the assortment of gadgets shown in the accompanying photographs.

For our operation while in motion, we use either a 19-inch whip made of piano wire, or a chromium-plated brass rod of the same length, both mounted in Amphenol type 84-ISP fittings. These tiny antennas don't look impressive by comparison with the mobile monstrosities used on lower bands, but they work out surprisingly well. We've had many satisfactory contacts at distances out to more than 40 miles while traveling at high speed, and stations more than 100 miles distant have been copied on several occasions with the car stationary. The weak-signal range under stationary conditions depends on the elevation and weather at the time, of course, but it has surprised the writer again and again. The pattern with the rear deck mounting appears to be vaguely clover leaf in shape, with the best lobe off the right rear side.

For something a little better in work with vertically-polarized stations, we use either of the arrangements shown on the opposite page. One is a simplified form of coaxial dipole, and the other a collinear array. The "coaxial" dipole is mounted on a piece of tubing (of any convenient length) that has coaxial fittings at each end, connected by coax that runs up inside the tubing. The skirt consists of four pieces of aluminum TV ground wire mounted on the four corners of the upper fitting and bent down alongside the vertical support. These can also be left projecting horizontally, if one prefers a ground-plane type of antenna. One of the 19-inch whips is screwed onto the top fitting to make the upper portion of the dipole.

The mounting bracket we use is none too solid for operation while in motion with this assembly, but these special antennas are used mainly when we want a little boost in signal while working in one spot. The coaxial is good for two or three db gain over the whip alone, the collinear giving five to six db.

Where both 2 and 6 are to be used in the mobile set-up, a convenient antenna is a whip that will work as a quarter-wave on 6 and three quarter-waves on 2. If the whip is adjustable, it can be set for optimum performance when changing bands, but no great loss in effectiveness results if a fixed length of about 55 inches is used for both. Many standard broadcast whips are just about right for this application. The radiation angle on 144 Mc. is higher than with the 19-inch whip, so the performance is not quite equal to the shorter one, but it is a convenient compromise for two-band work.

Checking mobile operation on three bands gave us an opportunity to use a choice pun we've been holding for months, to introduce a mobile radiator for 10, 6 and 2. The device shown at the right on page 18 is a highly effective radiator for 144 Mc. On this band it is a quarter-wave radiator and a half-wave radiator with a folded half-wave phasing section between them. By removing the phasing section and shorting out the ceramic spacer we have a 50-Mc. quarter-wave. With the phasing section left as shown for 2-meter use, the system is also usable as a center-loaded 10-meter quarter-wave. If the top section is an adjustable whip, the over-all length can be varied to give good performance on all three bands. We call it, inevitably, "the 2, 6 an' 10-na!"

The bottom portion is our 19-inch rod, the top of which is tapped to take a 6/32 screw and fitted with a 1-inch ceramic stand-off. The phasing section is 40 inches of aluminum TV ground wire bent into a 19½-inch U. This, in turn, is coiled up as shown in the photograph. The top section is a standard adjustable broadband whip. This is set for about 38-inch length when the gadget is used for 2-meter work. The whip and

(Continued on page 114)
Build Your Own Panoramic Adapter

A Useful Adjunct for Visual Reception

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

As most QST readers probably know, the panoramic receiver is a system that reproduces signals in visual form on a cathode-ray tube screen. With it, it is possible to "see," simultaneously, all signals within a range (100 kc. in this case) either side of any center frequency to which the receiver is tuned. This article tells how to build an adapter that can be attached to your communications receiver to provide panoramic reception, without interrupting the normal functioning of the receiver on aural signals. While it is not a project to attract the beginner, the many hams who have contact with TV servicing, or other branches of the electronics field, are sure to find it interesting and useful, and far from "too complicated."

WEBSTER gives two definitions for the word "panorama": (1) a view in all directions, and (2) a scene that moves before one's eyes. The term "panoramic reception" could hardly be more descriptive, since both definitions can be said to apply.

Panoramic reception is the simultaneous visual representation of all received signals within a selected band of frequencies. If you were to plot a graph of frequency versus S-meter readings, as you tuned a receiver across a portion of its range, the result would be something like Fig. 1. Each pip represents a different signal in this band, and the height of each pip represents the relative amplitude or strength of that particular signal. The panoramic receiver provides a similar representation on the screen of a cathode-ray tube.

Panoramic reception is extremely useful, and a most interesting addition to the ham shack. Its versatility and importance speak for themselves. Anyone having had the opportunity to use a panoramic receiver is immediately convinced of its functional position in communications. In addition to its ability to scan a band of frequencies continuously, it provides an excellent means for checking transmitter modulation, whether a.m., f.m. or s.s.b. It is useful in checking transmitters for spurious and parasitic signals as well as key clicks. These checks can be made on the home rig and also on received signals.

Principle of Operation

To obtain the graph of S-meter readings mentioned earlier, it was, of course, necessary to tune the receiver over the desired band. Since the tuning of h.f. amplifier stages is relatively broad, a limited band of frequencies might be covered with a superhet receiver by tuning only the h.f. oscillator. In the panoramic receiver, this tuning is done electronically through the use of a reactance tube. This tube acts like a variable inductance in parallel with the inductance in the oscillator circuit. When the grid of the reactance tube is driven by another (sweep) oscillator, its apparent inductance will vary continuously at a rate corresponding to the frequency of the sweep oscillator. Thus, the oscillator in the receiver will be swept back and forth over a band of frequencies. When the output of the second detector in the receiver is fed to the vertical plates of a cathode-ray tube (with horizontal sweep), the pattern on the screen will be similar to Fig. 1. The band of frequencies to be observed may be selected merely by tuning the receiver in the usual manner.

Using the communications receiver in this manner does not permit simultaneous aural and visual reception. A separate receiver might be provided for visual reception, but the most com-
Basic Sections

The panoramic adapter has three basic sections—a heterodyne-receiver portion converting the 455-ke signal from the receiver mixer to 250 ke, a reactance-tube and sweep-oscillator section for scanning, and a cathode-ray tube. Fig. 2 shows these sections in a simplified block diagram.

The various controls are shown in their positions relative to the block units. Vertical size (gain) is varied by changing the bias on the broadband stage. Horizontal size is controlled by varying the amplitude of the sawtooth voltage applied to the horizontal deflection plates of the c.r.t. The converter-oscillator frequency is centered on 705 ke. (to convert 455 ke to 250 ke) by adjusting the bias on the reactance-control tube. The scan width is set by varying the amplitude of the sawtooth wave applied to the reactance-tube control grid. Vertical position, horizontal position, focus and brightness are adjusted in the high-voltage bleeder circuit, as in many oscilloscopes.

Circuit Details

The circuit diagram of the panoramic adapter is shown in Fig. 3. The input signal is taken from the plate of the mixer in the receiver, using the coupling system shown.

The signals are amplified by V1, a Type 6SK7 tube. This stage has bandpass circuits with adjustable shape characteristics. Roughly, the response is from 555 to 355 ke, with peaks near each end to help compensate for the attenuation at the ends of the band scanned, caused by the receiver’s input selectivity. This attenuation varies from band to band on the usual communications receiver, so a unique connection of the second i.f. transformer, T2, is used to vary the response characteristic as necessary to maintain an essentially flat over-all response. This adjustment is made by a single panel control on the 25K pot at T2.

V2, a 6AS7, is the oscillator-mixer. The signal input to the adapter is always between 355 and 555 ke, with a center frequency of 455 ke. To produce the adapter i.f. frequency of 250 ke, the oscillator section of the 6AS7 must sweep over the range from \(555 + 250 = 805\) ke to \(555 + 250 = 805\) ke, or a center frequency of 705 ke, plus or minus 100 ke.

A 6AC7 is used as the reactance tube. It is connected across the 6AS7 oscillator inductance, L1. The center frequency (705 ke) is

\[\text{Fig. 1 — Graph that might be obtained by plotting receiver S-meter readings as the receiver is slowly tuned over a band of frequencies. The portions enclosed in the dotted circles represent the signals that might be "seen" on the screen of the panoramic adapter with the receiver tuning at three different settings.}\]

\[\text{Fig. 2 — This block diagram shows the essential components that go to make up the panoramic adapter.}\]
Fig. 3 — Complete circuit of the panoramic adapter.

Lr — B.c.o. coil for 455 kc, or 1.1-mh. choke or coil tapped at 0.2 mh.

T1, T2 — Replacement 455-ke. i.f. transformer.

T3, T4 — Replacement 262-ke. i.f. transformer.

T5 — Power transformer: 350—0—350 volts r.m.s., 90 ma.; 5 volts, 3 amp.; 6.3 volts, 3.5 amp. (Stan- 
cor P-6012 or equivalent).

T7 — Filament transformer: 6.3 volts, 1 amp.

The 6SN7 is used as a sawtooth oscillator and amplifier which drives the grid of the reactance tube. The width of the band scanned is adjusted by a potentiometer. The sweep amplifier also serves as the horizontal sweep for the c.r.t. The amplitude (horizontal size) is adjusted by another potentiometer.

A 6SK7 and standard 262-ke. transformers are used in the i.f. amplifier. No difficulty was encountered in adjusting the transformers to 250 ke. A 6SQ7 is used as second detector and vertical-deflection amplifier. Direct coupling facilitates signal-level indication and modulation-percentage measurements.

Power Supply

The adapter's power supply uses three Type 6X5 tubes, V9, V9, and V10, and a VR-150, VH. They provide a negative high voltage for the cathode-ray tube, and a positive low voltage for the other tubes. The negative high-voltage supply employs a voltage-doubler circuit using two of the 6X5 tubes. One of the 6X5 (V10) heater voltages is obtained from a separate filament transformer. This additional filament transformer is used so that the heater-to-cathode voltage rating is not exceeded, as it would be if the tube's heater were at ground potential.

The heater voltage for the 3AP1 cathode-ray tube, 2.5 volts, is obtained from one half of the 5-volt winding normally used for the rectifier tube.

A 6X5 is also used in the positive low-voltage supply, and it has its heater connected in common with the other tubes.

Construction

A standard relay-rack panel and chassis are used, because of their popularity and because this type of construction matches a great deal of existing equipment. The chassis is 11 by 17 by 3 inches, and the panel is 8½ by 19 inches.

No particular attention has to be given to the chassis layout beyond ordinary receiver-construction practice. A cathode-ray tube shield for the 3AP1 is necessary for compact layout. To do without the shield, it would be necessary to locate the transformers and choke at some distance from the cathode-ray tube to minimize the effect of their magnetic fields on the electron beam.

The brightness and focus pots should be insulated. They are mounted on fiber brackets, just behind the panel, with insulated shaft extensions through the panel bushings.

The four controls grouped around the cathode-ray tube are for focus, brightness, horizontal position, and vertical position. The equalizing control is mounted as near its associated i.f. transformer as practical. It can be seen in the bottom-view photograph, at the right.

A scale or head for the front of the c.r.t. can be constructed from thin lucite, similar to the one shown in Fig. 4. Accurate markings for modulation percentage should be made with the aid of a signal generator having the necessary calibration. For approximate modulation percentage measurements the screen can be assumed to be linear at low audio frequencies.

Installation

Most receivers do not have connections for panoramic adapters. If there is any objection to

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the installation of a panoramic-adapter connector, connection to the mixer-tube plate can be made above the chassis by connecting $C_{33}$ directly to the tube pin itself.

The installation of a connector is as follows: The connector is mounted on the rear skirt of the chassis and as near to the mixer tube as practicable. Any convenient type of coax connector will suffice. $C_{33}$ and its associated resistor in series are connected to the mixer-tube plate right at the tube socket. A lead is run from the resistor to the jack. This lead should be of coax and be kept as short as practicable.

**Alignment Procedure**

For initial adjustment, allow receiver and adapter to warm up for 15 to 30 minutes.

The first step in alignment is to adjust the adapter's oscillator to 705 kc. A broadcast receiver can be used for this adjustment or, if the receiver to which the panoramic adapter is connected has a b.c. band, it may be used. Set the band-scan width control to zero, and the center-frequency control to mid-scale. Adjust $C_{19}$ so that the oscillator frequency is 705 kc.

Adjust the vertical, horizontal, intensity (brightness), and focus controls for a trace on the cathode-ray tube. Adjust the horizontal size to extend the trace the width of the screen.

Alignment of the adapter's i.f. is simplified by the presence of its own cathode-ray tube and sweep circuits. Advance the band-scan width control 10 degrees to 20 degrees, and tune in any constant-carrier signal on the receiver to which the adapter is connected. A response curve will be seen on the c.r.t. This response curve is the characteristic curve of the adapter's i.f. amplifier. It is necessary to adjust the i.f. trimmers so that the response curve is in the exact center of the trace and to adjust them for the sharpest (narrowest) curve. The sharpness of this curve is a measure of the resolution of the adapter. The sharper the curve the closer the received signals can be in frequency and still be distinguishable.

Alignment of the adapter's front end is as follows: With the receiver tuned to any portion of its range that includes many signals (most of the amateur bands), set the equalizing control to maximum resistance. Adjust the vertical-size control so that signals are perceptible, and the band-scan width control near maximum. $T_1$ is then adjusted for maximum signal strength of signals in the center of the trace. Only one section of $T_1$ is used in the circuit. The other coil and trimmer have no effect and are disregarded.

Set the equalizer to zero resistance, and adjust one trimmer of $T_2$ for maximum strength of signals at one end of the trace, and the other trimmer of $T_2$ for maximum deflection of the signals at the other end of the trace. Rotating the equalizer will cause the point of maximum amplification to shift from the center to the ends of the swept band.

The approximate frequencies of the tuned circuits are: 455 kc. for $T_1$, and 355 kc. and 555 kc. for the two circuits of $T_2$.

**Interpretation of Signals**

An unmodulated constant carrier appears as a deflection of fixed height, as shown in A of Fig. 5.

![Alignment Procedure](image)

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An amplitude-modulated carrier appears as a deflection of variable height. Voice or music modulation causes the height of the deflection to vary irregularly. At slightly reduced sweep width a constant tone modulation of low frequency will produce a raggedness along the sides of the pip. As the modulation frequency is increased, sidebands become distinguishable. When the modulation frequency is further increased, it is possible to separate the sideband pips from the carrier

*Fig. 5 — Pips on the panoramic screen indicate signal characteristics. A — Constant carrier. B — Double-sideband a.m. C — S.s.b. with carrier. D — S.s.b., suppressed carrier.*

(Continued on page 116)
A Broad-Band Bandswitching Converter/Preselector

Improved Performance and Extended Tuning Range for Surplus Receivers

BY ROBERT F. LATTER,* W2YFM

Thus article describes the construction and line-up procedure of a two-tube broad-band bandswitching converter/preselector of simple design that permits the reception of 21- and 28-Mc. signals on receivers whose highest frequency coverage is limited to about 18 Mc. It also serves as a preselector for the 14-Mc. amateur band. While designed primarily for use with the BC-348, it also has application for many other popular surplus military receivers, as well as commercial models whose performance on the 14-, 21-, and 28-Mc. bands leaves much to be desired from the standpoint of stability, sensitivity, signal-to-noise ratio, and image rejection.

The author uses a BC-348Q (purchased new in 1946) that has been modified to include an a.c. power supply, S-meter, noise limiter and connections for a BC-453 "Q5-er." Basically, it is an excellent receiver both electrically and mechanically, and with the help of these modifications gives performance equal to or better than commercial receivers priced many times its original cost. It does not, however, cover the 21- or 28-Mc. amateur bands and, in spite of a recent alignment, lacks sufficient gain for optimum performance on the 14-Mc. band.

The converter/preselector is intended to eliminate the above limitations and was built with the following objectives in mind:

1) Simple operation and construction. This requirement was met by a bandswitching design incorporating only two tubes and seven tuned circuits.

2) High signal-to-noise ratio and high gain. This unit uses a 6BH6 pentode r.f. stage and a 6U8 mixer-oscillator. Because of the high gain of these tubes, any need for an additional amplifier at i.f. frequencies is eliminated. In this frequency range, the signal-to-noise characteristics compare favorably with other special designs.

3) High stability. This was met by using a fairly high-C Colpitts oscillator with grounded cathode, with the plate voltage supplied from a regulated source. Coupling to the mixer section of the 6U8 is through tube and circuit capacity only, resulting in negligible oscillator "pulling.”

4) Ease of alignment with simple tools. The author aligned the unit using only the BC-348 receiver and a Hammarlund 100-ke. crystal frequency standard.

The Circuit

Reference to the circuit diagram, Fig. 1, shows that the oscillator is disabled with S2 in the 14-Mc. position, to permit the unit to operate as a preselector on that band. The oscillator operates on 18 Mc. for both 21- and 28-Mc. reception. The plate load of the 6U8 mixer is a 10,000-ohm carbon resistor. As this resistor is not frequency selective, a little mathematics will show that the 28-Mc. band can be covered by tuning the receiver from 10 to 11.7 Mc. and the 21-Mc. band by tuning from 3 to 3.45 Mc. Thus the correct frequency at any dial setting is simply 18 Mc. plus the receiver dial reading. The 14-Mc. band is covered by tuning from 14 to 14.350 Mc. since the unit operates as a straight amplifier on this frequency. The choice of 18

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1 This assumes that the receiver has better stability and signal-to-noise ratio on its lower frequencies, which is usually the case.

This broadband converter/preselector is intended for war-surplus receivers that only tune as high as 18 Mc. The unit serves as a preselector on 14 Mc. and as a converter on 21 and 28 Mc. The power supply is included on the same chassis.

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Mc, as the oscillator frequency is arbitrary. It was made because of the band divisions of the BC-348 (i.e., it is inconvenient to have to switch from Band 4 to Band 5 in the middle of the 28-Mc. range, for instance), and because it is reasonably simple to construct a stable self-controlled oscillator at this frequency. In addition, the oscillator can easily be aligned and checked for proper operation with the receiver.

The circuit is quite conventional and is a modification of a single-band mobile design that appeared in CQ magazine.\(^2\) The switch \(S_1\) switches the antenna to the converter/preselctor and the output to the receiver, or permits the line-up instructions. The gain reduction caused by the resistor is small.

It is important that the converter output be fed to the receiver through coaxial cable, to minimize QRM from signals at the i.f. frequencies. It is advisable to reduce this effect further by mounting a coaxial fitting on the receiver in place of the antenna terminals. In the converter, ground leads should be connected together on a stage-by-stage basis, with the stage grounds connected by one heavy lead, to avoid unwanted oscillations and poor rejection of direct i.f. signals, since different parts of the chassis may not be at the same a.c. ground potential. Since we

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Fig. 1 — Circuit diagram of the broadband converter/preselctor. Capacity values in \(\mu F\), and all are ceramic except \(\text{*}\), which are silver mica. Resistors, \(\frac{1}{4}\) watt.

\(R_2\) — See text.

\(L_4\) — Wound over ground end of \(L_2, L_3, L_4\) and \(L_6\) wound on CTC LSS (\(\frac{3}{4}\)-inch diameter) slug-tuned forms. \(L_2\) wound with No. 20 push-back hook-up wire — other coils No. 21 enam.

The antenna to be switched directly to the receiver for reception on the lower-frequency bands. The other switch, \(S_2\), switches bands and decides the triode section of the 6B8 on 14 Mc. A switch with three positions could be used; however, the unused positions are handy to use as wiring tie-points. In the author's model, a swamping resistor of 10,000 ohms \((R_4)\) was used across \(L_3\) on 14 Mc. to eliminate a tendency toward instability. The value of this resistor, if required, should be determined by experiment as indicated in the

used surplus forms not generally available, coil values for \(\frac{3}{4}\)-inch CTC forms are given in Fig. 1.

Power requirements are small enough so that, in many cases, the receiver supply can be used. However, the author's model used a separate regulated supply, as shown in Fig. 2, as the components happened to be on hand. Alternatively, a much simpler selenium-rectifier \(RC\)-filter supply might be used.

**Construction**

Photographs of the unit show the physical layout. Since it was built with many "junk box"
parts previously used for a 28-Mc. converter, this is not intended to represent the best mechanical layout, particularly from an appearance standpoint.

The 6BH6 and 6U8 are mounted on a small 3 × 21/2 × 2-inch subchassis that is wired as a separate unit. The switches, coils and power-supply components are mounted on a 7 × 7 × 2-inch chassis, with a 7 × 7-inch panel. The 6U8 mixer coils are mounted horizontally on a 1 × 4-inch vertical strip of heavy-gauge aluminum at the rear of $S_2$. They are at right angles to $L_1$ and $L_2$ which are mounted on the front panel. All coils and switch decks are placed to reduce wiring distances to a minimum. Silver-mica condensers are used in the oscillator circuit to minimize drift.

**Adjustment**

The line-up procedure is simple and straightforward. The first step is to make certain that the voltages applied to the unit are correct as shown on the circuit diagram and that the VR tube is operating within its proper current range. If a grid-dip oscillator is available, check all tuned circuits (with the unit turned off) to be sure that the coils will tune to the desired frequencies.

If one is not available as in the author's case, the unit can be aligned using only the BC-348 (with S-meter) and a 100-ke. frequency standard.

Check the frequency standard against WWV to see that it is correct, and then tune the receiver to the 14.1-Mc. harmonic of this oscillator. Switch the converter to the 14-Mc. position. Couple the 100-ke. oscillator as loosely as possible to the unit through a small condenser to obtain a reading on the receiver S-meter. Adjust the 14-Mc. $L_2$ and $L_3$ for maximum reading. If any tendency toward oscillation is noticed, connect a swamping resistor of about 10,000 ohms across $L_3$. Use the largest value possible consistent with stable operation. Next check the amplitude of each 100-ke. marker across the 14-Mc. band. The response can be flattened, if necessary, by stagger-tuning $L_2$ and $L_3$ or decreasing the value of the swamping resistor. In many cases it will be necessary to detune the receiver r.f. stage with the antenna trimmer condenser or otherwise reduce the converter/preselector output to prevent overloading the receiver.

Next switch the unit to 21 Mc. Tune the receiver to exactly 18 Mc. using the 100-ke. frequency standard as a guide. Then tune the converter oscillator by adjusting $L_4$ until it can be heard at this frequency. If the oscillator will not tune to this frequency, change the turns on $L_4$ until it will. If the oscillator is operating correctly, the note should be pure d.c. with no spurious signals at other frequencies. Next, tune the receiver to 3.2 Mc. to pick up the 21.2-Mc. harmonic of the 100-ke. oscillator. As before, couple the unit to the 100-ke. oscillator as loosely as possible with a small condenser to obtain a reading on the receiver S-meter. Tune the receiver a little higher than 3.2 Mc. and adjust the oscillator slug ($L_4$) a fraction of a turn until a signal is heard. This will be the desired 21.2-Mc. signal, and this procedure is necessary to insure that the receiver is not picking up the 3.2-Mc. harmonic of the 100-ke. oscillator directly. Next, adjust $L_2$ and $L_3$ for maximum signal. Check the 100-ke. markers over the entire band to see that the response is reasonably flat.

The alignment of the 28-Mc. band is similar to the above except that the receiver is tuned to 10.6 Mc. for a 28.6-Mc. signal. If difficulty is experienced in obtaining a definite although broad peak when tuning $L_2$ or $L_3$, one or both must be rewound. Unless they are far from the correct value, the S-meter can be used to determine if turns should be added or subtracted. If in doubt when constructing the unit, it is better to err on the side of caution.

(Continued on page 118)

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A top view of the preselector/converter. The oscillator tuning adjustment can be seen to the left of the 6U8 mixer-oscillator.

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The Tin Can Low-Pass
An Inexpensive Filter for the Novice
BY LEWIS G. MCCOY,* WI1CP

- The accepted correction for TVI troubles where the transmitter is at fault is to "bottle up" the transmitter in a shield and couple out through a low-pass filter. In this article, WI1CP shows how simple and inexpensive it is to build a low-pass filter that will handle the output of a 75- or 100-watt transmitter from 80 through 15 meters.

In traveling around the country, giving talks on TVI, the writer was rather surprised to find that many amateurs, particularly newcomers, shield away from building their own low-pass filters because they felt the task was beyond their technical ability. Actually, a low-pass filter is one of the easiest construction jobs that an amateur is likely to encounter. In addition, one can usually save considerably on the green stuff by building his own. The unit described in this article was built at a cost of less than fifty cents.

Before getting into a description of the actual construction of the filter, a few words are in order to explain what a low-pass filter is and what it will do. As we know from studying the questions in the Novice and General Class examinations, we don’t want to radiate any spurious signals from our transmitters. When these spurious signals are harmonics or parasitic oscillations that fall in the television channels they can cause TVI plus the consequent headaches involved with maintaining good neighbor relations. Our problem is then one of keeping these harmonics from radiating. This is where a low-pass filter does yeoman duty.

A low-pass filter is a coil-condenser combination that, when properly installed on a transmitter, will pass all signals lower than its designed "cut-off frequency" while attenuating all other signals. In other words, let’s assume we have a transmitter operating in the 80-, 40-, and 15-meter Novice bands. We want the signal from the band being used to go from the transmitter to the antenna and be radiated. However, we don’t want harmonics or spurious signals higher than 21 Mc. to reach the antenna or the feedline. The answer is to install a low-pass filter at the transmitter output that will pass the 80-, 40-, and 15-meter signals while attenuating all higher frequencies. The filter shown in the photograph and at Fig. 1 is just such a device.

Construction

The box shown in the photograph was made from metal taken from two No. 2 tomato cans. This metal is an excellent material for making a small radio chassis or shield can. It is easy to bend and form small boxes from the metal found in "tin can" food containers. This metal is thin, and holes (for mounting tie points, etc.) can be punched out with a nail or ice pick. Also, the tin coating on the metal takes solder very easily. For construction, all one needs is a pair of tin snips, a soldering iron, and a supply of tin cans.

The dimensions of the box for the filter are 13/4" x 1 3/4" x 4" inches. Four pieces of metal are needed; one piece for the bottom and sides, 5 1/4 x 4 inches; two end pieces, 2 1/4 x 2 3/4 inches; and the top, 2 3/4 x 4 1/2 inches. The 5 1/4-inch length of the large piece is scribed off into three 1 3/4-inch sections. If a vise is available the piece of metal is clamped between two pieces of wood and then bent to form one side of the box. A metal straightedge or another piece of wood can be used to bend the tin to form a right angle. The piece is then clamped so that the remaining side can be bent. If a vise isn’t available, a satisfactory job can be obtained by holding the piece of tin firmly between two boards and then pressing the metal against a flat surface until a right angle is formed.

The ends of the box are made up with a 1/4-inch lip so that there will be plenty of soldering surface available when the ends are attached to the box. The top is made with a 1/4-inch lip for the same reason. When soldering the ends to the box, be sure the iron is hot enough to insure good connections.

A 3/4-inch hole is drilled or punched in the center of each end of the box to accommodate antenna and feed line, Fig. 1 — Circuit diagram of the low-pass filter.
C1 = 220-μf. mica, ±5 per cent tolerance.
L1, L2 = See text.
the coax leads to and from the filter. To avoid bending the box out of shape, a small block of wood should be held against the other side of the piece being drilled. Three tie points are needed to hold the coils and the condenser in place. The tie points used in the installation shown here are the single-terminal bakelite strip type selling for about three cents each. Three holes are needed on one side of the box to accommodate the 6-32 screws for holding the tie points. The placement of the holes will depend on the type of tie point used, but in any case, they should be placed so that the coils, \(L_1\) and \(L_2\), will be spaced about one inch apart and centered in the box. Remember to hold a piece of wood under the side of the box being drilled to avoid bending the metal.

The coils are made of No. 16 enamel-covered wire. Each coil is 7 turns, 1/2-inch inside diameter and 1 1/2 inch long. Any solid 1/2-inch diameter object, such as a drill bit shank, wooden dowel rod, etc., can be used as a winding form. Be sure to leave an inch or so lead length at the coil ends for mounting on the tie points.

**Wiring**

As can be seen in the photograph, the coils are mounted at right angles to each other to avoid undesired coupling. Before mounting the coils on the tie points, be sure to scrape the enamel from the wire where it is to be soldered. (Many beginners find themselves in trouble here because they don’t know that paint or enamel covering should be removed from wire before one can solder to it.)

One lead of the condenser, \(C_1\), is soldered to the bottom of the box directly below the center tie point. The other condenser lead is connected to the center tie point along with two coil leads. Keep the condenser leads short; about 1/4 inch will suffice.

The two end tie points serve as a junction point for the coil ends and the coaxial cable inner conductors. Many amateurs use coaxial cable, commonly referred to as “coax,” for connecting the filter to the transmitter and the antenna or antenna coupler. There are four types of coax commonly used by amateurs: RG-8/U, RG-11/U, RG-58/U, and RG-59/U. Any of these types will work with the filter. The coax used in the filter shown is RG-59/U because it is cheaper and easy to handle. However, the filter is not designed to work with 300-ohm Twin-Lead, or for that matter, any balanced line. This doesn’t mean that you can’t use Twin-Lead to feed your antenna and still use a low-pass filter. When we discuss the filter installation we’ll show you how to use Twin-Lead if you wish.

To connect the coax to the ends of the coils, the following procedure is followed: About two inches of the vinyl covering is removed from one end of the coax, then the outer conductor braid is trimmed back to a point about 1/2 inch from the vinyl covering. Enough of the covering around the inner conductor is removed to permit a connection to the tie point. The end of the cable is then fed through the hole in the end of the filter box up to the point where the vinyl covering begins. The 1/2 inch of outer conductor braid is then spread out around the hole and soldered in place. Do this carefully, as too much heat will melt the covering of the inner conductor, causing a shorted cable.

The same procedure is followed at the other end of the filter. Coax fittings can be installed on either end of the filter, but they, of course, add to the cost of the unit.

**Installation**

For a filter to work properly, the radio signal should flow through the circuit, not around it. In other words, if we want the filter to attenuate harmonics, we must keep the harmonics inside the coax and inside the filter box. This means...
the filter must be attached to the transmitter properly. This is shown at Fig. 2. At (A), the wrong way to install the filter, the coax is connected to the link on the final amplifier of the transmitter with no shielding being used on the rig. The harmonics, indicated by arrows, radiate from the transmitter and flow on the outside of the coax line and over and around the filter to the antenna. In this case, the filter doesn’t help the situation in the slightest. However, at (B) the harmonics are confined inside the transmitter.

![Diagram A](image)

![Diagram B](image)

Fig. 2 — At (A), we see the wrong way to connect a filter and coaxial line to a transmitter. The harmonics flow over the outside of the cable, over the filter, to the antenna, and can be radiated. At (B) the harmonic energy is confined inside the transmitter and can only flow through the cable and inside the filter.

And (C) and (D) we see two methods of connecting the low-pass filter to the antenna system.

and they must flow through the coax to the filter. In this way they are attenuated and never get a chance to reach the antenna. You will notice that, in this case, the coax is connected to the back panel of the transmitter, making a good tight connection. This is usually done by installing a male coax connector, 38-1SP, on the coax cable coming from the filter, and a female connector, 38-1R, on the transmitter. When mounting the socket on the transmitter, be sure to clean any paint from around the mounting point. Incidentally, the filter can be inserted in the coax line in either direction; in other words, the input and output characteristics of a filter are the same.

**Coupling to the Antenna**

In the average station the coax lines between the transmitter and filter and between the filter and antenna coupler (if one is used as described below) probably will be quite short. It is preferable to use the minimum possible length between the transmitter and filter; the other length is not so important because there will be very little harmonic energy in the line on the “output” side of the filter. If the length to the antenna coupler is not more than a few feet the coupler can be tuned in just the same way as before installing the filter, although the settings may differ. Longer lines may require “matching,” a subject that is beyond the scope of this article but which is covered in the Handbook.

There are two generally used methods for connecting a filter to the antenna system. The first is to connect the output of the low-pass to an antenna coupler as shown at Fig. 2C. In this case, the coax is connected to the link on the antenna coupler, and the coupler is used to couple the antenna to the link. This system has the advantage of offering additional harmonic attenuation because of the additional circuit tuned to the output frequency. Also, the feedline to the antenna can be 300-ohm Twin-Lead, open-wire line, or for that matter, practically any type of transmission line.

At Fig. 2D, we find the low-pass filter connected directly to a half-wave antenna via a 75-ohm coax line. A half-wave antenna offers a pretty good match for 75-ohm line, and this system will work well for those amateurs using such an antenna.

If greater harmonic attenuation is needed, it is suggested the reader study the BCI-TVI chapter of *The Radio Amateur’s Handbook*. Several filters are described there that will furnish considerably more attenuation than the “Tin Can.” However, for most Novice installations, the filter described here will be more than adequate.

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**Strays**

Research by W1YYM concerning the “17,000 db.” Stray on p. 15, August *QST*, reveals the figure to be a power gain of 10,793 — the numeral 10 followed by 1700 zeros, a number which would be approximately seventeen *QST* pages wide.

W45SMU TZT MPA and KZF are experimenting with facsimile down Kentucky way. Their first successful on-the-air test took place in June using type RC-55-B gear for local QSOs on the 11-meter band. W45SMU would like to hear from other facsimile enthusiasts with a view toward trying skip schedules when propagation conditions are favorable.
A Low-Cost Gallon

Making the Most Out of Very Little

BY A. W. ANTHONY, JR.,* W1CTE

Although the unit discussed here will probably not be widely duplicated, this story by W1CTE will serve to point up the idea that an alert ham often can find exceptional bargains in unsuspected places.

Forty bucks for a kilowatt final? "Nuts to that!" you say. And well you may. However, here's the story of one, largely built from obsolete and surplus materials. If you're willing to snoop around a bit here and there, it's quite likely that you, too, can come up with an equal bargain.

About two years ago, most diathermy machines in use were made obsolete by FCC rulings. The writer was able to buy a lot of eight of these for $80, including over a bushel of cables, pads, cauterizers and the like. These were by seven different manufacturers, and were completely different in all respects, including the tubes. Some used raw a.c. on the plates, while others had rectified, but unfiltered, d.c. (One even had grid-controlled rectifiers.) All were sturdy and well made, and were electrically OK. Nearly all have gone into ham use, chiefly as power supplies.

The largest one of the lot fired the writer's imagination. Its nameplate read, "Ultra Short-Wave Generator—Wavelength 6 Meters—50,000,000 Cycles!" Impressive in appearance, it was 22 inches wide, 16 inches deep, and stood on

Fig. 1—Typical high-power diathermy circuit. Some types include rectifiers.

easterns, with the top of its walnut case 45 1/2 inches from the floor. It weighed about 250 lbs.

Inside were two big bottles—WL-400s (not listed in the ARRL Handbook)—two heavy transformers, and an odd assortment of other components. When the thing was plugged in and turned on, it put out very hot 50-Mc. r.f. (horrible-sounding in the receiver).

First, Westinghouse was queried for dope on the WL-400, and they very kindly sent a leaflet although the tube is no longer made. It showed: Maximum d.c. plate volts, 3000; maximum plate ma., 200; plate dissipation, 150 watts; maximum frequency, higher than needed. The project looked brighter; maybe can do.

Power Supply

A closer examination of the power supply and the schematic (see Fig. 1) found in the instruction book really did it. One of the transformers turned out to be a combination filament transformer for the big tubes, and an autotransformer with two tap switches for adjusting both line voltage and primary voltage to the plate transformer. The latter was of about 1 kva. rating, and its

* 29 Grey Birch Terrace, Newtonville 60, Mass.
r.m.s. output voltage could be varied from 900 to 2500 volts by means of the autotransformer.

Since the plate transformer had no center tap, a bridge rectifier using four 806As was required. These and their filament transformers were included in a filter unit placed in space available in the bottom of the cabinet. Well-insulated leads were brought down to this unit from the main deck above.

A small bias supply, powered from the 10-volt winding on the autotransformer, and a tapped series booster transformer to increase the a.c. output of the plate transformer by 200 to 850 volts were also placed in the bottom of the cabinet.

The primary of the plate transformer in this dethermy rig could be turned on and off by a foot-operated switch that plugged in at the rear of the cabinet, as well as a panel switch. This same plug and cord now go to a relay controlled by the send-receive switch. There's also a mechanical interlock preventing application of plate power until the filament switch is on full.

**R.F. Circuit**

The original r.f. circuitry was the utmost in simplicity — merely one coil of very few turns of copper tubing between the plate caps, and another coil of smaller tubing between the grid caps. There was also a very small variable of special design. Alas, no use has yet been made of these coils! However, the very simplicity suggested the major strategy behind the conversion. A horizontal partition, with clearance holes for the tubes, was made to fit the cabinet, and placed at a level about halfway between the grid and plate caps of the tubes. The grid and plate tank circuits were then mounted on this partition,

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1 R.f. circuit is essentially a combination of Figs. 7-17B, 7-19B, and 7-20 in 1953 ARRL Handbook.
2 R.f. circuit is essentially the same as Fig. 6-25C in 1953 ARRL Handbook.

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Rear view of the amplifier. The shielding partition between grid and plate tank circuits is a sheet of plywood covered with aluminum foil. Neutralizing condensers are pieces of coax cable.

plate circuit above, and grid circuit below. Just to see how this arrangement might work out, a partition was made of plywood wrapped in aluminum foil purloined from the XYL's department — and it's still there!

About this time, WF7MA consulted with us, thought it was nuts, and said so. But, anyway, he was good enough to sketch a feasible circuit diagram. Little by little, components were dug up and fitted in. B & W coils — BVI for the grid and HDL (or HDCL) for the plate — and a couple of nondescript split-tator condensers from the junk box made up the tank circuits. Since there wasn't enough room to run the condensers fore-and-aft, they were placed with their shafts parallel to the panel, with their control knobs at the side of the cabinet. Short pieces of carefully-trimmed coax cable are used as neutralizing condensers, and are plugged into jack-top feed-through insulators mounted near the tubes.

*Continued on page 118*
A Civil Defense Control-Station Transmitter

Part II — R.F. Section and Filters

BY PHILIP S. RAND,* WIDBM

In August QST the special problems encountered in c.d. communication were discussed, and a solution in the form of a transmitter designed especially for this work was outlined. The power supplies and speech equipment were described in detail. In this portion, the construction and adjustment of the r.f. section are covered, and the interference-prevention measures included in the station are described.

Reviewing briefly, the r.f. portion of the transmitter consists of separate units for each of three bands, 50, 28 and 144 Mc., with provision for selection of any of four net frequencies without retuning adjustments of any kind. The r.f. assemblies are mounted side by side on a large chassis that contains all the cabling, metering and switching circuits. The entire r.f. assembly is housed in a case of perforated aluminum and provided with power cable filtering to prevent TVI and other forms of interference that might result from spurious radiations. The 50-Mc. r.f. section, described herewith, is shown in the rear-view photograph, mounted in place on the main chassis. For details of the external shielding, see the second photograph appearing in the first installment. The complete r.f. schematic diagram is shown in Fig. 3.

R.F. Circuitry and Design Features

Four pretuned c.d. frequencies in the 50-Mc. band are selected by means of the channel switch. This changes crystals and selects the proper pretuned coil in the plate circuit of each stage. To keep spare tubes needed at a minimum, the same type of tube (5763) was used in each of the low-powered stages. The oscillator uses crystals between 5.5 and 6 Mc., in a modified Pierce circuit. Two tripler stages follow, the second driving a 6146 amplifier on 50 Mc., with grid current to spare. A potentiometer in the screen circuit of the second tripler provides drive control. It is adjusted to about 3 ma. grid current in the 6146 stage.

The crystal-oscillator circuit shown was chosen for its ease of adjustment and reliability, and because crystals in this frequency range are inexpensive and readily ground to a specific net frequency. Entirely satisfactory operation of the transmitter could have been achieved with fewer tubes, obviously, but the arrangement shown makes possible duplication of the tube line-up in the 2-meter r.f. section. Stage functions may be altered, but the metering circuits remain the same.

All coils are slug-tuned except those in the final amplifier, where they are adjusted by varying the turn spacing to resonate at the desired frequency with the plate tuning capacitor set at half scale. Each coil in the first tripler plate circuit has a 5-μf. ceramic capacitor across it, to lower its out-of-circuit resonant frequency. On the first tune-up it was found by accident that the drive to the final stage was affected by adjustments to the slugs in any of the three unused coils in this circuit. A grid-dipper showed that they were self-resonant at about 50 Mc., and were absorbing

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Rear view of the control-station transmitter, showing the 50-Mc. r.f. section in place. In its final form this unit is completely encased in perforated aluminum shielding.
Top and bottom views of the 50-Mc. r.f. section.

Power from the second tripler plate coils. Adding the 5-μf. capacitors detuned them enough so that no further trouble resulted. Winding specifications for all coils are given in the coil table.

The switch for changing channels is made up of a five-wafer (one not used) and a two-wafer four-position ceramic switch coupled together with a right-angle drive. The two-wafer portion is mounted vertically alongside the 6146 and driven by a right-angle drive on the underside of the r.f. assembly. The method of connecting the two is shown in the bottom view. The shaft of the right-angle drive unit is notched to fit the shaft of the main switch.

The chassis is actually a 5 × 13 × 3/4-inch sheet of aluminum, to which all parts are mounted, as seen in the top- and bottom-view photographs. This plate then attaches like a bottom pan to a standard 5 × 13 × 3-inch aluminum chassis, which is mounted upside down on the main 13 × 17 × 3-inch chassis. This type of construction gives better shielding and makes for much easier assembling and wiring than building directly on a chassis in the conventional way.

The wiring of the main chassis is also shown in Fig. 3. The three 12-pin sockets to feed the r.f. units are mounted on the rear edge along with the 8-pin socket for the power-supply cable. Only the wiring for the 50-Mc. socket is shown in the diagram, to conserve space and preserve the readability of the diagram. The sockets for the other two units are merely wired in parallel with the one shown, except for the heater circuit switching.

The assembly is fitted with a standard 10 1/2 × 19-inch rack panel, on which are mounted the two motors, the meter switches, the band-change switch, pilot lights and drive control. The modu-

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**Coil-Winding Table**

<table>
<thead>
<tr>
<th>Coils, 4 each</th>
<th>No. Turns</th>
<th>Wire</th>
<th>Dia.</th>
<th>Length</th>
<th>Coil Form</th>
<th>Type</th>
<th>Slug</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>35 close-wound</td>
<td>28 en.</td>
<td>3/8&quot;</td>
<td>3/4&quot;</td>
<td>National XIR-91</td>
<td>1/4 × 5/8</td>
<td>iron</td>
</tr>
<tr>
<td>L2</td>
<td>21 close-wound</td>
<td>20 en.</td>
<td>3/8&quot;</td>
<td>3/4&quot;</td>
<td>National XIR-91</td>
<td>1/4 × 5/8</td>
<td>iron</td>
</tr>
<tr>
<td>L3</td>
<td>7 turns spaced</td>
<td>18 en.</td>
<td>3/8&quot;</td>
<td>3/4&quot;</td>
<td>National XIR-90</td>
<td>1/4 × 5/8</td>
<td>brass</td>
</tr>
<tr>
<td>L4</td>
<td>5 spaced</td>
<td>14</td>
<td>3/8&quot;</td>
<td>3/4&quot;</td>
<td>self-supporting</td>
<td>none</td>
<td></td>
</tr>
<tr>
<td>L5</td>
<td>3 close-wound at cold end</td>
<td>insulated hook-up wire</td>
<td>9/16&quot;</td>
<td>3/4&quot;</td>
<td>3/4&quot; dia. bakelite tube 2&quot;</td>
<td>long</td>
<td></td>
</tr>
</tbody>
</table>

Resistors are 1 watt unless otherwise noted. All 0.005 capacitors are disk ceramics, except final plate by-pass is mica. Use 0.001 for more highs.

Stab.GD — 4-position 5-wafer (1 not used) switch.
Stab.P — 4-position 2-wafer switch, ganged to above through National right-angle drive.

September 1954

35
lation choke for the screen of the final, the meter shunts and the filament transformer are mounted under the chassis.

Methods employed in shielding and filtering are shown in the photographs and block diagram in Part I. The r.f. unit is completely enclosed by the perforated aluminum shielding, with wide lap-overs to prevent r.f. leaks. The cable from the main r.f. chassis is made with shielded wire, and brought to a filter compartment on the inside of the rear wall of the case, where each lead is filtered and decoupled at the socket where the cable from the power-supply unit plugs in. The functions of the high- and low-pass filters in the antenna circuits were outlined in Part I. It may or may not be necessary to filter and shield to this extent in other localities so far as TVI goes; however, if there are several transmitters to be used close together, it will help to prevent interference between the various bands, and so is highly worth while from a c.d. point of view. (Field Day planners take note!)

**Constructing the 50-Mc. R.F. Unit**

Laying out the r.f. subchassis requires some thought so that all parts can be located for short leads and good by-passing. It is suggested that the layout shown in the photographs be followed fairly closely. All the parts mounted on the 5 X 13-inch plate must be kept a half inch in from the edge, to clear the lip on the inverted chassis when the plate is mounted. It may be necessary to file some clearance notches in the lips to get the plate into position easily. A clearance hole for the channel switch must be drilled in the end of the chassis and holes must be located and drilled in the front panel for this switch and for the final plate trimmer condenser shaft. The 5 X 13 X 3-inch chassis is bolted in place permanently on the main r.f. chassis.

The four coils in each stage are identical, so after one is checked out with a grid-dip meter the other three can be made the same and mounted in position. The tuning range afforded by the slugs in the exciter coils and the spreading of squeezing of the final stage coils is more than adequate to take care of minor differences. The 12-wire cable from the r.f. subchassis is made long enough so that it can be plugged into the
Low-pass and high-pass filters designed especially for the 30-Mc. station.

main chassis with the r.f. unit resting on the bench alongside for testing.

Coils for the final plate circuit are wound of No. 14 wire, and are self-supporting. They are mounted between tie-points and the top wafer of the channeled switch. Short lengths of bakelite tubing are then slipped into each coil, and the antenna coupling coils are wound on these.

**Tune-up Procedure**

The r.f. subchassis is made ready for adjustment by placing it on its side on the bench and plugging its cable into the main chassis. The tune-up switch in the screen lead to the final stage should be in the off position. With the plate meter switched to read the oscillator plate current and the grid meter connected to the first tripler grid circuit, insert four not crystals, set the channel switch to Position 1, and turn on the send-receive switch. Tune the crystal plate coil No. 1 for minimum plate current and maximum grid current. Next, advance the meter switches one position and peak the No. 1 coil in the first tripler plate circuit. Repeat this process until the final is reached.

Now connect a 50-watt lamp to the output jack, close the tune-up switch, applying screen voltage to the final stage, and adjust the final tuning condenser for minimum plate current.

![Diagram of tuned double stub for eliminating 50-Mc. interference in TV or other receivers. stub is tuned carefully to transmitter frequency by watching for minimum interference. Capacitor can be any small trimmer, but split-stator type (15 µuf. per section) provides cold shaft for elimination of hand capacitance and makes for easier tuning.](image)

**Fig. 5**—Tuned double stub for eliminating 50-Mc. interference in TV or other receivers. Stub is tuned carefully to transmitter frequency by watching for minimum interference. Capacitor can be any small trimmer, but split-stator type (15 µuf. per section) provides cold shaft for elimination of hand capacitance and makes for easier tuning. Squeeze or spread the turns on the final plate coil until the dip comes at half scale on the plate condenser. Be sure the transmitter is turned completely off before making this adjustment, as death is very permanent! Set the drive control for 3 to 4 ma. final grid current. The loaded plate current of the amplifier should be between 100 and 150 ma.

This procedure is repeated for each of the other three channels. If the final coils have been adjusted correctly it will then be possible to switch to any position without retuning of any sort. The function of the final plate tuning adjustment should be merely to tell if the stage is really tuned to resonance and operating correctly. If the crystal fails or a tube burns out, all following stages are protected by fixed bias, so their plate currents fall to zero.

In normal operation the two meters on the main r.f. unit are left in the final plate and final grid positions. These and the modulator plate meter enable the Radio Officer to tell at a glance how the transmitter is operating. The final plate current shows a slight downward flicker with modulation, because of the common power supply for both modulator and final. This is a normal condition.

**Neutralization**

The final grid current varies somewhat with tuning of the final plate circuit, indicating a need for some slight neutralization. No simple means could be found that would hold for all four channels, with the type of bandswitch used. No adverse effects were found from this condition, however. The final operates stably, and there is no tendency toward parasitics.

Neutralization was tried using a one-turn link around the bottom of the second-tripler plate coil and the final plate coil, as shown in the schematic. When these two links were polarized correctly the coupling could be adjusted for perfect neutralization. This made the final grid current completely stable, but was too complicated to install on all four channels. Since it did not improve the operation of the final stage it was omitted.
Interference Prevention

Operated without its perforated-aluminum shielding, this transmitter takes out every channel on a TV set operated in the same room. Harmonics of the crystal oscillator appear every 5½ to 6 Mc., or one to each TV channel. This could be prevented by using a higher starting frequency, but when the shields are in place interference shows only in Channels 2 and 11.

The special 50-Mc. low-pass filter, Fig. 4 and photograph, removes the fourth harmonic interference from Channel 11 and also a third harmonic from near the 2-meter band. Where the TV signal is strong, a double stub, Fig. 5, applied to the TV lead, will remove the adjacent-channel interference in Channel 2. It should be noted (Fig. 1, Part I) that the low-pass filter is connected between the antenna and the antenna change-over relay, thus being in the circuit for both transmission and reception. The high-pass filter is connected between the relay and the receiver. In this way the 50-Mc. receiver is protected from fundamental overloading by other transmitters in the room, and radiation of energy on frequencies higher than the 50-Mc. band by the 6-meter rig is blocked, giving added protection to the 2-meter receiver and TV Channel 11. This plan is carried out on other transmitters and receivers in the room, and is largely responsible for our being able to operate so many rigs so close together.

TVI from the 50-Mc. energy can be corrected in some instances by connecting an open-ended quarter-wave stub of 300-ohm Twin-Lead cut for the transmitter frequency across the input to the TV set. The double stub of Fig. 5 is more effective in difficult cases like the adjacent-channel problem in Channel 2. It consists of two shorted quarter-wave stubs connected in parallel and tuned with a small variable condenser. The stub is installed sandwich fashion, with the TV feed line as the filling and the two stubs as the bread. The sandwich is taped loosely to the feeder and slid along the line for maximum attenuation, while tuning the trimmer. When the best spot is found the stub is taped securely in place. The trimmer can be any small variable capacitor, but greatest ease of adjustment is achieved if a split-stator variable is used.

In conclusion, let me say that although we could have gotten by with one tube in the power supply, two in the modulator and two in the r.f. unit, and still run 50 to 60 watts input, the present transmitter more than justifies the extra expense and effort. It is a pleasure to operate a rig on 50 Mc. with more than enough grid drive, plenty of good-quality audio, and a full 40-watt output, to say nothing of being able to switch to any one of four channels at will.

<table>
<thead>
<tr>
<th>Voltage and Current Table</th>
</tr>
</thead>
<tbody>
<tr>
<td>osc.</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>Fil. on.</td>
</tr>
<tr>
<td>Grid Volts</td>
</tr>
<tr>
<td>S/R Switch in Transmit</td>
</tr>
<tr>
<td>Position: Grid Volts*</td>
</tr>
<tr>
<td>Grid ma.</td>
</tr>
<tr>
<td>Plate Volts*</td>
</tr>
<tr>
<td>Plate ma.</td>
</tr>
<tr>
<td>Screen Volts*</td>
</tr>
<tr>
<td>Screen ma.</td>
</tr>
</tbody>
</table>

| Voltage * at: |
| --- | --- | --- | --- | --- |
| Plate | +45 | +75 | +240 | +270 |
| Screen | +27 | +3.5 | +17 | +12 |
| Cathode | +1.25 | | | |

* Measured at socket with vacuum-tube voltmeter.

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**25 Years Ago**

September 1929

... The month's editorials treat on ARRL Division election procedures, and c.w. enthusiasts who purposely apply tone modulations to broaden their signals.

... L. G. Winne, W6QZ-W8QZ, discusses the interesting off-center single-wire-fed Hertz antenna in his "Notes on Etherial Adornments."

... "An Effective Low-Cost 'Phone and C.W. Transmitter of Modern Design" is the work of Technical Editor James J. Lamb and Asst. Technical Editor Beverly Dudley.

... "Vacuum Tube Amplifier Definitions," a subject long shrouded in misconception, are illuminated by H. F. Dart and C. K. Atwater.

... L. W. Hatry details purposeful modifications for the receiver described in March QST in his effort toward "Improving the All-Purpose Superheterodyne."

... In the "Experimenter's Section" we find discussions on "doublet" antennas, self-rectified t.p.t.g. sets, screen-grid tube biasing and other topical subjects.

... Killian V. R. Lasslingh, W6QX, outlines the proper procedures and equipments necessary for fully "Utilizing the Standard Frequency Transmissions."

... "WOCJC," the fifth of the series depicting up-to-date amateur stations, is an interesting installation owned and operated by E. H. Carter in Denver, Colorado.

... "XYL," by Eduldia M. Thomas, W5CNO, records the aspirations, frustrations and accomplishments of one who urges an increase in the number of XYL operators.

... "IARU News," in addition to its many reports from overseas societies, observes that WAs have more WACs than any other call area — 49 of the 272 issued to date.

... Among Communications Department features are propagation forecasts, W1MEC's schedules, and announcement of the staff addition of E. L. Batesy, W1UE.
MORE ABOUT SOLDERING ALUMINUM

As mentioned in W9SBD's article (page 42, June, 1954, QST), it is perfectly possible to solder aluminum. However, aluminum soldering is generally not advisable, particularly on parts exposed to weather, as corrosion will soon set in and the joint will be destroyed. Proof of this can readily be seen by placing an aluminum soldered joint in ordinary tap water for a few days. Corrosion will become quite apparent and in many cases the joint will fall apart. If aluminum cannot be jointed by other satisfactory methods—such as riveting or welding—and soldering must be resorted to, then the joint should be completely covered with a protective paint or lacquer. —R. W. Woodward, W7YVW

NOTES ON SELECTIVITY CONTROL FOR THE COLLINS 75A-3

Have just finished reading W3AM's article in January QST and note that he refers to the inability of 75A-3 owners to get broader bandwidth from their receivers. This is true, of course, but a simple modification can give the operator of the 75A-3 additional bandwidth at a twist of the wrist.

The first step in the modification consists of the removal of about half of the turns from each winding of a standard 455-ke. i.f. transformer. The transformer is then equipped with a plug so that it may be connected to the extra mechanical filter socket of the receiver. After the transformer has been aligned with the aid of the crystal filter, it is possible to make a bandwidth selection by throwing the mechanical filter switch to the proper position.

I hope that this will make some of the gang realize that for the price of one cheap i.f. transformer and about an hour's labor, they can get the equivalent of two receivers.

—Robert E. J. West, W1MKW

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A LITTLE OVER A YEAR AGO, one of the Collins mechanical filter conversion kits was successfully installed in the 75A-2 here at W8LLX. After months of operation with razor-sharp selectivity, it was decided to make provision for reducing selectivity at will. Fig. 1 shows a simple and inexpensive circuit that makes this operation possible.

The mechanical filter section of the 75A-3 is provided with an extra position marked "B" which is normally used for the installation of a 1-ke. mechanical filter. This section — "B" — has been used to accommodate the new filter. Of course, the normal mechanical filter switch for the receiver permits selection of coupling circuits.

As can be seen from Fig. 1, the new filter consists of a pair of 5000-ohm resistors, two 2.5-mh. r.f. chokes and an air trimmer of about 5- to 50-µf. range. The components are mounted on a strip of bakelite measuring 1⅛ by 3⅛ inches which is in turn fastened to a 6-prong plug that mates with the filter socket of the receiver. The arrangement of the plug prongs was the most difficult part of the job and once this was completed the wiring time was practically nil. The cost of the filter components was $2.69.

The filter is aligned by adjusting the air trimmer while observing the peak reading on the S-meter. One adjustment is all that is necessary. —Melvin C. Aichholz, W8LLX

REMOVING PILOT LAMPS

An ordinary wedge-type pencil eraser, obtainable from most any 5- and 10-cent store, makes an ideal tool for removing pilot lamps which are located in hard-to-get-at places. Use the wedge end of the eraser as the handle, slip the open end (the end which normally fits over the pencil) over the lamp, and twist. It almost seems as though the eraser was designed for the bulb-removing assignment. —Dana Terrill, W8MQS

PROTECTING CHASSIS FINISH DURING CONSTRUCTION

An application of wax to a new chassis, especially plated ones, will prevent finger marks during construction. After the work is finished, penell or crayon marks used during layout can be removed by applying more wax. Paraffin or candle wax, rubbed into a cloth moistened with benzine, naphtha or lacquer thinner provides a good protective coating and dries almost immediately. —Joseph J. Kowina, W2LGK

[Herron's Note: A coating of clear plastic spray may also be used to protect the finish of a chassis during construction. The protective layer peels off most easily after marking, drilling, etc., have been completed.]
Extending the Range of the ARRL
Lightning Calculator

- The ARRL Type A Lightning Calculator has long been a most rapid and convenient means of answering questions involving inductance, capacitance and their combination. The original scales are confined essentially to limits that permit a good degree of accuracy. Although any method of calculation for v.h.f. is bound to involve sizable error, an approximation is often of considerable value in providing a starting point for experimental adjustment. In this article, W2AWH and W1FWH suggest simple methods of extending the usefulness of the Calculator.

Applying Scaling Rules
for New Dimensions
BY YARDLEY BEERS,* W2AWH

Probably the easiest way of computing the inductance of coils having an air core and conventional shapes is to employ a Type A Lightning Calculator. However, in the two decades or so since this device first became available, increased use of very small coils has resulted from the development of high frequencies, and from the miniaturization of equipment. Many of the coils employed under these present conditions have parameters too small to lie within the direct range of the Calculator. Nevertheless, with the aid of two well-known "scaling rules" it is possible to use the Calculator with these small coils. These rules provide a procedure for selecting a "scaled-up" coil whose parameters do lie within range of the Calculator. The inductance of the actual coil may be computed from that of the "scaled-up" coil by multiplication or division by a simple scale factor.

The first of these rules is that if the length and diameter of a coil are both uniformly expanded (or contracted) by a factor $S$, without changing the number of turns, then the inductance will be changed by the same factor $S$. However, if the length is changed by a factor $S$ without changing the total number of turns, then the number of turns per inch is changed by a factor $1/S$. Hence, if we compare a coil with another having the same number of turns but having a length and diameter three times as large, then the second coil has three times the inductance and one-third the number of turns per inch.

Example 1: The inductance of a coil having a winding 1 1/8 inches long of No. 32 enamelled wire (114 turns per inch) on a 5/8-inch-diameter form cannot be calculated directly, because the diameter is outside the range of the Calculator. By choosing $S = 2$, the calculation may be accomplished. The scaled parameters are: length

* A Ploughman's Bush, Riverdale, 71, N. Y.
1 For a general discussion of this device, see Mix, "Getting Acquainted with the ARRL Lightning Calculator," QST, April, 1933, p. 44.
3½ inches, 57 turns per inch and diameter ¾ inch. With these values an inductance of 136 microhenrys is calculated. This value is then divided by \( S = 2 \) to give 68 microhenrys as the final result. The value measured by a Q-meter at 1.8 Mc is 70.2 microhenrys. Because of the low frequency and relatively small wire diameter the agreement between calculated and measured values is excellent.

Example 2: A 5-turn coil has a length of 5½ inch (8 turns per inch) and a diameter of ¾ inch. With \( S = 2 \), the scaled length of 1¼ inches, and diameter of ¾ inch are within range of the Calculator, but with the scaled value of 4 turns per inch, the inductance lies off-scale. With 12 turns per inch \((N = 3)\), a value of 1.94 microhenrys is obtained. This value is divided by \( N^2 = 9 \) to give 0.215 microhenrys for the scaled-up coil, and in turn this is divided by \( S = 2 \), to give the final result of 0.108 microhenrys. The measured value at 50 Mc is 0.168 microhenrys. In such an extreme case of a few turns, and with a high frequency, the large error is not surprising. It is, however, of the expected sign.

### Extending Ranges by Self-Calibration

BY WALTER E. BRADLEY, **WIFWH**

In answering correspondence that comes to the Technical Information Service desk, it sometimes becomes necessary to approximate the dimensions of coils and resonant frequencies of tuned circuits whose values fall outside the range of the ARRL Type A Calculator.

Some time ago, several of the scales were extended to cover both higher and lower values. Most of the scales can be extended without calculation.

### Inductance Scales

To calibrate the inductance scale for values lower than 1 μH, set 900 μH, opposite 1 μH. Then mark a line opposite 1000 μH. Set 800 μH, opposite the 1-μH line, and again make a mark opposite 1000 μH. Set 700 μH, 600 μH, 500 μH, etc., opposite the 1-μH line, each time making a mark opposite the 1000-μH line. When you reach 100 μH, opposite 1 μH, the 1000-μH mark will complete a calibrated scale from 1 μH down to 0.1 μH.

To extend the inductance scale for inductances up to 10,000 μH (10 mH), set 100 μH, opposite 1000 μH. (Be sure you don’t use the 1500-μH line.) A mark opposite 10 μH will indicate 10 μH. Set 90 μH, 80 μH, 70 μH, etc., opposite 1000 μH, each time making a mark opposite the 10-μH line. Each mark represents 1 μH.

### Capacitance Scale

There isn’t much point in extending the capacitance scale below the original 3-μH limit.

**Technical Information Service, QST.**

but if you want to go down to 1 μH, set 10 μH opposite the 1-μH line, and make a mark opposite the 10-μH line (this should come close to the 600-kc line on the frequency scale). This mark is at 1 μH. Set 20 μH opposite the 1-μH line, and make a mark opposite the 10-μH line (2 μH). To extend the scale to larger capacitances, set 1000 μH, opposite 200 μH, and make a mark opposite 100 μH. (2000 μH). Set 1000 μH, opposite 300 μH, and again make a mark opposite 100 μH. (3000 μH), etc.

### New Diameter Scales

On the basis of the observation of W2AWH that if the diameter and length are cut in half, and the number of turns per inch is doubled, the inductance will be halved, it is possible to plot scales for smaller diameters than ½ inch, or larger than 5 inches, if desired. For instance, if a scale for ½-inch diameters is wanted, set 10-inch length to ½-inch diameter. Although any pair will do, for convenience find an inductance line that matches a turns-per-inch line, and mark down the value of inductance, and the number of turns per inch (e.g., 13 μH, 13 t.p.i.). Now, make a new setting in which half this value of inductance (6.5 μH) lines up with twice this number of t.p.i. (30). Place a dot opposite length 5 inches. Repeat the process with length 8 inches on ½-inch diameter to plot length of 4 inches on ¼-inch diameter. Continue down to where length ½ inch at diameter ½ inch is used to plot length ¼ inch at ½ inch diameter. This will give you points for a scale of lengths from ¼ to 5 inches for ½-inch diameter.

To make scales of other diameters, merely repeat the same process, starting out with 10-inch length set at twice the diameter you want to plot (3½-inch diameter to plot 3½-inch diameter, etc.). To obtain scales for larger diameters, reverse the process. Set 5 inches length to 3 inches diameter. Choose values of inductance and turns per inch that line up. Then set twice this inductance opposite half this number of turns per inch. Make a dot opposite length 10 inches. This gives the point for length 10 inches at diameter 6 inches (twice the original diameter of 3 inches). Proceed to plot other points for the 6-inch diameter, setting 4, 3, 2 inches length opposite 3 inches diameter, each time selecting inductances and turns per inch that line up, resetting for twice the inductance, and half the number of turns, to get points for lengths of 8, 6, 4, etc., inches. When you have completed the 6-inch diameter scale, you can proceed to diameters of 7, 8, 9, etc., inches by making the first settings of 5-inch length opposite 3½, 4, 4½, etc., diameters.

### Turns Per Inch

The turns-per-inch scale can be easily extended, if desired. Simply set the diameter and length scales at values that can be easily

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The Viking Ranger

The "Ranger" is a complete, self-contained, 75-watt (input) r.f. and 65-watt phone transmitter covering all bands from 160 through 10 meters. It has a built-in VFO, with provision for using crystal control as an alternative. The r.f. and audio sections may be used separately to drive larger amplifiers; in other words, the 6146 final can be used to excite a high-power r.f. amplifier, while the speech-amplifier and modulator provide all the audio gain and power output needed for driving the grids of a high-power Class B modulator.

A block diagram of the transmitter is shown in Fig. 1. The VFO uses the series-tuned oscillator circuit with a 6A9J, separate oscillator tank circuits being used to cover two fundamental ranges: one on 160 meters and the second on 40 meters. The former is used for the 1.75- and 3.5-Mc. bands, and the latter for 7 Mc. and higher frequencies. Appropriate bandspread is achieved on each range by switching padding capacitors in or out as required. The VFO output is electro-coupled, using a broad-band circuit resembling the one shown in Fig. 2, but with a single set of circuit constants.

The second tube in the r.f. line-up, a 6C6P, can be used either as a frequency multiplier following the VFO or as a crystal oscillator, selection being made by means of a switch. It is capacity-coupled to the VFO output circuit in the former case. As a crystal oscillator, the circuit is the familiar grid-plate using the grounded (for r.f.) screen of the 6C6P as the plate, with feed-back condensers from cathode to ground and from grid to cathode. The output tank of this tube is a broad-band circuit that may be of some interest to home constructors. It is shown in Fig. 2. For frequencies up through 7 Mc, the terminals marked A, B and C are open as shown, and inductance L1 is chosen to resonate with the circuit capacitances in the neighborhood of 14 Mc. The loading provided by the 33,000- and 4700-ohm resistors broadens the tuning sufficiently so that adequate driving voltage is available for the following stage on 1.75, 3.5 and 7 Mc. On 14 Mc. and above, terminals B and C are shorted; this removes the 4700-ohm resistor from the circuit and thus decreases the resistive loading, thereby increasing the output available from the stage at 14 Mc. For 21- and 28-Mc. operation, terminals A and B are shorted together in addition, resonating the circuit in the 10-meter region. This arrangement is considerably less complicated, both in switching and operating, than a separate tank circuit for each band. Like all broad-band circuits, however, the efficiency is low compared with that of a normal tank circuit, so the scheme is best applied when the following stage requires very little driving power. Also, the tube used with such a circuit should have high transconductance, the 6C6P and 6A9J being good examples of suitable tubes. Both these requirements are met in the Ranger design.

The third tube, the 6C6P buffer amplifier, is capacity coupled to the 6C6P multiplier and has a conventional parallel-tuned plate tank circuit. Proper inductance values are selected by a switch from taps on the plate coil. The tuning condenser is brought out to a panel control for individual adjustment on each band. A potentiometer in the screen circuit of this tube provides control of excitation to the final stage.

The final amplifier has a pi-network output tank with fixed inductance values on each band. The tank coil, shown in one of the photographs, has been constructed with a view to reducing coupling between the active and shorted sections and thus reducing losses from circulating current in the "dead" sections. The sectionalized coil is used for 3.5 through 28 Mc. Additional inductance is switched in for 160-meter operation; this is a separate coil wound on a ceramic form. A double-section plate tank condenser is used, the second section being switched in on the lower frequencies.
The Viking Ranger can be used by the Novice, since its c.w. input is 75 watts and it can be crystal controlled, but it is basically a VFO-controlled 'phone and c.w. transmitter for all bands from 160 through 10 meters. It is bandswitching (one operation) and has separate tuning controls for the r.f. driver and final amplifier. The r.f. and audio sections can be used separately as exciters for larger amplifiers. The size is approximately 15 by 12 by 9 inches. The cover plate over the crystals has been removed in this view to show how the crystals are mounted.

where more tank capacitance is needed. Fixed padding condensers also are used on some bands for the same purpose. The network output capacitance consists of a 360-μf. variable plus various values of fixed capacitance that can be added across it by means of a progressively-shorting switch. A total of over 2000 μf. is available. The nominal range of load resistances that can be matched on any band is 50-500 ohms, but this range increases to approximately 25-2000 ohms on frequencies above 7 Me.

The audio section of the Ranger has a cascaded dual-triode speech amplifier using a 12AX7, followed by a 12AU7 (both triodes in parallel) driver for the push-pull 1614 modulators. The output stage operates in Class AB1, using cathode bias. The output transformer has a third winding used for negative feed-back to the 12AU7 grids, the purpose being not only to reduce distortion but also to lower the effective plate resistance of the output stage and thus improve its regulation when it is used for driving a Class B modulator. The regular secondary is center-tapped to permit using it as the input transformer for a Class B modulator.

The set has two power supplies, one delivering 500 volts for the final amplifier and modulator, the other 300 volts for the low level stages, both audio and r.f. These voltages, as well as a filament supply, are available at the "auxiliary" socket mounted on the rear apron.

Operating features include a "zero" position on the crystal-VFO switch, for obtaining a VFO signal without energizing the final amplifier. As normally wired, this switch turns on the VFO and first 6CL6 by grounding their cathodes (these two cathodes are keyed for c.w. operation). If the resulting signal is too strong or too weak for good zero-beating with an incoming signal, the cathode wiring can be changed so that either the VFO alone, or the VFO and both 6CL6s, will be operated from the switch. The second 6CL6 is cathode-biased and its plate current with key up is well within safe limits. The plate current of the 6146 is held to a low value during key-up periods by a 6AQ5 tetrode-connected clamp tube. A "tune" position is provided on the operating control switch, for making adjustments to supply the proper grid current to the final amplifier before going on the air. In this switch position, all the r.f. stages except the 6146 have normal voltages applied.

The photographs show the internal construction of the transmitter. The case, a single unit except for the front panel, is welded cane metal, copper plated to provide good electrical contact to the chassis and panel. The panel overlaps the front edge of the case and is equipped with knitted monel ("electronic weatherstripping") to ensure good contact. Each of the two small openings in the rear (for access to the connectors on the rear chassis apron) is tightly bonded to the chassis by screws. The panel meter is provided with a separate shield, and all shafts coming through the panel are grounded to the panel opening. These measures, together with v.h.f. filters in all leads to external connections, are for preventing harmonic leakage in the TV bands.

—G. G.
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 1955-1956 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, Conn.

We, the undersigned Full Members of the ARRL residing in the Division, hereby nominate: (Signature and address)

as a candidate for director; and we also nominate: (Signature and address)

as a candidate for vice-director; from this division for the 1955-1956 term.

(Signatures and addresses)

The signatures 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 radio 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, 1954. 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: Wesley E. Marriner, W8AND, and Harry B. Matthews, WB0UQT; Hudson: George V. Cooke, jr., W2OBU, and Thomas J. Ryan, jr., W2MKB; New England: Percy C. Noble, W1BYR, and Frank L. Baker, jr., W1ALP; Northwestern: R. Rex Roberts, WTC7Y, and Karl W. Weingarten, W7BG; Roanoke: P. Lauter Anderson, jr., WAMWH, and Gus M. Browning, W8RPO; Rocky Mountain: Claude M. Manet, jr., W6GC, and (no vice-director); Southwestern: John B. Griggs, W6KKV, and Walter R. Jones, W6EKM; West Gulf: A. David Middlebush, W6CA, and Carl C. Drumheller, W6FEO.

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

For the Board of Directors:
A. L. BUDLONG
Secretary

July 1, 1954

LEAGUE AUDITS

A director of the League recently intimated in a letter to his division membership that no proper audit of the League’s books had been made for the past six years; understandably, this has been the cause of some concern on the part of League members both in and out of the division concerned.

The facts: The League’s books are invariably audited every three months — as they have been for thirty-two years — by an independent Hartford firm of Certified Public Accountants, one of the best in the state; Hadfield, Rothwell, Soule and Coutts. Quarterly summaries of these audits are regularly sent by the General Manager to each director, vice-director and assistant. The yearly summary of our business operations, including detailed statement of revenues and expenses, and a balance sheet (similarly from year-end audit by IRRSCC) is contained in the annual report of the General Manager, sent to all directors, vice-directors and assistants, and available to any member of the League, postpaid, for 75c.

OST for
Ohio became the fourth state to designate an amateur radio week with the issuance of a proclamation which came about largely through the efforts of Ralph Crammer, WSVH0, member of the Columbus Amateur Radio Association and secretary of the Ohio Council of Amateur Radio Clubs. The text:

WHEREAS, at the present time a Joint Senate-House Resolution is pending in the Judiciary Committee in the United States Senate, which calls upon the President of the United States to declare, each year, the third week in June as Amateur Radio Week, and

WHEREAS, the radio amateurs of Ohio are playing an important part in promulgating and participating in matters of Civil Defense and distress emergency communication work, both through the medium of radio and through their organizational and individual activities, and

WHEREAS, the many contributions being made by the radio amateurs to the nation’s progress and defense are, frequently, ignored, and

WHEREAS, the radio amateurs of this country are diligent and sincere in their work, having in mind the pleasure and service of their fellowmen, and should have the encouragement and interest of all the citizens in their efforts toward their goal.

NOW, THEREFORE, I, Frank J. Lausche, Governor of the State of Ohio, do hereby proclaim June 13 to 19, 1954, as Amateur Radio Week in Ohio and urge all citizens of this State to exert their interest and influence and good will toward the observance of this occasion.

SECURITY RULES

In connection with FCC’s proposal (p. 46, August QST) to tighten the security aspects of licensing amateur (and commercial) radio operators, Senator Alexander Wiley of Wisconsin discussed the matter briefly in the Senate on June 15th and subsequently filed a statement in considerable detail. While too long to reprint in its entirety, the following excerpts from the Congressional Record will be of interest to amateurs:

...The proposed new FCC rules to ban offensive and/or felonious licenses are welcome steps and very definitely in the right direction. I am gratified that these steps are being taken, partly at my own suggestion and continued recommendation. For approximately one year, I have been discussing with the FCC and with United States security agencies the problem of tightening present security loopholes in the radio field. Even after the two new rules are added, a great deal more will have to be done in this area. The electronics security problem is a very complex one with many, many ramifications. (E.g., unlicensed operation. —Ed.) Even simply the administration of the two proposed new rules alone will require great and careful effort. Subversive forces will not take this effort on our part lying down. They will probably try to throw every sort of legal roadblock against it. Meanwhile, we must make sure that the two proposed rules are sound, equitable, and feasible from every standpoint and that there are no bugs in them....

Like our security agencies, I was concerned about the fact that individuals under the discipline of the Communist Party of the United States (which means under the discipline of the Soviet Union) could obtain and renew licenses to operate amateur or commercial radio stations. They could thereby be in a position in time of peace to communicate with a foreign Government and its agents for purposes detrimental to the interests of the United States. Moreover, such individuals could in time of war serve in innumerable capacities to damage the defense of the continental United States and to give direct aid to attacking forces. ...

I made it clear from the outset that in my insistence on protective action, I did not want in any way to overstate the case or to be misconstrued. I did not want any American inside or outside of Government mistakenly to assume that there is or was anything but the tiniest proportion of amateur or commercial radio operators who might even conceivably be guilty of subversive affiliation and intentions. On the contrary, the record of amateur and commercial licensees in our country is one to inspire the highest admiration on the part of the remainder of the American people. My own State of Wisconsin has long had a particularly fine "ham" radio group. In the Badger State, and in all the other States of the Union, there has never been a crisis, civil or military, a crisis of flood, tornado, hurricane, fire or other disaster — a crisis of war — in which amateur radio operators have not fulfilled the highest expectations of the members of their craft and of the American people as a whole.

Our desire therefore to close loopholes in this field in no way reflects upon the patriotism of the mass of such operators, any more than our desire to protect the security of Government reflects on the mass of faithful, honest, patriotic, hardworking Government employees; or any more than our desire to prevent Communist control of labor unions reflects on our esteem for the overwhelming mass of patriotic American workers who are utterly opposed to communism. I have had a great deal of correspondence with members and officers of the American Radio Relay League, as well as with the various editors of radio publications. After I had sent one particular open letter to Wisconsin radio amateur operators, Mr. Fred H. Zolin (WSONY), chairman of the Milwaukee Radio Amateur Club, wrote to me, for example, stating that "My open letter was read and discussed at the meeting. Your expressions in it on your attitude toward the radio amateurs were very encouraging."

The magazine QST, published by the ARRL, in its March, 1954, issue, stated realistically, "For our part, we repeat what we stated to the press — on the subject of security checks for radio operators: We had such checks immediately before World War II (including fingerprinting) and we don’t believe any amateur would hesitate to comply again, should such procedures again be required."...
CURE FOR TVI

If buzz-saw radiation from your TV receiver's 15-ky. horizontal oscillator has been dampening your operating pleasure, the following remedy, used successfully by Floyd X. Passmore, W6KJN, may be of help. An advantage of this method is that it is unnecessary to remove the receiver chassis to add internal shielding and filtering.

1) Connect two 0.1-µf. tubular condensers and two 0.001-µf. disk ceramic condensers in the TV receiver power cord, as shown in the upper portion of Fig. 1. These condensers should be rated at at least 300 volts.

2) Cut a piece of 300-ohm Twin-Lead to a length of about 22 inches (approximately a quarter wave at v.h.f. TV frequencies). Since it is impossible to cut for all frequencies, it will be necessary to compromise and try to hit the center of the frequencies received in your area.

3) Attach one end of the Twin-Lead to the antenna terminals of the TV receiver as shown in the lower portion of Fig. 1. Short-circuit the other end of the stub and connect it solidly to the receiver chassis.

4) Check the channels one by one and see if there is any attenuation of the signals to the TV set. If it is found that some of the channels on one end of the v.h.f. spectrum are weaker than before the stub was added, trim the stub a half inch at a time until a length is found which will not appreciably attenuate the signal on any channel.

If you live in an area where both v.h.f. and u.h.f. stations are received, a switch may be used to connect either a v.h.f. or u.h.f. stub to the antenna terminals.

TVI COMMITTEE OPERATION DESCRIBED

Northwest Electronic World, trade paper with extensive circulation among technicians, service-men, dealers and engineers in Washington, Oregon, Idaho and Montana, devoted part of its June issue to a feature story on the successful operation of the three Seattle TVI committees in cooperation with TV service dealers in that locality. Editor Edward J. Wirtz, Jr., W7JGM, who prepared the story especially for the information of non-ham readers, hopes something along similar lines might be accomplished in trade papers in other parts of the country.

In El Paso, Texas, KROD-TV recently telecast a half-hour feature program devoted to amateur radio. W5UBN, in car, and W5WVD, right, demonstrated two styles of hamming — mobile and hand-carried portable — with the cooperation of interviewer Bernie Bracher, KROD-TV staff announcer.
BY ELEANOR WILSON, W1QON

Again this year, as for the past two, amateurs across the country valiantly assisted in the annual All Women’s Transcontinental Air Race. A different flight route each year has given more operators a chance to participate and thus to gain some new and interesting experiences. This year the flight, the eighth annual, was from Long Beach, California, to Knoxville, Tennessee. While unable to give full details here and to credit all of the YLs and OMs who served, it is a pleasure to mention as many as possible.

W6NZF, Evelyn Scott of Long Beach, was General Amateur Radio Chairman, and she and W6NZP, W6CEE, Vada Letcher, YLRL President, operated under the Los Angeles Young Ladies Radio Club call W6MWVO at the Long Beach airport, the take-off point. K6CD, Eileen O’Connell, spent many hours prior to the race scheduling operators along the flight route; and W6LMQ, Eleanor Souter, relayed reports from her home station from daylight to dark continuously for four days.

W4TIE, Margaret Pearre, and W4AUDI, Lo
dette Mewborn, co-chairmen for Memphis, Tennessee, a stopover point, had the cooperation of YLs W4s UDQ WTI ZEG, W4s AFE DMN, and OMs W5s BAQ CV DQH HHK JU TIZ WTI YMB and ZEE. The YLs, operating W4EM on two meters at the Municipal airport, relayed traffic to the OMs at home stations, who in turn relayed on 75 and 20 ‘phone to other points along the race route.

Continuing the introduction of the new officers of the Young Ladies Radio League for the 1954-’55 term, five more are presented herewith, in addition to the twelve acknowledged last month.

W3RXV — Peg Ferber, of Slaton
tion, Penna., is the new Editor of the YLRL Harmonica. She is contemplating a number of changes in the format of the club paper and solicits comments from the membership. Peg was the first YL to pass the Novice exam, and she and her OM, W3RXW, were the first married couple to hold Novice licenses. Now General Class, Peg operates on several bands and has YLCC No. 21.

W2YBC — Gloria Matuska, of North
tesda, Ill., the new Publicity Chairman, is also president of the Chicago Ladies Amateur Radio Club. The XYL of W9ATW, Gloria has made more than 1000 contacts on 20 and 40 since receiving her license in March of ’53.

(Continued on page 184)

Enhancing the splendor of beautiful Estes Park in Colorado were these eleven YLs who attended the Rocky Mountain ARRL Division Convention June 12th and 13th. YL and XYL programs were scheduled for both days. W6SCF sustained her first-place winning streak by taking home the women’s top award — a deep freeze. (At the South Western Division Convention last October, she drew a complete amateur station.) The YLs, left to right, are W6MUM, Marie Ellis; W6RTA, Irene Kraft; W6RNO, Ada Northrop; W7IDS, Lizette Wolf; W6OSVY, Marge Wengrowyn; W6BBM, Sallie Kingsbrough; W6ERR, Anna Belmonte; W6OTYB, Betty Rogers; W6DSW, Dorothy Baldwin; W3LSX/B, Kay Barclay; W6SCE, Lucie Sanzo.
Hamshacks
(No Two Were Ever Alike)

BY A. DAVID MIDDDELTON,* WSCA

Hamshack . . . even the sound of the word kindles a warm glow! This ham-coined word recalls years of fun and work and countless hours spent in rigging up gear, hunting DX, handling traffic, chewing the fat. Did it ever occur to you that the other fellow was also sitting in a hamshack — maybe like yours? He is in a hamshack but not one like yours, OM. By the beard of The Old Man, no two were ever alike.

Hamshack! . . . Roll that word over in your mind! What does it mean to you? Perhaps a snug corner down in the basement by the furnace where it is warm in winter, cool in summer, cobwebby and sooty all the time. Or an attic cubby-hole, blistering hot in summer, so darned cold in winter you had to sit on your fingers to warm them so you could twist the Microvener on the cut-down Cardwell.

Judging from many recent station descriptions maybe your current hamshack is a pine-paneled den, complete with built-in air conditioning . . . disappearing bar . . . row of factory-built gear replete with lights, dials and gadgets. But t'was not always thus! And, to the fortunate, the word "hamshack" has far more pleasant memories.

Let's talk about hamshacks. Do you recall the acrid smell of overheated insulation, topped by the sickening sweet odor of hot transformer oil surrounding that 203 mounted upside down in all its glory? Remember that 203 (with hole in plate) — the bottle you scrimped, saved and sweated to buy? And not for 70 cents at Surplus Joe's, either! Can't you hear the grunt of that pole pig when you slapped the key, hard, as if you were trying to drive your signals over the Rockies for a try at a Transcon. Shut your eyes. See all those jars aglow in the dim dark? That beautiful sight is an even hundred and twenty of Mom's quart Mason canning jars, each with the top neatly cut off, perking away turning out the p.d.c. note once

* Director, ARRL West Gulf Division; Tijeras, N. M.

so highly-prized. Take another look. You'll never again see a set of "slop jars" with each plate sparkling and over all a faint hiss!

Hamshack! . . . There's a word to conjure with! Remember the day you put up a map of the U. S. A. and so proudly put in that lonely tack? Your first QSO! Sure, it was only over in the next state! So what? Suddenly the map was studded with tacks.

Then one day, apologetic-like, you put away the U. S. A. map. You were reaching out. Worldwide DX! You swiped the latest world map from Dad's National Geographic, DX! You were really living!

The QSLs came in dribbles, then in spurts, and all of a sudden they poured in and filled the walls. You put 'em on the ceiling. Then came the DX cards — down with those familiar old locals!

Later, it took a set only 10 by 10 to make you happy. Eventually a DXCC certificate went up on the wall alongside the WAC, WAS, RCC and ROWH not to mention a couple of "off-frequency" notices from NKF.

Both you and the hamshack were growing up. You took down all the cards when you decided the shack looked "corny." Take a long look, it will never be the same! Something is gone from that old shack and it'll never return.

Hamshack! . . . Let's go back a bit — way back! Actually it was not a hamshack in the true sense, and the equipment wasn't much, I'll admit . . . spark coil, pair of headphones, wooden box with several tap switches and knobs. The shack? — well, there rightly wasn't any. The pre-W. W. I gear was stowed away in a clothes closet. But it was a starter and I never forgot it. Years afterward, I found that its owner had never even held a license, but what did that matter? There was a bug in that closet — the ham bug! And it bit me hard!

My first look at a real hamshack? A windowless closet off a lad's bedroom. The one outstanding thing about that station was its one-tube receiver. For B batteries there were flashlight cells, wired in series, with taps running from each cell to a "switch" to vary the B voltage. A ceramic rotary? Well, hardly! Nails were driven in the wall behind the operating table and connection was made with a battery clip for the desired voltage. The receiving tube? A double-filament Audion. I had never seen one before!

On another day in '19 I visited the outstanding hamshack in Indianapolis. It took a lot of nerve to climb those stairs over Hamilton's garage underneath the tall poles out on North Alabama Street. That shack was the roost of 9ZJ and I'd heard he was not friendly with youngsters.

48 QST for
But ZJ took time out to show me around and let me listen to my first voice signal coming from the Prest-O-Lite laboratory at the Motor Speedway a few miles away. Why ol' ZJ had a row of tubes t-h-a-t long in his receiver!

Hamshacks! ... What's their prime function — to house the gear? I suppose that is the main requirement, or else why bother with a hamshack anyway.

Probably there have been as many different types of hamshacks as there have been hams. However, from the early days of ham radio until fairly recent years, the locale of the ether-busters fell, more or less, into one of several classifications.

There were many variations in layout, but in general one thing stood in common: the combined smell of coffee, Cames, hot transformer insulation and battery acid. It's a nostalgic scent — hamshack!

Let's look in at a few and say, I'll bet a new grid-leak drip pan that one of these descriptions will sound like home to you.

How about the basement hangout? Let's visit 9AYH (now W6AUQ) in the early Twenties, when Ray Hitecheck lived in Irvington, east of Indianapolis. The passing years have dimmed none of the details of Hite's basement shack which was typical of that period. Tucked away down by the furnace, and handy to the chimney draft pipe so that smoke from his then-forbidden cigarettes could be puffed directly into the flue, 9AYH's shack represented a once familiar pattern: rotary gap sitting firmly on a solid 2 by 4 bench, with an oscillation transformer made up of heavy, wide copper strip close by; on the operating table a set of Turney coils (the first in our neighborhood) and a 200 tube lit up like a church. It didn't take much for a rig in those days after you acquired the antenna change-over switch. I wonder if Ray really fooled his OM about those cigarettes? One thing I do know for certain: a ham's folks knew when he was pounding brass in those days, and so did all the neighbors within sound of that crashing, screaming rotary gap.

There was the attic hamshack. This one had many versions and ramifications. Usually attic shacks were cold as a landlord's heart in the winter and hotter than a $2.00 pistol in the summer, but one attic that always seemed comfortable to this young squirt was the shack-workshop-bedroom of Bill Sweetland, 9BGY (now W5WKA). Several features about 9BGY's hamshack stick with me now, 35 years later. One was the narrow stairway leading up to the shack. Why a guy couldn't even carry an Eseo motor generator set up or down those stairs without bumping his elbows! Ascending the stairs you got an elongated view of one of the 9BGY heaps, a tall slate-paneled spark. I recall this yarn about 9BGY's panel-mounted rotary. One night Bill was fooling around; his key was up but the juice was on. Bill was adjusting the gaps on the rotary when the rubber band that served as a key spring let go. Bill got the full kick of the big Thordarson and he flew across the attic, crashing into the opposite wall. The impact knocked him out. The next thing he knew OM Sweetland was up there trying to bring Bill around and giving him Old Ned for leaving the gap crashing away all that time!

Another thing about 9BGY's shack was the "swap drawer." A terrific idea! Bill had an old beat-up dresser in the shack and one of the drawers was open to visiting hams. Yes, anybody could open that drawer and take out anything he found there — providing he put something into the drawer, something some other guy might need or want. Was that a popular spot! Many of the beginning hams around Indianapolis owe a lot to that swap drawer. Wonder just how many similar dresser drawers are in use today?

A unique feature about this shack was that Bill could start his antennas right in the shack and then run them out the window (in summer he just took out the window pane), and he could get a lot of good licks in that way in tuning and adjusting his skyrwires which always seemed to work better than those of anybody else. The attic shack of 9BGY was sacred to ham radio ... no dirt-chasing female or room-straightening gal ever went in there.

Next, let's take a look at the close-with-a-window shack. Here was a happy place. Maybe it was because it was mine but I've seen few hamsacks as cozy as the off-the-bedroom shack at 9BJL in the early Twenties. Who ever laid out our house must have had a ham in mind because the room was just large enough to accommodate (a) a sizable operating table, (b) a row of chemical rectifiers lengthwise, (c) the op's chair plus one for the first visitor to arrive (others stayed outside in the bedroom), and (d) lots of sloping ceiling just right for QSL cards and maps and ARRL certificates. Sure, I know, it wasn't big enough to hold a double 6-foot rack. 9BJL didn't boast any

(Continued on page 148)
V.H.F. QSO Party

September 18th-19th

ARRL is pleased to announce another of its popular V.H.F. QSO Parties, open to all amateurs who can work any band or bands above 50 Mc. The Party will be held during a 33-hour period starting at 2:00 p.m. Local Standard Time, Saturday, September 18th, and ending at 11:00 p.m. Local Standard Time, September 19th. This week end of concentrated activity will furnish v.h.f. enthusiasts with an unusual opportunity to check out new equipment and antennas, renew acquaintances, and perhaps work some new states.

How to Take Part

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 point credit. It's also a good idea to swap signal strength and readability reports, although this is not required.

Scoring

Work as many stations on as many v.h.f. bands as you can. Count 1 point for successfully confirmed exchanges of section information on 2 or 6 meters, 2 points for such QSOs on 220 or 420 Mc., and 3 points on 1215-Mc. or higher bands. Then multiply this sum of station points by your section multiplier, which increases by one when the same section is rereacted on another band. A station may also be rereacted for credit on additional v.h.f. bands.

Certificate Awards

Certificates will be awarded to the top scorer in each ARRL section. In addition, a certificate will go to the high-scoring Novice, Technician, and multiple-operator station in each section from which three or more valid entries are received in these three special categories. See Rule 7 for details.

Reporting

Submit your results as soon as the competition is over. All that is required is a simple tabulation of stations and sections worked, as shown on page 60 of June, 1953, QST. Write ARRL for free convenient reporting forms.

Rules

1) The contest starts at 2:00 p.m. Local Standard Time, Saturday, September 18th, and ends at 11:00 p.m. Local Standard Time, Sunday, September 19th. 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.

4) Scoring: 1 point for completed two-way section exchanges on 60 or 144 Mc.; 2 points for such exchanges on 220 or 420 Mc.; 3 points for each exchange 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. Re-working sections on additional bands for extra section credits is permitted. Cross-band work does not count.

5) A contact per band may be counted for each station worked. Example: W2QED (S.N.J.) works W1DBM (Conn.) on 50, 144 and 220 Mc, for complete exchanges. This gives W2QED 4 points (1 + 1 + 2) and also 3 section-multiplier credits. (If W2QED 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 sections can provide another multiplier point only when contacted on a new v.h.f. band.

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

8) Reports must be postmarked no later than October 6th, 1954, 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 25th-26th

This popular "across the border" contest, sponsored by the Montreal Amateur Radio Club, will be held the week end of September 25th-26th, U.S.A. amateurs will swap short exchanges (see Rule 3) with as many Canadians as in many provinces and territories as possible, and VE/VO amateurs will contact amateurs in the ARRL sections in the U.S.A. One rule change permits VO-land (Newfoundland and Labrador) to compete on a separate basis with other Canadian areas. W/K stations will multiply their scores by 7.11 to equalize scoring opportunities for all participants. V22BB, contest chairman for MARC, urges those taking part to read the rules carefully and keep neat logs so that checkers can prepare the contest results 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, September 25th, to 11:59 p.m. EST, September 26th, 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 WZZZ 570 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 (VEI through 8 plus VO).

(Continued on page 118)
CONDUCTED BY E. P. TILTON,* WIHDQ

Elsewhere in this issue are the report on the June V.H.F. Party and the announcement of the September one. We'd like to get the contest summaries in one month earlier, and we used to do it now and then, but with the entries running to nearly 400, it's not likely to be done very often any more. Checking a contest of that size is not something that can be tossed off lightly some spare afternoon!

What is behind this growth in contest activity on the v.h.f. bands? Increased v.h.f. population, particularly on 144 Mc., is part of the story. Certainly there are many more 2-meter stations today than ever before, and the activity is much more widely distributed geographically. But perhaps more important is the discovery by hundreds of v.h.f. operators that these parties are fun for everyone.

Some of us once considered contest operating to be kid stuff, beneath our dignity as mature hams. Not a few boycotted the contests at first, refusing to participate at all. Then cautiously some adopted the "I'll give you a number, but I'm not in the contest" approach. Others, unaware that a contest was scheduled, came on the air on the second evening of a party and were forced into a fast series of contacts by scores of participants who had been digging for new stations all during the previous 28 or 30 hours. "Say — this sort of thing is fun, after all; guess I'll give it a real try next time!"

And give it a real try they did, discovering in the process that a week end of contest operating "has everything." One avid contest man of our acquaintance puts it this way: "There's a feeling of living with the gang that you get in no other way. You may not talk with them directly for the entire contest, except for the minimum required for a contest contact, but you know just how they're doing, and they know how you're doing. There's nothing like a contest, worked for all it's worth, to show how your station and operating skill stack up with the others in your class."

The pace of the v.h.f. parties is hot, but not too intense to leave time for a friendly word now and then. And there's a spirit of give-and-take about them. You come across a new section late in the party, and you haunt the guys until you get a shot at him. But once you've worked him you announce his frequency for others in the pack who may not have noticed him. And you spend precious minutes trying to pull through a weak fading signal because you know that working you may mean a new section and a better multiplier for him, even if not for you.

Yes, hundreds of v.h.f. operators have found that a contest means a week end packed with thrills. It's real fun; and when it's over you'll know more about your station and its capabilities than you could learn in months of random operating. See you September 18th and 19th!

For you fellows who like to go out to the hilltops in groups: note the new rule on multiple-operator stations. Section awards will be made wherever two or more logs are received from stations manned by more than one operator. We made it three or more in the June Party, but this turned out to be too high; there were multi-operator stations where excellent work was done, but not enough logs were received for an award. If you like multiple operating, talk other groups into going out in your section this time to give you some competition. There's no better sport: the September v.h.f. Party can be a fall Field Day, if you make it so.

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W7YB: . . . . . 48 W7YV: . . . . . 48 W7ON: . . . . . 49
W8JV: . . . . . 48 W8JMJ: . . . . . 48 W8W: . . . . . 49
W9C: . . . . . 38 W9C: . . . . . 38 W9C: . . . . . 38
W9A: . . . . . 38 W9A: . . . . . 38 W9A: . . . . . 38
W8OA: . . . . 48 W8OA: . . . . 48 W8OA: . . . . 48
W8H: . . . . . 44 W8H: . . . . . 44 W8H: . . . . . 44
W8H: . . . . . 43 W8H: . . . . . 43 W8H: . . . . . 43
W8W: . . . . . 41 W8W: . . . . . 41 W8W: . . . . . 41
W8W: . . . . . 41 W8W: . . . . . 41 W8W: . . . . . 41
W8W: . . . . . 40 W8W: . . . . . 40 W8W: . . . . . 40
W8W: . . . . . 38 W8W: . . . . . 38 W8W: . . . . . 38
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* V.H.F. Editor, QST.

September 1954
Here and There on the V.H.F. Bands

The more time you spend of 6, the more fun it is, says W9MFH, Ravenswood, Ind. Bob made his first out-of-state contact on 50 Mc, in April, 1951, and since that time he has had 1036 DX QSO's and his station worked total is now up to 220. Though he arrived on the 6-meter scene well after the big doings of the last sunspot peak were history, W9MFH has 35 stations, VE1 2 3 4 5, and Cuba. The picture is similar to one that we hope another you get to talk to almost everyone who operates there eventually. This makes it a fine field for the use of a card file. Bob keeps his up religiously, and finds it a big help in keeping on top of news around the country.

Whether it be sunspots or not, W9MFH has found the going much better on this 6-meter band than ever in his band, June had only 4 days (5th, 15th 23th, 30th) when he heard anyone worked, and up to July 18th only two dead days (12th, 16th) have come up.

This improvement in conditions is reflected in our 50-Mc. WAS box. Last year it went through the summer almost unchanged, but this season quite a few of the gang have moved up a notch or two. But lack of activity in Utah, Nevada and North Dakota is holding many consistently active 6-meter men at 46 or 47 stations. Many other states come hard, but those three have been impossible in the last round of years.

Nebraska has been a tough one, but W9JBT's took care of plenty of the gang this summer by spending his vacation at Lincoln and doing a fine job on 6. He's been on from there before, and in band conditions cooperated much better than in the two previous summers.

There has been little sign of resident activity in Vermont of late. W1CIX, who probably provided more Vermont stations than any other resident of the Green Mountain State, joined the ranks of Silent Keys some months back, and is sorely missed. The only Vermont contacts we've heard about this summer were the work of W1GJO, who operated portable in Averyville, Vt., July 10th through 16th. At the close of the band's throw from the Canadian and New Hampshire borderland, Grid put on 2E2O, mobile converter, NC88 and a 3-element beam and gave the prized Vermont W1CIX a W2TPA, OFW, W6s YAM (OTL) T, W4GKX, W4KZF, W4JBU, W5MDJ, W6HOM QL8 YF, W6s YP1 VIL, VE3s DER and A1B. For W5MDJ, Amarillo, Texas, this was the big one he'd been waiting for — Number 48. Grid says he'll give it another whirl next summer.

W8SQU, Cleveland, Ohio, got his W6QO a different way. On July 9th, he hooked up with W1PZA/2, mobile in New York, about a half-hour drive from the Vermont border. veröffentlicht later was worked, and they went together as W1PZA/1 in White River Junction, Vt. W9JBT gave him Nebraska the same week.

Here's late news, just in from W1AW, via WIOAK, W1MMN, Orange, Vt., who has done so well with his station this summer, that he completed a 6-meter transcontinental converter, W2YBP was the first signal heard, and George will be on 6 regularly soon.

COCT, Havana, Cuba, writes that the Cuban 90-Mc. Men think that W5CMS and W8NQD are the only U.S. stations on 6. They work the Ohio boys again and again, but seldom hear anything else, unless it be that never-lentener beacon of W5AJG. They also see XEW, Mexico City, almost daily on Channel 2, and commercial f.m. signals just below the band are heard often through the early summer.

Mike also reports that several of the Cuban boys now have TV set-ups working, but they don't use the 420-Mc. band. Mike indicates this authorization to use Channel 13 for testing after midnight.

Have you looked over the 2-meter standings this month? That 28 alongside W8QFQ is no misprint! When you get up to the midway mark, we've already noted that slowly, but surely, W9CF and W9JBT have picked up Numbers 25, 26, 27, and 28 in a matter of days. She had to stay up late at night, and grab up early in the morning, but it was worth his effort. Morning schedules with W2QED (0700 EDST) and W1HQF (0715) has brought the worth of getting a head start, W7JAI, W3JZ, Chichester, N. J., has also been on nearly every morning, and it was just a matter of time before W1AZK and W9WBFQ would make the grade. This they did, for the first Ohio stations to make the 2-meter column on 26 July last.

Conditions were better the following morning, with W9BFQ solidly readable on vfo at W1HQF. Was W1ECS in Rhode Island on? We'd never heard him in the morning.

A few minutes later, Al was just going out the door on his way to work when a telephone call stopped him. A female voice asked if you had had any 6-meter QSO's? What's this — a TV tip at this hour in the morning? Not a bad sound at all! "Yes, but not on the air!" "I know, but I want you to do! This is W8QFQ."

Work was forgotten for the moment, while W1ECS got going on 144 Mc. Result: the first Rhode Island-Ohio 2-meter QSO, and Number 26 for W8QFQ: Number 14 for W1ECS.

South Dakota and Number 27 came on the night of July 18th, when W8QFQ worked W9CTP, Marvin, S. Dak., at 2330 EDST. An "insurance" contact was made with W9CTP at Gary a few minutes later. At that time W9QFQ was up to 895, but by the 2200 on the 18th he had reached 84, and Margarete was able to get him hooked up with W3BGT and W3RUE. Also worked W6s IFS, Minneapolis, SV, St. Cloud, Minn.; CK Mitchellville, EMS, Adair, and OUP and IYW, Des Moines, Iowa; TT Millbank, S. D.; and W9LEF, Brainard, Neb. The last one was Number 28, a new F.P. This session lasted right through to the morning skeds to the east, when W9QFQ was running 87 off the back of the 52-element array as W8QFQ. But, alas, no W6s were heard that morning in the Midwest.

With their W1MEM/1 experience as a warm-up, W1PYP and W1RUD decided to see how it would be to operate on 144 Mc, from the highest spot east of the Rockies, and thus they provided New England contacts for W8QFQ. Last year, on the way down to the National Convention, Paul and Bob surveyed the possibilities all through the Blue Ridge and Great Smokys Range, and decided that Mt. Mitchell, NC was the spot for them under conditions during their stay on this 9948-foot elevation, but even so they managed to work nine states and a maximum distance of 600 miles. For most of the stations worked it was their first shot at North Carolina. The trip also included marathon band-switching, with stops at W1HIK, W8QFQ and W1HIQ, among other points. One night's work was also put in trying to put Arkansas on the 2-meter map, but four states in four QSOs was all they could manage in the time available.

Speaking of expeditions, the last go down in history as a high in this department. As we write, a few days in advance of that week end, we know of several ambitious projects scheduled, W8QFQ and W8QH, New Bedford, Mass.; W6WQP and W6WQR Peak; W6QFQ, W6MXX, W6DSZ and W6SVS/6 on White Mountain, near Bishop, Calif.; W6LS/6 on Mt. Whitney, Calif. (this should be quite an event, as it's the highest spot in the United States — and no. 22); KG6D, and W6QE/6 in Yosemite Park, Calif.; and probably others, if the weather is good. Should be a good time for another transcontinental 2-meter relay.

The year's best Atlantic Seaboard expedition to date came on the night of July 12th, when W2QED put in a very fine showing. (Why doesn't somebody arrange things so that DX stops automatically at 11 p.m.) The best DX we've heard of in this one was W1AZK to W9QFQ, 650 miles. The appearance of W1QV, Raleigh, N. C., on 2-meter was a pleasant surprise. No one had everyone up the coast after him. Among those who connected: W1RFU, who now moves into the top spot in the W1 2-meter standings.

W1AZK reports that the band was dead at his New Hampshire location until about 11 p.m., but things got better steadily until 0200 on the 13th. Don took time out for a bit of sleep between 0430 and 0700, and then got in a few more contacts before things folded up around 0835. W1TFDF and W4MFH supported heating through the full moon. Your conductor had to be away for two days, but even before we left, on the morning of the 12th, W2QED was putting in the loudest signal we'd ever heard from him.

Here's a 2-meter beam to end all beams! W9JBT, Elsberry, Mo., has a screen-reflector job that is attracting a lot of attention, both on the air and in the neighborhood. The latter is inevitable, as the reflector is a cylindrical metal silhouette about 12 ft. high, with a flat reflector plate 12 ft. wide. The driven element is 12 feet in front of the center of the screen. Gain on 144 Mc, is better than 17 db, and the beam is 90 degrees wide. Tests will be underway on 220 and 420 Mc, shortly. On these bands this pigeon catcher should be about the hottest thing yet built in the way of antennas. On 144 it's been doing all right, too, providing solid communication up into the Chiesa area and beyond, regardless of conditions.
2-METER STANDINGS

<table>
<thead>
<tr>
<th>Call</th>
<th>States Area Miles</th>
<th>Call</th>
<th>States Area Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>W1FJU</td>
<td>400 miles</td>
<td>W2AB</td>
<td>300 miles</td>
</tr>
<tr>
<td>W3AQ</td>
<td>300 miles</td>
<td>W4DI</td>
<td>200 miles</td>
</tr>
<tr>
<td>W5AX</td>
<td>300 miles</td>
<td>W6B</td>
<td>150 miles</td>
</tr>
<tr>
<td>W7CG</td>
<td>150 miles</td>
<td>W8OR</td>
<td>100 miles</td>
</tr>
<tr>
<td>W9Q</td>
<td>100 miles</td>
<td>W10A</td>
<td>50 miles</td>
</tr>
</tbody>
</table>

Good news for v.h.f. men of the West Gulf Division: WS6FKE, who handled v.h.f. program arrangements for the National Convention at Houston last year, will do the same job for the West Gulf Convention at Kerrville, Texas, Oct. 2nd and 3rd. There will be a special v.h.f. luncheon Saturday, and three hours of the convention program have been set aside for v.h.f. activities.

Your conductor had hoped to make this party, but a change in plans developed that will make it impossible. We will, however, be attending the Dakota Division Convention, Rapid City, S. Dak., Sept. 17th, 18th and 19th, and the Midwest Division Convention at Des Moines, Iowa, Oct. 16th and 17th, and looking in a longer range of radio club meetings and hamfests in many western states in between. If the v.h.f. section of QST looks a bit sparse the next couple of months, this trip will be the alibi!

Did your club use 2 meters in its Field Day activities this year? If not, perhaps you're missing good fun. Well, maybe not if your operating site was in Wyoming, but there are places where v.h.f. pays off. The South Jersey Amateur Radio Association, K2AZ/2, made 215 contacts on 144 MHz, using a new v.h.f. station.

Perhaps this one should be in with the "Strays." W2TNY, New York City, tells us. He's just bought a new Communicator, and on arriving back at his apartment he plugged it in and turned on his receiver. He found that 750 kHz was W2K2 (former NRRL President, George Bailey) who was testing, and then standing by for a check. A contact was made, and it turned out that George, too, was checking a new Communicator. It was the first contact for both.

Here's something rather unusual in the way of v.h.f. receivers. The contest job used by W1UIZ in one package, crystal-controlled front ends for 50, 144 and 220 Mc, a two-stage i.f. that is broad-band for 10 to 15 Mc, a special 10-to-15 Mc tunable receiver with crystal filter, b.f.o. and low-frequency i.f., and final detector with noise limiter and audio. Built compactly enough to be toted up Mt. Monadnock in a pack, it's the work of W1WID and W1UIZ.

September V.H.F. Party note: W3QQQ writes that several members of the Glenn L. Martin Radio Club, having had fine luck on 2 in the Field Day, are planning an expedition to Spruce Knob, W. Va., highest spot in the hard-to-net state. They plan to be on 6 and 2 for sure, and possibly 220 and 430, if equipment can be made ready in time.

A 50-Mc. DX note from an old friend: he's been 6-meter DX as HC2OT, OCSJF and 0AJDX. You all know who we mean; he's also worked in this contest as WS6NN and W5BR. Now Steve is in Columbia, where he hopes to be on the air on 6, 10, 15 and 20 meters in a few months. The new location is 6500 feet above sea level, with a good shot to the north. When the m.o.g. gets back up there, IRL1 should be good for some 20-Mc. DX contacts. And even before, possibly; we note that TV stations of Argentina, Brazil and Venezuela have been reported a few times around the States. If those frequencies can get through on sporadic E, certainly 50 Mc. can.

How About 1215?

More inquiries keep coming in about 1215 Mc. Seems like everyone is looking for someone who will jump in at the same time. WS6QB is one who would like to hear from anyone interested in coming serious on that band. And the Bell Gardens Amateur Radio Association (4148 Sherman Way, Bell, Calif.) would like information on equipment and activity on 1215 Mc. and higher bands. U.H.F. enthusiasts of the Los Angeles area please note.

OES Notes

The OES family is growing. We welcome many new appointees this month, wish them well, and express the hope that their reporting will be more regular than that of some present holders of the appointment. The reporting for the month of June reached a new high, by the way. Thanks, gang, and keep up the good work!

WICTW. Axtong, Mass. — Worked 6 states on 144 Mc., without Win, in Atlantic 24-hour opening on 144 Mc. W3WH in Delaware, 325 miles, was using only a pair of 6AK5s in the final.

At the suggestion of WOOP, improved action of noise limiter in the C.D. Portable for 50 Mc. described in QST for May, 1962. Referring to page 21, if value of C6 is changed from 500 to 50 µf., reception of weak signals through ignition noise will be considerably better.

W17T. Salem, Conn. — Nightly skeds with W1YQL, Marblehead, on 144.45 Mc., W1UIZ 145.55, 12 watts. About 25 per cent of skeds result in 2-way contact, though high-power at YQL gets through consistently. Suggest those looking for Maine contacts watch for W1KID/1, Mt. Agamenticus, on week ends through the summer.

K6AAM, Levittown, L. I. — Completed 220-Mc. amplifier described in May QST. Results much better than previous units using 82A. Regular skeds on 220 to noon Sundays with W6KN.


W7GPI, Albuquerque, N. Mex. — Increased activity on 144 Mc., W7ST FFB JFK UFO WJL, etc., with 82A in-elem arrays. Recent addition to 2-meter net: W5EYR.

W5NJS, Albuquerque — 430-Mc. stations active include W5F B 2ES FIJ EKT WQ8 NSJ Operating on Capillo Peak during v.h.f. relay, the 3rd harmonics of several 2-meter stations discernable heard at distances up to 120 miles. Worked W5ENX, W5DCK now has 9903 rig for 420 working nicely.

W6AIP. Sonoma, Calif. — Daily observations on 144 Mc. show signals good regularly 6 to 9 P.M. Occasional inversions later in evening reduce good signals to north and (Continued on page 34)

September 1954
June V.H.F. Party Results

Activity and Reporting at New Summer-time High

In years past, if conditions were generally poor throughout the East, we could look for a low yield in contest reports when it came time to total up the scores. Not so June, 1954. Thanks to a wider geographic distribution of activity than ever before, the V.H.F. QSO Party of June 5th and 6th broke all previous records. The tabulation shows 370 logs received from 47 ARRL Sections, a record in both categories.

Many of the leaders' scores were below levels set last June or September, but almost without exception activity and interest were phenomenal. Along the Atlantic Seaboard there was no break in the tally-dead nature of propagation throughout the Party, but elsewhere the 50-Mc. band did well with widespread sporadic-E skip openings, and tropospheric conditions helped things along on 144 Mc. and higher bands.

As in just about every spring and fall contest in the past, the v.h.f. operators of the Waltham Amateur Radio Association ran up the country's highest score, though they missed their September record by a wide margin. Using 50, 144, 220 and 420 Mc., W1MIT/1, atop Pack Monadnock Mountain, near Peterboro, N. H., made 281 contacts, with a section multiplier of 28, for 8316 points. They won the first multi-operator section award ever to be issued to a v.h.f. contest station, this type of award having been added to the contest rules for the June Party.

This country's high in the single-operator class was made by Liane Wait, W2FBZ, Upper Montclair, N. J., with 186 contacts and a multiplier of 25 for 1925 points. Not far behind her was W1RFU, Wilbraham, Mass., with 150 and 28 for 4306 points. If there were a most-contacts award, it would go to K2CMB, Paterson, N. J., for his 246 contacts on 144 Mc. And the hardest-work award would be for the boys of W1UIIZ/1 who toted gear for 50, 144 and 220 Mc. to the top of Mt. Monadnock, near Jaffrey, N. H. You can see from the accompanying picture something of what this barren pile of rock is like — but the spot where they are perched is about 2 miles of rocky trail from the nearest road. They earned their 159 contacts, 3933 points and New Hampshire section award!

But performance in a v.h.f. contest cannot be judged by number of contacts, section totals or scores, unless you know the possibilities of the area you're considering. There is simply no basis upon which a national scoring system can be worked out, so our awards are made on an ARRL Section basis only. Viewed in this light, W7OKV/7 in Oregon and W7s QKE, MZS and JHIX in Washington, all with over 50 contacts on 144 Mc., rate a big hand; and W6YEQ, who won the Santa Clara Valley section award with 123 contacts for 2286 points, and W6AJF, Sacramento Valley winner with 113 contacts and 2380 points, rank with the country's leaders.

There must have been plenty of activity in southern California, for W6AXK/6 worked 106 stations on 144 Mc., but his was one of but two logs received from the entire Southwestern Division. W6AXK reports that he had to explain the contest set-up to many of the fellows he worked, 28 of them Novices. How about more logs from Los Angeles and San Diego in September?

In the following tabulation, scores are listed by ARRL Divisions and Sections. Unless otherwise noted, the top scorer in each section receives a certificate award. Columns indicate the final score, the number of contacts, the section multiplier, and the bands used. A represents 50 Mc.; B, 144 Mc.; C, 220 Mc.; and D, 420 Mc. Multi-operator stations, with calls of participating operators, are shown at the end of each section tabulation.

**ATLANTIC DIVISION**

**E. Pennsylvania**

<table>
<thead>
<tr>
<th>Callsign</th>
<th>W3TDF</th>
<th>W3WF</th>
<th>W3AM</th>
<th>W3TEC</th>
<th>W3HED</th>
<th>W3VY</th>
<th>W3EDO</th>
<th>W3PMG</th>
<th>W3PFZ</th>
<th>W3PMN</th>
<th>W3MR</th>
<th>W5XY</th>
<th>W1CM/1, K1LD, LZD, MRL, NNH</th>
<th>PAIG QGQ QGQ TKG</th>
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<tbody>
<tr>
<td>Points</td>
<td>376</td>
<td>84</td>
<td>68</td>
<td>32</td>
<td>49</td>
<td>9</td>
<td>102</td>
<td>108</td>
<td>25</td>
<td>62</td>
<td>54</td>
<td>46</td>
<td>142</td>
<td>136</td>
</tr>
<tr>
<td>Multiplier</td>
<td>1026</td>
<td>85</td>
<td>12</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>8</td>
<td>8</td>
<td>9</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
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</tbody>
</table>

**S. New Jersey**

<table>
<thead>
<tr>
<th>Callsign</th>
<th>W3QED</th>
<th>W2RLV</th>
<th>W2UK</th>
<th>W2AFZ</th>
<th>W2BOA</th>
<th>W2BBD</th>
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<tbody>
<tr>
<td>Points</td>
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<td>1216</td>
<td>925</td>
<td>68</td>
<td>55</td>
<td>12</td>
</tr>
<tr>
<td>Multiplier</td>
<td>110</td>
<td>110</td>
<td>110</td>
<td>110</td>
<td>110</td>
<td>110</td>
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</table>

**Western New York**

<table>
<thead>
<tr>
<th>Callsign</th>
<th>W2BUT/3</th>
<th>W2BTV/2</th>
<th>W2BUT/2</th>
<th>W2BTV/2</th>
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<tbody>
<tr>
<td>Points</td>
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<td>198</td>
<td>198</td>
<td>198</td>
</tr>
<tr>
<td>Multiplier</td>
<td>92</td>
<td>90-15</td>
<td>90-15</td>
<td>90-15</td>
</tr>
</tbody>
</table>

Being the operator of the highest 2-meter fixed station in eastern America is not all sunshine and v.h.f. DX. Here WIPDN, Mt. Washington, N. H., tries to get his 16-element array back into some semblance of working order for the second day of the June V.H.F. Party. By nightfall there was nothing left but the boom.
And there are few home comforts on the bleak summit of Mt. Monadnock, near Jaffrey, N. H., scene of operations for W1UIZ/J in the June contest. Crew who carried gear up the rough paths; left to right: W4NBP/R, W1WID, Foster, Hazen, and operator W1UIZ. Beams for 220, 144 and 50 Mc, don't have to be elevated — there's no "ground" for at least 1000 feet straight down.

Great Lakes Division

Kewaunee

W4PCT .... 372 - 62 - 6-H
W4BAZ/AM .... 60 - 20 - 3-H

Midwest

WARMH .... 1466 - 98 - 1-R
WDXK .... 1144 - 78 - 12-ABCD

W5ULI .... 488 - 56 - 8-H
W5NHG .... 406 - 61 - 6-B
W5GNN .... 225 - 51 - 1-B
W5HPP .... 212 - 63 - 3-A
W5AVI .... 210 - 72 - 3-AB
W5RNH .... 188 - 46 - 3-H
W5RGS .... 120 - 40 - 3-H
W5ZQ .... 109 - 12 - 8-B
W5RZQ .... 109 - 13 - 8-B
W5FPR .... 96 - 22 - 6-H
W5EN .... 90 - 12 - 6-B
W5RQ .... 24 - 6 - 4-A

Wisconsin

W5FQ .... 153 - 122 - 2-ABCD
W5PJJ .... 4573 - 118 - 15-ABCD
W5SBB .... 279 - 70 - 10-B
W5BZU .... 158 - 70 - 10-B

Kansas

W5MOX .... 6 - 6 - 3-AB

Missouri

W5BYW .... 77 - 11 - 7-A
W5WEF .... 60 - 5 - 17-B
W5QMF .... 45 - 12 - 4-H

New England Division

Connecticut

W1HDO .... 4700 - 133 - 30-ABCD
W1XHL .... 1205 - 13 - 17-AB
W1HBA .... 1400 - 93 - 15-ABD
W1HIF .... 520 - 61 - 5-ABD
W1YDF/1 .... 425 - 7 - 6-H
W1ZPB .... 360 - 5 - 3-H
W1WT .... 260 - 69 - 3-AB
W1HBM .... 106 - 23 - 27-AB
W1QUD .... 186 - 58 - 6-H
W1UQY .... 180 - 5 - 17-B
W1R1M .... 184 - 63 - 6-H
W1ZPB .... 360 - 5 - 3-H
W1WJT .... 108 - 13 - 10-AB
W1YDF/2 .... 426 - 7 - 6-H
W1R1M .... 106 - 23 - 27-AB
W1QUD .... 186 - 58 - 6-H
W1UQY .... 180 - 5 - 17-B
W1R1M .... 184 - 63 - 6-H
W1WT .... 260 - 69 - 3-AB
W1HBM .... 106 - 23 - 27-AB
W1QUD .... 186 - 58 - 6-H
W1UQY .... 180 - 5 - 17-B
W1R1M .... 184 - 63 - 6-H
W1WT .... 260 - 69 - 3-AB
W1HBM .... 106 - 23 - 27-AB
W1QUD .... 186 - 58 - 6-H
W1UQY .... 180 - 5 - 17-B
W1R1M .... 184 - 63 - 6-H
W1WT .... 260 - 69 - 3-AB
W1HBM .... 106 - 23 - 27-AB
W1QUD .... 186 - 58 - 6-H
W1UQY .... 180 - 5 - 17-B
W1R1M .... 184 - 63 - 6-H
W1WT .... 260 - 69 - 3-AB
W1HBM .... 106 - 23 - 27-AB

Dakota Division

South Dakota

W4NBP .... 250 - 45 - 1-R
W4HPO .... 40 - 7 - 1-H
W4LJ .... 205 - 35 - 1-H
W4MPS .... 50 - 35 - 1-H
W4RHC .... 150 - 25 - 1-H

Dakota

W9NNQ .... 83 - 5 - 4-AB
W9ISI .... 125 - 20 - 2-H
W9QC .... 30 - 10 - 2-B
W9NNQ .... 83 - 5 - 4-AB
W9ISI .... 125 - 20 - 2-H
W9QC .... 30 - 10 - 2-B

Delta Division

Mississippi

W8C/L .... 132 - 15 - 7-BC

Tennessee

W4HII .... 200 - 30 - 1-H
W4HMM .... 50 - 10 - 2-B
W4HPO .... 40 - 7 - 1-H
W4LJ .... 205 - 35 - 1-H
W4MPS .... 50 - 35 - 1-H
W4RHC .... 150 - 25 - 1-H

September 1954
New Apparatus

**Sliding Drawer Assembly**

Much of the convenience and accessibility of commercial radio installations stems from the widespread use of slide-mounted units that make it easy to service a rack-mounted chassis from the front. In the past these slides and associated parts have usually been custom-made affairs beyond the reach of the average amateur, but that day is past. There is now available a sliding drawer assembly that can be used for supporting up to 50 pounds of gear — sufficient for anything except large power supplies. Two 1/4-inch aluminum brackets are fastened to a standard rack or cabinet, and they support the slide mechanism and a 10\(\frac{1}{2}\) X 14 X 3-inch skeleton chassis. The drawer slides in and out on ball-bearing suspensions, and a stop screw prevents the drawer from falling out of the slides and onto the operator's net corn. The support brackets and channel are finished in “gold-tone,” as is a 11-gauge aluminum plate that is available for either top (chassis) or bottom (drawer). The gold-tone finish may seem like “gilding the lily,” but it makes sense because the drawer assembly is also intended to be used as a mounting for a record player, typewriter or piece of test gear, where the chassis would be in clear view at all times. Amateur use, if it follows commercial practice, will generally include a front panel that hides the chassis.

The S.D. 1717 sliding drawer assembly and the T.P. 1718 drawer plate are made by Bud Radio.

Reports of the high-seas rescue of the five-man crew aboard raft Lehi, a “floating marine survival laboratory” en route Hawaii, received wide circulation in the nation's dailies during mid-July. The radiop phone whose diligence pinned down the source of the Lehi’s SOS was W1MPT aboard freighter Metapani.

The many friends and on-the-air acquaintances of John F. Wohlford, W4CA (ex-W5CA-3CA), will be saddened to note the appearance of his name and call in this month’s Silent Keys. An avid ever-active amateur, “Fred” was a past SCM of the Virginia Section and had been a member of ARRL continuously since 1916.

**ARRL QSL BUREAU**

The function of the ARRL QSL Bureau system is to facilitate delivery to amateurs in the United States, its possessions, and Canada of those QSL cards which arrive from amateur stations in other parts of the world. Its operation is made possible by a volunteer manager 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 4 1/4 by 9 1/2 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. For a list of overseas bureaus see p. 59, June 1954 QST — also p. 63 of this issue.

W1, K1 — J. R. Baker, Jr., W1DDJ, Box 232, Ipswich, Mass.
W2, K2 — H. W. Tahed, W2SN, Lake Ave., Belmatea, N. J.
W4, K4 — Thomas M. Moss, W4HYW, Box 644, Municipal Airport Branch, Atlanta, Ga.
W5, K5 — Oren B. Gambill, W5WL, 2514 N. Garrison, Tulsa 6, Okla.
W6, K6 — Horace R. Greer, W6TI, 414 Fairmount St., Oakland, Calif.
W7, K7 — Mary Ann Tatro, W7FWR, 513 N. Central, Olympia, Wash.
W8, K8 — Walter E. Musgrave, W8NGW, 1294 E. 188th St., Cleveland 10, Ohio.
W9, K9 — John F. Schneider, W9CFT, 311 W. Ross Ave., Wauau, Wis.
W0, K0 — Alva A. Smith, W0DMA, 28 East Main St., Caledonia, Miss.
VE1 — L. J. Fader, VE1FQ, 125 Henry St., Halifax, N. S.
VE2 — Austin A. W. Smith, VE2UW, 6164 Jeanne Mance, Montreal 8, Que.
VE3 — W. Bert Knowles, VE3QO, Lanark, Ont.
VE4 — Len Giff, VE4LH, 206 Butland St., St. James, Man.
VE5 — Fred Ward, VE5OP, 609 Convall Ave., Moose Jaw, Sask.
VE6 — W. R. Savage, VE6EO, 329 16th St., 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 — Kenneth Ash, VOA1, P. O. Box 8, St. John's, Newfound-

K4 — E. W. Mayer, K4KHD, Box 1001, San Juan, P. R.
K1B — Andy H. Fuchikami, K10B, 2543 Nanauk Dr., Honolulu, T. H.
KZ5 — Gilbert G. Foster, KZ5GF, Box 407, Balboa, C. Z.
Correspondence From Members

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

WAIT'LL NEXT YEAR!

Box 611
Craig, Colo.

Editor, QST:
I was a scavenger, a ignoramus and a kid to the amateur fraternity, particularly during the recent Field Day contest. I was dropped like a red-hot poker when I advised the other fellow that I wasn't in the contest (for which I blame no one — they wanted scores).

Having just procured my ticket not too many moons ago, I wasn't familiar with any phases of the contest. (Sure, I take QST and read all about it, and then forget about it.) I guess the only way to correct this deplorable situation is to get in the middle of the next contest and make as big a noise as anyone else. Were all the gang contestants except me?

Irv H. Miller, W9WQC

[Everton's Note: Stations “in the field” on Field Day may make contact with any other station for points. It is not necessary to be portable to give credit to a portable station for a contact. Just give him his report and your section.]

HELPING HAND NEEDED

6 Roosevelt Ave.
Springfield, Mass.

Editor, QST:
This afternoon I had a most interesting and enjoyable QSO. I was talking with K2BER, a blind ham who lives in Northport, L. I., N. Y.

Art operates mostly in the 80-meter Novice band, taking a personal interest in beginners. He gets a great deal of pleasure out of ham radio. However, Art needs the help of some local hams.

It seems that his handicap presents a problem to him. He told me, “I have no one to fill out my QSL cards — not even the Boy Scouts! I worry about it day and night.”

Art also has BCT problems. After working him for about an hour and a half he said, “I must QST again — I have BCT. Mother wants to hear on the air now.”

Here is a fellow-ham who is in need of some aid. I am sure that Art would appreciate receiving some help on his problems. Let’s show him the real spirit of amateur radio and give him a helping hand.

— Robert Hedin, WN1AIX

ECLIPSE EFFECT

Rhodes University
 Grahamstown, C. P.
 South Africa

Editor, QST:
... An annular eclipse of the sun is to take place here on December 25, 1954 (Christmas Day). Our Physics Department will be making a study of the effect this eclipse will have on the ionosphere, while at the same time, through the medium of amateur radio, it is hoped to study the effect of the eclipse on long-distance radio communication.

It is hoped, should the support of the radio amateurs of the world warrant it, to have transmitters running continuously (call sign Z62RU) during the eclipse period in the 7-, 14- and 21-Mc. bands.

To perform this experiment the help of many amateurs and short-wave listeners will be required, and all who are willing to cooperate are asked to contact me, c/o the above address before October 1st so that full information may be forwarded to them personally. Listeners are especially wanted from the Southern States, Central and South America, West Indies and Far East. The information to be forwarded will consist of report sheets which cooperating persons will be asked to fill in, giving details of the signal strength of our transmissions at various intervals during the eclipse. At the same time details of transmitting times and frequencies will also be sent.

— A. P. Dale, ZE4JC, Z53JW
Ionosphere Research Lab

REGEN B.F.O.

R.F.D. No. 1
Terryville, Conn.

Editor, QST:
The use of regenerative receivers as preselectors has been described on the “Correspondence” pages; however, they have another use. The procedure described here will convert an old broadcast short-wave receiver into a fairly-useful code receiver. It adds a b.f.o., so to speak, to the receiver without one.

An insulated wire from the regenerative receiver antenna post is wrapped around the b.w. receiver antennas and a code station is tuned in on an s.w. receiver. The regenerative receiver is then tuned to the same frequency (easy to tell by the increase in the s.w. receiver gain) and the best note is adjusted to the desired tone. Simple, eh?

— Joel Anderson, W1YZY

QRO TRANSMITTER

38 Forest Avenue
Saratoga Springs, N. Y.

Editor, QST:
Less than a month ago I completed the simple single-tube transmitter described in How to Become a Radio Amateur. So far I have worked about 10 states, with reports that are sometimes as good as those from stations running 60 watts. Transmitting on 80 meters only, I have worked up to 200 miles during the day.

Incidentally, I changed the circuit slightly by taking out the tri-tet coil and condenser — Lt and Ct — and am using a 6F6 oscillator. Keep up the good work.

— Bob Goldberg, KN4HPC

TECHNICIAN SPEAKS

1324 Atlanta Rd.
Marietta, Georgia

Editor, QST:
My complaint is a common one of the Technician grade amateur. I recently joined a local ham club with the hope of meeting someone interested in 220 Mc. and above. The list of sarcastic remarks runs like this:

“Why don’t you get your General Class license and be a real ham?”

“Listening to your grid-dipper must be exciting.”

“How is the QRM on 15 meters these days?”

“Technicians are not operators — they are tinkerers.”

After a while, this form of kidding gets old. If I was to find a interested party on 220 I certainly would not bring him to the club to get the same cold shoulder. While I point this out in the club, it is common to many General Class hams.

Of course we tinker. You cannot go downtown and buy a transmitter and receiver for 220 Mc. as the real hams do. Given 6 months, I wonder how many of these real hams could put on 100 watts free of TVI and build their own superhet for 220 Mc.

These same people are the traditional critics about a.b.d., the kloniitc, the knobby monster, the mobile operators, the Novices, and all the other hams that don’t conform to their standards.

We don’t want pity; you have more people on the lower bands than you can stand. Just stop discouraging the ambition to become Technicians and we may not have to listen to our grid-dippers. I have become so bitter now that you could give me a General Class license.

— George Hann, WA4BUK

September 1954
How's DX?  
CONDUCED BY ROD NEWKIRK,* WIVMW

How:

Doubtless you noted that an abandoned wartime landing craft played an important part in helping the F08AJ gang make good at Clipperton in April. 1 The best-up beached LST served as an invaluable breakwater and jetty during that DXpedition's debarking and embarking operations. However, although various theories were available, none seemed to know for sure how the craft got there in the first place. Now W1ADW, ARRL ORS and EC up Massachusetts way, comes through with information on the subject in a letter that reads the best of C. S. Forester. Joe won't forget that LST for quite a while because he was there when she piled up.

LST 563's running around was only one of the many difficulties to beset the naval expedition that installed an aerology and radio station on Clipperton in December of 1944. While the full story evidently is not a matter of public record, it is no secret that casualties attended personnel and equipment. Lt. Cmdr. W1TU (now also W4TR) and CRE W1ADW most probably were the first hams to set foot on Old Clip and also the first hams to operate radio gear on the atoll. They succeeded in firing up NPG30 on 4, 8 and 12 Mc. with a navy TCK rig, HQ-120 receiver and a Vee oriented toward San Francisco.

. . . . There were plenty of navy RMs around but neither of us had had any operating for four years and we really had a postman's holiday," reminisces W1ADW.

As for the actual grounding of LST 563, W1ADW states: "[We were guided] to a spot where there seemed to be a hole in the reef and we came in, dropping our stern anchor so that we could pull ourselves off. The anchor did not hit bottom because of very deep water beyond the reef edge. We slowly and helplessly broached in the heavy surf."

And then the fun began in earnest, "I'll never forget that Christmas Day, for I was washed off the pontoons eight times and each time I lost hide."

W0NWX and party, with the grit and determination they exhibited, undoubtedly would have won the island LST or no LST. But that derelict hulk did come in mighty handy, all thanks to this "DXpedition" a decade earlier.

---

With regard to the ARRL DXCC Countries List, the term "rare DX" long has been a pet proposition for polemics. Just what countries are rare and what countries make up the common garden varieties? Joker Joe, with over 200 confirmed, has his tongue hanging out for an EA9 contact; Seedy Sam, with only 93 in the bag, has worked three EA9s and would prefer not to be bothered by any more. Obviously, any discussion between Joe and Sam as to whether EA9s are rare is a waste of time — it's purely relative.

On the other hand, the adjective rarest readily lends itself to quantitative handling and analysis. How? Let's try it. Countries still unworked postwar by stations listed in the c.w.-"phone DXCC Honor Roll (p. 61) must be difficult to come by. Thus, if we ascertain which countries are most needed by this group of DX sharphunters we will have established beyond much doubt what constitutes "rarest DX."

Here is a tabulation in which are listed various Countries List items followed by figures that indicate how many of the top 22 DXCCers still hadn't confirmed them, to our knowledge, as of July 15th:

<table>
<thead>
<tr>
<th>Country</th>
<th>Rarest</th>
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<td>Albania</td>
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<td>Ana (Portuguese India)</td>
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<td>Andaman &amp; Nicobar Islands</td>
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<tr>
<td>Georgia</td>
<td>13</td>
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</tbody>
</table>

That's the way it goes. And now you know where you can go to get that super-duper DXpedition you've been dreaming about. Remember, however, that French Indo-China, Republic of Indonesia, Iran, Korea and Thailand still are on the taboo list (p. 56, June QST). Good luck, OM — FSE QSL!
What:

In the text to follow, frequencies (given in number of kc. above the broadcast), which are in parenthesis, are in parenthesis. Times, without parentheses, are broadcast times. Times are for Eastern time, unless otherwise specified. The following is a list of frequencies that are broadcast daily:

- 2.70B 1130
- 2.70B 1300
- 2.70B 1500
- 2.70B 1700
- 2.70B 1900
- 2.70B 2100
- 2.70B 2300

Twenty c.w. first of all. Among fitting commemorations of Admiral Pole’s 70th birthday this year, 2G20 continued his Asian journey under alias VS2RO, VS4RO, VS6RO and VS7RO. He reached all of the radio stations to which he addressed a message. W8YIN took the measure of FOAS (45) 6 GMT, JK6AJ (50) 6-7, KRE4A (50) 13, KX6A9 (50) 9, a V6K V93A (52-84) 3-6, V65CT (53-13) 13 and heard AC4NC (29-30) 1-2. Mine was caught up with, ZA6X (29-32) 1-2. "EA9DF of Ugo de Oro (58) 13 GMT, HAT07 (61), JA1FA (81), K2AZZ (95), KRC6OS (53), LOD5AV (29-32), ZD4PZ (45) 18, a ZC6, 43XI FQ (25), FS (16) and 9SAD (90) brought in, and with no evidence of FSB4AE (84), VKORH of Norfolk (40) 12 on the west path, VB2 25-18, 6A2Y 25, VS4R 25-28 and YJ1AA (58)

- Bearing down on the 100-mark, W4YDT raised AG2DX (39) 20, CR6OS (65), CT3AB (15) 0-1, DULAP (70), FBFAP (5) 14, HKT2R (24-25) 24, IS1CXP (55) 22, ITITAI (40) 21, J6A0 (60), ODSJL (30-0) 9-17 21 and 24FXF (56) 6-8. W6HIN ran across LUBDWW (35) “in the Mediterranean area and SUI1B, VS24B, VR2N and LSSB”.

- FOAS 80K, PX 140P 6, HAT4P 15, ZJEKF 22, S8S 1FS 1, 4W8A 21, V5Y1N (38) 6 and 8X7G (58) 8 made 111/100 for W6WGB. Bill is one who has no difficulty collecting FOAS, 9SAD and FSB4AE. W6WGB made land with K2Z2I (9-5) 4-5, K2S 2US4A (33), GMF 72 (95-12) 15, TAZ2E (45-20) 80, YIZAM (45-74) 2, ZP5AY (15-96) 23 and 9SAD (65), all times GMT. KL7P1 was among the fortunate to catch 2G20 in Brunei and Sarawak. W2WZ, on the other hand, with no band, ZB2WZ came to grips with AFQX (60) 19 GMT, CROAH (50-82) 13-14, DUKC8 (51) 13, 5LYI (85) 20, KAB1J (52) 12, KJ6AF (53) 5, SV2RI (50) 21 of Rhodes, V5CCL (53-13) 13 - ZE7DORF (58) 13. Among the many modified by 6WWU, we find CE6AD (6) 20 GMT, CTZOHO (27) 18, DSTYSV (72) 7, EASAP (10) 17, a couple of FA boys, IS1A8K (10) 26, STZNG (26) 21, TFSSV (25) 8, VQ4EC (26) 8, ZBLAVV (29) 5 and 52AFA (51) 17. Johny is in deep use of ZKEB1G and W5ZDJ/5J6 confirmations.

- W6UD, 14 breaks into the DX racket with K2Z2S E8C (4), P2JAR 9, an FOS and a KX6.

- A quick tour of the equipment was the main ingredient of the following 14-16, e.w. luck here and there, at WV1F W8AE 66 (46) 10 GMT, BLX2 (48) 13, MF2AG, Q3V80, 3V8AN, K3APQ, LBZSB, LK1K2P, VKIAC (20) 1 GMT of Macau, QV4CG, V51Q (20) 0, W3ZFA, YQIY1D, Q3V1Y, Q5VWW, K34R3B, KX8Q (23) 11, KTH2E, KJQ9S (worked) 12, J4CS 3A5 10 SAR 6ADC TP, K2S 1TQ DXD SAB 9GF (heard), W4TLM an FOS and ZB. W8YDT: ZQ4CA (55), 43FXF (70); missed Z6DAB (68) 11 GMT, WTQYD: CNZ2A (71), BLZ29 (22) GMT, ZE7DORF (63), Z6C28 (15), ZC6CK9 (39), ZDZDPC (32), 9SADAB (38), W4TICZ: HC1KID, K4D4R, W6TVRE: FMWTP (38), L1BNU/Trieste (25) 18 CST, J6AN1 AN, K1BAF (15), ZDZDPC (32), ZK2AB (29) 8-9, 43QX7D, V4W2Q, Q2AA2 (17), CX5CO, HK1B2, HPIA2, KG8s AN AO, KV4BD, PJZs AD A1, YV5A6, KG6T8B 1; a CT2, KG4AE, KG4A, OX3s HK, URH, a TA3, a ZC4, W6PQL: LZ1KD (20) 22 GMT, TASMFP (25) 21-4, VR43Q of Heard, W8NY: one YQ1IA 60, “Futaba Island.” W5PNE: K2s 2CR (10) 23 CST, Z7Y 55 (10), a KRB 6.

- In one hour and 25 minutes, 14AZC (ex-W4KE) rattled off QSOs with an LUS, MP45BE, an ST2, VZ6V (40) 2 GMT, 43KZ2K, a W6, W3CQ, DUNCI, YUVI, a JA4, a J6, DUC14T, O8PI and GOSP. This encompasses a fast WAC. Lloyd made a 39-minute WAC as JA2KE in 1949. .. A 83A at 700 watts captured CP8CA, FBFAX of the Kerguelens, FSKAG, EG1CPF, HIJDR, JA4AQG, KG6A4Y, KX6G9Y, KG6H9I (55) 6 GMT, LUIX2, MP4BBK, QSCQP, 4XZNB, PJEAE, SPA3K, TAZA 32 (9) 4, TSFSQ, TG4AC, VK160K of T.W.G., VPs 2MD ZAQ, VQs 2AB SD2, VRAS 3 (7) 6, VQ5I F2 2D WC6, VQ5I UWP (5) 14, YV5VI, PB1 20 (45), ZA2XRC and 43L7F 14 for sedulous W4QPM.

- These 20-meter o.m. items are established as active, or inactively active, by the radar-cared West Gulf DX Club gang: CN3s 24 (10) 22 GMT, AX201 1, CPE4K (20) 15, 3FMJ 1, CR45F 70, DUSC IVY 12, LEPI 2 (4) 13, FFBs BC BE BG CG, FFBs AB 110 5, AL
Princess Abdul Feizal, HZ1AF, another member of hammond's royalty, pays a visit to Captain Kurt Carles's W2XZM/MM hamshack aboard Flying Enterprise II during one of Kurt's recent Middle Eastern voyages.

rumbler at his Leesburg, Va., QTH. fifteenth. VK0RH of
Norfolk was 7-Me. country No. 112 for W2QHI.
A flock of VKA, F8A0A (30) who is fast with QSLs, and
VP8/MS worked W4YTD's Viking II. fifteen. W5WQ
awaits QSLs from 7-megetters HD8UQ, HC1LE, KC4AN,
KM6AX, LU2ZI and VP3YG. In fact Dave already has
the KM6 confirmed. In W7JUL's 40-meter log we note
JZ4A (30) and ZM6AR (25) who hopes to be a Tokodas
ZM7 worth next March. An input of 3.75 watts
rated KH6ANL for KAZ6K/3. W5WPG did drat a
job on D7UC, an F8S, HK7HE, an H8C, SP4KJ, a VP2,
VP8AZ, ZY3AM at 22 EDT, YU7A AD AKL and ZD4BQ.
An HT-18 at 4 watts is a 20-foot-high junk of wire
hauled in stuff like HB1MQ, KB6AS, PJA2R, an SP9
and YV6FH for K2DGT. Bob evidently is in
on a few 7-Me. trade secrets of his friend W2RDK! The latter is
receiving a pair of 10s for 40-meter antemnal battles
... of AK1. He's almost a very, W2YQ, recently confirmed his
100ths 7-Me. country. Now-
... a glimpse of luck on 40 at this shack and that shack. At
W7, APA: DL4IQ, VK7DJ (both A3), W7WJ: K4GAN,
K4IAS, VP3TG, VN12S: VP3, LG6AE/PA and Che.
W5DLI: a Heard VK1. Norfolk VK9, W2ARR, sends
of vks, Zs, W7YEC, Europeans and Oceanians in abundance.
W3WTA / K6G: KG4PT, KG4SB, W6GQ8: a KM6,
POLACE, W7BPLF: H8DDL, H8BOK, T6IIZ (ex-
CP1BXI) YV5FL and Oceana DX-a-plenty.

Eighty pleasantly surprised those who hunk on through summer intrusions of atmospheres. E4 (30) and 8AZ chatted with W4YTC, FASBG (5) was a guttaway,
as were S3MAQW and VP8AQ. ... W5PNE managed
PV9F (18) 0 CST and YSVE 23-9. Brian later got
to 100 and worked the YSVE chase. So seven nights
caused a G, an EI and a VP8 for W1NNH.
Midsummer static hardly daunts K2B7T. Hayden worked
D1AE AK OG, an EI8, G3s in quantity, P6AE GIN XYZ,
SM7CVD (40) on QSL and others rig up through the stuff.
Heard by K2B7T: OK1GZ, P65 SKE 6AX and others.
V3RA emplaced West Coast 3.5-Mc. adherents through
the summer but Easterns had great difficulty flagging
Rays down.

This is scanned last month, but less "lotz" than ever.
European-US. paths continued to open spasmodically
during the hot months just past and Europeans were heard
or worked by stations in several U.S. call areas. W1NQM,
W5NRE, enthusiastic par excellence, lets us scanner know
through this assemblage of recent 10-meter workings here
and there. At WVGOU: VP91. WVFC1: VP9. BK
L7. I3MO: a VP9, W3WYD. YO4. W2JUQ: GM8IN,
W3WYD: K7SOI. WV6DO. W2JUQ: J56 IN. YO4. W2JUQ:
CX1GG, VP4FR. 4H7TM: YO4. V08, a VP9. 6J7CH:
W4YTS: KH6AFS. W3TJQ: CE2HIJ. KY4DUU.
W8QJF: CBAW, a KH6, VK4, and G2DM. LU4AAT:
CTICWZ, ZAW 4CX. 47CJS. 88D: 1011, J56 IN. PAMMN,
VE1A: LX1EBI. ... GW. JW. GA. ZM. 10-Meter
report-dates are reported available on 10, as well as KG6JIF. The
upcoming LABRE affair, 'phone section, undoubtedly will
hook up the band - dust off your 28-Mc. helices and have
at it!

Where:
Your attention is called to a listing of several overseas
society QSL bureau revisions appearing in "IARU News" this
issue. With DX conditions ready for the
resound your local QSL Bureau with your requests for
increasing volume of postcards. We had better mention the
business of US., and Canadian amateurs sending DX-
destined cards to ARRL HQ, for relay overseas, which is not
a function of the QSL bureau is designed to operate in
such and unusual circumstances wherein certain DX stations
have requested and have been granted such facilities, these
incorately routed QSLs must be returned to senders. The
excepted instances invariably are called to your attention in
this "Where" section. When in serious doubt about where
to send cards, you're welcome to drop a line to Joevee for a
suggestion or two, but please don't send them the QSLs
that have been made up. The VP6 who specified "QSL as
via W1JEL" is not known to W1JEL — save your postage.
W2KNZ has the VK0TY log for the period from Dec. 19, 1952, to
May 2, 1954. If you still need Alan's postcard send a
re-updated schedule and a verifiable envelope accompanied by QSO
particulars to W2KNZ. Frank adds he has
... about fifty J2SKF QSLs and the rest [are supposed to have]
been mailed from T.N.G. It now appears that some of the
matter sent went astray and W2KZM is checking on the
matter. The Call Book is not necessarily in error when we
run addresses that differ somewhat from those listed for the
same stations in W4TLD's directory. Overseas
DXers often take bank numbers, etc., to expedite collection
of QSLs while their residant or station addresses continue
valid. Anyway, the following items attest to the penmanship
and good will of Ws HDY UDE WPO YTM ZDP,
W6 BYS HAZ HSH SIC WZ, W6 L5Z VXD. YW4TLD. YW4TLD.
W6 ALQ and ZD7ZZ. ZD7ZZ, W3WYD. VP3TG,
Leyto Waite (Nernland) and the WGCX DX Bulletin.
AP2C, Commandant, PMEO Regimental Center, Questa
... AP2C, QSL. 124 Garwood Road, Quetta,
Canada. CR4CA: QSL via W2ZOS. ... D1UCY,
C, Vieira, P.O. Box 815, California, Lagunas, P. I.
... F8AAY, J. P. Dentan, Oued-Amizour (Constantine),
Algeria. ... GB3NCB (QSL via R8G8). ... HB1MX,
HE QSL to HS1DX. ... EC8FS, Charles C. Fuller,
Box 328, Quin, Ecuador, RR7F, Embassy, Quito,
Ecuador. ... HR1FM, P. O. Box 413, Tegucigalpa,
Honduras. ... HR1LW, L. O. Williams, P.O.
99, Tegucigalpa, Honduras. ... HR1OS (QSL to
HR4OS). ... RSAC, Alfonso Corbo, P.O. Box 209,
Bogotd, Italian Somaliland. ... K4AMA, MW57-17,
FMAW, c/o FPO, San Francisco, Calif. ... K4AB
(QSL to W4QCW). ... ex-K5A4V, John W. Celihe,
6419 Aerie Rd., El Paso, Texas ... K50BG, Eugene M.
This venerable layout in Paecon, N. Z., is the trusty means by which ZL1CI raps out the 3.5-Mc. signal so regularly worked and heard throughout the world. Those are 801As in the final. (Photo via H 1YVC)

Owens, c/o CAAL, Wake Island .... K8WE, Charles R. Whitleff, c/o CAAC, Wake Island .... K8WEI, James M. Russ, c/o PAA, Wake Island .... KW6AS, Dale Scherniker, Marshall Islands .... ex-K2ZLS-K6EAR, Ivan C. Lundblom, 3501 NW 12th St., Miami 35, Fla. .... L1JF, c/o Sern School of Navigation, Bergen, Norway. .... L3F, Sue, Suez Canal Zone .... M5DRM, Ismailia, Suez Canal Zone .... MP2AL (QSL via R5GB) .... MP4BAR, C. M. Wetherell, IAL, Muhrag, Bahrain, Persian Gulf .... MP4BAV, R. Fuqua, c/o Kuwait Oil Co., Ltd., Kuwait, Persian Gulf .... MP4BBQ, B. A. Lovevitch, IAL, Muhrag, Bahrain, Persian Gulf .... MP4BBH, R. T. Green, IAL, Muhrag, Bahrain, Persian Gulf .... MP4QAB, J. Seitan, Qatar Petroleum Co., Ltd., Qatar, Persian Gulf .... OD5CQ (QSL via OD5LX) .... OD5LQ (QSL via OD5LX) .... PJ2QO (QSL via PJ3QAA) .... PJ2JAR, W. Hahn, Post 720, Lago Colony, Aruba, N. W. I. .... SP15J, Z. Kachicki, Poznan, Kazakhstan 4, Poland .... ST2NG (QSL via R5GB) .... SW1WP, Cretie (QSL via G5HLS) .... VK1BA, B. A. Fleiba (QSL via W1A) .... VK1KL, R. Fraser (QSL via W1A) .... VK9AU, Roy Taylor, Wewak, T. N. G. .... X6HAND (QSL to W9AND) .... Y12FD, F. O. Dahlen, Flying Wing, Officers Ares, RAF, Habbaniya, M5AF 19, Iraq .... Y13QW (QSL to G3WJD) .... ZB1AUV, 35/2 Inguanese St., Rabat, Malta .... ZC6G (ex-ZD2G), P. O. Box 401, Jeselton, British North Borneo) .... ZC6JD (QSL via R8GB) .... ZD3BFC, Civil Airport, Bathurst, Gambier, .... ZD4BM, B. A. Wibram, P. O. Box 260, Takoradi, Gold Coast .... 457NS, S. Nettleton, QPO Box 985, Colombo, Ceylon .... 5A7FA, A. G. Gerke, Burns, Box 110, Soledad, Calif., APO 231, c/o Postmaster, New York, N. Y.

Whence
After "I’ll keep T3AAs on for six more months, at least," avow W2ZTK, Lee is hard at work filling departed W1VQG’s shoes as T3AA’s chief op. Other bona fide Turkish stations include T3AAs AF AP MT and T2ZFA. W1VQG thinks you’ll have much difficulty confirming QSOs with other TAs even if they are in Turkey. AP2C has been radiating since March with a 90-watter to the tune of 40 countries on 20 meters. A ground-plane and RO-3542 are in use.... W6CRV of the USAF hopes to be signing his call sign shortly .... As noted by KL7PI, AC4CN schedules VU2ARC1 several days per week, phone on 14,120 kc. .... W5YY finds that KAs now operate 14,100-14,300 kc., phone.

After a two-year Bonsaland three-letter calls are getting around. 5A4CD fills a dipole with 100 watts of r.f. from a VFO-807-807a arrangement, receiving with an AR-88D .... W5WDI now signs CN5B5 with enthusiastic celerity. .... Ex-891MP lately is heard with a healthy 21-Mc. phone signal under the Arizona call VESGVD/W7 .... W5AYS has word that the ZDS ham population may be augmented in the near future. .... Listener BRS-125S7 corrects our labeling of WQ2W’s "transmitter" in the June column, pointing out that the unit alluded to in the photo caption actually is a British army-eur-pa 10-tube superhet receiver .... Z58MK is off to QV3 digizons. Z5DBFC is ex-MD2RF-CQ6BFC .... The WGD6CX crew comments on the scheduled venture to Fiji this month by efectuos EAKS DD DDD and DFI while W9YX has ZDB6C’s Cumbria timetable of 1600-1800 daily, GMT, using A1 and A3 on 14,050 kc. .... F88HC is another Madagaskarian reported active. .... The ZD8 and ZD7 entries lately reported active do not appear to check out.

The DXCC (New Zealand) award is now available on a worldwide basis. WAB is based on the confirmation of 30 or more DXCC-list countries in the Oceania continental area, with WAZL requiring the confirmation of QSOs with at least 33 of the 51 NZART New Zealand Branch areas. Write concerning both awards to New Zealand Assn., of Radio Transmitters Awards Manager, Box 480, Wellington, N. Z. October’s VK/IZ Test, a DX operating event of long standing, will be an excellent opportunity to build up muscle for WAZL prospects .... Electronics-minded 17-year-old Andre V. Ludjono, Marekaya 129, Macassar, Indonesia, desires to correspond with young U. S. hams or overseas hams. .... Ex-VK2ABE now signs VK3ABU in Wewak, T. N. G. .... KL7PI’s QSL to K6FYA bounced like a rubber sphere. Joe deploys the chain-zang system employed by several groups in sifting away the rare ones, a "you hold him while I hit him" technique .... From the pen of ZM1AS (ex-ZL1AJJ): "I will be here for about two more years and will be active later on all bands, c.w. and phone. Lee has two ARCSes and an English March meeting as an inhaler.... ZJ2KF Netherlands New Guinea operation, we see the in the SCODX Bulletin, is now but a most pleasant memory. (Continued on next page)

**DXCC CENTURY CLUB AWARDS**

<table>
<thead>
<tr>
<th>HONOR ROLL</th>
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<tbody>
<tr>
<td>W1FHW</td>
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<tr>
<td>W1SGH</td>
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<tr>
<td>W9M6C</td>
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<tr>
<td>W9YCO</td>
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<td>W93PA</td>
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<tr>
<td>W9EY</td>
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<tr>
<td>W9T3I</td>
</tr>
<tr>
<td>W93PB</td>
</tr>
</tbody>
</table>

**RADIOELECTRICAL**

| PK2VE | 222 | N1M1C | 216 | W1MV | 215 |
| W1FWE | 221 | W9HWH | 214 | W1MCO | 213 |
| W93PR | 221 | W1UQ | 212 | W9U1 | 210 |
| Z58BW | 216 | W8MEK | 210 |
| Z58KP | 207 |

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

**NEW MEMBERS**

| SM7AND | 129 | W57UF | 104 | W57MTA | 101 |
| SM7AYA | 129 | W57G | 104 | W57TMA | 101 |
| OH1DP | 114 | OHIOH | 104 | W4K8N | 100 |
| W9B2X | 112 | W9G9Q | 100 |
| OH1V | 111 | OH1Q | 100 |
| ZL4AV | 102 |

**RADIOELECTRICAL**

| Z58BN | 190 | W5AYF | 104 | W5W3B | 100 |
| L2GBF | 119 | W5AFW | 100 |

**ENDOCS**

| W9BD | 219 | H9B5M | 153 | W5JMT | 134 |
| W1A2X | 209 | W1E2W | 153 | W1Y7VU | 134 |
| W92W | 207 | W97I | 152 | W96TVV | 131 |
| W93FG | 181 | W9T7L | 146 | W76F | 130 |
| W95EY | 172 | W9AF | 128 | W955E | 128 |
| W93OT | 162 | W9I3R | 120 | W93AS | 120 |
| W93NS | 160 | W9U4N | 140 | W6UPF | 121 |

**RADIOELECTRICAL**

| Z586Q | 160 | W5AYF | 104 | W5UW | 100 |
| W5AGD | 117 | W8K5Y | 100 |

**CALL AREA LEADERS**

| W8M1S | 230 | W76AMX | 237 | VE4KO | 230 |
| W8RSL | 234 |

**September 1954**

11
Europe — Don’t let those "GB" calls untrack you. GB3SFS is the call of a 3.6-, 7- and 14-Mc. exhibition station that was operated in late August by the South Shields & District Amateur Radio Club in conjunction with the annual South Shields, England, Flower Show. And here’s another GB coming up: GB8NCB will be in operation at the RSGB National Convention, Bristol, Sept. 17th through 19th. "Transmissions will be confined to the 1.8-, 3.5- and 14-Mc. bands and operation will be mainly on telephony. . . . The maximum power that our regulations will permit will be used, 10 watts on 1.8 Mc. and 150 watts on the other bands," writes G8RQ, convention committee secretary.

GB3SFS and GB8NCB guarantee interesting QSLs for all stations contacted.

We understand L6s KAB KDP KBN KPF KSA KSI, L7s KAC KHM and K5K to be additional legitimate Bulgarian call signs now active. . . . From 7 Mc. upward, frequencies available to Teleote A02s closely parallel our own. But they have no 160-meter bands and have a typical European split 90-meter allocation: 3500-3625 and 3685-3800 kc. Maximum permitted input power is 600 watts. A32AA writes that antennas must be put up with considerable care at his location because of 120-m.p.h. winds prevalent in February... . . . H80AX tells W28HC he’ll be operating HB1MX/HE in Liege during the first two weeks of this month with a 15-watter on 10, 20 and 40. A1 and A2. . . . W2DDP sailed for the Mediterranean on the 20th and found W2YW’s holding forth in the radio shack. W2DPP subsequently enjoyed a pleasant visit with D/Xer E47CP of Berlin, . . . Two IARCs should be enclosed when writing for QSLs on the 02-GBs DX award (w6, 57-58, June QST) . . . . As of June 26th, W2s QHH W2 RXA and DK7 are the only U. S. A. holders of US6A (Switzerland) H-22 awards. HB9CZ fills us in on results of the March Helafrica-22 DX contest: U. S. scores from the top down are W2WZ 1740, W2DFF 1020, W4EP 284, W28AW 72, W2WC 30 and W3AYS 12. High non-Swiss European scorrer was DL3EV with 5094, and the highest non-European tally was turned in by FAHDA (5779). The winning Swiss entrants were acknowledged under HB4KBE/ U7’s photo last month. . . . News via W8EV will strike responsive chords among the hardened airmen of DT Xers, ex-02A9H, Archduke Anton of Habsburg, was worked as OESAH by Ben in late June. The story of OESAH, the 1938 ARRL DX Test, and the German-Austrian "Anachronism," stands among the highlights of DX history (see p. 26, June 1938 QST) . . . . DL4TH (W5QXH) radio engineer for USIA in Munich, returned Stateside for a well-deserved leave. . . . From friend LA6QB, NRRL (Norway) secretary: "I8SBY, formerly on Jan Mayen, now on it at Myggeneset, Greenland. . . . He has taken with him 16 pounds of [LB8YR] QSLs and hopes to manage to write them there." Concerning LA7UE and Bjorneland Island, LA6QB adds, "He didn’t get the crystals he needed and therefore was not able to go on the air." However, watch for LA7UE activity from the island of Svalbard in short order. . . . F8FW/FC (HB9LA, QSL via USIA) passed out Cordesia QSLs on several bands in early August.

Hereabouts — F8PA (K3CR) worked approximately one hundred St. Pierre seekers during July, using 40 meters only. Jack, who has visited F8S-land each summer for several years now, finally hooked his first W7 and ZL from the place. St. Pierre authorities still welcome visiting U. S. hams . . . . VPT3N describes VPT3L as an interloper and cards received for him at the Bahamas QSL bureau cannot be delivered. . . . "Since I was the last ham at Swan Island, and our government station has been desactivated and personnel removed, I am anxious to send cards to all who [deserve] them," writes ex-K84AV-W4MNXE. Swan should be a toughie from now on — check John’s new address in "Where." W1DXCC Club meeting will be held Saturday, Sept. 16th, at the Sheraton Hotel, Chicago. States meeting chairman W9FEC: "Registration will start at 2:30 p.m. and a turkey dinner will be served at 6:30. Reservations can be mailed to W1s FK4 FID GRY or ABA, and a payment of five dollars will cover everything." Act now so that arrangements can be facilitated — non-W1s also are welcome. . . . We regret to note in Silent Keys the passing of diligent D/Xer W2JQK, DXCC member with 250 confirmed.
JUNE CALENDAR

In the June Calendar of the International Amateur Radio Union is a brief summary of the first IARU Region I Conference, held at Lausanne, Switzerland, in May, 1953.

One of the recommendations of the conference led to a current proposal, by the Radio Society of Great Britain, that a three-digit RSM report be used in place of the present two-digit RS code for 'phone work. The third letter would stand for modulation quality and would comprise the following steps:

    M-1 — unintelligible modulation.
    M-2 — defective modulation due to spurious or parasitic oscillations or to causes unknown.
    M-3 — defective modulation due to frequency modulation of the carrier.
    M-4 — defective modulation due to overmodulation.
    M-5 — good modulation, not exceeding 100%.

New regulations governing amateurs in Ecuador, Denmark, Britain, Argentina, Paraguay, and Austria are briefly described. For the most part, the changes were favorable and were the result of considerable effort on the part of national societies.

Mention is made of the excellent documentary "Kanaal 3700" which was published by the Vereniging voor Experimenteel Radio Onderzoek in Nederland, reporting on emergency communications activities in the Netherlands during the 1953 European floods.

Another current proposal is that of the Headquarters concerning reinstatement of the Japanese Amateur Radio League as a member-society of the Union.

PHILIPPINES

Philippine amateurs are now permitted to communicate with amateurs in the USA, For- mosa, Cuba, Dominican Republic, Ecuador, France, Greece, India, Indonesia, Italy, Pakistan, Spain, Thailand, and Turkey. Further relaxation by the Magsaysay government of the restrictions is expected in the near future, the Philippine Amateur Radio Association reports.

WAC BOUNDARY CHANGE

Socotra, an island about 150 miles off the eastern point of Africa, has been listed under the continent of Africa for the WAC award, while it has been counted as an Asian country for the WBE award. Since it is governed by the British Protectorate of Aden, on the southern coast of Arabia, at the request of the Radio Society of Great Britain a slight change in the continental boundary is being made to include Socotra as part of Asia. The boundary then be described as "... Cape Guardafui just South of Socotra and straight on to 60° east, 12° north ..."

QSL BUREAU CHANGES

The following changes and additions to the list of QSL Bureaux which appeared on page 59 of June QST have been reported.

Austria: OSYV, Kierlingerstrasse 10, Klosterneuburg
India: Box 1, Munner P. O., Trivancore, S. India.
Japan (KA) FEARL, APO 111, c/o Postmaster, San Francisco, California
Okinawa: OARC, APO 331, c/o Postmaster, San Francisco, California
Triste: P. O. Box 301, Triste, F.T.T.

AUSTRIA

After long and diligent liaison work with government authorities, the Österreichischer Versuchsendeverband has succeeded in getting the

(Continued on page 118)
The Fall Season Opens. Good fall operating weather should be just around the corner as you receive this QST. Any remaining vacancies in the Transcontinental Corps (NTS) now should be rapidly filled. Preference will be given to first applicants in working out matching assignments, so don't delay writing if you have the experience and traffic interest. We would like to welcome additional appointment applications for Station and Leadership posts. Send these to appropriate SCMs, addresses on page 6, please. Stations newly sending code-practice schedules or with revised plans for operation in October and November should give us full data on these right now for future publication. It will be a big season with stepped-up DX activity, November Sweepstakes, all the usual plans. Emergency leaders to advance AREC and RACES will be needed on an expanded scale. See your SCM and SEC for details. Whatever your interest, get in the swim and enjoy amateur radio operating. Give the FMT (September 16th) a try if you can measure frequencies accurately. Ask for a copy of our booklet Operating an Amateur Radio Station for details on any appointive post.

Those Also Serve. M-D-DC SEC John Gore, W3PRL, currently is reporting to the National Emergency Coordinators on amateur work in connection with the Chestertown fireworks plant explosion. This devastated a large area and overloaded regular communications systems. In W3PRL’s words, “The experience acquired through repetitive net drills in handling messages... proved the effectiveness of our nets when they automatically go into action and produce communications results such as demonstrated on this occasion. Practically every member stood by ready to handle any and all traffic, proving the effectiveness of training received in regular operations.”

We are given to understand that certain amateurs attempted to ridicule operations in progress. However, net control appropriately established stations 5 ke., above and below the net operating frequency (3820 ke.) to monitor operations and assist participating low-power mobiles operating in the devastated area. Thanks are due all who refrained from any operations on or near the frequencies involved who were not in positions to give direct assistance.

Summary of the operational aspects will be reserved for next QST. The incident is touched on here especially (1) to emphasize that they also serve who stand by, observe circuit discipline to assist organizational lines, and permit those organized and prepared to get their communications through; and (2) to point out that every amateur should in advance be registered or aligned with the Amateur Radio Emergency Corps, RACES and other emergency operating groups. We liken those who poke fun or deprecate constructive efforts by their kibitzing and off-side remarks, to casual citizens who, out of mere curiosity, rush unwanted into devastated areas, making it necessary to set up restrictions and policing to insure that organized relief efforts are effective.

It is true that not every emergency is a state-wide or nation-wide calamity. But surely it does not speak well for any of us to pass hasty or ill-informed judgments on those attempting to do their duty in a spirit of public service.

Certified Code Speed. Do you know how fast you can copy? ARRL offers all amateurs official certification of their code receiving speeds. Do you have something on paper to prove your proficiency to those with raised eyebrows? ARRL’s Code Proficiency Program provides a means to determine your receiving speed and get a certificate to prove it. The practice transmissions start at 9:30 P.M. E.D.S.T. daily (through September 26th) and our full operating schedule is bulletin, general operating periods and code practice is available. The WIAW schedule is sent free on request by radiogram or card.

Emergency Lessons in Operation Alert. Many communications groups participating in the June 14th-15th civil defense test informally agree that the values of periodic tests are high, permitting revision of plans, increased emphasis on procedure training, changes in deployment and practical arrangements. Midwest Cllrs. (July) refers to two specific and positive conclusions, as follows:

“(1) Amateurs participating in... RACES nets should be encouraged to participate in the regular amateur nets... message bundling (know how) and a disciplined directed net operation is fundamentally the same whether a net is amateur, RACES or MARS. There is practice value in correctly handling messages...”

“(2) It was observed that the high RACES and MARS provisions at the high and low ends of the 4-Mc. band are hardly adequate for civil defense communication throughout the country, especially when QRM is bad in the 600-meter and disaster bands. Use of v.f. links where possible... could solve part of the trouble and guard against... long skin. An illustration in two adjacent states: Many stations in State A. operating v.h.f. on 2.95 Mc. for c.d. were up in the evening. They had planned on sending enough traffic to keep busy all night... the combination of QRM and QRM was too much on 75. In State B. communications continued as long as required: they had been moved down to the low end of the band on c.w. ...”

64 QST for
Making best use of all the available facilities always pays off. Greater familiarity with traffic methods either by its regular appearance in radio tests, or through daily net operation as per the suggestion in the first numbered paragraph preceding, doubtless could have increased the showing of what was handled in State B. ARRL suggests that ARBEC and RACES groups also arrange to have blackboard talks and practice set-ups, inviting operators skilled especially in message handling work to assist the training program. — F. E. H.

PREVIEW—1954 FIELD DAY

Listed below are high claimed scores for the 1954 ARRL Field Day of June 19th-20th. These are subject to checking and grouping according to the number of transmitters in simultaneous operation at each station.

**CLASS A**

(Listings show call used in FD, claimed score, and number of simultaneous-operated transmitters.)

<table>
<thead>
<tr>
<th>Call</th>
<th>Score</th>
<th>Transmitters</th>
</tr>
</thead>
<tbody>
<tr>
<td>W2LJ</td>
<td>17,847-10</td>
<td>7526</td>
</tr>
<tr>
<td>W3OR</td>
<td>23,999-10</td>
<td>3523</td>
</tr>
<tr>
<td>W4NE</td>
<td>12,246-10</td>
<td>2524</td>
</tr>
<tr>
<td>W4PK</td>
<td>12,246-10</td>
<td>2524</td>
</tr>
<tr>
<td>W5GT</td>
<td>7,366-10</td>
<td>2524</td>
</tr>
<tr>
<td>K6UK</td>
<td>11,747-10</td>
<td>2524</td>
</tr>
<tr>
<td>W6VY</td>
<td>7,945-10</td>
<td>2524</td>
</tr>
<tr>
<td>W6ZC</td>
<td>7,945-10</td>
<td>2524</td>
</tr>
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<td>W7ZB</td>
<td>7,945-10</td>
<td>2524</td>
</tr>
<tr>
<td>W8GB</td>
<td>7,945-10</td>
<td>2524</td>
</tr>
</tbody>
</table>

**CLASS B**

(Listings show call used in FD, claimed score, and number of simultaneous-operated transmitters.)

<table>
<thead>
<tr>
<th>Call</th>
<th>Score</th>
<th>Transmitters</th>
</tr>
</thead>
<tbody>
<tr>
<td>W2BO</td>
<td>3,887</td>
<td>3523</td>
</tr>
<tr>
<td>W4TV</td>
<td>4,818</td>
<td>3523</td>
</tr>
<tr>
<td>W9YF</td>
<td>9,763</td>
<td>3523</td>
</tr>
<tr>
<td>W3MD</td>
<td>15,547</td>
<td>3523</td>
</tr>
<tr>
<td>W5GD</td>
<td>15,547</td>
<td>3523</td>
</tr>
<tr>
<td>W6H</td>
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</tr>
<tr>
<td>W7BC</td>
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<td>W8GB</td>
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<td>3523</td>
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<tr>
<td>W9ZY</td>
<td>9,763</td>
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</tbody>
</table>

**CLASS C**

(Listings show call used in FD, claimed score, and number of simultaneous-operated transmitters.)

<table>
<thead>
<tr>
<th>Call</th>
<th>Score</th>
<th>Transmitters</th>
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</thead>
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<tr>
<td>K4AK</td>
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<td>WA4F</td>
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<td>WA5H</td>
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<tr>
<td>WA8H</td>
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<td>W3AJ</td>
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<tr>
<td>W5W</td>
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<td>W6C</td>
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<td>W7W</td>
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<td>W8G</td>
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<td>3523</td>
</tr>
<tr>
<td>W9W</td>
<td>9,763</td>
<td>3523</td>
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MEET THE SCDs

Carroll C. Currier, just completing a term as SCM of New Hampshire, received his license with his present call, WJGMH, in April, 1933, after a three-year interest in amateur radio.

WJGMH is located in a nicely-fitted shack in the basement. Equipment consists of a Viking II with a Viking VFO, a Collins 75A-1 receiver, and a BC-221 frequency counter. A large rig with a pair of 813s in the final, running 400 watts with 805 Class B modulators, is idle at present but will be ready for operation again as soon as the final is rebuilt. A three-element rotary beam and center-fed antennas are used. Bands utilized are 10, 20, 75, and 80 meters.

SCM Currier holds OBS, OBS, ROC, OTC, WN1H, W9EN, TCI, WANA, WVT, DDSN and Sea Gul Net certificates and several Public Service certificates for flood, fire, and hurricane emergency work. He enjoys traffic handling and has maintained membership in the League continuously since 1932. Cal was one of the charter members of the Manchester Radio Club, organized in 1939. He has always been interested in fishing, football, and baseball games, along with Kodachrome photography. Previously employed by the local utility company in Manchester in the engineering department, he is now retired because of a heart condition.

**NATIONAL CALLING AND EMERGENCY FREQUENCIES**

**C. W.**

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Call</th>
<th>Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>3550 kc.</td>
<td>4,050 kc.</td>
<td>3875 kc.</td>
</tr>
<tr>
<td>7100 kc.</td>
<td>21,050 kc.</td>
<td>7250 kc.</td>
</tr>
<tr>
<td>28,100 kc.</td>
<td>20,640 kc.</td>
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</tr>
</tbody>
</table>

During periods of communications emergency these channels are to be monitored by all stations. 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 calls.

The following are the National Calling and Emergency Frequencies for Canada: 3550, 7000, 14,000; Phone: 3550, 14,000. These are used by amateurs using radiotelephone throughout the United States.

**NATIONAL RTTY CALLING AND WORKING FREQUENCIES**

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Call</th>
</tr>
</thead>
<tbody>
<tr>
<td>3620 kc.</td>
<td>7140 kc.</td>
</tr>
</tbody>
</table>

These frequencies are generally employed by amateurs using radiotelegraphy.
With the AREC

It is pretty tough to suggest a solution to a hopeless situation. During a recent trip, we saw much evidence of stellar performance by amateurs in RACES, but once in a while we were confronted with RACES situations which had deteriorated to the extent that rescue appeared to be impossible.

There is little use in going into the history of performance resulting in such a mess, although in passing it might be said that in all cases it could have been avoided by proper implementation of the AREC long beforehand. If your civil defense officials are so completely alienated to amateur radio that they will have none of it, there is really little that can be done until or unless (1) they can be shown that they have an unwarranted impression, or (2) they are replaced by officials who do not feel that way. The principal value in trying to ascertain why they feel that way is to see that errors of the part of local amateurs, to make them feel that way are not repeated.

The headquarters has no panacea for all ill besetting amateurs in their AREC or RACES organizational efforts. For the past 10 years, we have been trying to organize amateur potential for emergency communication into a single strong facility through creation of a nation-wide organizational structure which has its life-giving roots necessarily at the local level. Our efforts have made all varying degrees of success (and lack of it), depending on the resourcefulness, leadership, availability and inclinations of amateurs within their communities. These results are now coming home to roost. If they have been most successful, AREC has embraced and encompassed RACES. Where they have been partially successful, RACES has given the amateurs a "shot in the arm" so that where a loose AREC organization previously existed, a loose or strong RACES organization now exists. And where AREC was nonexistent, there is now no RACES organization, or one so shot-through with politics, commercialism or anti-amateur sentiment as to be useless for all practical purposes.

We don't wish to put ourselves in the illogical position of taking credit for the successes and disclaiming responsibility for the failures. We only wish to point out that, generally speaking, the success of the RACES venture so far is, and doubtless shall continue to be, in direct proportion to the success of AREC organization which preceded it — and that any degree of failure is not just the failure of headquarters, or of this group or that person, but the collective failure of all of us.

At 1730 MDT, June 5th, WT6s TAB NJU and W7TTYG were engaged in a contact on 3655 kc. when a weak triple-frequency burst of W7KUX on Low Air Strip, about 85 miles west of Salt Lake City, Utah, with emergency traffic for Salt Lake City, weather conditions and skip being such that Salt Lake City stations were not readable at his location. TTY called "CQ Salt Lake City," but no luck. NJU then called a CQ for Salt Lake City and raised W7NYV/M who immediately put his home rig on the air. NJU thereafter acted as NCS and relay station, with W7NY handling all further traffic into Salt Lake City. The three Idaho stations relayed, W7ACD and W7LYE policed the frequency. It was explained that the situation, originally a field-day exercise, had suddenly become a real emergency, with one CAP aircraft, carrying a pilot and passenger, missing. W7QXF/W in Provo came on and relayed word to W7AHD to man the CAP station on 4507 kc. W7UMT in Bountiful offered c.w. liaison. W7NYV remained in almost constant contact with the CAA in Salt Lake City and in radio contact with W7KUX/X through NJU, since direct contact was sporadic because of skip and QRN. The frequency was kept clear until 1915 when W7KUX established contact with the Provo CAP station on 4507 kc. and W7NYV declared the net free. A similar announcement from the NCS, ended the emergency. Stations involved in relay or assistance in included W7s NVC KITX NJU TYG TAB QAF RDN UTM and TST. Traffic routed thus: W7KUX/X to W7NJU to W7NYV and return.

During a violent rainstorm in Milwaukee on June 9th, W9GER/M advised W9PD/M that he had found a cover off a manhole in the middle of the street. W9PD/M advised him to stay there while proper authorities were notified. W9GER then parked his car crosswise on the street to block the road until the cover was replaced, thus obviating the possibility of serious accidents occurring. — W9PD.

On June 10th starting about 1750, heavy rains of cloudburst proportions fell in Sidney, N. Y., causing severe damage to Unadilla and Sidney Center. Bridges and roads were washed out or made impassable by landslides. Sidney Center lost its water supply and many homes were washed out. In both Unadilla and Sidney Center. W2RZF was in contact with W2QH/LI/M, W2GFD/M and K3CVX/M at various times between 1000 and 2100 hours on 29.6 kc. W2QH/LI/M had experienced considerable difficulty in getting back to town over the roads in proceeding from Otego to Sidney and returned to Oneonta by another route. He was out of range on 29.6 when W2RZF received a call at 2100 hours from the Town of Sidney, with the town director to help furnish communications. W2JGJ/M was sent to Sidney Center. K3CVX/M was sent to Unadilla and W2GFD/M remained in Sidney as liaison with the c.d. director. The purpose was to keep contact between the town director, the town supervisor, the highway superintendent and crews of highway machinery and the c.d. rescue truck which furnished emergency lighting. W2RZF acted as control and relay station as needed. W2QHP operated W2GFD/M after 2000 hrs. Operations continued until midnight when we were released by the town director who complimented us on our help. — W2RZF, EC Delaware Co., N. Y.

Members of the Des Moines Radio Amateur Association hardly had time to close their log book on Field Day when a real emergency was washed right into their laps. After record June rains, the Des Moines River flooded through central Iowa, causing mounting damage. On June 22nd, amateurs in the Des Moines area were summoned to a "get ready" meeting at the city police station. Both mobile- and fixed-station operators showed up to volunteer their services. The meeting was called for 8 P.M., and because of the increasing danger to the city from the river, some of the mobiles were being dispatched to trouble spots by 8:30 P.M. Originally, city officials hadn't expected to need the help before the night of June 29th.

Under W6SYD, Emergency Coordinator for Des Moines, and W8NTA of the Des Moines police department, a net control station was set up on the third floor of the municipal building. The police station was unable to function well enough to manage the situation, so they called for help, which W8NTA relayed to the Des Moines Radio Amateur Association. The amateurs then relayed the emergency messages to police officers working the scene. This was the first time that the amateurs had been called upon to help in such a situation, and they were able to assist the police in managing the situation.

Under W8NTA, Emergency Coordinator for Des Moines, and W8NTA of the Des Moines police department, a net control station was set up on the third floor of the municipal building. The police station was unable to function well enough to manage the situation, so they called for help, which W8NTA relayed to the Des Moines Radio Amateur Association. The amateurs then relayed the emergency messages to police officers working the scene. This was the first time that the amateurs had been called upon to help in such a situation, and they were able to assist the police in managing the situation.

This is the mobile radio unit of the Fort Hale Mobile Radio Club of New Haven, Conn. It is completely equipped for emergency and civil defense use. Several transmitters and receivers are included for operation on most amateur bands. The amateurs in the picture are W1VYF, W1NIYX, W1NIZI, W1OFS (3rd from right) and W1MYT (extreme right). Others are civil defense officials and aides.
ARRL ACTIVITIES CALENDAR
Sept. 5th: CP Qualifying Run — W6WQP
Sept. 13th: CP Qualifying Run — W1AW
Sept. 16th: Frequency Measuring Test
Sept. 18th: 19th; 10th; YL, QSO Party
Oct. 8th: CP Qualifying Run — W6WQP
Oct. 9th: 10th: Simulated Emergency Test
Oct. 12th: CP Qualifying Run — W1AW
Oct. 16th—17th: CD QSO Party (c.w.)
Oct. 20th: QSO Party (phone)
Nov. 6th: CP Qualifying Run — W6WQP
Nov. 15th—20th: 21st: Sweepstakes
Nov. 17th: CP Qualifying Run — W1AW
Dec. 5th: CP Qualifying Run — W6WQP
Dec. 16th: CP Qualifying Run — W1AW

For 51 hours KB9DF was on the air continuously, handling emergency flood traffic. During that time, 22 mobiles were on the air for long periods and more than 20 other amateurs worked at FDB, traveled as soon as possible, or performed other services. The first night, 11 of the mobiles had a Civil Defense auxiliary personnel on board. The mobiles were directed to danger spots along the river — bridges, low-lying main streets, dikes — with orders to stay at the sites until patrol boats arrived. Information from the C.D. men was relayed to KB9DF by the mobiles; then KB9DF would call the city’s central flood control headquarters by landline as needed.

On June 23rd, when turned out to be most crucial, many of the mobiles were more or less on their own at trouble spots, acting as ears and voices for flood workers. When a crew yodeled for sandbags, the mobile relayed the word to net control which called flood control — and the sandbags got there in a hurry! Other mobiles, on route 89 and 24th, were linked in a bigger radio chain. Naval Reserve personnel with hand-carried portable telephones patrols a four-block section of dikes that threatened to give way and flood a big, low-lying area. The navy NCS was stationed at the side of a ham mobile rig, so word of any dike trouble (and there was plenty) could be passed along instantly.

The crew came early Friday morning, not long after flood control officials gave the word that the major danger was past and that the amateur net could shut down. The amateurs went home at 0930 on June 25th for some much-needed sleep, but remained on a standby basis.

Prize for most interesting came in letter of thanks from the city manager and chief of police, who pointed out that the amateur net had provided speedy communications while at the same time taking a major burden off police telephone facilities. A newspaperman called the amateur control station a “nervous center in the gigantic flood-control machine.”

Mobile station operators, some of whom worked both days and nights, grabbing only a couple of hours sleep when they could, included: W6s RPI, DDW, L/JF, FSG, PTV, HIB, LRY, PRF, GBB, BSK, OLY, ILS, QNO, BBE, MYQ, AUL, IUM, HOU, NWX, NUC, WMLL, BSG, NOS. Some of these, notably W8AUL and W9NWX, went to some trouble to install mobiles especially for this work. W8HKN and W9DFF assisted in the W8AUL mobile installation and W9DFH later helped operate it.

Operation of the net control station was done by W8M, STEV, PSS, IXC, PSC, ALC, ESG, W3A, FKH, HUY, LMM, W9CH, UOI JSL, and W8NPW.

W8PZO worked on 75 meters rounding up further possible out-of-town help, and W8CQH served as a car-borne reinforcement man for mobile operators on the job.

Speaking of RACES, one of the FCC staff in Washington recently extolled quite a bit of enthusiasm for the vigor and enthusiasm with which RACES members in one state were pursuing the RACES program. Which state? Connecticut! Under the able guidance, not to mention the prodding and encouragement of State Office Officer WILK, Connecticut had two such sessions, in addition to approved state RACES plan and thirteen station authorizations, twenty-five approved frequency re-allotments, and twenty-three station authorizations at local level. By the time you read this, the figures will be woefully inaccurate, since additional applications are being processed all the time. WLK’s gimmick is a call for an application form from the civil defense director of every town, to make the red tape of application less difficult, and easier to understand.

For May, 1954, we received 10 SEC reports (same as last year), representing 2209 AREC members (fewer than last year). One new section is represented, the Maryland-Del-D. C. section, making our total for the year twenty-one (one new area last year, three fewer than 1952). Sixty-six SEC reports have been received through May of this year, a nominal increase of two over this time last year. So we’re still just holding our own.

FREQUENCY MEASURING TEST, SEPTEMBER 16TH

All amateurs are invited to try their hand at frequency measuring. W1AW will transmit signals for the purpose of frequency measurement starting at 9:30 P.M. EDT (8:30 P.M. PDT), Thursday, September 16th. The signals will consist of dashes interspersed with station identification. These will follow a general message sent to help listeners to locate the station before the measurement transmission starts. The approximate frequencies used will be 3538, 7035 and 14,130 kc. About 4 ½ minutes will be allowed for measuring each frequency, with long dashes for measurement starting about 9:30 P.M. EDT. If signals are received, the frequencies will be measured in the order listed. Transmissions will be found within 5 or 10 kc. of the suggested frequencies. At 12:30 A.M. EDT, September 17th (9:30 P.M. PDT, September 16th), W1AW will transmit a second series of signals for the Frequency Measuring Test. Approximate frequencies used will be 3760, 7095 and 14,096 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 73.4 parts per million, or falls between 73.4 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) will approve applications for Class III and IV observer posts, good receiving equipment, and the main requirement.

All amateurs must make use of the cooperative notices (mail forms provided by ARRL) reporting activity monthly through SCMs, to warrant continued holding of appointments.

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. List should be based on average accuracy, as compared with readings made by a professional frequency-measuring lab.

TRAINING-AID NOTE

Affiliated-club instructors find ARRL training aids of great benefit in both code and theory education. Thirty technical films, thirteen filmstrips, ten quizzes and code-training equipment all prove to be of real help in radio amateur license preparation. The demand is always brisk, so affiliated-club officers are requested to keep needs and make the necessary arrangements early. Further information is available from the Communications Dept.

QUIZ QUESTIONS

RART training-aid quizzes cover a multitude of topics: Operating Procedures, DX, Traffic, ARRL Organization, FCC Regulations, FCC Procedures, Station Operating Practices, FCC Deregulation, QST, Novice, etc. The Levittown Amateur Radio Club (via W2RDK) finds them of high educational entertainment value, "The quizzes are very popular, indeed. We often have a little prize for the guy with the best score, and send out word in advance that the quiz is going to be held, although we don’t tell what the subject is. We almost always have the places packed on such nights!"
INDIANA 'PHONE NET

Efficient enjoyable net operation is the goal for Indiana "Phone-Netters," a goal easier to attain due to the new edition of the Indiana Directory. With the NDN Manager and PAM of Indiana, recently forwarded a copy of this booklet which helps expedite traffic throughout the Hoosier State. The directory includes suggestions for efficient net operation which are well worth repeating:
... Some stations make excessive use of call letters. When handling traffic identify yourself at the start; then use "break for check" or "roger, go ahead."
... (ICS) insist on correct form for messages. They should be short. Informals should also be kept as short as possible.
... Much repeating of messages is often unnecessary. Suit your transmission to the present condition of the band. Take frequent breaks to see if you are being received.
... Courtesy is always in order.

TRAFFIC TOPICS

Every summer about this time, we get those net registration blues. This column, each September, carries the annual call for net re-registration. Your net, if it has not been registered since August 1, 1954, now is listed behind a tab in the net directory card file marked "Inactive Nets." The only way to get rid of that kind of net is to register.

IT'S NET REGISTRATION TIME, OMY!

There are two kinds of registration: minimum registration and complete registration. The minimum consists of those elements without all of which we will not register the net at all—(1) Frequency, (2) Name and Date of operation. We would like, however, to have complete registration of all nets, and that would include the following items: (1) name of net; (2) net designation, if any (e.g., MTN for Mission Trail Net, TEN for Tenth Regional Net, etc.); (3) frequency or frequencies; (4) day or days of operation; (5) call letters of the net manager; (6) time the net starts and time it ends—be sure to indicate which time zone; (7) direct coverage of the net—that is, by stations who actually report into the net, not by out-of-net relays or liaisons; (8) purpose of the net—one word will suffice (e.g., traffic, emergency, rag-chew, etc.); (9) date the net will commence or did commence operation, if not continuous; (10) list of net control stations; (11) whether or not the net is affiliated with NTS by reporting into the appropriate NTS regional net; (12) other nets with which the net has regular liaison, if not in NTS; (13) call letters of the person submitting the information.

All this is contained on a small tan card which we will make available to anyone upon request. One of the cards will be enclosed with each Bulletin September and, one with each CD Bulletin in October. In mid-November, we send out form reminder cards to listed managers of all nets registered last season who have not re-registered. By December last we should be "closing the books" on the net directory, which should be in circulation by December 15th (but sometimes production delays make it later than this). Registrations received after the net directory goes into print are included in supplementary QST lists.

An initial list of registered nets will appear in November QST, to be followed by supplementary and corrective lists in January, March and May QSTs. The March and May supplements can also be used to correct the cross-indexed net directory.

Nets are registered only upon request, upon receipt of information specifically for that purpose. The little net registration cards are convenient for that purpose, but not required. Sorry, we cannot go through miscellaneous reports, correspondence or calls for net registration data.

In closing this little epistle, let us plead once again for a little dignity in choosing a net name, even if the net has something else it uses as a nickname. These net lists are of great interest to several government agencies, and are often used by them, but it's a little hard for them to take us seriously when we bend over so far as to give them the impression that we succeed only in making ourselves ridiculous. Look down the list and you'll see what we mean.

NETS NOT RE-REGISTERED SINCE AUGUST ARE MARKED "INACTIVE."

Someone has strongly suggested that we clarify the situation as to counting MARS traffic. Okay, let's do it.

As the MARS representative at the Oregon State Convention said, when you're operating in MARS you're not operating as an amateur. Therefore, the traffic you handle is not creditable toward your amateur or BPL traffic total. If you bear that basic fact in mind, the counting method becomes simple—you count each time the MARS station it is handled on amateur frequencies. If you receive it on MARS and relay it by amateur radio, it counts only one "delay." If you receive it by amateur radio and relay it by MARS, it counts only one "received." If you receive it on MARS and deliver it, you get no amateur count. Simple, eh? Of course if you handle it entirely on MARS your amateur count is zero.

How about overseas MARS relays? The MARS policy has been true for a long time. June 1953 QST that "third-party messages originating at overseas MARS stations will be reoriginated as amateur messages by the U. S. MARS station introducing them into the amateur bands." Such a message, received from an overseas point on a MARS frequency in MARS form, is converted to something approaching amateur form by being given a new number by the relaying station (his number), his call as the originating station, a proper amateur "check," but retains the original filing time and date. The place of origin uses the name of the country followed by the words "via MARS." The question is, when such a message is thus relayed and transmitted on an overseas circuit, do we count them as one "originated" or as one "delayed"?

We think it should be one "originated." We say "think" because the whole procedure is irregular so far as amateur forms concerned; but having selected the amateur amateur by means other than amateur radio, and hearing the number and call of the transmitting station as the originating station, it is more of an "originated" message than a "delayed" message, even though it is the original date and filing time, and does not indicate the place of amateur origin. So let's count 'em as "originated."

Miscellaneous net reports: Second Regional 'Phone Net
March, 477; April, 520; May, 565, Interstate 'Phone Net—March, 470; April, 538; May, 529. Early Bird Net for June, 519.

National Traffic System. While true that the NTS structure calls for local nets at section level, it is also true that combining the traffic men of two or more sections into a single net operating at section level is not only perfectly permissible, but often very feasible in areas where traffic activity within a single section will not support a section net. Such combinations have already been effected with good success in New York, New Jersey, and California (Bay Area). Where there are two or more nets operating in an area, it might well be possible to form the traffic system into a single "merger" effect. Of course we realize the "move" from one location to another would mean forming a conference among the sections involved in the traffic system.
College Net Expanding

The College Net is supported by college students with the purpose of advancing interscholastic good will via amateur radio. The net started as a meeting of several college stations on a preset frequency for roundtables, occasionally handing a few messages. After about five years of operation, net enrollment increased from four to forty colleges. By the end of the 65-66 academic year participation rose more than doubled to over 50 colleges and universities and 15 other scholastic institutions.

As listed in the current ARRL Net Directory, the College Net operates two sessions, both on 3060 kc; on Thursdays at 1600 punctually for fall; and on Fridays at 1615 for both traffle and roundtable.

Anyone interested can obtain more information by dropping a line or sending a radiogram to Roger Salaman, W1UDF, via W2BBZ, Hunt 11, Room 24, Rensselaer Polytechnic Institute, Troy, New York.

BRASS POUNCERS LEAGUE

Winners of BPL Certificates for June traffic:

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<tr>
<td>W2LXK</td>
<td>318</td>
<td>98</td>
<td>77</td>
<td>19</td>
<td>510</td>
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<tr>
<td>W2XFO</td>
<td>5</td>
<td>252</td>
<td>218</td>
<td>61</td>
<td>535</td>
</tr>
<tr>
<td>W2WBP</td>
<td>142</td>
<td>112</td>
<td>172</td>
<td>72</td>
<td>555</td>
</tr>
</tbody>
</table>

HPL for 100 or more origins plus deliveries:

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<tr>
<th>Call</th>
<th>Orig.</th>
<th>Recd.</th>
<th>Rel.</th>
<th>Del.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>K2AWK</td>
<td>149</td>
<td>1194</td>
<td>1060</td>
<td>940</td>
<td>3050</td>
</tr>
<tr>
<td>W2HSD</td>
<td>142</td>
<td>1184</td>
<td>1076</td>
<td>180</td>
<td>2498</td>
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<tr>
<td>W2VFA</td>
<td>159</td>
<td>897</td>
<td>935</td>
<td>78</td>
<td>2110</td>
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<tr>
<td>W2FJX</td>
<td>125</td>
<td>856</td>
<td>856</td>
<td>34</td>
<td>2046</td>
</tr>
<tr>
<td>K2WBG</td>
<td>111</td>
<td>645</td>
<td>578</td>
<td>13</td>
<td>1234</td>
</tr>
</tbody>
</table>

The BPL is open to all amateurs who report to their SCM a message total of 500 or more, or 100 or more origins plus deliveries for any calendar month. All messages must be handled on amateur frequencies, within 48 hours of receipt, in standard ARRL form.
WIAD OPERATING SCHEDULE  
*(Effective September 26, 1954)*

_(All times given are Eastern Standard Time)_

WIAD will return to its Fall-Winter operating schedule with the return to Standard Time. General operation covers all amateur bands on which WIAD has equipment. Novice periods include both early and late operation on 3.5 and 7 Mc. (see Footnote 2 in box). Master schedules showing complete WIAD operation in EST, CST or PST will be sent to anyone on request.

**Operating—Visiting Hours:**

- Monday through Friday: 1500-2300 (following day).
- Saturday: 1900-0230 (Sunday).
- Sunday: 1500-2230.

**General Operation:** Use the chart below for determining times during which WIAD operates in general operation on various frequencies, phone and c.w. Note that since the schedule is organized in EST, certain morning operating periods may fall on the evening of the previous days in eastern time zones. WIAD will participate in all official ARRL operating activities, using scheduled general operating periods for this purpose if necessary.

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

- **Frequencies (ke):**
  - C.w.: 1885, 3555, 7125, 14,100, 21,020, 52,000, 145,600.
  - Phone: 1886, 3550, 7255, 14,280, 21,350, 52,000, 145,600.
- Frequencies may vary slightly from round figures given; they are to assist in finding the WIAD signet, not for exact calibration purposes.

**Times:**

- Sunday through Friday: 2000 c.w., 2100 by phone.
- Monday through Saturday: 2330 by phone, 2100 c.w.

**Code Proficiency Program:** Practice transmissions are made on the above listed c.w. frequencies, starting at 2100 daily. Speeds are 15, 20, 25, 30, and 35 w.p.m. on Monday, Wednesday and Friday, and 5, 7154, 10, and 15 w.p.m. on Sunday, Tuesday, Thursday and Saturday. Approximately ten minutes of practice is given at each speed. Exit: On October 12th WIAD will transmit an ARRL Code Proficiency Qualifying Run instead of the regular code practice.

**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 WIAD will be made on Saturday at 2150 Estimate Daylight Saving Time. Identical tests will be sent simultaneously by automatic transmitters on 1885, 3555, 7125, 14,100, 21,020, 52,000 and 145,600 kc. The next qualifying run from W2WVF only will be transmitted on September 5th at 2100 EST or PST on 3550 and 7125 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 any 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 a higher speed.

Code-practice transmissions will be made from WIAD each evening at 2130 EST. Speeds are 15, 20, 25, 30 and 35 w.p.m. on Monday, Wednesday and Friday, and 5, 7154, 10 and 15 w.p.m. on Sunday, Tuesday, Thursday and Saturday. 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 own copy. For practice purposes the order of words in each line of QST text sometimes is reversed.

**Date** Subject of Practice Text from July QST
- Sept. 2nd: DX position in Clipperian, p. 10
- Sept. 7th: Make Your Own Field Circuits, p. 16
- Sept. 10th: 819s in a High-Power Linear, p. 20
- Sept. 15th: Single-Ended Multiband Tuner, p. 23
- Sept. 21st: Multiband Tuning Circuits, p. 25
- Sept. 24th: Inverting Never-Never Land, p. 30
- Sept. 27th: Some Principles of Radiotelephony, p. 34
- Sept. 30th: Communications in Civil Defense, p. 85

**WIAD OPERATING NOTE**

The ARRL Headquarters station will remain on Summer Schedule (see page 77, July QST and chart on page 79, May QST) through September 25, 1954. Beginning 25, 1954 and each time the new Fall-Winter schedule detailed elsewhere on this page goes into effect. Note that WIAD will be closed from 2330 EST on Saturday, 5th until 1300 EST on November 7th (Labor Day holiday), and also that instead of the regular code practice WIAD will transmit a code-proficiency qualifying run on September 18th and a frequency measuring test on September 16th.

**BRIEF**

The following item, believed to be a tip on operating procedure, comes from the Egyptian Radio Club's *Podunk News*:

> "Advice to the amateur: In promulgating your esoteric cognitions or articulating your superficial sentimentalities and anecdotal philosphical observations over the air, beware of platitudinous pedantry. Let your conversational communications possess a clarified consciousness, coalescent consistency, and a concatenated cogency. Eschew all conglomerations of lament garriety, jejune babblement, asinine affections. Let your exophthalmic disconsolations and unpromissed expectations have intelligibility and veracious vivacity without melodramatic or phrasal bombast. Sedulously avoid all polemical profundity, pietistic crevency, vestigial elegance, sibylline, double-entendre, preternatural loquacity and pestiferous profanity."

We understand that English translations are available for a moderate fee from *Podunk News* Editor W3DZG.

**WIAD GENERAL-CONTACT SCHEDULE**

*(Effective September 26, 1954)*

WIAD welcomes calls from any amateur station. Starting September 26th, WIAD will listen for calls in accordance with the following time-frequency chart:

<table>
<thead>
<tr>
<th>Time</th>
<th>Sunday</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Saturday</th>
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</thead>
<tbody>
<tr>
<td>CST</td>
<td>0120-0200</td>
<td>0200-0300</td>
<td>0300-0330</td>
<td>0330-0350</td>
<td>0400-0420</td>
<td>0500-0520</td>
<td>0520-0550</td>
</tr>
</tbody>
</table>

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1. General-contact period on stated frequency begins immediately following transmission of Official Bulletin which begins at 0000 and 2000 on c.w. and at 2100 and 2330 on phone. Starting time is approximate.

2. WIAD will listen for Novice (on Novice band indicated) before looking over the band for other contacts.

3. Operation will be conducted on one of the following frequencies: 21.030; 21.350; 29.000; 28.780 kc.
**Station Activities**

- All operating amateurs are invited to report on the SCM on the first day 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: W. H. Wend, W3JW. W3NER, W3JJQ, W3JYF.**

**Net: 3610, 3580 ke. The Delaware Valley Council of Radio Clubs, now 17 clubs strong, continues to extend an invitation to all clubs interested in promoting club activities to send their monthly reports and notices of club meetings. PFR, the monthly club meeting held in the Clissland School, Arvorda Road & Lansdowne Ave., West Philadelphia, the last Mon. of each month, has been operating successfully for several years. This is the time TRAFFIC season begins, all ORS should be looking forward to a bigger and better PFR. E. H. Net. Net for the last time this season of 2.5 meters, 147.066+, also the last ORS report on net. Conditions will be considerably better this season, according to predictions, and will add to your operating pleasure.

## SOUTHERN NEW JERSEY — SCM: Herbert C. Brooks, KR2B — PAM: Z1. The new QTH of H2E is in Westmont. Bill is now spending his leisure time getting close to DXCC. Congratulations. Bill, LYL and CAG are working DX on 40 meters. Bill Johnson, URS, Ocean City, is working as radio operator aboard the U.S.S. North America on the Lakes during the summer months. Z1 was NC at the State Control Center during "Operation Alert." Other stations taking part in the Frontier Area are W3PEY, W3QOK, W3TV, W3YMO, W3AIQ, W3ZU, K8LL, and W3AIQ.

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*Note: The text is a mixture of information on amateur radio club activities, club meetings, operating conditions, and general radio news. It also mentions a specific date, September 71.*
presented the 100th NYS 'Phone Net' certificate at the Rochester 'Fest.' UFP on 2 meters for the band opening on June 24th and now is working on 220-Mc, converter. EKBF, also 2-meter 'net' certificate, KE2UL, at Cellarmon for the summer vacation, finished work on the VOR chart that ends at QTH to Hilton. L2NZ is operating from St. Bonaventure U. for the first time this summer, 1Q-2XQ on 75 meters. K2NDY visited K2DYN and EJ2E, RUF, to go to 750 watts to 2 meters and ALR to 400. K6CU, CUY, QRX, YL12, from Bakersfield, is working hard for Gen. Class, ZOC and his YLI, K2EPY, motored to Oswaw to attend the North Shore RC Hamfest. RFQ is running again, west of town. The Whippany Street Speech Club, at a meeting of the Lockport ARC, COU visited ZRC and spent the week end operating on Field Day. K2DYP is suggesting that ARRL take a trip. The Central Mass. Traffic Net (NETN) which meets Mon. through Sat., at 4 p.m. on 3740 kc, K2DXY has a Viking 1 and 2X-25 and works a lot of phone. The equipment is on the air. NOCR and KEBB took over the management duties of BRFN and 1PN during Marge's illness. SVF was a week-end filler, 6X5WCI run through the hospital and K25DU on the air. In a flash, FFJ lost four children for which the whole section is sorry. Harvey and his YLI managed to save four other children.

The 6-meter V.H.F. Contest and VESDII crippled the 2-meter trophy. VESDII also became member No. 3 of the 100-meter group. W3WY (WNY, York), KN6C made Tech. Class, KJK got first-class commercial, W3D and KAL are the mother and father of KJK, SW took a short trip to 180-Hz, and K2BNU after the Rochester 'Fest.' DOT got hooked up with QTH via APII isn't finding DX he works, as shown by a SP and a YLI. RARA DX club met recently. A.A. is an arm of K2U, W2Q, and the regular DX meet is the last of the year. A.A. has several interesting DX in store. A.A. chairmen: BIJl, nst. chairman; EB2N, snc.-treas. DPIV directed the DX units. The DX group and the Meridian section of the RARC group held the 2XQ, TEP, and K2AL meeting of the RARC group held at the QTH of UFP, TRP, and NFQ. K2UX, K2V, 432, EMW 194, O3R 129, HKA 78, ZRC 64, DSS 55, K3Q 129, K2Q 108, 4KQ 109, K2Q 109, K2Q 109, 14Q 107, DVE 2, May (K2DXY 12, May), K2DXY 12, May.

W2QX IV. W2QX IV.

The Lawrence area — SCM, R. M. Heck, W2QX IV.

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MORE ABOUT HI-FI

Last month my colleague, Mr. Lindenmuth, made a number of introductory comments on the subject of Hi-Fidelity. This month, at the risk of straying perhaps a bit too far off the ham field, we'd like to say some more about it, especially since "Natco" has entered the field with some really new ideas. First, the Hi-Fi approach and the ham approach are quite different. It's all a matter of degree and concept. There probably isn't a ham in the business who would be at all concerned if his vocal utterances were garbled by 5% harmonic distortion, or was told that his frequency response suffers from a slight droop at 10 Kc. So what, says the ham, he heard me, didn't he? Audio distortion isn't as important to hams, and shouldn't be. The audio bug, incidentally, is a ham at heart anyway, but he lives in the world of audio instead.

This whole business of Hi-Fi concerns the reproduction of electrical signals with a minimum of distortion. It's the urge for the microscopic last bit of perfection that makes the subject interesting. Although hams certainly haven't any use for 0.1% distortion, or flat frequency response, after getting exposed to some of the problems encountered in "trying for the last zero," it's difficult not to become somewhat fanatic like those already involved. Probably it's some basic human instinct to always get something better.

As a good example of where the search for something better can lead, we can point to the new National Criterion tuner. This receiver differs from the old-fashioned conventional circuitry in many ways. Because of our interest in getting something better than conventional we have developed a new type of FM detector in this receiver. Many people have looked at our schematic, scratched their heads and mumbled "what the H...". We think it is the first big advance in detector circuits as it escapes problems associated with conventional Foster-Seeley or ratio detectors and adds features which could never be achieved otherwise.

You might ask what's wrong with conventional detectors? If you aren't interested in elimination of all distortion, they serve satisfactorily. We can summarize what we consider to be the big faults.

1. Lack of linearity. It becomes a very difficult task to design out every trace of non-linearity. It isn't theoretically possible to remove all the higher order harmonics, especially with large frequency excursions. What's more, very small deviations from true linearity can introduce surprisingly large percentages of harmonic and intermodulation distortion. What looks to be a straight line curve can very easily introduce 2 or 3% distortion.

2. Narrow bandwidth is another limitation. Getting a wide bandwidth with a conventional detector is difficult with respectably linear response. Wide bandwidth is of obvious value in covering up I. F. drifts, added freedom from impulse noise, need for critical tuning, and is a requirement for a high capture ratio.

3. Response to A. M. signals has been very much reduced by the ratio detector, but small amounts still remain.

Natco's new "linear impedence detector" circuit solves these problems. In the first place it's completely linear — in theory it represents an absolutely straight line throughout its entire bandwidth. The bandwidth isn't kilocycles, but megacycles wide, centered around the I. F. frequency. The limitation of usable bandwidth is not the detector as it usually is, but the I. F. bandwidth. Incidentally, this is one reason why we do not need AFC since critical tuning and small drifts are of no consequence. Furthermore, AM rejection is complete. The detector has extremely short time constants, good up to at least 100 Kc, reduces peak impulse effects, and is much easier to control in production. True linearity is assured by the very nature of the circuit. Its audio level is somewhat lower, however, and requires an audio amplifier stage. This is, of course a direct result of the extreme bandwidth, but an example of the old saw which holds in every phase of life — you can't have your cake and eat it too. The advantages of this circuit were too good for us to lose, so we included a low distortion audio stage, plus a cathode follower.

The constant battle for perfection continues. Just how we can improve on this one we don't know. Maybe a new idea will come along some day to show us how we can have our cake and eat it too.

— Elliott W. Markow

National Company, Inc.  
61 Sherman Street, Malden 48, Mass.  
"Forty Years of World-Wide Distinction in Electronics"
Ideal "Butterfly" for VHF applications!

The BFC "butterfly" type capacitor has very low minimum capacity, low inductance and isolated rotor for use in VHF applications as a series capacitor with no rotor connection. For dual split-stator capacitor use, it has a low-loss positive rotor contact. Mechanical and electrical symmetry and stator terminal locations minimize circuit inductance.

Brass rotors and stators are soldered and nickel-plated. The contact wiper is heavily silver-plated beryllium copper. Tapped studs on the silicone treated statie front panel permit mounting the capacitor without grounding the rotor. The sleeve-type bearing is nickel-plated brass.

Get your free copy of The Hammarlund Capacitor Catalog which lists the complete line of standard capacitors. Write to Hammarlund Manufacturing Co., Inc., 460 West 34th Street, New York 1, N. Y. Ask for Bulletin C-7.

(DAKOTA DIVISION)

NORTH DAKOTA — SCM, Earl C. Kirkby, WHNYN
                                    — PAM: GZD, RM: LHB, The Black Hills Amateur Radio Club is operating the Dakota Division Convexion in Rapid City, So. Dakota, Sept. 17-18-19. Hope to see a lot of you there. The Sioux Amateur Radio Assn., of Grand Forks has its mobile bus about ready to go, with a mobile a.m. generator, antennas, and operating tables installed. The Red River Radio Amateur Club of Fargo was out on Field Day, as was the Jamestown Radio Club. QRP has its new Globil King, NQI now has his Elmore on 160 meters and is getting out far. VAR is now on the air from Drayton with an Elmore A44 mobile and A44H in his home. As this is being written everyone on the air is talking about going to the big Hamfrodes in Grand Forks July 18th. KLF has his station set up at the Boy Scout Camp handling relay traffic for the boys. Traffic: W0RKL 182, K7Z 54, CAQ 2, EBA 2.

SOUTH DAKOTA — SCM, W. R. Stoboski, WARRN
                                    — PAM: W. A. Budd, WARRN, Asst. SCMs: Earl Shirley, 6QYR; Martha Shirley, 6WYL; SEC: GCP, RM: SMV, PAM: PRL, NEO, SIR, stationed in Chicago with the AF, visited this past summer and the SARC, Sioux Falls, EBO, Maughan, visited the SARC, and is reported moving to Canton. LBS has 2nd-class commercial phone Red. SMV purchased 3 LBS and sold his own to 1XQ. While building, SMV is using PHR's Lycox. RWE has returned to the air after a year's layoff while rebuilding. NQI has succeeded to "phone. Two thunderstorms and a tornado chased the SARC from Field Day operations. SMV and the gang are keeping the c.w. net on operation a going. The 75-foot tower has discharged its Saturday night session until further notice. The c.w. net reports for June, 54 QNI in 13 sessions, 29 messages handled. Traffic: W6X 118, S7T 410, QVI 2, QVI 201, LBS 16, SMV 15, MPO 10, RWE 9, QVX 7, RNP 2.

MINNESOTA — SCM, Charles M. Boye, W6LYC
                                    — Asst. SCM: Vince Smythe, 6BGO, SGO, QTV, RM: DQL, OMC, PAM: JIE, UCV. Our state traffic nets are doing very well in spite of the hot weather and the QRM. HR has a remote control for her rig that can be operated from her bed. BGY is the guy that fixed it up for her. Two more laddy hams have joined our ranks. They are W1RHS and Jerry Granette, and LXR, Emme Nordorf. Emme is Red Malmgren's sister and she applied for Red's call letters and received them. JYXK is a new ham in Minneapolis. LYNH received his General Class license, N1Z received ORS appointment, QDP is looking for Maine and Delaware for W3S. BOI was moved to Seattle to join the W3B group and sold his home in the Cities on furlough. Warren is stationed in Florida, OMC is in the QSL business. DQL attended the Rocky Mountain Division Convention at Red Park, Colorado. Herb had a nice visit with 10 Regional Net members there. The St. Paul Radio Club elected officers at its last meeting. They are HR, YL, VY, SEC: NCE, and W1E. They are going to attend the XI Convention at Milwaukee. Some more new hams are DUE, OYS, and OY, RLL still is making ham radio for flying. BOI is back on the air after a long layoff. And a new ham is UAN. Want to be in your country? If so, drop a card to George Lord, GTX, Box 8, Alexandria, Minn. Following the contest there is an antacom event of the Minnesota QST 10.000 Lakes QSO Party. Let's put this contest over with a bang. Those who are putting on this contest will give a nice piece of wall paper signed by our Minnesota Governor to the highest scorer. The date is Sept. 10th and

(Continued from page 78)
HAS "MORE THAN MEETS THE EYE!"

Just looking at the outside of an HQ-140-X communications receiver isn't enough, when you're in the market for a new rig. Sure, it's in an attractive case that's built for rugged service; and the controls are comfortably placed for lengthy DX operations. But, it's what's inside the cabinet that's important.

For example, the HQ-140-X offers a professional-type tube lineup. The use of a separate mixer (6BE6) and oscillator (6C4) contribute to the high degree of oscillator stability. Modern 6BA6's are used for the RF amplifier and for all three stages of IF amplification for maximum efficiency.

The nine individual sections of the band-spread capacitor, and the six sections that make up the main tuning capacitor, at all times maintain the proper L/C ratio regardless of what part of the receiver's range (540 Kc to 31 Mc) you use. Plates are heavy brass, soldered to their shafts, built into a large sturdy frame for rugged use.

Features like those described above rate high with 'hams' the world over. For detailed information on the HQ-140-X, write to The Hammarlund Manufacturing Co., Inc., 460 West 34th Street, New York 1, New York. Ask for Bulletin R-90.
The Heathkit IMPEDANCE METER KIT is basically a resistance type shifting wave ratio bridge, with one arm a variable resistance. In this manner it is possible to measure radiation resistance of long wave and antenna transmission line impedance; approximate SWR and optimum receiver input. Use it also as a monitor or as a field strength meter where high sensitivity is not required. Frequency range of the AN-1 is 10-1500 MHz and range of impedance measurements is 0-600 ohms. The circuit uses a 100 microamperemeter impedance meter as a sensitive null indicator. Shielded aluminum light weight cabinet, strong self supporting antenna terminals.

HEATH COMPANY
BENTON HARBOR 9, MICHIGAN

MINNESOTA (10,000 LAKES) QSO PARTY
Sept. 10 (1800 CST) to Sept. 12 (2000 CST)
Sponsored by the Minneapolis & St. Paul Radio Clubs to encourage better acquaintance with radio stations in Minnesota and elsewhere. (Minnesota net frequencies are: c.w. 3595 kc, phone 3820 kc.) This party is open to all amateur radio operators to encourage everyone to make new friendships in Minnesota. Radio Net Manager is W9JXX, 205 South Second St., Minneapolis 2, Minn. (2) Any and all amateur bands and any type of communication may be used. (3) Scoring: (a) Minnesota stations, 3 points for each contact with another Minnesota station, 1 point for each contact outside Minnesota. MULTIPLES by the number of states, provinces, etc., contacted. (b) Stations outside Minnesota, 1 point for each contact with a Minnesota station. MULTIPLES by the number of states, cities, towns, etc., contacted. (c) A station may be worked only once for scoring credit. (d) No limits or power multipliers. (4) Awards: (a) Certificates to 3 highest Minnesota scores and for highest score from each state, province, and foreign country. (b) Separate awards for Novices. (c) Separate awards for A.R.R.L. Expert groups. (d) Submit logs to: Contest P.O. Box 512, St. Paul, Minn. (before October 1, 1954).

DELTAS DIVISION
ARKANSAS — SCM, Fred Ward, W6ULX — The SCM may be a lot better that the first time we write the news for Arkansas as our term expires, and the new man will take over. We have enjoyed working your SCM, but we have not had an opportunity to attend to the job as I should have. Let's all get behind the next SCM and help him. Remember that he needs reports each month. The civil defense members are active in some ways, but showed where the weak points were and the next one should be much better. The club members did an excellent job. Field Day also was a good doings this year, with more stations taking part than last year. WUB has a new beam for 15 meters, CAF has Greene County well organized for emergencies. EMF is in a new call at Forrest City. Traffic: W6ULX 12.

LOUISIANA — SCM, Thomas J. Morgavi, W5PMO — The Central La. Amateur Radio Club has organized with 45 members and is affiliated with ARRL. ZHT is vacating in North Carolina, KKK sends K5E, CUN and PAN notes. New members the HJ and Bourne and Crawfish Net every morning. The following took part in "Operation Alert" on October 14th: W5T, QSO, TPK, HAB, WUE, LSK, LRA 31, LUN, LHE, CNG, MAY, NRS, FBJ, NIP, HLT, LRG, UXG, XDR, NG, OVY, URR, RTG Net Control, DGB, and USN. TRO monitors 20,000 kc. in Alexandria 555, and Alexandria, runs 300 watts on 20, 40, and 80 meters. Field Day messages were received by the SCM from DJ7T/6, at Lake Bovee; with DJ7T, DJ8G, and DJ9S as operators; from MU7J, the Monroe Amateur Radio Club, 3 transmitters, 12 operators; from SUM7J, the Southport Radio Club, two 20-watt transmitters with SIM, NXM, and ULI as operators; from KC7B, the Baton Rouge Radio Club, approximately 18 miles northeast of Baton Rouge, with 17 operators and 1 AEC members; from the Westside Amateur Radio Club, operating from Fontainebleau State Park with 13 operators and 4 AEC members using the call ABD/6; from LU9Z/6, Central La. Amateur Radio Club at Big Creek, 25 miles northeast of Alexandria; from TEB/5, the Webster Parish Amateur Radio Club at Lake Fournaise, La., with 15 operators and one AEC member. The Greater New Orleans Amateur Radio Club is sponsoring "Weekend in Old New Orleans," over Lake Pontchartrain and Lake Loyalty, all operating 20, 40, and 80 meters, with a special call sign of W3G, and on the air every evening. The W5LX crew has dropped the "TN" from WWFD and W5WW and Y2Z participated in the FCD2 drill. AMZ reports that the c.w. net is about washed up. It may be the link weather. Let's all get our OMC out and get going. QSLing is in Gulfport. The QTH of 4CTK, ex-YYT, is Ft. Payne, Ala. TGD/5 is now in Jackson, QM7 has a new 50-watt (Continued on page 78)
NEW Heathkit COMMUNICATIONS RECEIVER KIT

**MODEL AR-2**

**$25.50**

Ship Wt. 12 lbs.

CABINET:

A new Heathkit AR-2 Communications Receiver. The ideal companion piece for the AT-1 Transmitter. Electrical and mechanical design tailored for sensitive and good signal to noise ratio. Construct your own Communications Receiver at a very substantial saving.

SPECIFICATIONS:
- 5½ inch PM Speakers
- Heatsink on side
- Noise Limiter—standby switch
- Electrical bandspread and scale
- Transformer: 250 watts
- Gain control with AVC or NVC
- 100-125 volts A.C., 50-60 cycles, 45 watts

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Here is another Heathkit addition to the 160m radio field. The AT-1 Transmitter Kit. Incorporating many desirable design features at the lowest possible dollar-per-watt price. Panel mount, stand-alone operating box, key select filter, A.C. line filtering, good shielding, etc. Very low cost with up to 35 watts output. Built-in power supply provides 425 volts at 100 MA. A simple construction which includes all circuit components, tubes, cabinet, punched chassis, and detailed construction manual.

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- Electrical bandspread and scale
- Transformer: 250 watts
- Gain control with AVC or NVC
- 100-125 volts A.C., 50-60 cycles, 45 watts

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GOTHAM proudly presents a 6 element 2-Meter beam for 2 meters at only $97.95. Contains a 12 foot boom, 1 1/2 aluminum tubing; 3/4 aluminum tubing for matching, and fittings; all hardware, and instructions. Vertical or horizontal polarizations are possible.

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D100T • Deluxe 10m 3-El. T match, $149.95. 9’ 8” boom, 1 1/2” aluminum, 3/4” aluminum tubing; 3” aluminum tubing; 2” aluminum tubing; 1” aluminum tubing; 1/2” aluminum tubing; 1/4” aluminum tubing; 1/8” aluminum tubing. 1 peak mount

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S150T • Std. 15m 2-El. T match, $72.95. 12” boom, 1 1/2” aluminum, 3/4” aluminum tubing; 3” aluminum tubing. 1” aluminum tubing. 2” aluminum tubing. 1 peak mount

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15 M. BEAMS
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20 M. BEAMS
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MODULAR CONSTRUCTION SETS greatly simplify any electronic building project. The advantages of this new system over the standard chassis-type construction are:

1. MODULAR SETS are flexible as to cubic content. The smallest set, the M-2 (2 MODULAR plates and hardware) can easily be adjusted to a cubic content of less than 10 cubic inches or more than 100 cubic inches, or any size in between.

2. MODULAR SETS can be worked without special tools, drills, reams, punchers, etc. An ordinary pocket knife is all that is needed for a quick, neat, easy job. If tools are available, MODULAR SETS machine perfectly.

3. MODULAR SETS permit compact construction because the builder works in three dimensions, length, width and height.

4. MODULAR SETS break down complicated circuits into simple, definite stages or units. Any electronics job can be simplified (and understood) by building one MODULAR plate at a time and then joining the units together.

5. MODULAR SETS permit easy, quick servicing. There is no hodge-podge wiring jumble, but instead an easy-to-see, easy-to-get-at, systematic wiring circuit, broken down into basic units. MODULAR SETS can be disassembled for testing, repair, or design changes.

6. MODULAR SETS enable the builder to add stages to his rig. For instance, an 807 final amplifier stage can be added to an existing 6AG7 oscillator to provide a 15 watt transmitter. Later, a modulator can be added to permit phone operation. Changes can be made without altering the original construction.

7. MODULATOR SETS are safe to use. An operator cannot get an electrical shock by touching a MODULAR plate accidentally. And accidental shorts within the rig are minimized, since the MODULAR plates are non-conductive.

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79
new in operator. ZAI made 240 contacts for K5MR during Field Day. QOP has a new Viking II. Flashy RF converted his YL to an XYL on June 29th. Congratulations, QTI Livie, however, was deeply saddened to learn that TDFBR's equipment never left the ship at Cape Island. Genesee County was represented by IQG, CIV, PAL, UFS, GKA, NAK, and OHL in the c.d. alert. RLK is QRT building during the summer months. ROX reports the CBE for months. 811 contacts with 2 1/2 rigs during Field Day. W8NQYS received his 20-w.p.m. Code Proficiency certificate. DL and NNG will vacation in Ontario, Aug. 12 is spending a month on the West Coast. ILC was NCS on 2 meters during the c.d. alert. The Canton group has over $400,00.00 in club gear and is contemplating the purchase of a tent. DEX reports that the Ohiocos are holding well on 8RM. LYD announces that the RAC selection for Cuyahoga County has been tentatively approved by both the County and the State. The CACARC also approved the plan. The Van Wert Club is the section's latest ARRL affiliate. Officers are ABL, pro.; DUG, vice-; QWD, secy.; OWC, treas.; GEI, net. mgr. The West Park mobile group was out in full force on Field Day. Springfield (27) reports that HTE spoke on "The How and Why of RTTY" at the last club meeting; GLE's students are progressing nicely in code and theory; BFP has been nominated as club historian; and 15 members were IRE at the 8L Field Day site. The Hamilton Bulletin announces that 875 contacts were made in the Field Day exercises; the 1d and OEQ are vacating in the Dakotas; new Novices are SBK and SCII; and local c.d. officials wrote a letter of thanks to the Club for its operation in the c.d. alert. Iowa's AFV reports that the annual State Hamfest and Radio Parts Show will be held Sun., Sept. 12th at Ask Grove on Winton Road. OVARA's Biker Waves states that the Club's transmitters made 1,550 contacts in Field Day competition, with 1112 of them being on 30-, 40-, and 80-meter c.w. SDJ made YLC and neca but one more state for VCWA. LFQ has worked his 19th state; meters and TUM is up to 185 countries worked. Toledo's Shack Gazette mentions that DQR and GDE are operating 2-meter mobile; TVT has moved from Findlay to Brookville; Green; and new Technicians in the area are RZM, RZN and RJQ. Over 26 WASS certificates have been sent out by the Sycamore Smithies! The Columbus Caracara reports that the Club made 490 Field Day contacts; PAIGE and PA9UN were guests at a recent club meeting; IRE is now operating out of Ohio; and LWO has completed building a 2-meter transmitter. Eastern Ohio's Ham Flashes mentions that Warren Karaisky, Jr., has 9 members in the school's radio club; LQW is president; MTC has recently gone mobile; MVWA's official call is QLY; the Ashtabula gang is building emergency 2-meter equipment; and SKM of Conneaut has purchased an antenna farm. Dayton's RF Carrier announces the results of its v.b.l. contest. Local winners were SYL, HOM, and LIZ while leading non-members were LIVIE, SDJ, and EHI. Also included in the bulletin was a copy of Governor Reusch's proclamation which proclaimed the week of July 19-21 Amateur Radio Day in Ohio. The V.B.L. (June) W8FYO 508, RO 224, DG 165, ARO 155, JAW 144, AJE 102, HFE 101, FM 110, KZM 92, AMH 80, ABU 87, DAE 73, MLG 69, FPL 66, HBR 49, MQG 49, GAI 30, GZ 19, ZAU 17, LYY 14, CTZ 13, ROX 12, PAM 10, KZH 9, GCR 8, PGB 8, DL 6, APR 6, OUP 6, WAY 6, PDC 3, HF7 3, JMD 4, ILK 2, LMB 4, DMD 2, HFI 2, ZL 3, IVE 3, R3, DNS 2, NQG 2, THJ 2, AYR 1. (May) W8WAV 92, DL 18, JNR 3.

HUDSON DIVISION

EASTERN NEW YORK — SCM. Stephen J. Nessan, W2HLI — SEC; RTE, RMS; YOC; K7NU, FRM; PAAM; QWI, QJL, JIP. The SLRC has a Novice examining procedure all set up and invites prospective licensees in the vicinity of Rockland and Bergen Counties to contact OMV. K2HFG is mobile on 29 Mc. K2BFU dropped the "N." Rockland County AREC Net operates every Wed. at 7 P.M. on 29.6 Mc. SB is the NCS. The HHRDL claims Field Day was a huge success, the Westchester County boys really turned out and the gang got a big write-up in the local papers. Similar claims were made by WARA, Yonkers, and the Highland Radio Club. W8QL reports that Zero Beat is not being published during July and August. LL and S2 were awarded WVT certificates. After Labor Day, Director Cook, OBU, will maintain a speaker's watch on 3.8 Mc. nightly from 7:30 p.m. on, when at home, for contacts with any amateur in our division for QSOs dealing with questions and discussions of League matters and policy. One of our very active clubs is located near your home: if you do not know its location and desire information, please drop a line to the SCM. MRQ is portable at a boys' camp in Lowville for the summer. K3QPH and OKI are organizing a 2-meter net in Westchester, Concats to the SEC, RTE, and all the ECs for a job well done in the national c.d. test. AAO is coordinating a code class at the VA hospital in Albany. There are about twenty in the class, including twelve M.D.s. ITQ is firming up a 322 on 144 Mc. New members of the SAR are OKA, F2E, EIC, AWS, and HWW, also KLM, on the same frequency; YFP is active on NYSEP. Do not lose your appointment, check your endorsement date now. LEL is mobile on 144.
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Check the features and characteristics for which E-V microphones have become favorites in every field. Then, take your choice, and know you can expect performance that is guaranteed by E-V research-engineering. Here are 9 models of today's most complete microphone line.

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Me. HBM is moving to W3-Land. W5TYT is now in POK. Traffic (Jan 27th) K2RBB 332, W3AF 68, LEEU 88, LEO 64, K2SEQ 36, W2APH 31, K2BE 27, W3M 24, W3B 18, YXX 11, G9D 9, TSCG 9, K2CQG 8, K2WPJ 6, K2DOX 5, W2VPH 3, K2LMM 2, (May) K2BBN 68, K2BB 64, K2SEQ 34.

NEW YORK CITY AND LONG ISLAND (CJ)

Carleton I. Coleman, W2YBT — Asst. SCM: Harry Hamburger, 2A2 SEC: ZAI, PAU 195X. RMs: VNJ, LQ, K2OUL, on an extended visit to Europe, has so far called upon FAKW, F8UQ, 948M, and 948M, and now goes to BHB- 8 and 11-Land. The Columbia University Amateur Radio Club in recent elections came up with FXT, press, Old time, vice-prez.: DAB, tech. dir.: 4NXN, comm. mgr.: 3XVT, press., and K2LLJ, asst. 2AE operated /1 from Camp Col-umbia, Conn., the first Field Day in its 40-year history. The Northeast Traffic Net, a new one, operates on 3746 kc. Manager is S.J. St. at 4 p.m. Net operators are K2GSP and K2DHYV in pub. mgr. Get your November friends to call in, the purpose is to train as well as handle traffic. NUM is now OBS, KN-BX new OBS. The Fordham Radio Club also held its first Field Day this year held on the City's Rierson's Park, by permission of N.Y.C., through the efforts of 2IN, K2CQY was the coord. His and did an excellent job. Needless to say, a re-ception Warden Ed Dres is PVR. OME is rebuilding and coming up with a 300-watt rig for c.w. and 'phone on 10 through 80 meters. CLG is cutting 2-meter openings in the new Chrylser. How does ZAI get those Florida vacations every six months? QG has a new 38-ft. tower and two-ele-ment beam. 30-40 watts to 80 meters. RGN is up to 70 countries with that Viking and a new two-element Tower mini made. MFU has been active in TCPN and NYSEPN. K2ALL, active on 230 kc. has been listening at 3 and 4 a.m. with carriers heard on 225 kc. without modulation. He works with K2BKX Sun. 10 to 12 a.m. KUK gave the first mail exchange to K2TFR, who passed one of the first Tech and Class exams. AEE, still trying for WAS, has 41 confirmed on 'phone and 48 worked. Summer code and theory classes have been started at Columbia, AIP reports. The Brooklyn Polytechnic Occident Club elected IGS, press., EJ, vice-prez.; K2OUC, Gen. RC reports the UTL is keeping tabs throughout the summer. JOA graduated from high school. NJI has on three weeks a week with traffic down somewhat. VNJ, the RM, reports. JEX was elected YL chairman for the second district of YLLEX. OGC built a new pi network for all bands. K1G is operating at SX during the fall, Brooklyn EC. RGN, reports a very successful c.d. drill on 10 and 2 meters with a large turnout. QG, Queens EC, reports slow but steady progress in the amalgamation of ABERC and c.d. Nassau EC. FL reports a new building, complete. K2BQG is working the West Coast. VKF, Staten Island RC, reports one large scale RACES and ARRL projects, and an informal set-together the other three Monday nights. Monday nights on 2 meters in the N.Y.C.-L.I. section are several c.d. nets which one can join. GP says things are a bit slow but he manages to work a few Europeans on 3.5 and 7 Mc. JQF was with FBA/3 Field Day near Rochester. K2BID and K2D2CJ received A.B. degrees at Columbia. The Northern New Jersey Amateur Radio Club had a real high-class Field Day at the Rockefeller Institute. Course — Transmitters — will be available this fall at the N.Y.C. School of Education, evening session. Training and High School. Candidates must be 17 years old or younger. Must hold a Novice ticket or the equivalent. Tuition is free. Write FBC, 4th Ave. Box 181, Jersey City 2, N.J. Reprints: W2KSF 809, JOA 729, KAT 608, K2BQG 83, W2YU 315, AEE 302, LPS 296, KZD 244, VNJ 181, JGY 79, EG 60, QG 249, K2QG 290, 2AE 170, W2TAF 3, KUD 8, EJ 7, IN 6, KUM 6, K2DVY 2, W2QBF 1, K2J 1, W2E 273, 1YU 283, 1GO 57, IVS 40, IN 26.

NORTHERN NEW JERSEY — SCM, Lloyd J. Mame- mon, W2YQ — SEC: NAK, PAM: CCH, RMs: EAB, NAK, CGG, QAE. A new RACES, replacing WCL, BAI has moved to Florida. We are sorry to lose Rues from the Northern New Jersey ranks. UWA is becoming active again. He has a new rig with 819 final ready to go. K2OGER is operating out of a trailer from a park. YWO reports YQ7 is working on new 144-Mc. rig. K2JH finally worked his first DX after 18 years of trying. This all proves a good DX man never gives up. K2BBCV reports he was away on sea duty about the first of the year. K2EUN is active in NHT, TAN, and NJN. Starting Sept. 7th, Director Cooke will maintain a speaker watch from 3000 kc. nightly, for contact with any amateur in the Hudson Division. If you have questions on League policies or on any other matters, give him a blind call on 3000 kc. and he will come right back at you. K2CZK passed General Class exam. NIF reports that young hams who are Boy Scouts in his area are receiving a lot of help in radio through their efforts as counselor. K2DOX and K2QBP are installing new mobile rigs in their ears. VNY is receiving a few new country lots on come leave on leave from the service. ZPD is working on 220-Mc. car mobiles. A new group is coming up on 1626. The AEC has moved its 220-Mc. mobiles. A new group is coming up on 1626. The AEC has moved its 220-Mc. car mobiles. A new group is coming up on 1626. The AEC has moved its 220-Mc. car mobiles.

(Continued on page 84)
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<td><strong>6 A.C.-D.C. and Output Voltage Ranges:</strong></td>
<td>off 1000 ohms per volt, 2-12-60-200-600-volts.</td>
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<td><strong>4 D.C. Current Ranges:</strong></td>
<td>0-6-6-60-600 MA.</td>
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<tr>
<td><strong>3 Resistance Ranges:</strong></td>
<td>5-500-500,000 ohms and 0-0-20 megohms.</td>
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<td><strong>6 Decibel Ranges from -20 to +70 db.</strong></td>
<td>1% Wirewound and Film Type Resistors.</td>
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<td><strong>Recessed 6000 volt safety jack.</strong></td>
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MORE watt-hours per dollar plus unchallenged performance can be counted on with an Eimac 4-125A radial-beam power tetrode. For reliable, trouble-free operation, the Eimac 4-125A offers a simple internal design that includes a rugged thoriated tungsten filament, non-emitting grids, a pyrovac plate that can take momentary overloads, low inductance leads, and the elimination of internal insulators. High power gain, low driving power and low inter-electrode capacitances allow uncomplicated circuitry permitting easy suppression of TVI-producing harmonics. As for band freedom and all around versatility, the Eimac 4-125A gives a signal with a wallop from 160 meters thru 2 meters and has been proved in all types of military, commercial and amateur application. All of these features add up to more watt-hours per dollar, real long-run economy achieved through 20 years of Eimac specialization in the design, development and production of transmitting tubes. To be sure of Eimac quality, ask your distributor for Eimac—the mark of excellence in electron-power tubes.

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our clubs participated in the Field Day activities this year. New ARCEC members: PUS, CPI, GAR, and QEO each earn another RP. ARCEC members have a new daughter. GA's carrying a heavy load of schedules. Traffic: (June) W2CFI 72R, G8R 718, Q5O 814, BZK 229, G8J 103, Q5P 838, H8U 856, K4F 915, KB 32, C0G 233, LL4G 325, Q5D 922, EBE 16, BVL 14, BLC 13, CXE 8, 2V6 1, 2R5 8, 2CV 1, WIS 1. (May) W8MB 246, W2S 4.
 NEBRASKA — SCM, Floyd B. Campbell, WACB9 — Asst. SCM-NOS: Tom Bostrom, WYX, SEC: JDI. The reports received during Field Day show that we are very much in need of new ARCEC members. Contacts include SCM and SCM for blanks. GDZ has mobile with Morrow converter and Emeco transmitter. UOB, DQN, WN6SYV has been appointed as new EOCs for the Sidney area. DQN, E4G, and VEC can operate mobile units in case of emergency. RCT, at Sioux Ordnance Depot, is in full readiness just in case and will be on 3702 kc. The Panhandle Slow Speed Exchange has scheduled 1100 kc in operation with GDZ as NCS, sided by DQN and RCT. KXQ has a new B-5000, EXP is on with a new Siran. H7D added a 600 to his shack. BV5 has a new A-44 mobile rig. R7N, NIW, and WN6YOF are new calls at Alliance. UKZ visited in North Platte with good fishing reported in the Alliance section. WN6ROV and UKZ visited calls at North Platte. Any Novices interested in the Panhandle Slow Speed C.W. Net can contact GDZ at 1707 Third, Sioux Villa, Sidney, for rules, etc. This Net is run on 7 words a minute and handles any and all traffic. Traffic: (June) WZE 219, HTA 78, AEM 71, VYX 15, WR 22, KSW 19, WHM 25, KQ7 18, OFL 16, MAO 11, KVQ 10, QM5 8, DLT 7, NZG 6, Q5U 6, RFR 6, CBB 5, HQ4 1, HU5 4, VGY 6, REE 4, CBB 3, EBE 2, BEA 2, EYF 2, EUQ 2, GTW 2, I5V 2, EK6 2, FLA 1, PON 1.

NEW ENGLAND DIVISION

CONNECTICUT — SCM, Milton E. Chaffey, W1DFW — SEC: LFK, PAM: RRE, RM: K5Y, MCN, and CN-3340, CFN-3880, CEN-29,580 kc. Traffic men note: MCN, Mon.-Fri., 0445 to 0640, local time on 3464 kc., Conn., Mass., N.Y., and Pa. direct. Jim has put on an exhibit of ham radio at the Cheshire Fair in June. TYQ is back on the air with 500 watts and a full-wave antenna on 80 meters. QFJ has a new 14-Mc. beam. TXJ has 12,000 feet of copper wire buried under his antenna. FPS is on and says it's too. Traffic: (June) W1WZ 260, HTA 79, AEM 71, VYX 15, WR 22, KSW 19, WHM 25, KQ7 18, OFL 16, MAO 11, KVQ 10, QM5 8, DLT 7, NZG 6, Q5U 6, RFR 6, CBB 5, HQ4 1, HU5 4, VGY 6, REE 4, CBB 3, EBE 2, BEA 2, EYF 2, EUQ 2, GTW 2, I5V 2, EK6 2, FLA 1, PON 1.

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In addition, these plate powers are "Chloramite" treated, both coil and core, to protect against moisture and lamination chatter. Essential information on decal simplifies installation, and baked grey enamel finish adds distinctive good looks to amateur rigs.

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CORPORATION
167 Washington St., Boston 8, Mass.
KDF won the mobile hunt from nineteen other intrepid searchers, who bunched up by two a fine dinner of spaghetti and meatballs with salad. Ely and Salyon, both of the BRRF, called on your SCM as did Nat, HPB, Ruth, UQA, and Felix, their cell Summer was almost over and we start another season of ham. Good luck to you in the mobile hunts. Traffic: WILKP 119, OHT 90, BPI 60, UDD 22, AFT 18, BK 12, BVM 16, TGW 6, LHA 4, TVQ 2.

EASTERN MASSACHUSETTSES—SCM. Frank L. Baker jr., WIALE—BL is our Section EC. AWA is PAM for 6 meters. UE is IM for 80-meter c.w. and AQA for 40 meters. Eastern Mass. Net is on 3600 kHz at 7:00 p.m. through Fri. Appointments enclosed: DW Westwood, SKN Medford, QV4XW Medford, Q3G Abington, BBL Manchester as EGC, WAG, LIL, and NAJ 00 (as on 800 kHz as OBS; MX as OBS; PXH as BD). The Television Interference Committee of Greater Boston has been formed, representing the manufacturers, the broadcasting industry, the amateur fraternity, and the FCC. TWG is chairman, Jack Manning, W4KP, EWP, W4SP, etc. TWG and GMC are on the committee. JED reports that the Merrimack Valley Amateur Radio Club station, NBN, is on the air with the HT-9 on 160, 80, 40, and 75-meter phone. Also a collinear for 2 meters has been erected at the club headquarters on River Rd., West Andover. ZQ1 has a Gonset. The following radio clubs are here: Flutter, Sudbury, Satuit, South Shore, Arlington, Framingham, Walpole, El-Ray, and Yankee. Hingham went up to Williston, N. H. The South Shore Amateur Radio Club of New Mass. AMH of New Hampshire was on from c.d. headquarters. PXH, BGW, and BGH took part in the May F.M.T. Some new General Class hams: KP7Z Lexington, ZWH Aubournale, Y6Y Needham, KRF Lexington; Novice and Tech. Class: BTH Walhall; Tech. Class: BKF Peabody. The Bedford Radio Club elected KEO, prof.; NAD, treas.; VIC, secy.; and 80-meter c.w. traffic net has been in operation on 3600 kHz. On Thu., at 8:15 with QSOB as CCC and YFP, WYV, WMY, and SYV active. South Shore will hold their summer meet on the 3rd Fri. of each month at the Quincy YMCA. Deep Sea Dragnet had its penultimate at PVU'S QTH. LM is in Maine. WAI, Arlington, Mass., has a Viking II, 75A-2, which is doing well with 80 and 40 meter phone. WAI is mobile for the summer. Many old groups took part in the nationwide c.d. drill. Quincy area meet on 1A set up in the City Hall with most of the towns in Natick 5 on BL. BL was on at Region 5 Headquarters at Mattapan. MCR reports that BL had 92 minutes taken part with 29 stations, of which 24 were mobile and 5 fixed. MCR planned 5-meter operation to be an annual feature at Central Control on 2 and 10 meters. Col. Phan of the State c.d. office, visited the New Bedford Club. AEN has a Viking II, HBC-7, and a 75A-2. WGI and KBM are on the 3600 and BSW-60s. TUSZ has his Sonar mobile rig in a new car. OTZ built an emergency rig for 10 meters. RIV has a new QTH.

EHU is in Hull for the summer. First big group session, sponsored in the c.d. drill with LN, IVVN, WRT, WMY, VMY, TO, NUR, and VMD. LN was on 2 and 10 meters. He related to WMM on 10 meters and was referred to Sector Control in Lynn. PN writes he is still sailing for the Standard Oil Co. of N. J. aboard the SS Eso Lestet Lottie, but does not have a rig aboard. He is considering the hobby of collecting all of the early wireless magazines in complete sets. CPO is moving to St. Louis, Mo., for awhile. MW is out on Field Day but the gas generator failed. New officers of the M.I.T., Radio Society are 4YID, prof.; YFA, vice-prof.; Ralph Gagic, secy.; W2B, treas.; 900X, station manager. The Falmouth (Wales) Radio Club was out on Field Day. CLJ is rebuilding the rigs and will be on 40- and 80-meter c.w. and 10-meter phone. As EC for Norfolk he has BU, MGL, MDL, and WBB lined up with him and they were on during the big c.d. test. IBE is active on many nets. Traffic: (June) WTVS 401, UK0 225, AVY 85, WAI 20, BYE 28, EPE 18, CLF 15, OLE 1, LM 4, WU 4, MX 2. (May) WIFE 120.

WESTERN MASSACHUSETTSES—SCM. Roger E. Eyer, WYJTH, SEC; KDE, RM; BVR, PAM; RDR, WAM met 7 p.m. EDST, Mon. on 3600 kHz WCC has a new 60-watt rig using a pair of 807s in the final and VFO control. WDW finds that the higher he puts his antenna the more he works. WFR and YB, on vacation operating portable in the Catskills. WNIAJX is up to 26 states and also has worked 5B and WP9.

WN1ABD Eats WH6 as his best DX. TVJ drove the ED float in the Northampton Tercentennial Parade. BVE has been appointed Sector 3 Radio Officer and LRA is Deputy Radio Officer. RIJU now is KKSGM. TVJ has a new 80-meter antenna and a new mike and reports a marked improvement over his old set-up. ZEO, WNIAX, BAF, and EFC were among those out on Field Day. New officers of the PR are HRC, prof.; UJU, vice-prof.; 1W, treas.; TDS, secy.; WP9, ARW, and OIA key on the activities committee, while HPA, TDS, and LIL make up the new Novice exam committee. LEO is publicity mgr. EFC, ZD, and LUC had a very fine write-up in an editorial of the Southbridge Evening News for their c.d. work, RIJU operates a portable from York Bench, Maine, on 75, 80, and 10 meters during the summer and, when the bands were opened, helped out at the local post office. His newly appointed EFC renewed his EC appointment. Traffic: (Continued on page 90)
MALLORY DEPOSITED CARBON RESISTORS

Have High Stability for Critical Circuits

Many professional and amateur designers often overlook the fact that "fixed" resistors of the carbon rod type are not really fixed in value. As a result of ambient temperature changes and natural aging, ordinary carbon resistors can drift as much as 20% in resistance over a relatively short period of time.

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Your nearby Mallory distributor carries a complete line of these high-stability resistors. They are available in wattages from 1/4 to 2 watts, and in resistance values from 10 ohms to 10 megohms. You can get them with resistance tolerances of 1% or 10%, with identical stability characteristics. The cost of the 10% units is so attractive that you will find them economical to use in many instances in place of ordinary carbon rod units.

See your Mallory distributor for high stability resistors when you start designing that new circuit! If you would like full specifications, write to P. R. Mallory & Co. Inc., Box 1558, Indianapolis 6, Indiana.

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WITVJ 141, BVR 89, WCG 65, TAY 56, WEF 35, WDW 29, JYH 7, UVI 6, WCC 5, EFC 1, OBI 1, ZEO 1.

NEW HAMPSHIRE — SCM. Currier, WIGMH — SEC: BUX, RM; CRW: PAM; AXL, W2B has a new rig with a 4-12SA in the final. He has a code class about ready for examinations at La Salle Seminary in Woonsocket. CQG reports that he is now 9DEM. A new family (not in ZUR (Ann) and ZUR (Ralph). RZ5D is portable for the summertime in Enfield. The Manchester Radio Club has WUL on ARRL 198 just returned from a trip to New Jersey and calling on many local acquaintances en route. The following are new EC, MIS: MI, RF, RX, and USB, SSK has an FM mobile rig and keeps in touch with his XYL, who is W7T, while he is away on business trips. UNY spent the holidays at home over the 420 kHz. He is on the 420 kHz. Intended. In the two-day set-up "Club 73" handled almost one hundred messages at its traffic booth in the lobby of a local theater in Portsmouth. WUG has a rig set up at his summer cottage in Moultonboro, GMH had a fine visit from WBM, VXR, and his XYL. Traffic: (June) WIGMH 71, CQG 70, CDX 63, POK 69, GWC 65, KF 3, (April) W2J 68.

RHODE ISLAND — SCM, Merrill D. Randall, W1JBB—Acting SCM, Don Schwartz, W1RTR. JBB, Rhode Island SCM, is enjoying his annual leave until in March, taking a trip around the New England area. "Red" will be back next month. Traffic: (June) W1YAO 19, W4COY 11, W1JBB 5, (May) W1WA 27, BSN 22, YAO 9, TQG 7, TRX 4.

VERMONT — SCM, Robert L. Scott, W1RMA—PAM: RPR, RM: OAK. Vermont nets meet on 3806 or 3250 kHz. Field Day reports were received from TRX/1 at Sunset Lake, 20 operators 12 AREC: MEF/1, Woodford, EC at control. Others known to be on but not reported. BJR/1 is in the towers of a building inay, RQV and VVS have new Elmac mobile transceivers. CWB is back on the air on a 75-meter mobile and fixed. S. Johnsbury c.d. station now at the local broadcast station, WTWN, Thirty-two stations have been awarded W-VT certificates. RSA is AARC WTPN gets his blown-up power transformer replaced. UGW has a job with R.C.A., as engineer in Camden, N.J. TAN reports code and thousands as usual. Traffic: W1QAZ 9, RNA 90, ADF 85, TLI 17, ITG 28, TAN 11, EKG 9, VNP 8.

NORTHEASTERN DIVISION

ALASKA — SCM, Dave A. Fulton, K17AGI—The Elmendorf ARC held its Field Day at Mile 39 on Glen Allen Highway. Those participating were AKE, ATU, AXL, RDP, BEY, BOY, ATL, and WCG VP/17. This was the first Field Day for most of the boys and the score indicated plenty of club spirit. NARS members of the EARC have received some surplus 2-meter gear and should be on the air soon. The Anchorage Club operated AA, the club station, during Field Day and made a fair showing. A vote of thanks should go to L78K for his part in the Field Day exercise. Others operating during Field Day were the Kodiak Club, FA, and CO. Had there been a prize for key clinks we know who would have taken first place and hope the party or parties concerned take steps to clean it up. The SEC, TI, reports a very good showing for the o.d. test. W1KEE and his XYL are back with us and nice hopes to be signing MZ again. Traffic: (June) K1AAR 1531, PAP 255, LBL 6, (May) K1FAP 960.

IDAHO — SCM, Alan K. Ross, W71WU—Golf: W71WUS’s father was a V55. He says he averages 4 QSOs per day the first month on 80 meters. Bonner County: NJY went to VA Hospital in Spokane for a checkup. Kellogg: KB7 reports heavy QRN from power lines. Lewiston: IDZ reports that NOG moved to Lewiston, and is with the County Soil Conservation Dist. as an engineer, still. GEC is rebuilding, as well as being a W6 friend in the Bay Area. CTT works at the Atom Plant, Richland. AOO is going mobile in his station wagon. IDZ is building a 6-meter transceiver and converting the World: WN9SBK was in Boise for the summer. The gang from here, plus Mountain Home, Bliss, Shoshone, Dietrich, Meridian, Nampa, and Caldwell, gathered at Anderson Dam, with HPH and his XYL as host and (Continued on page 128)
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Actually it's a delightful malady and one that will mean increasing your enjoyment in "hamming" many times over.

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MODEL 20A
• 20 Watts Peak Output SSB, AM, PM and CW
• Completely Bandswitched 160 thru 10 Meters
• Magic Eye Carrier Null and Peak Modulation Indicator
Choice of grey table model, grey or black wrinkle finish rack models.
Wired and tested $249.50
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MODEL A
IMPROVES ANY RECEIVER
Upper or lower sideband reception of SSB, AM, PM and CW at the flip of a switch. Cuts QRM in half. Excited carrier method eliminates distortion caused by selective fading. Easily connected into any receiver having 450-500 KC IF. Built-in power supply. Reduces or eliminates interference from 15 KC TV receiver sweep harmonics.
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• Accessory Power Socket. Furnishes blocking bias for linear amplifier and voltage for optional VFO (Modified BC458 makes an excellent multiband VFO.)
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SUCCESSOR TO THE POPULAR MODEL 10A
• 10 Watts Peak Output SSB, AM, PM and CW
• Multiband Operation using plug-in coils. Choice of grey table model, grey or black wrinkle finish rack model. With coils for one band.
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Perfected Voice Operated Break-in with loudspeaker. Prevents loud signals, heterodynes and static from tripping the voice break-in circuit. All electronic—no relays. Plugs into socket inside 20A or 10B Exciter.
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Plug-in IF stage — used with Slicer, allows receiver to be switched back to normal.
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PS-1 NETWORK
Plug-in prealigned 90° phase shift network and socket available separately for use with GE Signal Slicer and SSB Jr. $8.95

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Bulletin No. 47—Crystals,

- Crystal, Frequency Standards
- Mini-Type Specifications

Bulletin No. 45-A—Solid
- Ultrasonic Delay Lines

Bulletin No. 46-A—Bantam 8X
- Crystals

- Standard Frequency, Ship-to-Shore, and TV Service

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HAWAII — SCM, James E. Kefer, KB9KS—The 1954 Field Day brought forth all the K16 clubs and several individual groups who put on a very active display. This should put K16 par milling well on the map! Fellow, I regret missing the May report because of pressing business, which makes it necessary for me to submit my resignation as SCM to be effective with this report. I earnestly plead with all of you who are ARRL members, seriously consider a suitable candidate for my replacement and to vote for him at the designated time! The following stations made BPL for the month of June: K2A2K, K2FPC, K2FOE, KB9USA, K2R7J, K2RDK, K2RHO, K2JAC, and K2AB, KBPLs for May were: K2FPC, K2RC, and K2AB. Last April BPL reporting were K2AB and K2RC, and Aloha. Traffic: (June) K2FPC 4504, K2JAC 1502, K2R7J 1297, K2RDK 1190, K2RHO 994, KB9USA 877.

(Continued on page 94)
The CD-2 is a combined 2 meter crystal controlled transmitter and double conversion super heterodyne receiver. It is designed for CD fixed and emergency operations, and is engineered to meet all the rigid specifications of the FCDA. The CD-2 is a rugged, quality constructed unit, dependable for the serious work of CD — ideal for just pleasant QSO'ing on two. Compare these fine outstanding features . . .

- 110 VAC AND 6 VDC OPERATION
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by Bill Cummings, W1RGM

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MODEL 20A MULTIPHASE SSB EXCITER

$249.50

20 watts peak output — SSB, AM, PM, CW.

Great new performance features plus all the time-proven characteristics of popular Model 10A.

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An SSB adapter that will improve any receiver.

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1. Harmonic TVI virtually eliminated through the use of linear amplifiers.
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150 JAMES ST., NEW HAVEN 13, CONN.


NEVADA — SCM, Ray T. Warner, W7JU — ECQ: KAA, LBS, NRU, TJY, and ZT. OPS: JOU, ORSA: MVP, VIV, YDC, operating K7FDB. Stued Field, continues to be Nevada’s most active traffic station with a total message count of 1122. Congratulations, Al, YVC, WN7VQ, and WN7VP are all new station transmitters in Henderson. PRM has a new Commander transmitter for mobile work and is experimenting with antennas. VIU made 133 contacts while portable on Field Day. CQW, of Las Vegas, again is active after spending several months in the South. Pacific, JU has a new Elmec mobile receiver and is all-band mobile 10 to 80 meters. Traffic: K7FDB 1122, W7JU 14, VIU 8.

SANTA CLARA VALLEY — SCM, Roy I. Counsel, W6ELO — At the writing your SCM has just been relieved from the hospital. K6BBD, of Santa Clara, has been appointed Asst. SCM to help out in such emergencies and to keep a record in this column. Soon I hope to have an Asst. SCM in each county of the section to help facilitate League activities and take some of the load off your SCM. Also to get closer with than will appear at the beginning areas of the section. Field Day has come and gone and I hope it was a memorable occasion. NU1 was chairman of the San Mateo group at the Dave news from all groups and persons. Please don’t be bashful or wait for recognition to seek you out. Don’t say something big and important either. Anything you would write a letter to the SCM and is fine for this column. Why can’t every club appoint someone to run on the news? In one point, there is a place for the AREC even when civil defense or emergency. The “honorary” ECQs ought to resign, and the fellows in each town ought to run for SEC Jay Amos, who is the new SEC who will be active. We can help you develop your AREC organization consistent with e.d. and RACES. AREC does not require you to be a member. Fixed stations with emergency power are extremely valuable. Why not sign up as a non-paying member, even if you cannot take an active part more than once or twice a year? Because of the slowness of the Oakville TVI committee, the FCC has started sending complaints direct to the amateurs although they feel that it would be far more effective if the committee handled the entire situation. Oakland hams are likely to have more trouble with TVI complaints than those in any other part of the Bay Area. Also, the committee is not sufficiently staffed. Mc, the present committee chairman has done a marvelous job for years, but the pressure of business is too much. They follow what they have been doing, but the congratulations. But Mc feels he is handicapped by not being a ham himself, and that a new amateur chairman should take over. I sure hope the Oakland gang will rally behind the new chairman. Lastly, a lot of the gang who handle traffic, especially by phone, never send in traffic reports. Again, don’t be bashful. Ask for a bunch of reporting cards, address and stamped, next time you write to your SCM. Traffic: K6EYG 204, W7NNP 237, K6WAY 189, BDF 158, W6QPY 87, HBF 31, YDI 13, ECN 11, TDZ 86, LUF 8/1, 07/8.

SAN FRANCISCO — SCM, Walter A. Buck ley, W6GGC — EC: NL. The SFRC held an Old-Timers Night at its June Meeting. AIIX took over for GGC, who was at Coyote for the Mission Trail Roundup. Many of the “Spark Plug Boys” showed up old-time radio gear and each gave a short talk on “way back when” days. An “Old-Timers Night” will be held once a year at the request of all the gang. The SFRC had a very able repre-
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International Crystal, first to offer nationally advertised One-Day processing of small lots of commercial crystals, now offers the same service to amateurs for spot frequency crystals.

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.01% TOLERANCE—Crystals are all of the plated, hermetically sealed type and calibrated to .01% or better of the specified frequency when operated into a 32 mmf load capacitance.

ONE-DAY Processing

Orders for less than five crystals will be processed and shipped in one day. Orders received on Monday thru Thursday will be shipped the day following receipt of the order. Orders received on Friday will be shipped the following Monday.

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In order to give the fastest possible service, crystals are sold direct and are not handled by any jobber. Where cash accompanies the order, International will prepay the Air Mail postage; otherwise, shipment will be made C.O.D. Specify your exact frequency and the crystal will be calibrated to .01% or better of this frequency with the unit operating into a 32 mmf load capacitance.

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75-40-20-15-11-10 meter bands with one streamlined antenna! No external taps or projections ... no plug-in coils!!

The original Band-spanner design remains unchanged ... time has proved it's effectiveness. The top whip however is now fabricated from stainless steel. This new whip stands up under the roughest mobile service, retains full flexibility ... eliminates plating flaking ... assuages the user of maximum rust resistance by the use of precision-tapered solid stainless steel.*

The Webster "Band-spanner" is essentially an effective, Center-loaded Antenna with the loading inductor wound directly on the upper portion of the fiber glass support column. This inductor has sufficient turn to permit resonance at the lowest frequency band, (75 meters) with the particular top whip used. A unique Webster design offers a portion of each coil turn to be internally wound. The top whip is arranged to push down or pull up from the inside of the loading section. This whip has a circular conductor offset to its lower end and this conductor provides positive electrical connection between the bottom end of the whip and the internally-exposed loading coil turns. The whip may, by merely raising or lowering it, be "Tapped" on any desired portion of the loading inductor. This type of continuous adjustment of the loading inductor permits exact antenna resonance to be achieved anywhere within a given band, minimizes loading problems, assures most efficient operation. The complete arrangement is self-cleaning ... tends to hold the whip firmly at any pre-set position. The overall effect is neat, streamlined, mechanically sound and study.

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Lightweight (Total weight less than 2 pounds)
Top whip push-in complete for in storage or door clearance.
All parts individually replaceable.

DIMENSIONS
Overall height (whip fully extended) 99".
Column extensions are available where greater height is desired.
Height, support column including loading section, 62". (Minimum height.)
Diameter support column, 1".
Diameter loading section, 1 1/8".
Diameter top whip, 3/4" for 24", (adjustable range) tapering to 1/4" at top with 1/8" (approx.) cone ball.
Mounting stud 1/4 inch long, threaded 14-24 SAE.

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sentative at the San Jose Convention in LOU. The SFSYRC held its meeting with the discussion of the annual picnic being held in August. The Tamalpais Radio Club still is looking for a permanent meeting place for monthly club meetings. The 36ers shopped up at San Jose and with 18 mobiles going out on a 10-meter hidden transmitter hunt. The Mobiles, local Bay Area 75-meter mobile gang, held their semi-monthly breakfast at the 10-Meter Hotel with 79 members attending. No report was received from the Humboldt Club this month. QMO, president of the SF Mobiles, attended over the meeting at the convention at the request of CEE, Vada Letcher, president of the YLRC. The CRCRC was housed to George Hartz at the regular meeting, which was held at Albany. The John O'Connell Radio Club held Field Day at Diamond Heights, as did the 36ers, who copped out with the boys said they did real good and learned a lot of real hamming on the trip. The Mission Trail Net also had breakfast at an exhibition over the convention with most of the Bay Area check-ins attending. The AREC is busy on the air every Sun. A.M. with more calls adding to the list each month. The San Francisco Section Net also is adding calls to its 8-meter c.w. check-in list each Mon. night under the able direction of NL EDY and all. More calls on the new still, BBS, wildlife the recent convention. Congratulations to JZ, HC, FON, and WGO on the wonderful activities program they had at the San Francisco Convention. Congratulations to QTO, QMO and K5FCT on their BFL traffic totals for the month of June. ATO reports that PBS, Charles Bay, is a recent addition to the TV Committee. GGA reports a fine score of 2.9 parts per million on the May Frequency Measuring Test. Both PHT and QMO report fine outlets for Alaskan Club. QMO reports a three-day PHT traffic. PHT reports a fine outlet for traffic to Japan, Oregon, and the East. K5FCT was off the air for two weeks while overhauling the operation of the generator. He did a good job for the SFSYRC on Field Day, 12 hours without a stop. The following clubs had good turnouts for Field Day: SFSYRC, M. Rose-SF, SHIL and Las Balboa Park; SFSYRC, Windy Hill at KRON TV station; BERA, Mt. Davidson; QRM (O'Connell School Club); Mt. Davidson, etc. The YLRC has a new station KNSGD, Eda Hill. She built her own Heathkit transmitter. Congratulations to HST, who married Lillian Blackburn the 16th day 29th. We enjoyed meeting station 8TSN and George Hartz, National Emergency Coordinator. Traffic: W6DKE 11140, PHT 778, K5FCT 7440, WQMO 5200, GGC 50, MWF 54, ATO 6, GQA 3.

SACRAMENTO VALLEY — SCM, Harold L. Lucero, W6FDN — SCM, this month's report was on his new station. The SCM is on the air and the SCM is in the air. We should hear more. GDO, our expert from Sacramento, came in second in the hidden mobile hunt on 75 meters. Great job, Betty. W6BDD, is high with traffic and is doing a wonderful job as Official Bulletin Station. George Hartz, of AREL, Headquarters, paid the Sacramento and the Redding Cone a visit and explained the Traffic System and emergency operation of amateur stations. The AREL President attended the Division Convention and during this convention, the SCM section members attended the SCM section Convention in San Jose. Wish more could have as it was really worth while. We have a very fine hill from Headquarters and hope to have it as soon as possible to the v.h.f. operators in the Sacramento Valley section. Traffic seems to be quite low, but this probably is because of the vacation period. With the coming months it should pick up, especially after the talk by George Hartz. Well, gang, this is the smallest so far and hope to do better in the coming months. Fellowes, I am leaving it up to you for more appointments in the section. Traffic: W6FBF 867, JDN 6.

SAN JOAQUIN VALLEY — SCM, Edward L. Bently, W6GOW — SEC; KRO, RM: OPU: PAMA: ZRJ, WJF. The main activity in June was Field Day. From the reports I have received so far, this year was a little better than last year. We know of five groups in the section that participated, and I am sure there were some who did not send in reports. Most groups found that 40 dropped, where 35 was up, 75 and 80 meters more than made up for it. In spite of poor conditions, all participating groups are finding that better organizing, better trained operators, and improved equipment, and improved better results each year. We have word that KRO is moving from this section. He has recommended EBL to replace him as SEC, and we hope to have him at his old work. Many thanks, Bill, for the good work as SEC. The Merced group, with the aid of ZRJ, EC, is getting well organized for e.d. work. A local emergency team of 5 was out on June 4th proved a big success. K6DDU, ex-6C1B, will be on the air soon with a Viking. Our former SCM, who moved to another state, is now settled in New York and has his old call, 6FYM. Howard soon will have his gear set up and on the air. The American Legion Net picnic at Visalia was attended by a great crowd. The next meeting of this section will be at FEA, GCS, GYU, GRO, IEM, KNY, NGR, SJF, SNF, WJF, and WUD. New officers of the Turlock Club are GYN, vice-pres.; ERE, secy.; K5CMT, sgt.
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to the West Virginia hams who participated in the last 1/4 test. Traffic: (June) WAUL 350, G8Y 98, NYH 49, GGG 48, MBA 43, HZA 28, ISB 24, KQD 14, PQQ 5, FUM 2, (May) WAUL 374.

ROCKY MOUNTAIN DIVISION

COLORADO — SCM, Karl Broegegger, W4CDX — SEC: MMT. K4WBN will conduct Novice and General Class theory and code classes starting Sept. 21, 1955. He is interested in details calls Lee at Empire 6-3522 Ext. 610, Fitzsimmons General Hospital. The Convention was a success with over 200 registrations. We all want to thank the Denver Radio Club and those who helped for a real fine job. WLZ and WRO received distinguished service plaques for their unassuming work on behalf of the Convention. IUH has moved to Pueblo. KHE has been QRL around the house and has turned in a large goose egg for June traffic. R4TA has 18 reports from and to the other RPL. THZ is on 50-meter c.w. with a new home-brew rig. DRY has added a SCR-294 at home for c.d. AGU has a new 2-watt mobile. A new net has been called the Hi-Noon Net. It meets at noon every week day on 3045 kc. Don't forget the Coffee Club these at 2955 kc. every morning from 0900 to 0730. Last winter the net did some very fine work disbating Santa Fe trains when the lines went down. The net covers California, Colorado, Arizona, New Mexico, Oklahoma, Texas, and Louisiana. The net as a whole did very well with all mutual aid areas in operation. We have been doing a fine job and has gotten EC's for all areas. New ones are: KQJ, QL, QNN, QNC, QP, QVH, QSD, QZ, QRC, and QAA. Brush Traffic: K4FAU 1620, WBD 1215, FAM 762, WBE 395, WZTA 358, WBK 178, QLD 47, UTAD — SCM, Floyd L. Hinshaw, W7UTM — Three Field Day groups report activity in Utah this year. The Ogden Club had twenty twenty-a, the Kay Club had twenty sets, and the Bountiful Peak, 1950 feet high, with two transmitters. The Salt Lake City group operated from Murray Park, also with two transmitters. SCM received a report from the Ogden and Kay Club groups. JPN is on vacation in the East. SF now has his 2-meter transmitting and is looking for contacts. Operation Alerts appeared satisfactory from the standpoint of liaison to regional headquarters and also for state coverage. More power is needed at the configuration, but given the trend of things, the test by TCC, BSE, GPN, TME, ZN, LHZ, MQO, and RUP, Traffic: (June) W7UTM 23, QD 5, (May) W7TMK 68, QD 5.

SOUTHEASTERN DIVISION

ALABAMA — SCM, Joe A. Shannon, W4AM1 — SEC: ISD, RMI: KIX, PAM, RNX. New appointments in the section are W4GS as QSO and W4NYA as RW for Auburn. Three clubs report election of new officers: Birmingham — DLE, pres.; Y3X, 1st vice-pres.; KRL, 2nd vice-pres.; KNN, secy.; WLM, asst. secy.; WJB, treas.; WJW, asst. treas.; RBB, comm.; W4CS, and W4N. Mobile — W4CS, pres.; W4M, secy.; WJW, treas.; W4N, and W4E. Montgomery — AENB (e.w.) Net meets daily at 1900 on 3575 kc. AENB (phone) meets daily at 1830 on 2055 kc., and on Sun. morning at 0000. AENB night meetings meet Net meets Thurs. at 1900 and Sun. at 1300 on 2950 kc. AENB reports that 170 stations reported during in June with three members: YXX, Q8, DQA, and W8B. AENB reports that 67 members are on 75 meters back from new QTH in Anniston. WOG is working DX with new folded dipole while TOX continues his building. He has finished two ccw-controlled converters for 75 meters which work! USM is now meeting IUP Traffic: W4WOG 101, KIX 75, TX 37, USM 55, RNX 46, BJZ 39, BJL 35, EBZ 29, KG4 29, K4Z 27, K4V 25, AENB 24, VY 13, (May) W4ZAR 65, UHA 58, YAI 41, USM 42, BJL 17, BFL 13.

EASTERN FLORIDA — SCM, John W. Hollister, Jr., W4FWZ — Typical of AREG in c.d. "Operation Alert" was Wade Emergency Net as reported by RBD. LBN has 5 mobiles going. Operators included IYT, PSB, and BXX. The Kc. Kc. held its 100th meeting with WS (charter member) in charge. About 72 members for neighbor is on R4W. R4W is new MO and PNA is easy. RWM did a swell job during his tenure as MO. Now is the time to plan on getting into the c.w. traffic net. See DNB's, reports. AEX reports DNB. RWM reports the c.d. station being enlarged. Deland: RYU is using a Heathkit on 80 and 40 meters. Englewood: R6T is using VP 200 with 40-meter beam. Ft. Lauderdale: 80-meter beam. DNB reports an FB plan for communications for the Gold Coast Marathon. Key stations will include MVR, SDNJ/MJ, RHH, LFL, PPL, RJR, and the Florida Dream. Net. JVP reports a large turnout for the c.d. test. IM, our SEC, says he is really proud of the AREG. Gainesville: JUU reports a W3 Florida station needed in the Tropics.

(Continued on page 108)
PRECISION AT EVERY STEP

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When you buy it, your Pan-El quartz crystal is sealed in the plastic case shown here; clearly labelled, and with the frequency stamped on top of the holder clearly visible through the plastic. We have taken one apart to show the jeweller-precise, shock-resistant mounting, and how the electrodes, of gold or silver, are bonded directly to the crystal. Each crystal is carefully brought to frequency, triple flushed with dry nitrogen, hermetically sealed in a nitrogen atmosphere, and packed as pictured, ready for you to choose your desired frequency at your dealer's counter.

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P-18A 3500 to 4000; 7000 to 7400; 8000 to 8400 to the nearest integral KC..............$2.75 each

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All with .09" pins spaced .486" to fit FT243 sockets, except as noted.

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Net, that ZQI is ANCS, that TKE moved up from St. Petersburg (on 50/144 McF), that OEX built cascaded 144-Mc. converter for the club, and that WEG has gone to J-Law. Only Hill, AYD and a new 20-meter beam, and that DRY is on 20-meter mobile. Jacksonville: WXZ is the YTL of COW. MARS c.w. frequency is 3347 kc. Field Day was held at the lake cottage of RTU with NNK, RJR, UWE, HXR, QGJ, NJ, AT, EWM, WEF, ZBE, BCF, BXT, and others. UHE reports 135 messages handled on special Armed Services Day booth. KQQ reports: ZUS is using Elman AF-67/PMRA-8A. Miami: DFC is setting QSLs for members from PAA. PBB reports none 144-Mc. activity including ITW, BSN, KQG, KTH, and KQX. KIT reports plans for a Tri-County AREC drill for RC. Club officers are AZO, IEH, WYR, and QLC. KIT reports 105 AREC members. Oceaneer: KREC reports VM using Elman mobile. St. Petersburg: From the clippings sent often by EYJ. I think St. Petersburg is the publishing center. Traffic: W4XRS, W7R, W5C, W5R, W4YUW, W7A, W4LE, W4MG, W5J, W4LV, W5J, W5R, and W5LE are busy with 75 meters. MUX is editor of PARO Ham News. W4JZ is taking over the problem of obtaining the Piscataqua High School Radio Club station license. JFR is setting up new in a new shack. RKF is giving 10 meters a whirl again. RKF and RWF have about 50 meters in the section from down at the store. UTB/VEB are on 15 meters as K2UJS. SOH has completed the shack. TXZ/VEZ has the beam going. WBFM on 10 meters. Mobile Hamfest. ROP has been busy testing gear. RDF works 75 meters late at night because of working hours. S275A has left for YFF-Land. NOX/NYZ won a 4-250A at the hamfest. Please get in touch with PLE or AOB if interested in c.w. work. Traffic: W4MKS 9.

GEORGIA — SCM. George W. Parker, W4AEK — SEC: OPE, PAM: LXE, RM: MTS. Neta: Georgia Cracker Net meets on 1016 kc. at 0800 sun. and 1900 Tue., Thurs., Mobile Round-up Sun. at 1300. Mobile operators are scouting all over the Atlanta Area. DMO has a new 10-meter net. ORC has a new 10-meter fan for 20 Telrex. ZUR is building a 30-meter fan, WUB, from Massachusetts, was a guest of ZD. PMJ is back in Atlanta. Recent openings on 10 meters are not all that they are. DMO has a new mobile rig, kilnace throughout. NS is building a new mobile rig. G4R is a new ham at Ft. McPherson. LNB has completed a pair of 4-125A fans for a kw. on 2 meters. WN4FED is new in Danville and active on 80 meters. WN4QF is new in Cedartown. The Cedar Valley Club participated in its first Field Day. ARH now is active on 40-meter c.w. OCG is off the air because of illness but will be back. WN4RXY needs more for a W4. Summer ORN has brought a dearth of reports to your SCM. Don't forget that your appointment contains with it the promise to send a monthly report. Appointment rates are available as AO, OBS, OPS, and ORS. We also need contributions. Contact the SCM or the new SEC. U.B. Abbott, OPK, 890 McMillion N.W. Atlanta. Traffic: (June) K4KVR 130, K4WBP 109, W4QCG 54, HYW 12, CAZ 39, M39, ARH 15, MA 14, WN4FED 12, WN4BV 2, (May) W4NTS 24.

WEST INDIES — SCM. William Werner, KP4DI — SEC: HZ. On June 14th-15th c.w. "Operation Alert" amateur stations were set up at Red Cross, San Juan, City Hall, Rio Piedras: police station, Puerto Nuevo; and Central Park, Gurabo. PW, PD, DJ, MJ, CV, MV, NZ, MG, RC, LI, RR, and USA were at these stations, while EY, RONE, and FAC, Ramsey A.F.B., handled traffic to FCCDA in Washington. QM provided real emergency traffic from Mayaguez to Red Cross, San Juan, when a flood threatened Mayaguez. AZ at Ensenada sent c.w. traffic to Gurabo. The PRA held a Field Day at San Martin using three Viking IIs and three 75A-3 receivers, TO, RC, RM, DJ, YM, MV, TF, AZ, WU, ZL, WN, UW, ZR, ZR, TZ, SV, PW, and GR9MD were present. It is oversaturating the 600-watt emergency power plant of KP1HD, the Caracas station, TO's XYL received General Class license and the call ZL, PF received Flag Chevrons. Certificate to RR is now an ORS. D.V's frequency measuring skill is 0.0003 sec or 3 cycles of error on 7-Mc. measurement. CO2R6 note received from the Cuban Emergency Net, which he is the NCS. Arrangements have been made for the exchange of daily weather information between Cuba and Puerto Rico during the hurricane season. Cuban stations participating are CAMIC, Prov. of Pinar del Rio; CORCH.

(Continued on page 104)
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Model SS-50
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Complete with Tubes, built-in Power Supply (less speaker)... $149.95
Speaker in matching cabinet $11.00

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Model 20 A Multiphase Bandswitching SSB Exciter

Has new performance features, plus the proven characteristics of the popular Model 10A. 20 watts peak output. $SSB, AM, PM, CW............. $249.50
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Prov. of Havana; COSPN, Prov. of Matanzas; CO8ED, Prov. of Santa Clara; COYK, Prov. of Camaguey; CO8DL, Prov. of Oriente. Cuban National Net frequencies are 7200 and 3750 kc. P.R. Emergency Net frequencies are 7205 and 3755 kc. The first three calls in P.R. have heard is WP4AAB, Río Piedras. WP4WS and WP4WF are regular visitors to NCO KP41D on Wed, WP4KMI and son, WP4KG, spent several days in KP4-land. The Antillas Net schedule has been changed to 7 A.M. and 6:30 p.m. on 3805 kc. Members of the South Puerto Rico Amateur Club are purchasing six 2-meter Connet Communicators for local network. WP4WS also will have one in San Juan. The most active mobile on all bands is W7/KPRZ. WP4FM improved modulation by replacing 810a. Transmitters: KP4HZ/KP48, RX 6K, ID 51, PD/KP4 43, USA 4, ES 3, VC 2, OA 1, PF 1, QM 1.

SOUTHWESTERN DIVISION

LOS ANGELES — SCM, Howard C. Bellman, W5YVJ — SEC: QW; RM: BHG, GJP; PAM: PIB. At this writing messages have been received from Field Day entries KS7I, TOC, KGCX, ROJ, ZAT, CG, M8O, KF4B, K51S, 15, KF8L, LS, K5FCX, CED, CLZ, and K5NEBK. We learned that CILX, a non-Observer, qualified in the May P.M.T. on Field Day. K50EH worked his first contact in Sweden. He reports that the Teen-Age Cactus Net, 7270 kc., meets at 1300 PDT Mon. through Fri., during the summer. Congratulations on recombination of LSN, Len., ZDO, who was one of the few on 430 Mc, on Field Day, reports he heard Yuma Airport on 433 Mc. on a half-watt transmitter on each of three nights on early July, Cactus 3 lived on Camoga Park, M1Z has sent out invitations to those interested to join him in forming the Southern California Electronics Interference Committee, and the suggestion of the local FCC office. The purpose will be to make available "relief or counsel to anyone confronted with an interference problem." Interested amateurs are urged to contact the call K5GEO, UBD, of Eagle Rock Radio Club (telescopes style), report 9 members of the Club operated at QV on Field Day. K5BEG wants to know how to find the name of the telephone operator who announces the time on the record. He needs her name for his log, JAU, of Sunland, comments: "Only activity as present is 20-meter SSB, no other patch traffic from Far East and Europe." In a telephone conversation with Jerry, I learned he practically owns 50 meters himself, what a bunch of night operators. Jerry says that K5BAG, the Pacifico Club, bit off over 10,000 points in Field Day, MBA reports So. California DX Club's band is well represented. V.P. 7vy, p.s.: N6BA, W5TQ, K5FC, F5, fun and traffic. Traffic: (June) K5FCY 782, W5GJP 684, USF 328, LDR 300, HJK 107, K7EA, 78W, WB6BGR 58, WMG 48, 498, ORS 56, UED 18, AM & N 7, Q, W6MWB 128, K5CST 111, Y6H 99, LDR 38, MBA 25, FIB 15, FA 14, (Apr.) W6BWI 859.

ARIZONA — SCM: Albert H. Steinbrehner, W7LVE — Asst. SCM: Kenneth P. Cote, 7Q9H; Dr. John A. Stewart, 7QX; SEC: GJF, PAM: KOY. Over 100 stations, representing 26 communities in Arizona, participated and handled over 185 messages during "Operation Birdwatch." IRX acted as NCS, with JXH located at field headquarters, and KOY and MA8 as relay stations. It was a job well done. Civil defense "Operation Alert" was well covered throughout the state. However, your SCM received only one report: from the Tucson Group, which handled 116 messages with the following stations participating: SPR, HUV, PLM, DJC, QRC, OEQ, DEQ, LHO, LAD, LID, LHY, LFT and VZJ. Field Day this year saw several groups scattered around the State: on Mt. Lemon, near Tucson, were QRC, VJL, JG2E, working mostly s.w.; LAD, HUD, LID, L5R working "phone" and TFG and 7 operators in town. SUI and one operator were at Coles Ranch; and OPF and 28 operators were on Rincon Mountain. We regret to report the passing of W7NTYB, Phil Fleckas, New Novice; WFQ, The OprC elected PEG, press; NYT, vice-press; and LAD, any-treas. Appointment: Please send in activity reports. Traffic: W7KSV 79, SUI 84, IRX 28, RUX 10, LVR 5.

SAN DIEGO — SCM, Don Stansifer, W6RLU — Asst. SCM: Tom Walls, 6EWH; Shelton, 6DID; WA6WAM; Dick Huddleston, 6DID, SEC; VFT, ECG: BAO, B2C, DEY, DLM, FHJ, HFP, IRX, IBX, K5L, KUV, WTA, RM: ELQ. The San Diego County TVI Committee now has FAY as its head. All TVI complaints should go through P.O. Box 5237, San Diego. Congratulations to the 10-meter (Continued on page 169)
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AREC group under WYA, the EC, who furnished communications with 22 mobile units at the 4th Torrey Pine State Car Road Race. Those participating were 1KUH/6, 6AAY, K1AB, K1AR, K1AFL, WAP, PKP, CDR, K2D, DGB, G1X, W618BP, K8AZW, W6P, WYA, ZUM, SR, Q0, 4EN5/6, 9TWA/6, and 6DIIU. K9DBG now is active on 144 MHz. W6LQ is back on 20-meter working DX after touting. His latest DX includes O1MSV and 7811XK. JMD has left the area and will be active from Ohio as W8. A new club, the North Shore Amateur Radio Club, was organized in June and elected the following officers: KG6JIV, pres.; SIZ6, vice-pres.; and SK6, secy. From reports received all the clubs in the area enjoyed Field Day and a good time with much operating of varying degrees was experienced. Another new club, the Rohr Communicators, recently elected the following officers: UG6K, pres.; EC6Y, vice-pres.; Van der Hyden, secy. The Club is active 160 through 2 meters. DQN put in two weeks in the Navy after completing summer school at U.S.C. KBNR finally has his 80-meter pile up going. Congratulations to IAB, whose traffic total for April topped the list for the country. The SCM welcomes news from clubs and individuals via the telephone, mail, or the air prior to the 7th of each month. Traffic: W6LQ 1010, IZ8575, K9YB 159, DBG 18, W6CW 3.

SANTA BARBARA — SCM, Vincent J. Hagerty, KG6IOX — Emergency Coordinator KFM reports a fine turn-out for the June 14th drill with 27 operators in attendance; eleven mobiles on 2 and 10 meter participation. An emergency power unit was in service at the control station. Three XYLs were in attendance at the drill. FYW reports the Paso Robles Club made 26 contacts during Field Day operations: BIY, BOZ, BRY, FYW, YCZ, MSW, T06Q, BOZ, OXJ, and K6NBRZ took part. KG6SA reports that the Ventura County Radio Club made over 600 contacts with its Field Day set-up. K6NBI was the sole traffic rover for the month. The Santa Barbara Amateur Radio Club reported by radio to the SCM from its operating base on La Cumbre Peak during Field Day operations. Traffic: K6NBI 244.

WEST GULF DIVISION

NORTHERN TEXAS — SCM, T. Bruce Craig, W6QJD SEC: RRM, PAM: IWQ, RM: PUN, QH7, IWQ is recuperating from a recent hamslop, belonging to the Civil Defense Planning Committee are CVW, KVA, FIR, SLL, UXF, YKU, and Chairman and EC for the Tarrant County, CVA, UXF is the NCS. The Tri-South Amateur Radio Club at Borger reports the following new officers: TA, pres.; ZKL, vice-pres.; NDD, secy.; and PSZ, TVI chairman. The Club has a Hutchins County Emergency Net on 28,729 kc.; the mobile calling frequency is 28,990 kc. YQ0G has transferred to Waco from the Oklahoma section. AQN now is in Amarillo, having moved into the section from Madisonville. LGY reports the following new name took part in Field Day at Bonham State Park: LGY, TVG, TRM, VY7, GZU, RKL, TMB, TMW, LML, LLS, MJN, SQT, ATG, RUM, UCO, and KUC. LGY took part in the mock bombing of Dallas, ZWR has moved into the Northern Texas section at Levelland, from Tulsa. RO2G has to have a traffic report from RDG, indicating that he is on the recovery road. N1G vaccinated in Northeast New Mexico and ran up a good score of 24 stations in his home town of Lubbock. JQ9D failed to get more than half that many when he was working from a temporary in Culberson County, Texas. PTK is vacationing in Louisiana, where he will visit PTO. ZOK is on vacation in Colorado. Traffic: (June) K8F 724, W7PM 292, UCO 194, UHF 128, KPB 116, YK3 30, TVX 28, CRM 27, DYU 18, RDG 18, YXR 16, ZWR 7. (May) K6F7 444, W5LY 6.

OKLAHOMA — SCM, Dr. W6P, W6QV; VHRST — Asst., SCM: Ewing Cendy, 60JQ SEC: CEG, RM: GYS, PAM: SVR, ROZ. New officers of the Layton-Fl. Sill Amateur Radio Club are FSC, pres.; RDE, vice-pres.; PHIL, secy. Your SCM attended two fine picnic hamfests, one at Tulsa and the other at Quartz Mountain State Park, north of Altus, and met a lot of old and new friends. AOX has been going to hamfests for years hoping to win something worth while and he finally hit the jackpot, the prize of a pocket transistor and a pair of earphones. The best thing this month was Field Day, with most of the clubs and many individuals throughout the State proving their portable gear again having a good time even if the weather was not near the top. GJQ has moved to Enid to become farm program director for the new TV station. GJQ's mobile was put to good use when he was flagged down by a woman whose husband was having a heart attack. Help was gotten from the highway patrol via Hutchinson, Kansas, and amateur radio. Farm activity is at a fairly low level because of hot weather, summer static, vacations, etc. SCO is on the honor roll for OES reporting regularly. The Oklahoma 5-meter group has its share on the transponders. Traffic: WRC 386, PML 387, WQ 42, KY 34, TNW 29, SVR 26, SWJ 25, ADG 19, MXS 15, RST 15, FEC 13, GJQ 12, GYV 10, EHC 4, PNG 4.

SOUTHERN TEXAS — SCM, Dr. Charles Fermaglich, W6PJP — As yet there is no complete report on the amateur activities during the recent Rio Grande food. As far as the boys did a great job, I heard one fellow say, "I wish I could

(Continued on page 108)
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have done something — I just listened and didn't transmit, because some others were handling the traffic." This man did a lot by standing by until needed and not QRMing the stations that were handling traffic. KBW, who is now taking reports, QIE, LSO, ZINT, OOG, OXO, QEM, QFZ, LOW, YTB, FPE, N2R, and BBO stood by and handled traffic. Many groups in southern Texas were active during Field Day but there should have been more. Next year we should make a concerted effort to have a larger turnout. Listen for our new kW. I will be happy to work you on 70 now. KBW is now single sidetone. LSE has a new kW, and is starting on another one. NOD is heard on 75 meter mobile and is bringing up a new 400-watt rig. OUG and his XYL was up again with a new baby boy. BHO and family vacationed in Colorado. EKT, one of Houston's new hams, now is an OES. JTG is moving up still in October, NNJ still is messed around ADZ. "I ain't doing nothing." TFA and 805K are preparing gear for the ninth rocket test. The last time they decapitated a cow. The second-stage rocket is expected to reach an altitude of 100 miles. URU is going to town on 40 and 75 meters since repairing lightning damage. ZBK is working 75, 40, and 20 meters with a vertical on 40 and 20 meters. YUJ has a new kW. URU has an FM mobile signal that really gets out. It is with regret that we report the untimely death of Ralph Levy, BHY. Traffic: WAKZ 19.

NEW MEXICO — SCM, G. Morton Sayre, W5ZU — PAM: BW, V1IF. PAM: FPB, RAI. JTF. Field Day found most New Mexico club stations very active. Sandia reported 432 contacts. Mesa 403 for 2616 points. Pecos 1407 points. In the practice alert on June 14th, 37 stations reported 38 2686 ke. On June 23rd, 27 stations were on PLK, mobile, reported a fire in the Sierra Ludronne, and prompt reporting was made through the 38 2686 Net. Three weather measures for A.P. bases in New Mexico were handled during the test. Only Albuquerque and Los Alamos had city cards, with others helping. QO relayed traffic from boasting to Lovington Station Officer. In the May P.M.T. QRO, 4.4 average error per million on two observations; AF 33.8 average, error per million on three observations. CEGG made Official Bulletins at 1745 MST, Tues., Thur. Sat. at 38 2686 ke. NSJ completed c.e. converter for 420 Mc. RDK has completed 1960s crystal rick size on 1960s rick size. YPI, FPB, UBO, and WNL now have Vee-Dr. CA-34 sixteen-element 2-meter beams. EYK is now on 2 meters. GIA, EQA, and YPP have QSO Communicators. SUV and GYS are the only hams left in Gallup. JFT had to leave Galup for health reasons. RRF has a new sixteen-element beam on 2 meters, His and another worked FAG east of Albuquerque 60 miles through or around Sandia Crest. The New Mexico Breakfast Club had 38 2686 ke., still is very active. REE, VE1Z, GIA, RFE, W2Z, W2ZT, VZU, RZU, VZT, Z0XZ, Z0YN, VZT 10, R1K 17, B3Z 18, B5X 10, E1Z 10, CX9 9, OME 9, BAG 8, SQI 9, GIA 4, BHI 3, W5G 3, FRP 2.

CANADIAN DIVISION

MARITIME — SCM, Douglas G. Johnson, VE1OM — Asst. SCM: Fritz A. Webb, DB, SEC: RR, EC's: ER, DQ, WO6U, PAMs: OC, VO2N, New OES is W7SNR/VOB. Halifax AJR remembers taking part in "Operation Atlantic" as were RR, TK, OM, PB, IQ, WL, Binkis Fisher, GC, and PC, and mobiles WP, AW, and NO. EC ER reports a successful excursion. Best wishes to JE, on his XYL on his recent marriage. EY, FE, and OM are active on 50 Mc. HB was a recent visitor to Halifax. DQ has moved to his summer home in Grand Lake. POE is the captain of the club and individuals active on Field Day week end: VE2KL: NL, KK, AAM, GO, FV, JO, LC, VN, ND; VO6U: ID, LD, LD, VE1IM, VY1, VE2C7Y, VQ1; VO6UE: G2F, WIP, and G3VW are the best along yet. Bوعنشت يتAW and her OM, Doug, for a fine hamfest on July 3 and 4. About 100 hams and families attended. W2GO and his XYL were vacationing from outside V51. VO2N reports the Labrador Net meets daily at 2300 on 3780 ke. for the summer months. Other nets, please note. Corresponds to VO1OY at VAC and W6UW at 4KVM/7. VE1OM reports the OES is working out PB with a.a.b. phone on 14 Mc. Jim also went out on Field Day under a single operator status. Tidnish 242, VE10Q 204, VO6U 38, WO6U 65, VE1U 55, VO1T 45, VE1ME 31, VE1DB 6, VE1OM 6, W5MV/5, VE1Z 2.

ONTARIO — SCM, G. Eric Farquhar, VE3A — Another Field Day has passed into ham history. Good weather was enjoyed by everyone at all locations. With competition everyone awaits the publication of final results. Participation in the event drew operators from many directions. Several were not entitled to VE-Land but the event; like us, we know of one VE3 who flew from the West Coast and made it in time to take part. We welcome to hams radio bridges, the call of NG, who got her ticket and called the BUR on vacationed in Connecticut, and JU went to North Bay and the Soo. AJR and DNV operate from summer cottage. AJR reports the Quinte Club has purchased a 150-kw generator. DPV spent July and August in camp at Haliburton. VE3C is NCS twice weekly on 38 2686 ke. on OSN. BQV visits Mexico. BSW completed a static charge, and tracer. CAB turns in an interesting OES report. We join the Nortown Radio Club in expressing appreciation to Bob Mitchell, BHF, holder of OES appointment, for his untiring (Continued on page 110)
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WIRE STRIPPER   WIRE CUTTER   WIRE CRIMPER
SARVES — time and money
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Lakea, W2LDN/VE6, with Duke Ellington’s Band, was a visitor at various points. 6Y2 visited HR, Traffic: VE9CW 293, HR 37, RE 31, DS 18, FO 16, GO 14, LE 8, MI-6, BZ 2.

I.A.R.U. News
(Continued from page 85)

restriction on amateur licensing lifted (see page 33, June QST). The membership of OVSF is to be congratulated for their success in convincing the authorities of the desirability of amateur radio. Austrian amateurs now are permitted to work hams of any country not prohibiting such communications.

Regulations have been enacted which, in most respects, are not too different from those of other countries. Residents over 16 who can show proof of sufficient knowledge and skill are now being licensed. The application must indicate proposed maximum power, method of operation and specification of control equipment, and the applicant must already be the holder of a broadcasting-receiver license. Four classes of license are issued: Class A, power input up to 25 watts; Class B, power up to 50 watts; Class C, one year as Class B, power input 100 watts; and Class D, club stations only, with trustees who are citizens over 21, 250 watts. The examination, which includes a 12 w.p.m. code test, is conducted in public by a three-man board which is appointed for a three-year term in each of several districts. The board then deliberates in private and later announces the results. Apparently, the full Atlantic City license allocation for Region I is allowed. The license is good until revoked, provided the yearly fee is paid. Mobile operation is permitted. Other hams may operate a licensed station, with the licensee, of course, responsible for their actions. Third-party message handling is permitted only for messages concerning protection of human life, during the failure of normal systems.

W/VE Contest
(Continued from page 60)

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 the Montreal Amateur Radio Club, Inc., 535 Lasaldowne Ave., Westmount, Quebec, Canada, and must be postmarked not later than midnight October 16, 1954.

Strays

W5JET is an instructor at Connally AFB, Texas. — W5ADR
Without trust in Daddy's strong arms, fear would blot out the fun of first flight. But because Daddy's smiling, loving face is below, life adds a thrilling new dimension, founded in love and trust.

All our adventures begin in and come home to the security we cannot do without.

To give and to get security is the main business of living. It is a privilege and a responsibility. It provides us life's finest rewards.

Have you ever thought that this security is possible only in a democracy? We continue to grow stronger as a nation when more and more secure homes are bulwarked together. The security of your country depends on your security.

*Saving for security is easy!* Here's a savings system that really works—the Payroll Savings Plan for investing in United States Savings Bonds.

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phasing section are carried in the rear deck ordinarily, and just the bottom portion is used except when we need another 5 or 6 db.

The Polarization Question

One of the time-honored arguments for vertical polarization in v.h.f. work is that it makes mobile operation more effective. There is no doubt that matching polarization does help to extend the range of the mobile station in open terrain, and vertical is certainly the natural polarization for the mobile. But cross polarization may not work as much hardship as might be expected. Over short distances, with elevated antennas and open terrain, the loss from cross polarization may run to 20 db or more, but as the distance increases, particularly as the terrain becomes more irregular, there is a considerable polarization shift. In very hilly terrain it is often difficult to tell which polarization is in use at the other end of the path, and it is not uncommon to find spots where cross polarization gives better signals than matched polarization. The same is true in cities, as the result of the numerous reflections from buildings, overhead wires and the like.

Tests we've made, both with the home station and the mobile, have shown that the use of horizontal polarization works no great hardship on the vertically-equipped mobile. Perhaps it would be a different story in completely flat terrain, but in the hills of western New England we have no trouble working the predominantly horizontal 2-meter stations of the Connecticut Valley. And, in a recent trip through western New York, we had good coverage over the rolling terrain south of Lake Ontario. When our travels have taken us into predominantly vertical areas, we've noticed no marked difference in effective operating range.

We have made a horizontal antenna, as shown in one of the photographs, but we've not found it of any great advantage up to now. Nor does it appear that we can hear the few vertical adherents appreciably better than their horizontal brethren when we use the regular whip. There are many ways of achieving horizontal polarization in a mobile antenna system, but none of them is beautiful or very convenient. The one shown in the last photograph is a gamma-matched dipole made of brass rod, bent around into a circle. It works well, apparently, and it shows a considerable gain over the whip when we are working the horizontal gang from a hilltop that is well above surrounding terrain. But at times like this we are not concerned with actual "mobile" set-ups ordinarily, and if we want to go to the trouble of putting on a different antenna, we prefer a portable beam of some sort. With a knock-down array, it is a simple matter to make it either horizontal or vertical, as local preferences may dictate.
NEW!
“Realist”
HIGH-FIDELITY TUNERS

FM $39.95
AM $29.95

5 uv sensitivity; tuned RF stage; Armstrong circuit with double-tuned limiter, low-noise triode mixer; balanced AFC; 20-20000 cps ±0.2 db; 180 kc bandwidth, 6 tubes (2 dual) plus rect.; AC power supply. Only 4 1/4 H x 9 1/4 W x 6 1/2 D; ship. wt. 6 1/4 lbs. $39.95

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ENGINEERING ASSOCIATES
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Panoramic Adapter
(Continued from page 84)
by reducing the band-scan width. The higher the frequency of modulation the farther away these pips will move from the center pip, the carrier. This is shown at B of Fig. 5. Single-sideband modulation, with carrier, has a similar appearance, but is minus one of the sidebands. (Fig. 5C.)
Single-sideband suppressed-carrier transmission appears as a single pip, or small group of pips, varying in amplitude and is most noticeable by its appearance and disappearance, (Fig. 5D.)
An f.m. signal appears as many deflections spreading over a variable bandwidth. During periods of no modulation, a single carrier appears. An m.c.w. signal looks like a c.w. signal of periodically varying height, if only the modulation is keyed. If the modulation frequency is high enough, sidebands will be distinguishable.
Noise such as static appears as irregular deflections and flashes along the whole sweep. Noise due to electrical equipment operated from the power lines is likely to be synchronous or nearly so and will stand still on the screen or drift slowly from one side to the other.
If the receiver's rejection of the images is poor (most noticeable on the higher-frequency bands), the images appear as signals, but move in an op- posite direction across the screen when the receiver is tuned.

Operation
When the panoramic adapter is used with a receiver whose h.f. oscillator operates on the high-frequency side of the mixer, the lower fre- quencies appear on the left side of the adapter's screen, and the higher frequencies on the right. Some communications receivers operate the h.f. oscillator on the low-frequency side of the mixer on one or two of the higher-frequency bands, namely, 10 and 20 meters. When this is done, the high- and low-frequency ends of the screen are interchanged.
Most receivers operate with a.v.c. applied to the r.f. stages. If such is the case with the receiver to which the adapter is connected, the effect of the a.v.c. will be noticed on the adapter's screen. When a strong signal is tuned in it will reduce the amplitude of all the signals on the screen.

To check modulation, reduce the band-scan sweep to zero. A single horizontal line will be seen if no modulation is present. With the receiver tuned to the center of the carrier frequency, adjust the center-frequency control for maximum vertical deflection of this line. The gain control is now adjusted to center the line vertically. This l.c. level represents the strength of the carrier signal. As modulation is applied to the signal, it will appear across the screen with this line as its axis.

Circuit Variations
Different sizes of cathode-ray tubes could be substituted for the 3API at the builder's discre- tion without undue difficulty. Some of the larger-

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(Continued on page 118)
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GLOBE KING XMTR

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in keeping with WRL's policy of always giving you MORE WATTS PER DOLLAR, we now offer you a complete 500 watt band switching 160 through 10 meter transmitter using the popular husky 4-250 A tube in final. Complete TVI shielding and by-passing of RF section and meters. Includes co-ax antenna, change-over relay and push-to-talks features. Pi-network final tuning will match any antenna system from 52 to 600 ohms with output impedance selector switch on front panel. This arrangement serves as an ideal antenna tuner. Metering of all stages with 2 - 3" meters. Several safety features included for protection of final tube which is forced air cooled. Has provisions for VFO. High level 100% plate modulation. Hammerstone finished cabinet approximately 31" H x 211/2" W x 15" D.

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WRL — BOX 811 — CO BLUFFS, IOWA

117
screen cathode-ray tubes require higher operating voltages, and thus would require some circuit changes.

The r.f. oscillator coil, \( L_1 \), is 1.1 mh. tapped at 0.2 mh. If a slug-tuned coil is used in its place, trimmer \( C_1 \) can be replaced with a fixed capacitor of 82 \( \mu F \).

Return-trace blanking was tried and found to be of little consequence. This is the reason for the unused socket as seen in the photos.

**Bandswitching Converter/Preselector**

(Continued from page 87)

the side of high inductance since the removal of turns is an easy matter even after all connections are soldered. After all bands have been aligned, readjust the oscillator to exactly 18 Mc., using the receiver and 100-ke. oscillator. Alternatively, the unit can be aligned by using as a "signal tracer" a borrowed receiver that covers the 21- and 28-Mc. bands, and adjusting each stage separately.

Check the rejection of direct signals by switching \( S_2 \) to 21 Mc. and \( S_1 \) to direct. Pick up a strong signal at about 3.1 Mc. Then switch \( S_2 \) to "Conv." The signal should drop at least 7 or 8 S units if proper attention has been given to shielding the output of the converter and to the ground connections as previously indicated. Repeat the test on 28 Mc.

That is about all there is to it, except to hook up the antenna and enjoy the results. You should now have a combination that is hard to beat, with plenty of what it takes to haul in that weak DX signal. The 21-Mc. band is an adventure in itself — don’t miss it up because your present receiver only goes to 18 Mc.

Let Joe brag about his new gold-plated super-snooper special that has depleted his bank account. You will be amazed at what this simple unit plus a good surplus receiver and "Q5-er" can do.

**Low-Cost Gallon**

(Continued from page 88)

Coax connectors are provided for r.f. input and output. The output line that goes to an antenna tuner was tried at first without tuning the line, and some mighty strange manifestations were wrestled with for a while. Adding a series condenser fixed up all of that, and now the final is very sweet to operate.

**Economizing**

There are numerous cases of make-do with available items, hence low cost. For instance, the rectifier-filter unit, and the series booster for the plate transformer originally were two APQ-9 400-cycle radar-jammer power supplies (surplus cost $1.50 each). These were hack-sawed apart and reassembled as shown in one of the photographs. The transformers were reconnected with (Continued on page 180)
No fancy talk or pretty pictures this month! Just a heap of good buys for you guys and gals. Look over these used equipment and specials list that Uncle Dave, W2APF and "Tiny" Miller got together for you. We have all the new rigs, too; so if you don't see what you want... call or write; 24-hour service on all stock items.

### USED EQUIPMENT LIST

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Price</th>
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<tbody>
<tr>
<td>Sonar MB611</td>
<td>$25.00</td>
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<tr>
<td>Sonar FM Exciter</td>
<td>$45.00</td>
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<tr>
<td>Morrow 3BR</td>
<td>$45.00</td>
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<tr>
<td>MM-1 Micro Match</td>
<td>$30.00</td>
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<tr>
<td>Web 10 meter, 25W Xmt.</td>
<td>$25.00</td>
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<tr>
<td>National 5886, power supply</td>
<td>$25.00</td>
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<tr>
<td>Thor Dorsen, 100W, Xmt.</td>
<td>$95.00</td>
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<tr>
<td>Collins 32V3 (Demo)</td>
<td>$695.00</td>
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<tr>
<td>Nat. NC183D (W Spkr)</td>
<td>$295.00</td>
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<tr>
<td>Hallicrafters, S53A rec.</td>
<td>$75.00</td>
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<td>GE No. 155 Scope</td>
<td>$25.00</td>
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<tr>
<td>RME, DM30X</td>
<td>$20.00</td>
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<tr>
<td>Lafayette VHF Converter</td>
<td>$25.00</td>
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<tr>
<td>Precision 864, Rack Mtg Multi-Meter</td>
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<td>RME HF10-20</td>
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<td>RME DB222A</td>
<td>$75.00</td>
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<td>2 - Eldico, TR75-TV</td>
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<td>Nat. HRO60 (W/coils &amp; Spkr)</td>
<td>$450.00</td>
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<td>WRL, Globe Trotter Xmt.</td>
<td>$95.00</td>
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<td>Nat. NC100X (no Spkr)</td>
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<td>Meissner Analyst</td>
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<td>Rider Chanalyst (W/UHP)</td>
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<td>Gonset Tri-Band</td>
<td>$30.00</td>
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<td>2 - Gonset 3-30 Conv.</td>
<td>$35.00 ea.</td>
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<td>Hammarlund, 420 &amp; 411</td>
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<td>1 - Hallicrafters, SX42 (no Spkr)</td>
<td>$90.00</td>
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<td>(As Is)</td>
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<td>1 - Hallicrafters, SX42 (W/R44 Spkr)</td>
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<td>Hallicrafters, SX42 (W/R42 Spkr)</td>
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<td>Hallicrafters, SP44 (Panadapter)</td>
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<td>Motorola, FMT30DS (Complete)</td>
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<td>Jackson, 106 (Sig. Gen.)</td>
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<td>Jackson, 109 (YTVM)</td>
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<td>CBY, 52208 (ARC 5-TYPE)</td>
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<td>National NC57 (W/&quot;S&quot; meter)</td>
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<td>Collins, 32V2 (Converted 32V1)</td>
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### SPECIALS LIST

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<tr>
<th>Item Description</th>
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<tr>
<td>Condensers, Oil 2MFD X2500 V.</td>
<td>$3.95 ea.</td>
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<tr>
<td>10 for ..................................</td>
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<td>Condensers, 1 X 1 MFD X7000 V.</td>
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<td>Ready made Xmtg Antennas</td>
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<td>10 meter - $4.80</td>
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<td>20 meter - $5.40</td>
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<td>American EL4 Microphones</td>
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<td>Astatic JT30, W/Stand</td>
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<td>Astatic 54M3, W/Stand</td>
<td>$6.88</td>
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<td>Astatic D104</td>
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### PLATE XFRMS

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<tr>
<td>415-0-415 V., 300 V., at 200 MA</td>
<td>$6.51</td>
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<td>425 V @ 160 MA</td>
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<td>515-0-515 V., 385 V., @ 225 MA</td>
<td>$8.34</td>
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<td>500 V @ 220 MA</td>
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<tr>
<td>1200-0-1200 V., 1000 V. @ 225 MA</td>
<td>$13.61</td>
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<tr>
<td>1790-0-1790 V., 1500 V. @ 225 MA</td>
<td>$24.89</td>
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### RESISTORS ASS’D, PLASTIC BAG...

<table>
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<tr>
<td>50 - Mica Cond. Ass’d, plastic bag</td>
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<tr>
<td>35 - Ceramic Cond., Ass’d, plastic bag</td>
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### 1000 FOOT - WIRE KITS - ALL COLORS, SIZES

<table>
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<tr>
<th>Types</th>
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<tr>
<td>100, 10 FT. - HOOKUP (Per Kit)</td>
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### FILAMENT XFRMS

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<tr>
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<td>5.0 V - 10 Amps</td>
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### MODULATION XFRMS

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<td>A3808 - PRI 3800/3300/CT - SEC</td>
<td>$10.12</td>
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<td>10M/5M/4M/60W.</td>
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<td>A3829 - PRI 9M/6900/CT - SEC</td>
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<td>6250/5M/4M/175W.</td>
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### TUBES

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<tr>
<td>Jan 872A</td>
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### 6 FT. AC Cords

<table>
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<td>5 for $1.00</td>
<td></td>
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</tbody>
</table>

### ADVANCE 8200, COAX RELAY

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Price</th>
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</thead>
<tbody>
<tr>
<td>Advance 8204, Coax Relay</td>
<td>$11.14</td>
</tr>
<tr>
<td>Advance 8200, Coax Relay</td>
<td>$8.98</td>
</tr>
</tbody>
</table>
SAVE HOURS OF WORK

quickly make round, square, key and "D" openings with Greenlee Radio Chassis Punches

In 1½ minutes or less you can make a smooth, accurate hole in metal, bakelite or hard rubber with a Greenlee Punch. Easy to operate. Simply turn with an ordinary wrench. Wide range of sizes. Write for details. Greenlee Tool Co., 1869 Columbia Ave., Rockford, III.

their primaries in series, and their secondaries in parallel, for both filament and plate. The chokes and condensers were rewired in various combinations of series and parallel to avoid exceeding their ratings too far. The two units just fit the space available at the bottom of the cabinet. Yes, the doors can be closed.

No meters were bought for the job. The 600-ma. plate meter is OK, of course. The 15-volt a.c. voltmeter can be used to indicate grid current, even though its scale doesn’t apply. By means of two toggle switches, the grid current of either tube, or both, may be checked. A spare 5-ma. d.c. meter was mounted in the panel space formerly occupied by the “patient-load” resonating condenser. The milliammeter was converted into a 5-kv. voltometer by adding 1-meg-ohm ½-watt resistors in series-parallel.

Originally, the unit was unshielded. Shielding has been added from time to time, more from a sense of fitness of things, however, than from compulsion of TVI. The TV receiver is only 20 or 25 feet from the rig, and shows not a shadow when the rig is keyed. The shielding is a heterogeneous mixture of aluminum foil chiefly, but also includes copper screening, and punched aluminum sheet, the latter once having housed a Sperry amplifier rack.

Operation

The GO-9, used as the exciter for this amplifier, is operated at about quarter power, except when the final is running at maximum input. Then the exciter is run at half power. The final can be operated at plate inputs from about 160 watts with the autotransformer set at Tap 1, to a maximum 1000 watts on Tap 9 where the series booster is on full. On Tap 9, a dummy antenna was fed with gratifyingly rapid heating-up of the noninductive resistors, and thus it qualifies as an honest-to-goodness “full gallon.” (The XYL, overhearing various conversations about how the “gallon” was coming along, once inquired about the “jug.” And the Jug it has been ever since.)

One lives a bit more dangerously when pushing the voltages higher. The plate tank condenser used to are over unduly until an overlooked bent plate was discovered. The worst casualty thus far has been a punctured coax neutralizing condenser, while operating on Tap 8. The 2300-volt r.m.s. rated coax was replaced with an equivalent with 4000-volt rating, and no trouble has been experienced since. The extra power available is very useful in QSOs with the writer’s son, WTPSR, in Tuscon, Arizona, where the noise level is notoriously high. Upping a few taps on the plate transformers often makes the difference between very poor and good QSOs. Reports from several who have worked us with both the GO-9 alone, and the GO-9 plus Jug, say that the note, keying etc., are identical, but the signal louder, with Jug. Apparently, the latter mirrors and amplifies what is fed to it which, after all, is what expected of it.

The out-of-pocket cost of Jug was just under

(Continued on page 188)
NOW HEAR THIS

A BUY OF A LIFETIME

PORTABLE ELECTRONIC MEGAPHONE and AMPLIFIER SYSTEM

COST U.S. NAVY $1850

YOURs FOR ONLY $89.50

20 WATT POWER AMPLIFIER

MEGAPHONE—Dynamic MICROPHONE Pistol GRIP-TYPE

All Units BRAND NEW and GUARANTEED

BATTERY CHARGING RACK Included

Lafayette made a terrific deal with the U.S. Navy—bought a quantity of U.S. Navy Model PAE-2 Portable Amplified Electronic Megaphone Systems which enables us to offer the complete system at a price which can never be duplicated again.

Here is an ideal system for such applications as fishing boats, yachts, traffic control, sports events, construction crews, surveyors, carnivals, car owners, life-saving stations, or any place where handling of large crowds is necessary, and wherever convenient power line connections are not available, because unit operates from self-contained rechargeable 6-volt storage battery. Can also be used as a stationary or permanent system when used with charging rack, which is designed to hold entire portable amplifier and battery.

System consists of portable amplified electronic megaphone—operated by a trigger switch in the pistol-grip-handle—dynamic type microphone unit rated at 50 ohms at 1000 cps. and a reproducing unit. All contained in megaphone mouthpiece and housing.

A powerful 20 watt 6 tube amplifier, housed in a water-proof, two-piece, portable metal case (as illustrated), having compartment for and supplied with 3-cell 6-volt storage battery. Amplifier built with finest quality parts to rigid Navy specifications.

A UNIVERSAL BATTERY CHARGING RACK that operates from 110 volts AC 50-60 cycles, 110 volts DC, 12 volts DC, 24 volts DC, 48 volts DC, or 96 volts DC. The charging rack consists of a battery charger with timing switch and also provides a space for stowing the portable amplifier. Two pilot lights in the front panel of rack indicate a "Low" or "High" charging rate. Timing switch controls the rate of charging. Has separate On/Off switch.

Approximate Dimensions & Weights: Megaphone 20” long, diameter 13/4” Shpg. Wt. 12 lbs. Amplifier dimensions—In 2-piece Portable Metal Case, housing, 6 volt storage battery—12 1/2” H, 12 1/2” W, 9 1/2” deep. Shpg. Wt. Approx. 25 lbs.

Charging Rack 16 1/2” H, 12” W, 12” deep. Shpg. Wt. 34 lbs.

Complete System consisting of electronic megaphone, 20 watt portable amplifier with tubes and storage battery in case, as illustrated. Universal Battery Charging Rack with all necessary interconnecting cables and plugs and 38 page Instruction Book with schematic diagrams of all units.

Net 89.50

NEW YORK, N. Y. 100 Sixth Ave.
BRONX, N. Y. 542 E. Fordham Rd.
NEWARK, N. J. 24 Central Ave.
PLAINFIELD, N. J. 139 West 2nd St.
BOSTON, MASS. 110 Federal St.

Lafayette Radio
FAMOUS IN RADIO FOR 32 YEARS

DEPT. VI
BUY OF A LIFETIME!
TRIED AND PROVEN THE WORLD OVER

LEITINE MODEL 240 TRANSMITTER WITH MOBILE CONNECTIONS AND A.C. POWER SUPPLY

This outstanding transmitter has been acclaimed a great performer throughout the world. Excellent for fixed station, portable or mobile operation. Air-SCC plug-in coils used for greater efficiency — never obsolete — will take any new freq. An outstanding buy, direct from our factory, ready to operate. NOVICE $15.00. Save money. Buy only once. The 240 operates in the 80 and 40 meter Novice Bands, as well as the General Class Bands. The 240 is a 40 to 50 watt Phone-CW rig for any freq. from 1.7 to 20 mc, complete with: 18 x 14 x 8 cabinet, A.C. power supply, 40 meter coil and crystal and tuning 6X4 & 6X5, 6X7 final, 5UG rect., 6SJ7 crystal tube amp, 6N7 phase inverter, 240-CW grid, for excellent audio quality. Weight 30 lbs. CVI instructions included. 90 day guarantee. Price $79.95. 25% deposit with order — balance C.O.D.

90, 20, 10 meter coils $2.91 each. 160 meter coils $3.60. Also for CAP, Broadcast, MARS, Marine, State Guard, Civil Defense

LEITINE VFO & ANT. TUNER NOW IN STOCK

LETTINE RADIO MFG. CO.
62 Berkeley Street
Valley Stream, N.Y.

$40, not counting the drain on the junk box. Those interested might call on medical-equipment sales places, second-hand motor dealers, and so forth.

Many thanks are due several hams for their help and sympathy, notably W1FTH, who also took the pictures, and W9CPV, W9DKW, and W7PSR (who now says he can relax).

Lightning Calculator
(Continued from page 41)

divided by 2, such as setting 2 inches diameter to 2 inches length. At half the number of turns per inch you want to calibrate, read the inductance. Now set length and diameter to 1 inch (each, half of 2 inches). Opposite half of the inductance previously read, place a mark. This mark calibrates the turns-per-inch scale at the desired point. For instance, to calibrate a point for 200 t.p.i., set 2-inch length to 2-inch diameter. Read inductance 1400 opposite 100 t.p.i. Set 1-inch length to 1-inch diameter. Opposite inductance 700 mark t.p.i. 200.

Frequency Scale

The frequency scale can be extended in either direction simply by marking off the intervals with a divider. The distance from 150 Mc. to 200 Mc. should be the same as from 15 Mc. to 20 Mc., or from 1500 kc. to 2000 kc., etc. Similarly, the distance from 400 kc. to 300 kc. should be the same as from 4000 to 3000 kc., etc.

In conclusion, it should be reemphasized that the error (percentagewise) is likely to be sizable in cases involving the smaller values of inductance and capacitance. The values indicated should be considered only very approximate, and subject to experimental adjustment.

Silent Keys

It is with deep regret that we record the passing of these amateurs:

W1IDY, William S. Koehler, Pelham, N. J.
K2CCO, Arnold J. Schwartz, Malverne, L. I., N. Y.
W9QKS, Charles H. Schrader, Clinton, N. Y.
W9OW, Charles H. Walton, Downingtown, Penna.
W3RUF, George D. Custer, Berlin, Penna.
W4CA, John F. Wohlford, Roanoke, Va.
W5HTA, Carl L. Flesher, Colorado City, Texas
W5DND, William C. Campbell, Orange, Texas
W6ARG, James W. Smith, Long Beach, Calif.
ex-W6AU-6CO, Paul Clark, San Jose, Calif.
W6CUE, A. C. Gall, Manhattan Beach, Calif.
W6IF, Leslie J. Riedman, Long Beach, Calif.
W6U6Q, Burton B. Wetherbee, Turlock, Calif.
W8BLB, Frank M. Natheron, Parma Heights, Ohio
ex-W6CNI, Army G. Belle Isle, Syracuse, N. Y.
W9AML, James B. Heard, Berthoud, Colo.
W9YKN, Harris W. Shields, Kennesett, Iowa
C31RF, D. C. Hill, London, England
OM9RG, Bryan Groen, Galashiels, Scotland
VE5G, George A. Gauld, Lampard, Saskatchewan

TRYLON

Towers and Masts

Amateur radio types • Guyed towers for FM-TV antennas • Vertical Radiators • Microwave towers • Commercial Communication towers • Transmission line supports, etc.

SERIES 450
Height to 80' Width—6,5" 16' section—112 lbs.
Use—Tower for Trylon Rotary Beam, A.M., Broadcast, and Microwave antennas

SERIES 2400
Height to 250' Width—25,6" 16' section—124 lbs.
Use—Tower for Trylon Rotary Beam, A.M., Broadcast, and Microwave antennas

SERIES 6000
Height to 600' Width—60" 16' section—653 lbs.
Use—TV Broadcasting and Curtain antennas for International Broadcasting

WIND TURBINE CO., WEST CHESTER, PA.
Sensitive, accurate and unusually compact, the Micro-Match 260 Series monitors both incident and reflected power without the necessity of removing the coupler or reversing its connections. Three models of this equipment are available.

**WRITE FOR 44 PAGE CATALOG ON**

- DIRECTIONAL COUPLERS
- STATION GUARDIANS FOR TRANSMITTER PROTECTION
- RF LOAD RESISTORS
- RF POWER AND VSWR INSTRUMENTS
- ABSORPTION-TYPE RF WATTMETERS
- PRIMARY STANDARD RF POWER MEASURING INSTRUMENTS

**Model 261 Coupler**
(only) with Type 83-1R Connectors. Complete instructions to build #262 Indicator are included $22.50

**Model 262 Indicator**
(only) provides relative power measurements when used with the #261 Coupler $14.50

**Model 263 Laboratory Type Coupler and Indicator**
(complete). Coupler equipped with type N connectors. Indicator provided with three scales calibrated in watts, 0-10, 100, 1000 $85.00

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BRISTOL, CONNECTICUT
MORE SIGNALS PER DOLLAR
From Money Invested in an Antenna
Self Supporting STEEL TOWERS
For Rotary Beams, FM, TV

ATTRACTIVE — NO GUY WIRES!
• 4-Post Construction for Greater Gintghth
• Galvanized Steel — Will Last a Lifetime
• SAFE — Ladder to Top Platform
• COMPLETE — Ready to Assemble
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• Withstands Heaviest Winds

Width of Base Equal to 1/5 Height

Towers are shipped to your home knocked down, FOB Kansas City, Mo. 4th class freight. Prices subject to change...so order now! Send check or money order...or write for free information.

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VESTO CO., Inc.
20th and Clay
North Kansas City, Mo.

Yl News & Views
(Continued from page 47)

W3YTC — Miriam Reinhardt, of Emporium, Penna., is Chairman for the Third District. The XXL of W3IX, Miriam has built both a midget 50-watt and Heathkit transmitters, plus an antenna coupler, since receiving her license in May, 1952. She operates 80 and 40, phone and c.w.

W3WST — Carol White, the Sixth District Chairman, has been active in many capacities since first becoming interested in amateur radio when she was thirteen years old. Licensed in 1936 as W3WPP, she operated intensively for five years, particularly enjoying DX hunting with low power—still her chief delight. In 1952 as Asst. Communications Manager, she was the first ARRL woman staff member to hold a call, and in 1944 she became Acting Communications Manager. The first vice-president of the YLRL, she served two terms in that office, and in 1946 she was elected the first president of the Los Angeles YLRC and later served several

LOOK WHAT HAPPENED!
Further recent improvements in our new type magnet provides thrust pressure of over 200 grams and 300% increase in relay contact pressure — Dow relays have now definitely set a new standard for the industry.

Type DKM
1000 Watts
Length 4 1/2"
Width 3 1/4"

Type DKM
500 Watts
Length 3 1/2"
Width 2 1/4"

FEATURES:
1. AC types entirely free of hum, guaranteed equally as silent as DC. Transmit contact pressure now increased to over 100 grams; receiver contacts 45-50 grams.
2. Causes negligible change in c.w. up to 100 mc.
3. Special type receiver connector automatically grounds receiver contact inside of connector during transmit and protects receiver from RF — Optional — not available for DKM.
4. External SPDT switch available (Optional).
5. Relays supplied with UIF connectors — Type "N" on request. Add $1.00 for SPDT external switch. Add $1.00 for special receiver connector.

AG types (All voltages). Amateur net .......... $10.50
DC types (All voltages). Amateur net ............ 9.50

See your distributor — if he has not yet stocked Dow Chastial relays, order from factory, send check or money order, or will ship COD. Prices net FOR Warren, Minn. Shipping weight 9 oz. Dealers inquiries invited — Literature on request. Watch our ads for line of open type relays, using our new magnet.

THE DOW KEY CO., INC.
WARREN, MINNESOTA

(Continued on page 180)
B&W

Model 600
Dip Meter

★ COVERS 1.75 to 260 MC.
★ 500 MICROAMPERE METER
★ WEDGE-SHAPE FOR EASY ACCESS TO HARD-TO-GET PLACES

Highly sensitive, accurately calibrated instrument for the ham shack. As Grid Dip Meter, Model 600 may be used to determine resonant frequency of tuned circuits, antennas, feed lines, and parasitic circuits. It may be used to neutralize transmitters, and to tune all stages to approximate operating frequency with power off. Also useful as an RF Signal Monitor, Auxiliary Signal Generator, and Absorption Wave Meter; can be used to measure capacity, inductance, and circuit "Q"—all operations fully described in instruction booklet. Size: Approx. 5 x 3 x 7". Wt., approx. 2 lbs. 97F140. Net 39.75

Newark stocks the full line of Barker and Williamson Amateur Equipment and Test Instruments.

B&W

Model 5100
Transmitter
$442.50 Net

★ INPUT — 135 WATTS PHONE
150 WATTS CW
★ SELF-CONTAINED VFO
★ COVERS 80-40-20-15-11-10 METER BANDS
★ RAPID BAND SWITCHING
★ BUILT-IN LOW PASS FILTER
★ TVI SUPPRESSED
★ PI NETWORK OUTPUT
★ UNITIZED CONSTRUCTION

Complete self-contained amateur transmitter designed for maximum efficiency and operating ease. Only three tune-up controls—VFO set, final amplifier tuning, and pi network controls—are needed. No tuning of exciter stages at any time. Single band-switch selects correct multiplier output frequency and pi-network inductances for desired band.

Tubes: 14813 VFO; 2S816 Crystal Osc-Buffer-Ker. 4; 6AQ5 Excit. Multipliers; 24346 RF Amp.; L-6U8 Speech Amp.; 16AQ5 Driver; 26146 Modulators; L54545V45V, HV Rect.; 2S817Y HV Rect. 15VR150 and 15VR150 regulators.

Blue-gray steel contoured cabinet with recessed touch-latch cover. 97F135. Size: 22 x 11 1/2 x 14 3/4". Wt., 80 lbs. Net 442.50

Single-Sideband Adapter in compact matching cabinet is now available for the Model 5100. This permits operation on either CW, AM, telephony, or SSB with comparable power output on all bands.

B&W

BALUNS
Provide maximum transfer of power, maximum signal-to-noise ratio, minimum SWR, and minimum line radiation without tuning.

ALL-BAND BALUNS
Sturdy bi-filar airwound coils for impedance matching of feed lines in both transmitters and receivers. When two coils are assembled and wired, the assembly will operate as a multi-band balun to match 75 ohms unbalanced to 75 ohms balanced, or to 300 ohms balanced. 40F927. Each Coil, Net 3.75

1 KW SINGLE-BAND BALUNS
Weather-proof cases, with coax input connectors and ceramic feed-through output connectors. For T-Matched Beams: match 75 ohms unbalanced to 100 ohms balanced. (40F929).

40F930 Model 700 10 Meters
40F931 Model 701 15 Meters
40F932 Model 702 20 Meters

For Folded Dipoles: match 75 ohms unbalanced to 300 ohms balanced. (40F930).

40F933 Model 710 10 Meters
40F934 Model 711 15 Meters
40F935 Model 712 20 Meters
40F936 Model 713 40 Meters
40F937 Model 714 80 Meters

Wt., 3 lbs. Net, Each 16.50

F.O.B. Chicago, Include Shipping and Insurance Charges.

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125
ANNOUNCING
A Complete New Line of
COLLINEAR AMATEUR ANTENNAS
for the TWO METER Band

THE construction of these antennas has been completely revised to provide a lighter weight beam consistent with our quality of merchandise.

8, 16, and 32 element models in partially assembled kits are stocked for immediate delivery.

COLLINEAR antennas for the two-meter CD and CAP frequencies are also available.

If your local Distributor does not have our literature, write direct and kindly send us his name.

U. H. F. RESONATOR CO.
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Racine, Wisconsin

El Monte, Calif., as W6GST. . . . W5CHR, Jean, is active in the Knights and Ladies of the Roundtable and the West Texas Emergency Net. . . . W4RLO reports that the Southern belle Net meets each Friday on 3920 kc. at 0730 CST. Frances, the YLRL Fourth District Chairman, will be off the air until January, 1956, as the hospital at which she is staying prohibits transmitters. . . . On July 3rd in Syracuse, K2DYL, Joan Hofmann, became the bride of K2ATE; Al Michael, K2ATC was best man and W2WNO was of group. . . . W3V TPT HUX HWX JAA LIV MBH O5D SPX and W3REI were present at the Great Lakes Net Picnic at Napoleon, Ohio, on June 27th. . . . W9VRM is a new 11-year-old YL from Gering, Nebraska, who is moving soon to Lava Beds National Monument, Calif. Suide's dad is W9XSL and her proud uncle is ARRL's General Manager, W1BYD.

YLS You May Have Worked

[With this issue, a new column feature is inaugurated. Henceforth each month we hope to present a YL you may have worked or heard or know. The YL need not necessarily be BPL, DXCC, YLCC, etc., at all — the requisite for recognition is simply that she be a YL. The idea behind the project is to become better acquainted with more of the wonderful YLS of our hobby. So if you know a YL whose photograph and amateur biography you would like to see published here, write and let us know — and don't hesitate to tell us about yourself, either. — Ew.]

OM W9OTL, County Supervising Teacher Clarence Weatland in Rhinelander, Wisconsin, suggested that the story of W9YUD, Dorothy Richter, might encourage more high schools to follow through with courses in radio theory and code, with ham tickets for report cards.

In February, 1953, after a demonstration of amateur radio at her high school, Dorothy's interest flared, and soon code sessions and study of the License Manual supplemented regular school homework. A "first-class pop talk" induced Dorothy's father to study along with her. With high school graduation in June, there was an added

BE SAFE WITH
Q-max
A-27
LOW-LOSS LACQUER & CEMENT

• Q-Max provides a clear, practically loss-free covering, penetrates deeply to seal out moisture, imparts rigidity and promotes electrical stability. Does not appreciably alter the "Q" of R-P coils.

• Q-Max is easy to apply, dries quickly, adheres to practically all materials, has a high-GWP range and acts as a mild flux on tinned surfaces.

In 1, 5 and 55 gallon containers.

Communication Products Company, Inc.
MARLBORO, NEW JERSEY (MONMOUTH COUNTY) Telephone: Freehold 8-1880

W9YUD extracurricular diploma for both Dorothy and dad — General Class licenses and the calls W9YUD and W9YUB, and amateur equipment solved the graduation gift problem.

Now studying at Stevens Point State College, Dorothy keeps daily schedules with her dad on 75 and 80.

W9OTL observes that, "As a future Home Economics teacher, Dorothy's ham radio hobby may be reflected in changes in house planning, taking into account some special radio facilities — maybe a new cabinet on cooking or sewing or even home management. Moral to her story: Let's get more high school students acquainted with ham radio!"

Addenda: Forty-four amateurs in three states recently received "Trail Blazing" citations issued by the Oneida County, Wis., School Department for their efforts in promoting the amateur school program initiated by W9OTL in 1952. Purpose of the program is to broaden the scope of school studies by arranging on-the-air discussions among different groups of pupils and between pupils and adults engaged in various professions. In Oneida County alone, as a result of the program, some 2000 pupils have spoken via amateur radio in the past 18 months.
NEW! ... SILVER-PLATED ROLLER
WITH POSITIVE ACTION, STAY-PUT CONTACT
No. "666" MASTER
ALL-BANDER
For 10-11-15-20-40-75 Meters
A great advancement in antenna coils...
...fully enclosed, the non-linear, "variable spaced" adjustable silver-plated roller with built-in Hvy "Q." Maintains a fairly constant "Q" over the lower ham bands. Operates with a minimum of losses...meaning more QSO's. Positive action, silver-plated roller assures steady signal that will stay put. Simple one-shot tuning for any band. "Get 6 Bands on 1 Coil."
Net $14.95

No. "333" MASTER
MIGHTY-MIDGET
For 40-20-15-11-10 Meters
Another first and finest with Master Mobile, the new Hvy "Q" non-linear "variable spaced" Mighty-Midget...engineered to provide the highest "Q" consistent with good mechanical design. Compact, extremely rugged, yet lightweight. Its operation assures precision tuning with the new adjustable silver-plated roller that stays put! Perfect for 40-20-15-11-10 meters. "Get 5 Bands on 1 Coil."
Net $9.95

AT LEADING RADIO JOBBERS EVERYWHERE

Master Mobile Mounts, Inc.
1306 BOND STREET • LOS ANGELES 36, CALIFORNIA

The New—20 METER SHORTBEAM
...3 ELEMENT ROTARY BEAM

Pre-Tuned!

RADIO SPECIALTIES INC.
354 Seventh Ave., Brooklyn, N. Y.
Phones Sterling 8-4134
TERRITORIES OPEN

Available through your distributor

The new RADIO SPECIALTY 20 meter short beam is precision tuned and tested—insuring premium performance and dependability. You get "top-man-on-the-frequency" results even in a limited area installation. It is engineered to provide you with a truly practical, light weight, all-weather structure with all these superior specifications:

- Element lengths, 16 feet (approximate)
- Boom — 16 feet
- Approx. weight 20 lbs.
- Turns with a C.V. Rotator
- Front to back ratio better than 20 DB
- Designed for 52 ohm coax.

- Director spacing .1 wavelength.
- Reflector spacing .15 wavelength.
- Pre-tuned for 20 meter phone band.
- 6 FT aluminum used for elements, boom, crossarms and mast.
- One man installation.
IN DEMAND .....  

. . . a new, revised edition is now available. Mobile antenna techniques are treated in a brand-new 21-page chapter and the latest dope on ground planes for fixed stations is included. Send for your copy now.

$1.50 U.S.A. Proper, $1.75 Elsewhere

THE AMERICAN RADIO RELAY LEAGUE
Incorporated
West Hartford 7, Connecticut

Hamshacks
(Continued from page 48)

such item but a flock of early DX was worked from that tiny space. Besides, one leap and I was in bed, lights out, when any "inspection" took place. Or conversely, early morning 80-meter skeds with GOTO were a lot easier because I didn't have to dress. Just one long jump from bed to chair, turn on the 203, put the clip on the storage battery, wait till the "detector-and-one-stage" lit up, and I was ready to go!

Then there was another "little-room" shack that I knew well, except that I never really got into it — that is, not all of me. Out in Cleveland's east side lived Norm McConnell. SBS (now W9??). Mae was a little guy, and whoever built his house must have had him in mind, for while Mae's closest shack was tall enough for him, it was not for a 200-pound near-six-footer. But cute — I'll tell the world! Tucked away in that closest shack, SBS was as cozy as a kitten, and with the rig purring away, just as happy. But it was tough on a visitor, a big one anyway! Why, that shack was so small Mae had to put his Edison gramaphone out on the living-room floor when we played it into the microphone for the first 5-meter test made in Cleveland. Too bad we didn't have subminiature components in those days; SBS sure needed them!

Did you ever have a shake in the kitchen? I still can see SCCH in a corner of a Cambridge, Ohio, kitchen with the "two-tubers" on the table, a single 210 on a shelf in the corner complete with plate transformer. Rectifier? Naw! Straight a.c. Those were the rugged days before 1926! A kitchen shack was both good and bad. The op

Now! Enjoy Easier Keying EASY-WORKING VIBROPLEX SEMI-AUTOMATIC KEY

Twice as easy as hand sending

There has never been a bug that responded to the hand so naturally, smoothly and with so little effort as the easy-working Vibroplex semi-automatic key. It does all the arm- tiring work for you — automatically. Simply press lever — Vibroplex does the rest. Gives you freedom from nervous and muscular tension while sending. Takes years of hard wear and rough usage. Used and recommended by thousands of the finest operators on land, sea and in the air. Place your order today. Choice of five models. Prices $12.95 to $29.95. Left-hand models, one dollar more. At dealers or direct.

Headquarters for NEW portables, all models and styles of type. Also, REBUILT standard and portable typewriters with ALL CAPITAL letters and other styles of type, immediate delivery. Get our prices before you buy!

THE VIBROPLEX CO., Inc. 833 Broadway, New York 3, N. Y.

A KITCHEN SHACK WASTEACH GOOD AND BAD

was close to the source of goodie but also too close to the sink. Need more be said?

The garage shack was popular in the '20s. How many recall that haven of rest, good rag-chews and super DX — Loren Windom's garage shack out on Franklin Avenue in Columbus? Windy's two-call station, 8GZ-SZG, with the 75-foot downspout masts and the trolley wire off-center-fed Hertz!

Although my Hamerican scrapbook holds a prized photo of Windy's shack in 1926, no photographs necessary to living back that long, simple operating bench with the 204 sitting in the corner and his famous "plate-glass receiver" resting in the center in front of a big op's chair.

(Continued on page 180)
Another Johnson First!
the "Whipload-6"

BANDSWITCHING ANTENNA LOADING COIL

Designed to provide high efficiency base loading for standard mobile antennas, the JOHNSON Whipload-6 also offers for the first time instant bandswitching on 6 bands—75, 40, 20, 15, 11 and 10 meters.

On 75 meters a special variable capacitor, with a dial scale for accurate calibration, is shunted across the coil to permit tuning the entire band. Complete coverage is available on the other bands without tuning. Large diameter airwound coil, with low loss polystyrene support strip, provides high Q and much greater efficiency than usual small diameter loading coils. Taps for each band are easily adjusted initially using a grid dipper or field strength measurements, and require no further attention. A fibre-glass housing protects assembly against mechanical shock and exposure without sacrificing high Q and efficiency. Mounts on standard mobile whip.

May be used with the "Bi-Net" for automatic 10 and 20 meter operation.

E. F. JOHNSON COMPANY
2828 SECOND AVENUE SOUTHWEST WASECA, MINNESOTA

FOR MILITARY, COMMERCIAL OR AMATEUR APPLICATION
You can build it BETTER with a FREED TRANSFORMER
You can test it BETTER with a FREED INSTRUMENT

<table>
<thead>
<tr>
<th>PRECISION TEST INSTRUMENTS</th>
<th>TRANSFORMERS — FILTERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. 1030 LOW FREQUENCY &quot;Q&quot; INDICATOR</td>
<td>MINIATURE AUDIO</td>
</tr>
<tr>
<td>No. 1110A INCREMENTAL INDUCTANCE BRIDGE</td>
<td>HIGH FIDELITY</td>
</tr>
<tr>
<td>No. 1020B MEGOHMETER</td>
<td>MILITARY PULSE</td>
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<td>No. 1010A COMPARISON BRIDGE</td>
<td>TOROIDAL INDUCTORS</td>
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<tr>
<td>No. 1060 VACUUM TUBE VOLTOMETER</td>
<td>PRECISION FILTERS</td>
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<tr>
<td>No. 1040 VACUUM TUBE VOLTOMETER</td>
<td>SUB MINIATURE — HERMETICALLY SEALED</td>
</tr>
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Mobile Power Supplies

★ 500 VDC 225 Ma.
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★ Complete power supply
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  Pos #1 750 V 225 Ma.
  Pos #2 400 V 170 Ma.
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Model 6A $49.50 (job factory)

Order from
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PALCO ENGINEERING, INC.
CARMEL, INDIANA

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DX? Just ask any lucky ham who visited 8GZ in the mid-20s. Australian 6SA worked on schedule at 6 P.M. local time on 7 Mc! Skeds 'round the world, clicking off on the nose where the mercury arc in the attic was tripped. Outside wind and rain howled and stormed, but inside all hands and other places were kept warm with the biggest "parabolic-reflector" unit I ever saw — and felt! Or was it the warm glow of the most genuine ham spirit I have ever known, or the coffee Mrs. Windom would serve up at any old time upon a shout from the shack?

That "plate-glass receiver" and its two tubes outperformed anything you lead! Well, Windy never said there were only two. Who was suspicious enough to look under that table for that second a.f. stage?

Winter or summer 8GZ's shack was aglow with DX, good ham chat and hams, not to mention the warm feeling as you pawed through the bushel baskets (yes, honest) of DX cards!

Something passed out of ham radio when those tall pipes fell and the Franklin Avenue 8GZ closed down for the last time.

The years roll on and hamshacks change but the spirit contained within their walls continues. Take a look at the 1936 shack of W6QD at Manhattan Beach, Calif. Two things stand out — GD's antenna mast sitting in the surf and the "corn-fed kilowatt" in its wooden cradle rack!

W6QD was located in a tiny, cozy apartment (made from a garage) right on the beach. How better to get an edge on Chuck Perrine, W6CUIH, who lived high above on the hills overlooking the beach? I wonder which was the better location.

The same year of '36 recalls a visit to the U.S.A.'s highest station, W9DOA, on Colorado's Italian Mountain. W9DOA, made famous by a yarn in Clint DeSoto's Calling CQ, was over 13,000 feet above sea level and surrounded by even higher peaks. W9DOA was a simple ham layout but a wonderful boon to the Clara L miners during the long winter months. At W9DOA the operator sat on a case of dynamite when he pounded brass. But who cared? the "caps" were in another room! W9DOA, where the antenna lead dropped 500 feet vertically from an 80-meter Windom supported by steel cables between two cliffs.

Ten years later at Kayenta, Ariz., W7TLY was one of the most remote hamshacks in the country. A bedroom shack at the end of Bennett Hyde's huge stone trading-post home with a BC-610 sitting in the corner and overhead a five-element beam with the never-ceasing wind singing through it. W7TLY's 10-meter signal will be long remembered. W7TLY, where the op was stared at by the silent and searching eyes of Hyde's customers, friends and neighbors — the Navajo!

W7TLY is gone from Kayenta. But not forgotten is that remote Arizona hamshack, as different from all others as it could possibly be, but in which there was that timeless, ageless ham spirit which lives in the hamshacks of yesterday and today!
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**NEED A TURN COUNT DIAL**

for that roller inductance? Vacuum Condenser? Any other multi-turn device?

2" Model TC2 $3.90

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See page 141 April QST. Order or Write for descriptive literature.

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Write for your copy of our latest bulletin on METEX Electronic Weatherstrips, or send data on your particular problem to

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...motor driven variable inductor, is the answer for push-button ease of operation from the DRIVER’S SEAT.

No more need to hover around a section of a particular band with your VFO or crystals because the antenna is peaked at one frequency. Now, you can work the ENTIRE band and have your antenna peaked on frequency by using a MORROW MLV-50. This unit is a motor driven variable inductor used to tune mobile whip to operating frequency by remote control from the driver’s seat. The MLV-50 is normally installed in the trunk next to the antenna base, and will tune an entire given band with the use of a normal loading coil. For use on 75, 40, 20, 15, and 10 meters. Supplied with a 15-foot cable, and 3 position lever switch with bracket for dash mounting. Available in 6 and 12 volt models. Complete with instructions.

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• 4 E ............................ $8.75
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• 8 E ............................ $20.50
  2 MTR—TWO 4 EL. YAGI
• PD 3 E 10 ...................... $24.95
  3 EL. 10 MTR/T-MATCH
  PLUMBERS DELIGHT
• 3 E 10F ........................ $42.40
  3 EL. 10 MTR/FOLD, DIPOLE
• 3 E 10T ........................ $41.80
  3 EL. 10 MTR/T-MATCH
• 3 E 15T ........................ $59.00
  3 EL. 15 MTR/T-MATCH
• 2 E 20T ........................ $47.95
  2 EL. 20 MTR/T-MATCH
• 6 E 10-20T .................... $98.95
  3 EL. 10 MTR/3 EL. 20 MTR
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WKBCH/CA Atns CAS CHK
KTFJ WSGG 152-7-B

WEST GULF DIVISION
Northern Texas
WSSFW 7-9-5-1-A-B
WSINX 16-6-2-B

Southern Texas
WSXNX 392-32-14-A
WSXBD 47-18-3-A-B
WSKIL 70-16-7-A-B
WSOHU 3-1-B

New Mexico
WSFPM 3-3-1-B

CANADIAN DIVISION
Maritime
VOSU 4-2-1-C

Quebec
VAEOA 60-12-5-B

British Columbia
VETASM/BC 175-22-8-A
VEUOG/T 96-32-8-B
VETCC 12-15-3-B
VEETM 20-16-3-B
VETFH 5-5-1-B

Novice award winner, 2 WD6RN, op. 3 Ho, staff — not eligible for award. 4 WIYNC, op. 5 Multi-operator station — not eligible for single-operator award. 6 Multi-operator award winner.

World Above 50 Mc.
(Continued from page 55)

south. The 50-Mc. band open frequently during early summer for contacts as close as 400 miles. Single-ended 0A4 and 5942 grid-input r.f. amplifiers for 50, 144 and 220 Mc. now tamed and in regular use.

V7ZDO, Camoga Park, Calif. — Completed new crystal-controlled 430-Mc. converter using 6J4 r.f., 6J4 mixer with i.f. output 48 to 55 Mc, working into modified ARR-8 for use a.m. or f.m. reception. Also increased power of 2-meter mobile to 170 watts.

V7TMU, Shoomahib, Wash. — Keeping sked with VE7 on 50 Mc. Monday nights; would like Oregon sked.

V7UWX, Port Orchard, Wash. — Completion of new 50-Mc. crystal-controlled converter improved results on 430, where the first i.f. is the 50-Mc. band. Completed work on sync generator for TV rig, using 46 tubes. A 10,000-Mc. rig now also complete, including a 5-e. circuit. Paget Sound 2-Meter Net meets each Monday night at 2000 MST, 145.8 Mc. Not control rotates each week.

V8UZ, Columbus, Ohio — From 20 to 35 stations heard regularly on 144 Mc. in Columbus area. Six-meter DX logged 19 days in June, including VE6UF, who was running 14 watts input, June 27th.

W9LR, Reesdale, Ind. — W8IFS and W9JW worked on 144 Mc. the night of June 26th — first Minnesota stations heard other than by auroras. Experimenting with long Yagi arrays, starting with 5-element job on 10-foot wooden pole. Shows considerably more gain than previous 5-element. Worked 15 stations between July 5th and 15th.

W9JEF, Weshore, Wis. — Excellent operating June 26th brought in Illinois, Indiana, Ohio, Kentucky, Minnesota and South Dakota all at once. Many stations now getting South Dakota contacts, thanks to W8IFS, Marvin, and W8ORE, Gary, S. D. Building automatic keyer with view to stirring up band to the east during last hour of each time.

W9MOX, Overland Park, Kan. — Note to Illinois stations: Several of you heard over here from time to time, but no contacts possible because you don’t stand by and lock around often enough. How about turning your antennas west and giving the Kansas stations a break now and then? W8DSR now has his 2-meter rig running on s.a.b., with fine signal on the crystal-controlled converters. Is this the first successful 144-Mc. s.a.b.? w9uG, Goose Bay, Labrador — Our most remote OES reports 50-Mc. openings to eastern USA. How about getting up there OMs and giving the boys a break? Experimenting on 220 Mc. with V8OR and W7SNR/VO6.

WSMJD Wins 50-Mc. WAS
As reported earlier, working W1GJO/Vermont gave Joe Pryor, W5MJD, Amarillo, Texas, 48 states on 6. Now, with a few lines showing up in which we can include a late report, we are pleased to report that 48 cards have been received and found in order. As of Aug. 2nd, W5MJD is the proud holder of 50-Mc. WAS No. 10.
ROTOROMATIC ANTENNA ROTATOR

RUGGED AND DEPENDABLE

Safely supports heavy multiple arrays. Heavy wind loads absorbed by oversized steel gears. Ball bearing gear motor delivers full torque at low temperatures. Heavily plated, corrosion resistant, slip rings and contacts.

1½ RPM
1200 to 1 Gear Reduction
Continuous Rotation
Positive Locking

Instantly Reversible Motor
Noiseless Slip Rings
RF Rating 2½ kW
Selsyn Direction Indicator

Rotator housed in a sturdy aluminum casting... ¾" steel rotating table... ¼" steel tilt type base plate. The 138-112 Rotomatic assembly includes a control box with an illuminated bearing indicator, antenna relay switch and beam reversing switch. Auxiliary slip rings permit beam switching with an accessory antenna relay (138-108). Write for full information on JOHNSON parasitic arrays, element kits, boom assemblies and other available beam accessories.

AMATEUR $324.00 NET

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2827 SECOND AVENUE S. W. WAUSAU, MINNESOTA
MARS Air Force Station AF6AIR

MARS (Air Force) station AF6AIR of Headquarters 4th AF, Hamilton AF Base, California, became an active part of the joint MARS program early in 1949. Fourth AF MARS mission involves the training of MARS members in the eight western states. AF6AIR is NCS of the western net operating on 7832.5 kc. The major part of MARS Air Force APO San Francisco traffic is handled through this station which is connected by radioteletype with AIR, the headquarters USAF-MARS station in the Pentagon. This circuit utilizes a relay station, AF5FKF, at San Antonio, Texas. Offshore MARS Air Force radioteletype facilities are utilized at Hijikam AF Base, Hawaii, and Tokyo, Japan. AF6AIR is an alternate link station in the MARS civil defense networks tying into the seven FCDA regional offices. AF6AIR is also a liaison station of the MARS-CAF. The MARS director is WOJG Daniel J. Olivier, AF6IHC of Novato, Cali.

The photograph shows three of the four operating positions of AF6AIR. Two positions on the left, not shown, use BC-610 transmitters and SP-600-JX receivers. The man standing in front of the hidden operator is the station chief, T/Sgt. Rodrigues. The center of the picture shows an operating position utilizing a Globe King transmitter.

To the right in the photo is shown a portion of the radioteletype facilities which include the Collins KW-1 transmitter, Haufman CV-89 converter, SP-600-JX receiver and Heintz-Kaufman frequency-shift exciter. Behind the operator on the right is a 21/2-kw. amplifier using push-pull 8860s in the final. Printing is accomplished by Model 19, 15, and 28 printers. There are two typing operators.

The antennas at AF6AIR include a number of multiband T2FDs, a Gordon 3-element beam, numerous doublets, and a stacked vertical on two meters.
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"Phasemaster-Jr."

Up to 50 watts output.
Fixed or mobile, 6-12v fil.
SSB, AM, PM or CW.
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LAMPKIN 105-B MICROMETER FREQUENCY METER. Heterodyne type, uses only one crystal to measure all transmitters 0.1 to 175 mc., crystal-controlled transmitters to 500 mc. Precision CW signal generator for receiver final alignment above 20 mc. Weight 12½ lbs. Width 13". Price $220.00.

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Approved for G.I. training

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Amateur radio operators are offered opportunities for advancement by enlisting in the Naval Reserve Program.

Civilians who are qualified for enlistment in the Naval Reserve and who hold radio licenses issued by the Federal Communications Commission may be enlisted in the rates in Column 2 of the table below. At any time following enlistment in the rate indicated in Column 2 they may be examined for advancement; when qualified, they may be advanced to the rates in Column 3.

1) License Held  2) Rate in Which Enlisted  3) Authorized Rate When Qualified

Radiotelegraph  Commercial
First Class  Seaman  Radioman, Second Class
Second Class  Seaman  Radioman, Second Class
Third Class  Seaman  Radioman, Third Class

Amateur
Extra Class  Seaman  Radioman, Second Class
Advanced Class or Class A  Seaman  Radioman, Third Class
General Class or Class B  Seaman  Radioman, Third Class
Conditional Class or Class C  Apprentice  Seaman

Naval Reserve Electronics Division 12-1 at Eureka, California, has an excellent representation of amateur radio operators. They are Cmdr. Cecil Chisholm, K6EKC; Julio J. Sannazzari, RMC, W6CWR; Don Hitt, SN, W6PKJ; Edward Kirkwood, CEL1, W6SLX; and Louis Baribault, ET1, K6AJB.

Eighteen amateurs are authorized to operate their equipment at naval stations in Alaska.

Amateur radio stations at Kodiak are operated by Leo W. Fitzpatrick, ET1, KL7AZW; Ronald James Custer, AT2, KL7AWR; John Trent, KL7DG/KL7; Lt. Cmdr. Harry W. Jackson, KL7BZP; Cmdr. A. H. Stewart, KL7ALJ; Charles Hamilton, KL7EX; Lt. Cmdr. Albert McLane, KL7AUJ; and Mrs. C. H. McLane, KL7AYI.

Amateur radio stations at Adak are operated by Robert E. Mooring, KL7AER; Ralph A. Reedy, KL7AVA; William B. Ryburn, KL7AYQ; John E. Nichols, KL7AYT; Arnold P. Simmons, KL7BAM; Harold R. Jones, W62VW/KL7; Lee C. Rabie, KL7AZP; James R. Barto, W5DG/KL7; Joseph A. Brown, W4ONJ/KL7; and Norman L. Lake, KL7BBP.

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consignment which is a product of the Member of the
American Radio Relay League take the 7¢ rate. An
attempt to deal in apparatus in quantity, even if
by an individual, is commercial and all advertising by
him must follow the rates of paragraphs (1), (2),
(3), and (5) apply to all advertising in this column regardless of
which rate may apply.

(7) Try to stay away from overly ad, it is
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There's no extra for that.

(8) No advertisement may use more than 100 words in
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quartz suitable for making monolithic Diamond Drill

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<thead>
<tr>
<th>RCA No.</th>
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<th>DC Plate Input (watts)</th>
<th>DC Plate Volts</th>
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<td>2E26</td>
<td>Beam Power</td>
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</tr>
<tr>
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<tr>
<td>8005</td>
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<td>500</td>
<td>1500</td>
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*Total for tube