QST

October 1956
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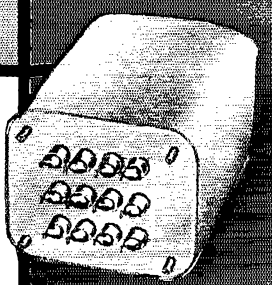
amateur radio

PUBLISHED BY THE AMERICAN RADIO RELAY LEAGUE

NEW HERMETIC POWER COMPONENTS

HIGHEST RELIABILITY FOR MILITARY AND INDUSTRIAL USE



Listed below are just a few of the 50 new **stock items** in the United hermetic power series. These MIL-T-27 power components add to the 200 other hermetic stock items of filter, audio, and magnetic amplifier types. Through the use of proven new materials and design concepts, an unparalleled degree of life and reliability has been attained, considerably exceeding MIL-T-27 requirements. Test proved ratings are provided, not only for military applications but for **industrial, broadcast, and test equipment service (55°C. ambient).**

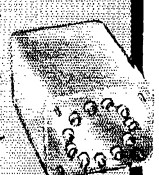
For complete listing of these new items, write for Catalogue #56.

MIL-T-27 RATINGS IN REGULAR TYPE — INDUSTRIAL RATINGS IN BOLD TYPE

TYPICAL POWER TRANSFORMERS, PRI: 115V., 50-60 cycles.

Type No.	HV Sec. C.T.		Approx* DC volts	DC MA	Fil. Wdg.		Approx* DC volts	MA DC	Fil. Wdg.	MIL Case
H-81	500	L	180	65		L	170	75		
		C	265	55	6.3VCT-3A	C	240	65	6.3VCT-3A	HA
	550	L	200	60	5V-2A	L	190	70	5V-2A	
		C	300	50		C	280	60		
H-84	700	L	255	170		L	240	210		
		C	400	110	6.3V-5A	C	360	150	6.3V-6A	KA
	750	L	275	160	6.3V-1A	L	260	200	6.3V-1.5A	
		C	420	105	5V-3A	C	380	140	5V-4A	
H-87	730	L	245	320		L	210	420		
		C	390	210	6.3V-6A	C	350	310	6.3V-8A	NB
	800	L	275	300	6.3V-2A	L	245	400	6.3V-2A	
		C	440	200	5V-4A	C	400	300	5V-4A	
H-93	1000	L	370	280	6.3V-8A	L	340	340	6.3V-10A	DA
	1200	L	465	250	6.3V-4A 5V-6A	L	455	300	6.3V-5A 5V-6A	

*After appropriate H series choke. L ratings are choke input filter, C ratings are condenser input.

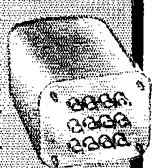


United "H" series power transformers are available in types suited to every electronic application. Proven ratings are listed for both high voltage outputs.. condenser and choke input filter circuits... military and industrial applications.

United "H" series filter reactors are extremely flexible in design and rating. Listings show actual inductance at four different values of DC. Bold type listings are industrial application maximums.

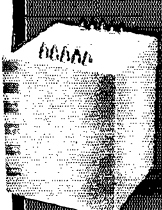
TYPICAL FILAMENT TRANSFORMERS, PRI: 105/115/210/220V., 50-60 cycles.

Type No.	Sec. Volts	Amps. (Mil.)	Amps. (Ind)	Test Volts RMS	MIL Case
H-121	2.5	10	12	10000	JB
H-124	5	3	3	2000	FB
H-127	5	20	30	21000	NA
H-131	6.3CT	2	2.5	2500	FB
H-132	6.3CT	6	7	2500	JA
	6.3CT	6	7		
H-136	14, 12, 11CT	10	14	2500	LA



United "H" series filament transformers have multi-tapped primaries, good regulation, and are rated for industrial as well as military service.

United "H" series plate transformers incorporate dual high voltage ratings and tapped primaries to provide versatile units for a wide range of military and industrial electronic applications. Large units have terminals opposite mounting for typical transmitter use.



UNITED TRANSFORMER CO.

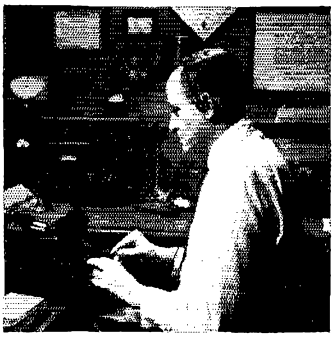
150 Varick Street, New York 13, N. Y. • EXPORT DIVISION: 13 E. 40th St., New York 16, N. Y.

CABLES: "ARLAB"

Past Winners

1955: Robert W. Gunderson, W2JIO

1954: Benjamin S. Hamilton, W6VFT



1953: J. Stan Surber, W9NZZ

1952: Don L. Mullican, W5PHP

NOMINATIONS INVITED FOR FIFTH ANNUAL EDISON AWARD

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

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

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

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

RULES OF THE AWARD

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

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

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

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

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

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

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

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

ROSEL H. HYDE, Commissioner, Federal Communications Commission.

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

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

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

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QST

OCTOBER 1956

VOLUME XL • NUMBER 10

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

OFFICES

38 La Salle Road
West Hartford 7, Connecticut

TEL.: ADams 3-6268 TWX: HF 88

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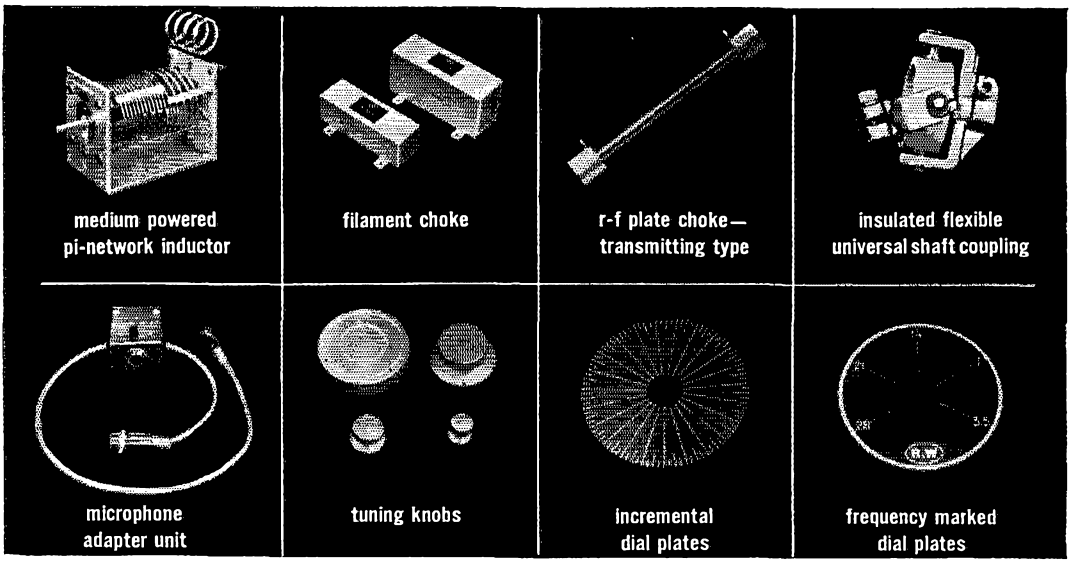

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Reports Invited. All amateurs, especially League members, are invited to report station activities on the first of each month (for preceding month) direct to the SCM, the administrative ARRL official elected by members in each Section. Radio club reports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

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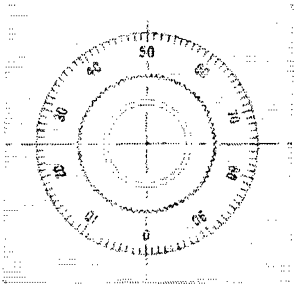

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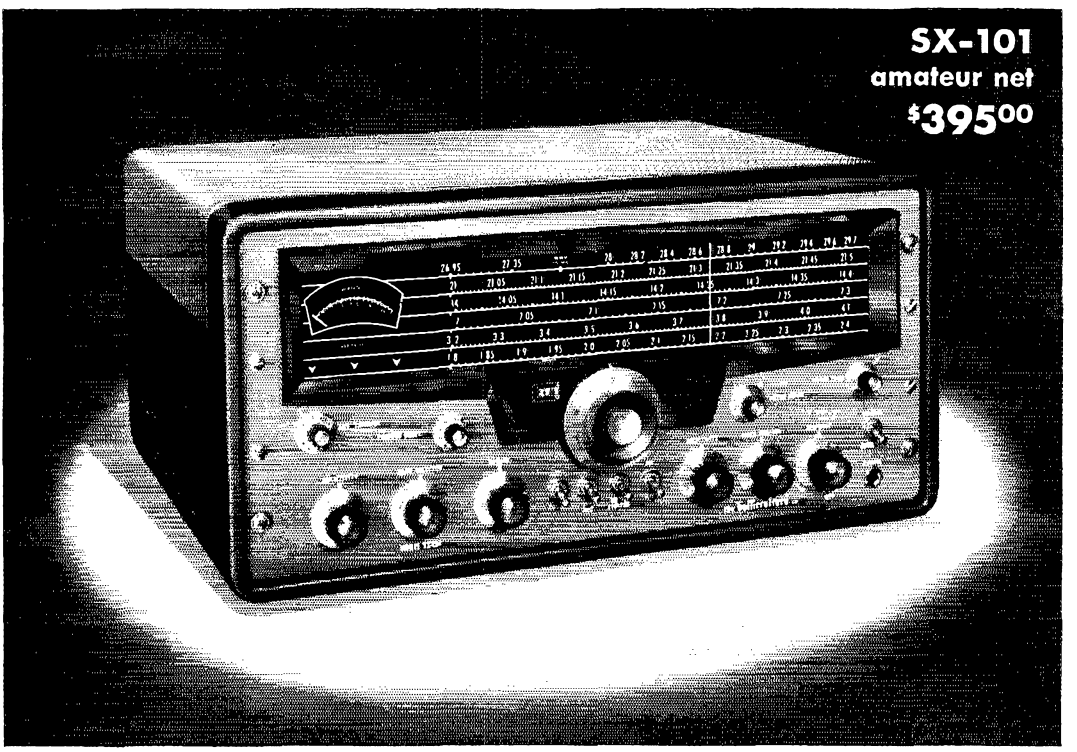

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is a noncommercial association of radio amateurs, bonded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio art and of the public welfare, for the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

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

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

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

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

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

New England Division

PHILIP S. RAND W1DBM
Route 58, Redding Ridge, Conn.
Vice-Director: Clayton C. Gordon W1HRC
65 Emerson Ave., Pittsfield, Mass.

Northwestern Division

R. REX ROBERTS W7CPY
837 Park Hill Drive, Billings, Mont.
Vice-Director:

Pacific Division

HARRY M. ENGWICHT W6HC
770 Chapman, San Jose 26, Calif.
Vice-Director: Harold L. Lucero W6JDN
1113 Elinore Ave., Dunsmuir, Calif.

Roanoke Division

P. LANIER ANDERSON, JR. W4MWH
428 Maple Lane, Danville, Va.
Vice-Director: Theodore P. Matheweon W4FJ
110 N. Colonial Ave., Richmond, Va.

Rocky Mountain Division

CLAUDE M. MAER, JR. . . . . WØIC
740 Lafayette St., Denver, Colo.
Vice-Director: Walter M. Reed . . . . . WØWRO
1355 E. Amherst Circle, Denver, Colo.

Southeastern Division

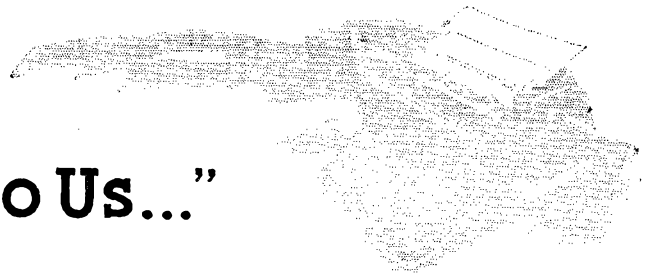
JAMES P. BORN, JR. W4ZD
25 First Ave., N.E., Atlanta, Ga.
Vice-Director: Thomas M. Moss W4HYW
P.O. Box 644, Municipal Airport Branch,
Atlanta, Ga.

Southwestern Division

WALTER R. JOOS W6EKM
1315 N. Overhill Drive, Inglewood 3, Calif.
Vice-Director: Robert E. Hopper W6YXU
4327 Santa Cruz, San Diego 7, Calif.

West Gulf Division

ROBERT E. COWAN W5CF
3640 Encanto Drive, Fort Worth 9, Texas
Vice-Director: John F. Skelton W5MA
1916 Briarwood Lane, Irving, Texas



"It Seems to Us..."

INTERNATIONAL CONFERENCE

Just nine years ago this month, several hundred delegates to the Atlantic City conference of the International Telecommunications Union held their final session, packed their bags, and headed for home. For five months they had been meeting to solve the regulatory problems of international communications, compounded by almost fantastic advances resulting from wartime research in the use of radio and electronics. The changes in regulations, particularly allocations, were so sweeping that it has required all this time for the various radio services to adjust themselves to the new frequency assignments; in fact, a number of countries still have not completed the changeover to the ACy allocations table.

Yet for the past couple of years, there has been discussion, in the Administrative Council of ITU in Geneva, as to when the next conference should be held. The United States has consistently opposed any proposals to set a date, in the belief that much more experience is needed with practical operation under the Atlantic City regulations before their utility can properly be appraised to determine whether they need to be changed again. But this year the U. S. was outvoted; some 60 nations adopted a recommendation to hold another international radio conference in late 1959. Our country was the only one opposed to holding the conference that early. So the time is now definite.

Its hand thus forced, and in the realization of the tremendous task facing us all in the planning for the conference, the Department of State this autumn is calling meetings of the various radio services to organize preparatory work and a schedule of meetings and committees. This work will proceed over the next three years, with industry representatives pitching in to tackle our common problems and come up with answers — and eventually a U. S. policy. As usual, the League will participate fully in this preparatory work, as representative of the amateur service. Let us be thankful that in the United States the communications policy is worked out by teams of industry people, under Government sponsorship, rather than wholly by the Government itself!

DIRECTOR ELECTIONS

If all eight division director offices are contested in the current elections, the first week of October will see something on the order of 30,000 ballots leaving Hq. addressed to Full Members of those divisions. That's hardly competition, at least in quantity, for the national politicial elections which shortly follow, but to each and every one of us amateurs involved it should be of similar importance.

So, if you're in one of the divisions holding elections this year, watch for your ballot. When received, mark it for the candidates of your choice, and let the postman bring it back to West Hartford for tabulating in November. Your voice is heard in the selection of a representative on the ARRL Board of Directors only if you make use of your right of ballot. It's up to you!

NOVICES ON 21 MC.

With the continuing improvement in DX conditions on the higher-frequency amateur bands, we'd like to say a word to Novices using 21 Mc. We want to remedy a situation which might cause some hard feelings among the fraternity toward the Novice segment. In fact, in a couple of instances it already has.

You probably already know, WNs and KNs, that on the DX bands it is common procedure for foreign amateurs on voice to operate just below the American phone assignment. In 21 Mc., for example, the foreign phones will be below 21,250 kc., all the way down to 21,200, and perhaps some even lower than that. This is all quite permissible, by their own regulations. And it is also practical, because a foreign station in the American band simply wouldn't be heard here because of the QRM. It is a gentleman's agreement that the c.w. boys stick generally to the lower end of the band, to allow space for these foreign voice stations.

Undoubtedly, some Novices aren't aware of this custom, for a number of you are well up above 21,200 kc. You've got every legal right to be there — all the way up to 21,250 kc., if you wish. But stop and think a moment how your c.w. signal may be cutting up some W's

reception of a weak foreign phone carrier. There's still room for you below 21,200 kc. and we recommend that you stick a bit more closely to that region. You'll help yourself by being nearer to c.w. DX, which usually hangs around the lowest 100 kc. of a band. You'll help your phone brethren by not QRMing the DX they're trying to receive. It's a very simple way to make everybody happy. How's to go along with it, OMs?

OUR COVER

The Field Day logs this year included the usual number of fine photographs taken at various sites. Our cover this month shows an operating position set up by the Wantagh Radio Club, using the call K2BCI. At the left is W2DQN, at the right W2LID. On page 69 of this issue you'll find a preview of the high claimed scores for the '56 Field Day.

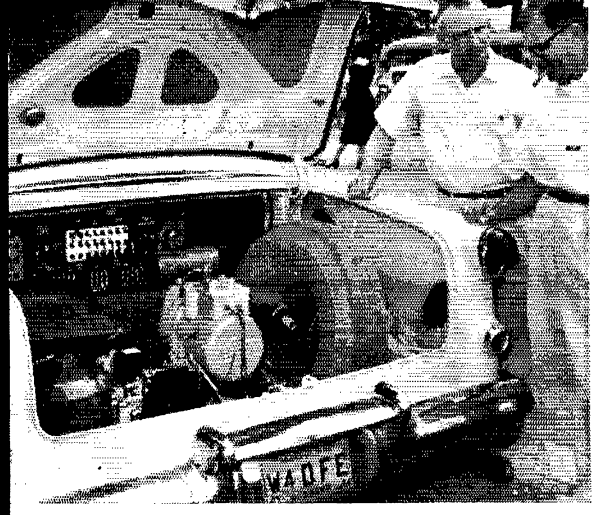
HAMFEST CALENDAR

Indiana — The Purdue Radio Club, W9YB, will hold a hamfest on Sunday, October 14, in the Purdue Memorial Union, West Lafayette, Ind. There will be a mobile contest, swap table, and a prominent technical speaker.

Kansas — SeKan Radio Clubs 4th annual hamfest at Riverside Park in Independence, October 21. Mobile hunts on 75 and 10 meters. Everyone welcome.

New York — The Antique Wireless Association invites you to attend its biennial Old-Timer's Nite, to be held this year at the Doud Legion Post, Buffalo Road, Route 33, Rochester, N. Y., on Saturday evening, November 3.

This event, sponsored jointly with the Rochester Amateur Radio Association, promises to be one of the big ham events of the year. A buffet supper will be set at 6:30 p.m., and will be followed by a fast-moving program. Out of state speakers will include such personalities as W1SS. Huge exhibit and demonstration of early wireless equipment will be on display. Everyone welcome — novice to old timer — a get-together for everyone. Advance reservations would be appreciated. Send $2.00 to Bruce Kelley, W2ICE, R.A.R.A., P. O. Box 1388, Rochester, N. Y.



It is quite obvious that this is the mobile installation of W4DFE, but W4WAZ and W4YWP are wondering where the OM puts his luggage when he takes the family off on a trip. This photo was taken at a hamfest in Birmingham by K4HKD.

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A.R.R.L. N.H. State Convention

Concord, N. H. — Sunday, Sept. 30th

The 18th Annual ARRL N. H. State Convention will be sponsored by the Concord Brasspounders at the State Armory and City Auditorium (right next door to each other) on Sunday, Sept. 30th. Highlights of the Convention include contests for mobiles, QSLs, and gadgets, and treasure hunts on 2, 10, and 75 meters. FCC exams will be given, and there will be net and ARRL meetings. Technical talks will feature s.s.b. and transistors. Director Rand will be present, as well as a representative from ARRL Hq. The banquet will feature family style roast beef. Advance sale tickets at $4.25 are available from the Concord Brasspounders, P. O. Box 312, Concord, provided check or money order and stamped self-addressed envelope accompany the request. Tickets at the door will be $4.75, or registration without the banquet will be $2.25. Mobiles check in on 3950 kc., 29.0 Mc., or 144.5 Mc.

A.R.R.L. NEW ENGLAND DIVISION CONVENTION

Providence, R. I. — October 21

The Providence Radio Association, Inc. is sponsoring the convention at Rhodes-on-the-Pawtuxet in Providence on Sunday, October 21. The P.R.A. is celebrating its 35th anniversary of affiliation with the ARRL, and its 37th year of continuous existence.

The convention will feature many fine exhibits, lecture-demonstrations and plenty of good fellowship.

Registration for the day will be $3.00 at the door. Advance reservations may be secured by writing Fred Stonely, W1VZP, 67 South St., Lincoln, Rhode Island. Banquet tickets for an "All-U-Can-Eat" roast beef dinner are available only by advance request prior to October 15. For further details write W1VZP.

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The Monimatch

An Inexpensive S.W.R. and Power Indicator

BY LEWIS G. McCOY, W1ICP

• Here it is — an s.w.r. bridge that can be left in the line with any amateur transmitter, costs only pennies to make, and offers no constructional problems. We've called it the "Monimatch," to indicate its dual function of showing when a match is achieved during matching-network adjustments, and thereafter monitoring the line to make sure that nothing has gone out of adjustment. Make one and you'll find the major problems of matching and transmitter tuning are problems no longer.

IF YOU have had the opportunity to use a bridge or reflectometer of the type that can be permanently connected to the transmitter, even at inputs up to a kilowatt, you know what a handy instrument it is for tuning transmitters and adjusting antenna systems. It will not only show you when the load at the end of your transmission line is matched to the line, but will furnish a continuous indication of the match. It will also give a visual indication of your relative power output, which can be quite important when making tuning adjustments.

The "Monimatch" is an easy-to-build version of such a bridge, based on a design developed at the Naval Research Laboratory.[1] It is simply a section of transmission line to which a linear inductor is closely coupled. The combination of inductive and capacitive coupling is such that the incident component of r.f. voltage on the line is balanced out when the constants are properly chosen, leaving only the reflected component to actuate an r.f. voltmeter used as the indicator. The circuit of the Monimatch, shown in Fig. 1, combines two such bridge circuits back to back so that either the incident or reflected component may be read.

With this type of bridge or reflectometer the current flowing through the indicator circuit is a function of the operating frequency, so the circuit of Fig. 1 uses an adjustable resistor in series with the d.c. instrument to keep the readings in the desirable part of the meter scale. This avoids the necessity for adjusting the transmitter output to an "on-scale" level, but in turn precludes the possibility of an accurate s.w.r. calibration because the linearity of the rectifier-type r.f. voltmeter used as an indicator is too greatly affected by the amount of resistance in the d.c. circuit. It does not, however, affect the accuracy with which a good match between load and line will be indicated. The dependence of voltmeter readings on frequency also makes a direct power calibration impracticable. But despite the fact that calibration in terms of either power or s.w.r. is not especially convenient (although not impossible), the instrument is nevertheless capable of performing the really important functions of determining when a match exists, monitoring the match, and showing *relative* power output.

Constructional Details

It is usually most satisfactory, for the majority of installations, to build the Monimatch in two units, the bridge itself and an indicator unit. A view of the bridge is given in the photograph, with additional constructional details shown in Fig. 2. This unit is built in a 12 by 2½ by 2-inch aluminum slip-cover-type box (Premier AMC-1014) with all parts mounted on the piece having one side and the two ends. The indicator section,

[1] Norgorden, "A Reflectometer for H-F Band," *NRL Report 3638*. Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Price, 50 cents.

The essentials of the Monimatch are a few pieces of metal, a resistor, two diodes, and some fittings. Dimensions are shown in Figs. 1 and 2.

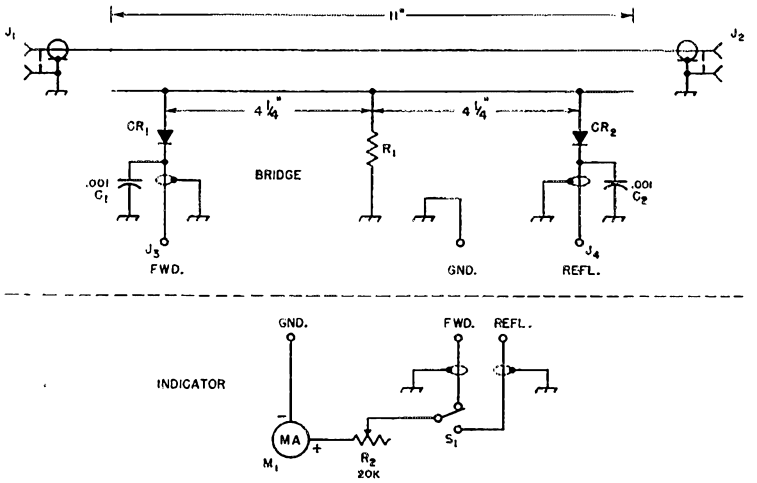


Fig. 1 — Circuit diagram of the Monimatch. J_1, J_2 — Coax receptacles, chassis-mounting type. J_3, J_4 — Insulated tip-jacks. R_1 — 68 ohms, 1 watt, for 52-ohm line. 47 ohms, 1 watt, for 75-ohm line. R_2 — 20,000-ohm potentiometer. S_1 — S.p.d.t. toggle.

which is not shown since there is nothing particularly novel in its construction, can be mounted in an ordinary metal meter case. Such a case will provide sufficient room for the d.c. milliammeter or microammeter (whichever is used) together with the variable resistor and toggle switch shown in Fig. 1.

The transmission-line section should have a characteristic impedance approximately equal to that of the actual line to be used with the device, but this point does not seem to be very critical. The construction shown works equally well with 50- and 75-ohm lines, and does not introduce a perceptible s.w.r., over the primary frequency range for which the Monimatch was designed, when inserted in a matched line. (The bridge is useful, incidentally, on both 50 and 144 Mc., the latter frequency being about the limit at which the line length in the instrument could be considered small enough compared with the wavelength.) The line section consists of a metal trough with $\frac{5}{8}$-inch sides for the outer conductor, and a length of $\frac{1}{4}$-inch copper tubing centered in the trough as the inner conductor.

In the unit shown in the photograph, the first construction step was making the $\frac{5}{8}$-inch diameter holes for the coax sockets in the ends of the box. These should be located as shown in Fig. 2. When the coax receptacle is mounted it extends approximately $\frac{1}{8}$ inch inside the box; the trough fits around this protrusion when it is mounted in place.

The trough can be made either from thin aluminum or copper sheet, aluminum being used in the model shown here. It should be made $12\frac{3}{4}$ inches long and then cut back $\frac{1}{2}$ inch at each end to make a $\frac{1}{2}$-inch tab, as shown in Fig. 2, for holding the trough in place. The preferable method of mounting is to drill a hole in the tab and secure it with one of the screws that holds the coax fitting. This requires that the fitting be mounted with its sides making angles of 45

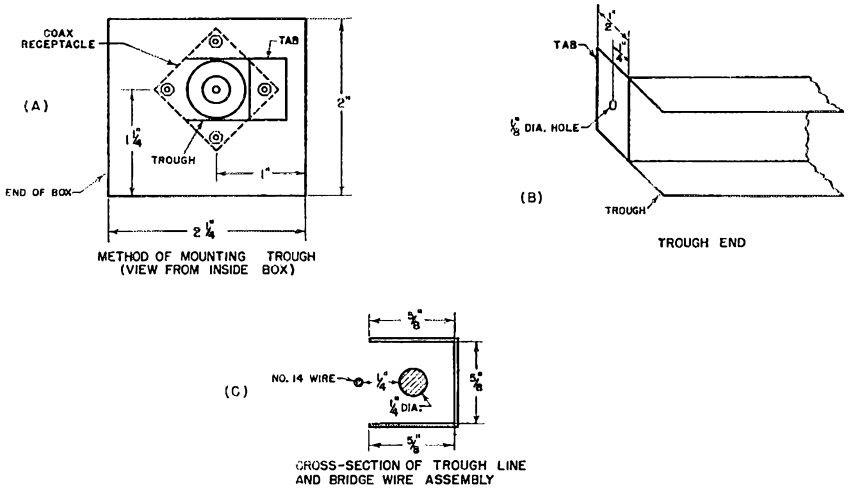
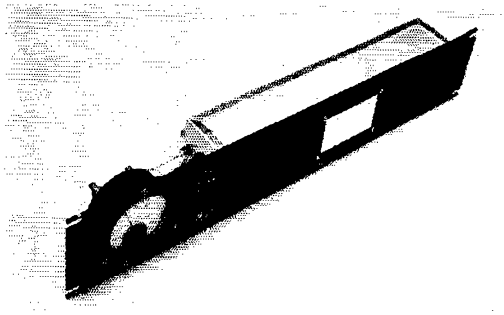


Fig. 2 — The drawing at A shows the method of mounting the trough to the end of the box. The trough is held in place by one of the screws that fastens the coax fitting to the box. Dimensions and constructional details of the trough ends are shown at B. A cross-sectional view of the trough, inner conductor, and bridge wire is shown at C.



This unit, built by W1CUT, has the bridge and indicator mounted on a 3½-inch relay rack panel to make a single assembly for rack mounting. The indicator may be built in any desired form, however, and placed wherever the operator finds it most handy to have it.

degrees with the edges of the box, as shown in the drawing. An alternative is to use a short length of stiff wire, fastened under two of the screws, to clamp the tab to the fitting. (This is the method used in the unit pictured.) Before mounting the trough, the ¼-inch copper tubing should be installed between the two inner-conductor terminals of the coax fittings. The length of the tubing is approximately 11⅝ inches, and its ends are soldered to the coax fittings.

After the trough-line assembly is complete the next step is mounting the bridge wire, an 11-inch length of No. 14 tinned wire. First, trim the leads on R_1 to approximately ⅜ inch. Solder one of these leads to a soldering lug mounted on the side of the box (about 1 inch from the edge) as shown in the photograph. Next, mount the tie points which support the crystal diodes. They should be placed 2 inches from the ends of the box and 1 inch from the edge. Two short leads of shielded wire are used to connect each of the tie points to the insulated pin jacks, J_3 and J_4. The pin jacks may be mounted in any convenient location. The cathode leads of the diodes and the 0.001 disk capacitors can then be mounted in place on the tie points. When soldering a diode, hold the lead with a pair of pliers to conduct the heat away, since the heat of soldering can ruin a diode.

Indicator

The required sensitivity of the d.c. meter for the indicator will depend on the frequency band and the amount of power used. Typical current values are shown in Table I. A 0–1 milliammeter is usable for power inputs over 100 watts. At 100 watts, the 0–1 instrument won't be sensitive enough to give a full-scale deflection on 160 and 80 meters (it takes about 200 watts at 3.5 Mc. for full scale), but it isn't actually necessary to have a full-scale deflection for impedance-matching purposes. On the higher-frequency bands the 0–1 milliammeter will be adequate even with 25 watts input.

If the power input is less than 50 watts and the bridge is to be used on 160 and 80 meters a 0–100 microammeter will be needed to obtain large-enough readings for matching. Incidentally, don't worry about burning out a sensitive meter if high power is used. Naturally, caution should be used when making adjustments, but it is only necessary to be sure that there is enough resistance in series with the meter before turning on the transmitter. After power is applied the resistor can be adjusted, if desired, to give full-scale deflection in the forward direction.

Setting Up

A nonreactive load of the correct resistance to match the coax line is needed for the adjustment of the bridge. If you do not already have such a load or a dummy antenna of known resistance, a suitable dummy for 52-ohm coax can be made by connecting four 220-ohm 1-watt resistors in parallel, keeping the connecting leads just as short as possible. This will provide a 4-watt 55-ohm load, close enough to 52 ohms for the purpose. For 75-ohm coax, the load can consist of four 300-ohm 1-watt resistors in parallel.

Initial adjustments should be made on 28 Mc. Connect the transmitter to J_1 and connect the dummy load (with short leads) between the inner-conductor terminal of J_2 and chassis ground. Adjust the transmitter output to approximately four watts, taking care not to overheat the dummy load. If the transmitter does not have built-in provision for reducing power output to this level, the arrangement shown in Fig. 3 may be used. The 40-watt lamp in series with the bridge will limit the r.f. current o about the proper value at powers up to 50 watts or so, and for higher power a second lamp may be connected across the line as shown. The total lamp wattage should be approximately equal to the actual output of the transmitter.

Solder the center of the 11-inch wire to the remaining lead from R_1 and space it about ¼ inch from the inner conductor of the trough line. The

Table I

Typical values of rectified current with the indicator switched for forward reading, R_2 at zero resistance, and the coupling wire spaced ¼ inch from the inner conductor.

Band	10 Watts Output	50 Wa tts Output
1.8 Mc.	25 μa.	100 μa.
3.5 Mc.	72 μa.	250 μa.
7 Mc.	200 μa.	1 ma.
14 Mc.	750 μa.	Over 1 ma.
21 Mc.	Over 1 ma.	"
28 Mc.	"	"

An output power of slightly over 200 watts was required to obtain a reading of 1 ma. on 3.5 Mc.

free lead of CR_2 should be soldered to the wire approximately 4¼ inches from R_1, as shown in Fig. 1. Before turning on the transmitter for the first test, make sure that the wire does not touch the inner conductor at any point. Then turn on the transmitter and check the reading on the meter. It should be very low or zero. If there is any meter indication, the diode lead should be unsoldered and moved a short distance one way or the other along the wire and the test tried again. When the point is found that gives a good null or zero reading, the bridge is in adjustment for reading reflected power.

Next, remove the bridge from the line and reverse the input and output connections; that is, connect the cable from the transmitter to J_2 and the dummy load to J_1. Then solder CR_1 to the bridge wire at the same distance from R_1 as CR_2, but on the opposite side. Follow the same procedure again, adjusting the position of CR_1 for the lowest possible reading. The bridge is then ready for use.

If the bridge is going to be used on 6 or 2 meters and the power input is over 50 watts, the bridge wire should not be coupled as closely as described above. The proper distance will have to be found by experiment, but probably will not be more than ½ inch from the inner conductor.

Using the Monimatch

If you use an antenna coupler or balun coils in your antenna system, the bridge should be inserted in the coax line between the transmitter and coupler or balun. If a low-pass filter is used for TVI reduction, the bridge should be placed between the transmitter and the filter so harmonics generated in the diodes will not reach the antenna. The indicator unit can be placed in any convenient location. However, to avoid stray r.f. pickup on the leads from the bridge to the indicator, the leads should be run in shielded wire.

To check the accuracy of the impedance match in the system in use, first set S_1 to read forward power, apply power, and set R_2 for full-scale reading, or at zero resistance if the power is insufficient to drive the pointer to full scale. Next, switch S_1 to read reflected power. If the line is matched the meter will read zero. If the antenna system employs tuned feeders and a coax-link antenna coupler the coupler should be adjusted so that the meter shows no reading, or as close to zero as possible. With a coax-fed antenna the matching system should be adjusted so that the reflected power is zero or as small as possible. While it has been emphasized many times in the past, the point is worth mentioning again — with such a system all matching adjustments *must* be made at the antenna. It is impossible to match a coax line to an antenna by making adjustments at the transmitter.

If you find that the indicator reads zero in the reflected-power position when the transmitter is running continuously, indicating a matched line, but that there is a momentary "flick" of the needle when the transmitter is keyed, you can be fairly certain that there is a parasitic oscillation in the transmitter. Also, if you find it impossible to get a reflected reading of zero, it may be because there is enough harmonic or subharmonic content in the transmitter output to cause a "residual" meter reading even with perfect matching at the fundamental frequency.

To use the bridge as an output indicator,

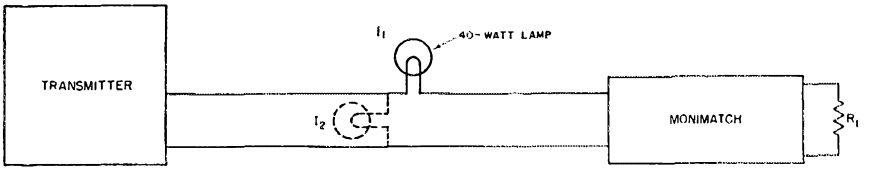


Fig. 3 — Shown above is a simple method of reducing the power output to prevent overheating the four-watt dummy load (R_1). For transmitters of more than 50 watts output another lamp (I_2), or lamps, should be shunted across the line to make the total lamp wattage equal the transmitter power output. If the transmitter has a drive control or some other method of reducing the output, the above system won't be needed.

switch S_1 to read forward power and adjust R_2 so the meter reads about half scale. Then tune the transmitter for maximum meter indication, while holding the plate current to within the ratings for the amplifier tube or tubes. You'll notice when tuning a tetrode amplifier having a screen dropping resistor that the maximum-output tuning point won't always be exactly the same as the point at which the plate current dips to minimum. Also, you may find that as you increase the amplifier loading the output doesn't increase correspondingly, and may even go through a maximum and then drop off as the input to the amplifier is increased. You'll probably also find that the power output is rather sensitive to grid excitation with a tetrode amplifier, and too much grid current is just as bad as too little. All of which adds up to the fact that an output indicator such as this is gives you considerably more information than the plate-current dip alone. Working together, the output indicator and the plate milliammeter will do a good job for you.

A 28-Element 144-Mc. Beam

High Gain 2-Meter Array of Rugged Mechanical Design

BY FRANK I. LESTER,* W2AMJ

• Every so often a new antenna does such an outstanding job that its proud owner is told "You should write that thing up for *QST*!" The 28-element 2-meter array erected some months ago at W2AMJ generated that *kind of interest*. Here Frank answers numerous requests for information on the beam that is responsible for the big signal from Bergenfield.

THE LATEST OF SEVERAL 2-meter arrays at W2AMJ has been up for several months now, and its performance and ability to withstand adverse weather conditions have resulted in many requests for information on its construction. This article was prepared to answer these inquiries, and to provide a description complete enough so that others can duplicate the design if they so desire In addition, there may be mechanical hints that will be useful to 2-meter men who are building other types of arrays.

A great deal of thought was given to this project before work was actually started. We wanted a beam that would have reasonably high gain, but it would have to be of such design that it would be easy to handle and be able to take the shellacking that coastal storms have been giving us in recent years. Antennas have taken terrific beatings at frequent intervals, and too many of them have not had what it takes.

Solving the Mechanical Problems

Being somewhat over 35 (ahem!) the writer decided that a fold-over tower was a must. Not only would it make the inevitable adjustments easier, but it would make it possible to "lower the boom" when the weather bureau begins sending out advance warnings of the impending visits of some of our windy girl friends from the West Indies. In the latter situation it is comforting not to have to wait for something to come crashing through the roof. The tower selected was a Rohn, Type FK101C, that may be tilted over and raised by a winch, at the ground level.

Pondering the feed line problem, it was decided to use half-inch Styroflex coaxial cable. The initial cost of this cable is admittedly high, but costs are not always what they seem. When you take losses into consideration it may turn out that expensive cable and a 100-watt rig will cost no more than it would to put on the extra power to make up for the loss you have to take with inexpensive transmission lines. And there is no way to make up the line loss factor in receiving!

The beam is turned by a CDR Type TR-4 rotator, which is mounted near the top of the tower. At the top the Styroflex cable is bent back on itself so that the fitting at the end faces downward. At this point a length of RG-8/U is attached by means of a Type N fitting, running up to the beam. Enough slack is left to provide for 360-degree rotation. The Styroflex cable is run down the tower to the hinge point, where it then is fastened to the boom for the rest of the way. Thus it is necessary only to detach the fitting at the point where the Styroflex enters the house when lowering the array to the ground. The portion of the cable between the bottom of the boom and the house goes up in the air with

* 280 West Main St., Bergenfield, N. J.

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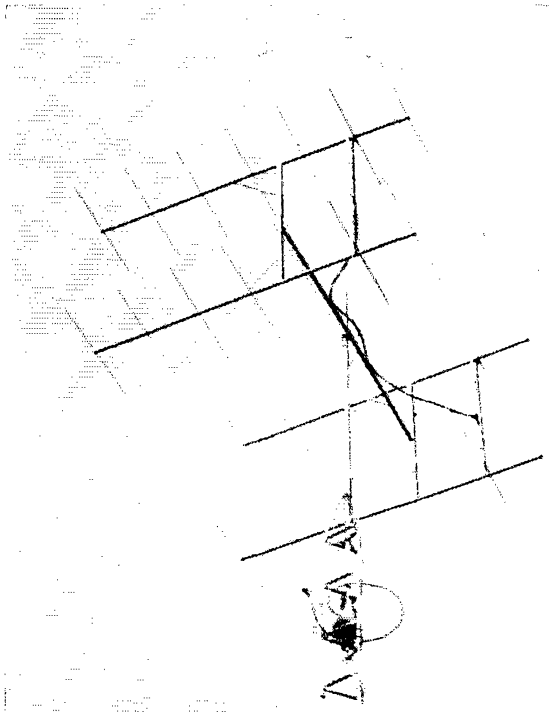

Four 7-element Yagis, with a phasing system entirely of coax, make for high performance in the 2-meter array at W2AMJ. The transmission line below the flexible rotation loop, visible near the rotator, is of low-loss coax.

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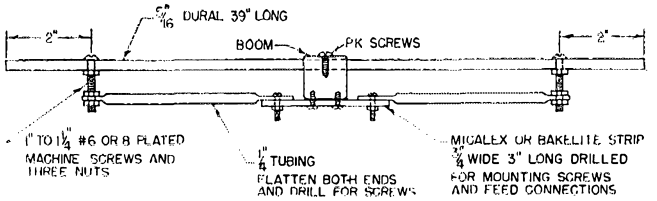


Fig. 1 — Details of the driven elements used in the 28-element array at W2AMJ. Booms are drilled as close as possible to the top surface, each element being held in place by a single self-tapping screw. Parasitic elements are mounted in the same manner. Spray all screws with Krylon after assembling.

the boom, when the tower is tilted over. The rotator cable, being flexible, can be run down the tower support.

Raising or lowering is a 5-minute operation for one man, under ordinary weather conditions. If winds are above about 35 m.p.h. it is well to have a helper, with a rope attached to the upper part of the tower to keep it from twisting when it is part way up or down. This up-and-down business results in some development of the arm muscles, if one is as fussy as the writer was in the adjustment of his array. We went through it at least 50 times during the two-month period when the antenna system was being adjusted to our satisfaction! A feature that will appeal to other QCWA members: You have to climb the tower only once — during the initial installation.

The beam itself is the result of much experimentation with this general type of array, and previous experience with a Twin-Five and a Twin-Seven of somewhat similar design. The Twin-Five used temporarily atop this same tower had open-wire phasing lines. With it spurious responses from the seven TV stations just across the Hudson River (Channels 2, 4, 5, 7, 9, 11 and 13!) were very troublesome, so the new array was designed around a phasing system made completely of coax. This brainstorm paid off, though there was still some TV interference remaining. More about that later.

Drawings are provided to show the principal details of the array. It is made up of four 7-element Yagis, spaced approximately 5/8 wavelength apart vertically and slightly over one wavelength horizontally. Individual elements are spaced 15¾ inches apart, on 8-foot booms. Two 16-foot lengths of 1-inch square .049-inch wall 63ST tubing were purchased and cut at the middle. Square material has obvious advantages over round for the booms, particularly if the constructor must do his drilling without the aid of elaborate drilling fixtures. Anyone who has attempted to drill round tubing for Yagi antennas will know what I mean! The booms are drilled for the elements as closely as possible to the top surface, so a single self-tapping screw can be used to hold each element in place. See Fig. 1.

The booms are supported in an H frame of 1½-inch 24ST round tubing, having a 3/32-inch wall. Ends of this tubing are slotted one inch deep to take the square booms, and the cross brace is Heliarc-welded to the vertical members. (Heliarc welding is a special process for welding aluminum, and can be performed quite reasonably by a well-equipped welding shop.) Dimensions are given in Fig. 2. Horizontal bracing for the booms is provided by short lengths of soft aluminum tubing. The ends of these braces are flattened in a vise and drilled to pass bolts for fastening them to the booms and vertical supports. Similar tubing is used as additional bracing between the booms, these members also serving as supports for the coaxial phasing lines. These braces are flattened at the ends and then bent at right angles for fastening to the square booms just ahead of the driven elements.

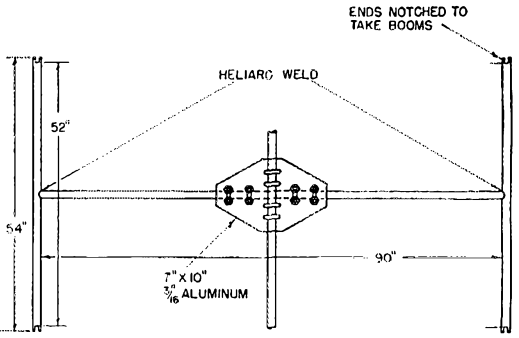


Fig. 2 — H-frame that supports the booms in the 2-meter array is a one-piece welded assembly. Horizontal member is fastened to the main vertical support by means of a plate of sheet aluminum and eight ¼-inch U bolts.

The main vertical support is 2-inch thick-wall dural tubing. The main horizontal member of the array is fastened to this by means of standard U bolts and a metal plate, as shown in Fig. 2. If the plate is sheet aluminum, it should be at least 3/16 inch thick. Sheet steel of lighter gauge would be satisfactory. Use of at least four U bolts for each member is recommended.

Elements are all 5/16-inch dural tubing with 1/32-inch wall. Lengths are as follows: reflector — 41 inches, driven element — 39 inches, 1st director — 36⅞ inches, 2nd director — 35¼ inches, 3rd director — 34¾ inches, 4th director — 33⅞ inches, 5th director — 33½ inches. The rather unorthodox driven element design, arrived at by experimenting for lowest s.w.r., is shown in Fig. 1.

The Coax Harness

The phasing lines are made of parallel pairs of RG-11/U coax, though RG-8/U could also be used. The vertical pairs are electrically one wavelength long over-all (physically about 5/8 wave-

length) and the horizontal pair is two wavelengths long electrically, resulting in a spacing of just over one wavelength horizontally.

Start by cutting 8 pieces of the coaxial cable 29 inches long and 4 pieces 56 inches long. Remove one inch of the outer black jacket from each end of all cables and then comb out the braided outer conductor back to the line where the jacket was cut. Dress the shield wires to one side and twist them together to form a pigtail. Keep these pigtails on opposite sides of the cable; this will make it easier to connect them together later on. Now remove ¾ inch of the polyethylene covering from the inner conductor at each end of all pieces.

The harness may now be assembled, as shown in Fig. 3. Twist the inner conductors of two of the short pieces of cable together. Then add one of the longer pieces to this same connection. The two short pieces should be in a straight line, and the longer piece should run off at approximately a right angle. Be sure that no strands of the outer conductor are in a position to short to this junction. Solder the triple connection, and tape the whole area up to the outer conductors tightly with No. 33 plastic tape. Now tie the outer shields together and solder the joints. Cover the joints with plastic tape, being sure to use enough to provide a complete seal. Repeat this operation with the other cable pieces until four such assemblies are made.

Solder lugs to the ends of the inner conductors for connection to the dipoles and then connect the inner ends of the horizontal lines together, as shown in Fig. 3. The harness is now ready for connection to the array, but before this is done it is a good idea to "buzz out" the system to make sure that no opens or shorts have developed in the soldering and taping process.

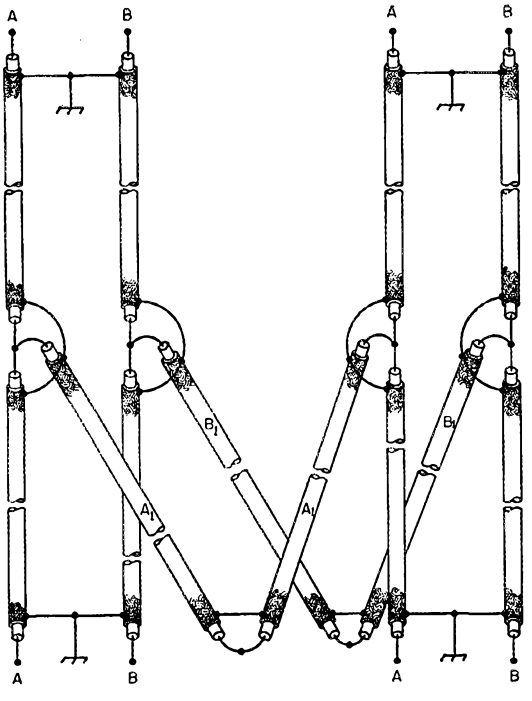


Fig. 3 — Phasing harness for the W2AMJ array. Sections marked A feed the left side of all dipoles. Those marked B feed the right sides. Note the grounding points at the four ends.

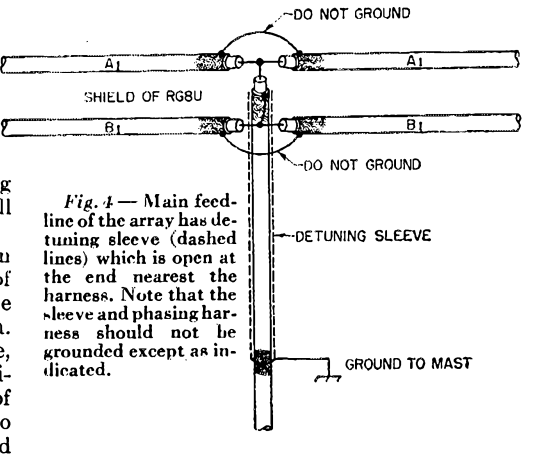


Fig. 4 — Main feedline of the array has detuning sleeve (dashed lines) which is open at the end nearest the harness. Note that the sleeve and phasing harness should not be grounded except as indicated.

The parallel parts of the harness are now twisted together and then connected to the assembled beam. Start at the center and twist toward the ends, taping the pairs to the vertical supports to keep them twisted and in place. Be sure that the various parts of the harness are identified, so that you can be sure that the system will be wired up in phase, as shown in Fig. 3. Connect the vertical pairs to the dipoles, and then twist the horizontal pairs together and tape them to the horizontal support Connect the inner ends of the cables together at the center of the array. The outer conductors of the harness should be grounded to the supporting structure only at the points indicated, at the ends of the vertical members.

The length of RG-8/U that is to run to the Styroflex cable may now be prepared. It is fitted with a detuning sleeve at the feed point to keep r.f. current from flowing down the outer conductor. This sleeve is made from half-inch tinned copper braid, that is soldered to the outer conductor at its bottom end. The top end is open. Cut a piece of braid somewhat longer than 13 inches and expand it over a broom handle, so that it can be slipped over the RG-8/U readily. Cut off about ½ inch of the vinyl jacket from the coax at a point 13 inches down from the end of the outer conductor, slip the braid over the coax and solder it to the exposed portion of the outer conductor at this point, grounding this joint to the supporting mast. Tape up this sleeve, being certain that the top end remains insulated from outer conductor at the top end. It thus forms a quarter-wave shorted stub, open at the top end, to serve as a detuning sleeve and balun. Connect the coax to the horizontal

(*Continued on page 118*)

Simple Trap Construction for the Multiband Antenna

Using Standard Parts in the Low-Impedance Wire Radiator

BY ARTHUR GREENBERG,* W2CYK

• **The low-impedance multiband antennas described in *QST* over a year ago have aroused an unusual amount of interest. An over-all length of only 107 feet, combined with the simple trap construction described here by W2CYK, makes an attractive proposition for the average back yard.**

THE POPULARITY of the bandswitching multiband transmitter has, more than anything else, pointed up the need for a multiband antenna. Articles published in *QST* and other publications describe an antenna made up of a wire about 110 feet in length with two 7-Mc. resonant traps inserted approximately 20 feet from the center. The article by W3DZZ in *QST* for March, 1955,[1] and the one by W9YJH in *QST* for December, 1955,[2] each describe traps in which the physical construction is more complicated than necessary. The capacitors used in these traps are not simple and the use of aluminum tubing for the plates of the capacitor in such a way as to have them in contact with the copper wire of the antenna leaves the materials subject to galvanic action. The pull on the capacitors when the antenna is erected subjects them to considerable stress. The mounting of the forms and the winding of the coils as described are not too practical for home construction, and the materials used are not the easiest to secure.

* 211 Willis Ave., New York, N. Y.

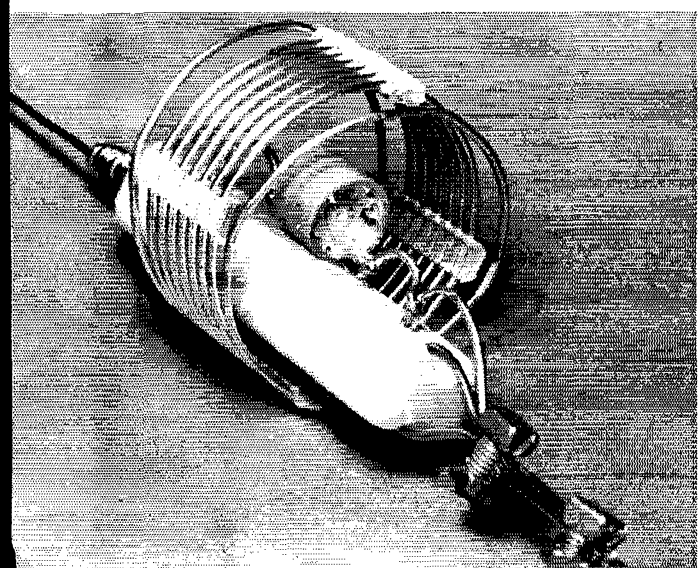
[1] Buchanan, "The Multimatch Antenna System."
[2] Pemberton, "Multimatch Antenna for Phone."

Components

In trying to reduce these deficiencies, a method of constructing the traps has been developed which not only eliminates the above-mentioned faults, but makes it possible to secure the materials commercially and at a low cost.

The research work done by W9YJH and the other amateurs mentioned in his article shows that the traps for the phone band require a capacitor of approximately 95 $\mu\mu$f. and an inductance of approximately 5 μh., giving them a resonant frequency in the phone portion of the 40-meter band. The Centralab Corporation of Milwaukee makes an inexpensive capacitor which is ideal for use in the construction of the traps. It is Model 850SL-100N, of 100-$\mu\mu$f capacitance and a rating of 5000 d.c. working voltage. It is a transmitting capacitor designed for high-voltage, high-current applications and is made with a tolerance of approximately 10 per cent. The size is $1\frac{3}{16}$ inch in diameter and $\frac{5}{8}$ inch long with solder lugs projecting about a half inch beyond the body. It will stand wide temperature changes with no significant change in capacitance.

For the inductors, the Barker & Williamson Co., Model 3905-1 air inductor, $2\frac{1}{2}$ inches in diameter, 6 turns per inch, of No. 12 wire is used. Nine turns of this coil give the proper inductance to bring the traps to a resonant frequency of approximately 7200 kc. when used with the above-mentioned capacitors (see photographs). It might be well to mention at this time that the recommended size for the capacitors, as given by Max Pemberton, W9YJH, was 95 $\mu\mu$f. The commercial ones of 100 $\mu\mu$f. with their normal tolerance come close to the optimum. Certainly, from the tests, the difference is not material.



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This close-up view shows the mounting of the capacitor and how the service connectors (Burndy KS90 Servits) are used. The insulator is a Birnbach 668, 4¼ inches long.

Assembly

The traps are made as shown in the photographs with the coil mounted around the 4¼-inch porcelain insulator, and the capacitor mounted within the coil, to the inside of the insulator. This locates the capacitor approximately in the center of the coil. By using a 10-turn length of the inductor, a half turn on each side may be used to slip through the anchor holes in the porcelain insulator to act as the terminal leads. The antenna wire is then connected to the insulator as shown. Use of small service connectors, commonly known as Servit connectors, available in hardware or electrical supply houses, makes for simple, neat and strong antenna and trap splices. There is no pulling strain on the wire of the inductor as the lead from the inductor is made with a small expansion loop.

The resonant frequency of the traps constructed as above is generally a little below 7200 kc., and has been used this way satisfactorily without adjustment. They can, however, be set to exactly 7200 kc. by breaking the poly at 3 points of mounting at each end of the coil and spreading the outside turns, as shown in the photographs, until the traps are exactly on frequency. Each complete trap weighs less than 8 ounces. The two of them needed for the multiband antenna will cost about $5.00 and can be assembled in less than a half hour.

No advantage was found in encasing these traps in plastic material or coating them with plastic sprays. All the material used is waterproof, and the spacing of the coil leaves enough insulation between the turns to prevent breakdown. The voltage across any two turns is not excessive even when using high power.

Results

Antennas with these traps are being used on 75, 40, 20, 15 and 10 meters, and are fed with RG-59/U coaxial cable of random lengths. They are being used with many of the popular transmitters and under varied local conditions, all with excellent results. W2CMM, who aided the writer in his experimental work in the development of these traps, is using a Viking II; K2IHX, a

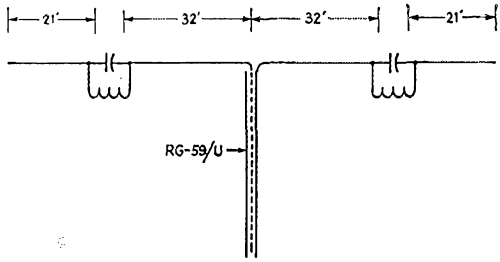

Fig. 1 — Dimensions of the multiband antenna used at W2CYK.

Collins 32-V2; K2AAO, a Viking Ranger; W2BB, a Heath DX35; K2JDK, a B&W 5100B, and the writer is using a BC-610 running over 400 watts input power. An antenna with the traps is being used by W6VLH, running a kilowatt of a.m. from a Johnson rig with full modulation. It is not felt, however, that the traps as described should be used with such high power.

The dimensions of the antenna are as follows: 32 feet from the center insulator to the traps and 21 feet from the traps to the end insulators, giving an over-all length, including the traps, of approximately 107 feet, as shown in Fig. 1.

No claims are made as to the standing-wave ratios when feeding with a 75-ohm transmission line on the various bands. The s.w.r. is dependent upon the impedance at the feed point of the antenna. The frequency being used, the height above ground, as well as the length in wavelengths are important factors in determining this impedance value. For instance, it is obviously impossible to maintain an impedance of 72 ohms on both 7200 and 3900 kc. with the same antenna, since the effective height at 3900 kc. will be only half that on 7200 kc. It is not likely that an antenna will exhibit an impedance of 72 ohms at its center when used on 4, 7, 14, 21 or 28 Mc., which were the frequencies on which the antenna has been tested and is being used. Let it suffice to say only that the antenna on all these bands is being fed at a low-impedance point. Seventy-two-ohm Twin-Lead or coaxial cable will result in a satisfactory match giving excellent results.

(Continued on page 120)

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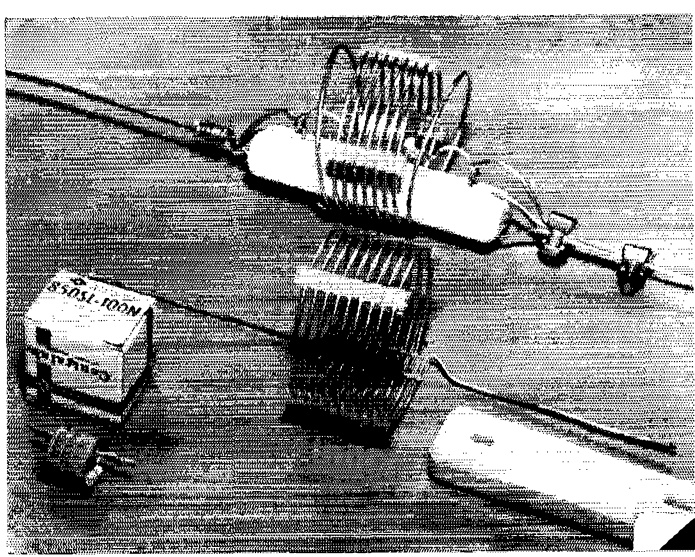


The components used in construction of these traps are all standard items easily obtained. This view of the assembled trap shows the end turns of the coil freed to permit accurate adjustment of inductance. It also shows alternate methods of connecting the antenna wire.

A Novel Method of Matching to the Ground-Plane Antenna

BY WALTER J. DAUKSHER,* W2OKX

• **This article describes the results of an experiment in matching carried out with a u.h.f. model antenna. The principle can be extended to lower frequencies.**

THE ground-plane antenna is an omnidirectional vertically polarized antenna that has great utility on the v.h.f. and u.h.f. bands. In recent years the ground-plane antenna has been used on the lower-frequency bands, the object being to obtain a low angle of radiation for DX work.[1]

Theoretically, a ground-plane antenna over a perfectly-conducting ground surface infinite in extent has a radiation resistance equal to half the radiation resistance of an isolated dipole — namely, 36 ohms for an infinitely-thin antenna. Because a practical antenna always has considerable thickness, and because the average ground-plane antenna uses four quarter-wavelength-long radials to simulate the ground surface, the radiation resistance of the ground-plane antenna may be as low as 25 ohms.

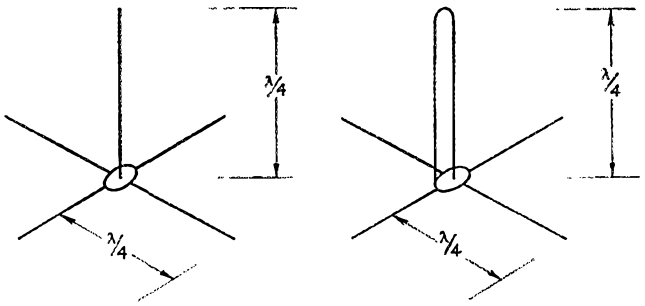


Fig. 1 — The conventional ground-plane antenna (left) and the folded ground-plane antenna (right).

The most popular method of matching a 50-ohm coaxial transmission line to the antenna is to shorten the antenna so that its input impedance has a capacitive component added to it; an inductive stub is then used to tune out the capacitance and simultaneously transform the radiation resistance up to 50 ohms.[2]

Alternatively, one may feed the ground-plane antenna without use of a matching stub or network and accept the 2/1 s.w.r. that results.

In general, the construction of a coaxial inductive section for matching purposes takes the simplicity out of constructing a ground-plane antenna. Further, the stub involves computations based upon some assumptions which may not be strictly true for the particular antenna to be constructed.

Consider now a ground-plane antenna with a vertical element constructed similar to half a folded dipole, Fig. 1. There is an effective radiation resistance step-up similar to that in a conventional half-wave folded dipole. In particular, if the rods that make up the dipole have equal diameters then the radiation resistance step-up is four times and a ground-plane antenna so constructed would have a radiation resistance of about 100 ohms.

Suppose now that a movable short is placed between the rods that make up the vertical element of the ground-plane antenna. When the short is at the top of the vertical element a radiation resistance of about 100 ohms exists at the base of the antenna. When the short is at the bottom of the vertical element the radiation resistance is zero because the antenna is now short-circuited. It should be, then, that the radiation resistance can be varied between zero and 100 ohms simply by sliding the short along the length of the vertical element. (There are additional reactive effects which are deemed second-order effects and hence are not considered here.)

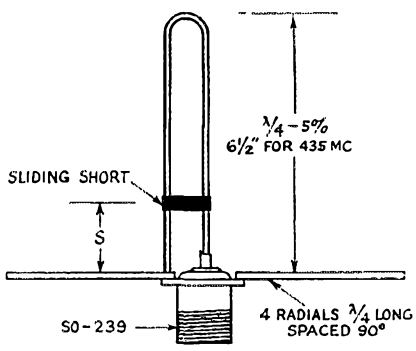


Fig. 2 — Details of the antenna constructed for the s.w.r. tests.

*112-06 209 St., Queens Village 29, Long Island, N. Y.

[1] McCallum, "The 'Plain Ground-Plane' Antenna," *QST*, August, 1953, p. 36.

[2] DeCamp, "Matching Coax Line to the Ground-Plane Antenna," September, *QST*, 1952, p. 18.

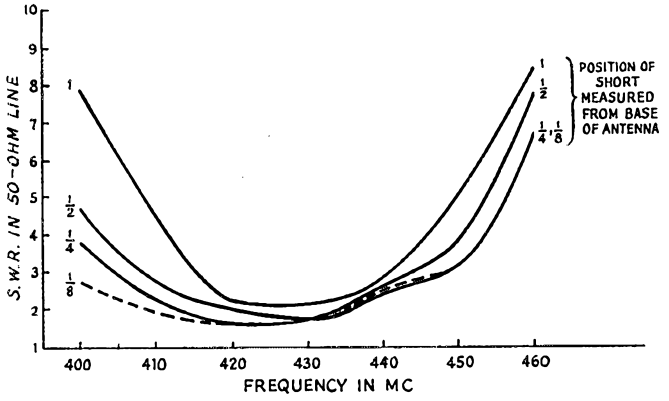


Fig. 3 — Standing-wave ratio *vs.* frequency, for various positions of the shorting bar. Fractions are in terms of height of the folded element.

Tests and Results

In order to test the above theory a ground-plane antenna designed for 435 Mc. was constructed of $\frac{1}{16}$-inch brazing rod as shown in Fig. 2 and in the photograph. A sliding short was used to vary the radiation resistance. Measurements were made of transmission-line standing-wave ratio as a function of frequency for several positions of the short. The results of the measurements (Table I) are shown graphically by Figs. 3 and 4.

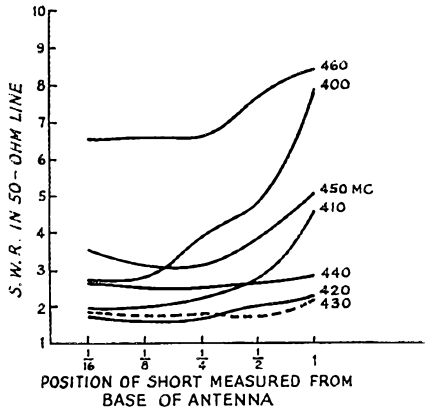


Fig. 4 — Standing-wave ratio as a function of the shorting-bar position, for various frequencies.

Inspection of the curves will reveal several interesting points. Fig. 3, for example, shows that as the short is moved down towards the base of the antenna the transmission line s.w.r. approaches unity, and, in addition, the frequency range over which it remains low increases — that is, the bandwidth of the antenna increases. Fig. 4 shows that placing the short too close to the base of the antenna will raise the standing-wave ratio, yet on the other hand the position of the short for minimum s.w.r. is a broad one. For the antenna tested the optimum short position seemed to be somewhere in the region of $\frac{1}{8}$ to $\frac{1}{4}$ of the way up from the base of the antenna.

The apparently irreducible minimum of standing-wave ratio may be due to uncompensated reactance in the matching section in addition to connectors and the like necessary to connect the antenna to the s.w.r. measuring equipment.[3]

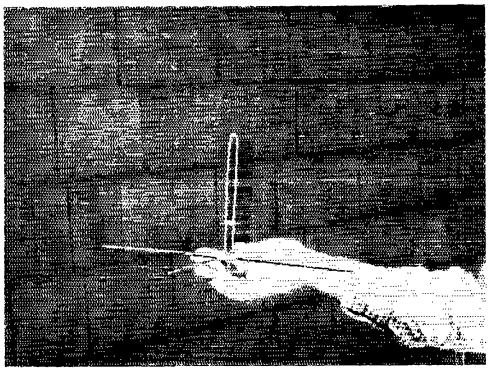
General

The data may be used directly if it is desired to construct a ground-plane antenna for 435 Mc. Antennas constructed for other frequencies will no doubt have other ratios of element dimensions to frequency and consequently it is recommended that the short position be made adjustable for initial tune-up. Also, the vertical element may be made single (instead of folded) above the short position, in which case it is very similar to a gamma matching section.

TABLE I

Frequency	S.W.R. with Sliding Short (Fig. 1) at S = 1	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{1}{16}$
400	7.9	4.7	3.8	2.7	2.7
410	4.5	2.7	2.2	1.9	1.9
420	2.2	2.0	1.6	1.6	1.7
430	2.1	1.7	1.7	1.7	1.8
440	2.8	2.6	2.4	2.5	2.6
450	5.0	3.8	3.1	3.1	3.5
460	8.4	7.7	6.6	6.6	6.6

[3] The equipment included a Hewlett-Packard u.h.f. slotted line and an AIL Type 20 instantaneous s.w.r. indicator.



The model antenna constructed for s.w.r. measurements. Its resonant frequency is 435 Mc.

A Single-Tube Converter for the "Novice Special"

Improving Stability at the Higher Frequencies

BY DONALD MIX,* W1TS

• **This single-tube crystal-controlled converter, employing only one crystal, covers the 10-, 15- and 20-meter bands with a single manual adjustment. Although it was designed primarily for use with the "Novice Special" regenerative receiver described in the June issue, it should improve materially the performance of any of the less-expensive communications receivers that include the ranges of 3300 to 3750 kc. and 10 to 12 Mc. When used with the regenerative receiver, the frequency stability on these higher-frequency bands will be at least as good as the receiver's stability on 3.5 Mc.**

AN ARTICLE in the June issue[1] described a simple two-tube regenerative receiver for the beginner. This receiver is capable of considerably better performance than the average of this type. However, it was pointed out that, although the sensitivity remained good at the higher frequencies, poorer frequency stability could be expected at frequencies above 7 Mc.

The reasons for this are fairly obvious. A given percentage change in capacitance reflected into the tuned input circuit by movement of the antenna, and similar effects, will cause the same percentage change in frequency at 30 Mc. as it does at 3 Mc. However, a change in frequency of one per cent at 3 Mc. is 30 kc.; at 30 Mc., it is 300 kc. — a change 10 times as great. The situation is further aggravated by the fact that a practical tuned circuit for 30 Mc. can tolerate much less capacitance than one at 3 Mc. Therefore, the percentage change will usually be much greater at the higher frequencies. The total effect makes a stable simple regenerative receiver a practical impossibility at the higher frequencies.

A solution to the problem was suggested at the end of the article in the June issue — the use of a frequency converter to change the higher frequencies into lower frequencies that the receiver can handle with good stability.

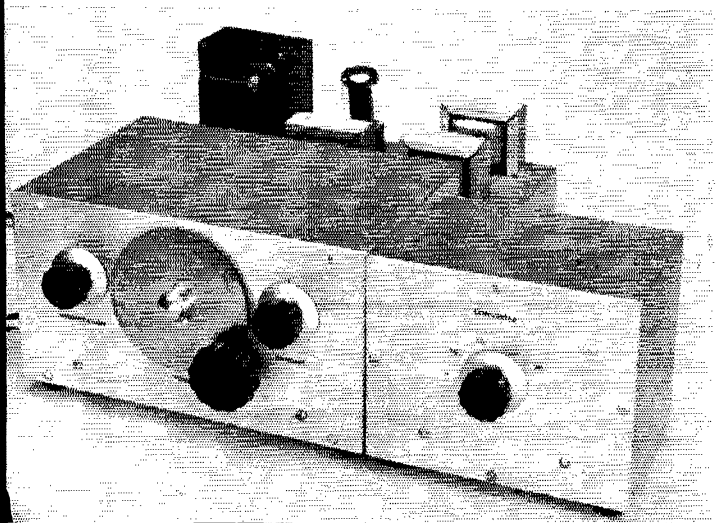
Frequency Conversion

In the circuit of Fig. 2, the triode section of a 6AN8 triode-pentode is used as a local oscillator. The pentode section is used as a mixer. The input circuit of the mixer, C_1L_2, is coupled to the antenna, and is tuned to the incoming high-frequency signal. The signal from the oscillator is also fed to the mixer. When the two signals are combined in the mixer, additional frequencies appear in the output circuit of the mixer. One of these new frequencies has a value equal to the *difference* between the incoming-signal and oscillator frequencies. To convert a signal in the 20-meter band (or any other band) into a signal in the 80-meter band, it is necessary only to select an oscillator frequency that differs from the incoming-signal frequency by about 3500 kc.

This may sound confusing, but an example should make it clear. If we wish to convert an incoming signal at 14,000 kc. into one in the 80-meter band (3700 kc., for instance), we add 14,000 to 3700 and get an oscillator frequency of 17,700 kc. This provides a difference of 3700 kc. between the oscillator frequency and the incoming-signal frequency. Now, when the output circuit of the mixer is tuned to 3700 kc. and coupled to the input of the regenerative receiver, we will hear the original 14,000-kc. signal at 3700 kc. on the receiver.

* Assistant Technical Editor, *QST*.

[1] Mix, "The Novice Special," *QST*, June, 1956.



The single-tube converter combined with the regenerative receiver makes a 3-tube receiver covering all bands from 80 through 10 meters with good frequency stability. The converter dial is a Johnson 116-222-5.

Suppose we now combine the same oscillator frequency with a signal at 14,350 kc. — the high-frequency end of the band. Subtracting 14,350 kc. from 17,700 kc. leaves 3350 kc. Thus, with a fixed oscillator frequency, we can cover the 20-meter band by tuning the regenerative receiver from 3700 to 3350 kc.

The 15-Meter Band

Now let us see what happens when we combine frequencies in the 15-meter band with the same oscillator frequency. The difference between 21,000 kc. and 17,700 kc. is 3300 kc. And the difference between 21,450 kc. and 17,700 kc.[2] is 3750 kc. Thus, we can cover the 15-meter band by tuning the receiver from 3300 to 3750 kc.[3]

Since both bands are received over the same range on the receiver, the beginner might ask why signals in both bands are not heard simultaneously. The answer is that they would be if it were not for the tuned input circuit C_1L_2. Adjustment of this circuit (which covers both bands by means of C_1) selects the desired band. The selectivity is sufficient to attenuate signals in the unwanted band to the point where only the strongest ones will be heard at all.

Frequency Stability

Because the frequency fed to the receiver from the converter depends on the oscillator frequency, the frequency stability of the combination depends chiefly on the stability of the oscillator. Since the oscillator is fixed at one frequency, it can be crystal-controlled.[4] With crystal control, the frequency is essentially independent of circuit values. In addition, the oscillator is not coupled directly to the antenna, so any effects that the antenna may have on oscillator-circuit values will be minor. Furthermore, the regenerative receiver is no longer connected directly to the antenna, and its frequency stability therefore will be improved.

[2] An oscillator frequency of 17,700 kc. was chosen for two reasons. First, it puts the center frequencies of both bands at the same point on the receiver dial, making it unnecessary to shift the band-set capacitor when changing bands. Second, the low-frequency limit of the regenerative receiver's tuning range with the 80-meter coil is about 3200 kc. Other oscillator frequencies would move one band or the other closer to or beyond this limit.

[3] It should be noted that the high- and low-frequency ends of the 15- and 20-meter bands are reversed on the receiver tuning dial; i.e., 3300 kc. corresponds to the low-frequency end of the 15-meter band, while it corresponds to the high-frequency end of the 20-meter band. This reversal happens when the signal frequency shifts from one side of the oscillator frequency to the other. Frequencies in the 14-Mc. band are below the oscillator frequency; frequencies in the 21-Mc. band are above the oscillator frequency.

[4] Crystals for this special frequency can be obtained promptly direct from the manufacturer at the usual cost of an 80-meter ham-band crystal.

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Top view of the single-tube converter.

The 10-Meter Band

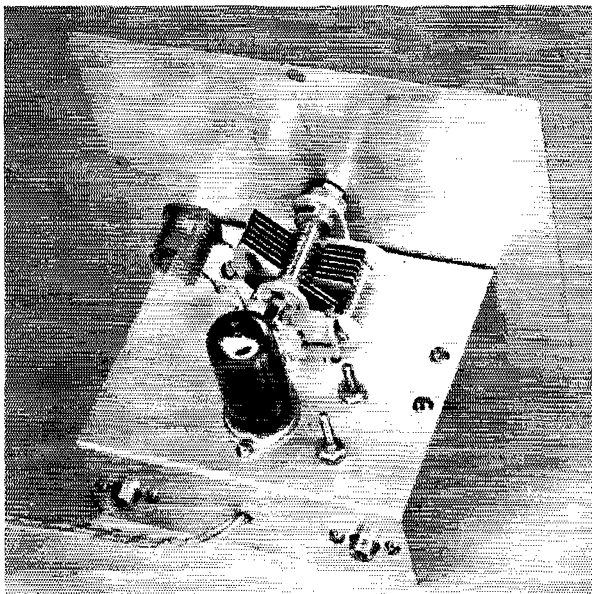
If we take the difference between 28,000 kc. and 17,700 kc., we get 10,300 kc.; the difference between 29,700 and 17,700 kc. is 12,000 kc. So, if we tune the receiver over the range of 10,300 to 12,000 kc., we should hear signals across the 10-meter band. This range can be covered by the receiver with the 40-meter coil plugged in and the band-set capacitor set at approximately 50 on its dial. The tuning range of the input circuit of the converter is wide enough to include the 10-meter band as well as the other two bands. The frequency stability of the regenerative receiver will still be quite good in the 10–12-Mc. range because the receiver is not coupled directly to the antenna.

Converter Output Circuit

In addition to the frequency (or band of frequencies) that we want, several other frequencies appear in the output of the mixer as a result of combining oscillator and signal frequencies. The unwanted frequencies can be eliminated by the use of a circuit in the output of the mixer tuned to the *desired* output frequency. This circuit also provides a means of coupling the output of the converter to the input of the receiver.

In the case of the 15- and 20-meter bands, where the desired output frequency is in the same range (3300 to 3750 kc.), a simple broad-tuning circuit adjusted to the center of the range would be adequate. However, if the 10-meter band is to be included, provision must be made also for tuning the mixer output circuit to the 10–12-Mc. range. To avoid the necessity for switching output circuits, advantage has been taken of the properties of the multiband tuner.[5] This is a circuit that can be adjusted so as to have two simultaneous response frequencies. Values have been chosen to make these two responses at the approximate centers of the two desired output bands — at about 3500 and 11,000 kc.

[5] Chambers, "Single-Ended Multiband Tuners," *QST*, July, 1954.



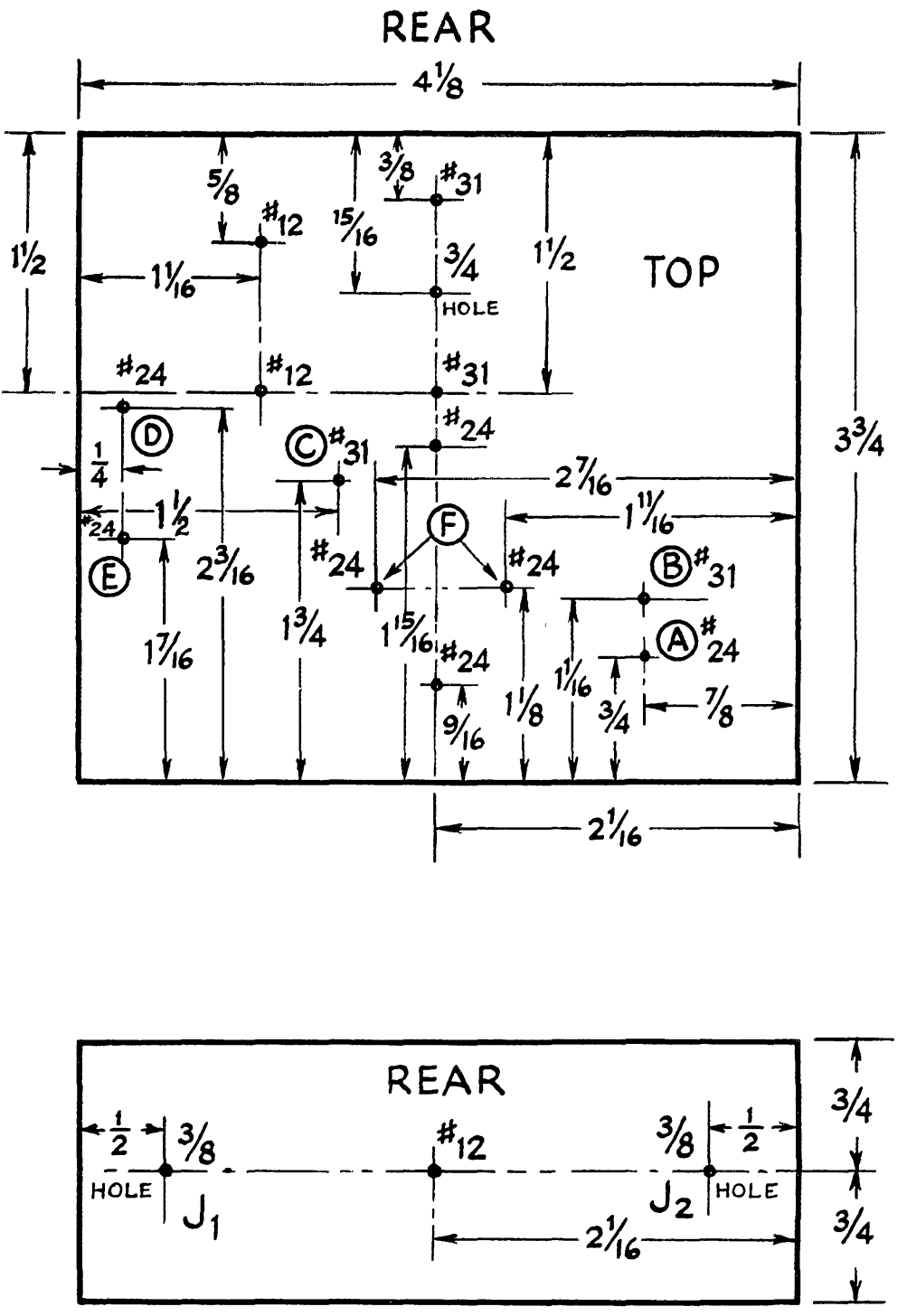


Fig. 1 — Sketches showing drilling of the chassis. Sketches are actual size.

Construction

The converter is assembled on a 3¾ × 4⅛ × 1⅝-inch miniature aluminum chassis (Bud CB-1627) which fits into a 4 × 5 × 6-inch aluminum box with 5 × 6-inch removable covers. (Be sure to note the size of the covers, since some makes of boxes of this size have the openings on the 4 × 6-inch sides. Bud Type AU-1029 is the right style.) If you bend up your own chassis from a strip of aluminum sheet 4⅛ inches wide, you can omit the ¼-inch lips used by the manufacturers. This makes the wiring a little easier.

Fig. 1 shows how the chassis should be drilled if duplicate parts are used. Two No. 24 holes should be drilled in the panel, ⅞ inch up from the bottom, and 1⅜ inches in from either side. These holes should be duplicated in the front end of the chassis, keeping the chassis central on the panel, with the bottom edges of the panel and chassis flush. A ½-inch clearance hole for the shaft of the input tuning capacitor C_1 should also be drilled in the panel. This hole should be located centrally, and 2⅞ inches up from the bottom of the panel if a duplicate capacitor is used. The panel should be fastened to the chassis with 6-32 machine screws and nuts, using washers or a strip of aluminum with corresponding holes to space the panel 1/16 inch from the chassis. This spacing is necessary to allow the bottom lip of the box to slide up in between the two when the unit is placed in the box.

The input tuning capacitor C_1 and the 6AN8 tube are centered on top of the chassis. Before mounting C_1, mount the two cone insulators (National GS-10) that support the oscillator coil L_3 in the holes marked F in Fig. 1. (C_1 will cover the mounting screws.) Turn the tube socket (Eby 9401) so that Pins 1 and 9 are toward the front.

The input coil, L_2, is soldered between a rear stator terminal of C_1 and a ground lug fastened to the chassis with a machine screw and nut at the hole marked A in Fig. 1. The antenna coupling coil, L_1, is wound over the grounded end of L_2, and is held in place with Duco cement. The outside end of L_1 is soldered to the grounded end of L_2. The inside end of L_1 drops down through Hole B, and thence runs back to the insulated terminal of J_1. Hole C is for an insulated lead from the stator terminal of C_1 to Pin 8 on the tube socket.

A lug strip with three insulated terminals and two mounting feet is fastened with machine screws and nuts at Holes D and E. (Space these holes to fit the mounting holes of the particular strip you use.) This strip is used to support R_2 and R_4.

The pins of the crystal holder are soldered between Pin 2 on the tube socket and a grounding lug. Grounding lugs can be placed under mounting screws as found most convenient.

Output Coils

The output coils should be mounted after most of the wiring has been done. If you examine the North Hills slug-tuned coils, you will find that there are no connections to two of the terminals. On L_4 wind a layer of Scotch tape over the winding. Then, over the tape, scramble-wind 15 turns (L_6) of small magnet wire (about No. 28) close to the terminal end of the form. Solder an end to each of the unused terminals. Perform the same operation on L_5, but make the winding (L_7) only 3¾ turns.

If the rear cover of the box is to be used, clearance holes for J_1, J_2 and the power cable will be required. Remember that if the power cable is to be fitted with a plug, the plug should not be connected until after the power wires have been passed through the hole in the back cover. Rubber feet can be attached near the four corners of the bottom of the box by drilling

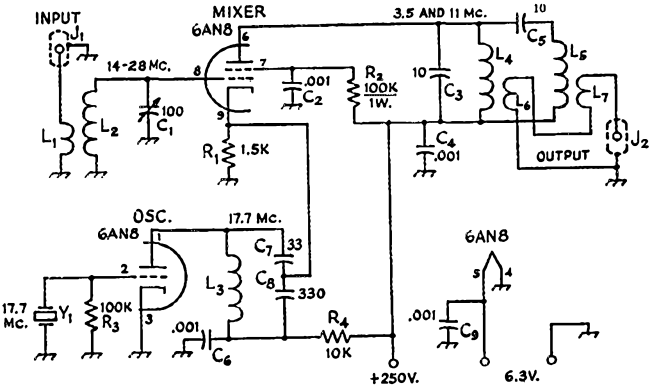
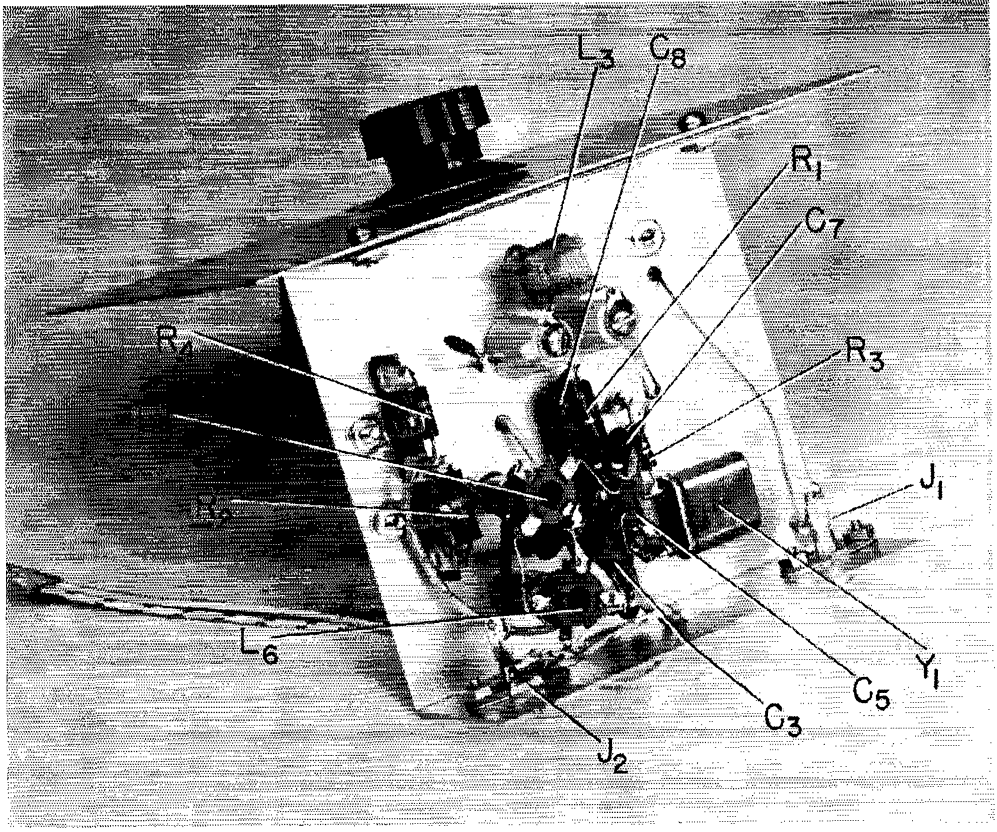


Fig. 2 — Circuit of the one-tube converter for the "Novice Special" receiver. All 0.001-μf. capacitors are disk ceramic. Other capacitances are in μμf. All resistors except R_2 are ½ watt.

C_1 — Mixer input tuning (Hammarlund MC-100-S).
C_3, C_5 — Tubular ceramic (Centralab TCZ-10).
C_7 — Tubular ceramic (Centralab TCZ-33).
C_8 — Mica.
J_1, J_2 — RCA phono jack.
L_1 — 3 turns No. 22 magnet wire close-wound over ground end of L_2.
L_2 — 1 μh. — 10 turns No. 18, ⅝-inch diam., ⅝ inch long (B & W 3007 Miniductor).
L_3 — 1.4 μh. — 12 turns No. 24, ½-inch diam., ⅜ inch long (B & W 3004 Miniductor).
L_4 — Iron-slug-tuned coil, 36-64 μh. (North Hills 120-F).
L_5 — Iron-slug-tuned coil, 18-36 μh. (North Hills 120-E).
L_6, L_7 — See text.
Y_1 — Third-overtone crystal, 17.700 kc. (International Crystal type FA-5).



Bottom view of the single-tube 3-band crystal-controlled converter.

No. 33 holes and fastening the feet on with ½-inch No. 6 sheet-metal screws.

Power Supply

The converter requires a power supply delivering 200 to 250 volts at about 15 ma. The combination supply described in the July issue [6] can be used to supply the converter as well as the receiver and transmitter. If this is done, it will probably be most convenient to mount a duplicate 5-terminal outlet on one side wall of the power-supply chassis and wire it in parallel with the receiver power outlet. Otherwise, the two sets of wires (receiver and converter) can both be connected to the original receiver power plug.

Adjustment

Preliminary adjustments can be made before placing the unit in the box. The antenna wire should be fitted with a phono plug to fit J_1. A short length of shielded wire (Belden type 8885 or similar, or a length of RG-58/U or RG-59/U coax cable) should be fitted with a phono plug at each end. The center conductor of the wire should be connected to the insulated pins, and the braid should be soldered to the outer shells. One plug should go to J_2 on the converter, and the other to the antenna connector on the receiver.

[6] Chambers, "Twenty-Five Watts for the Beginner," *QST*, July, 1956.

With the slugs of L_4 and L_5 set at about mid-position, turn on the power supply. Set the band-set capacitor on the regenerative receiver to maximum capacitance (zero on the dial). Adjust the regeneration control so that the detector is oscillating. Now adjust the input capacitor of the converter in the region of about 75 per cent of maximum capacitance, listening carefully for an increase in background noise. When this spot is found, signals in the 20-meter band should be heard as the receiver bandspread dial is turned. Tune in a moderately strong phone signal (detector not oscillating) near the low-frequency end of the phone band and adjust the slug of L_4 for maximum signal. If the detector goes into oscillation as the slug is adjusted, readjust the regeneration control. Also, make sure to keep the signal peaked up on the tuning dial of the receiver. The setting of the slug for maximum signal will not be very critical, since the circuit tunes quite broadly.

When this adjustment has been completed, readjust the input tuning capacitor to the region around 25 per cent of maximum capacitance. Somewhere in this region, a second peak in background noise should be found. If the 15-meter band is open, you should now hear signals in this band as you tune the receiver. At a time when the band is active, you should check the high-frequency end of the band to make sure that the entire band is being covered. If it is not,

(*Continued on page 120*)

The Ultra Modulation System

Using Higher Audio Power without Splatter

BY OLLIE J. ALLEN,* W4FHF, F7AW

• **A novel method of wave-form shaping, applied only to the downswing of modulation, that permits the application of increased audio power in plate modulation without exceeding 100 per cent modulation on the down peak. Because there are no sharp breaks or bends in the wave form there are no high-order harmonics of appreciable amplitude, hence the signal occupies no more spectrum space than one with the normal modulation percentage.**

IT IS INTERESTING to note the number of articles appearing in amateur publications that deal with circuit techniques for increasing the modulation percentage of a.m. transmitters. Most of them emphasize the importance of operating the phone transmitter at 100 per cent modulation, and recommend methods of avoiding overmodulation and splatter when the modulation level is cranked a bit too high. Various speech-clipper circuits have been devised and many speech-limiting amplifiers have been designed, all with the prime purpose of maintaining the modulation percentage as close to an average of 100 per cent as possible. Why should so many topnotch amateurs struggle with their rigs to squeeze out the maximum audio and still not overmodulate?

The answer is quite simple to the old-timer, but for the newcomer to amateur radio a brief explanation is in order. As an example, it is a well-known fact that a 100-watt transmitter modulated 100 per cent is equal in communication effectiveness to a 400-watt transmitter modulated only 50 per cent (since in both cases the audio power is 50 watts) and gives less heterodyne interference. How much more effective would the 100-watt transmitter in question be if the audio level could be increased to 100 watts? This question in turn raises another: How can the audio level be increased beyond 50 watts on the 100-watt transmitter without overmodulation? The answer is the purpose of this article.

Shortly after I designed and built my first phone transmitter, I realized that although my modulators were adjusted for 100 per cent on voice peaks, the average modulation level was only 70 per cent. Although this may not appear to be too bad percentage-wise, it means that the average power in the side bands is only one half of the audio power developed. In other words, my 200-watt transmitter had only 50 watts average power in the side bands.

At about this time speech clipping was first being introduced. With speech clipping I could raise my average modulation percentage to close to 100 per cent, but there was a limit to how much clipping could be used. The results obtained from using higher audio power with speech clipping were encouraging but I was not satisfied, so I began experimenting with peak limiting circuits.

Others have had the same object, and have tried various and devious methods to accomplish it. As early as 1920 attempts were made to increase the level of audio beyond the conventional limits of 50 per cent audio power to 100 per cent carrier power. In most cases, the effort was made to limit the negative half cycle of the modulation envelope since overmodulation downward is principally responsible for overmodulation splatter. The methods used were for the most part unsuccessful because of the squaring off of the negative peaks and sometimes even the positive peaks. The resulting spurious frequencies generated were suppressed with filters and chokes.

It was obvious that in order to increase the audio power in the side bands, the increase could only be realized on the positive half cycle. The audio voltage in the negative half cycle could not exceed the d.c. plate voltage on the r.f. amplifier being modulated.

Circuit Details

The first problem was to control the negative half cycle and still permit the positive half cycle

* Lt. Col., U. S. Army Signal Corps, Ex-J8AAB, HL1AB and W9ZAE. Correspondence concerning this article may be addressed % Ultra Modulation Co., P.O. Box 485, Red Bank, N. J.

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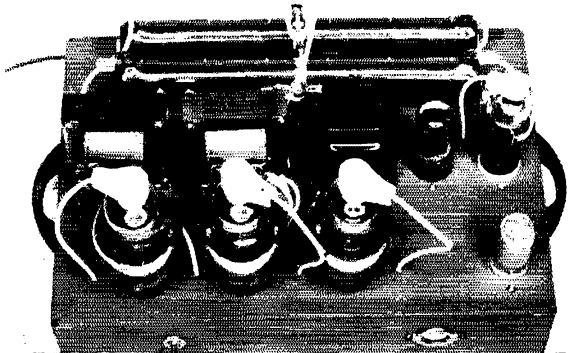
A typical parts layout for an Ultra Modulation unit. Aside from providing adequate insulation, there are no critical features in the construction.

♦



to rise unimpeded to high levels. This was accomplished in part by the use of two diodes, V_2 and V_3, Fig. 1, in series with the leads from the secondary of the modulation transformer to the modulated stage. The purpose was to have one diode, V_3, pass the unlimited positive alternations of the audio to the r.f. stage, and the other diode, V_2, pass controlled negative alternations. This was necessary to prevent carrier cutoff and negative-peak overmodulation at high audio levels.

To keep the secondary of the modulation transformer from swinging "free" without a load during that portion of the negative half cycle when the negative audio voltage exceeded the B-plus voltage to the final, another diode, V_1, was connected across the modulation transformer secondary, in series with a load resistor, R_1. This resistor had approximately the same value in ohms as the modulating impedance of the r.f. amplifier.

The most difficult problem was to get the right amount of negative audio voltage to the final. This was done by connecting the plate of the diode, V_2, used for control of the negative half cycle to a tap on the load resistor, R_1. Only negative audio voltage was developed across this resistor since it acted as a load for the modulation transformer only during the negative half cycle. The tap was set so that just the proper amount of negative audio voltage was fed to the final to give approximately 100 per cent modulation on negative peaks. The positive half cycle rose to the maximum level developed in the modulator stage.

Oscilloscope patterns of various audio-to-carrier-power ratios are shown in Fig. 2, with and without the Ultra Modulation circuit. The unmodulated carrier is superimposed at the left in each photograph for reference purposes. No splatter or increased band width was detected at audio-to-carrier-power ratios up to 5 to 1.

The Final Amplifier

The effect of all this audio on the final r.f. amplifier was interesting. The d.c. plate current flowing in the final increased in proportion to the increase in audio over that required for normal modulation. As a result, the final plate-current meter showed increased plate current when the audio peaks caused the modulator plate-current meter to swing upward. However, it must be kept in mind that the final amplifier must be capable of handling the combined audio and carrier power developed.

In transmitters using tetrodes in the final amplifier with a separate screen supply and an audio choke, Fig. 3A, the "floating" screen causes considerable distortion when the audio power exceeds the carrier power, although at audio levels below the carrier level the floating screen causes negligible distortion. To eliminate this type of distortion, the screen should be modulated along with the plate by means of a dropping resistor, as shown in Fig. 3B. The actual value of this resistor can be easily determined by referring to the chapter on Amplitude Modulation in *The Radio Amateur's Handbook*.

Modulation Indicator Circuit

The modulation indicator circuit shown in Fig. 1 serves two functions. Primarily, it is intended to simplify the initial adjustment of the transmitter. It also serves as a negative-modulation indicator during transmission. The circuit is con-

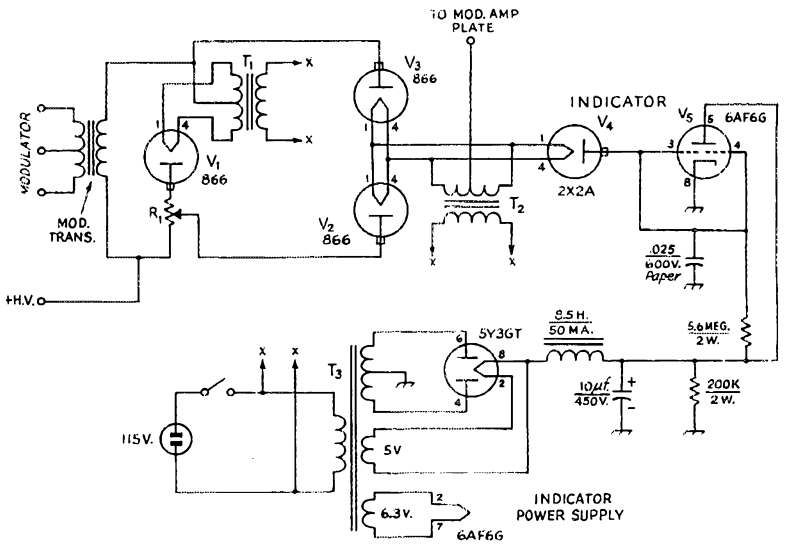


Fig. 1 — The Ultra Modulation circuit, including downward-modulation indicator and indicator power supply.

R_1 — Equal to modulating impedance of modulated amplifier; power rating one half of audio output from modulator.

T_1, T_2 — Filament transformer, 2.5 volts c.t., 10 amp.; 10,000-volt insulation.

T_3 — Power transformer; 470 volts c.t., 40 ma.; 5 volts, 2 amp.; 6.3 volts, 2 amp. (Stancor PC-8401).

V_1, V_2, V_3 — 866 or 816, where d.c. currents are within tube ratings.

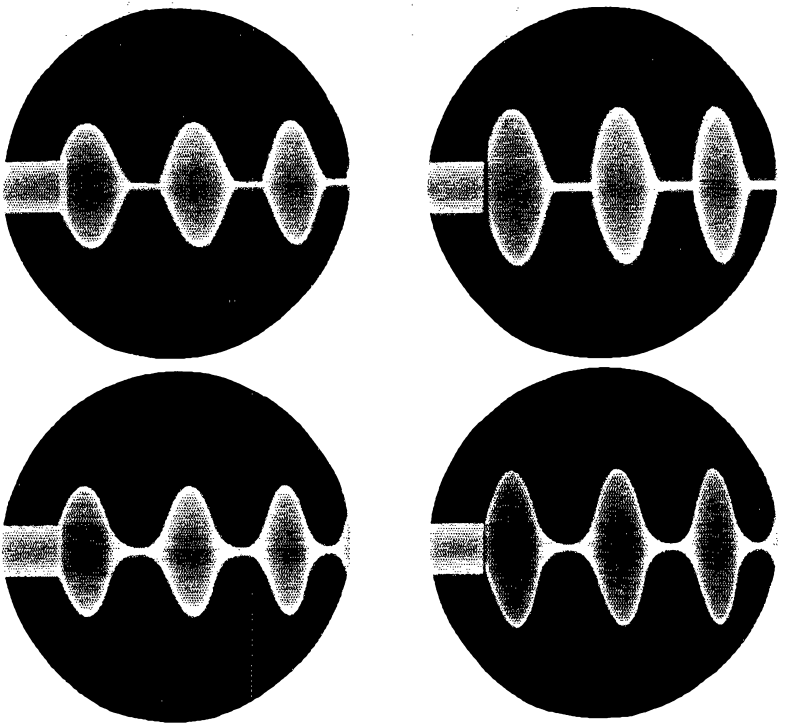


Fig. 2—Oscilloscope patterns of carriers modulated at high levels with and without the Ultra Modulation circuit. Upper left: 100-watt carrier modulated with 100 watts of audio, conventional circuit. Lower left: same conditions, but using Ultra Modulation circuit. Corresponding patterns for a 100-watt carrier modulated with 200 watts of audio are shown at the right.

nected so that the eye will open fully (90 degrees) when overmodulation begins. The setting of the tap on resistor R_1 determines how far the eye will open on negative modulation peaks. At the proper setting of R_1 the eye will open to approximately 45 degrees on modulation peaks. With the tap set at the end nearest the diode, the eye will just begin to flicker open when the audio voltage slightly exceeds the voltage for conventional 100 per cent modulation. The additional audio voltage is necessary because of the voltage drop across the diodes in the circuit, plus the drop across the small resistance remaining between the tap and the resistor terminal.

The value of R_1 in ohms is the same as the modulating impedance of the r.f. amplifier. It can be determined by dividing the plate current (without modulation) into the plate voltage. The power rating required of R_1 is half the maximum audio power developed in the modulator stage.

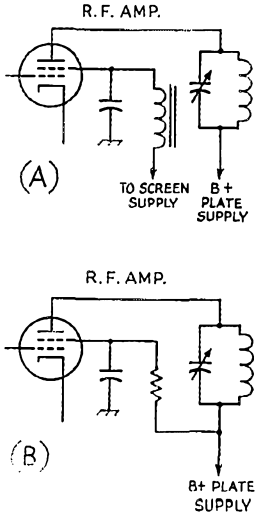


Fig. 3—A—plate-and-screen modulation of a tetrode r.f. amplifier using fixed screen supply and audio impedance in screen lead; B—using a screen-dropping resistor.

Construction

The circuit can be constructed on any chassis of suitable size, or may be built right into the modulator deck of a transmitter. The diode sockets should be mounted on stand-off insulators in high-power rigs, and high-voltage wire should be used throughout. A single filament transformer with two secondary windings can be used for T_1 and T_2, and diodes such as the 816 can be used at V_1, V_2 and V_3 for transmitters in the DX-100 and Viking II class. Shielding should be used around the leads running from the unit to the secondary of the modulation transformer.

An oscilloscope is not actually necessary for the adjustment of the circuit, but is useful for determining when the speech amplifiers or modulators begin to distort, or when the modulation transformer begins to saturate. *The Radio Amateur's Handbook* gives photographs of scope patterns of the various types of distortion developed in a phone transmitter.

The Ultra Modulation circuit is presently in use by many amateurs throughout the country; also, two of the Armed Services are exploring the use of this circuit on military sets under all possible conditions.

An Adjustable Low-Pass Filter for the Receiver or Speech Amplifier

Simple System Limiting Audio Bandwidth

BY JOEL L. EKSTROM,* W1UGX

• A low-pass filter in the audio section of a receiver will often be of help in reducing the effects of high-pitched heterodynes, side-band splatter and noise. It is also useful after a clipper in the speech amplifier of a phone transmitter in suppressing high-frequency harmonics generated in the clipper.

MOST OF US are aware of the value of restricting the bandwidth of our receiver audio systems and speech amplifiers, but the question arises as to how to go about it simply and economically. Many of us settle for the simple *R-C* tone-control type of circuit in our receivers, but this is not nearly so efficient as the inductance-capacitance type filter. Since most of us cannot afford more than one high-*Q* inductor and since a multisection filter is not too easily switched to give varying bandwidths, the discussion will be limited to the single-section type filter.

Once having decided on a single-section filter, we have a choice of two types: the *m*-derived

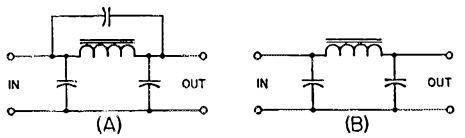


Fig. 1 — Low-pass filters. A — *m*-derived filter. B — Constant-*k* filter.

(Fig. 1A), and the constant-*k* (Fig. 1B). Now the *m*-derived filter may be designed to have a very deep attenuation notch slightly above the cutoff frequency, but the attenuation decreases beyond this point, which is undesirable. Some may desire this notch-type characteristic for c.w. reception, but this is a case of special, not general, interest. Also, objectionable ringing may be introduced by transient-type signals. In addition, the switching is complicated by the capacitor across the inductance. For the above reasons, the constant-*k* filter, with its slower but steadily-increasing attenuation and simple switching, is to be preferred for a general-purpose filter.

The Pi Section

Consider a filter such as that shown in Fig. 2. This is one member of a class of filters called

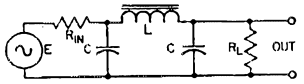


Fig. 2 — Pi-section circuit for case where the internal impedance of the generator equals the load resistance. In this case, the capacitances are also equal.

Butterworth filters, after the chap who first used such a configuration. It is known as a third-order Butterworth filter. (An ordinary *R-C* tone control is an example of a first-order Butterworth filter. The higher the order, the more nearly ideal the low-pass filter action becomes.) The input and output *R*'s, as well as the *C*'s, are identical. This filter is also known, incidentally, as a constant-*k* pi-section filter. The component values are given by:

$$L = \frac{R_L}{\pi f_c} \qquad \text{and } C = \frac{1}{R_L 2\pi f_c},$$

where $R_L = R_{IN}$, L is in henries, C in farads and f_c is cutoff frequency. At this frequency, frequency in cycles per second where the voltage response is down by 30 per cent from the unattenuated value.

This configuration is fine if it is fed from a voltage source having an internal impedance, R_{IN}, equal to the load resistance R_L. However, it gets rather complicated when R and C must be varied to alter f_c (change the bandwidth). Therefore it is desirable to modify the circuit so as to operate from a constant-current generator, such

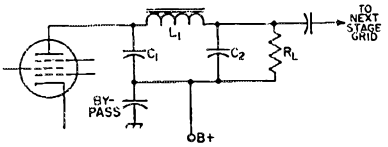


Fig. 3 — Pi-section circuit to operate from a constant-current source, such as the plate circuit of a pentode.

as the plate circuit of a pentode. Under this condition the hookup looks like Fig. 3, and the component values are given by:[1]

$$L_1 = \frac{2R_L}{3\pi f_c} \qquad (1)$$

$$C_1 = \frac{3}{4R_L f_c} \qquad (2)$$

$$C_2 = \frac{1}{3}C_1 \qquad (3)$$

From here on the rest is easy. Since the gain at

*2421 St. Paul St., Baltimore, Md.

[1] See Appendix.

frequencies below cutoff is approximately proportional to R_L, making L larger will allow the use of a larger R_L. An inductance value of 500 mh. or more is suggested. C_1, and C_2 in parallel with R_L, may be switched by a small two-pole rotary to give any desired number of bandwidth steps. We use a three-position switch to give bandwidths of 3, 2 and 1 kc., and this has proved very useful and flexible. Our filter is driven by a 6AC7. The filter, in turn, drives the output tube. Incidentally, the best place for the filter in a receiver is as near the speaker or phones as possible. In this way harmonics generated in the previous audio stages are filtered out. The output stage may be operated with negative feedback if desired. The schematic of our filter is shown in Fig. 4.

The values are based on an L of 1 h. Using this value in (1),

$$R_{L.A} = \frac{3\pi f_c L}{2}$$

$$= \frac{(3)\ (3.14)\ (3000)\ (1)}{2} \text{ ohms when } f_c = 3000 \text{ cycles,}$$

$$R_{L.B} = \frac{(3)\ (3.14)\ (2000)\ (1)}{2} \text{ ohms when } f_c = 2{,}000$$

cycles, etc.
Then, from (2),

$$C_{1A} = \frac{3}{(4)\ (R_{L.A})\ (3.14)\ (3000)} \text{ farads when } f_c =$$

3000 cycles,

$$C_{1B} = \frac{3}{(4)\ (R_{L.B})\ (3.14)\ (2000)} \text{ farads when } f_c =$$

2000 cycles, etc.
From (3),

$$C_{2A} = \frac{1}{3}\ C_{1A},$$

$$C_{2B} = \frac{1}{3}\ C_{1B}, \text{ etc.}$$

The inductor should be of the high-Q type. Most of the well-known transformer manufacturers, such as UTC, Chicago, etc., produce high-Q toroids.

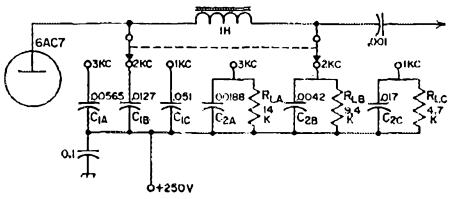


Fig. 4 — Practical pi-section low-pass audio filter with selectable cut-off frequencies. By varying the value of the output resistance, along with the values of input and output capacitance, only a single inductor is required. All capacitances are in μf. All resistors are 1 watt. The 1-h. inductor should be of the high-Q type, such as a toroid.

Fig. 5 shows the response of the filter at any frequency in terms of the ratio of this frequency to the cut-off frequency. As an example, when the cut-off frequency is 3000 cycles, the attenuation at 6000 cycles is determined from the ratio of 6000/3000 = 2. For a ratio of 2, Fig. 5 shows that the attenuation is about 18 db.

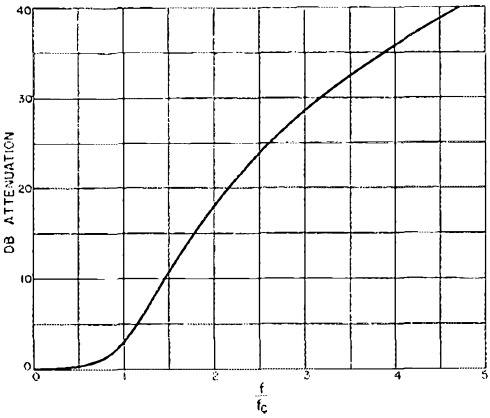


Fig. 5 — Curve for determing the over-all response of the filter at any frequency relative to the cut-off frequency.

Appendix

These formulas will not usually be found in standard reference books. This is an unsymmetrical filter, and the books usually deal with the symmetrical case of Fig. 2. The basic formulas are from a set of notes in a network-design course at M. I. T., where it is shown that in order to preserve the same transfer function in the current-driven filter, the original Butterworth voltage-driven filter must be modified so that L is ¾ as large, C_{IN} ¾ as large, C_{OUT} ½ as large, and the load resistance the same. Knowing this, and knowing that the design formulas for the voltage-driven Butterworth are the same as those for the pi section, Equations (1), (2) and (3) were easily derived. — *The Author.*

Strays

On November 24th and 25th the Radio Society of Great Britain is sponsoring a new contest for one-operator voice stations using 21 and 28 Mc. only, with the British Isles working the rest of the world. Stations using less than 25 watts are in a special section of their own. Exchanges will be five numerals, the RS report plus a serial number of the contact—001, 002, etc. One contact per band with each station is allowed; 5 points are scored for each contact, with a bonus of 50 points for each country-numerical prefix worked. League members interested in working the British Isles on 21 and 28 Mc. during the contest are invited to send a postcard to Hq. requesting a copy of the detailed rules of participation and scoring.

A V.F.O.-Driver Circuit for 7 Mc.

A Stable Unit with Time-Sequence Keying

BY ROBERT L. KARL,* W8QFH

• In this article W8QFH describes a 7-Mc. v.f.o.-driver circuit that should have appeal to those working at frequencies of 7 Mc. and higher. The circuit is not too complicated, yet the frequency stability is excellent. Time-sequence keying provides for break-in operation, while a cathode follower and doubler stages supply the required isolation between the oscillator and the keyed stage. The unit may be used as a low-power transmitter on 40 meters, or as a driver for a pair of 6146s or equivalent. Additional multiplier stages may be added for the higher frequencies.

THE CIRCUIT shown in Fig. 1 is one that has been found excellent as a low-power 40-meter c.w. transmitter, or driver for a higher-power amplifier. It features good frequency stability, time-sequence keying for break-in operation, and a self-contained power supply. The output stage can be run at inputs up to 20 watts, and the output circuit is designed to feed low-impedance coax to a low-impedance antenna, an antenna tuner, or the grid tank of a following amplifier.

One half of a 12AT7 dual triode operates in a Clapp oscillator at 1.75 Mc. The bandspread tuning system departs from the conventional in that series tuning is used instead of parallel. This, in conjunction with the parallel padder C_3, provides essentially linear frequency tuning over the 300-kc. range of the 40-meter band. In general, the low-frequency limit of the tuning range of the band-spread capacitor C_1 is determined by the setting of C_2, while the high-frequency limit is set by C_3. To reduce drift, air-dielectric capacitors are used throughout the tuned circuit, except for the feed-back capacitors C_4 and C_5 which are silver mica.

The second half of the 12AT7 is used as a cathode follower, for isolation purposes. The plate

* 22060 Charter, Detroit 19, Mich.

(Continued on page 122)

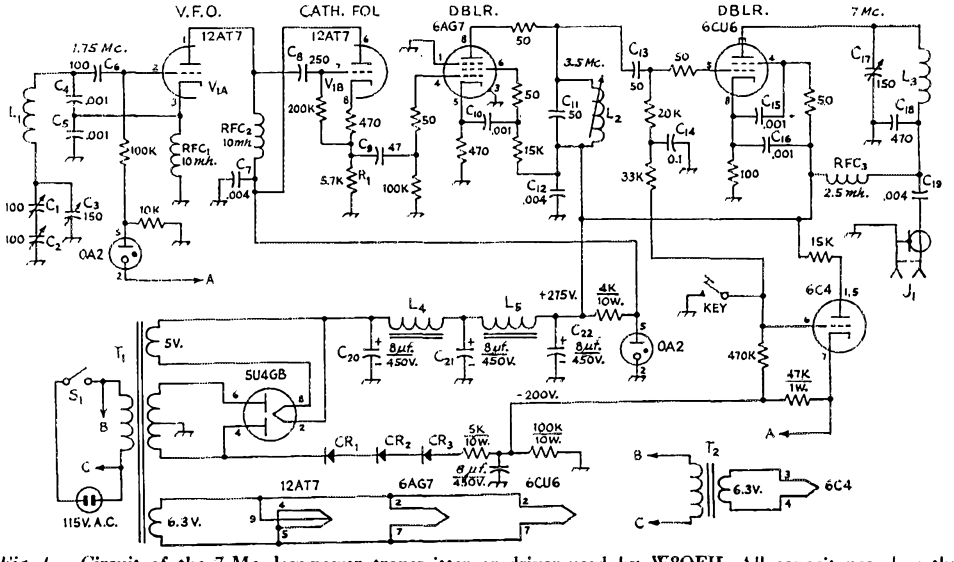


Fig. 1 — Circuit of the 7-Mc. low-power transmitter or driver used by W8QFH. All capacitances less than 0.001 µf. are in µµf. All resistors are ½ watt unless otherwise specified.

C_1, C_3 — Air variable (see text).
C_2 — Bandspread — Air variable.
C_4, C_5 — Silver mica.
C_6 — APC air trimmer used as fixed capacitor.
C_7, C_{10}, C_{12}, C_{15}, C_{16}, C_{19} — Disk ceramic.
C_8, C_9, C_{11}, C_{13}, C_{18} — Mica.
C_{14} — Paper or ceramic.
C_{17} — Air variable.
C_{20}, C_{21}, C_{22} — Electrolytic.
CR_1, CR_2, CR_3 — 130-volt 100-ma. selenium.
J_1 — Coax output connector.
L_1 — 90 turns No. 30, ⅞-inch diam., close-wound.
L_2 — Iron-slug coil — approx. 30 µh. (North Hills 120-E or approx. 60 turns No. 32 d.s.c. on National XR-50 ½-inch diam. iron-slug form).
L_3 — 21 µh. — 32 turns No. 18 enam., 1¼-inch diam., close-wound.
L_4, L_5 — 10.5-h 110-ma. filter choke (Stancor C1001 or equivalent).
R_1 — 4.7K and 1K in series.
S_1 — Toggle switch.
T_1 — Power transformer: 700 volts, c.t., 90 ma.; 5 volts, 3 amp.; 6.3 volts, 3.5 amp. (Triad R-11A).
T_2 — Filament transformer: 6.3 volts, 0.6 amp. (Triad F-13X).

More About the Three-Control Six-Band 813 Transmitter

Supplementary Data on the 500-Watt Rig

BY C. VERNON CHAMBERS,* W1JEQ

• The 813 transmitter described originally in *QST* for January, 1954, and carried in subsequent editions of the ARRL *Handbook*, still continues to enjoy widespread popularity. Answering several hundred inquiries during the past 2½ years has given us an opportunity to find out the things that most often bother the ham in duplicating the performance of the original. This article covers these problems and also the matters of coupling to an antenna system and the installation of a differential keying system.

Most of those who have had previous experience in building a multistage transmitter have had little difficulty in duplicating the 813 rig described in *QST* for January, 1954.[1] However, many who have made this their first major attempt at construction have run into various stumbling blocks or have been uncertain about specific points. There are others who have asked about such things as a simple method of installing a differential keying system and a suitable antenna tuner. We will try to cover the points brought up most frequently.

Some of those who have written in more recently have apparently overlooked the second article which dealt with some of the problems. If you missed it, look in *QST* for June, 1955.[2]

* Technical Assistant, *QST*.

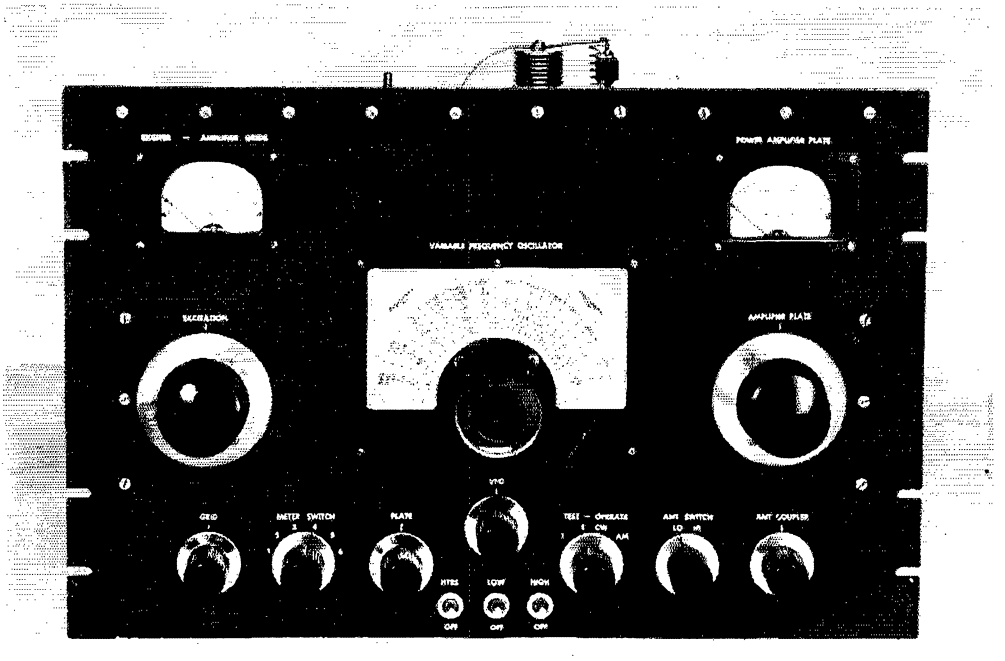
[1] Chambers, "Three-Control Six-Band 813 Transmitter," *QST*, January, 1954. Also *The Radio Amateur's Handbook*, 31st–33rd editions.

[2] Chambers, "Supplementary Data on the Three-Control 813 Transmitter," *QST*, June, 1954.

Drive to the 813

The most common difficulty reported is inadequate drive for the final at the higher frequencies, especially 28 Mc. Fear that the driver is incapa-

Fig. 1 — This front view of the 813 transmitter identifies the decal markings for the meters and the tuning controls. Dials for the amplifier plate capacitor and the excitation control are National types AM-3 and P, respectively. The latter is no longer manufactured. The grid, plate, v.f.o. and antenna-coupler capacitors located at the bottom of the panel are equipped with National type HRS-5 (black) knobs. Type HRS-4 knobs are used with the three rotary switches.



ble of delivering ample excitation for the 813 should be dispelled. The tube lineup is entirely adequate for proper drive to the final, and a large majority of those who have built the unit have had no trouble. Most of the difficulty arises in adjustment of the slug-tuned coil L_2, and insufficient voltage from the exciter power supply. The circuit, including L_2, has a wide tuning range — approximately 3.5 to 5 Mc. When adjusted for constant input to the grid of V_4 as originally outlined, the coil will resonate somewhere around 4.5 Mc. and the grid voltage across the 22K grid resistor (the one connected in series with L_2) will be −18 volts or so as indicated by a v.t.v.m. If, in the attempt to regulate the drive for V_4, it is necessary to tune L_2 above 4.5 Mc., the grid voltage for V_4 will drop too far below −18 volts to assure adequate drive for the tube.

Practical experience with the transmitter has proved that flat input to the buffer is less important than previously anticipated. Therefore, L_2 may be tuned for maximum drive to V_4 at 3.6 Mc. (approximately −25 volts). This results in increased excitation all along the line, and provides a considerable boost in the 28-Mc. excitation to the 813. Naturally, the amplifier excitation is also increased at the lower frequencies, but this is of no consequence because any excessive drive can be handled by means of the excitation control.

It is difficult to check the resonant frequency of L_2 (with the coil wired into the transmitter) because of the swamping effect of the 4.7K cathode resistor for V_3. If you want to grid-dip the inductor, it is suggested that the cathode resistance be temporarily increased to 50K or more. The plate voltage should be off.

It is important that V_1, V_3, V_4 and V_5 operate with a plate potential of 300 volts. The 6146, V_6, requires a full 400 volts for the plate. When checking plate voltage for these tubes, remember that the plate current for V_5 and V_6 increases as the operating frequency is raised. Therefore, make certain that the exciter supply delivers 400 volts under 28-Mc. load conditions.

The varying load caused by band changing in the multiplier stage may cause the plate voltage for V_1, V_3, V_4 and V_5 to drop below 300 volts in some cases. If this happens, the existing dropping resistor (1000 ohms fixed) should be replaced with a slider-type, 20-watt unit. Adjust the resistance so that these tubes receive 300 volts when the rig is tuned to 28 Mc. Fig. 4 shows a suitable mounting position for the resistor.

The accompanying current-voltage chart shows operating conditions for 3.5 through 28 Mc. in the original transmitter. Voltage readings were made with a v.t.v.m. (except for the 813 plate voltage) and the output voltages of the exciter and the amplifier plate supplies were 400 and 2000 volts, respectively, with the rig fully loaded at 28 Mc. Grid voltage for V_3 is not listed because this tube operates Class A.

Voltage-Current Chart for the 813 Transmitter

Tube	Band (Mc.)	Grid 1 (volts)	Grid 1 (ma.)	Grid 2 (volts)	Grid 2 (ma.)	Cathode (volts)	Plate (volts)	Plate (ma.)
V_1	3.5	−16	—	150	—	0.6	300	—
V_3	3.5	—	—	—	—	39	300	—
V_4	3.5	−18	—	190	—	19	300	35
V_5	3.5	−64	—	115	—	27.5	300	5.5
V_5	7	−64	—	115	—	27.5	300	5.5
V_5	14	−58	—	170	—	34	300	8.5
V_6	3.5	−75	*	170	—	—	400	55
V_6	7	−76	*	170	—	—	400	63
V_6	14	−80	*	185	—	—	400	87
V_6	21	−80	*	195	—	—	400	90
V_6	28	−75	*	175	—	—	400	105
V_7	3.5	−165	17	400	40	—	2000	220
V_7	7	−185	18	400	40	—	2000	220
V_7	14	−190	19	400	35	—	2000	220
V_7	21	−190	20	400	35	—	2000	220
V_7	28	−190	19	400	40	—	2000	220

* Approximately 2 ma. Depends on setting of excitation control.

In their anxiety to do a thorough job, some of the boys carried the TVI preventive procedure a bit too far by using shielded wire for some of the r.f. leads, particularly the leads from the tanks to the control grids of the 6146 and the 813. The capacitance of shielded wire, of course, detunes the multiband circuits and a good portion of the excitation may be lost.

Inasmuch as two rigs are seldom completely identical as to stray capacitance, it is understandable that the original values of inductance for the multiband tanks — especially those at the grid and the plate sides of V_6 — may require slight modification. If the tuning range of these tanks has been affected by a new order of minimum capacitance, it may be impossible to resonate the exciter for maximum output at 28 Mc. The proper

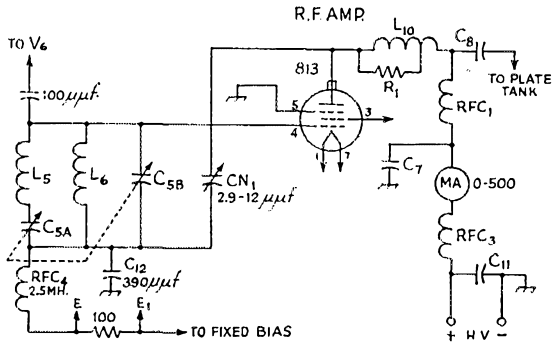


Fig. 2 — Capacitive-bridge neutralizing circuit for the 813 power-amplifier stage. This same method of stabilizing an amplifier may be used with the 6146 at 3.5 Mc. C_{12} and RFC_4 (not labeled in the original circuit) now have values of 390 μμf. and 2.5 mh., respectively.
CN_1 — 2.9-12-μμf. neutralizing capacitor (E. F. Johnson N-250).
C_{12} — 390-μμf. tubular ceramic.
L_{10} — Parasitic choke: 6 turns No. 16 tinned wire, 1¼ inches long, ¼-inch diameter.
R_1 — Five 470-ohm 1-watt carbon resistors in parallel, tapped across 3 turns of L_{10}.

adjustment of multiband tanks has been covered in previous articles.[3]

Output Impedance, Antenna Couplers and Antennas

These three subjects are grouped under a common heading because of their close relationship. And let's start out by clearing up the fairly prevalent opinion that there is something tricky about the output-coupling circuit ($L_8C_{10}S_2$). Except for a simple switching arrangement which shorts out the unused part of the link winding, it is identical to the series-tuned arrangement commonly used for coupling amplifiers to 50-ohm coaxial lines. Anyone interested in the circuit will find the required reading under "Output Coupling Systems" in Chapter 6 of *The Radio Amateur's Handbook*.

Several constructors who encountered difficulty loading the 813 transmitter discovered that they had improperly wired the $C_{10}L_8S_2$ combination. To prevent others from making the same mistake, we offer the following:

A tap on L_8 — the one that goes to C_{10} and S_{2B} — effectively divides the inductor into two sections. The 8-turn section is used for coupling to the LO-BAND plate inductor, L_7, and the 1-turn link is used for coupling to L_9 at 14 through 28 Mc. There are two precautions to observe when installing this tapped coil. First, make certain that the small link is adjacent to L_9. This, in turn, will place the 8-turn section next to L_7. Second, carefully study the transmitter diagram before wiring L_8 to S_2. It is very easy to end up with the wrong link shorted when the switch is thrown to either the LO- or HI-BAND positions. The circuit of the transmitter shows the switch in the 3.5–7-Mc. position.

The transmitter output circuit is designed to feed a 50-ohm resistive load. This doesn't mean feeding a 50-ohm coax line with any old antenna connected at the other end. Unless the antenna is matched to the line, it will introduce reactance in the output coupling circuit and cause the amplifier plate capacitor, C_9, and the output capacitor, C_{10}, to resonate at dial settings that do *not* coincide with those previously listed.[1] To operators having no prior working acquaintance with coaxial output systems, we recommend "Matching the Load to the Line," Chapter 13, *The Radio Amateur's Handbook*, as a complete source of information on any adjustments which may be necessary to match the antenna to the transmission line.

If the antenna to be used with the transmitter is fed with an open-wire line or is a high-input-impedance affair, it is advisable to use a coax-coupled matching circuit between the transmitter output and the antenna or feedline. The 500-watt antenna coupler described in the "Coupler or Matching-Circuit Construction" section of Chapter 13 (*Handbook*) is ideal for coupling most of the popular all-band antennas to the 813 rig. Another section of Chapter 13, "Coupling the Transmitter to the Line," explains how the an-

[3] Johnson, "Multiband Tuning Circuits," *QST*, July, 1954.
Chambers, "Single-Ended Multiband Tuners," *QST*, July, 1954.

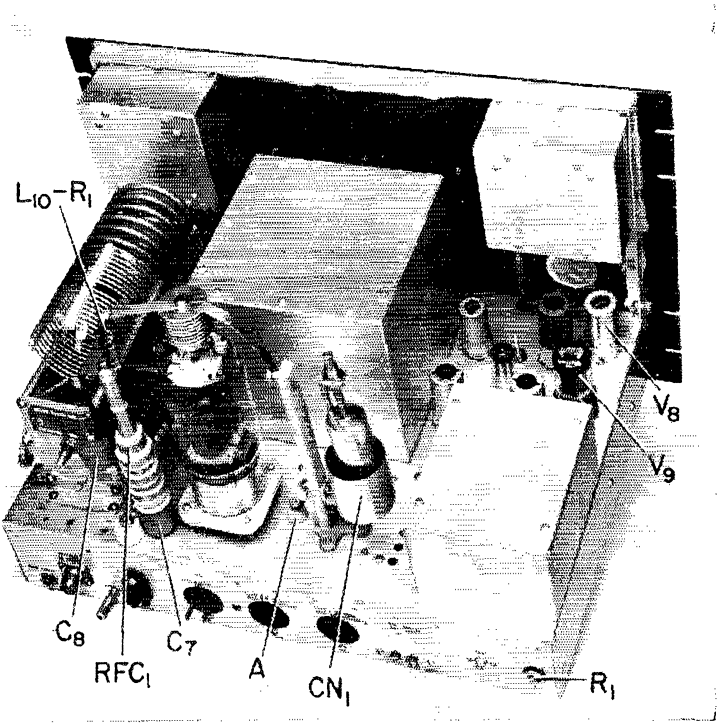


Fig. 3 — Rear view of the modified 813 transmitter. The type R-175A choke is mounted on C_7 (original component) to the left of the tube. The parasitic trap, $L_{10}R_1$, is at the top of the choke and the neutralizing capacitor, CN_1, is to the right of the 813. Keyer tubes are to the right of the buffer and the multiplier tubes in the upper right-hand corner of the chassis.

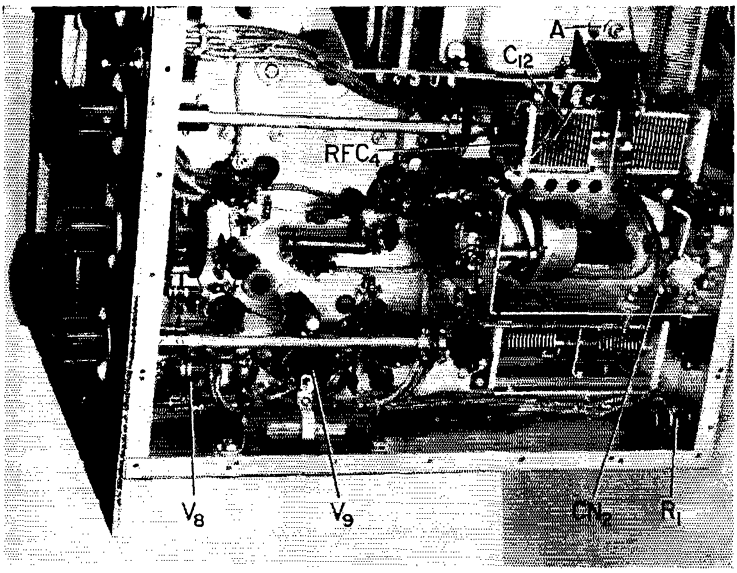


Fig. 4 — In this view, the potentiometer for the keyer control-tube, V_{8A}, is mounted on the wall at the bottom right-hand corner of the chassis as seen in this view. The neutralizing capacitor for the 6146, CN_2, is supported by National TPB through-point bushings. Sockets for the keyer tubes are in the lower left-hand section of the unit and the 20-watt adjustable resistor is mounted on the bottom wall.

tenna-coupler adjustments may be speeded up and checked with the aid of an s.w.r. bridge.

Neutralization, Parasitics, and R.F. Feed-Through

The second article on the 813 transmitter [2] explained why some duplicates of the rig might require neutralization and suggested the *Handbook* capacitive-bridge system as a cure for instability. This bit of information has prompted a number of inquiries. Some reported the need for neutralization and questioned the effectiveness of the recommended neutralizing circuit. Others asked if a neutralizing circuit would clean up certain erratic current readings observed while tuning the final. And still others referred to r.f. feed-through (from grid to plate of the amplifier when operated without plate and screen voltage) detected by one means or another.

The first step toward the cure for instability is the grounding of the beam-forming plates (Pin 5) of the 813 as recommended earlier.[2] Following the usual practice at that time, the transmitter diagram did not show this connection.

If instability is encountered in a rig having Pin 5 grounded, attempt to determine the frequency of oscillation. Three common types of oscillation may take place in an amplifier. Since different measures must be taken to suppress each type, it is important that the type be identified before it can be treated intelligently. V.h.f.- and low-frequency parasitic oscillations are difficulties that may or may not pop up in a duplicate transmitter and either one can cause erratic meter readings. The methods of testing, and the remedies for these types of oscillation are thoroughly treated in "Stabilizing Amplifiers," Chapter 6 of the *Handbook*.

Should the oscillation be at the fundamental frequency, it may quit when a load is coupled to the amplifier. When loading fails to stabilize the output stage, check the performance of each exciter tube — one of them may be oscillating hard enough to drive the final during key-up periods. The *Handbook* section referred to above explains how the tests should be made.

When the need for neutralization has become an established fact, consider use of the capacitive-bridge system previously referred to.[2] Fig. 2 shows this circuit applied to the original 813 amplifier. As far as neutralization is concerned, CN_1 is the only addition to the amplifier. However, it was necessary to reduce the value of C_{12} (originally 0.001 $\mu\mu$f. and not labeled) to 390 $\mu\mu$f. to make the ratio of CN_1 to C_{12} equal the ratio of the tube grid-plate capacitance to the input capacitance (see *Handbook*). The value of RFC_4 (not labeled on the transmitter circuit diagram) has been increased to 2.5 mh., and L_{10} and R_1 have been added to suppress low-frequency and v.h.f. parasitics that developed after the amplifier had been modified for neutralization, and the National type R-175A plate choke had been substituted. More about the choke later on.

The neutralizing capacitor is mounted on the chassis as shown in Fig. 3. A feed-through bushing, *A*, to the left of CN_1 permits connection between the stator side of the capacitor and the grid circuit. Strips of $\frac{3}{8}$-inch-wide flashing copper are used for above-chassis leads to the capacitor. A heat-radiating plate cap for the 813 serves its intended purpose and also provides a convenient means of terminating the copper leads running to CN_1 and the parasitic trap. Fig. 4 shows the positions of the feed-through bushing, *A*, C_{12} and RFC_4 as viewed from the bottom.

Neutralizing adjustments are also described in Chapter 6 of the *Handbook*. The section about this subject should also be reviewed for information about r.f. feed-through (mentioned earlier). Note in particular that feed-through cannot always be reduced to zero but that the correct

adjustment should give a minimum reading on the r.f. indicator. The sensitivity of the indicator will frequently determine whether or not the reading can be reduced to zero.

The 6146, when operated straight through, is probably the only driver tube that may require neutralization. We were able to *make* the stage oscillate weakly and intermittently, but only after increasing plate and screen voltage, removing excitation and adjusting the grid and plate controls to settings not normally used. All of this was done so that the capacitive neutralizing system could be tried in this stage. The system did work and required neutralizing and grid bypass capacitances of approximately 1.5 and 500 $\mu\mu$f., respectively. This means that the 0.001-$\mu\mu$f. capacitor formerly used between C_4 and ground must be replaced with the 500-$\mu\mu$f. unit. The neutralizing capacitor, labeled in Fig. 4 as CN_2, may be a pair of 3-$\mu\mu$f. ceramic tubulars connected in series. Incidentally, several makes of TV-type tubular trimmers broke down when tried in the neutralizing circuit.

A low-frequency parasitic that turned up in the multiplier-driver stage after neutralizing components had been installed was killed by replacing the 1-mh. grid choke with a 2.5-mh. job. This oscillation occurred only when the plate voltage for V_6 was increased to 450 volts or above.

Keying

Although the 813 transmitter employs straight cathode keying of the oscillator, we have received very few unfavorable reports concerning chirp, clicks, etc. However, many perfectionists have requested dope on a differential keyer circuit that could be added to the rig. A few hours of lab work proved that the system described by Puckett [4] could be easily included as an integral part of the rig. All that is required in the way of operating voltage for the keyer will be found right there in the r.f. unit.

The keying circuit uses a type 12AU7 control tube and a type 6BL7GT vacuum-tube keyer, as shown in Fig. 5. This circuit also shows the modifications which have been made to the transmitter so that the keyer could be included. The bottom end of the 47K oscillator grid resistor has been lifted from ground and then returned to Pin 1 of V_8. The original key jack, J_1, has been moved over to Pin 7 of V_8, and the bottom end of the oscillator cathode choke is now grounded. Cathode bias for the multiplier stage, previously developed across a 220-ohm resistor, has been eliminated and the cathode of V_5 is returned to the plates of the 6BL7GT.

Undoubtedly, some individuals will question the advisability of keying the multiplier stage in preference to keying the following multiplier-driver. Actually, we would have preferred to key the 6146, but we felt that the voltage drop caused by the 6BL7GT (the tube may be regarded as a cathode resistor of about 1000 ohms) would adversely affect the output capability of the tube.

Installation of the keyer components is illustrated in Figs. 3 and 4. Heater voltage for V_8 and V_9 may be obtained by tapping onto the heater line for the r.f. tubes. Negative control voltage for the keyer tubes may be taken from the 6146 bias supply by connecting in at the junction of the 1.2K and 10K resistors. Plate voltage for V_{8B} can come from the 300-volt line for $V_1 - V_5$.

Adjustment of the keying circuit and the keying characteristics are explained in Puckett's article. The only other comment about keying that we have to offer concerns bias for the final amplifier. The "beyond cut-off" bias for the original rig tended to introduce clicks *after* the keyed stage and, as a result, the fixed bias for the 813 was reduced to approximately −65 volts. This was accomplished by substituting a 4700-ohm, 2-watt resistor for the 470-ohm filter resistor used in the bias pack.

General Information — Electrical

Yes, a National type R-175A r.f. choke may be used as RFC_1 in the 813 plate circuit. However, use of this choke as a replacement for the original homemade affair did affect the tuning range of the plate tank and made necessary the removal of 1 turn from L_7. The turn was removed from the C_8 end of the coil. Fig. 3 shows the R-175A mounted on C_7 at the rear of the chassis.

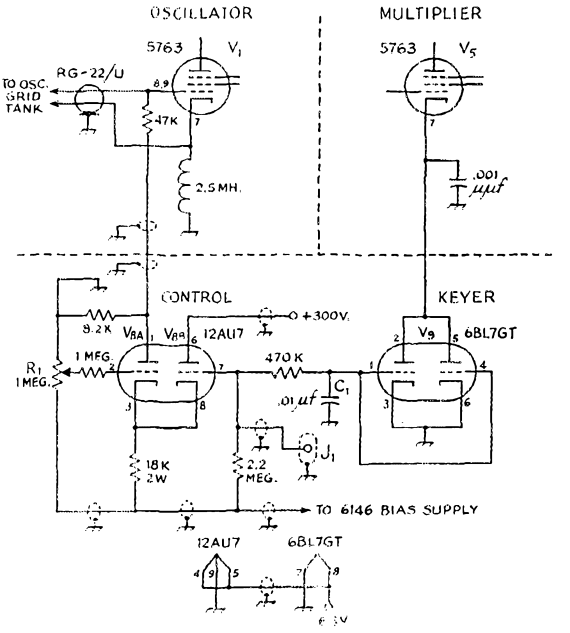


Fig. 5 — Circuit diagram of the differential keyer as connected to the 813 transmitter. Oscillator and multiplier wiring not shown is identical to that of the original transmitter. Capacitors are disk or tubular ceramic. All resistors ½ watt unless otherwise specified. J_1 is the original key jack for the transmitter and R_1 is a 1-megohm potentiometer.

[4] Puckett, "De Luxe Keying without Relays," *QST*, September, 1953.

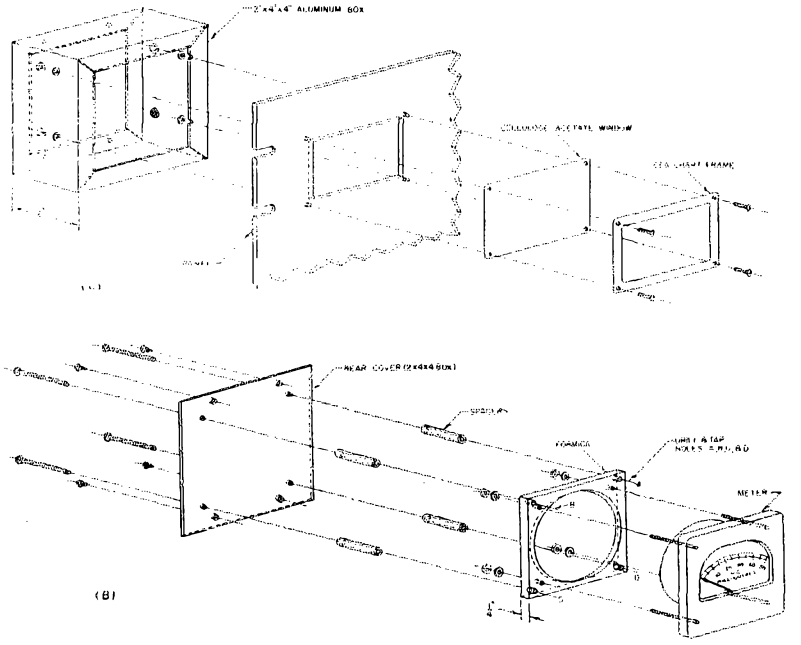


Fig. 6 — The chart frame, the panel and the aluminum box are held together, as shown in A, by the hardware supplied with the CFA. B shows a meter (Triplett Model 327-T), its insulated mounting ring, and the rear cover of the box. The meter assembly is slipped into the metal box after the latter has been attached to the rear of the panel. Shielded meter leads enter the bottom of the box through a rubber grommet. The shield braid should be bonded to the outside of the aluminum case at the point of entry.

The 100-ohm shunt in the screen lead to the 813 has been replaced with a 1-ohm, 1-watt resistor. This increases the full-scale reading of the 50-ma. meter to 100 ma. and prevents pinning of the pointer by high screen current drawn during tuning adjustments.

The parallel-tuned circuit formed by C_7, C_{11} and RFC_2 (approximately 250 $\mu\mu$f. in parallel with 2 μh.) has a natural resonance somewhere around 7 Mc. which may cause heating of the choke, harmonic output, or TVI difficulties. A check with a grid-dip meter will let you know if the resonant frequency needs moving. Raising or lowering the value of any one of the three components involved will do the trick.

Although we don't particularly recommend it, crystal control can be added to the transmitter provided you are prepared for some rather difficult mechanical problems. The oscillator revision may be patterned after the circuitry used in the remotely-tuned v.f.o. described elsewhere.[6] However, a great deal of care went into the mechanical design of the v.f.o. for the 813 rig, and it is difficult to visualize any switching or plug-in arrangement permitting crystal-v.f.o. operation that will not affect the stability of the v.f.o.

General Information — Mechanical

Procurement of a National type ACD-1 right-angle drive has been impossible for many constructors. Production of the unit was stopped shortly after the transmitter was completed. However, the National type RAD drive, now available, fits the application very nicely.

The meter boxes were improperly identified in *QST* for June, 1954. They are ICA type 29840 — not type 29804 as listed.

A new sketch of the mounting and the shielding of the meters is presented herewith as Fig. 6. Section A of the drawing shows the assembly formed by the chart frame and its cellulose-acetate window, the panel and an aluminum box. The front cover for the box is not used.

Section B of Fig. 6 shows the support for a meter. The distance from the face of the meter to the rear cover should not exceed 1⅞ inches. Reduce the length of the threaded meter terminals if necessary.

W1STX has just informed us that the full-scale drilling template for the transmitter is still available. See the Ham-ad on page 147, *QST*, July, 1955, for further information.

We are able to furnish 8 × 10-inch glossy prints of any or all of the photographs illustrating the articles (including the shots shown in this issue), at $1.00 per print, postpaid.

As is Headquarters' policy, each future inquiry about the transmitter will receive individual attention. However, we believe that the preceding articles [1,2] and this current write-up present just about every bit of constructional and operational data that there is to offer.

[6] Mix, "Simple Remote Tuning for the V.F.O.," *QST*, January, 1953. Also *The Radio Amateur's Handbook*, 31st–33rd editions.

Hints and Kinks For the Experimenter

CHECKING THE FREQUENCY OF PORTABLE A.C. GENERATORS

To check the frequency of a portable 115-volt a.c. generator, connect it in series with a receiver-type power transformer and a standard 115-volt line as shown in Fig. 1. The voltage

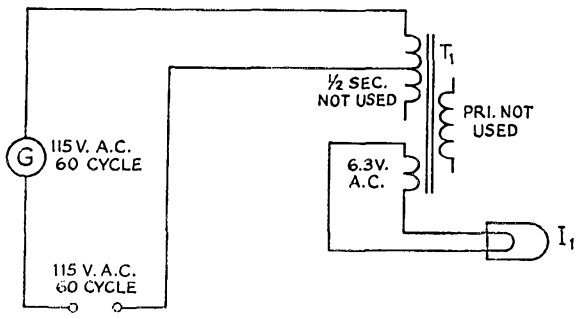


Fig. 1 — Circuit used by W4VXD/1 for checking the frequency of portable a.c. generators. I_1 is used as a beat-frequency indicator.

rating of the transformer is not too critical, but the high-voltage secondary winding should be rated for no less than 250 volts. Notice that the primary winding is not used and that only one half of the high-voltage winding is wired into the circuit. I_1 is a 6.3-volt pilot lamp connected in parallel with an appropriate heater winding.

Connect the generator to the normal load before starting the engine. Gradually increase engine speed by regulating the throttle until the brilliance of I_1 remains constant, thereby indicating that the frequency of the generator current is exactly the same as that of the "house" current (60 cycles). The lamp will glow brightly and be extinguished at engine speeds causing a phase difference between the generator current and the line current. I_1 actually shows the beat frequency between the two currents, and when the beat frequency is zero (constant lamp brilliance) the generator frequency is the same as that of the house current.

After the test has been completed, record the throttle setting that results in 60-cycle output under load.

— *Lt. C. E. Donaldson, III, USN, W4VXD/1*

TUBELESS V.F.O. FOR THE 20A S.S.B. EXCITER

A TU-6-B TUNING unit from a surplus type BC-191 or BC-375 transmitter may be easily converted into a tubeless v.f.o. for a Central Electronics model 20A s.s.b. exciter. The tuning unit contains all of the parts needed for the v.f.o. and the only expense involved in the entire project is the cost of a few feet of coaxial cable and an output plug.

Section A of Fig. 2 shows the tuning-unit circuit before modification. Components labeled C_1, C_2, C_3 and L_1 are the only ones used in the v.f.o. If you happen to have an instruction book for the BC-375 you will find these four components identified with the numbers 601 (L_1), 607 (variable capacitor), 609 and 610 (400-$\mu\mu$f. mica). These parts are located in the left-hand compartment as seen from a front view of the tuner.

The circuit for the v.f.o. is shown in section B of Fig. 2. It is quite similar to the circuit described in *QST* for June, 1954. The connection between the oscillator circuit and the exciter is made through two lengths of RG-59/U. These cables add about 20 $\mu\mu$f. per foot across C_2 and C_3, respectively, so the length employed should be no greater than necessary. The inner conductors may be terminated in a 300-ohm plug that will fit the crystal socket. The outer conductors of the cables should be bonded together and grounded at the exciter end.

The only difficulty encountered in the conversion was in unsoldering and resoldering connections due to the mass of metal involved in the large wire, etc. This problem was solved by using two irons simultaneously.

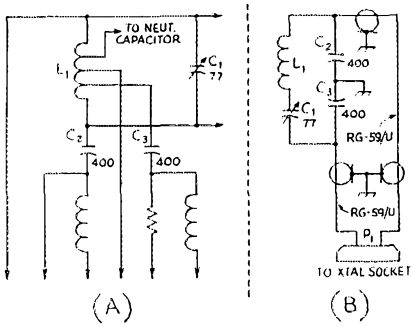


Fig. 2 — Circuit showing the "before" and "after" wiring of the TU-B-6 tuning unit. W8ZVC uses B as a tubeless v.f.o. for a type 20A s.s.b. exciter. Capacitance values are in $\mu\mu$f.

Stability of the tubeless v.f.o. is excellent and bandspread is adequate. My unit works out to have 496 dial divisions in covering the 5- to 5.5-Mc. range.

— *Carl Enix, W8ZVC*

(*Continued on page 146*)

A 4X250B Amplifier for 144 Mc.

500 Watts Input with High Efficiency and Low Drive

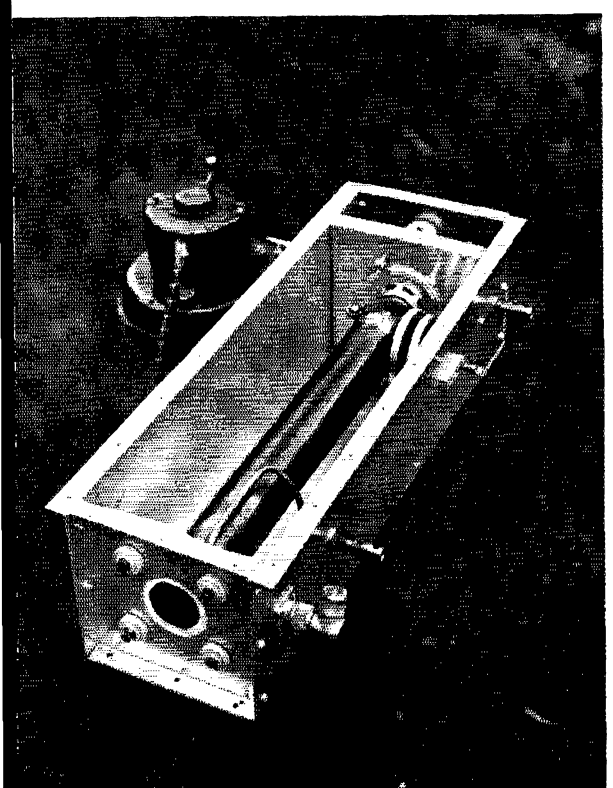
BY W. J. EDINGER, JR.,* W6LSB

THE AMPLIFIER shown in the accompanying pictures was built as a quick and easy way to put a big signal on 2-meter c.w. It delivers more power than can be obtained with older types of tubes running at the 500-watt level, and it does so with far less grid drive. In fact, its performance compares quite favorably as to useful power output with that of amplifiers using larger tubes that run up to the legal limit. Construction is relatively simple, and the rig has shown itself to be almost foolproof in operation.

The design is far from the ultimate for the 4X250B tube, as the amplifier was built from parts and materials that are readily available and easy to use. Amateurs who have access to facilities for silver plating might be able to squeeze out another few per cent efficiency by making the entire assembly of brass, and then giving it a plating of silver. But even when ordinary copper and aluminum components are used, as shown, the amplifier takes the manufacturer's rated maximum input with ease, so it can't be doing too badly. Running at 500 watts input on c.w., it has spanned the long haul to the Los Angeles area many times, a path that goes over high mountains that were long considered to be an impassable barrier to v.h.f. signals.

The construction methods shown may be used without modification for the older 4X150A tube, but the plate voltage should be reduced to 1250 or less. The amplifier can be run at 250 watts input on c.w., or 200 on phone, with the 4X150A, and it will deliver the same high efficiency that is possible with the 4X250B. With the newer tube the maximum input for plate-modulated phone work is 300 watts, the top plate voltage being 1500 for voice and 2000 for c.w.

* Box 77, Hood, California.



The 500-watt 4X250B amplifier, with the top cover removed.

Mechanical Details

The entire amplifier is built inside a 4¾ × 4¾ × 17-inch box, which can be mounted on a standard 5¼-inch rack panel. A 2½-inch compartment at the end houses the grid circuit components. Air is forced into this section by the blower, and it then flows up through the special socket, through the tube's plate fins, and out through the inner conductor of the plate line. The line, end pieces and tube mounting partition are 1/16-inch sheet aluminum, held together with 6/32 screws. The bent-over edges of the various parts were tapped, but self-tapping screws might also be used.

The inner conductor is made from a 12-inch piece of 1⅝-inch o.d. copper pipe, a standard size available at any plumbing shop. The end plate is 1/16-inch copper sheet, soft-soldered to the pipe. Connection to the plate ring of the 4X250B was made by a strip of thin copper 1¼ inches wide. This is soldered around the pipe so that it projects ¾ inch beyond the end. The portion that slips over the tube was slotted to make ¼-inch tabs. These are held tightly on the tube surface by means of a wrap-around clamp. This method appears to be better than finger stock, as there is a large r.f. current to be passed and tight contact is important. The copper stock used was a thin material that is obtainable from hobby shops, where it is stocked for tooling purposes.

The copper plate at the end away from the tube forms one element of a bypass capacitor, the other being the aluminum insert at the end of the box. It is 4 inches square. Insulation is provided by a sheet of 10-mil. teflon 4¾ inches square. The bolts that hold the copper plate in place run through ⅝-inch holes in the aluminum end plate, where they are centered by ceramic buttons.

«

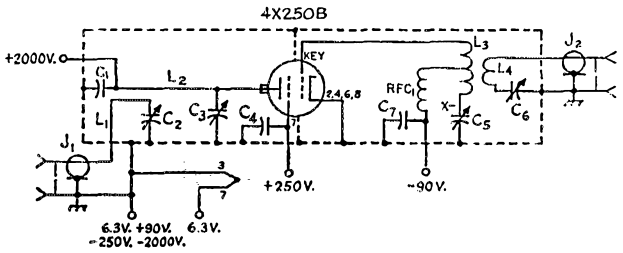


Fig. 1 — Schematic diagram and parts information for the W6LSB amplifier. Neutralization, if needed, is connected at point X. See text.

C_1 — High-voltage bypass capacitor; see text.
C_2, C_5, C_6 — 25 $\mu\mu$f. variable, receiving type.
C_3 — Plate-tuning capacitor made from neutralizing capacitor. Discs 1½ inches in diameter.
C_4 — Screen bypass (part of Eimac socket for 4X250B).
C_7 — 0.001-μf. ceramic.
L_1 — Output coupling loop; 4½ inches No. 12 wire bent into loop 3 inches long. See photo.
L_2 — Inner conductor of plate line, 12-inch length of 1⅝-inch copper tubing. See text and photographs.
L_3 — 4 turns No. 14 enam., ½-inch diam., 1 inch long. Tap at center.
L_4 — 2 turns No. 16 enam., ½-inch diam., coupled to midpoint of L_2.
RFC1 — Single-layer r.f. choke (Ohmite Z-144).

The plate line is tuned by means of discs 2½ inches in diameter, taken from a neutralizing capacitor. The fixed plate should be fastened to the inner conductor as close as possible to the plate of the tube. Resonance at the low end of the band is achieved with about ¼-inch spacing between the plates.

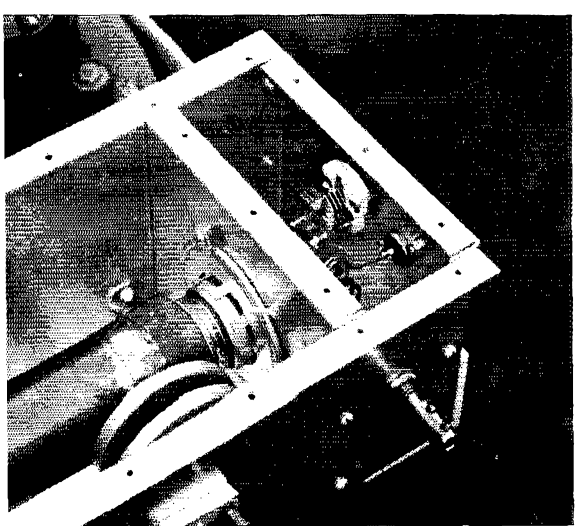
Adjustment and Operation

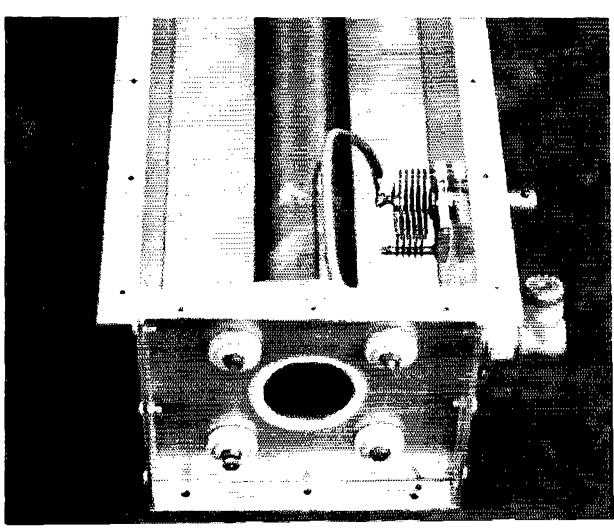
No attempt was made to optimize the grid circuit of the amplifier, as a surplus of drive was available from the exciter. It is possible to drive a 4X250B satisfactorily with a stage as small as a single 6360, and W6BAZ is among those who are doing it. In adjustment of this amplifier the screen voltage was regulated at 250, and the bias set at minus 90 volts. The drive and loading were then adjusted so that the operating conditions agreed with those recommended by the manufacturer for 2000-volt c.w. work. Keying is done in the cathode circuit of the driver stage.

Neutralization was not necessary to prevent oscillation, but a small amount did make the maximum grid current and minimum plate currents coincide. This was accomplished by running a piece of insulated wire from point X on the schematic diagram through the partition, allowing about a half inch to project through into the plate compartment.

At this writing the amplifier has had many hours of running time at 500 watts input (2000 volts at 250 ma.) on c.w., and it has shown no temperamental tendencies whatever. It was the easiest amplifier to adjust that has ever been used at this station, and it worked well right from the start. It was not the result of original engineering; rather, it was put together from ideas gathered from *W6s* RLB AJF BAZ VSV and others, plus a few mechanical innovations of my own.

Below at the left is the tube end of the amplifier. Air blown into the grid compartment passes through the tube socket, through the plate-cooling fins, and out through the inner conductor of the plate line. The amplifier should not be operated unless the cover is fastened tightly in place. The variable capacitor visible in the grid section is for tuning the input coupling loop. The grid-tuning capacitor is on the front wall of the line. Below at the right is a close-up view of the end of the line away from the tube, showing the coupling loop and its series-tuning capacitor. Ceramic buttons on the recessed end plate carry the high voltage.





• Recent Equipment —

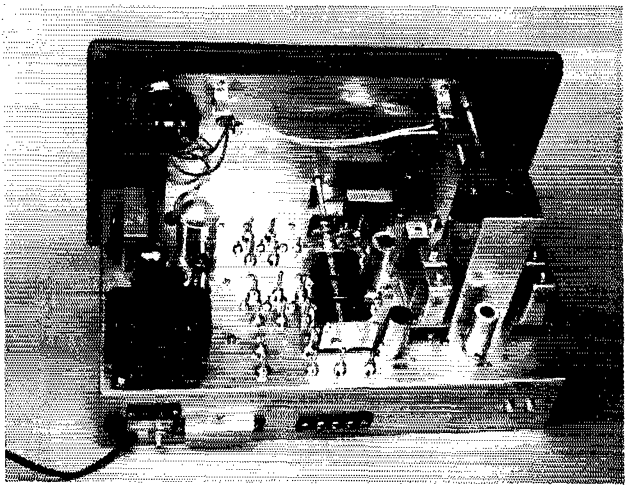
The RME-4300 Receiver

THESE DAYS anyone with a radio catalog can soon discover that receivers are getting rather expensive. This is the inescapable result of building into them more and more features, of course, and there isn't much anyone can do about it. However, there are still a few amateurs left to whom $300 to $600 is a considerable handful of the long green, and so any receiver that sells for less than $200 is of more than passing interest to them. The RME-4300 is just such a deal.

The 4300 is an amateur-bands-only receiver, covering 160 through 10 meters in six ranges. (The last range is 27 to 29.7 Mc., to cover both 10 and 11 meters.) The outstanding feature of the writer has been looking forward to for years, and it is rather paradoxical that this (in the writer's opinion) highly-desirable feature should show up first on a receiver far from the top of the price range. Incidentally, the sample receiver we looked at was rather rough in the slow-tuning condition, but it was an easy job to follow the instruction book and free the planetary enough to make it smooth. (Just one more example of the virtues of reading the instruction book!)

Circuit

The tube line-up of any receiver is best described in a block diagram, and Fig. 1 shows the



The RME 4300 features a two-speed tuning dial and a cast aluminum panel. The large aluminum can at the right houses the crystal filter; the two small cans on either side mounted on small channels are the i.f. transformers mentioned in the text.

The two phono jacks at the lower right are input and output for an external selectable sideband adapter.

tuning is that two-speed tuning is provided; direct drive for getting quickly to the desired portion of the band, and a 75:1 (!) planetary reduction drive that requires 37½ revolutions to cover the dial. The two knobs have the same axis, so you tune with the slow knob (front) and reach over it for the rear knob and direct drive. This is the approach to tuning a receiver that the tubes used in the 4300. The receiver is straightforward and conventional in most respects, using one r.f. stage and two i.f. stages. Selectivity in the i.f. is obtained from a crystal filter that has a phasing control and four degrees of selectivity. The second i.f. stage is the pentode section of a 6U8, and the triode section of the tube serves as the b.f.o. The b.f.o. injection is obtained through

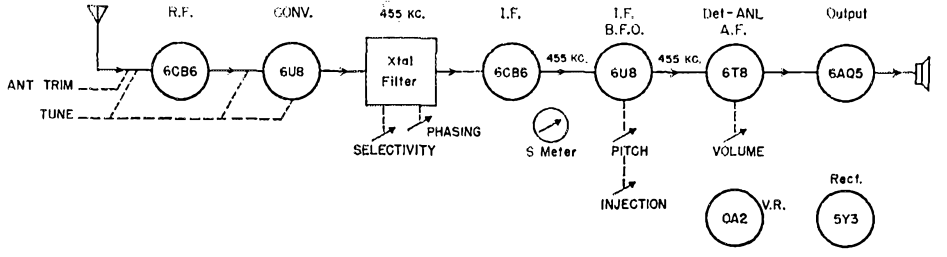
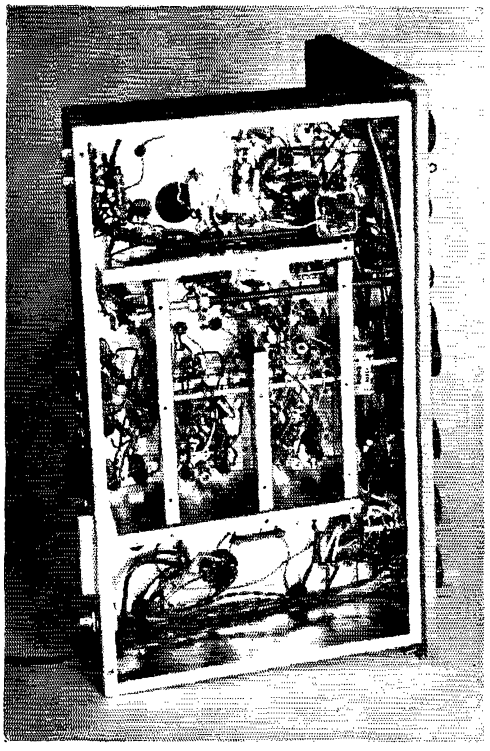


Fig. 1 — A block diagram of the RME-4300 receiver. The r.f. and both i.f. stages are on the a.v.c. line, and the r.f. and first i.f. stage are on the manual gain control.

the coupling between the two tubes in the envelope and at the socket, and it can be controlled by a knob on the panel (labeled INJECTION) that varies the plate voltage on the b.f.o. A twin diode



Shield partitions underneath the chassis contribute to the chassis strength as well as to the circuit isolation.

section of the 6T8 serves as a full-wave second detector, the only instance we can recall where full-wave rectification has been used at this point in a receiver. Another diode section of the 6T8 is used for the automatic noise limiter, and the triode portion serves as the first audio stage.

Loudspeaker or headphone output is obtained from the 6AQ5 output stage. The well-regulated 150 volts from the 0A2 is used on the mixer screen, the oscillator and b.f.o. plates, and as the reference voltage for the S meter. The S meter reads the difference between this reference voltage and the cathode voltage of the 6U8 pentode. A.v.c. voltage is applied to the grids of the r.f. and i.f. stages, and the manual gain control varies the cathode voltages of the r.f. and first i.f. stages.

Two phono jacks on the rear of the chassis permit connecting an external single-side-band selector (RME-4301) without any wiring changes in the 4300. To facilitate use of the selector (which is the phasing type permitting single- or double-side-band reception), there is a four-position switch brought out to the front panel. The positions are marked CW, AGC, SSB/AGC and SSB/MGC. The first position turns the b.f.o. on and the a.v.c. off, and the second position turns the a.v.c. on and the b.f.o. off. The latter two positions cut the external side-band selector into the circuit, with or without a.v.c. Obviously, if you don't have a selector connected and operating, these two latter positions will give no audio output from the receiver, so don't think the receiver isn't working before you read the instruction book, as some of the "brains" did in the lab here!

Another panel switch has three positions marked REC, STD-BY and TRANS. This switch turns off enough of the tubes in the receiver to kill the output, but the oscillators run all the time, to minimize drift during transmissions. Additional circuits on the switch tie in with terminals at the rear of the receiver so that this panel switch can be used to turn on the transmitter as it kills the receiver output, or it can be wired so that the receiver is controlled by an external circuit.

A small trimmer capacitor brought out to a panel control marked CAL is used to bring the oscillator into exact calibration at any desired point on the tuning scale. This will affect the calibration on other bands, of course.

Physical

One of the points that interested us considerably was the use of a cast aluminum front panel. A heavy panel helps to resist cabinet deformation and resultant microphonics, and that is why it is refreshing to see some attention paid to this detail in the 4300.

The i.f. transformers in the 4300 are different than any we've seen in other receivers, and we can only speculate why it was done this way.

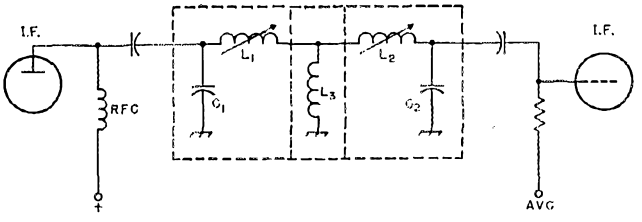


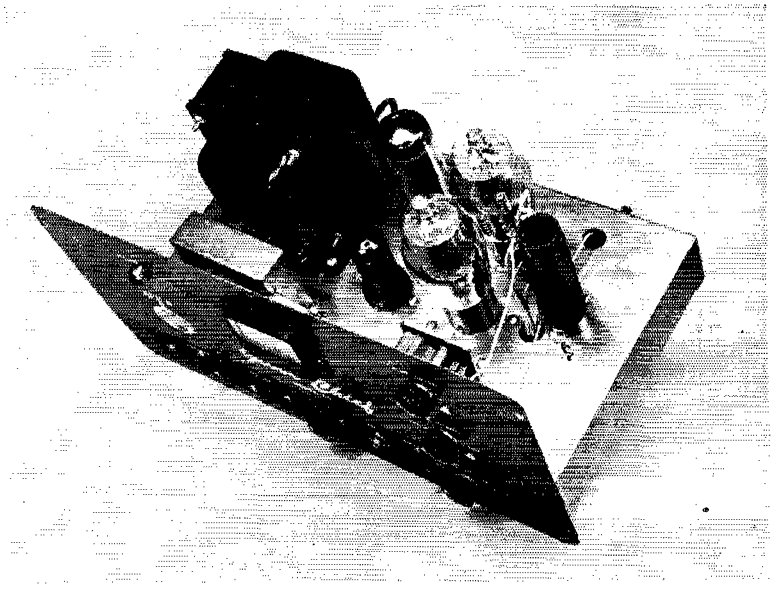
Fig. 2 — Conventional i.f. transformers are not used in the 4300. Instead, separately shielded coils, L_1 and L_2, are coupled through a common inductor, L_3.

Each i.f. transformer consists of two separately shielded coils, coupled through a common inductor as shown in Fig. 2. The two shield cans are mounted on a small U-shaped chassis, as can be seen in one of the photographs. As mentioned above, we can only guess at the reason for this: it might be the least expensive way to get a good i.f. transformer at this frequency, it might be that the designer wanted the two adjustment screws accessible from the top of the chassis, or it might

be that it was considered desirable to minimize capacitive couplings. In any event, it's a good idea for any home constructor to bear in mind, since single shielded slug-tuned coils are a lot easier to come by these days than are good i.f. transformers, particularly at odd frequencies. Furthermore, an arrangement like this gives a wide range of coupling possibilities. — *B. G.*

The Globe Chief

THE GLOBE CHIEF transmitter, a new addition to the World Radio Laboratories line of amateur equipment, is a crystal-controlled c.w. transmitter rated at 90 watts input. It is completely band switching, covering 160 through 10 meters. For the Novice operator, a special marking on the plate meter shows when the 75-watt Novice power limit is reached. The transmitter is available both in kit form and completely wired. One of the features of the kit is that all wires are precut and pretinned, which should cut construction time considerably.



Top view of the Globe transmitter. The controls along the bottom of the panel, from left to right, are: a.c. switch, oscillator plate tuning, transmit-tune switch, and band switch. Above the band switch are amplifier tuning and loading controls. The meter reads amplifier plate current. The oscillator coil is under the chassis.

The r.f. tube line-up consists of a 6AG7 modified Pierce oscillator driving a pair of parallel-connected 807s. A parallel-tuned tank is used in the plate circuit of the oscillator, which is capacity-coupled to the grids of the 807s. The plate circuit of the 807s uses a pi-network designed to work into a load range of 50 to 600 ohms. A tapped coil is used in the pi, and the switches for selecting the proper tap on this inductance and the appropriate oscillator plate coil are ganged with a single control. Two output terminals are available on the back of the chassis; one is connected directly to the output of the pi network and the other connects to a coil in series with the pi-network output. This arrangement enables the operator to match low-impedance loads on 160, 80, and 40 meters.

For 160-meter operation, 160-meter crystals are used; 80-meter crystals can be used for either 80 or 40, and 40-meter crystals are needed for the other bands. The 807s are operated as straight-through amplifiers on all bands except 28 Mc., where they are used as doublers.

A type of blocked-grid keying is used to key the grids of the oscillator and amplifier tubes. The blocking bias is obtained from a resistor common to the B- return of both stages. In the key-up position the amplifier is not biased to cutoff but to a plate current drain of 20 to 30 ma. This load helps to regulate the supply voltage from key-up to key-down conditions.

One power transformer, with a 5U4GB rectifier, furnishes all the voltages for the transmitter. The power supply and r.f. section are mounted on a 2 × 8 × 13-inch steel chassis which is enclosed in an 8 × 8 × 14½-inch grey Hammertone cabinet. An octal socket mounted on the back of the chassis provides 115-volt terminals to operate an external antenna relay, and also serves as a means of connecting to an external modulator. A companion modulator unit for screen modulating the Globe Chief is available. — *L. G. M.*

Narrow-Band Phone Possibilities

A FAVORITE discussion subject among amateurs interested in the technical aspects of radiotelephony is the possibility of further reduction in the bandwidth of transmission, as a means for reducing QRM in the phone bands. Practically everyone is familiar with the limited speech-range technique that has been recommended for many years, where band pass filters in the speech amplifier limit the frequencies to those necessary to good "communications quality" speech. Methods like this can reduce the transmission bandwidth of an a.m. phone signal to about 6 kc. Through the use of s.s.b., the required bandwidth can be reduced to slightly less than half this figure, or around 2700 cycles. In any case, the actual figure can vary with the individual voices involved, but the bandwidth can be reduced perhaps only 10 or 20 per cent before it can be criticized in some instances as not retaining good "communications quality."

We hams are not the only people interested in the subject. It is of vital importance to the telephone companies and, to this end, the Bell Telephone Laboratories have been working on the problem for many years. You undoubtedly know that their carrier-telephony systems use s.s.b. as a matter of course, to permit more conversations to be carried by the same pair of wires. Obviously, if some way could be found to reduce the bandwidths below the amateur figures mentioned above (which are slightly greater than those used by the telephone companies), a great saving in wire lines could be affected. And, of course, any solution that the Bell Labs finds is worth looking into for a possible amateur application.

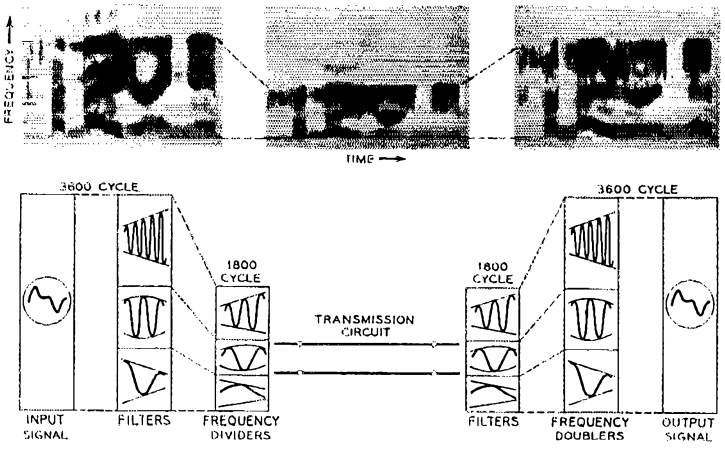
Some of the approaches have been mighty complicated and could hardly be expected to enjoy any popularity in amateur radio. These have been along the lines of "coded speech," where the voice is analyzed at the transmitter, encoded into a signal that requires less bandwidth than the original speech, and then transmitted to the receiver. At the receiver the message is decoded and the speech recreated through a synthesizer. One such system, called the Vocoder, originally suffered from lack of naturalness and sometimes from lack of intelligibility. In its present form, however, it is often difficult to distinguish between the original and the synthesized voice.

A system that sounds even more like science fiction, and has even greater potential in bandwidth saving, makes use of Audrey,* an electronic device for automatically recognizing spoken digits. As utilized for band reduction, its job is to analyze the sounds it hears and make up its "mind" as to which sound in its memory category most closely resembles it. Tied together with the synthesizer section of a Vocoder-like sound generator at the receiving end, it transmits voice over a very narrow bandwidth.

A third system, and one that should be kept in mind by the hams described in the opening paragraph, is called "Vobanc," for voice-band compressor. Based on an original idea of R. L. Miller of the Bell Telephone Laboratories, it strives only for 2-to-1 reduction in bandwidth. Filters divide the incoming speech signals into three bands (below 1000 cycles, 1000–2000 cycles, and above 2000 cycles). Three frequency dividers then operate to halve the predominant frequency within each of these three bands. After the frequency division process, more filters confine the divided signals to half the original bandwidths of the speech sounds. At the receiving end, frequency doublers restore the signals to the original bandwidth. The illustration shows sample spectrograms of a signal before, during and after transmission, and a pictorial representation of the operation.

Future developments along these lines will certainly bear watching.

* For "automatic digit recognizer."



• Technical Correspondence —

RECEIVER BAND WIDTH FOR SATELLITE TRACKING

Box 478, Route 3
Fairfax, Virginia

Technical Editor, *QST*:

In the article of the July, 1956, issue of *QST* entitled "Radio Tracking of the Earth Satellite" there is a statement that stirred my thinking a bit. This was the footnote 2 on page 40 concerning the calculation of usable predetection band widths of a tracking receiver, and the conjecture there about band widths of less than 5 kc.

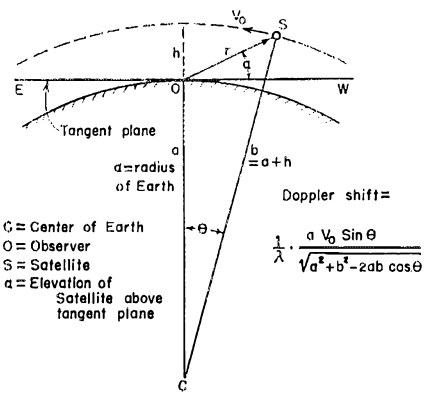


Fig. 1

A few minutes with a slide rule answered the question of whether or not the question of Doppler shift had been considered in relation to this problem. This factor is not ordinarily encountered, but is of some importance here on account of the relatively high velocity of the transmitting source.

Anyone who has stood by a railroad crossing and listened to a train whistle go by has been struck by the sudden change in the pitch of the sound from the whistle just as the train passes the crossing. This change in pitch is due to the motion of the whistle with respect to the stationary observer and is a demonstration of the Doppler effect. As the train approaches the observer the whistle, which is the source of the sound, is moving forward, so that as far as the observer is concerned the velocity of propagation has been increased. The transmitted frequency always remains the same, but since the velocity of propagation is higher, the observer hears a shorter wavelength and hence the higher-frequency pitch. When the train is directly abreast of the observer there is no relative motion between the two and the whistle sounds its actual pitch, but as the train recedes from the observer the velocity of propagation is reduced, so far as he is concerned, and he hears a lower-pitched sound.

The Doppler shift caused by relative motion between a source and an observer is calculated as the change in the number of wavelengths per second due to the motion. Stated in equation form, the frequency shift, Δf, is equal to the relative velocity in meters per second divided by the wavelength in meters:

$$\Delta f = \frac{V_a}{\lambda}$$

This frequency is added to the real frequency if the source is approaching and is subtracted from the real frequency if the source is receding.

Although the example given above was for sound waves, there is a Doppler effect present with any type of radiation. For instance, the Doppler effect in light waves is used to measure the velocity of receding nebulae or the rotation of stars through the shift in the frequency of the lines in the spectrum of the emitted light.

The Doppler principle may be applied directly to the case of the signal to be transmitted from the Earth Satellite. Ordinarily, we do not experience Doppler effects in radio because the wavelengths are relatively short compared with the velocity of propagation (the speed of light) and the speeds we travel are relatively low. Thus Doppler shifts are usually on the order of a few cycles, which is negligible. Some difficulty has been experienced in operating fixed-frequency s.s.b. at v.h.f. in fast-flying aircraft. In this case, the Doppler shift in the received carrier results in the local injected carrier being too high or too low for proper demodulation, and anyone with s.s.b. receiving experience can appreciate the effects of the wrong carrier-injection frequency.

The Earth Satellite will have a linear velocity in its orbit of some 18,000 miles per hour (which is 26,400 feet per second) as it circles around the Earth. If the transmitter frequency sent from the satellite is 108 Mc. (λ = 9.1 feet) the maximum Doppler frequency shift would be +2900 cycles as the satellite approaches the receiving station, and −2900 cycles as it recedes. This would

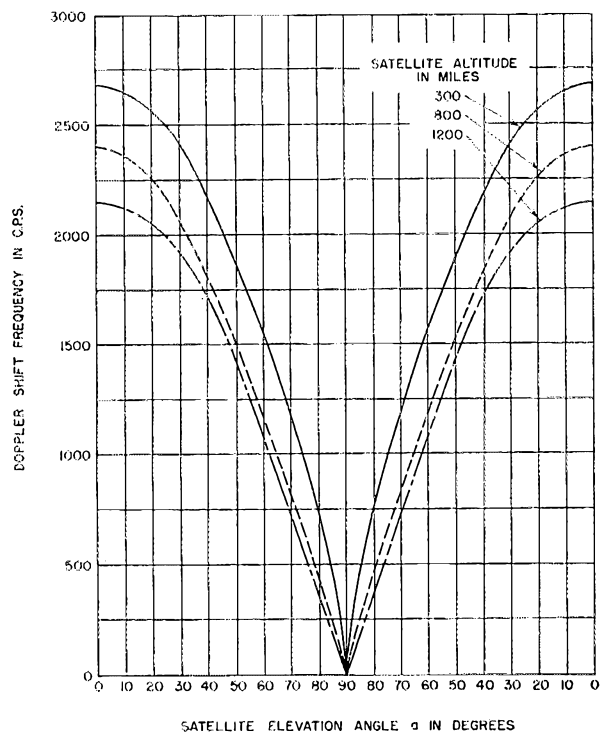


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Fig. 2

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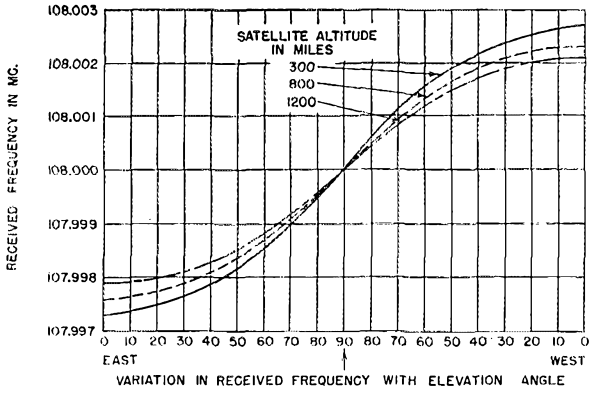

Fig. 3

result in a total "band width" of the received signal of 5800 cycles. This shift then would limit the predetection band width of the receiving system.

The actual Doppler shift will be somewhat less than 5800 cycles, however, since in its orbit around the earth the satellite will not approach the observer head-on nor recede directly away from him. In order to determine the exact manner in which the Doppler shift will affect the received frequency the actual relative velocity between the satellite and a fixed receiving point must be known. Fig. 1 shows the geometry of the relative motion for a satellite path directly over the receiving station. The change in the length of the vector r expressed in wavelengths per second will be the Doppler shift.

Fig. 2 is a plot of the Doppler shift frequencies for several satellite altitudes over the receiving station for the angle of elevation of the satellite from a plane tangent to the Earth's surface at the receiving point. An examination of these curves shows that for a low satellite altitude, the received frequency differs from the real frequency by a large amount most of the time, and as the satellite altitude is increased the frequency shift is more gradual.

Fig. 3 shows the variation in received frequency with the angle of elevation of the satellite. A narrow-band receiver (i.e., less than 5-kc. predetection band width) would have to be retuned in order to receive the satellite signal as the transmitter moves across the sky. An a.f.c. system would adequately tune a local oscillator over such a range to keep the i.f. constant.

— *Paul E. Wilkins, W4SB.A*

YAGI DESIGN

Telrex Labs.
Asbury Park, N. J.

Technical Editor, *QST*:

I've been busier than a cat on a hot tin roof answering questions, letters, etc. generated by our article appearing in August *QST* (Greenblum, "Notes on the Development of Yagi Arrays"). Too many of these chaps unfortunately are arriving at the conclusion that the article eliminates the necessity for a site free of contamination, instrumentation, elevator towers and masts, etc., etc. Perhaps we should point out the data presented was intended as a guide. It is in reality our format for design factors when designing an array to meet definite specifications.

It does not eliminate the need for a couple of good antenna men (plus a boy) and with one or two mechanical design men in the background.

— *M. D. Ercolino, W2BDS*
Pres. and Chief Engineer, Telrex Labs.

801 South Main St.
Burbank, Calif.

Technical Editor, *QST*:

Several *QST* readers have pointed out to us recently that there are discrepancies between the article "*Long* Long Yagis" in the January, 1956, issue of *QST* and the Yagi article by Greenblum in the August, 1956, issue.

Because Mr. H. G. Johnson, co-author of the former article, used the same experimental methods in designing the 144-Mc. long Yagi marketed commercially by our firm we hasten to point out that whenever the theoretical treatment becomes too cumbersome, as it does *in* the case of the multielement Yagi, more often than not there are differences in apparent results and therefore in the conclusions to be drawn.

Not only are there discrepancies between the above two articles, but in some respects both are somewhat in disagreement with the paper "A New Method for Obtaining Maximum Gain from Yagi Antennas" by H. W. Ehrenspeck and H. Poehler of the Antenna Laboratory of the Air Force Cambridge Research Center.

Which all simply points up a fact that has been mentioned in *QST* many times before: In many areas of development the heuristic method ("cut-and-try," in amateur lingo) is still the only practical one, and in such instances the amateur is in as good a position as anyone to contribute some useful information to the art. Once enough experimentally-derived information is accumulated from enough sources, the next step is to attempt to resolve those discrepancies which are great enough to be outside the potential error of measurement. In so doing, it often turns out that what at first appeared to be a discrepancy was not really a discrepancy at all, but only the failure to take into consideration some parameter not originally thought pertinent.

— *Woodrow Smith, W6BCX*
Chief Engineer, Gonset Company

I.F. TRANSFORMER POLARITY

Bendix Radio
Baltimore 4, Maryland

Technical Editor, *QST*:

The remark in Mr. Carl J. Heinen's article (*QST*, May, 1956), and the technical note this month (Technical Correspondence, July — *Ed.*), regarding i.f. transformer polarity, indicate that amateurs might be interested in the real cause of this effect.

In any transformer, in addition to the magnetic coupling between coils, there is capacity coupling between windings, also. Depending on the way the transformer is connected in the circuit, this capacity coupling may either aid or buck the coupling due to mutual inductance. In practical i.f. transformers, the capacity coupling is a substantial percentage of the total coupling. Standard engineering practice for 455-kc. i.f. transformers is to have the coupling slightly less than critical, and the capacity "aiding" the magnetic coupling, since it has been found that production units run more uniformly this way, considering winding and coil spacing tolerances. Therefore, reversing the polarity of one winding would change the capacity coupling from "aiding" to "bucking," the total coupling would be quite a bit less than critical, and the gain would be down.

The point brought up in July *QST* is fairly well taken, however; this could influence the gain to a great extent and also shows why designers of commercial equipment strive for as little regeneration as possible: the effects are too unpredictable.

Another possible cause is actual magnetic or capacitive coupling between two separate i.f. transformers, since no shield is perfect. This frequently happens, and in high-gain stages it is easy to see that reversing the polarity of one transformer could have a large effect on the gain if this external coupling is present.

— *Harry R. Hyder,*
Principal Engineer, Computer
Engineering Department

PHONE QRM *VS.* SINGLE SIDE BAND

Telecommunications
Training Centre,
Haripur, Hazara
West Pakistan

Technical Editor, *QST*:

Re Technical Correspondence from W6PNW (*QST*, July, 1956). I cannot let this topic go by without some comment.

I must point out to Mr. Neil that he missed one of the main features of s.s.b.: the elimination of heterodyne QRM.

(Continued on page 130)

Strays

Myron Zobel, W6NMC, now has a half-hour TV show billed as *Global Zobel*, featuring adventure films. Foreign hams with interesting footage, or who can shoot travel and adventure films, are urged by W6NMC to get in touch with him, as he is interested in purchasing such material. Global Zobel is a well-known world traveler who has used a luxurious, radio-equipped "land-cruiser" on his journeys.

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For many years it has been contrary to U. S. Navy policy to permit amateur stations aboard ships of the U. S. Navy. A new tentative policy, permitting such amateur operation, is now being given a trial aboard the *USS Eldorado*. WØTWT has been authorized to operate while the ship is at anchor at various points above the Arctic circle. While anchored off Point Barrow, Alaska, WØTWT/KL7 worked KC4USA on 20 meters, according to an announcement by the Director of Naval Communications, Rear Admiral H. C. Bruton (W4IH).

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Speaking of calls, the XYL of W6HSE holds W6MOL.

A new claimant for the title of youngest Extra Class Licensee. Roger Wallace, W4BGV, has just received his Extra Class license at the age of 14. Any more challengers?

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W2EFU (ENY SCM) reports that W2BO was heard working W2PU with clean reports on both ends.

—•••—

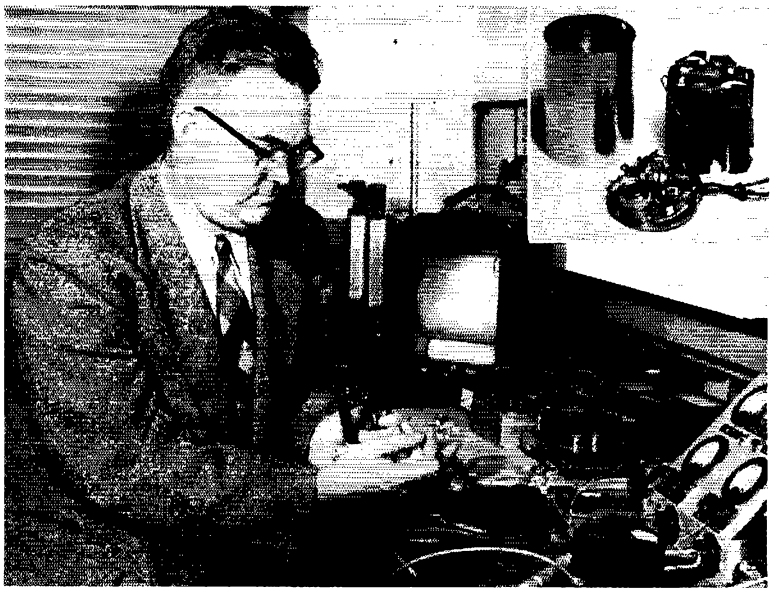
We hear from W1DDC that the Paul Levesque mentioned in the recent *National Geographic* story by Dr. White on the heart beat of a whale is W1QND of Shirley, Mass. W1QND is an electronic technician for the company that furnished the recording gear.

—•••—

Not all pink tickets are bad news. W8UXL, FCC engineer at the Chillicothe, Ohio, monitoring station, sports a personal QSL that is intriguing. The bold title — on a pink card with corrugated edges — "A PINKed TICKET FROM CHILLICOTHE, OHIO."

—•••—

Guess this QSO must have been quite legal — WN7COP recently worked WN7FBI.



This may be the type of transmitter you'll hear if you plan to listen for the Earth Satellite when it is launched — by present plans, some time next summer — during the International Geophysical Year. The model illustrated is now undergoing tests at the Naval Research Laboratory where it was developed. Holding it is John T. Mengel, head of the Tracking and Guidance Branch of Project Vanguard.

Operating on a frequency of 108 Mc., the transmitter uses a Philco type SBDT-12 transistor as a crystal-controlled oscillator, powered by seven Mallory type RM-12 mercury cells. It is capable of continuous operation for about two weeks with this power supply. Output is approximately 10 milliwatts. The cylindrical container is thin aluminum, gold plated to increase its effectiveness as a heat shield. Total weight is 13 ounces.

Groups planning to set up satellite tracking stations can look forward to seeing more technical dope in *QST* soon, starting with a description of the Minitrack low-noise converter in the November issue, if the necessary clearances can be obtained in time.

Happenings of the Month

EXAM POINTS CHANGE

A further reduction in the schedule of amateur examination cities has been announced by the Federal Communications Commission, because of the continuing drop in the number of exams given at these cities. Tallahassee, Florida, formerly an annual point, is removed from the list. Butte, Montana, becomes an annual instead of a semi-annual city. Exams will be held twice yearly in Jackson, Miss., formerly a quarterly point. In the latter instance, the territory within 75 miles of Jackson now becomes a Conditional-Class area for those who wish to use the mail procedure.

TRAFFIC WITH PANAMA

The *Liga Panamena de Radio Aficionados* recently approached the Government of Panama requesting that a special arrangement to permit amateur handling of third-party message traffic be initiated with the United States. LPRA's President, Juan F. Arias F., HP1JF, obtained full cooperation of government authorities and, through the usual diplomatic channels, Panama proposed such an agreement to the U. S. The arrangement has now been concluded and became effective September 1, 1956. Panama is thus added to the list of countries with which U. S. amateurs may handle third-party traffic — Canada, Chile, Cuba, Ecuador, Liberia, and Peru.

CALL SIGNS

Amateur call signs are issued in alphabetical sequence, in the order in which applications are processed. With most call areas now in the K series, because of lack of W call signs, a number of licensees have complained to FCC that their K calls mark them as "novices" on the air, and some even request the Commission to reissue another call in the W series! Such requests only take valuable time from the processing of other applications, of course, inasmuch as the Commission is obliged, by its own rules, to make no exceptions of this nature in the issuance of calls.

Another current FCC problem is taking time to answer letters from amateurs who mistakenly believe that after 25 years of holding a ticket they are entitled to two-letter call signs. Actually, while this was proposed by ARRL several years ago, FCC turned it down on the basis it required too much administrative and processing time — in work which was already running behind because of its great volume.

WHAT BANDS AVAILABLE?

Below is a summary of the U. S. amateur bands on which operation is permitted *as of September 1st.* Changes will, as usual, be announced by W1AW bulletins. Figures are megacycles. AØ means an unmodulated carrier; A1 means c.w. telegraphy; A2 is m.c.w.; A3 is a.m. phone; A4 is facsimile; A5 is television; F1 is frequency-shift keying; n.f.m. designates narrow-band frequency- or phase-modulated radiotelephony; and f.m. means frequency modulation, phone (including n.f.m.) or telegraphy.

3.500–4.000	— A1
3.500–3.800	— F1
3.800–4.000	— A3 and n.f.m.
7.000–7.300	— A1
7.000–7.200	— F1
7.200–7.300	— A3 and n.f.m.
14.000–14.350	— A1
14.000–14.200	— F1
14.200–14.300	— A3 and n.f.m.
14.300–14.350	— F1
21.000–21.450	— A1
21.000–21.250	— F1
21.250–21.450	— A3 and n.f.m.
26.960–27.230	— AØ, A1, A2, A3, A4, f.m.
28.000–29.700	— A1
28.500–29.700	— A3 and n.f.m.
29.000–29.700	— f.m.
50–54	— A1, A2, A3, A4, n.f.m.
51–54	— AØ
52.5–54	— f.m.
144–148 220–225 420–450[1]	AØ, A1, A2, A3, A4, f.m.
1,215–1,300 2,300– 2,450 3,300– 3,500	AØ, A1, A2, A3, A4, A5, f.m.
5,650– 5,925 10,000–10,500 21,000–22,000 All above 30,000	AØ, A1, A2, A3, A4, A5, f.m., pulse

[1] Plate input power must not exceed 50 watts.

In addition, A1 and A3 on portions of 1.800–2.000, as follows:

Area	Bands, kc	Input power	
		Day	Night
Minn., Iowa, Wis., Mich., Pa., Md., Del., and states to the north of these including the District of Columbia	1800–1825 1875–1900	500	200
N. D., S. D., Nebr., Colo., N. Mex., and states to the west of these states including Hawaiian Islands.	1900–1925 1975–2000	500*	200*
Okla., Kans., Mo., Ark., Ill., Ind., Ky., Tenn., Ohio, W. Va., Va., N. C., S. C., Tex. (West of 99° W *or* North of 32° N)	1800–1825 1875–1900	200	50
Tex. (East of 99° W *and* South of 32° N), La., Miss., Ala., Ga., Fla., Puerto Rico, Virgin Islands, Alas. Guam, and other Territories and Possessions of the U. S. not listed above.	None	No Operation	No Operation

* Except in State of Washington where daytime power limited to 200 watts and nighttime power to 50 watts.

(*Continued on page 144*)

Annual Simulated Emergency Test

(October 13–14, 1956)

This is the usual October *QST* notice of the ARRL's annual Simulated Emergency Test in which all AREC members, under their ECs, together with traffic nets and other interested amateurs, are asked to participate. The usual bulletin to ECs giving some further information and any last-minute details will be along about the middle of September. *All amateurs are invited to participate*, either in the local drill exercise conducted by your EC, or in the long haul traffic-handling aspect, or both.

The 1956 SET will have two principal feature changes from last year's drill: first, *all* amateurs taking part in the SET are being invited to originate a message *to ARRL Headquarters* briefly indicating the part they are playing. Second, there will be no Test Emergency Alert (TEA) this year.

The SET is not a contest. It is the annual test of AREC facilities in conjunction with the principal agencies we serve. The object is for each AREC group to better its last year's score, to show continuous progress and improvement from year to year; you compete with yourselves, not with other groups. Here's a step-by-step rundown of how the SET works.

(1) The EC calls a surprise alert of his AREC organization sometime during the October 13th–14th week end. If another date is more convenient for local reasons, an exercise held at that time can be counted as your SET. Conduct your drill on the designated week end if you can.

(2) The group participates in a simulated emergency under the EC's direction. Any kind of emergency likely to occur in your locality can be simulated, natural or man-made. Close coordination with local agencies to be served is desirable, especially Civil Defense and Red Cross.

(3) During the test, each participating amateur will originate a message to ARRL Headquarters briefly describing his participation. Keep these messages short, because there will be a lot of them (we hope). Twenty-five words should be the outside maximum, and we'd like to see most of them kept down to ten words or less. Each AREC group should designate one or more of its members to act as clearing agent for this traffic, to be put on regular traffic nets or cleared on one of the National Calling and Emergency Frequencies. *Be sure the messages are in standard ARRL form, complete with check and filing time.*

(4) The EC's message to headquarters should briefly describe the type of emergency simulated and indicate the number of participating amateurs. If a RACES drill, also indicate the number of non-amateur operators participating, if any.

(5) The EC solicits a message from the local Red Cross Chapter Chairman or Disaster Chairman to go to American National Red Cross, Washington, D. C. W2CRD, W3PZA, W6CXO or W9DUA can be terminal points for all such messages. In Canada, messages should be addressed to Canadian National Red Cross, Toronto, Ont.

(6) The EC solicits a message from the local Civil Defense Director to be sent to the Federal Civil Defense Administrator, Battle Creek, Mich. These messages should be relayed through the state c.d. control center, if feasible; otherwise, direct to FCDA. FCDA will have a station on the air at Battle Creek, and FCDA regional control centers will be activated in those regions in which amateur stations have been established. In Canada, such messages should be addressed to the Federal Civil Defense Coordinator, Ottawa, Ont.

(7) Invite the press to your exercise. ARRL sends out a press release, but *you* must furnish them with local angles in which they are most interested.

(8) After the test, your EC should report details and summarize score on a form with which he will be provided. *See that yours reports, so your work will receive credit.*

This is a 100 per cent ARRL-sponsored test in which we have the cooperation of both the Federal Civil Defense Administration and the American National Red Cross, as the two principal agencies to be served in any emergency. But it is up to us to put it across, to show what we amateurs can do on our own. Mark October 13th–14th on your calendar as a *must* activity, and plan to take part in the annual Simulated Emergency Test.

23rd ARRL Sweepstakes — Nov. 10th–11th and 17th–18th

How many ARRL sections and how many stations in those sections can you work in two week ends? If you are located anywhere in the League's field-organization territory (see page 6), you are cordially invited to take part in this popular annual operating activity. Any amateur bands, phone or c.w., may be used. The total operating time allowed each contestant is 40 hours. Phone entries are compared only with other phone entries — c.w. scores only with other c.w. scores — in your particular section, in the competition for awards. The week-end periods starting Saturday afternoon (1500 PST or 1800 EST) on the 10th and 17th of November mark the open season for SS contacts.

A complete announcement of the contest, including the rules governing participation, will appear in November *QST*. The rules will be almost the same as those of the 1955 SS. Amateurs in remote ARRL sections who do not receive the next issue before the Sweepstakes may refer to November, 1955, *QST* for contest details.

Contest reporting forms will be sent to all amateurs who request them by mail or radiogram. It is not necessary to use these forms if the report form prescribed in November 1955 or in the next issue of *QST* is followed.

Silent Keys

It is with deep regret that we record the passing of these amateurs:

W1AHF/W1VSK, Daniel W. MacLean, Eastport, Maine and Alton Bay, N. H.
W1ANS, George W. Farley, Milford, N. H.
W1BU, George E. Howard, Norfolk, Mass.
W1NQA, J. Orion Baker, Boston, Mass.
W2TFO, Raymond F. Slack, Long Branch, N. J.
W3NKX, Joseph V. Otto, Baltimore, Md.
W5MQH, Henley W. Williams, Dallas, Texas
W5QWM, Ray Biles, Sunray, Texas
W6IBS, Vaughn G. McKenney, San Diego, Calif.
W6IPG, Charles R. Fernstrom, Oakland, Calif.
ex-W7FQK, Charles A. Middleton, Aberdeen, Wash.
W7TNK, Robert M. Van Leuven, Spokane, Wash.
KN9BGI, Maurice F. Benfer, South Milwaukee, Wis.
WØHBL, Minford L. Sherman, Topeka, Kansas
WØMTC, Lavina P. Allen, Wichita, Kansas
WØNCZ, Robert G. Kurtz, Kansas City, Kansas
WØSDL, Kenneth P. Grier, Minatare, Nebr.
EI4X, N. V. Patterson, Dublin, Ireland
EI5Y, B. E. King, Dublin, Ireland
EI6G, Charles McCarthy, Cork, Ireland
GI3FZQ, Adam Forsythe, Belfast, N. Ireland
VE3BPF, Glen A. Rogers, Belmont, Ont., Canada
ZL4AT, John Stone, Dunedin, New Zealand

List of TVI Committees

THE FCC ROSTER of TVI committees continues to grow. In the past year 85 committees have been added in 79 cities, to bring the grand total registered with the Commission to 522 committees serving in 491 cities, as of August 1, 1956. Hearty congratulations to all who are participating in this cooperative endeavor. The list of cities served follows:

Alaska: Anchorage, Fairbanks.

Alabama: Anniston, Birmingham, Gadsden, Huntsville, Mobile, Montgomery.

Arizona: Phoenix, Tucson.

Arkansas: Fayetteville, Little Rock.

California: Alhambra, Arcadia (2), Artesia, Azusa, Bakersfield, Baldwin Park, Burbank (2), Camarillo, Canoga Park, China Lake, Colton, Compton, Coronado, Covina, Downey, Dunsmuir, Eagle Rock, East Bay, Edwards Air Force Base, El Monte, Encino, Etiwanda, Fairfield, Fresno, Fullerton, Glendale, Granada Hills, Hawthorne, Hayward Area, Hemet, Hollywood, Inglewood, La Canada, Lakewood, Lancaster, Long Beach, Los Angeles, Lynwood, Manhattan Beach, Marin County, Marysville/Yuba City, Merced, Modesto, Monrovia, Monterey Bay, Monterey Park, Monte Vista, Mt. Diablo, Mountain View, North Bay, North Hollywood, North Peninsula, Norwalk, Orange, Orange County, Oxnard, Pacoima, Pacific Palisades, Palo Alto, Palmdale, Palos Verdes, Pasadena, Pomona/Ontario, Pt. Magu, Redlands, Redondo, Reseda, Rialto, Riverside, Richmond, Sacramento, San Bernardino, San Diego, San Fernando, San Francisco (5), San Gabriel, San Mateo, San Pedro, Santa Ana, Santa Barbara, Santa Clara County, Santa Monica, Sherman Oaks, Sonoma County, Southgate, South Pasadena, Stockton, Studio City, Sylmar, Tarzana, Temple City, Topanga, Torrance, Turlock, Upland, Van Nuys, Ventura, Walnut, West Covina, Westchester (in City of Los Angeles), Whittier, Woodland.

Connecticut: Darien, Norwalk, Norwich, Shelton, Torrington, Waterbury.

Colorado: Alamosa, Boulder, Colorado Springs, Denver, Grand Junction, Greeley, Pueblo.

Delaware: Wilmington (3).

District of Columbia: Washington.

Florida: Bradenton, Clearwater, Daytona Beach, Ft. Lauderdale, Ft. Walton Beach, Ganesville, Jacksonville, Key West, Lakeland, Miami, Orlando, Pensacola, Sarasota, St. Petersburg, Tampa, West Palm Beach.

Georgia: Albany, Atlanta, Augusta, Cartersville, Hapeville, Macon, Marietta, Savannah, Valdosta, Warner Robins.

Hawaii: Hilo, Honolulu, Lihue, Kauai, Wailuku, Maui.

Idaho: Boise, Kellogg, Nampa, Twin Falls.

Illinois: Alton, Belleville, Chicago, Creve Coeur, Decatur, Des Plaines, East Moline, East Peoria, East St. Louis, Freeport, Galesburg, Granite City, Joliet, LaSalle, Moline, Morton, Mt. Prospect, Mt. Vernon, Pekin, Peoria, Rock Falls, Rock Island, Silvis, Wheaton.

Indiana: East Chicago, Elkhart, Evansville, Ft. Wayne, Gary, Hammond, Portland, South Bend.

Iowa: Conway, Davenport, Newton, Sioux City, Spencer, Waterloo.

Kansas: Kansas City, Lawrence, Leavenworth, Salina.

Kentucky: Lexington.

Louisiana: Algiers, Bogalusia, Monroe, New Orleans, Baton Rouge.

Maine: None.

Maryland: Annapolis, Baltimore (3), Cumberland, Hagerstown.

Massachusetts: Adams, Boston, Dennisport, Fitchburg, Framingham, Marshfield, New Bedford, Pittsfield, Scituate, Worcester.

Michigan: Allegan, Berkley, Birmingham, Bloomfield Hills, Clawson, Ferndale, Flint, Grand Rapids, Grosse Point, Grosse Point Park, Hazel Park, Ishpeming, Lansing, Marquette, Menominee, Mt. Clemens, Mt. Pleasant, Muskegon, Oak Park, Pontiac, Royal Oak, Traverse City, Troy.

Minnesota: Fairmont, Minneapolis, Red Wood Falls, St. Paul (2).

Mississippi: Cleveland, Hattiesburg, Jackson, Kcesler Air Force Base, Pascagoula.

Missouri: Sedalia, St. Louis.

Montana: Great Falls, Livingston.

Nebraska: North Platte, Omaha, Scotts Bluff, Sydney.

Nevada: Las Vegas.

New Hampshire: None.

New Jersey: Denville, Kearny, Millburn, Millville, Morris Plains, Mt. Ephraim, Paterson, Red Bank, Scotch Plains, Summit, Ventnor, Washington.

New Mexico: Albuquerque, Hobbs, Las Cruces, Roswell.

New York: Albany, Amsterdam, Batavia, Bellerose, Bethpage, Binghamton, Bronx, Brooklyn, Buffalo, Clayton, Elmira, Franklin, Harrison, Hornell, Hudson Falls, Huntington, Jamestown, Lockport, Niagara Falls, North Tonawanda, Penn Yan, Poughkeepsie, Rochester, Rome, Salamanca, Schenectady, Silver Creek, Syracuse, Trumansburg, Watertown, White Plains.

North Carolina: Asheville, Charlotte, Dunn, Greensboro, Lumberton, Spindale, Winston-Salem.

North Dakota: None.

Ohio: Bellaire, Canton, Cleveland (6), Columbus, Conneaut, Dayton, Greenville, Middletown, Newcomerstown, Springfield, Wadsworth, Zanesville.

Oklahoma: Bartlesville, Clinton, Enid, Lawton-Fort Sill, McAlester, Oklahoma City, Ponca City, Shawnee, Tulsa, Wagoner.

Oregon: Astoria, Bend, Coos Bay, Eugene, Klamath Falls, Medford, Newberg, Pendleton, Portland (2), Roseburg, Salem, St. Helens.

Pennsylvania: Altoona, Ardmore, Ardsley, Beaver Falls, Belle Vernon, Belleview, Bethlehem, Boyertown, Bradford, Chalfont, Connellsville, DuBois, Easton, Erie, Fairview Village, Lahaska, Lancaster (3), Larchmont, Lebanon (2), Lehighton, Lititz, Levittown, Lock Haven, McKeesport, Morton, Myerstown, Morristown, Northampton, Philadelphia (8), Pittsburgh, Reading, Red Lion, St. Mary's, Scranton, Selinsgrove, Sharon, Springfield, State College, Tamaqua, Washington, West Lawn, Wilkes Barre, York (3).

Puerto Rico: San Juan.

Rhode Island: None.

South Carolina: Charleston, Columbia, Florence.

South Dakota: Rapid City, Sioux Falls.

Tennessee: Bristol, Chattanooga, Humboldt, Jackson, Knoxville, Memphis, Nashville, Oak Ridge.

Texas: Alice, Arlington, Baytown, Corpus Christi, Dallas, El Paso, Ft. Worth, Galveston County, Garland, Houston, Kermit, Lubbock, Midland, Odessa, Orange, Refugio, San Antonio, Snyder, Texas City, Tyler, Waco, Woodsboro.

Utah: Ogden, Provo, Salt Lake City.

Vermont: Burlington, Middlebury.

Virginia: Christiansburg, Fredericksburg, Hopewell, Newport News, Norfolk, Petersburg, Radford, Richmond, Roanoke, Staunton, Winchester.

Washington: Bellingham, Bremerton, Centralia, Chehalis, Ellensburg, Ephrata, Everett, Kennewick, Longview, Pasco, Richland, Seattle, Spokane, Sunnyside, Tacoma (2), Vancouver, Walla Walla (2), Yakima.

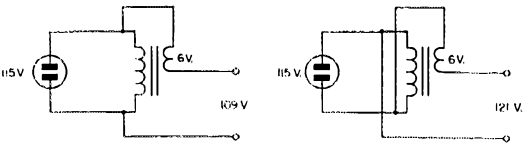
West Virginia: Dunbar, Fairmont, Huntington, Morgantown, Nitro, Parkersburg, St. Albans, Weston.

Wisconsin: Eau Claire, Fond du Lac, La Crosse, Marinette, Milwaukee, Neenah, Oshkosh, Port Edwards, Racine, Wausau.

Wyoming: Casper, Cheyenne, Gillette, Powell, Sheridan.

Quist Quiz

Our Hints & Kinks Editor received a note the other day, describing the use of a filament transformer as an adjustable auto transformer. Using a four-pole switch, the writer showed how the secondary voltage could be connected to add to or buck the line voltage and hence be used to raise or lower the voltage at the rig. A four-pole ganged switch is a lot of switch, and our Editor worked out a system using a switch with fewer poles.

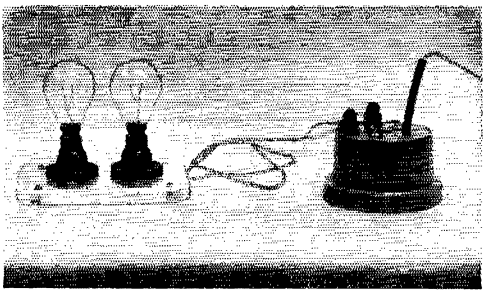


The sketch shows the basic principle of connecting a transformer so that the voltages add or buck, giving the sum or difference output. How would you connect the swiches to give the above voltages and, of course, 115, using a 3-position switch and as few poles as possible?

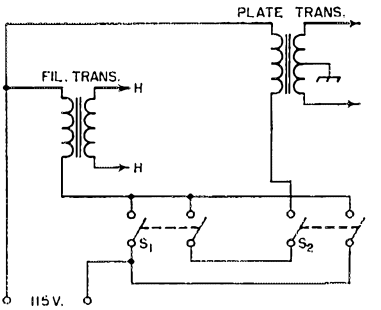
—•••—

Len Atkinson, G2BDL, liked the Quist Quiz a few months ago, but decided that an even greater mystery could be made out of it. To this end he mounted the lamps on a Lucite baseboard and used cutaway sockets, to show that nothing was concealed in them. The secret? Small silicon-junction diodes concealed in the bases of the lamps and in the switch box.

A number of incorrect solutions to the problem were received at Headquarters, but the topper was the ham who pulled the wire out of flexible insulated wire and then threaded some enameled wire back through the insulation! This despite the fact that the problem stated that no special wire was required.

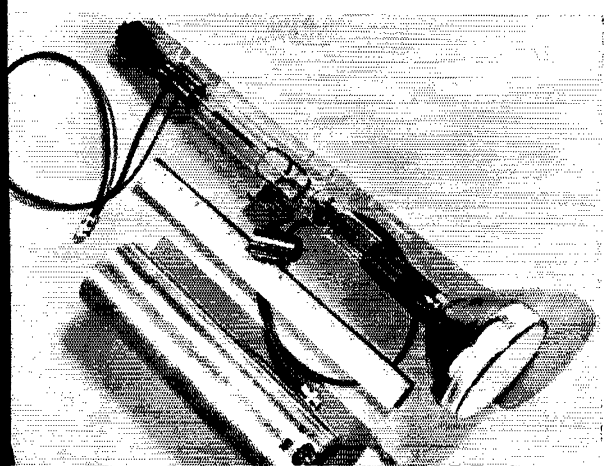


LAST MONTH'S ANSWER



Here's the answer to last month's rather easy problem. The secret lies in using double-pole switches and wiring one pole of each one in parallel and using this to control the filaments. The other poles are wired in series and control the plate power. It is thus necessary for two switches to be closed for plate power but only one for filament power.

(One answer we received was based on Boolean algebra, but most of the hams just used their heads.)



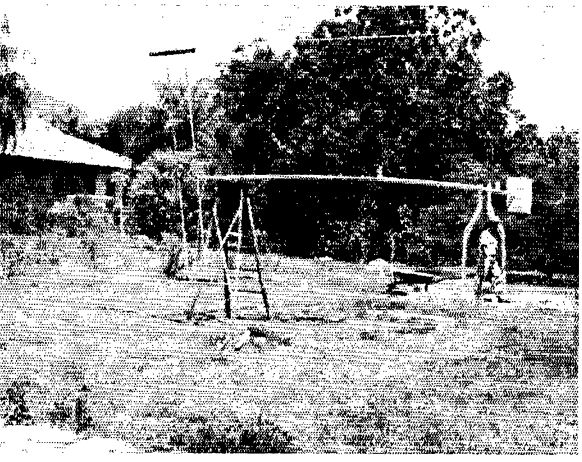
FEEDBACK

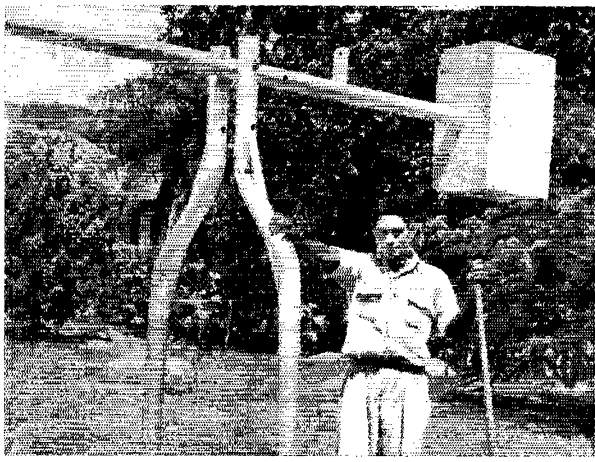
The *Q* Multiplier shown on page 42 of *QST* for September, 1956, should have pin 3 of V_4 (the cathode of the 12AX7) returned to ground through a 10K ½-watt resistor.

«

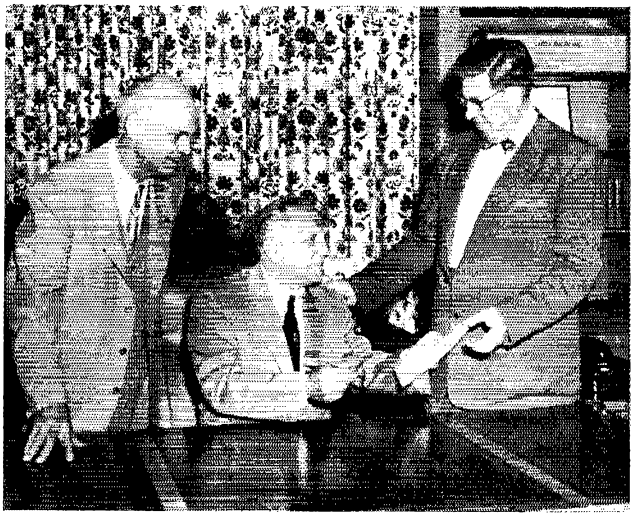
This is a receiver? Yep, microwave signals go directly from the antenna into the tube, where they are amplified, detected, and displayed on the tube's fluorescent screen. Developed by Sylvania in cooperation with the Naval Research Laboratory, the tube is called a "Wamoscope" and operates between 2000 and 4000 Mc.

Strays



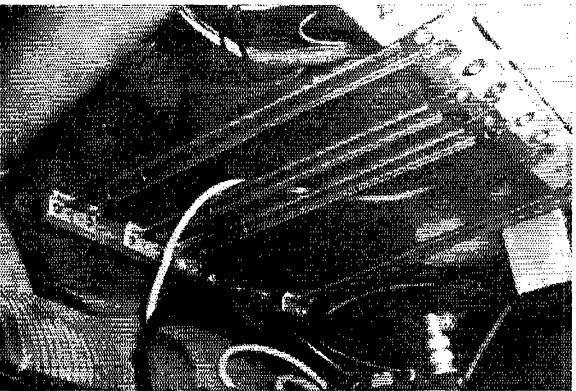


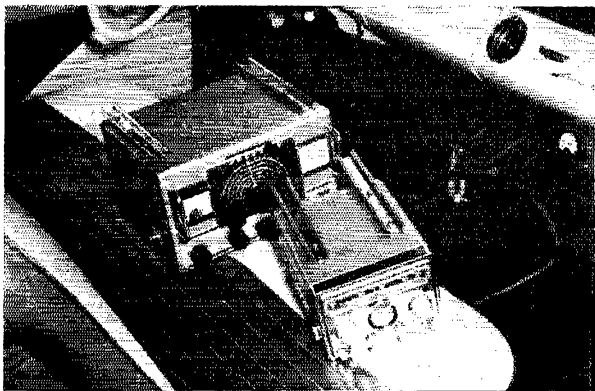
Now here's a mighty ingenious tilt-over tower designed and built by HR1LW. It is 42 feet high, with the top section made of 2-inch pipe welded into the bottom section of 4-inch pipe. The fulcrum is 8 feet above the ground and the block of concrete on the end is about 500 lbs. The rotating mechanism runs up the side of the mast. No guys are used. That is *not* HR1LW in the photos, but his gardener.



An important moment in California amateur radio history. Gov. Goodwin Knight presents to Archie Waring, W6ACN (*l.*) and Assemblyman James L. Holmes, W6REK, the bill making permanent the privilege of call letter license plates for W6 hams. W6REK was co-author of the license plate bill.

W9KNQ wanted to rig up the mobile gear in his convertible so that it would be neat yet easily removable. His clever solution was to obtain furniture drawer slides and ordinary hinges. The photographs show the setup quite clearly. The fixed portions of the drawer slides are fastened to the bottom of the dash with sheet metal screws and to the firewall by means of a steel strap and the hinges. The other portions of the drawer slides are fastened to the tops of the mobile converter and transmitter. Power cabling and antenna leads are left in place permanently.





Correspondence From Members-

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

RTTY ANNIVERSARY

38-06 61st Street
Woodside 77, New York

Editor, *QST:*

The reason I am writing is that it is the 10th anniversary of ham RTTY. . . . If our venture into radioteletype had fizzled, there would be little object in announcing the fact, but since over 3000 hams have teletypewriters now we feel that we have been, at least moderately, successful. I believe that many amateurs besides our gang possess some interest in our doings, as evidenced by the mail received here at society headquarters and, for that reason, thought they might be interested in learning of the anniversary contest being run. Prizes will be given for the best photographs of an RTTY station. Similar prizes will be awarded for write-ups on new ideas in f.s.k. and a.f.s.k. equipment. Judging will take place October 10th.

Doesn't seem like ten years, does it? You will recall, of course, that *QST* was the first and only magazine that would give our (at that time) small group recognition. The real expansion of amateur radioteletype began after that date.

— *John Williams, W2BFD*

[EDITOR'S NOTE: Readers may get contest details by writing to Amateur Radioteletype Society, 38-06 61st St., Woodside 77, N. Y.]

QRP COLUMN

2 Normandy Blvd. West
Morristown, New Jersey

Editor, *QST:*

I recently built the transmitter described in July *QST*, "Twenty-Five Watts for the Beginner," and I'm having loads of fun with it. Using a 6BQ6 instead of a 6DQ6, and running about 5 powerful watts of plate input, I have already worked seven states (all solid contacts) and am enjoying my contacts immensely.

I think a greater number of amateurs are now realizing that they can have a lot of fun with low-power rigs. This really takes some of the routine out of c.w. work, and makes a fellow wonder whether or not he's going to work someone!

One fellow I worked (incidentally, he was running 1 watt) suggested that I write in to you, and get your opinion of a low-power column, probably a monthly feature in your magazine. QRP?

— *Ed Helpert, K2KDG*

SWING HAPPY

2625 W. Ainslie Street
Chicago 25, Illinois

Editor, *QST:*

Why don't you stop your anti-bug swing smear campaign. I got one es can'ts ee wha tharm itd oes. Somegu yscan't copyanyth ingtha tdoes ntsou ndli kea tapetransmiss i on.

— *Richard W. Gillis, W9PCQ*

THIRD-PARTY TRAFFIC

12 Washington Park
Maplewood, N. J.

Editor, *QST:*

It occurs to me that *each* issue of *QST* should have a special page devoted to rules and regulations concerning third-party messages, prohibited contacts, and changes governing amateur operation. . . .

Fifteen meters is used constantly by Central and South American amateurs asking, "Will you please call up my uncle at the Biltmore, etc." One mobile was overheard arranging for traffic with a TI station.

It seems to me that American amateurs should be constantly checking rules and regulations before extending their operations to international contacts; either that or stay on 2 meters.

— *F. Bruce Parsons, W2COT*

[EDITOR'S NOTE: Third-party traffic is permitted only with Canada, Chile, Cuba, Ecuador, Liberia, Panama, and Peru. U. S. amateurs may not contact Cambodia, Indonesia, Iran, Korea, and Viet Nam. The "Happenings of the Month" column continues to report all such changes.]

V.H.F. HANDBOOK

Staff, COM FAIR WING 6
% Fleet Post Office
San Francisco, California

Editor, *QST:*

. . . I would like to suggest the publication of a *V.H.F. Handbook*. We already have s.s.b. and mobile handbooks, why not v.h.f.? Certainly the increased activity warrants it.

With the amount of information and suggestions that would be at your disposal, from Official Experimental Stations and other amateurs experienced in v.h.f. technique, a vast treasury of information would be at the disposal of the beginner or newcomer to the v.h.f. bands.

Keep up the fine work with *QST*.

— *RM2 James Morgan, W9PRJ/KA7JM*

YAGIS

4880 — 39th Street
San Diego 16, Calif.

Editor, *QST:*

I consider Carl Greenblum's "Notes on the Development of Yagis" to be one of the most interesting and instructive articles you have published. I am looking forward to reading the second part.

Please consider two suggestions: (1) that Mr. Greenblum plan a follow-up article to answer some of the questions that we will want to ask; (2) that *QST* investigate the possibility of combining all this material in a reprint brochure to be offered to members and interested parties at a reasonable cost.

— *Ernest R. Liljegren, W6JKM*

BUILDER AND BUYER

239 Bristol Road
St. Louis 19, Mo.

Editor, *QST:*

Any member of the amateur radio fraternity presumably wants to learn something of the art, ("Newcomer Trends," page 62, August) and it would be most impossible if all articles were at the first-grade level. For my part, I sincerely hope you do not clutter up the magazine with a preponderance of material slanted toward people who can't rise above Mickey Mouse.

Personally, I have built a considerable amount of gear, including a complete kilowatt rig, in the past few years, yet at the same time I have several pieces of manufactured gear, and can see advantages on both sides. For my part, I believe the trend toward "store bought" gear is not anyone's fault in particular, but simply economics. For example, the trade-in value of well-known manufactured gear is generally very good, but just try to get your money out of home-brew gear when you tire of it. You do well to recover 20 percent.

Nevertheless, more power to your technical articles — long may they wave.

— *M. L. Seyffert, W0CZA*

(Continued on page 136)

YL NEWS and VIEWS

BY ELEANOR WILSON,* W1QON

Field Day

You may have noticed that we've been pushing YL participation in Field Day for a couple of years now. Some increase in activity was apparent this year over last, but it seems to us that we really haven't begun to show what we could do in the year's most interesting amateur event.

We should have lots of opportunity to dig in on FD week end. We can tag along with our OMs (or drag them along with us), we can join with a local radio club, we can try to persuade the YL club to which we may belong to set up, or we can even operate all by ourselves in the field or work class E at home. It's up to you, and until you've really put in a FD week end, you don't know what you have been missing.

The number of YL clubs and nets throughout the country is growing. Going out as a unit on Field Day sounds like an ideal annual project for a club or net. Why not start campaigning now to get your group out next June?

This year members of the Los Angeles YLRC pointed the way for YL club activity. With thirteen operators working four transmitters, W6MWO/6 claimed 779 QSOs. The breakdown of contacts was 158 on 75; 147 on 40; 81 on 15; 78 on 10; 151 on 6; and 164 on 2 — all phone. Their six meter score was the top club score for that band in the Los Angeles area. Members *K6s* ANG, BUS, EJE, GMX, JCL, OQD, *W6s* AVF, DXI, JZA, TDL, WGX, WRT, and KN6PFY took to the San Jose Hills in West Covina for site of operations. Ascending to an elevation of 1200 feet, the last run of the trip up was so vertical that some of the cars couldn't make it, and the girls had to walk. The equipment used was two Vikings, two Communicators, with portable beams for 2 and 6, a ground plane *with radials on 10 and 15, and dipoles on 40* and 75.

Down in South Carolina the Shaw Sumter ARC used K4ALM's call for operation on several bands. Lucy and five OM club members set up in an old airport building lacking power and water. Their 531 contacts ran up a score of 3186.

Out with the Washington RC of which Liz is President, W3CDQ braved thunderstorms and stayed through the night operating W3CAB/3 at Ft. Washington, Maryland. . . . K5BNQ went to Robbers Cave State Park near Wilburton, Oklahoma, with the Oil Capital Mobile Club of Tulsa. Doris took her family and spent the whole week end, working W5HMF for 160 contacts on 20, 40, and 75. . . . Storms, heavy rain, and transmitter troubles plagued W3DBN's shift with the So. Chester County ARC, but Flo still enjoyed it all. . . . Taking their respective OMs along, W5YKE and W5RYX set up their stations at Lake Lavon, Texas. It wasn't until Martha and Novlyn returned home that they discovered they were less than three miles from each other with nary a contact exchanged between them. . . . W3BKP, Phyllis, did some operating with the Altoona, Pa. ARC. . . . In Massachusetts *W1s* TUD, ZEN, and ZJS worked 10 for the Framingham ARC, and W1QON batted fat June bugs while operating W1YFA with the Walpole ARC.

Undoubtedly there were more YLs who worked FD to some extent. Another year we hope they'll drop us a card about their activities. You can bet all of them who did participate had a good time while gaining some practical experience. CU next year!

YLRL Seventeenth Anniversary Party

Note well the various amendments and additions to this year's Anniversary Party. They have been made by the present officers in answer

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

Using the Los Angeles YLRC call W6MWO, K6ANG (left) builds the score on 75, while Midge, K6BUS, pitches in as log-keeper. Billie has been appointed chairman for next year's FD activities.

to your comments and suggestions with the hope that you will enjoy the contest more than ever.

Here are the rules:

CONTEST PERIOD

Phone —

Starts: Wednesday, Nov. 7, 1956, 12 noon EST
Ends: Thursday, Nov. 8, 1956, 12 midnight EST

C.w. —

Starts: Wednesday, Nov. 14, 1956, 12 noon EST
Ends: Thursday, Nov. 15, 1956, 12 midnight EST

Eligibility: All licensed YL or XYL operators throughout the world. Non-members of YLRL may participate but are not eligible for awards. Contacts with OMs do not count, the YL/OM Contest will be held in February.

Operation: All bands may be used. Cross-band operation is not permitted.

Procedure: Call "CQ YLRL" or "CQ YL".

Exchange: QSO number; RS or RST report; name of section, state, U. S. possession, VE district, or country. Maryland and the District of Columbia count as one state. California is divided into eight (8) sections as follows: Santa Clara Valley, East Bay, San Francisco, Sacramento Valley, San Joaquin Valley, Los Angeles, San Diego, Santa Barbara.

Scoring: (a) Add total number of contacts. Multiple contacts with same station, regardless of number of bands used, will count as *one* contact. (b) Multiply total of (a) by number of different sections, states, U. S. possessions, VE districts, or countries worked. (c) All contestants running 150 watts or less input *at all times* may then multiply the result of item (b) by 1.25. Phone and C.w. contests will be handled as separate contests. Stations and multipliers will count only once in each contest — example: a station contacted in the phone section of the contest may be worked in the c.w. portion of the contest for additional credit.

Scoring Example:

Power input: 100 watts

1	W9LOY	5–9	Illinois	1
2	K5BNQ	5–9	Oklahoma	1
3	K6OAI	5–9	Calif., Los Angeles	1
4	W6GGX	5–9	Calif., San Diego	1

Total of contacts 4
Total of sections × 4
16
Power Multiplier × 1.25
80
32
16
20.00

Logs: Copies of all logs, phone and c.w., must be postmarked not later than November 30, 1956, or they will be disqualified. Please file separate logs for each mode of operation. Send them directly to Vice President, Gloria Matuska, W9YBC, 2322 South Second Avenue, North Riverside, Illinois.

Awards: For YLRL members only: (certificates will be awarded to non-members).

Highest phone score — cup
Highest c.w. score — cup

Cups will be awarded on a permanent basis instead of the progressive basis that was formerly used. Another first for YLRL: a gavel will be awarded to the highest YL club entry. The aggregate scores of phone and c.w. reported by club secretaries and confirmed by the receipt of contest logs by the Vice President shall constitute a club entry. Segregate club entries into phone and c.w. totals. Both single and multiple operator scores may be counted as club entries. Only the bonafide club members in a local territory may be included in club entries.

Certificates will be awarded for high place phone and c.w. winners. Highest score in each district, U. S. possession, VE district, and country, where at least three (3) entries are received will receive certificates. Highest single operator c.w. score and phone score in any club entry will be rewarded with a club certificate where at least three (3) single operator phone /c.w. scores are submitted. Only single operator stations are eligible for awards. Multiple operator scores will receive separate listings in the final results. The winner of the phone cup is not eligible for the c.w. award and the winner of the c.w. cup is not eligible for the phone award.

AWTAR Radio Operators Net

Speaking in behalf of all of the contestants in the Tenth Annual All Woman Transcontinental Air Race, Mrs. Betty Gillies, Race Chairman, commented, "Another successful race is ended and once again thanks to the amateur radio communications net for their help. Each airport along the route has become dependent upon information received through the net — we would be lost without it. Every best wish and again our deepest thanks."

Of the amateur liaison maintained with the pilots for the fifth consecutive year, Amateur Radio Chairman Viola Grossman, W2JZX, summarized: "It is hard to express due thanks for the unselfish service given by all of the radio chairmen for the various stopover cities for their weeks and months of preparation, and for those who monitored the frequencies for long hours and who kept many schedules during the race period, July 7th thru the 10th. We enjoyed the association with the Ninety-Niners very much, and the cooperation of all concerned was wonderful."

From their perch outside the operations shack at the San Mateo County Airport, Esther, W6BDE, and Gertie, W6FEA, Radio Chairman for California, were able to watch 86 AWTAR pilots take-off in 50 planes in 26 minutes, while relaying the departure times immediately on 75 to W6QGX, Harryette, at the first stopover city, Bakersfield, Calif.

Winners of the handicap were Mrs. Frances S. Bera of Los Angeles who flew a Cessna 180 with her sister, Mrs. Edna Bower of Long Beach, as co-pilot. (See September column for photo of KN6SBG, Joyce Failing, who crossed the finish line at Flint, Michigan, first.)

Forty meters was the band used most extensively in this year's net. In 1952 and '53, 75 meters was used to best advantage; in 1954, 20 meters; and in 1955, it was 75 again. Prevailing band conditions plus a different flight route each year are the determining factors in the choice of frequencies used.

The chairmen and operators in each stopover city worked out their own system of relay. The group at Amarillo, Texas, a compulsory stopover city, directed by W5PCN and the father and son team of W5IGU and W5UBW evolved a

(Continued on page 130)

How's DX?

CONDUCTED BY ROD NEWKIRK.* W9BRD

How:

In the Just In Case You Didn't Know Department — ever wonder how come so many guys show up on the right frequency at the right time when a new DXpedition fires its opening salvo? Extrasensory perception? Not necessarily.

Those early birds most probably have cultivated the "W1AW habit." During 1956 W1AW's regularly scheduled bulletin transmissions have called the turn on the imminent activation of such DX morsels as Deepfreeze KC4s, South Sandwich LUs, XE4A, Aves Island YVØs, and other fast-breaking items for which *QST* deadlines have closed.

Mere scuttlebutt doesn't suffice for W1AW's purposes. Its special bulletins are concise flashes documented by bona fide notifications from parties directly involved. You're passing up a solid bet if you don't keep a wary ear on W1AW!

—...—

Newcomer DX-chasers occasionally inquire, "Any DX men at Hq.?" and for them it's a valid question. Actually, W1s DF DX IKE TS VG WPO and ZDP all are postwar DXCCers. W1AW, too, has made the grade although the Hq. station's responsibilities to amateurs in ARRL field areas leaves precious little time for DX pursuits per se. W1ICP, ex-WØICP, displays a hard-won radiotelephone DXCC diploma earned back in the Ozarks. Incidentally, League Vice-Presidents W5NW and W1BDI are heard of late banging away on 20, the former heading for 200 countries and the latter concentrating on the north-south path with a backyard "Lazy H".

—...—

In reply to our recent inquiry on the subject, KV4BK notifies that he has confirmed QSO with Novices in each of our 48 states. Forty-two were worked on 7 Mc., six on 21 Mc. What other DX stations can claim WN/KN WAS achievement? 'Tain't easy!

—...—

Some years ago, when the DX Century Club was a fraction of its present size, many of you will recall we passed a pleasant week end with a DXCC-member QSO party. The contest angle was purposely secondary although we remember W4BRB as the guy who worked the most members.

But we think a constructive angle was overlooked, a gimmick that might well be included in future such affairs. We suggest that the transmission exchange also include (1) the call of the station whose long-overdue QSL is most needed, and (2) the call of the goof each participant would nominate as DX Hog of the Year. Not only would certain hollowheads receive a few hours of richly deserved publicity, but each party log would be most interesting reading.

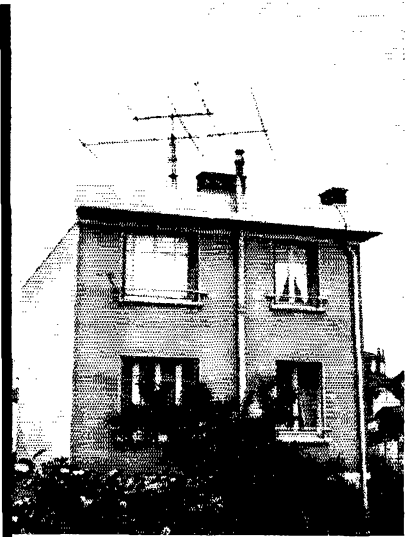
Shall we, *really?*

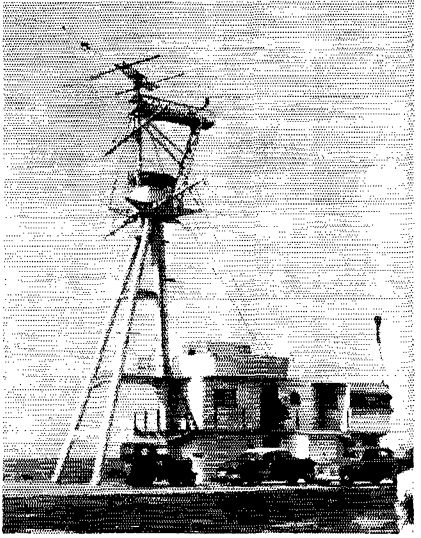
What:

October ushers in our annual Africa big-game DX season on the short and long paths. CR VQ ZD ZE and the French-African brethren, rampant on a field of ZSs, will shove Europe aside through much of each day while the rarer African items glisten in first magnitude. We have possible Seychelles, Ifni and Glorieuses sideshows afoot, you know, so adjust your sun helmets and prime those elephant guns for the hunt ahead!

20 phone will serve to start our Bandwagon a-rollin' on this month's kilocycle caravan. **EA9**AR (172) 23, F9RY/**FC** (128) 22, **IT1**ZZM, **KA3**KB, **KC6**CG (240) 8, **KG6s** AED GX, **KJ6**BN, a KM6, **KX6s** BP and BQ, **PJ2**CE, **OD5**LJ, **TI7**AA expeditioning in the C. R. mountain areas, **YO3**VI, **4X4s** BO and HK bring K4HNA closer to ARRL's coveted phone DXCC certification . . . . . K2BZT dug up **ET2**US (160) 21, **LZ1**KBD (290) 0, **HH3**DL (242) 2, one KM6 and an Eniwetok KX6 via the mike route . . . . . From the oriental angle KA3CY caught **KG6s** AAY (285), IG (210) of Chichi Jima, **OD5**AY, **OQ5**AN, **UAØ**KJA (190), **VSs** 1CZ (170), **2**CR (170), 4BO (145), **6**CY (170), **YO3**VA (125) and **4X4**IO (125) . . . . . Here and there, at *W5GAH;* **KC4**USA (294) who changes crews in November, **KG1**BO (247), **KW6**CE (210). *K6DNH;* **HR1**FM (205), **VR6**AC (143) 4, **VS2**DW (169) 15. *K6HFA:* **KM6**FAA (265) 6 . . . . . 14-Mc. voicers **AC3**SQ (185) 14, **BV1**US (163) 14, **CRs** 5BP (161) 7, 6AU (182) 23, **CP5**AD, **CT3**AN, **DU1s** GF GR, **EAs** 8AI 8BC 9AZ (107) 6, 9BC, **ET2s** AG US (163) 2, **EL2**F (154) 7-8, **FB8s** BC (120) 4, BP (122) 16, BV, **FF8s** AK (185) 0, AP (190) 7, **FM7s** WN WS, **FO8**AB (155) 0, **GD3**UB (157) 23, **HA5s** KBA KBK, **HC8**GI (113) 5 of the Galapagos, **HI6**EC (175) 6, **HR1s** FM (205), LW UA, **HZ1**TA (120) 2, **I1RC**/Trieste, **IS1**BV, JAs in quantity, KAs likewise, K6KNY/**KW6**, **KC6s** RK (250) 12, UZ (236) 9, **KC4**USV, **KG6** 1BK 1FR 6NAA, **KJ6**BM, **KM6**AX, **KR6**AD, **KV4**BI, **KW6**CD, **KX6s** AF BU, **LX1**DA 5, **LZs** 1KAA (159) 5, 1KSA 2KSP, **M1**B (180) 3, **MP4**KDS, **OD5s** AF BO FH (132), **OQ5**FH, **OY2**A (120) 5, **PJ2s** AB CH CL, **SUIs** AR AS (190) 3, **SVØs** WH WJ WO WQ WS WT, **SVØ**WN of Crete, **TA2**US (115) 1, **TF3**CJ (310) 6, **TG8**IH, **VK9s** RM WP, **VPs** 1SD 2AB 2DJ 2VA (167) 3, 5FH (124) 7, 7NB 7NZ, **VQs** 3DA (138) 4, 5FS (140) 6, 8AL (118) 5, **VRs** 1A 2AA 2BC (155) 6, 2BZ 3D (147) 8, 4RY (160),

* 4822 West Berteau Avenue, Chicago 41, Illinois.

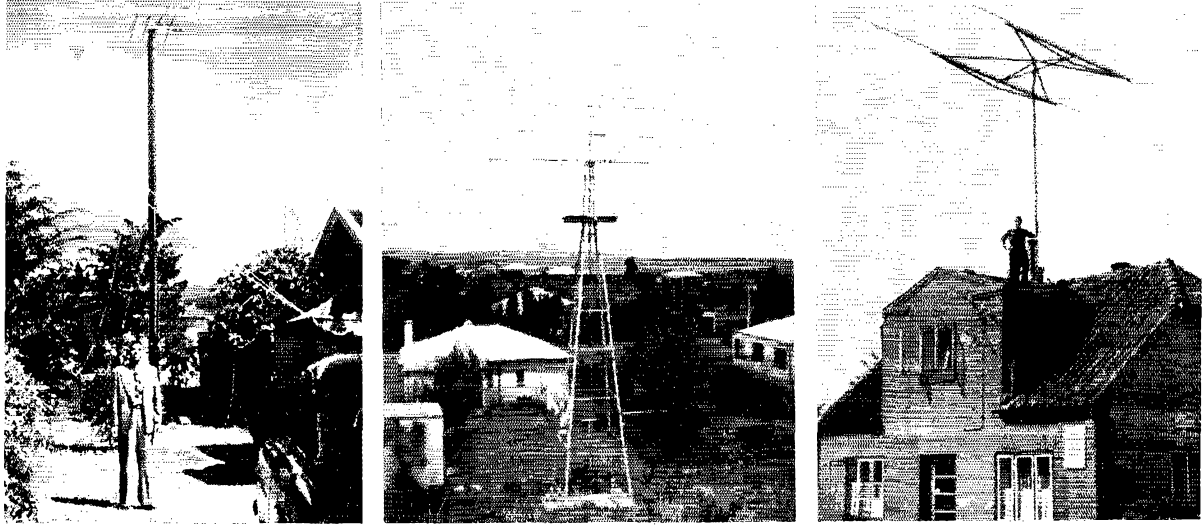




Tag along with the gadabout "How's" camera for a peek into ham backyards around the world. From left to right, across these facing pages, we see the exterior aspects and antennawork of F9MS at Suresnes (Seine); KA2NY, Yokosuka; ZD3A, near Bathurst; VP5DX, Jamaica; ZS5MP, Natal; and DJ2LK, Rendsburg. That KA2NY totem pole, a revamped man-o'-war superstructure, has sprouted several new skyhooks since last pictured in

VSs 1EW 1FE 1GR 2BE 2CB 2CP 2DO 2EK 2ES 4NW (156) 15, 6AE (116) 15, 9GV (110) 4, VU2ES, XW8s AB AC, XZ2s AD (160) 18, KN SS (167), YI2AM (180) 3-4, YK1s AC (130), DF (126) 5, YO3s CM GM RCC RF RW, ZA1UB (112), ZB1BG (101) 6, ZC4AH, ZDs 3D (103) 8, 4BR 7, ZK1s BL (150) 4, BS (189) 8, ZM6s AC AP AS, ZS9G (159) 13, 3V8BV, 4X4s AD DK DR FF, 4S7YL (96) 6, 5As 1TV (165) 5, 2TZ 3TY and 4TX are suggested by the *Newark News* Radio Club, Northern California DX Club's *DXer* and West Gulf DX Club's *DX Bulletin*. . . . . U.S.S.R. radiotelephone activity increases slowly but noticeably on 20. UAs 1KBB (190) 0, 4CB (190), 4FJ 4KBK (178) 4, 6KAA 0KDD, UB5s KAG, UG WF (122) 4, WL (150), UC2KAB (127) 4, UO5KBR and UQ2AN (130) 4 practice their English regularly.

20 c.w., center ring of the gala DX circus, supplied K2BZT with AP2U (70) 2, FB8BX (77) 3, UA9s KDL (80) 3, OC (42) 2, UF6KAC (70) 1, UP2s AC (49) 23, AS (83) 0, UQ2AK (39) 2, VK9XK (18) 10, VQs 4DT (22) 21, 5GC (35) 22, VR3B (38) 11, YI2AM (33) 0 and 4S7WP (20) 1. "Anybody who hasn't LX by now just hasn't been on," says Hayden, recounting five different ON-DL DXpeditionary Luxembourg QSOs . . . . . W6SUQ hung on for CR7LU (19) 14-15, FO8AD (101) c.w.-to-phone, GC2FZC (89) 7, HP1EH (71) 10, KG6IG (54) 11, UB5UB (36) 7, VP4LG (26) 17, ZDs 2GWS (45) 16, 6BX (35) 15, 9AE (44) 16 and 9S4AX (84) 7 for a 119/87 record . . . . . W2HMJ confirms the workability of FG7XC, DU6IV (87) 11, KA9BK (87) 11, KG6GX (87) 12, Russian Antarctic customer UA1KAE (60) 10-11 at Pt. Mirny, VSs 1EW (53) 11, 1GZ (25) 11, 2DZ (72) 10-11, 6AE (88) 11, 6DE (50) 10-11, VU2s AL BK DF JA all 11-14, W2AIS/VK5 (87) 10, YI2OT (41) 4, YJ1AA (37) 11, YL ZS6WJ (14) 12-13, 4S7s MR PT and YL all 10-11, plus AP2 FB8 and UA9 numbers already mentioned . . . . . W5JPC made it 105 via DU1VQ (55) 15, EA9DF (76) 5, HA5AL, KG6NAB (73) 10, KX6BP (75) 9, PZ1AH (6) 13, VK9RM (76) 8, a VS1 and ZB1AY (80) 7 . . . . . K6DNH's 135/105 upsweep clobbered HH3DL (17) 2, LUs 1ZW (83) 13, 9ZB (70) 12, an antarctic UA1, Cocos Islander VK1RW (33) 15, VP5RR (60) 5, VQ2s AS (50) 14, BH (45) 13, GR (82) 14, VR2CV (75) 6, Marion Island's ZS2MI (60) 16, ZS3VC (23) 15 and Siberians UA0s CE KJA KJF SK all 11-14 . . . . . Seventy watts and a ground-plane brought home CN8JX (40) 0, DM2APM (60) 23, GD3HQR (40) 20, HAs 9KOB 8KWA, HK5CR (80) 2, KT1TW (60) 2, LZ1s KNB KSB, PZ1AP (50) 0, UC2AA (100) 23, VP7NZ (20) 2, YOs 6AL 8CF, 4X4s IV (50) 2 and IX (55) 3 to W1DBA of R. I. . . . . Choicest at K6JQJ: EL12C (67) 17 FR7ZC (46) 7, UP2KBC (37) 22, UR2KAA (35) 22, VS4BA (80) 7, ZM6AT (60) 2 and 3A2GG (25) 22 who is DL4GG in Her Grace's backyard . . . . . W9KXK captured CR4AG, FB8ZZ (30-60) 13-14, I5RAM (45) 13, KW6CA (75) 12, LZ1KEP, VR2BA (28) 12, YJ1RF (85) 13, a UA0, ZS9G and a 4S7 for 174/160 . . . . . W4HKJ tried c.w. for the first time in years and came out with CP3CD (12) 4, FG7, LX1BS, UB5s DW KAG KBA, UD6AL and other aforementioned delicacies . . . . . Phony FI8 VR4 and ZA4 jokers didn't fool W4WOG. Ned snubbed 'em for FF8BT (25) 21, JA2AB, KR6QW (60) 14-15, YS1O, ZB2R (35) 3, ZC4GT (40) 2 and a collection of Us. SU1IC sought W4WOG's condolence for rough treatment at the hands of DX-hogdom . . . . . W1BPW's rock-bound 50-watter was agile enough for HA5BM, I1BLF/Trieste, LZ1VK, PJ2AE, TI2PZ, VP7BB and 4X4BT . . . . . W7YAQ worked BV1US (51) 6, FK8AE (20) 6, a host of JA/KAs KR6 KW6, VS1HJ (100) 13, and VS2FB (110) 15 . . . . . Ex-W2UXG, whose present call and QTH escaped Jeeves, found his current QTH good enough for BV1, DU1JFD, KC6s CG UZ, KG6s AGC FAE NAA, KJ6BP, KM6s AX FAA, KX6s AF BQ BS BU, VS1s HA HE, VS6CO and XZ2OM. Shangri-La? . . . . . K2KDW, basking in the profusion of eastern European stations now on 20 meters, collected HA5s AP BW SG, LZ1KAB, a dozen OKs, UB5CR (45) 1, VQ4EO (85) 4, YO2KAB, 4X4s CJ (1) 3 and IO (50) 3 at his portable-2 summer QTH . . . . . W5GAI has 87 in the log counting CN8IX, SP3PL, UC2KAO (75) 3, VQ2PR (82) 6, ZB2I (61) 7, 4X4BX and elusive CP5EQ (58) 1 . . . . . With much other gist to disseminate we'll step up the pace. We find, at *W1ICP:* UO5KAA, VK9WP, *W1YYM:* F8EX's Andorra gang for No. 100, *W2GVZ:* UL7CB (78) 1, heard about one UL8AA (26) 0, Spitzbergen, YA1AM (52) 3, UD6 UO5 UP2 UR2, *K2ENO:* ON4CK/LX, YO3FT, ZB1. *K2GFQ:* Chichi KG6 for 203/182, *K2GMF:* DM2AIL, HC1LE (18) 21, W7EMY/KJ6 (75) 7, ZC4FH (20), 4S7. *K2OMT:* FL8AB (45) 23, HI8FR (87) 22, UB5s, ZB2T (51) 19. *K2PGP:* UB5 UR2, OK3HM. *W3TYW:* HA5BU, LX, Nauru VK9, Rio de Oro EA9, UB5DW (53), two LZ1s. *W3UXX:* ZD4CC, ZS7H. *W3WGH:* FF8 HI8 LZ1 UB5 ZB2, LU6ZS. *W4EVI:* DU7SV 7, SL3AG 7, UB5 UC2. *W4GUV:* I1BRN/MI, ON4 in LX, SV1SP 5. *W4WOG:* SV1AB, DL9CI/LX. *W4YOK:* GC2. *K4AMC:* PZ1AJ 1, UA2KAA (50) 1-2. *K4CHK:* TI2. *K4HNA:* CN8IQ. KG1AG 2, DU HA UB5 UC2. UA2KAW. *W6ZZ:* VK9 a la Nauru. *K6MHT:* OA5C 23, VS1HB 15, ZE3JO (55) 15, KX6 VP7 VQ4 VS2 UA0. *W7DJU:* CN8JW. JAs 1AG 1AVV 1BDC 1CO 1DM 2FW 3BP 4AF 4IG 5EN 6FB 8AA 0CA, KAs 2DL 2DS 2KS, KG1AX, VE8OW, four VS1s, W5AYX/VE8. *W7WMY:* antarctican UA1, 9S4. *W8WTO:* KV4AA (80) 19-22. *W0VFM:* FG7, KM6, UA1RF 2. *K0CTI:* KH6AFI KW6 (15) 6-7, KV4BK (48) 8, sundry Oceanians. *DL4SD:* AP2RH, CN2AE, UAs galore, UG6AB, ZC4RK . . . . . K6HFA belabored CR9AI (65) 15, EA8BF, JA0BR and *not* Iwo, KG6AFT, UA0KFE of Sakhalin Island and VK6DG on Troughton Isle . . . . . WGDXC, NCDXC and Willamette Valley DX Club's *DX* complete our 14-Mc. c.w. tour with notes on ACs 3SQ (84) 14, 5PN (87) 12, CE0AD (38) 4, CN2AY (45) 4, CP3CC (100) 5, CRs 6CK 6CZ 9AH (84) 14-15, 10AA (95) 13, DU1RD (83) 14, EAs 6AM (25) 7, 6AW (24) 19, 9AP (26) 0, ET3AF (54) 4, FB8s BI (80) 14 of Juan de Nova Isle, BR (40) 4, FE8AF (21) 22, FM7WD (85) 3, FP8AP (60) 12, FY7YB (38) 10, HV2AB (21) 2, HZ1AB (45) 23, KB6BA (74) 8, KG6AGC (84) 7-8, KR6RR (83) 13, KW6CD (50) 9, KX6s NA (50) 12-13, NC/KC6 (57) 8 on Ponape, LU8ZB (80) 12, LZ1s KAA KGZ KPZ KSP, MP4QAH (28) 13, OD5LX (78) 4, OQ5BT (48) 14, OYs IR (74) 13, 5S (82) 6, 7ML (65) 20, PI1KM (70) 13, SVs 1AB (45) 1, 0WS (35) 6, 0WT (101) 6, SU1WW (91) 3, VK9s DB (30) 13, OQ (10) 13, VPs 2GN (63) 11-12, 3ZA (60) 8, 8BR (70) 14, 8BS (58) 12, VQ2s GW (70) 14, IE (78) 5, VQ3FN (70) 13, VQ4s AQ CC EC EG ET FI, VQ8s AG (10) 12, AH (24) 14, VQ6LQ (62) 2, VU2s AC



December, 1952, *QST* (then as KA2KW). ZD3A's landscape has no rotary in view, but who needs much forward gain with a Gambian prefix? These vistas also will remind W/K/VE antenna architects that not many weeks remain before inclement weather comes to terminate our climbing-and-splicing season. (*Photos via W1ZDP and W3VKD*)

HW JJ RM all 11-13, **VS**s 1GO 1GX 1HC 12-13, 2FD (76) 16, 2EV (36) 12, 6CG (13) 12, 6DI (84) 13, 9AS (99) 4, **XZ2**s AD (36) 15, 1T (72) 19, YA1AA (27) 15, YK1DF (83) 6, **ZB**s 1ZR (9) 5, 2Q (51) 4, **ZC**s 3AC (50–130) 14, 4TC (80) 16, **ZD6**RM (45) 14, **ZE**s 1JV 2JC 5JJ 6JJ, **ZK1**BS (32) 16, **ZS3**s AD (35) 13, HX (45) 14, Q (90) 6, **ZS7**D (68) 13, 3V8s AD (86) 1, AN (1) 4, 4S7s EM (63) 18, MG (20) 13, 4X4s DH FA FS GS IE, 9S4s BN (70) 6 and CH (70) 7, plus Russians UA9s *AC CM DI KAB KCA KYB SJ VA VB*, UAØs AG CD KOB KQB KTA KUA KYT OM SB YF, UB5s AO BY CL DU KBW KCA LB UA, UC2s AG KAB, UD6s AL (42) 6, BM (41) 3, UF6s AB (78) 14, KAF (105) 4, UG6AG (15) 13, UI8KAA (37) 13, UJ8s AF (17) 14, KAL (34) 20, UL7KBK (48) 14, UN1AA (73) 3, UO5AA (47) 6, UP2AA (64) 5, UQ2s AH KAA AS, UR2s AO (51) 22, KAB (50) 4 and KAK . _ . _ . Zanzibar visitor VQ1JO (ZE3JO), VR4AA (VP2VB/P), and provocative PK7ADM took up where SM8KV/LA/P of Spitzbergen, PX1EX, and the Luxembourg invasion (ON4s, DLs ICR 3AO 9CI) left off.

15 phone doings are now coming into their own after summer's drouth. WØZZT ambushed **CR6**BH, ET2PA, a GD3, HZ1AB, TF3KA, UQ2AN, VQ8s 4EO 5GC, ZB1AJX, 4X4FQ and 5A1TA. **CR5**SP, **MP4K**AC, SP8CK and 4S7GE escaped . _ . _ . Thirteen-year-old W5GAH raised that CR5, KM6AX (300) 3, KX6BS (300) 3, IT1ZGY (176) 20, OQ5s BW (215), FO (230) 19, VS1EW (200) 16–17, a VQ5, ZE2JK (160) 20, ZP5CF (210) 22, ZS9G (165) 20, 4X4s BO (217) 19 and DK (115) 16 with a 75A and Viking . _ . _ . Two viewpoints, first from W6ZZ: "In these days of VFOs it seems to me the only thing of value is the band used, and whether A1 or A3. Time means little, as with erratic conditions you can usually hear *any* DX at *any* time, at least on 15 and often on 20 meters." Next, from K2BZT: "We all realize that most DX stations are VFO and that, by the time *QST* is printed, the shift of conditions can make the time obsolete. But, darn it, when you are going after the ones you need you have to work out their *patterns* and such information *is helpful*." K2BZT's viewpoint appears to be in the great majority, so we'll continue to supply accurate frequencies and times when available. Anyway, W6ZZ successfully miked with CE1AH, KH6s in quantity, KL7s AZI BFW, KV4BD, KX6s BQ BU ZB, VP7NB, VR2BC (ex-VP1GG), YN1HF, ZLs and ZP5KB . _ . _ . Reeling 'em off, first *K2MWE:* CN8JO, HR2MC, PJ2AO, VE8MIC. *W4YOK:* CR6, CN8s BB DW MM. *K4CHK:* KX6ZB. *K4DAP:* CN8, HC1ARE. *K4HNA:* CN8IQ, HK3AB, XE3BR. *W6SUQ:* TI2BX (410) 17. *K6KII:* CP5EQ, KM6AX. *W8YIN:* ZA1A (215) 0. *WØUWD:* GD3IBQ . _ . _ . 21-Mc. tuners of NNRC logged or taped the articulations of CEØAD, CRs 6AG 7AF 9AH 9AK 9AL, EAs 8BO (250) 22, 8CA 23, 8CB 9EE, EL2F, FO8AG, HC1MK, IT1TAI, JA9BE 7, LXIs DC BG, MP4s BBL (180) 3, BBW KAC I, OAØBL, OD5AV, OQ5s AO BJ BS, SVs 1AD (210) 21, 6FP (200) 21, ØWE/Rhodes, ØWN/Crete, ØWO ØWS, TG9AD, UB5WF (237), UC2KAT, VPs 1EK 1OLY 2AB 4LF 5EM 5RR (230) 0, VQs 2DT 4DS 4ERR 4RF 5EK, VSs 1FE 2DB 6CT, VU2JT 3, YN1PM 18, ZBs 1AY 2P, ZD4s BQ BV BZ, ZD6RD, ZD8SC (125), ZP5s CF ET IB JP, ZP9AY, ZM6AS, 4S7YL, 4X4s *DK* IE, 5As 1TA and 3TV.

15 c.w. produced **CR6**AI, HCs 1ARE 4MK, JAs 3AB 5DF, KA2KS, KW6CA and ZD8SC (125) for K6JTG . _ . _ . WØUWD preferred LXs, HA5BW, HZ1HZ *IIBLF*/Trieste, LZ1KAA, SP1KAA, UA3BF, UC2KAB, VP2GN, VQ5GC, 4X4s BX CK and the 15-watter of 9S4AX . _ . _ . FA8DA, HA5AD, JA3AB, an SP1 and ZB1AY closed W4YOK's DX season (college QRT) . _ . _ . W6ZZ reached No. 114 on 21 Mc. (a UC2) while bagging KL7BTX, OA4AU, SP3PJ and many other Europeans on c.w. but FQ8s AR and AY temporarily escaped . _ . _ . K2PGP tried IT1AI, SP1 ZB1, VPs 6PJ 9BO and that persistent but evidently uncredentialed ZP6CR feller . _ . _ . YL W1YYR, unruffled by the QRM of five offspring, chatted with AP2M (60), DU6IV (80), a PX1, UA4FC (60), VQ2GR (90), VS6AE (80), VU2AF (40), ZD6RM (156) and 3V8AD. Mary's OM is W1YQC . _ . _ . EL2F, OQØDZ, SVØWT, VQ4CK, ZB1AJX and ZD4BV were appropriated by W1EGS . _ . _ . Hither and yon, first *W1ICP:* UP2KAA, ZD4CF. *W2PZI:* CR9AH, HZ1, MP4BBL, ST2NG, UA3CR, UB5SB, Windwards VP2. *K2BZT:* Andorra, KW6, DL1CR/LX. *K2ENO:* ZB1. *K2MWK:* KV4BK, WP4s ADI ADK. *W3LII:* SP UA3 UC2 VS6. *W3WGH:* UC2 PX ZB1, ZD6BX, 4X4BX. *K4DAP:* HA5BB, OA4BN, UC2 ZB1, VQs 2GR 4RF 19–21. *K4CHK:* KL7FAK. *K4DRO:* LX, HK2GO. *W6SUQ:* UC2, VQ4CC. *K6KII:* JA KA KW6. *K6OVJ:* DU7SV. *W7YAQ:* CR9 KA2. *W8IBX:* Europeans in number. *W9FNX:* LX, KL7PI, VP6BG. *WØQGI:* ZD8 . _ . _ . KH6PM bumped into W6BOY/VR4 who has three frequencies, 21,160–260–360 kc., the last two for phone as well as c.w.

15 Novice efforts gain momentum as our daily 21-Mc. openings grow more solid with the waxing season. KN6OPI rose to 34 countries with nine Gs, three GMs, GI3AXI, four OHs, other European items including Spitzbergen, CE2AT (100) 22, DU7SV (102) 8, EL1WG (104) 21, FA8DA (100) 17, JA1ANG (80) 5, LA9IC north of the Circle with 15 watts, UA4FE (107) 15, YU3KN, ZB1AY (104) 21, VKs and ZLs . _ . _ . From random Novice logs, at *KN5COU* we find: KV4BK (100). *KN5DZF:* EI9J, KL7BKN, WH6BTH, WP4s ACS AEP. *KN9AYH:* KZ5CF. *KN9DKM:* VO DL, TF3KA. *KNØDQI:* LU2 PY3 and one ZD3IO.

Forty, eighty and **ten,** barren and bleak DXwise at summer's end, are beginning to stir anew. **One-sixty** is a question-mark, however. Will W1BB & Co. break down the 1.8-Mc. atmospheric and oceanic barriers in the 1956–1957 season as successfully as in recent years? We shall see.

Where:

SP6BZ, who ought to know, writes that the proper address for the SP bureau is: Polish QSL Bureau, P. O. Box 320, Warsaw 2, Poland. That "2" is imperative . _ . _ . CN8JO not only QSLs 100 per cent but makes use of Moroccan postage in deference to ham philatelists . _ . _ . VS2DQ, in lines to W1RDV, gives an official view of the activity status in several rare Asia-Oceania areas. "In DX from this part of the world there seems to be a lot of pirates. VS5NN is *most* doubtful. He says 'QSL via Box 600' but I know nothing about him except for the large amount of American cards coming in. And as far as I know there is no licensed station there except VS5AT. . . . Similarly, there is no licensed station on Christmas except ZC3AC

Ceylon's 4S7MR claims a host of North American DX friends and has scant difficulty making new ones. An RAF-style 13-tube super, control panel, and home-built sender hold down Ron's Negombo operating table. (*Photo via WIICP*)

♦

who is not very active at present. Sarawak has VS4BO, VS4BA and VS4NW. Borneo has ZC5VS. ZC5SS and ZC5SF. On Cocos-Keeling, ZC2PJ [and VK1RW]." . . . . CE3AG follows up his previous notification on Chile call-area reallocation with further specific details on suffix allotment: O'Higgins Base (Grahamland) CE9s AA through AF; Gabriel Gonzales V. Base (Grahamland) CE9s AG through AM; Pedro Aguirre C. Base, Deception Island (South Shetlands) CE9s AN through AS; and Arturo Pratt Base, Greenwich Island (South Shetlands) CE9s AT through AZ. Luis adds, "The intention is not to change these call letters in the future, even though the operators are changed." This checks with procedures established in KC4, VP8, LU, FB8, LA and UA antarctic licensing and bodes for additional QSL confusion thereabouts. Reference Easter Island, CEØs AA AC and AD are tickets currently valid and CE3AG states: "I am receiving by radio a copy of the logs of CEØAC and CEØAD. New cards are being printed and soon will be distributed." . . . . Via W3BVN, ZD1DR requests patience on the QSL front, promising to clear his entire W/K/VE backlog before he shuts down for leave in November . . . . Singapore Amateur Radio Transmitters, Box 2394, Singapore, is the new SART address specified by VS1s GX GZ and HF in QSOs with Ws 7PHO and ØJMB . . . . ST2NG advises W2PZI to scratch one ST2BC . . . . So. Calif. and W. Gulf DXCs have word of a ZA QSL bureau answering to P.O. Box 75, Tirana, Albania . . . . FK8AO's QSL policy, via W6YY: For airmail replies enclose three IRCs, and for first-class answers, one IRC; otherwise it's the bureaus route. FK8AO has confirmed some 1500 QSOs during the past three years . . . . From the mill of ZL1AIK (ZK1AC): "I understand that it is not now the policy of the present radio supervisor in the Cook Islands to reallocate call signs although some were reallocated in the past." . . . . As should be obvious, the following QTHs represent stations previously active, now active, or imminently active on DX bands. We cannot undertake to duplicate complete rosters of, say, the latest dozen licensees in Nicaragua. That is unwarranted for space considerations because only a limited percentage of those YNs would become active DXwise and thus be of interest to "How's" readers. W1s BPW ICP RDV UED VG WPO YNP, W2s GVZ HMJ, K2s ENO GFQ KDW, W3s DLI TYW, W4s HKJ WOG, W5JPC, W6s ITH OUN YY, K6DNH, W7s DJU PHO, W8YIN, WØs QGI QVZ, ISWL, NNRC, WIA, NCDXC, SCDXC, WGDXC and WVDXC produced this postal patter:

AC4NC (via VU2AX)
AC5PN (via VU2AX)
CN8JH, Navy 214, Box 60, FPO, New York, N. Y.
CN8JO (via AAEM)
CN8JV (via CN8JH)
CN8JW (via CN8JH)
DL4SD, SP3 D. Sher, 332 ASA, APO 108, New York, N. Y.
ex-**DL4XT**, J. Hampton, Box 67, Evarts, Ky.
EL2S, c/o Govt. Radio Stn., Monrovia, Liberia
EL3A, T. W. Curtis (to 1133 Columbia Rd. NW, Washington, D. C.)
F9MS, C. Ronsiaux, 63 rue Paul Bert, Suresnes (Seine), France
FE8AG, Sgt. G. Casiglia, BP298, Douala, Fr. Cameroons
FF8AI, Box 5149, Dakar, Fr. W. Africa
FF8BP, H. Mialet, 120 Ave. Gambetta, Dakar, Fr. W. Africa
FG7XD (via KV4AA)
FL8AB, M. G. Depagne, Marine Nationale, Djibouti, Fr. Somaliland
ex-**FN8AB** (to VU2AX)
ex-**FR7ZA**, L. Ferrier, D.A.C., Box 730, Tananarive, Madagascar
FR7ZC, P. Ferrand, Trois-Bassins, Reunion Island
GD3JEA (to G3JEA)
HC5GA, Ing. G. Almuja, Loja, Ecuador
HK3AK, H. N. Trujillo, P.O. Box 1728, Bogota, Colombia
HR1MM, U. S. Army Mission, Tegucigalpa, Honduras
HR2MC, P.O. Box 530, San Pedro, Cortes, Honduras
HV2AB (via ARI)

CAUTION

Under this country's treaty obligations and on formal notice received from other nations, FCC-licensed amateurs are warned to engage in no communications with stations in the countries listed below. This is in accordance with the FCC Public Notice of December 21, 1950 (p. 23, Feb., 1951 *QST*), and as since revised.

French Indo-China (Cambodia and Viet-Nam), *Republic of Indonesia, Iran, Korea.*

Prefixes to be avoided: *FI8-3W8, PK, EP-EQ, HL.*

JZØAG (via PAØKOP)
KØDXD, VE8, 920th AC&W Sqdn., APO 677, New York, N. Y.
KA2KK (via W3OLM)
KA2TR (via W6SMU)
KA3KB (via W9LHD)
KA9BK, APO 181, San Francisco, Calif.
KA9CY (to KA3CY)
KB6BD, G. Y. Matsuo, Canton Island
KC4USV, C. A. Smay, 2201 So Dinwiddie, Arlington, Va. (or via ARRL)
KG1AR/OX (to KG1AR)
KG1AX, D. L. Wiesen (W2WHB), Comm. Sect. 1st Eng., Arctic Task Force, APO 23, New York, N. Y.
KG1BF (via W2UGL)
KG6IA (via KG6IG)
KL7BHE, 2201 Sunrise Dr., Anchorage, Alaska
KL7PIV (to KL7BHE)
KM6FAA, MARS Stn., Box 22, Navy 3080, FPO, San Francisco, Calif.

What the Caribbean is to Yank DXpeditionary enthusiasts the Gulf of Bothnia is to Finnish DX rovers. OH1s RT ST and SU, shown at left ready to steam for the Aland Islands aboard *SS Bore III*, scored 276 QSOs (70 U. S. contacts) with a 50-watt 807 rig, Geloso receiver, and ground-plane, while "on location" this summer. Plans already are afoot to include OH1s NK PI and SY in a gala 1957 Alands DXcursion.

ex-KR6AF (to W4AVF)
KW6CE, c/o CAA, Wake Island
LJ3D, RNAF Club Stn., Trondheim, Norway
LZ1KAA, Box 547, Sofia, Bulgaria
PX1EX (via REF)
SM8KV/LA/P (to SM5KV)
SP3PL, J. Jarombek, Niecala 3-A, M14, Poznan, Poland
SP6BY, Box 6, Wroclaw, Poland
SVØWE, H. B. Wood, Alexandrow, Diakou 13, Rhodes, Greece
TI2BC (via RCCR)
TI6AL, A. Lam P. O. Box 445, Puerto Limon, Limon, C. R.
UA6KOD, Box 38, Taganrog, U.S.S.R.
UA9DT, Box 9, Sverdlovsk, U.S.S.R.
UC2KAB, M. Kaplan, Radio Club Gomel, Byelorussian S.S.R.
UP2AS, Box 231, Kaunas, Lithuanian S.S.R.

ZB2s T and R, familiar fixtures on several DX bands, have contributed Gibraltar QSOs to W/K brethren in almost forty states. That's ZB2T's 20-watt rig to the left of the RAF-type receiver. ZB2T is scheduled to leave The Rock this month and ZB2Q, third member of the group and not shown, will QRT early in 1957. Several antennas are available and radiation Statesward has the apparent assistance of a huge aircraft-hangar reflector near by.

UQ2AN, Box 1601, Riga, Latvian S.S.R.
VE8MC, Arctic Project, U. S. Weather Bureau, 24th & M Streets, Washington 25, D. C.
VE8OW, J. A. Gilbert, Resolute Bay, N.W.T., via Eastern Arctic Patrol, Ottawa Ontario, Canada
VK1TV (via WIA)
VK9AA, R. H. Harrison, c/o RTC, Goroka, Papua Territory
VP1ML, M. Lizarraga, Box 121, Belize, Br. Honduras
VP1OLY (via VP1HA)
VP2GN (via VP2GE)
VP5FH (via W6TI)
VP8BC, E. Roberts, Box 117, Port Stanley, Falkland Islands
VP8BL, Box 182, Port Stanley, Falkland Islands
VQ2BH, 19 Iris St., Broken Hill, No. Rhodesia
VQ8AH (via VQ8AF)
VR2AK (via ZL1AIK)
ex-VR3A, VK3AFB, 79 Bealiba Rd., So. Caulfield, SE8, Victoria, Australia
VR4AA (via KV4AA)
W2AIS/VK (via W2BAK)
W3DOK/VO2, C. Bowers, CG Air Det., Navy 103, FPO, New York, N. Y.
W5BVW/VE8 (via KØDXD/VE8)
W7EMY/KJ6 (to W7EMY)
WØPQR/VE8 (via KØDXD/VE8)
WP4AFH, APO 845, New York, N. Y.
XE3BA, L. Echazarreta C., Box 351, Merida, Yucatan, Mexico
YI2DK (via G3HKP).
YN1BW, c/o U. S. Embassy, Managua, Nicaragua
ZA1A, Box 38, Tirana, Albania
ZA1KAD, P.O. Box 731, Tirana, Albania
ZA1UB, Box 75, Tirana, Albania (see preceding text)
ex-ZC5CT-VS4CT-VS5CT, P. H. J. Green, G3DCT, 65 Balcombe St., London, N.W. 1, England
ZD2GWS, GPO, Buea, So. Cameroons, Nigeria

ZK1AC (to ZL1AIK)
3A2GG, Box 189, Monaco
5A2TG, Box 372, Tripoli, Libya

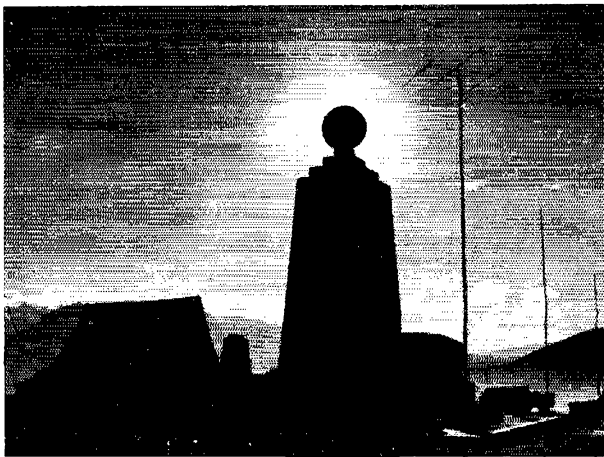
Whence:

Asia — Ws 1WPO 6YY 7PHO and ØQGI join to supply Laos observations. XW8AC, operated by F9FW, works Yanks on phone with an ART-13 and BC-348. He knocks off around 1300 GMT when the local power company hits the sack. Neighbor XW8AB fled to 7 Mc. to slip the 20-meter wolf pack but is said to be gathering up courage for another extended 14-Mc. effort . . . . . Though not accentuating the positive, VS2DQ's lines are pertinent: "It seems absolutely certain that India is not prepared to permit anyone other than an Indian national to do amateur operation in the Nicobar Islands. I keep in touch with VU QSL Manager VU2JP over this, and neither of us knows anything about a recent VU5AB." . . . . . KA3CY advises, "I have just gotten the call KAØCY to use on Iwo Jima whenever I can get down there. I already have the QSLs, and when I do get on from there I will QSL 100 per cent as I have always done [as W5CTY and KA2CY] in the past. By the way, KA stations have just been given the 40-meter band, 7005 to 7095 kc., so you might tell the OMs and YLs to look for me there." KA3CY is armed with 1000 watts of c.w., a.m. and s.s.b. . . . . W1RDV learns that TA2EFA activity has ceased.

Africa — Notes from sharp-eared W6YY: A brand-new Mauritius c.w. candidate is VQ8AH. . . . VQ8CB, now QRT, hacks away at red tape involving his migration to New Zealand. . . . ZD9AE is observed on 14,050 kc. each Saturday working W6s long-path fashion at 1400 GMT, and FL8AB habitually appears around 14,040 at the same time. A case for Buridan's mule! . . . . . LREM, exhibiting CR7BS at Mozambique's 1956 Economic and Cultural Activities Show, states the station will be active on DX bands till the end of this month. CR7AR assures that special souvenir QSLs will ensue . . . . . "DX is really fine in Maroc," opines CN8JO, reporting 55 countries worked during his first month of operation. Bill has a six-wavelength rhombic for 21 Mc. beamed on Washington, D. C., with a 4-element wide-spaced rotary in the works. CN8JO reminds us that third-party ham traffic is not permitted in Morocco . . . . . Via WGDXC, FR7ZC (ex-F3JW) tells of FR7ZB's 40-meter operation. FR7ZC, plugging 14 Mc. with jerry-built QRP, will receive QRO power components through the beneficence of W9s AMU YFV and others. Paul is a Navy radio officer and looks forward to visiting America some day.

Oceania — Got your logsheets all ruled up for the VK/ZL DX Test, October 6th-7th and 13th-14th? See p. 69, last month's *QST*, for details . . . . . From ZL1AIK: "I am employed as a newshound by a Pacific Islands magazine and, as such, move around. When in Sydney I am licensed as VK2ANZ, in Fiji I am VR2AK, and in the Cook Islands I'm ZK1AC. I have also had past calls ZL2QB and ZL2AFT." Jim's latest session as ZK1AC, from May 15th to June 21st of this year, resulted in quite a few U. S. QSOs on 40 meters. ZL1AIK's portable outfit is a WW-II cloak-and-dagger item, a Marconi Type-A Mk-III running a mere eight watts input . . . . . According to W6ZZ, VR2CG leaves Fiji in favor of ZL3DX, KH6IJ and KL7BFW paid Miles personal calls in Menlo Park . . . . . VR2BZ and W6MUR report FW8AB back in France for keeps, forwarding address and possible ham replacement in doubt . . . . .

(*Continued on page 140*)



♦

Ecuador's Equatorial Monument eclipses a tropical moon at the site of HC1ARE, special installation assembled in July to commemorate the 25th anniversary of ARE's inception. During thirty hours of operation some 750 QSOs with 55 countries were recorded. (*Photo via W2OHF*)

ARRL Merit Award for 1955 Goes to W4HHK and W2UK

Pioneering in the Highest Amateur Tradition

BACK IN JUNE, 1953, W4HHK, Collierville, Tenn. and W4AO, Falls Church, Va., were trying to work each other on 144 Mc. They never quite made it (the band was open for tropospheric DX at the time) but they noticed strong bursts at fairly frequent intervals. Were these meteor bursts? Could they be heard when the band was dead? And if so, would it be possible to use them for communication?

Schedules were set up to find out, and when W4AO had to be away for a period, the schedules were taken up by W2UK, New Brunswick, New Jersey. After months of daily tests it was demonstrated that the high-powered signal of W2UK could be heard by W4HHK by the burst method almost at will, despite the separation of 940 miles.

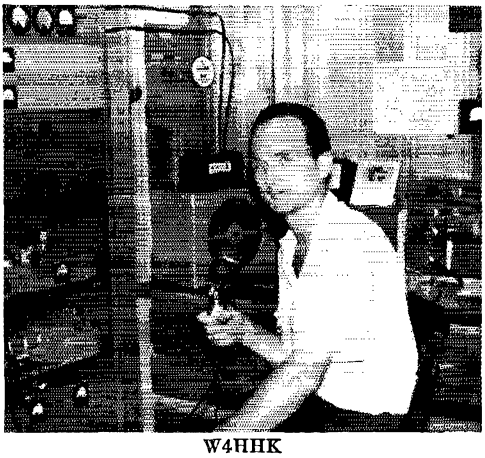
Consistent DX of 1000 miles or more — was it within the realm of possibility on 144 Mc.? Antennas were built and rebuilt. Transmitters were pushed to the legal limit of power. Receiver noise figures lowered to the ultimate of close to 2 db. High-speed keying and tape-recorded playback were tried. One thing was shown for sure: signals could always be heard. There was often enough for complete identification, and occasionally bursts came through often and long enough for exchanges of information.

There was a marked improvement in the number and duration of the bursts during meteor showers, and the characteristics of the signals (recorded daily on tape) showed unmistakably that the bursts were of meteoric origin. This was news, for previously it had been thought that meteor reflections would be heard only on frequencies low enough to be within the range of normal ionospheric reflections.

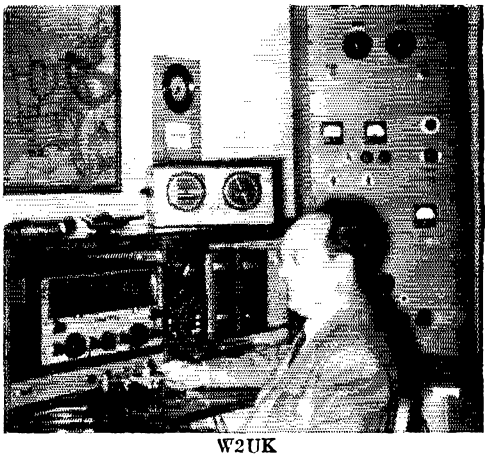
Interest in the work was stirred in scientific circles when W4HHK's tape recordings of the signals of W2UK were played for a group of propagation physicists attending a meeting of the International Scientific Union (URSI) in Washington, in May, 1954. As a result of this, W1HDQ, of the ARRL Staff, was asked to prepare a summary of the work and supply some samples of the recorded signals, for presentation at the General Assembly of the URSI to be held in The Hague in September, 1954.

This was done, and the presentation was made by Dr. J. T. de Bettencourt, of MIT's Lincoln Laboratory, before an audience made up of leading propagation physicists from most of the countries of the world. Thus scientific attention was focussed on one of the worthwhile aspects of amateur radio that has had too little recognition — our ability to contribute to man's knowledge of wave propagation phenomena.

The untiring efforts of Paul M. Wilson, W4HHK, and Ralph E. Thomas, W2UK (now KH6UK, of Kahuku, T. H.), resulted in the discovery that meteor bursts could, indeed, be used for 2-meter DX communication, and the technique has been used in many parts of the country since that time. Their daily schedules, covering a period of two years, and requiring untold hours of patient listening and transmitting at all hours of the day and night, were pioneering in the highest amateur tradition. The accomplishment was richly deserving of the recognition it received when the 1955 ARRL Merit Award for outstanding contributions to the stature of amateur radio was presented to these two amateurs as announced at the National Convention in San Francisco, July 8, 1956.



W4HHK



W2UK

June V.H.F. Party Summary

Record Scores Made by Field Stations on Both Coasts

In reporting the results of last fall's V.H.F. Party, we assumed that the record of W1MHL/1 in making 522 contacts for 28,562 points would stand unchallenged for some time. It did — until the next contest! Never a group to rest on their laurels, the Waltham Amateur Radio Association spent the next eight months figuring out ways to cram in a few more contacts. Result: In the weekend of June 9th and 10th they beat their best previous efforts on three of the four bands they used. High power, big antennas, a choice location, and long-range planning and alert operating all contributed to their phenomenal score.

For any club that would like to beat it, here is a breakdown of the top June V.H.F. Party score: 203 stations worked in 13 ARRL Sections on 50 Mc., 386 in 17 sections on 144 Mc., 25 in 11 on 220 Mc., and 7 in 7 on 420. Grand total — 31,344 points! And to demonstrate that large QSO totals are not exclusive to the East, the San Bernardino Microwave Society also beat W1MHL's previous high with 527 contacts. Using 50, 144, 220, 420, 1215 and 3300 Mc., K6OEE/6 ran their section multiplier to 20, scoring 11,520 points, a new "west-of-the-Mississippi" record for v.h.f. contests. The third spot in the unlimited class was made by the Electric City Radio Club, W3KX/3, with 302 contacts on 50, 144, 220 and 420 Mc., a section multiplier of 47, and 15,040 points.

The 50-Mc. band continued its rise as a factor in the high scoring. Of the nearly 400 reporters, more than 56 per cent used 6, and a number of respectable scores were made using that band alone. W1HOY (Mrs. W1FZJ), Medfield, Mass., turned in the country's highest 6-meters-only score, 170 contacts in 15 sections for 2550 points. The same contact total, but one more section, accounted for the highest one-band total, made by K2IEJ/2 on Long Island. W7VMP, Phoenix, Ariz., relying almost wholly on rapid-fire utilization of sporadic-*E* openings, worked 92 6-meter stations in 19 sections, for 1748 points. The skip was scarce in most areas, but fortunately it showed up to best advantage in parts of the country that need it most for good scoring.

Portable stations working from choice locations are the life of the spring and fall parties. The summary shows more than one-fourth of all the reporting stations in this category. Some work it Field Day style, with a staff of operators and two or more transmitters running simultaneously. Others assign the operating task to one of a party, to keep the station eligible for a section award in the single-operator class. A notable effort of this kind was made by the work of W1UIZ/1, providing that hard-to-work state (Vermont) for 301 contacts and 13,904 points. Some fellows do the whole job alone. The one-man operation of W2BVU/1 gave out Maine contacts 190 times on four bands, for 6541 points.

Home-station honors go once more to W1RFU, Wilbraham, Mass., but his 10,520-point total was made with the operating assistance of W1FAB. The single-operator high was made by W1OOP, Needham, Mass., who made 186 contacts on four bands for 6090 points.

Most of the scores quoted on a national-high basis tend to highlight the work of stations in the areas of high population density, where spectacular scoring is to be expected. We should not overlook the efforts of groups like the Tualatin Valley Amateur Radio Club, W7OTV/7, whose 99-contact total would have been impossible even a year ago. W7UFE, with 81 contacts on 6 and 2, for 972 points, posted the high in the Northwest. Reports were received from 54 ARRL sections, believed to be an all-time high geographically.

From all reports, propagation was not particularly favorable. Middle Westerners report conditions all the way from fair to terrible, but that didn't prevent them from making plenty of contact totals over the 100 mark. Skip propagation on the 50-Mc. band helped to boost section totals, mostly in the South and West, but it was not a major factor.

A word of advice to those of you who may be reporting your participation in the September Party at about the time you read this: Be *sure* to put your class of license down on the reporting form if you work on the bands open to Technicians. Every contest of late has required a large amount of letter writing to fellows who

Top single-operator station in June V.H.F. Party was W1UIZ/1, Mt. Equinox, Vt. Shown here with rear view of the rack-mounted gear for 50, 144, 220 and 420 Mc. is maintainance engineer, W1WID.

neglect to do this. There are special awards for Technician Class licensees, but they cannot be given unless there is a contest for the award in your section; that is, three or more such licensees submitting logs. Same goes for Novices, but their participation is obvious from their calls. Leading Technician in the June Party was W1FOS, Wakefield, Mass., with 154 contacts on 50 and 220 Mc., for 3360 points. Best Novice work was by KN2RDT/1, who used the Vermont lure to land 101 2-meter fish in 12 sections, for 1212 points.

The contest weekend netted some new microwave DX records. Details of the work done on 1215 and 3300 Mc. by W6IFE/6, W6VIX/6, K6BAT/6 and K6AXN/6 over paths of 185 and 190 miles were reported last month.

— E. P. T.

SCORES

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.; D, 420 Mc.; and E, 1215 Mc. or higher. Multiple-operator stations are shown at the end of each section tabulation.

ATLANTIC DIVISION

Eastern Pennsylvania

W3TDF...4732-182-26-AB
W3HYJ/3..2058-147-14-B
W3AHW...1932- 92-21-AB
W3OLV/3..1261- 97-13-B
W3BAO....1230-123-10-B
W3BNU... 477- 53- 9-B
W3HYO... 468- 78- 6-B
W3AMO[1]... 438- 73- 6-A
W3UBO... 369- 41- 9-A
W3DJZ/3.. 365- 73- 5-B
W3BXD... 312- 39- 8-A
W3THB... 270- 45- 6-B
W3EDO/3. 260- 52- 5-B
W3WHK/3 136- 68- 2-B
W3YRB/3. 135- 27- 5-A
W3IMW... 124- 31- 4-B
W3UQJ.... 76- 19- 4-A
WN3GVW. 72- 24- 3-B
W3ULB... 69- 23- 3-B
W3MFT... 51- 17- 3-B
W3SOH...   8- 4- 2-A
W3ZCR...   3- 3- 1-A
W3KX/3[2] (14 oprs.)
15,040-302-47-ABCD
W3BYF/3 (W3s BYF HPL LXM TEB WN3FHP)
3036-138-22-AB
W3TF (6 oprs.)
2322-128-18-ABC
K2AWY/3 (K2s AWY GLQ)
1725- 75-23-AB
W3SST/3 (12 oprs.)
1368-114-12-AB
W3BHC/3 (W3s ARS BHC IUM PKP ZYZ)
1008- 72-14-B
W3DEX...(W3s BJG DEX)
470- 47-10-AB

Md.-Del.-D. C.

W3CGV...2737-113-23-ABCD
W3TOM...2180-109-20-AB
W3GKP...1392-116-12-B
W3LMC... 690- 75- 8-B
W3DVN... 480- 60- 8-AB
W3LZZ... 290- 58- 5-B
W3DMS... 260- 52- 5-A
W3FSR... 145- 29- 5-A
WN3EVA... 125- 25- 5-B
W3RQP... 100- 25- 4-B
W3HB.... 96- 24- 4-B
W3VAM... 95- 19- 5-A
W3WAF... 2- 2- 1-B
W3BBG (W3s BBG ZTD)
747- 83- 9-A
W3PGA (W3s ECY HXN KLA VCO ZAQ)
690- 69-10-AB

S. New Jersey

K2HOD...1664-128-13-B
W2BLV.... 473- 43-11-B
W2ORA.... 261- 29- 9-A
K2ITQ (K2s ITP ITQ ODO)
4242-202-21-AB

Western New York

W2WFB...2436-116-21-AB
K2INS/2..1392- 87-16-AB
W2ALR...1100-100-11-B
K2JWE/2. 737- 67-11-B
W2LXE... 264- 66- 4-B
W2QY.... 255- 51- 5-B
W2UAD... 225- 45- 5-B
W2GBX... 204- 51- 4-B
K2LRN[1].. 135- 27- 5-A
W2GBN/2. 105- 21- 5-B
KN2PVN.. 58- 29- 2-B
K2DYC... 42- 14- 3-A
W2YBP/2. 28- 14- 2-B
K2MPE... 26- 13- 2-A
K2GSM... 1- 1- 1-A
W2RHQ/2[3] (18 oprs.)
4374-161-27-ABD
W2UPT/2 (W2s JGJ MTA UPT)....4104-152-27-AB
W2FRL (W2s ALL JTE UTH K2s CEH HIT)
3276-150-21-ABC
K2IXJ/2 (W2SPU, K2s DBB GVK HWC IXJ)
2320-116-20-AB
K2DLW/2 (K2s DLW QLH)
1350- 90-15-AB
W2QYV (W2s DRN KEI QNA UM8 K2GAL)
904-113- 8-AB
W2CFY/2 (W2s CFY CWZ K2s CBT EEC SRY)
726- 66-11-B

W. Pennsylvania

W8SFG/3.. 576- 64- 9-B
W3IHF/3.. 78- 26- 3-B
WN3GHU.. 34- 17- 2-B
W3KWH (W3s APN AYY RXT SDV SVJ)
468- 78- 6-AB
W3NCE (W3s NCE RUZ)
96- 16- 6-B

CENTRAL DIVISION

Illinois

W9DRN...1111- 95-11-ABCD
W9USI.... 792- 85- 9-ABC
W9OBW.... 672- 83- 8-ABD
W9BOZ.... 252- 63- 4-B
W9KCW.... 230- 46- 5-AB
KN9APQ.. 228- 57- 4-B
W9MYC.... 220- 55- 4-B
W9CT..... 212- 53- 4-B
W9YOI[1]... 208- 52- 4-A
W9SEK.... 176- 44- 4-B
W9PEN.... 168- 42- 4-B
K9AVZ.... 156- 39- 4-A
W9KLD.... 140- 28- 5-B
W9NW..... 140- 35- 4-B
W9ADO.... 104- 26- 4-B
KN9BBK.. 100- 25- 4-B
W9ROS.... 90- 30- 3-A
W9QBJ.... 80- 20- 4-B
W9OKB... 69- 23- 3-B
W9INF/9.. 18- 18- 1-B
W9RSU.... 16- 8- 2-A
W9WJJ.... 6- 6- 1-A

Indiana

W9BRN.... 567- 81- 7-A
W9HVY... 144- 36- 4-B
W9BUM... 132- 33- 4-B
W9MHP... 99- 33- 3-A
W9OVL.... 87- 25- 3-AC
W9FVI.... 68- 17- 4-B
W9FJI..... 10- 5- 2-A
W9UIA.... 6- 3- 2-A

Wisconsin

W9NVK... 480- 60- 8-AB
W9RXS... 325- 65- 5-B
W9TQ..... 108- 27- 4-B
W9ZBO[1]... 46- 23- 2-A
W9GTD... 39- 13- 3-A
W9UJM... 8- 4- 2-B
W9DUQ... 1- 1- 1-A

DAKOTA DIVISION

Minnesota

WØDXY... 24- 8- 3-B
WØRGR... 8- 3- 2-AC
WØORZ.... 2- 1- 1-C

DELTA DIVISION

Tennessee

W4HHK... 456- 38-12-AB

GREAT LAKES DIVISION

Kentucky

W4KZF.... 108- 27- 4-A
W4HJQ.... 105- 21- 5-B
W4BAZ/4.. 34- 17- 2-B
W4C8N.... 10- 5- 2-A

Michigan

W8RMH..1404-114-12-ABC
W8NOH... 675- 75- 9-AB
W8DX.... 552- 65- 8-BCD
W8CVQ... 513- 57- 9-AB
W8PT..... 432- 72- 6-B
VE3ANY/W8
420- 60- 7-AB
W8OKT... 348- 58- 6-B
W8ARR... 260- 50- 5-BD
W8GTK... 260- 52- 5-B
W8QLO... 215- 38- 5-AC
W8PYQ.... 80- 20- 4-AB
W8DDO.... 57- 19- 3-AB
W8GYU.... 50- 25- 2-B
W8BGY.... 48- 24- 2-B
W8JXU/8 (W8s JXU LOX OSI)..... 123- 41- 3-B

Ohio

W8LPD...1800-144-12-ABC
W8SRW...1012- 92-11-AB
W8LAH... 970- 97-10-AB
W8BVJ.... 770- 77-10-AB
W8HOH... 720- 90- 8-AB
W8SQU... 528- 66- 8-A
W8HQK... 513- 74- 7-AB
W8SDJ.... 420- 60- 7-AB
W8LCY.... 288- 48- 6-B
W8PLQ.... 280- 56- 5-AB
W8BAX.... 276- 44- 6-ABC
W8NEE[1]... 265- 51- 5-AC
W8EVY.... 224- 56- 4-A
W8LGI.... 224- 56- 4-A
W8SVU.... 224- 56- 4-A
KN8BBR.. 198- 33- 6-B
W8NAF.... 176- 44- 4-B
W8PCK.... 156- 52- 3-A
W8RKL.... 147- 49- 3-A
W8WRN... 125- 22- 5-ABC
W8PBX.... 56- 28- 2-A
W8BMO... 50- 25- 2-AB
W8IFZ.... 42- 21- 2-AB
W8FAZ.... 36- 11- 3-ABC
W8TCO... 32- 16- 2-A

HUDSON DIVISION

Eastern New York

K2HPN/2.3744-144-26-AB
W2HBC...2352-111-21-ABC
W2MHE/2 888- 74-12-B
K2OJB.... 102- 34- 3-B
W2HF/2... 44- 11- 4-B
K2GCH/2 (W2s JFB YPM K2s GCH HBN RWP)
1104- 92-12-B

N. Y. C.-L.I.

W2FHJ....2970-135-22-AB
W2YHP...2835-135-21-AB
K2IEJ/2...2720-170-16-B
W2EIV....1612-124-13-B
W2LID....1284-107-12-B
K2OIL[1]....1040- 80-13-A
W2KIR.... 915- 61-15-B
W2GLU.... 800- 80-10-B
K2DDK.... 660- 60-11-B
K2KRC.... 650- 65-10-A
K2MYS... 568- 70- 8-B
W2VKP... 495- 55- 9-B
W2ENW... 400- 50- 8-B
W2JBQ.... 400- 40-10-B
K2AZT.... 369- 41- 9-A
W2AOD... 363- 30-11-BD
K2HDG/2. 180- 36- 5-A
W2WOF.... 78- 13- 6-BCD
K2DEM/2. 60- 20- 3-B
W2TUK... 27- 9- 3-B

N. New Jersey

W2DZA...2160- 79-24-ABC
W2TTM...1818-101-18-AB
W2PWX...1170- 90-13-B
K2ICE....1068- 89-12-B
W2CBB... 690- 46-15-B
KN2RLG[1].. 390- 39-10-B
W2APO.... 363- 33-11-B
W2OGY... 297- 33- 9-B
KN2RIC.. 104- 52- 2-B
KN2SYB.. 63- 21- 3-B
K2PRR/2... 5- 5- 1-B
K2KGJ (K2s KGH KGJ)
1254-114-11-AB

MIDWEST DIVISION

Iowa

WØUOP... 296- 37- 8-AB
WØUSQ.... 192- 32- 6-AB
WØSMJ.... 102- 17- 6-AB

Kansas

WØZJB.... 200- 25- 8-AB
WØBDK... 110- 22- 5-B
WØFGY.... 42- 14- 3-B
WØJAS/Ø (WØs JAS MVG)
576- 48-12-AB

Missouri

WØTGC... 200- 50- 4-AB
WØIHD..... 116- 29- 4-B
WØLFE.... 84- 21- 4-B
WØLOM.... 72- 18- 4-B
WØPTG.... 40- 10- 4-B
WØWKG.. 30- 15- 2-A

Nebraska

WØWWN.. 162- 24- 6-ABCD
WØBTG... 150- 30- 5-AB
WØEET/Ø. 119- 17- 7-AB
WØWRT... 51- 17- 3-B

NEW ENGLAND DIVISION

Connecticut

W1PHR....2825-113-25-AB
W1RJA....2750-125-22-AB
W1CLH....2548-182-14-B
W1FTX....1162- 83-14-A
W1TXI....1122-102-11-B
W1HDF...1008- 47-18-ABCD
WN1KAC/1 720- 80- 9-B
W1ZPV.... 528- 48-11-B
W1HDQ[4].. 506- 46-11-A
W1FVV.... 400- 40-10-A
W1UEA/1.. 384- 48- 8-B
W1BUZ.... 352- 32-11-A
W1AW[4]... 351- 39- 9-AB
W1NEQ.... 210- 30- 7-B
W1AMY.... 205- 41- 5-B
W1FPF.... 168- 21- 8-B
W1FEG.... 123- 41- 3-B
W1RFJ.... 65- 13- 5-B
W1SWX.... 10- 10- 1-B
W1QAK/1[3] (W1s PTG QAK VSE WN1HAD)
5535-205-27-AB
W1ECV/1 (7 oprs.)
2574-117-22-AB
W1ORS/1 (7 oprs.)
909-101- 9-B

Maine

W2BVU/1.6541-190-31-ABCD

E. Massachusetts

W1OOP...6090-186-30-ABCD
W1FOS[1]...3360-154-20-AC
W1HOY...2550-170-15-A
W1AQE....2278-134-17-AB
W1KBN[5]..1308-109-12-AB
W1VYS.... 896- 64-14-AB
W1J8M.... 740- 74-10-B
WN1HIY.. 610- 61-10-B
W1MEG.... 351- 39- 9-AB
W1DDN.... 300- 50- 6-A
W1VXW.... 204- 34- 6-B
W1CGU.... 150- 30- 5-A
W1LUW/1 (W1s LUW YVB)
352- 32-11-AB

W. Massachusetts

W1VNH...4752-135-33-ABCD
W1ZWL...1300-100-13-A
/1. 429- 34-11-AC

(Continued on page 124)

The World Above 50 Mc.

CONDUCTED BY EDWARD P. TILTON, W1HDQ

IF NEW 2-METER DX RECORDS weren't set during the Perseid meteor shower in mid-August, it wasn't for lack of trying. Since 1953, and the pioneering work of W2UK and W4HHK, the Perseid shower, an annual event at this time, has been used by increasing numbers of 2-meter DX enthusiasts. Growth of interest in meteor-scatter DX has been slow, however. To make the best use of the phenomenon requires not only use of c.w., but some proficiency in it. It also calls for high power, large antennas and low-noise receiving gear, not to mention great patience and a willingness to pass up a few hours of sleep.

Probably more midnight and early-morning oil was burned in the cause this August than ever before. Any sacrifice is worth making, if a new state is in prospect on 144 Mc.! Here are some of the 1956 Perseid shower results reported to date:

W6NLZ, Palos Verdes Estates (near Long Beach), Calif., got an early start, working W5FAG, Albuquerque, N. Mex., July 29th. This 680-mile path brings W5FAG almost inside the tropospheric-scatter range, and W6NLZ reports that the signal had something approaching tropospheric characteristics. It was nearly solid, but with very strong bursts. On Aug. 12th, an evening schedule with W7JIP, McMinnville, Ore., paid off around midnight. This was apparently the peak of the shower, and W6NLZ heard W5HXK, Watonga, Okla., W5s VWU and FAG, Albuquerque, and W7LHL, Seattle, Wash.

W7JIP, in addition to working W6NLZ, exchanged reports with W9QXP/6, near Los Angeles, between 0120 and 0300 on the 13th. He heard W6AJF, Sonoma, Calif., on short and frequent bursts, but no contact was made. A schedule with W8KAY was unproductive.

W7LHL, Seattle, Wash., heard good bursts and identified W9QXP/6 at 0430 PST Aug. 10th, but bad line noise at the southern end made a contact out of the question. They had better luck the next morning, and exchanged the necessary calls, reports and acknowledgments successfully. Evening and early-morning skeds with W7LEE, Parker, Ariz., bore fruit at 0300 PST Aug. 12th, though more than two hours were consumed in exchanging the complete information. "The hardest I ever worked for a QSO!", says W7LEE, but the first 2-meter contact between Arizona and Washington was well worth it. DX: about 1050 miles — and consider the country that lies in between!

W7LHL was listening during the tries between W7JIP and W6NLZ. He sent us a tape recording of some of the results, which included one of the loudest and longest meteor bursts we've ever heard — an almost complete c.w. CQ called by W6NLZ, holding throughout at a level that all but blocked the tape recorder. Ernie

2-METER STANDINGS

	U. S. States	Areas	Miles		U. S. States	Areas	Miles
W1FZJ	21	6	1120	W5VY	7	3	1200
W1REZ	21	6	910				
W1RFU	19	7	1150	W6NLZ	6	3	1000
W1HDQ	19	6	1020	W6WSQ	5	3	1280
W1KCS	18	6	850	W6AJF	5	2	640
W1AJR	17	6	810	W6RRZ	4	2	360
W1IZY	17	6	750	W6DNG	4	2	350
W1UIZ	17	5	680	W6ZL	3	2	1400
W1BCN	16	5	650	W6AJF	3	2	640
W1AFO	15	5	810	W6BAZ	3	2	320
W1MMN	13	5	520	W6MMU	3	2	388
				W6ORS	3	2	365
W2ORI	26	8	1000	W6LSB	2	2	360
W2NLY	23	7	1050				
W2BLV	22	7	1020				
W2AZL	21	7	1050	W7VMP	6	4	1280
W2DWJ	21	6	720	W7LEE	6	3	1020
W2OPQ	20	6	970	W7LHL	4	2	1050
W2AMJ	20	6	960	W7JU	4	2	353
K2CEH	20	7	910	W7JIP	3	2	850
W2WFB	20	6	900	W7YZU	3	2	240
W2UTH	19	7	880	W7JUO	2	2	140
W2AZP	19	7	650				
K2IXJ	19	6	925	W8WXV	28	8	1200
W2CBB	19	6	740	W8SFG	26	7	850
K2IEJ	18	6	745	W8RMH	25	8	800
W2AOC	18	6	660	W8LPD	25	8	750
W2LHI	18	7	620	W8DX	25	8	720
W2KIR	18	6	—	W8SRW	27	7	850
W2RXG	17	6	675	W8SVI	22	8	725
W2PAU	16	6	740	W8JWV	22	8	710
W2SHT	16	6	650	W8BAX	21	8	685
W2PCQ	16	5	650	W8WRN	20	8	670
				W8EP	18	7	800
W3BGT	28	8	740	W8PT	18	6	610
W3RUE	25	8	950	W8ZCV	17	7	970
W3KCA	21	7	—	W8RWW	17	7	630
W3GKP	21	6	800				
W3KWL	19	7	740				
W3NKM	19	8	660	W9KLR	27	8	850
W3IBH	19	7	650	W9ZHL	25	8	760
W3TDF	19	6	720	W9EQC	25	8	820
W3BNC	18	7	750	W9EHX	24	7	725
W3FPH	18	7	—	W9EYJ	23	8	850
W3LNA	16	7	720	W9BPV	23	7	1000
				W9GAB	23	7	850
W4HHK	29	9	1280	W9WOK	22	8	860
W4AO	23	7	950	W9UCH	22	8	750
W4HJQ	22	7	750	W9UED	22	7	960
W4MKJ	20	8	725	W9KPS	21	7	690
W4JCJ	20	6	660	W9MUD	19	7	640
W4DWU	19	6	675	W9REM	19	6	—
W4JFV	18	7	830	W9LF	19	6	—
W4OLK	18	8	720	W9ALU	18	7	800
W4UMF	18	6	600	W9JGA	18	6	720
W4VLA	17	7	825	W9MBI	16	7	660
W4TLV	16	7	1000	W9JIY	15	7	560
W4WNH	16	7	750	W9LEE	15	6	780
W4CLY	15	5	720	W9DSP	15	6	760
W4ZBU	14	5	800	W9DDG	16	6	700
W4WCB	14	5	—				
W4TCR	14	5	720	WØEMS	27	8	1175
W4IKZ	13	6	720	WØIHD	26	7	870
W4SOP	13	5	680	WØGUD	25	7	1065
W4CPZ	12	5	650	WØUOP	18	6	—
W4UDQ	11	5	850	WØONQ	17	6	1000
W4MDA	11	5	680	WØINI	17	5	830
W4GIS	9	2	335	WØOAC	14	5	725
				WØTJF	13	4	—
W5RCI	21	7	925	WØZJB	11	4	650
W5JTI	19	7	1000				
W5HEH	15	7	830	VE3DIR	26	8	915
W5AJG	14	5	1280	VE3AIB	25	8	910
W5ABN	12	5	780	VE3BQN	17	7	790
W5QNL	10	5	1400	VE3DER	16	7	820
W5CVW	10	5	1180	VE3BPB	13	6	715
W5SWV	10	3	600	VE2AOK	12	5	550
W5MWW	9	4	570	VE3AQG	11	7	800
W5ML	9	3	700	VE1QY	11	4	900
W5FEK	8	2	580	VE7FJ	2	1	365

also was eavesdropping on the skeds with W4HJQ and W8KAY, kept by various western stations, but heard nothing this far east.

W4HJQ, Glendale, and W4WNH, Elizabethtown, Ky., had night skeds with several western stations. No contacts were made, but W4WNH heard W5HXK when the latter was calling W6NLZ! Shelby also heard W2NLY, W2CXY, W5HEZ, and W1RUD. W4HJQ logged the same sigs, and also heard ". .FAG" during W4WNH's sked with W5FAG. Both fellows heard many unidentified bursts.

W2NLY, Metuchen, N. J., back in business with a tremendous new array, had a QSO of sorts with W5JTI, Jackson, Miss., and heard W5HEZ, Baton Rouge, La., and W5RCI, Marks, Miss. Jim also heard bursts several times on the right frequency during skeds with W5VY, San Antonio, Texas, but made no positive identification.

The only other eastern 2-meter report comes from W1KCS, Providence, R. I. Al worked W9WOK, Bensenville, Ill., for what is believed to be the first Rhode Island-Illinois QSO on 144 Mc. This took place between 0600 and 0628, Aug. 12th. W1KCS also kept schedules with W4HHK, but was not able to complete a QSO, though bursts were heard.

The most startling report of all comes from W7LEE, Parker, Ariz. Bob says he heard just about everybody. W6NLZ came in with the big array at W7LEE in any direction, and was S9 when they were aiming at each other. W5VWU was also S9 during his attempts to work W6NLZ. W5HXK, Watonga, Okla., was heard well — but was disregarded because under him was the tape signal of W2CXY! W8KAY was also heard. (This is 2 meters?)

The gang on 50 Mc. who have been working on ionospheric scatter saw signals rise many decibels during the peak meteor hours of the morning. Near-solid c.w. QSOs were made by your conductor with W4IKK, Rome, Ga., W4NWB, Travelers Rest, S. C., W4FWH, Doraville, Ga., and W4RMU, Oceanway, Fla., during week-end tests on Aug. 4th, 5th, 11th and 12th. By the week end of Aug. 18th and 19th, signals had receded to nearly their normal summer scatter levels. It is of interest to note that W4IKK and W4RMU were both running only 75 watts input, and W4RMU's beam is a single 3-element job. These hauls would not be considered of more than passing interest if the band had been open at the time, but it was not. The signals sounded like the usual ionospheric scatter, except that they were strong enough to be audible at all times. Bursts ran nearly up to the S9 level.

During the morning hours of both week ends, numerous phone signals could be heard from distances of out to about 1100 miles in several directions. W4s, 8s, 9s and 0s were heard by W1s and W2s who were listening carefully. Most were readable only on peaks, but on c.w. they could have been worked easily. Your conductor and W1FZJ took time out to compare notes on voice the morning of the 11th, and W9AAG, Woodhull, Ill., reported that he was able to copy a high percentage of the whole conversation. The regular morning scatter tests made from W1HDQ were reported heard by W4AYV, Umatilla, Fla., and W5ZVF, Little Rock, Ark., in addition to many W4s in Georgia and Tennessee.

These results point up some facts that apparently still are not understood by very many v.h.f. enthusiasts. Meteor showers offer exceptional opportunities for DX on 144 Mc., where high power, fairly large arrays and c.w. are used. Precise scheduling is a great help in capitalizing on these chances. On six, working out during a meteor shower requires little more than the use of c.w., and some careful listening. Signal levels are high enough so that random QSOs are much more readily made than on 144 Mc., but schedules will help.

The principal problem would seem to be knowing when to look for meteor DX. Here are the approximate dates of showers coming up in the next few months, supplied by W6AJF: Orionids, Oct. 15th–25th; Taurids, Nov. 1st–10th; Leonids, Nov. 15th–20th; Geminids, Dec. 9th–13th; Ursids, Dec. 21st–22nd. Your conductor must profess complete ignorance on the subject of meteor showers. How about some of our amateur astronomers passing along authoritative information that can be useful to the v.h.f. men who want to make the most of this intriguing DX prospect in the months to come?

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

Work on 50 Mc. via ionospheric scatter is gaining momentum. Here is a form of v.h.f. DX that requires no "band opening" and no special conditions. And it works over terrain that presents formidable obstacles to better-known modes of reliable propagation. A quiet location and the ability to use c.w. effectively are the principal requirements. Transmitter power of some magnitude helps, and large antennas are desirable, but one of these attributes can be traded for the other, to a considerable extent.

All summer long, ionosphere scatter schedules worked out well for 6-meter operators in many parts of the country. A group of stations in the Bay Area have been working out regularly on early-morning schedules. Here are details of their setups, supplied by W6AFC:

W6AFC, Redwood City, 50.008, 100 watts, 5-el.
W6AJF, Sonoma, 50.038, 500 watts, 6-el.
W6BAZ, Santa Rosa, 50.046, 200 watts, 6-el.
W6UOV, San Mateo, 50.022, 600 watts, 4-el.
W6VDG, Redwood City, 50.014, 700 watts, 5-el.

Their practice has been to call CQ on c.w. during the odd five-minute periods, beginning at 0630 or 0700 PDT. They listen during the even periods. Listening for replies is concentrated on the first 50 kc. of the band, unless special arrangements are made otherwise, because of the slow tuning that is required under weak-signal conditions. Stations worked include:

W5KWP, Santa Fe, N. M., 50.034, 100 watts.
W5NSJ, Albuquerque, N. M., 50.045, 120 watts, 3-el.
W5SFW, Amarillo, Texas, 50.1, 500 watts.
W7QDJ, Clearfield, Utah, 50.06, 350 watts, 4/4.
W7VMP, Phoenix, Ariz., 50.034, 700 watts, 6/6.
W7YJE, Seattle, Wash., 50.55, 400 watts, 4-el.
WØCNM, Grand Junction, Colo., 50.075, 50 watts, 3-el.
WØFKY, Same, 50.04, 124 watts, 4-el.

In Fresno, Cal., W6NDP and K6EDX are trying the scatter technique. K6EDX, having seen several TV DX stations by the meteor route, out to 2000 miles or so, is confident that 50-Mc. DX is possible beyond the 1500-mile "limit" now tentatively set for scatter and meteor-burst work.

Results of your conductor's week-end scatter tests have been reported in detail previously. For the record, they have been copied in Virginia, South Carolina, Georgia, Florida, Tennessee, Arkansas and Illinois, that we know of. Get out your map of the United States and draw a few lines representing this work at the eastern and western edges of the country. Right away one fact strikes you: only coordination between the innermost ends of the territory thus far covered is needed to set up a transcontinental 50-Mc. scatter network. What are we waiting for?

General activity on 50 and 144 Mc. throughout the southeastern part of the country is now an accomplished fact. W4FWH, Doraville, Ga., north of Atlanta, says that he can work Alabama and North and South Carolina regularly on either band. Florida stations are heard on 144 Mc., but contacts are few because the boys down that way are troubled with high line noise and do not copy weak signals well. Net frequency in those parts is 145.35 Mc.

W4GIS, East Point, Ga., has been able to run his states total on 144 Mc. up to 9, with no more than a 522 transmitter and a 16-element collinear array. None of these contacts, up to 335 miles distant, has been on what Larry would call a real band opening, so better things are expected under ideal conditions.

A prominent feature of the 50-Mc. summer DX season was the frequent appearance of Cuban stations when the band was open. Activity on 6 around Havana is maintained by CO2XZ, CO2ZX (yes, there are *two* of them!), CO2QY and CO2PT. XZ and QY also operate on 144 Mc., as does CO2VY, who has worked many Ws. VY will soon also be on 6, according to Gus, CO2ZX, who passes this info along.

While we're dealing with international matters, here's a bit of 144 Mc. DX news from across the Atlantic, courtesy of I1ER, who was a v.h.f. man before some of you were born. On July 30th, I1BBB worked FA8IH, for what may be the first 2-meter QSO between Italy and Algeria. Exact locations are not known, but the distance could not have been less than about 600 miles.

Here are some v.h.f. net times and frequencies, courtesy of the *Northwest Scanner* (191 Willona Drive, Eugene, Ore.): Eugene — 145.8 Mc., nightly, 2100; Medford — 1900 nightly, 144.45 Mc.; Portland — 2100 nightly, 146.25 Mc.; Yakima Valley, Wash. — 2030 nightly, 145.5 Mc.; Ogden, Utah — 2000 MST Mondays, 145.35 Mc.

Here's a fellow who's really accommodating. W4IKK writes that on Aug. 7th he hooked up with W3HFY/3 who was driving into Pennsylvania from Delaware. Learning that W4IKK needed the latter state on 6, he turned back and drove down into Delaware again. The contact was maintained solidly in both states.

Some months ago we reported the formation of the Dallas-Ft. Worth 6-meter Net. Activity in both areas has grown now to the point where the two groups have split up to form nets of their own, the Dallas County and Tarrant County Nets. K5BEL reports that the first on-the-air session of the Dallas County Net was held Aug. 5th, following a personal get-together for organization purposes July 29th. At that time the following officers were elected: President — K5BEL, Secretary-treasurer — K5BDL, Net Control — K5CCB, Social Committee — K5BNH and K5BNI. Present membership has already grown to 30 stations. Meetings are held each Sunday, on the air, at 1500 CST. It is hoped that the group will function radio club fashion, and plans are being laid for social and technical projects.

Another new v.h.f. club was formed recently in Philadelphia. The Mt. Airy V.H.F. Club elected as its first president, W3IBH, with W3SAO as secretary. The meeting place is the Chelten Hills Recreation Center, Horter and Mansfield Streets, Mt. Airy, Philadelphia.

The Syracuse V.H.F. Club has been going strong for some time now. Last year their V.H.F. Roundup was a huge success, so another is being planned for this fall. The 1956 version will be held at Martin's Restaurant, Liverpool, N. Y., Oct. 6th. Featured speaker will be John Landeck, W9WOK, well-known v.h.f. man. Reservations may be made with Jim O'Hearn, W2WZR, Nedrow, N. Y.

Here's a novel idea in v.h.f. contests. W6COH will take on all comers on the following proposition: to see who can work the largest number of 2-meter stations in a continuous 24-hour period. Operation to be by one operator, including log-keeping. In a recent run from Mt. Pinos, near Santa Barbara, Jim worked 102 stations, but a generator breakdown put him out of business at the end of 19 hours. His best DX was Ball Rock, in Northern California, nearly 400 miles.

Several fellows have reported working K8AIR/aircraft mobile on 50 Mc. recently, some with interesting results. W8HJR, Grandville, Mich., caught him at 19,000 feet elevation over New Mexico. Signals ran in cycles about 15 seconds apart. The aircraft was about 500 miles to the west of the next farthest station that could be heard at the time. This with low power and a simple quarter-wave whip in the airborne station. W4FWH has worked K8AIR as far away as over Kentucky, under normal conditions.

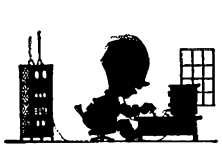
W8SSO, Wyandotte, Mich., says we never have anything about Michigan activity in this department. Well, OM, you know how the news gets into print? People write — like you did. Howard passes along the information that the Motor City 6-meter net operates every Sunday at 2030. Newcomers are welcome. And there should be newcomers, for they have more than 25 stations now active on 6 around Detroit.

What is probably the best s.s.b. DX on 144 Mc. was a contact between W3YHI, Andrews AFB, Md., and W8KAY, Akron, Ohio. This is a 280-mile over-the-mountains haul, made with s.s.b. at W3YHI. W2JJC and W2NCF have covered about the same distance, but up the more open Atlantic Seaboard, in working W1DEO, near Portland, Me. W2NCF, a recent addition to the 2-meter

(*Continued on page 126*)

W0ZJB	48	W4UCH	41	W8RFW	45
W0BJV	48	K4DJO	41	W8SQU	45
W0CJS	48	W4MS	40	W8LPD	44
W5AJG	48	W4FNR	39	W8HJR	43
W9ZHL	48	W4IUJ	38	W8YLS	41
W90CA	48	W4IKK	38	W8PCK	35
W60B	48	W4RFR	37		
W0INI	48	W4NWB	35	W9BRN	48
W1HDO	48	W4CHD	35	W9ZHB	48
W5MJD	48	W4AZC	31	W9QUV	48
W2IDZ	48	W4ZBQ	34	W9VZP	47
W1LLL	48			W9RQM	47
W0DZM	48	W5VY	48	W9ALU	47
W0HVW	48	W5SFW	47	W9QKM	47
W0WKB	48	W5LFQ	47	W9UIA	45
W0SMJ	48	W5GNQ	46	W9UNS	45
W0OGW	48	W5ONS	45	W9MFH	42
		W5JTI	45	W9JFP	42
W1VNH	47	W5ML	44	W9JCI	41
W1CLS	46	W5FSC	44		
W1CGY	46	W5JLY	44	W0ORE	48
W1LSN	46	W5JME	43	W0QIN	47
W1AEP	46	W5VV	42	W0NFM	47
W1DJ	41	W5FAL	41	W0TKX	47
W1RFU	41	W5HEZ	41	W0KYF	47
W1FOS	40	W5BXA	41	W0MVG	47
W1SPX	36	W5HLD	40	W0JOL	46
W1WAS	23	W5FXN	38	W0TJE	44
		W5EXZ	38	W0URQ	44
W2MEU	47	W5HFF	33	W0JHS	43
W2AMJ	46	W5NSJ	32	W0IPI	43
W2BYM	46	W5ZVF	31	W0CNM	42
W2RLV	45			W0FKY	42
W2FHJ	45	W6WNN	48	W0PKD	41
W2RGV	44	W6UXN	47	W0ZTW	41
W2GYV	40	W6ANN	45	W0USQ	40
K2JNS	40	W6TMI	45	W0ZTW	36
K2AXQ	39	K6EDX	42	W0VIK	35
W2SHV	39	W6IWS	41	W0WNV	34
W2QVH	38	W6CAN	40		
W2ZUW	37	W6ABN	39	VE3AET	45
W2ORA	36	W6GGG	35	VE3AIB	35
K2HRB	31	W6BWG	33	VE1QZ	34
K2ITP	31	W6OJF	31	VE1QY	32
		K6GTG	30	VE3DER	31
W3OJU	46			VE1EF	28
W3TIF	45	W7HEA	47	VE1GF	27
W3NKM	41	W7ERA	47	CO6WW	21
W3MQU	41	W7EDX	47	VE4HR	20
W3OTC	40	W7FDJ	46	CO2ZX	16
W3RUE	41	W7DYD	45	LU9MA	11
W3KMV	39	W7ACD	45		
W3MXW	38	W7JRG	44		
W3LFC	37	W7BOC	42		
W3FPH	35	W7JPA	42		
W3UQJ	25	W7FIV	41		
		W7CAM	40		
W4FBH	46				
W4EQM	46	W8N8S	46		
W4CPZ	45	W8CMS	46		
W4QN	44	W8OJN	46		
W4FLW	43	W8NQD	45		
W4OXC	41	W8UZ	45		

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



Operating News

F. E. HANDY, W1BDI, Communications Mgr.
GEORGE HART W1NJM, Natl. Emerg. Coordinator
PHIL SIMMONS, W1ZDP, Asst. Comm. Mgr., C.W.

ROBERT L. WHITE, W1WPO, DXCC Awards
LILLIAN M. SALTER, W1ZJE, Administrative Aide
ELLEN WHITE, W1YYM, Asst. Comm. Mgr., Phone

Rehashing Field Day. Numerous club bulletins currently report on the FD experiences. For every simulated emergency test or competitive activity the recap, critique or study of results is of high interest. Also such notes spell out the means to further progress, success and enjoyment in the particular activity. Along this line the Vermilion County Amateur Radio Club, Inc. (Danville, Ill.), writes:

"We can be proud of our Field Day. All who participated are to be congratulated . . . it was a better job than last year . . . the generators did a fine job and the results show that in case of emergency, the club could aid in any civil defense program to the fullest extent. As to improvement: (1) A closer check on spare parts would be necessary in case of a longer operational period. A club project might well be the study of the needs for the equipment and the acquisition of such parts for storage. (2) Extension of operator training seems important. This bulletin editor speaking for himself, found that a complete change of operating habits was required in order to do a better job on Field Day. Those like him who were inexperienced in such operation may have found out the same thing. (3) The 'big picture' indicated that among the younger operators there is a need for more practice in net operational procedure."

The Saginaw Valley Amateur Radio Association's Field Day also provided some significant quotes by W8HMM:

"Confidence was shattered when our 75 meter phone rig began to override c.w. signals on 40 . . . The 80-meter rig was rebuilt in the field to provide break-in operation . . . Lightning increased and rain then began to fall . . . What would they take for one of those towers . . . When power unit was stopped for refueling just as 20 meters became lively . . . Hushed phones, quiet keys and clinched fists were conspicuous." W8KNB: "The FD planning and organization was rough. Hope I never have to go through that again, but say, when are we going to start on plans for the next Field Day?"

DX Operating Notes. The following excerpt from the South Carolina Amateur Radio Activities Bulletin (July), Rock Hill Amateur Radio Club, is by K4AIM.

"A DX Hound will of course leave no stone unturned until he has worked every country he can *hear* . . . and that is the crux of the matter. You have to hear them to work them. For the receiver to 'go to town' a little study of the instruction book, consideration of the antenna match, etc., can often make it so much better . . . many of us expect the receiver to keep on putting out its best with never a thought of aging tubes or changes in coils and components. The good DX man must stay 'on top of' his receiver all the time. To snag them yourself is a very real achievement.

"An important aspect of DXing is that signals do not always follow the same path. Many times the long path is the shortest way home. Learning the paths and the hours and times starts you on the road to real DX. *When* and *where* have great importance. While it is hard to believe, it is so that there are people with beams who are not familiar with azimuthal bearings and still use Mercator type maps. Lone wolfing may satisfy the ego but a helping hand will often smooth a lot of bumps in the road. This helping hand may be on the other side of town or the other side of the world. Of course you in turn have to hold out your hand when the occasion arises. It may be just as hard for a VK6 to know about and reach a Vermont station as it is for you to get the VK9 in your city. It's a two-way street.

"DX contacts may come as a result of luck . . . you happen to be on a clear channel and he happened to tune to your frequency. This is wonderful. But again you may stalk a station for months or years to finally land him. When you hear a DX station that you want to work and call him to no avail, study his listening habits, his operating times, and if he is working another W, zero beat the W's frequency. But *before radiating any signal have the courtesy to wait until the contact is finished. There is no substitute for LISTENING.* You can't hear that rare DX while you're chattering with a local. Good DX men often sit at the receiver all day without once turning on the transmitter."

Fall Meeting Subject? We feel that if some General Class member, at each club meeting, would give a ten or fifteen minute talk to the newcomers — and cover beginner problems, these fellows would be greatly benefited by his efforts. . . . *San Francisco Radio Club News, June* '56.

An Observer Reports. "Notices sent so far have been a matter of record between the SCM, the OO and the station concerned. I'm particularly pleased with those who after receiving a card, call me on the phone or drop a postal to let me know they appreciated the notice. In one or more instances checks between the station and myself have practically eliminated the trouble and every one went his merry way. Discrepancies might be classified into groups: (1) Improper equipment adjustment resulting in spurious signals such as key clicks, harmonics, excessive side-band width from over-modulation, etc. (2) Improper operating practices (including prolonged testing and fiddling around without signing!)

"Club or group operated stations additionally often come in for justified criticism. This may come from not being familiar with the station. It is my impression that in some instances the operators involved do not particularly care about amateur radio, especially the technical side of it, where they are operators with more a military than an amateur background. These operators should remember . . . that they are sharing a band in an amateur capacity with thousands of other amateurs. A trustee may have to answer to FCC for their carelessness or violations. The above is a plea to all hams to remember that the amateur bands are for the benefit of all and not the privileged or exclusive right of one individual or group." — KH6KS *in HARC News, July* '56.

Some of those multioperator disqualifications in the ARRL DX Test resulted, we believe, from all operators not having as intimate knowledge of equipment as that of the owner, together with the fact that a visitor doesn't have all

responsibilities or consequences pointed at *him*. Enthusiasm for working somebody else's "big" station doesn't team too well with less familiarity with the gear and the band edges.

Unlicensed Operator Apprehended. With licensing procedure so simple it's hard to conceive why any person will take the chance of a heavy penalty, and risk the enmity of amateurs, through poaching on their frequencies. Amateurs can help themselves to keep the bands clean, as well as FCC to do its job by advising of any unlicensed or unauthorized or improper transmissions in our amateur bands.

In December '55, a Mr. Ralph Everett Legg, 310 N. Lake Street, Pasadena, Calif., was apprehended by an engineer from the Los Angeles office of the FCC while operating an unlicensed station in the 75 meter amateur band, although *not* using an amateur call. The Commission's General Counsel forwarded this case to the Attorney General who in turn forwarded it to the U. S. Attorney at Los Angeles. On July 3, 1956, Mr. Legg pleaded guilty in Federal Court for violation of the Communications Act and was placed on probation for a period of five years. (Sec. 501 of the Act provides penalties or conviction of violation of provision of the Act for which penalties other than forfeiture are not provided, that may result in fine up to $10,000 or imprisonment for terms up to two years, or both.)

— *F. E. H.*

NATIONAL CALLING AND EMERGENCY FREQUENCIES (kc.)

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

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

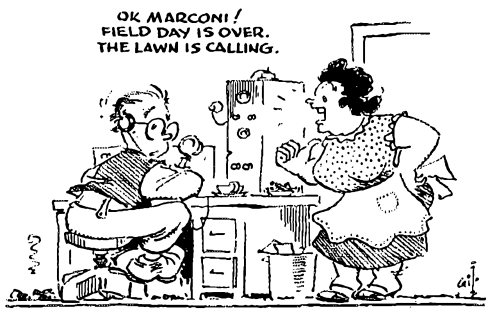
The following are the National Calling and Emergency Frequencies for Canada; *c.w.* — 3535, 7050, 14,060; *phone* — 3765, 14,160, 28,250 kc.

NATIONAL RTTY CALLING AND WORKING FREQUENCIES

3620 kc. 7140 kc.

PREVIEW — 1956 FIELD DAY

Here are some high claimed scores reported for the Twentieth ARRL Field Day. These are subject to checking and grouping according to the number of simultaneously-operated transmitters at each station. Final FD results will soon appear in *QST*.



— *Idea courtesy Phil-Mont Mobile Radio Club's* The Blurb

CLASS A — Portable Clubs and Groups

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

W6UF/6	20,844-13	W9AB/9	5634- 3
W2LI/2	20,493-11	K6FD/6	5603- 7
W2GSA/2	18,225-11	K6GOB/6	5532- 6
K6BAG/6	17,139-10	W3CWC/3	5507- 2
W8EV/8	15,750- 9	W6CX/6	5378- 8
W1DC/1	13,950- 9	W6MWO/6	5328- 4
W9RK/9	13,518-12	W9AP/9	5328- 8
K2AA/2	12,519- 6	W1OMI/1	5319- 4
K6DTA/6	12,420-11	W7YYE/7	5262- 5
W7HZ/7	11,700- 7	W8ET/8	5250- 3
W6PD/6	11,286- 4	W3AFM/3	5202- 4
K6EBN/6	10,980- 9	K6CLZ/6	5130- 3
W2VDJ/2	10,737- 6	W2QYV/2	5103- 4
W5SC/5	10,693- 8	W2PE/2	5064- 3
W9PC8/9	10,422- 4	W5CT/5	5049- 5
W6NWG/6	10,365- 7	W5DXD/5	5046- 3
W6TOI/6	9593-10	W3BTN/3	5040- 8
W6VUP/6	9360- 4	W2ZQ/2	5031- 4
W6UW/6	9228- 8	W1GLA/1	4986- 7
W7DK/7	9198- 7	W5CF/5	4980- 5
W3RCN/3	8703-10	W6HAL/6	4977- 4
W6LUC/6	8637-10	W0YDX/0	4932- 2
W3PKV/3	8262- 3	W3MFW/3	4919- 2
W1BKT/1	8235- 4	W6MHM/6	4887- 4
W6PW/6	7854- 8	W4JP/4	4851- 4
W9SW/9	7758- 6	W4PAY/4	4827- 4
W6PM/6	7674- 6	W3OK/3	4797- 4
W5ZDN/5	7672- 3	W4YKY/4	4707- 3
W6MGJ/6	7620- 4	W7NCW/7	4691- 9
W2OR/2	7599- 4	W8ACW/8	4689- 6
K9AVE/9	7533- 6	W3VRZ/3	4662- 6
W2YKQ/2	7308- 5	W5MUZ/5	4662- 3
W2IN/2	7253- 5	K6QZJ/6	4650- 7
W6OT/6	7252- —	W5LFM/5	4590- 2
W8KP/8	7040- 4	W2BVL/2	4554- 6
K6AAZ/6	6881- 4	W8RNF/8	4554- 7
W6AVJ/6	6864- 5	W2OYH/2	4419- 2
W8MRM/8	6834- 4	W0DKI/0	4401- 1
W6LS/6	6712- 7	W7NTO/7	4374- 4
W9SWQ/9	6597- 4	VE3ZM/3	4320- 7
W2KOJ/2	6534- 5	W0CKF/0	4318- —
W6OZ/6	6435- 7	K4JVA/4	4296- 3
W5PDO/5	6427- 4	W3ATR/3	4284- 2
K6CXI/6	6408- 4	W3NFK/3	4284- 4
K2BC/2	6396- 4	W9ERU/9	4284- 2
KP4ZA/KP4	6316- 4	K6KGK/6	4256- 2
W3VTJ/3	6240- 4	W1OSA/1	4249- 5
W5EKK/5	6165- 1	W4VTA/4	4168- 7
W2GLQ/2	6084- 5	W1SS/1	4110- 4
W6JU/6	6054- 4	W2NWD/2	4167- 2
K6PVN/6	6048- 4	KZ5JW/KZ5	4080- 2
W8OUD/8	5949- 8	W2FEB/2	4077- 3
K2CF/2	5895- 2	W8CEA/8	4077- 1
W9FGF/9	5841- 3	W1ECO/1	4059- 5
VE3JJ/3	5787- 8	W0TIU/0	4059- 2
W9OFR/9	5751- 4	W8NCM/8	4038- 3
W1EIA/1	5733- 1	W6OYJ/6	4035- 5
W1WKN/1	5715- 5	W2UBW/2	4032- 8
VE3BRR/3	5697- 9	W7OTV/7	4023- 1
K6RXC/6	5679-14	W3AJU/3	4008- 2
W2ARL/2	5670- 2		

CLASS B — One- and Two-Man Portables

(Listings show call and score.)

W3EIS/4	6575	W0AJA/0	2443
W2JBQ/2	4928	W0BBM/0	2264
K6BKT/6	3000	W8MZA/8	2148
W6KLZ/6	2853	K6HKE/6	2093
W9EWC/9	2739	W9D8P/9	2061
W9ESQ/9	2466	W7WOQ/7	2052

CLASS C — Mobiles

W8QAV/8	4239	W8CDB/8	2444
W8ERA/8	3537	W8CZM/8	2444
W8GHO/8	3065	W8GHT/8	2444
W8PM/8	2984	W8IWP/8	2444
W8INO/8	2970	W8MAE/8	2444
W8AEU/8	2943	W8MWE/8	2444
W8QXG/8	2930	W8NGY/8	2444
W8LEX/8	2835	W8NLJ/8	2444
W9NJB/6	2620	W8NLX/8	2444
W8FKB/8	2592	W8NOX/8	2444
W8QXW/8	2592	W8NYX/8	2444
W8GMK/8	2565	W8PVA/8	2444
K5EXZ/5	2552	W8RDP/8	2444
W8OHA/8	2552	W8SDV/8	2444
W8GQX/8	2525	W8SZV/8	2444
W8ZXL/8	2525	W8VUJ/8	2444
W8HFE/8	2511	W8WAG/8	2444
W8BDZ/8	2444	W8ZJQ/8	2444

CLASS D — Home Stations, Emergency Power

K2OFQ	435	W7WLG	117
K4CDA	250	W4RWM	47

CLASS E — Home Stations, Commercial Power

W3MSR	381	K2MFW	131
W9BHR	350	W1ZIO	126
W4WKQ	321	K2OPJ	114
W8NCF	320	W4HKJ	114
W4YI	296	W5KRI	114
W4FGH	295	K6EA	110
W9EXL	236	W3UMU	104
W2DSC	150	W0YCA	103
W4RUE	144		

Section Emergency Coordinators of the Amateur Radio Emergency Corps

The Section Emergency Coordinator is appointed by the SCM to take charge of the promotion of the Amateur Radio Emergency Corps organization throughout the Section. He acts as the SCM's executive in the furthering of provisions for emergency amateur radio communications in every community likely to suffer in case of a communications emergency. One of the duties of the SEC is to recommend the appointment of Emergency Coordinators for the various communities in his Section. Does *your* town have an EC? If not, recommend the name of a likely prospect to the SEC. The SEC invites your questions concerning the status of the AREC in your Section.

ATLANTIC DIVISION				
Eastern Pennsylvania	W3NNT	Douglas Morick	510 Hickory St.	Bethlehem
Maryland-Delaware-D. C.	W3PKC	John Campodonico	629 McCabe Ave.	Baltimore 12, Md.
Southern New Jersey	W2VRW	John Wesley Sammis	120 Rhoads Ave.	Haddonfield
Western New York	W2UTH/FRL	Henry A. Blodgett	515 Victor-Holcomb Rd., Rt. 1	Victor
Western Pennsylvania	W3GEG	Alfred C. Heck	515 Cedar Ave.	Sharon
CENTRAL DIVISION				
Illinois	W9HOA	A. B. Brand	1211 Harlem Blvd.	Rockford
Indiana	W9QVQ	Frank M. Carroll	542 S. Maple Ave.	Orleans
Wisconsin	W9OVO	Clayton Cardy	334 W. Spruce St.	Sturgeon Bay
DAKOTA DIVISION				
North Dakota	WØCAQ	Douglas H. Classon	449-16th Ave., So.	Fargo
South Dakota	WØYOB	Wallace Koppman	725 St. Charles St.	Rapid City
Minnesota	WØGTX	George P. Lord	P. O. Box 8	Alexandria
DELTA DIVISION				
Arkansas	W5VKE	W. W. Cannon	Rt. 4, 695 Gray St.	Fayetteville
Louisiana				
Mississippi	W5PFC	C. C. Ferguson, sr.	307 Duncan Ave.	Jackson
Tennessee	W4RRV	S. B. DeHart	227 S. Purdue	Oak Ridge
GREAT LAKES DIVISION				
Kentucky	W4JSH	Meck W. Brazelton	222 State St.	Lexington
Michigan	W8GJH	Francis E. Gary	620 Thayer St.	Flint 3
Ohio	W8UPB	Dana E. Cartwright, sr.	2079 Observatory Rd.	Cincinnati 8
HUDSON DIVISION				
Eastern New York	W2KGC	William L. Stahl		Fishkill
N. Y. C. & Long Island	W2ADO	Maurice Mulligan	Box 134	Westbury
Northern New Jersey	W2IIN	John J. Vitale	57 Sayre St.	Elizabeth 3
MIDWEST DIVISION				
Iowa	WØMG	Russell R. Rosenkrans	2121 Byron Ave.	Waterloo
Kansas	WØPAH	W. G. Schrenk	444 Westview Drive	Manhattan
Missouri				
Nebraska	WØJDJ	Francis B. Johnson	820 S. 44th St.	Lincoln 10
NEW ENGLAND DIVISION				
Connecticut	W1EOR	John L. Henley	RFD	Andover
Maine	W1TVB	Chester A. Dykeman	RFD 1	Gray
Eastern Massachusetts	W1BL	Raymond E. Boardman	53 Thurston Rd.	Newton Upper Falls 64
Western Massachusetts	W1RRX	William F. Ham	222 Westfield Rd.	Holyoke
New Hampshire	W1BXU	William E. Goldthwaite	24 Franklin St.	Concord
Rhode Island	W1TQW	Robert H. Rothman	710 Elmgrove Ave.	Providence
Vermont	W1SIO	Carl M. Anderson	9 West St.	Brattleboro
NORTHWESTERN DIVISION				
Alaska	KL7AMS	Delbert Bailey	Box 1071	Anchorage
Idaho	W7IWU	Alan K. Ross	2105 Irene St.	Boise
Montana	W7KUH	Walter R. Marten	3021 6th Ave., So.	Great Falls
Oregon	W7OYS	Jim A. McCurdy	Fairview Rt.	Coquille
Washington	W7PQT	Vern C. Shafer	519 Talcott	Sedro Woolley
PACIFIC DIVISION				
Hawaii	KH6ABI	Leon K. Johnson	6081 Keoki St.	Honolulu
Nevada	W7JU	Ray T. Warner	539 Birch St.	Boulder City
Santa Clara Valley	W6NVO	Edward T. Turner	2837 Fernwood	San Mateo
East Bay	W6CAN	J. Wayne Clark	70 Hoffman Ave.	Napa
San Francisco	W6NL	Samuel C. Van Liew	215 Knowles Ave.	Daly City
Sacramento Valley	W6JEQ	L. B. LaDue	5400 Carmen Way	Sacramento
San Joaquin Valley	W6EBL	F. E. Robinson	Sonora Motor Hotel	Sonora
ROANOKE DIVISION				
North Carolina	W4ZG	Roy C. Corderman	730 Yorkshire Rd.	Winston-Salem
South Carolina				
Virginia	W4RTV	Hughes L. Motley	121 South Holly Ave.	Highland Springs
West Virginia	W8GEP	Basil B. Bennett	Athens Star Route	Princeton
ROCKY MOUNTAIN DIVISION				
Colorado	WØNIT	Donald Middleton	920 West Adams	Pueblo
Utah	W7IOE	John Tempest, jr.	1599 Orchard Dr.	Salt Lake City
Wyoming	W7ACG	Carter A. Ross	1152 South Willow	Casper
SOUTHEASTERN DIVISION				
Alabama	W4TKL	W. W. Varnedoe	Rt. 4, Box 135	Huntsville
Eastern Florida	W4IYT	Andrew C. Clark	41 Lenape Drive	Miami Springs
Western Florida	W4PLE	Landon L. Hoyt	29 Elliotts Rd.	Fort Walton Beach
Georgia	K4AUM	Elron N. Allred, jr.	Box 24	Hephzibah
West Indies (Cuba-P.R.-V.I.)	KP4HZ	Jorge N. Toledo	P. O. Box 8151	Santurce, P. R.
Canal Zone	KZ5WA	P. Alton White	Box 82	Gamboa
SOUTHWESTERN DIVISION				
Los Angeles	W6LIP	Bruce T. Huntley	4570 San Blas	Woodland Hills
Arizona				
San Diego	W6VFT	Ben S. Hamilton	8447 Denton	La Mesa
Santa Barbara	K6CVR	Robert Hemke	728 W. Mission St.	Santa Barbara
WEST GULF DIVISION				
Northern Texas	W5PVI	James M. Cotten	208 East Oak	Weatherford
Oklahoma	W5KV	Robert D. Reed	4339 So. Peoria	Tulsa
Southern Texas	W5QEM	Roy K. Eggleston	1109 Vernon Drive	Corpus Christi
New Mexico	W5FHP	Thomas V. Widner	3430 Montclaire Drive, N.E.	Albuquerque
CANADIAN DIVISION				
Maritime	VE1RR	Holland H. Shepherd	15 Flint St.	Fairview, N. S.
Ontario	VE3KM	T. W. Clemence	2278 King St., East	Hamilton
Quebec	VE2BR	A. George Brewer	4334 Montrose Ave.	Westmount, Montreal
Alberta	VE6MJ	Sydney T. Jones	10706-57th Ave.	Edmonton
British Columbia	VE7DH	William J. Emerson	693 Sixth St.	Nanaimo, Vancouver Island, B. C.
Yukon				
Manitoba				
Saskatchewan	VE5LU	Lionel O'Byrne		Rowatt

With our last CD (Communications Department, not civil defense) Bulletin, at the request of FCDA, we sent out some 5900 Conelrad reporting forms with a letter of transmittal requesting appointees to report the results of the Conelrad test as heard on their home communications receivers, car radios, portables, or whatever they had on hand to listen with. Considering that this test was conducted in the middle of a working day, the returns have been tremendous. To date (and they are still trickling in) we have received almost two thousand of these report forms completed. In addition, several amateurs have gone to the trouble to prepare graphs, charts, detailed written reports and even tape and wire recordings of the test. The stack of reports has been made available to the agency under contract to FCDA to analyze them. Since many of you will be interested, we'll try to have some results for you next month.

Right now, we want to say that the percentage of returns (over 30 per cent) has been most gratifying. We are usually happy to get a 20 per cent return on such questionnaires, and customarily expect between 10 and 15 per cent. The stamped, ARRL-addressed return envelope helped, of course; but you'd be surprised how many clubs and nets made reproductions of the report form for their members, and how many individuals copied the format so that their observations could be included. This type of cooperation is the sort of thing that makes amateur radio a valuable asset to the nation. Your educated reporting is worth more in an over-all analysis than the reporting of a lay individual.

So congratulations, fellows, on a job well done. Those of you who didn't use the form can use the envelope next time you write to the League about something.

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Are you ready for the Simulated Emergency Test? See announcement elsewhere in this issue of *QST*.

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Amateurs were of material assistance in the search for the body of a drowned camper near Lakeville, Pa. on July 15th by bringing quick aid to the searchers. A plea for a compressed air unit for the aqualungs being used in the search was transmitted by W3QLW to an amateur in Matamoras, who contacted a hospital in Port Jervis, just across the river. Other amateurs who assisted included *W3s* RHT UKF and EM. — *W3QLW*

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A fire at a supermarket in East Paterson, N. J. on July 23rd brought amateur assistance in the form of an emergency net to assist police and firemen with communications. Three mobiles were put into operation, one at Route 4 near the Broadway bridge, another at a midway point between the bridge and the burning store, and another at the store itself. Amateurs involved were *K2s* QGT RLZ JQG and W2CRJ.

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Information has reached us that a number of amateur stations performed creditably during typhoon Wanda which hit Okinawa from July 30th to August 1st. KR6QW was alerted July 30th at 1230. All stations in Okinawa went off the air as power lines went down, except KR6QW and KR6QX, who had emergency power. KR6PO did a good job relaying weather reports and plots of Wanda until his power failed. The NCS stayed on the air throughout the storm to furnish weather reports and plots to Japan and Formosa. The following additional stations were reported to have been active: BV1US; *KA2s* AD EB NG HG DM KA WW NA RR; KA3CY KA5MB; *KA7s* HH CW EG; KA8GA; *KR6s* USA ME MD PO AM MF RR RB SF; VE7JB.

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At the top of the list of our non-emergency activities this month is a job done by W4RRH, SCM of North Carolina, that we think you ought to know about, both because he deserves a lot of credit and because we hope other SCMs and SECs might find themselves inspired to do the same thing.

Aside from the "routine" business of weeding out his EC patch to allow active ECs more developing space, and planting new EC seeds in bare spots wherever qualified men can be found, W4RRH has made available to each EC the following: (1) a map of the state showing the complete AREC organization by districts — 29 districts in all, with an EC in all but two of them. (2) A complete list of towns in each county of the state. (3) A complete list of amateurs in each town in the state, making it easy for each EC to contact amateurs in towns of the counties assigned to his district, appoint his assistant ECs and cover the district in a short time. This was a lot of work and took much time, but will pay dividends in making North Carolina one of the best-organized sections, AREC-wise, in our Field Organization. Our hats are off to Riley Fowler, W4RRH, North Carolina SCM.

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On March 5, the Eastern Florida Dade Emergency Net, Flamingto Net and Graveyard Net were requested to help in a big telethon drive for the Variety Childrens Hospital. Mobiles and fixed stations were requested to assist in the pick-up of donations called into the telethon HQ at the Miami Beach Auditorium. Sixteen collecting posts throughout the county were established, where the mobiles would return their donation pick-ups to Telethon representatives. The existing Inter-County Emergency Plan was utilized, whereby four NCSs located in the four corners of Dade County used their respective mobiles and fixed stations on separate frequencies, with a common frequency in the middle for W4BTM at telethon Hq. W4BTM and K4AG set up under the telethon stage only a few feet from the telephone operators receiving the donation calls, which allowed quick transfer of information. "Operation Pick-Up" went very smoothly with good cooperation on the part of all amateurs and nets. Many stations remained ready to serve throughout the entire telethon. Forty-one stations participated in this exercise. — *W4IYT, SEC Eastern Fla.*

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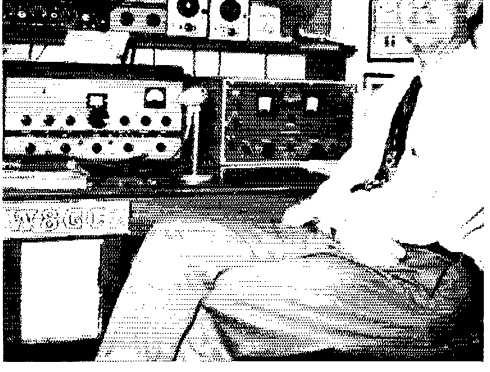
AREC members of Cuyahoga County, Ohio, cooperated with the Sports Car Club and the Cleveland Jaycees by furnishing vital communications at the Akron races on July 1. Five mobile units worked on the inside of the track to back up the field telephones used by the officials in case of line failure and to furnish communications in the event of an accident. Another function was to clear people from the infield who strayed into dangerous positions. Six other mobiles and a fixed station set up next to the airport tower to furnish communications for the Jaycee officials in the widely separated spectator areas outside of the track. Many important communications were handled, such as calls to the Sheriff to remove people from dangerous positions, data on gate crashers, water for people working in the sun, requests for relief of workers made ill by the heat, calls for a doctor, etc. Ohio's Governor Lausche visited the control station and spoke over the network, complimenting the men on the work they had done in past emergencies and



Shown seated at his operating position is Emory Reaser, W8GCZ, PAM of West Virginia. Emory also holds ORS appointment and is manager of the West Virginia Fone Net.

stating that he was very glad they were covering the races at that moment and not some emergency condition where Ohio citizens were suffering. — *W8AEU*

— • • • —

Eighteen SECs reported June activities, representing a total of 4485 AREC members. This is an increase of three reports over June of last year, but a decrease in number of AREC members represented. None of the sections reporting

F. B. Parsons, W2COT, is the energetic EC for Maplewood, N. J., a position he has held for a number of years. His AREC group is connected with Essex County Civil Defense under the State of New Jersey RACES plan.

for June was a new one for this year. The following reported: Mo., NYC-LI, W. N. Y., Tenn., SJV, Santa Barbara, Ala., Wis., Wash., SCV, Md.-Del.-D. C., Mont., Nebr., Ore., E. Pa., E. Fla., N. M., S. C.

The mid-year summary is best shown in chart form. Note our steady progress in SEC reports since the low in 1954; also that despite this we are still a long way from 100 per cent. There are 73 ARRL sections, you know.

Year	*Total Reports*	*Diff. Sections*
1956	113	30
1955	98	26
1954	77	21
1953	103	25

RACES News

A recent note from FCDA tells us that 41 states now have approved RACES plans on file, and that there are 525 other RACES plans approved or pending. It's easier to list the states *not* having RACES plans, so here they are: Arkansas, Kentucky, Mississippi, North Dakota, South Carolina, Texas, Utah. Massachusetts has the greatest number of RACES plans (112) with New York and Connecticut following with 77 and 70 respectively.

Other FCDA tidbits: FCDA is receiving many reports of amateur operation in Operation Alert. If they send them to us, we'll include them in the *QST* story of the operation next month. FCDA Region IV (Hq. Thomasville, Ga.) has a new communications officer in the person of W5BUN; he is replacing an old friend and EC, Stark Totman, W4YB, who is transferring to National Headquarters in Battle Creek.

— • • • —

Tennessee SEC W4RRV reports the results of some tests made for c.d. purposes from the top of the Great Smoky Mountains in Eastern Tennessee and Western North Carolina. On June 4th and 6th he operated low-powered mobile, using ¼-wave verticals, and succeeded in making six solid contacts with Oak Ridge, Tenn.; his own location at the time was between Newfound Gap and Clinghams Dome on the North Carolina side. No contacts were made on two, probably because no one was listening.

On June 19th and 20th a party of hams consisting of *W4s* SOI BBL ZBQ KNY and ASD operated on six and two meters from the Smokies and made about 50 contacts with twelve towns in ten states on six and 18 contacts with five towns in four states on two meters. The conclusion to be drawn is that a low power station on six or two meters can make reliable contact from atop the Smokies with almost any point in Eastern Tennessee and would be most useful for RACES purposes.

— • • • —

The new RACES Radio Officer for the state of Vermont is none other than Ann Chandler, W1OAK, a long-time stalwart in our National Traffic System. We know that Ann will do a good job, and are looking forward to seeing some c.w. activity in the Vermont RACES setup.

— • • • —

FCC approval of the Indiana State RACES Plan was received on July 13, 1956, according to advices received from SCM W9NTA. The RO is W9ZKX, and assisting him are W9TT, W9IHO and W9ZHL. SEC W9QYQ was instrumental in drawing up the plan and getting it approved. W9NTA sent us a copy of a letter from State C.D. Director Strohbehn expressing his gratification at having RACES approved for Indiana and predicting "a great RACES program which certainly has our approval and cooperation."

CODE PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW will be made on October 15th at 2130 EDST. Identical texts will be sent simultaneously by automatic transmitters on 1885, 3555, 7080, 14,100, 21,010, 50,900 and 145,600 kc. The next qualifying run *from W6OWP only* will be transmitted on October 5th at 2100 PDST on 3590 and 7128 kc.

Any person may apply; neither ARRL membership nor an amateur license is required. Send copies of *all* qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m., you may try later for endorsement stickers.

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

Date Subject of Practice Text from August *QST*
Oct. 1st: *Notes on . . . Yagi Arrays*, p. 11
Oct. 4th: *"Tattoo" — Automatic C.W. Transmitter Control*, p. 18
Oct. 10th: *Simple LC Filters for Amateur Use*, p. 25
Oct. 16th: *Multiple V Beams*, p. 28
Oct. 18th: *Improved Keying for the DX-100*, p. 34
Oct. 22nd: *Portable Beam for 50 and 144 Mc.*, p. 35
Oct. 26th: *Socorro Island — 1956*, p. 46
Oct. 30th: *Ham Vacation à la W3VKD*, p. 50

A.R.R.L. ACTIVITIES CALENDAR

Oct. 5th: CP Qualifying Run — W6OWP
Oct. 13th-14th: Simulated Emergency Test
Oct. 15th: CP Qualifying Run — W1AW
Oct. 20th-21st: CD QSO Party (c.w.)
Oct. 27th-28th: CD QSO Party (phone)
Nov. 3rd: CP Qualifying Run — W6OWP
Nov. 10th-11th, 17th-18th: Sweepstakes
Nov. 13th: CP Qualifying Run — W1AW
Dec. 5th: CP Qualifying Run — W6OWP
Dec. 19th: CP Qualifying Run — W1AW
Jan. 3rd: CP Qualifying Run — W6OWP
Jan. 5th-6th: V.H.F. Sweepstakes
Jan. 12th-13th: CD QSO Party (c.w.)
Jan. 17th: CP Qualifying Run — W1AW
Jan. 19th-20th: CD QSO Party (phone)
Feb. 2nd-17th: Novice Round-up
Feb. 6th: CP Qualifying Run — W6OWP
Feb. 8th-10th: DX Competition (phone)
Feb. 12th: Frequency Measuring Test
Feb. 15th: CP Qualifying Run — W1AW
Feb. 22nd-24th: DX Competition (c.w.)
Mar. 7th: CP Qualifying Run — W6OWP
Mar. 8th-10th: DX Competition (phone)
Mar. 18th: CP Qualifying Run — W1AW
Mar. 22nd-24th: DX Competition (c.w.)

ELECTION NOTICE

(To all ARRL members residing in the Sections listed below.)

You are hereby notified that an election for Section Communications Manager is about to be held in your respective Section. This notice supersedes previous notices.

Nominating petitions are solicited. The signatures of five or more ARRL full members of the Section concerned, in good standing, are *required* on each petition. No member shall sign more than one petition.

Each candidate for Section Communications Manager must have been a licensed amateur for at least two years and similarly a full member of the League for at least one continuous year immediately prior to his nomination.

Petitions must be in West Hartford, Conn., on or before noon on the closing dates specified. In cases where no valid nominating petitions were received in response to previous notices, the closing dates are set ahead to the dates given herewith. The complete name, address, and station call of the candidate should be included with the petition. It is advisable that eight or ten full-member signatures be obtained, since on checking names against Headquarters files, with no time to return invalid petitions for additions, a petition may be found invalid by reason of expiring memberships, individual signers uncertain or ignorant of their membership status, etc.

The following nomination form is suggested: (Signers will please add city and street addresses to facilitate checking membership.)

Communications Manager, ARRL. [place and date]
38 La Salle Road, West Hartford, Conn.

We, the undersigned full members of the.....
.....ARRL Section of the.....
Division, hereby nominate.....
as candidate for Section Communications Manager for this Section for the next two-year term of office.

Elections will take place immediately after the closing dates specified for receipt of nominating petitions. The ballots mailed from Headquarters to full members will list in alphabetical sequence the names of all eligible candidates.

You are urged to take the initiative and file nominating petitions immediately. This is your opportunity to put the man of your choice in office.

— *F. E. Handy, Communications Manager*

Section	*Closing Date*	*SCM*	*Present Term Ends*
Yukon *	Oct. 10, 1956	W. R. Williamson	Mar. 17 1949
Idaho	Oct. 10, 1956	Alan K. Ross	June 17, 1956
Nevada	Oct. 10, 1956	Ray T. Warner	Aug. 16, 1956
Arkansas	Oct. 10, 1956	Owen G. Mahaffey	Oct. 15, 1956
Kansas	Oct. 10, 1956	Earl N. Johnston	Oct. 20, 1956
Vermont	Oct. 10, 1956	Robert L. Scott	Resigned
Hawaii	Dec. 10, 1956	Samuel H. Lewbel	Feb. 3, 1957
Sacramento Valley	Dec. 10, 1956	Harold L. Lucero	Feb. 16, 1957
Michigan	Dec. 10, 1956	Thomas G. Mitchell	Feb. 17, 1957
Minnesota	Dec. 10, 1956	Charles M. Bove	Feb. 17, 1957
Oregon	Jan. 10, 1957	Edward F. Conyngham	Mar. 1, 1957
Missouri	Jan. 10, 1957	James W. Hoover	Mar. 1, 1957
Manitoba *	Jan. 10, 1957	John Polmark	Mar. 2, 1957
Mississippi	Jan. 10, 1957	Julian G. Blakely	Mar. 8, 1957
British Columbia *	Jan. 10, 1957	Peter M. McIntyre	Mar.13, 1957
Western Penna.	Jan. 10, 1957	R. M. Heck	Mar. 17, 1957
Md-Del.-D. C.	Jan. 10, 1957	J. W. Gore	Mar. 21, 1957

* In Canadian Sections nominating petitions for Section Managers must be addressed to Canadian Director Alex Reid, 169 Logan Ave., St. Lambert, Quebec. To be valid, petitions must be filed with him on or before closing dates named.

ELECTION RESULTS

Valid petitions nominating a single candidate as Section Manager were filed by members in the following Sections, completing their election in accordance with regular League policy, each term of office starting on the date given.

Western New York	Charles T. Hansen, K2HUK	Aug. 10, 1956
Northern Texas	Ray A. Thacker, W5TFP	Aug. 10, 1956
Santa Clara Valley	G. Donald Eberlein, W6YHM	Oct. 15, 1956

In the Kentucky Section of the Great Lakes Division, Mr. Albert M. Barnes, W4KKW, and Mr. Meck Brazelton, W4JSH, were nominated. Mr. Barnes received 108 votes and Mr. Brazelton received 85 votes. Mr. Barnes' term of office began Aug. 16, 1956.

In the Montana Section of the Northwestern Division, Mr. Vernon L. Phillips, W7NPV/WXL, Mr. Ray Woods, W7SFK, Mr. Leslie E. Crouter, W7CT, and Mr. Walter R. Marten, W7KUH, were nominated. Mr. Phillips received 70 votes, Mr. Woods received 49 votes, Mr. Crouter received 36 votes and Mr. Marten received 25 votes. Mr. Phillips' term of office began Sept. 1, 1956.

DX CENTURY CLUB AWARDS

HONOR ROLL

W1FH....266	W8NBK...256	W3JTC....254
W8HGW...265	W3BES...256	W5A8G....254
W6AM....265	W6DZZ...256	W3KT.....254
W9NDA...260	W3GHD...256	W7AMX....253
W6MX....260	G2PL.....255	W6TT.....253
W6ENV...260	W8KIA....255	ZL2GX....253
W6VFR...259	W2AGW...255	W6SN.....252
PY2CK...257	W8BRA....254	W6MEK....252
W6SYG...257		G6ZO.....252

Radiotelephone

PY2CK....249	W8HGW...231	W9RBI....227
VQ4ERR...243	GM3DHD 230	W3JNN....226
W1FH.....240	W9NDA....227	W6AM.....224
ZS6BW....237	W1NWO...227	W8GZ.....223

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

NEW MEMBERS

W5MMK...205	OK3EA....105	W4VPD....101
W3MFJ....127	W3NQC....104	JA3BB.....101
W3RBE....122	W7MWR....104	ZS4FP.....101
WØQDF....120	WØNGF....104	W1GOF....100
VK3XO....120	W2WFC....103	W7NRB....100
W6MPY....114	W4OPM....103	WØCDV....100
VP7NS....112	W6NHA....103	WØPDN....100
OH4NT....111	VK3AHH...103	DJ2BW....100
CR7LU....110	W5MCO....102	DL7EM....100
W7IQI....108	K6DNH....102	DL9TJ....100
W6TKX....106	W7BGA....102	G3FKH....100
W6YBR....106	GI3IVJ....102	G8KS.....100
OH7OL....106	JA6AK....102	MP4QAL...100
OK1JQ....106	W2CJM....101	ZL2AFZ....100

Radiotelephone

W5MMK...152	LU5DC....102	W1VFK....100
I1ZCT....115	CO1AF....101	W5UBW....100
W5TIZ....108	EA4EP....101	W6LTY....100
W2GIC....103	VP9L.....101	SU1AS....100

ENDORSEMENTS

W6RW....248	W1BFT....174	W2ROM....138
FA8IH....230	W6CAE....174	CR7AF....138
W5ADZ....229	W6YK.....172	W4DCW....135
W6NTR....226	GI4RY....171	OZ7KV....134
W5FFW....224	W5NW.....170	ZS6LW....134
W6NNV....223	VK5RX....168	W7PZ.....132
W6LDD....212	W9KA.....165	W6ITH....131
W8SDR....205	W3AYS....162	JA6AO....131
W6LDJ....203	W6SWG....162	W2HQL....130
W2EMW....201	W8MWL....162	W3SOH....130
W4CYY....200	WØVBQ....160	W8DLH....130
W8KML....200	W5PZL....160	WØDST....130
ZS1BK....198	W7PHO....160	W1BRX....125
W6BVM....191	PY4ZS....160	K6CJQ....123
W5DMR....191	W6FOZ....159	K6EWL....123
W5OLG....190	W7FB.....154	W3SWV....122
W9BQE....188	ZL2HP....153	WØCDP....122
W4EPA....182	W8HMI....151	K6EVR....120
K2GFQ....180	DL3RK....151	SM5KV....120
W9UXO....180	W1ODW....150	EA6AF....119
I1XK.....180	W6NZ.....150	W9ROU....116
W6ALQ....177	W7KWO....150	W5VGR....115
W2LV.....177	W8DEN....150	DJ2AE.....114
W6MEL....176	W7VMP....146	W5TIZ.....111
W9QIY....175	W4AIS....140	W1PFA....110
	W6QNA....140	

Radiotelephone

W8KML....200	PY4ZS....148	W6ITH....131
W8BKP....190	W4EEE....147	W2PUN....120
W7ADS....161	K2CJN....141	ZS6LW....112
W5GXP....160	KL7AON...140	W6CLS....111
W6CHV....160	W8SDR....136	W5HJA....110
LA5YE....160	LU8BS....135	W6MEL....110
W6SYG....150	W5KUJ....131	G3AIZ.....110

W/VE/VO Call Area and Continental Leaders

W4TO.....247	VE3QD....210	VE8AW....181
WØYXO....250	VE4XO....118	VO6EP....190
VE1HG....159	VE5QZ....140	ZS6BW....243
VE2WW....189	VE6VK....143	4X4RE....218
	VE7GI....212	

Radiotelephone

W2BXA....203	WØAIW....201	VE5YE....140
W4HA.....201	VE1CR....120	VE7ZM....163
W5BGP....218	VE2GQ....118	ZL2GX....206
W7HIA....185	VE3KF....163	OD5AB....170

CLUB COUNCILS AND FEDERATIONS

British Columbia Amateur Radio Association, Inc., Ernie Savage, VE7FB, Secy.-Treas., 4553 West 12th Ave., Vancouver 8, B. C., Canada.

Central California Radio Council, Edward J. Roussey, W6VCZ, Secy., 1509 Newlands Ave., Burlingame, Calif.

Chicago Area Radio Club Council, Inc., George Nesbed, W9LQF, Secy., 2129 S. Harvey Ave., Berwyn, Ill.

Cleveland Area Council of Amateur Radio Clubs, Inc., C. E. Ormston, W8YMB, Secy., 3703 Boston Rd., Brecksville, Ohio.

Eastern New York Council of Radio Clubs, George W. Tracy, W2EFU, Secy., 1138 North Country Club Drive, Schenectady 9, N. Y.

Federation of Long Island Radio Clubs, Robert I. Lippman, K2CFH, Secy., 30-51 Hobart St., Woodside 77, N. Y.

Indiana Radio Club Council, Joseph A. Cress, W9GRA, Secy., 7441 Baring Parkway, Hammond, Ind.

Los Angeles Area Council of Amateur Radio Clubs, Mrs. Billie Lue Blakesley, K6ANG, Secy.-Treas., 409 W. Brookdale Pl., Fullerton, Calif.

Michigan Council of Clubs, Currin L. Skutt, W8FSZ, Secy., 119 N. Foster St., Lansing 12, Mich.

Ohio Council Amateur Radio Clubs, Ralph Crammer, W8VHO, Secy., 3989 Indianola Ave., Columbus 14, Ohio.

Philadelphia Area Council of Radio Clubs, Joseph D. Welch, W3UQV, Secy., 5026 Walnut St., Phila., Penna.

Sacramento Council of Amateur Radio Clubs, Walter H. Wade, W6LLR, Secy., 7044 — 28th St., Rio Linda, Calif.

St. Louis Area Amateur Radio Council, Mrs. Marie Van Aller, WØPFO, Secy., 4960a Mardel, St. Louis, Mo.

San Diego Council of Amateur Radio Organizations, Sidney A. Burnett, W6KSI, Secy., 219 Citrus Ave., Imperial Beach, Calif.

Twin City Area Amateur Radio Council, Ben F. Swezey, jr., WØRAG, Secy., 3214 Benjamin St., N.E., Minneapolis 18, Minn.

Western Pennsylvania Amateur Radio Club Council, R. M. Heck, W3NCD, Secy., Rt. 1, Sharpsville, Pa.

Wisconsin Council of Radio Clubs, Harold W. Petersen, W9NLH, Secy., 77 W. Pine St., Sturgeon Bay, Wis.

BRIEF

From the KYN-KPN (Kentucky) section bulletin we note that W4QCD (S. S. Loomis, 601 East Main, Corbin, Ky.) is an enthusiast for c.w. chess games as well as traffic handling. We'll be glad to give additional calls of amateur operators who would like to be contacted for the purpose of completing some games.

TEAMWORK KEYNOTES AMATEUR CONTACTS WITH KC4USA AND KC4USV

The Radio Amateurs of Greater Syracuse club has received a "well done" from the U. S. Navy for success attained in organizing an operational amateur communications group to maintain contact with KC4USA and KC4USV. At Little America and McMurdo Sound nearly 9000 miles from Washington, D. C., 166 Seabees and Navy personnel have been wintering over in the Antarctic. Amateurs all over the nation have frequent contact, but the Syracuse group is especially organized in a long term project to burn the midnight oil on a voluntary basis in support of these men of Operation Deepfreeze.

We're indebted to W2KUD, club president, for facts on this going enterprise, and we refer you to the lead article in the August issue of the *National Geographic*, if you care to pursue the fascinating broad story (with color photographs) of life in the Antarctic. Many amateurs will have heard the daily c.w. schedule between W2COU, W2WS and K4GFR, the staff communications officer of the expedition at Washington (7.05 Mc. c.w. 1700 EST daily) for traffic routings.

Ken Thomas of the RAGS group conceived this day-by-day communication with the KC4s as a club objective. The late W2BTB visited Washington in December to examine all angles of the proposed operation and discussed the club's plan for cooperation. Paul Blum, W2KCR, was made Chairman of the club's *Operation Deepfreeze Committee*. The communications group has been reportedly too busy to worry about credits for its operations. Up to the end of July, they have totaled more than 650 messages, the major portion of all personal traffic of KC4USA and KC4USV — not to mention informal telephone accommodations for the Seabees in keeping in touch with their families in the U.S.A.

Three operating teams including fourteen volunteering operators man three different Syracuse stations capable of running the full permitted amateur power. One or more of the stations is in operation from midnight to seven A.M. seven days a week. The purpose is to handle as much as possible of the personal traffic from the Antarctic. The stations and their operators — W2KCR (s.s.b.): W2KCR, W2COU, K2HWP, W2TEB, K2DUY, W2KUD, W2RWJ, W2WS, W2QAR. W2CKY (AM): W2CKY, W2VSP, W2UBJ, W2ABV. K2KID (s.s.b.): K2KID.

In connection with this work the RAGS committee has a secretary, Evelyn R. Reid, K2DXD. These licensed operators, all members of ARRL and RAGS, alternate on all-night schedules now going into the fourth and fifth months. Initial contacts with KC4USA-V on 14,293 and 14,281 kc. are followed by work there or a move to points in the band less subject to interference. Much traffic is handled in collaboration with the Red Cross on the delivery side, since "next of kin" data are often involved. All families of expedition personnel have been notified of the availability of the service. Dozens of appreciative letters have been received. Many of the expeditioners vow that on return they will make a pilgrimage to Syracuse to visit the club and the operators! Real teamwork and success and conduct of reliable communications over the thousands of miles is a challenging objective for any club and RAGS is setting a pioneering example for club and teamwork activities in this field.

Paul Blum, W2KCR, at his station with W2TEB (left) and K2KID (center). The trio is discussing details of the communications work with KC4USA and KC4USV.

RESULTS, JULY CD PARTIES

Perhaps the reason ORS W6BIP leads in sections worked is because he raised QSL Manager VE8AW, ARRL's only Yukon appointee, during the course of the July c.w. CD Party. But you almost had to be an Easterner to rate the "top ten" — eight of the pace-setting brasspounders were W1s or W3s. Note the tight battles for section honors between ORS/OPS W1JYH and ORS W1EOB in W. Mass. and between OO W3VOS and ORS W3PZW in Md.-Del.-D. C. Three rare Canadian sections were provided in quantity by OPS/EC VE6NX, ORS VE7AC and OO VE2YU. Greater use of the higher bands keynoted the summer party; an early-afternoon meeting on 21 Mc. July 22nd was attended by *W1s* ARR CRW EOB JYH TYQ UGW ZDP, *W2s* AYJ DRV KEL WS, K2DSW, *W3s* ARK JNQ NF PZW QOR/3 TMZ, *W4s* BZE KVX LAP PNK ZM, K4IXG, *W5s* AHC DEJ, *W6s* BIP JVA/6, *W7s* FZB JU UJL WAH, *W8s* AJW AQ BUM PLQ, *W9s* KLD WRO YZA, VE2DR and *VE3s* BBM DH GT. A smattering of work was reported too on 28 Mc., a band which will bear close watching in the October Party.

In the radiotelephone get-together July 28th and 29th, ORS W3TMZ wound up ahead of other appointment-holders in score, QSOs and sections. Courtesy of a Ranger running a modest 60 watts input, Jack seems to have modulated to some sort of QRP record. OES/ORS W8NOH, ORS K2EIU, OPS W3BNR, ORS/OPS W8NYH and ORS W1GVK also salted away five-digit tallies. Activity centered on the 40- and 75-meter phone portions in what proved to be an East-of-the-Mississippi affair entirely. We trust that the W5/W6/W7 clan will again boom through the heterodynes during the better conditions anticipated this fall.

The highest claimed scores are shown below. Figures after each call indicate score, number of contacts and number of sections worked. Final and complete results with listings by League divisions and sections will be forthcoming in the October CD Bulletin.

C W.

W6BIP	144,875-260-61
W1JYH	138,600-455-60
W1EOB	126,850-423-59
W3JNQ	121,520-429-56
W3VOS	104,145-348-60
W1WEF	100,980-367-54
W3PZW	98,570-359-54
W1TYQ	98,020-338-58
W3NF	93,810-347-53
W9DIK	92,060-309-58
K2DSW	90,630-312-57
W1AW[1]	88,920-305-57
VE6NX	88,128-192-51
W1UGW	85,860-319-53
W3TMZ	83,600-304-55
W3QOR/3	80,340-305-52
W6JVA/6	79,200-180-48
K2AFQ	78,780-297-52
VE7AC	73,776-168-48
K2EIU	72,520-290-49
W9YZA	69,360-266-51
W2AYJ	65,520-245-52
W7UJL	64,625-150-47
W9FGX	64,080-261-48
W2FEB	62,540-232-53
W9YYG	61,200-250-48
K6DYX	59,724-141-46
W9MAK	58,448-219-52
VE2YU	56,165-234-47
K6ORT	54,225-130-45
W3CUL	53,140-202-51
W4KFC	50,985-210-47
W2EEN	50,715-203-49

[1] W1WPR, opr.

PHONE

W3TMZ	21,700-140-31
W8NOH	15,000- 95-30
K2EIU	13,440- 90-28
W3BNR	11,125- 89-25
W8NYH	10,625- 85-25
W1GVK	10,120- 92-22
W1YBH	9800- 95-20
W3EAN	9460- 81-22
K2AFQ	8800- 74-22
W1EOB	8395- 66-23
K2OMT/2	7590- 66-22
W3ADE	7260- 59-22
K2DSW	6930- 71-18
W1MRP	6840- 72-19
W3CUL	6175- 59-19
W4WQT	5980- 47-23
W2EEN	5605- 55-19
W4JUJ	5220- 51-18
W1FZ/1	5200- 60-16

BRIEFS

Each summer many visitors drop in to meet the Headquarters gang. Among those who saw the ARRL offices or W1AW or both in June and July: *W1s* CCK CPP FEO FJD GYR HAD HFA JBF JEL JJP QJL SHV TIV TRE TSL TTA TYU UOQ VJE VVS WEA WZJ YAO ZEP ZJY ZQM, *WN1s* GVM IVB KZT LCI LPG, *W2s* CGU CJU DGW EUP EUQ GBM GG JTP LSX MTQ TUK VC YHP YSM ZRC, *K2s* AJV CIN GWW JVL LCG LCH LCN MVR OTK PPB, *KN2s* RUX TFA, *W3s* BGP BSF CFA LNW NKM NUG QXF ROJ WOC WQF WYR YLL ZUF ZUG, WN3GEU, *W4s* DAL DEE DEM EBO JXF LUS OHM RTV RXF SBB TDW TEA, *K4s* AJP BEH CCN, W5EYY, *W6s* CFO QGV TZZ, *K6s* BHG BWD KFF KMZ, *W8s* DAA GZK IBV NLV PEN QOV QQH SPU TFE TMA, KN8AFN, *W9s* CRD GSP HTF HXX QBI RYK UOR, KN9DCK, *WØs* ANK BTV NHO NHY QDQ RLQ, KNØDKA, KH6IJ, KP4AAC, *VE2s* AGG FM UY, VE3BAL, VK2JU, ex-HB9NP, ex-GM3NH.

If planning to come to W1AW, check the visiting-hours schedule which appears every other month in *QST*. Before you come up, it's also a good idea to ask ARRL for the printed map which shows how to reach the station from main highways.

— • • • —

". . . Skillful homebuilding to get on the air was necessary in the early days. With the popularity of phone and the influx of many new operators it seems wise to restate the case of code. More often than not this new amateur purchases all his equipment ready-made. His only effort may be to cut some coax. Now he is in business, can communicate immediately on phone and gab with the best. Nothing remarkable or startling has been accomplished.

"Suppose this same individual gets a key with his purchases and attempts to use code. He discovers that he is not proficient . . . and wonders why he gets no answers; he becomes aware that it will take some doing to bat it off and take it with the skilled. Often at this stage the newly-licensed will return to phone. . . . If, however, Mr. New Ham perseveres in code, it will one day dawn on him that he has become master of a most accurate and efficient means of communications. His DX horizons will have *greatly* increased, the reliability of his schedules likewise. He will have found himself in a new and truly fascinating hobby. . . . Code *is* important, and the fellow who forgets what little code he knew on getting his ticket cannot know or enjoy these things."

— *WØDZG* in *Podunk News*

TRAFFIC TOPICS

This year, in the Simulated Emergency Test, hoping that it will increase activity, we are returning to the practice used in former years of all participating amateurs originating a message to ARRL Headquarters indicating their participation. ECs will summarize their groups activities, as usual, but each amateur operator participating will be asked to originate a message to ARRL to be relayed through whatever week end routes are available. In addition, traffic will be flowing nationally for both the Red Cross and Civil Defense. Some details of the test are given elsewhere in this issue (see Table of Contents). We think it well here to make particular note of the changed aspect of the SET from previous recent years when nationwide traffic was kept at a minimum. This year we are letting down the bars.

There should be plenty of traffic to keep everyone busy. A lot of it will be directed at ARRL. Some will be directed to American National Red Cross, and to FCDA. W1AW, W1NJM and other stations representing ARRL Headquarters will be on to receive traffic to this headquarters. W2CRD, W3PZA, W6CXO and W9DUA will be active for the Red Cross, and any traffic directed to ANRC can be delivered to any one of those stations. FCDA will have a station at Battle Creek, and some of the FCDA regions will have stations on the air to handle FCDA traffic.

It will be a big traffic week end. Monitor your National Calling and Emergency frequencies (see box insert) and get into this shindig. Help get this traffic delivered promptly to its destination. It's a job for us traffic men.

— • • • —

Transcontinental Phone Net reports traffic count of 512 for First Call Area, 969 for Second Call Area, 204 for the combined Fourth, Ninth and Tenth Call Areas; total, 1685. North Texas-Oklahoma Net reports 31 sessions, 788 checkins and 211 messages in July. The Early Bird Transcontinental Net handled 594 messages during the month.

National Traffic System. Your headquarters has a publication labeled CD-24 that explains in detail the operation of the National Traffic System. It outlines basic principles and objectives, goes into the operation of each level of nets, recommends specific operating procedure (with examples), explains fully the operation of the Transcontinental Corps, and includes appendices fully exemplifying each NTS operation and a functional diagram showing how the system is laid out. CD-24 "takes you by the hand" and gives you all the dope on NTS.

Now of course there is nothing in any sense mandatory about all this. It is simply the picture of a structure —

a structure designed specifically for a nationwide organized purpose. If we eliminated the personal and human elements, NTS would work like a clock. In some places at some times it has approached this, but ofttimes there are deviations made necessary by personnel unavailabilities or disinclinations which, having an adverse affect on a particular part of the system, thus have the same effect on the over-all system. For a system consists of interdependent parts, each having a specific function or relation with respect to the whole.

When we used the phrase "made necessary" above, we meant just that. Deviations sometimes *are* necessary. What we should all take particular care to guard against are deviations that are *not* necessary but are a result of someone's opinion for a concession to his convenience; against deviations that have only one thing in their favor: that they are the path of least resistance. If we want a system, we'll constantly strive to support that system's structure. Temporary expedients may at times become requisite; but let's guard against inroads into NTS organization in the name of expediency, and let's strive to eliminate such temporary measures as quickly as possible.

July reports:

Net	*Sessions*	*Traffic*	*Rate*	*Average*	*Representation (%)*
EAN	24	568	0.75	23.7	80.6
CAN	22	806	1.11	36.6	100
PAN	26	—			100
1RN	26	326	0.53	12.5	89.0[1]
2RN	26	219	0.40	8.4	100[1]
3RN	57	210	0.43	3.7	66.1
RN5	32	292	0.56	9.1	48.0
8RN	42	124	....	3.0	81.0
9RN	31	545	0.48	17.6	95.2
TEN	70	1195	....	15.7	62.7
TRN	12	6	....	0.5	61.1[1]
Sections[2]	392	2810	....	7.2	.....
TCC Central		679			
TCC Pacific	83[3]	437			
Summary-Total	760	8117	CAN	9.2	.....
Record	760	8117	1.16	15.2	1000

[1] Regional net representation based on one session per night. Others are based on two or more sessions per night.

[2] Section nets reporting: IFN (Ind.); Iowa 75 Meter Phone; TLCN (Ia.); AENB, AENP & AENT (Ala.); QKS & QKS SS (Kans.); CN & CPN (Conn.); SCN (Cal.); WVN (W. Va.); GSN (Ga.) MSN (Minn.); KYN (Ky.); NTX (Tex.).

[3] TCC out of-net schedules, not counted as net sessions.

Several NTS net managers have opined that we're having a rough summer — and we are. But we continue to topple records of previous years, indicating we have had rougher ones. Both the number of sessions and the amount of traffic handled exceeded all previous July totals, and this with three NTS regional nets not reporting. So keep on thinking we're doing poorly if it will make you strive to do better; but don't let it discourage you. About the time you read this, activity will be picking up.

W9DO says that cooperation on CAN is better and better, with 100 per cent representation from all regions, any one of whom takes over as NCS in case the regular NCS doesn't show up. PAN Manager W7APF is having trouble recovering from an operation, but W7NH has been doing an excellent job as his stand-in. On 2RN, W2ZRC says traffic has been slow, conditions horrible, attendance excellent, with K2DXV outstanding for his substituting for vacationing regulars. W3WG, W3BUD and W3LXQ have received well-earned 3RN certificates; W3PZW has resumed his NCS duties on return from Alaska. W4COU is really getting after the boys on RN5, but says there is too much paper work. W4KKW has been elected Kentucky SCM, but hopes to continue as 9RN Manager. WØSCT has brought up S. Dak. attendance on TEN, sez Lydia, WØKJZ. TRN is at low ebb with no Maritimes representation at all; VE2DR has done much to hold the fort.

Transcontinental Corps: Vacancies exist in the Pacific and Eastern Areas, but all spots in the Central Area are filled by good reliable stations at this writing. Vacations and bad conditions of course hamper TCC operations, in which long-haul contacts are required. Here is the present TCC roster: Eastern Area (W8UPB, Director) — W1EMG, W1NJM, W1YNC, W2ZRC, W3COK, W3WG, VE3VZ; Central Area (WØSCA, Director) — WØBDR, WØDQL, WØKJZ, WØLGG, WØSCA; Pacific Area (WØKQD, Director) — W5QKJ, W6ADB, W6BPT, W6HC, W6RFW, W6VZT, W6YHM, K6DYX, K6GUZ, K6GZ, W7FRU, WØKQD. In the Eastern Area there are 24 TCC functions, 11 of which are now covered by 7 stations; in the Central Area there are 12 functions, all covered by 5 stations; in the Pacific Area there are 24 functions, all but two of which are covered by 12 stations.

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for July traffic:

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
W7PGY	19	696	633	57	1405
W3CUL	115	526	444	79	1164
KH6QU	89	524	439	51	1103
W2KEB	24	523	402	152	1101
W7BA	27	513	480	31	1051
WØPZO	9	487	472	7	975
WØBDR	74	456	418	9	957
WØSCA	11	471	461	5	948
W7VAZ	8	424	381	43	856
W9NZZ	232	310	2	303	847
W2KFV	12	437	326	64	839
W9DO	21	397	382	36	836
WØGAR	9	311	316	4	640
WØLCX	6	306	300	6	618
W6DDE	0	262	289	0	551
W5DTA/5	6	250	261	7	524
KØFEI	9	249	254	9	521
K5FFB	18	244	237	19	518
W3WG	19	233	237	14	503
Late Report:					
W7APF (June)	1	332	320	12	665

More-Than-One-Operator Stations

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
W6YDK	18	416	306	110	850
K7FEA	13	319	314	5	651
K3WCO	302	0	208	5	515

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

W6GYH	298	W9JYO	121	W8WTO	108
W8OPU	148	W9KTX	116	W1BPW	103
KP6AK	127	W1YRH	115	WØKJZ	102
W6FEA	126	W3ZRQ	113	W1FAU	101
		W6LYG	112		

More-Than-One-Operator Stations

K3WBJ	117	W3UCR	116

BPL medallions (see Aug. 1954 *QST*, p. 64) have been awarded to the following amateurs since last month's listing: W9MAK, WØTVR.

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

BRIEFS

With his hand on the paddle of his trusty bug
And a leer that covered his grinning mug,
He rattles it off 'til it makes no sense
Like a kid with a stick on a picket fence;
And he has the boys in a mighty sweat —
He's the holy terror of the c.w. net.
But it happened one night when the skip was long
That a W3 with a signal strong
Came back and asked him to QRS:
"You're 579, QRM I guess."
With a smile on his face he left his bug,
And giving his shoulders a knowing shrug,
The hand-key took at a five-word speed.
His feeling of virtue would make you bleed;
For he never discovered that it made no diff,
And his sending was still like a hieroglyph.
Dots and dashes all over the place
But he couldn't make spaces to save his face.
The space he needs is six-feet-under.
Will he ever find it? I'm beginning to wonder.

— *W7OMO in Pacific Area Net News*

After reading over the results of the 1956 DX Contest in the last issue, W3RPG wonders how many countries were worked by W/VE phone entrants on ten meters. We're pleased to advise that W9DUB lead with 55 different, while W1ONK and W8RLT landed 53 apiece. Others who talked to 50-or-more countries on 28 Mc. during the Test: W3DHM, W3GHS, W3MSK, W3RPG, W4ESP and W8ZOK.

Skywires — Then and Now

IN THE EARLY DAYS of ham radio the unmistakable sign of an amateur station was an enormous antenna — and we really mean enormous. A flat top antenna consisting of four or more wires, separated from two to four feet and hundreds of feet long, was not at all uncommon. Some of them even ran a full block. With the coming of the radio law of 1912, the biggest ones were cut down to size but a 200 meter spark transmitter still needed plenty of skywire to get anywhere. And so did the early receiver with its woefully insensitive crystal detector.

TODAY, many well located amateurs still have room to put up any type of antenna they prefer. Many of the rotary beams and rhombics now in use are just as impressive appearing as the old Marconi flat tops. Most of us, however, get along with more modest installations, but there is an unfortunately large group who must do the best it can with antennas bearing little or no resemblance to the correct designs shown in the Handbook.

IF YOU are unable, because of lack of space or an uncooperative landlord, to put up the type of antenna you should have, don't be too discouraged. There are many ways to get around such handicaps. Skywires of less than the correct length can still be made to radiate reasonably well with a simple "PI" or "L" section tuner; mobile operation is successful using a short whip and a loading coil, a combination which could be installed almost anywhere; and we once heard of an amateur who made a full size 80 meter half wave of No. 32 black enamelled wire and put it up on a dark night. It was practically invisible, and no one was ever the wiser.

UNDERSTAND — we do not recommend these makeshifts. A properly designed antenna is a tremendous advantage. Even without it you will find amateur radio can still be a richly rewarding hobby. If you still doubt that a less than ideal antenna can give worthwhile performance, ask someone who had wartime experience with the SCR-299. This completely mobile station, built for the Signal Corps by Hallicrafters, used a 30 foot whip with a base loading coupler. With this set up the SCR-299 operated on any frequency from 1.5 to 30 megacycles, and gave real long distance communications on every battle front — frequently while travelling at high speed.

REGARDLESS of your particular type of skywire, now is the time of year to give it a thorough once-over to make sure it will stay up through the winter months. The combination of a wrecked antenna and a howling blizzard right in the middle of amateur radio's most active season shouldn't happen to anyone . . . Please see that it doesn't happen to you. — CY READ, W9AA

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

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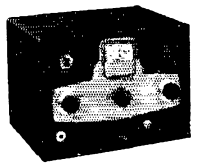

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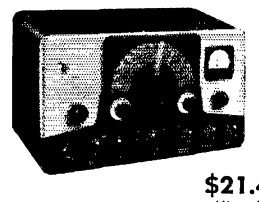

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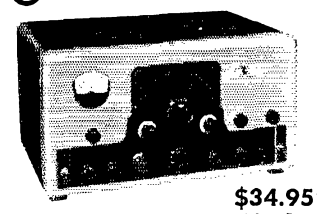

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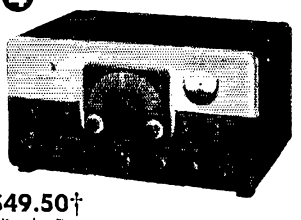

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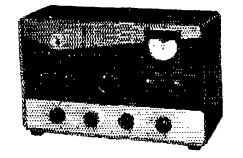

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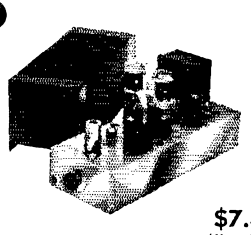

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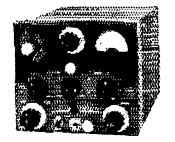

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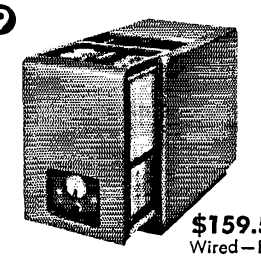

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UNIT	POWER RATING	FREQUENCY COVERAGE	DESCRIPTION — FEATURES	AMATEUR NET
1	50 watts CW input	Bandswitching 80, 40, 20, 15, 11 and 10 meters	Easy to assemble and operate. Effectively TVI suppressed . . . built-in power supply . . . enough power for world-wide contacts. Wide range pi-network output tuning — no antenna tuner needed. Complete with tubes, less crystal and key.	Cat. No. **240-181-1** Kit **$54.95**
2	75 watts CW input ...65 watts phone	Bandswitching 160, 80, 40, 20, 15, 11 and 10 meters	Completely self-contained . . . serves as a transmitter or RF and audio exciter. Effectively TVI suppressed . . . built-in VFO or crystal control . . . 100% AM modulation . . . high gain audio. Pi-network antenna matching from 50 to 500 ohms Timed sequence, break-in keying. No internal changes required to switch from transmitter to exciter operation. Complete with tubes, less crystals, key and mike.	Cat. No. **240-161-1** Kit **$214.50** Cat. No. **240-161-2** Wired **$293.00**
3	275 watts CW and SSB*...200 watts phone *P.E.P. input with an auxiliary SSB exciter	Bandswitching 160, 80, 40, 20, 15, 11 and 10 meters	Built-in VFO or crystal control. Pi-network antenna matching from 50 to 600 ohms — silver-plated final tank coil. Timed sequence, break-in keying . . . TVI suppressed . . . high gain push-to-talk audio system . . . low level audio clipping . . built-in low pass audio filter. As an exciter will drive any of the popular killowatt level tubes. Complete with tubes, less crystals, key, and mike.	Cat. No. **240-104-1** Kit **$349.50** Cat. No. **240-104-2** Wired **$439.50**
4	90 watts CW and SSB (P.E.P.) . . . 35 watts AM	Bandswitching 80, 40, 20, 15 and 10 meters	More than a single-sideband exciter — a self-contained transmitter, too. Extremely stable, temperature compensated built-in VFO. "Fool-proof" voice controlled operation. Effectively TVI suppressed — completely self-contained. Pi-network antenna matching from 50 to 600 ohms. Plenty of power to drive conventional or grounded grid kilowatt amplifiers. With tubes and crystals, less key and mike.	Cat. No. **240-301-2** Wired **$495.00**
5	600 watts CW . . . 500 AM and SSB* *P.E.P. input with an auxiliary SSB exciter	Bandswitching 80, 40, 20, 15, 11 and 10 meters	VFO and exciter stages gang-tuned. Two compact units — RF unit small enough to place on your operating desk beside your receiver. Built-in VFO or crystal control . . . effectively TVI suppressed . . . high gain push-to-talk audio . . . timed sequence, break-in keying . . . low level audio clipping. With tubes, less crystals, key, and mike.	Cat. No. **240-500-1** Kit **$649.50*** Cat. No. **240-500-2** Wired **$799.50***
6	150 watts CW input . . . 100 watts AM	Bandswitching 6 and 2 meters	New for VHF! Designed for use with the Viking "Ranger," Viking I, Viking II, or similar power supply/modulator combinations capable of at least 6.3 VAC at 3.5 amp., 300 VDC at 70 ma., 300 to 750 VDC at 200 ma., and 30 or more watts audio. Operates by external VFO (with 8-9 mc output) or built-in crystal control. All circuits metered. With tubes, less crystals, key, and mike.	Cat. No. **240-201-1** Kit **$99.50*** Cat. No. **240-201-2** Wired **$129.50***
7	10 watt Speech Amplifier	———	Self-contained 10 watt speech amplifier complete with power supply. Speech clipping and filtering designed to raise average modulated carrier level . . . improves the performance and effectiveness of your AM transmitter. Inputs provided for mike and phone patch. Complete with tubes.	Cat. No. **250-33-1** Kit **$73.50** Cat. No. **250-33-2** Wired **$99.50**
8	60 watts maximum PA input	Bandswitching 75, 40, 20, 15, 11 and 10 meters	Designed for under-dash mounting. All controls readily accessible to operator. Coupling system engineered for maximum power transfer — all stages ganged to a single tuning knob. Unit may be wired for either 6 or 12 volts. Requires power supply delivering 300 volts (30 watts PA input) to 600 volts (60 watts PA input) at 200 ma.	Cat. No. **240-141-1** Kit **$99.50** Cat. No. **240-141-2** Wired on Special Order
9	1,000 watts CW, AM and SSB	Continuous tuning 3.5 to 30 megacycles	Boldly styled kilowatt power amplifier — contains every conceivable feature for safety, operating convenience, and peak performance. Low power or maximum legal input with the flip of a switch. Compact pedestal contains complete kilowatt — rolls out for adjustment and maintenance. Excitation requirements: 30 watts RF and 15 watts audio for AM; 2-3 watts P.E.P. for SSB. Completely wired and tested with tubes. (Matching desk top and 3 drawer pedestal available.)	Cat. No. **240-1000** Wired **$1,595.00** Cat. No. **251-101-1** Desk Top and Pedestal F.O.B. Cory, Pa. **$123.50**

***Price subject to change at time of delivery.**

Station Activities

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

ATLANTIC DIVISION

EASTERN PENNSYLVANIA — SCM, Clarence Snyder, W3PYF — SEC: NNT. RM: AXA. PAM: TEJ. EPA nets: 3510 and 3850 kc. Quite a bit of activity was noticed on the CD Party from Eastern Pennsylvania appointees. Some of those heard were QOR, NF, ZRQ, EAN, BNR, CUL, ADE, BUR and PYF. YUW has a new mobile rig. VMJ has a new 2-meter converter. ID is mobile with a 10-watter and Sonar MR3. DVB now has an amateur Extra Class license. CMN dropped the "N." The Wyoming Valley Amateur Radio club is now incorporated. The West Philadelphia Radio Assn. (MKA) installed a new Sonar 2-meter c.d. transceiver. HLR now has his General Class ticket. YDX has added its fourth transmitter for club activities. New officers of the Harrisburg Radio Amateurs Club are ARY, pres.; JXQ, vice-pres.; ADE, treas.; and BQA, secy. New officers of the Delco Radio Club are UMK, pres.; BGP vice-pres.; VAS, secy.; DWI, treas.; and AJ8, trustee. BGR is the new Eastern Pennsylvania Area Radio Officer, replacing FBF. SMC is now Class 1 OO. DJZ is the new State Radio Officer, replacing UA. BBX is running 500 watts on s.s.b. LSG is looking for some c.d. activity in South Coventry Twp., Chester County. Again I call to the attention of all appointees, OPS, ORS, OO, OES and EC, that monthly reports must be submitted to keep your appointments valid. Many have been missing as many as six months. ARRL rules require cancellations if reports are not received by the SCM. Many have been dropped and many more will have to be cancelled if reports are not received. HQJ recently entertained KZ5FL and his XYL. KZ5ML. CSS has a new PMR-7 mobile receiver. The Philmont Mobile Radio Club had a part in an emergency radio program over Philadelphia station WCAU. ZRQ made BPL, and has a new Gonset Communicator for mobile use. The Delaware-Lehigh ARC had a hidden transmitter hunt, with PYF as the hidden and VSB as the finder. EUD is back after mobiling in New England on 75 meters with his new Elmac. There are a few openings for Official Experimental Stations for operators on the u.h.f. frequencies. If you are interested along these lines, why not apply to your SCM for appointment. Traffic: (July) W3CUL 1164, TEJ 205, BHC 198, ZRQ 196, LXQ 162, DIIJ 129, YDX 95, OK 75, DSH 71, WKX 70, OGD 57, CSP 56, BNR 53, BFF 28, BUR 28, ELI 22, NF 21, YVX 17, DUI 14, PYF 14, WUE 13, ZXV 11, YGX 6, PVY 5, EAN 4, SMC 4, NQB 2. (June) W3YVX 4.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA — SCM, John W. Gore, W3PRL — The annual MEPN Picnic was held at Braddock Heights Park on Sun. July 22nd. Over 500 were present. Activities consisted of meeting friends, an auction, a rummage sale, ladies' and children's programs and a mobile judging contest. FRV won a 2/6 communicator and YYB won the first prize in the mobile judging contest. EQK finally has bought a new car and has equipped it with an Elmac AF67 and PMR-6. Art is now a member of Radio Club Argentino and has been awarded TPA "101" and CCC certificates. CDQ received a visit from 8ELG and family from Grafton, Ohio, and also found time to play a prominent part in the ladies' program at the MEPN Picnic. EOV has a Viking II at his QTH and operates all bands mobile and finds time to report in to seven separate nets. HCE, after 20 years in Army service, has returned to civilian life at Salisbury and is now on the air on 80, 75, 40, 20, 10 and 2 meters, evidently trying to make up for lost time. CCV and WN3EGP have arranged to get out a local bulletin in Baltimore for the "Key Klicks Klan." The first issue was dated July 8th. GKP has been most active in research and study at his OES base, also in development of new ideas and approaches to the many problems presented. Through the past years this wealth of information and his thorough and complete reports no doubt assisted Headquarters. The Areo Amateur Radio Club and the Patuxent River Ham Club are now affiliated with the ARRL. The Patuxent Club lost no time in getting into action as a new club on Field Day with a Viking II, an NC-300 and a 2½-kw. gas-driven generator and did a fine job. EEB reports points as listed for the 1956 Delaware QSO Party: EEB 2090 (New Castle County), MCD 1848 (Kent Co.), TBG 169 (Sussex Co.). Twenty amateurs from 20 states were state winners with 240 points for highest state scorer and 5 points as the lowest. Kieth Kelly gave a talk before the CARC on July 9th, discussing typical radio tower details and factors to be considered in design of the various types and the problems to be solved in proper guying. On July 23rd the CARA held a very interesting informal "Question and Answer" session. MSU attended the ARRL Convention in San Francisco and returned with a very interesting report on the activities there. The National Capitol Area Hamfest will be held Oct. 7th at Gaithersburg. The Patuxent River Ham Club ((QT) wishes to be contacted by any persons playing chess by amateur radio. Team play is preferred. Traffic: (July) K3WCO 515, W3WG 503, PZW 442, K3WBJ 377, W3UE 244, UCR 208, BUD 106, TN 48, WV 46, PKC 36, ZSR 36, PRL 35, COK 34, PQ 27, EOV 19, JZY 14, CQS 12, ULI 10, W5RVI/3 9, W3MCG 6, OYX 6, BWT 4. (June) W3WV 138, ULI 19, JZ5 5. (May) W3UE 534, TBP 50, ULI 50.

SOUTHERN NEW JERSEY — SCM, Herbert C. Brocks, K2BG — SEC: YRW. PAM: ZI. Appointments of the month: K2OMT, Class II and IV Official Observers and K2CPR and K2CWJ, Class I Official Observers. Our traffic-handlers continue to do a fine job, with RG heading the list. K2CPR is adding many new countries to his list on 15 meters. BZJ, Pennington, has a new rig and a multi-band antenna. K2DSL, is heard nightly on NJN, SVV, Mercer County EC, held a meeting of the County operators, with the SCM and SEC attending, to receive applications and issue membership cards in AREC. The meeting was held in the Mercer County C.D. Headquarters. It is hoped that other counties will hold similar meetings. K2CWJ and K2JGU are now MARS members. K2BG has a new sixteen element beam on 2 meters. K2INQ has received a Code Proficiency certificate. The many RACES area stations were well manned during "Operation Alert" and all report a volume of traffic handled. ZI is back on the air after having transmitter troubles. BZJ, ISZ, SXK, ZI and K2DSL participated in Operation Alert at the State Control Center. We would appreciate receiving reports from other groups active in RACES. RG has worked 16 states and 2 Canadian areas with his QRP transister. No reports were received this month from the DVRA, Southern Counties Radio Club or Tri-City Radio Club. All appointees are urged to report activities on Form I. Traffic: (July) W2RG 175, YRW 169, HDW 141, K2JGU 68, EWR 29, W2ZI 26, K2DSL 15, W2BZJ 13, K2CPR 5. (June) W2YRW 71.

WESTERN NEW YORK — SCM, Edward G. Graf, W2SJV — SEC: UTH. FRL. RMs: RUF and ZRC. PAMs: TEP and NAI. NYS c.w. meets on 3615 kc. at 6 P.M.; ESS on 3590 kc. at 6 P.M.; NYS phone on 3925 kc. at 6 P.M.; TAR on 3570 kc. at 5 P.M.; NYS C.D. on 3509.5 and 3993 kc. at 9 A.M. Sun.; TCPN 2nd Call Area on 3970 kc. at 7 P.M.; SRPN on 3980 kc. at 10 A.M.; ISN on 3970 kc. at 3 P.M. RQF raised his antenna to 40 feet and has a new MD7-ARC-5 modulator. EMW received a QSL from ZD6RM for his 202nd confirmation and renewed his ORS appointment. K2HRP reports good openings July 8th, 28th and 29th on 144 Mc. CZT vacationed in Florida. SOK has two stacked Long Johns on 2 meters. We welcome the Antique Wireless Assn., of Rochester, as an ARRL affiliate. This club has an outstanding collection of antique ham gear and a library of movies. Watch for the date of the V.H.F. Roundup being sponsored by the Syracuse V.H.F. Club. Last year's was a huge success and this year's should be even better. RHQ has a 32-element 2-meter beam at the new QTH. PPS has a new three-element Telrex 14-Mc. beam on a 60-ft. crank-up tower, a B&W exciter, and an s.s.b. transmitter and receiver. K2KGQ QSYed QTH. Sorry to hear that K2LRN is on the sick list. QZR put up an eight-element Telrex on 144 Mc. The ARATS held a family picnic at Ellicott Creek Park. LXE has a 65-ft. tower up. A very interesting and instructive talk was given at the RAWNY meeting on "The FCC and the Radio Amateur" by AHR, FCC District Engineer and GA, his assistant. K2GDI was away at Columbia U. for the summer. Glad to hear that QLI is better and up and around. K2s HPT and KIN dropped the "N" in March. K2HPT has a DX-100. KN2-PKT now has WAS, confirmed. ZXH changed his QTH to Horseheads. The Sidney Amateur Radio Club's call is AU. ZRC is on s.s.b. with 813s and has a 75A-4. RUF vacationed in W6- and 7-Land. Reports not received at this writing will be included in the August report as I am taking a week's vacation and rest. Traffic: (July) W2RUF 250, K2IYP 241, DXV 164, W2ZRC 99, PHX 56, BKC 30, K2CUQ 28, W2ATA 26, DEX 24, FEB 19, RQF 16, WS 14, K2DG 10. (June) W2BKC 25, RQF 24, EMW 16.

(Continued on page 82)

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For almost a quarter of a century the constant goal of Hallicrafters engineers has been the improvement of receiving and transmitting equipment standards. This policy of continuous improvement is again reflected in the design and engineering of Hallicrafters amazing new HT-30 Transmitter/Exciter.

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WESTERN PENNSYLVANIA — SCM, R. M. Heck, W3NCD — SEC: GEG. RMs: UHN, NUG, GEG and NRE. PAM: AER. The Allegheny Kiski Amateur Radio Association Field Day set-up, though hampered by local thundershowers, ran up approximately 217 contacts for 2178 points, with operators NUF, SWV, RSR, ROZ, LPQ, WGR and WGH aided by several others. The antenna installation at the AKARA station, RVC, was damaged during a recent electrical storm. The club cooperated with the c.d. during the recent July Test. The Radio Association of Erie is going to hold talk sessions on amateur radio each Sun. for seven weeks for the Boy Scout groups in their area. NXK worked on the plans for the RAE's Tri-State Hamquet held Aug. 18th at Lake Le Bouf with a dinner, prizes, transmitter hunts, etc. Atlantic Division Director Crossley was guest speaker. BBO worked VU2EK recently. BFR is honeymooning in Up-State New York. The Washington County ARC still is active but somewhat scarce on news items. The August SHBP&M Hamfest was well attended and a fine time was had even though it was necessary to dodge the showers. (I mean downpours.) Congratulations to the Radio Amateurs of Corry on its affiliation with the ARRL. YOZ reports his CD Party score as 14,580 points. Congratulations to OP, of Slatington, who filed for the first WAPC (Worked All Pennsylvania Counties) award. I understand the Western Pennsylvania Amateur Radio Club Council committee has checked his log summary and the certificate soon will be sent out. Traffic: W3YA 14, BZR 5, UHN 4.

CENTRAL DIVISION

ILLINOIS — SCM, George T. Schreiber, W9YIX — SEC: HOA. RM: BUK. Asst. RM: AA. PAM: UQT. Cook County EC: HPG. Section nets: ILN, 3515 kc. Mon. through Fri.; IEN, 3940 kc. QKE and HPG report that plans for the Central Division Convention to be held over the 1957 Labor Day week end really are cooking. Many manufacturers already are signed up. CTZ resigned as Asst. RM for ILN and AA was appointed in his place. MRQ, now retired in Florida, paid a visit to the home scenes and got into ILN via the rig of his son, WDN. Doctor's orders have forced SHR, one of the section's leading traffic-handlers, to give up the activity for several months. EVA runs 300 watts mobile, c.w. of course, and drags a motor generator in a trailer behind his car. FRP sold his complete station preparatory to retiring to Florida but will keep on the air with his mobile gear until departure time. The women's cross country airplane race, known as the Powder Puff Derby, provided lots of traffic for K9AMD. AA has an HT-30 on the air and by the time you read this probably will have added the 300-watt amplifier. New calls in the section, all Novices, are EAA, DZH, DYY, DWN, DDN, DNZ, DWM and DWQ. The Kankakee RACES plan has been approved, reports KLD, and the club there soon will have a RACES rig on the air. The Greenville College Radio Club is back on the air now that school has started. The club has quite a code class going. Although he has been in the service for some time and in Japan, OYJ reports he is receiving QSL cards and a TVI report from Waukegan. How about it, Waukegan gang, can't you hunt this bootlegger down for OYJ? A new ORS is OYL of Peoria. Congrats to IAI, ex-6JAO, on the new YL in his family. The YRAD Club of Sterling had an interesting booth on ham radio at the county fair. PQN, now with the Air Force in Japan, signs KA2SS. Watch for him on 20-meter phone and c.w. as well as on 10. The Montgomery County Radio Club has a fine bulletin known as *Ham Hash*. YFO is back to normal, he reports, after a long session in the hospital. VSX reports that every ham in the county, 17 of 'em, turned out for Field Day. UIN's code lessons have been resumed at 0800 to 0900 Daylight Time on 7240 kc. The Vermillion County Amateur Radio club sends Vol. 1 No. 2 of its bulletin, which we read with interest. The St. Clair County Radio Club had a static exhibition of amateur radio in a store window in Belleville recently which, it was estimated, was viewed by 80,000 persons, half of whom were interested enough to comment. HUX reports he again is tinkering with crystal-control oscillators for the first time since the war. ACU and his wife took a trip to the Coast and were lucky enough to run into a hamfest in Montana. LL, who moved to Wilmington, Ill., is looking over the situation for a new skywire. Additional new calls: Novices: DVL, DLA, DKT, DUA, NAX and DFC. Technicians: ZOK, YNI, DFC, CWF, and AUA. General Class: K9BTA and YNI. KLD is new on single sideband. WFS reports that lack of room keeps him off 80 but he enjoys 40 and 20 meters. Let me repeat, so many of you are missing this column. The deadline here is the fifth of the month, please. Traffic: (July) W9DO 836, YYG 185, UBI 184, ICF 123, AA 88, MAK 79, CTZ 77, K9AMD 67, W9BUK 64, YIX 47, OCB 27, PCQ 27, VEY 22, QQG 21, FAW 19, CEE 18, EDH 15, FRP 12, K9AVL 10, W9PHE 10, OYL 7, VSX 7, HPG 6, STZ 6, KLD 3, WFS 2. (June) W9CTZ 72, ICF 44.

INDIANA — SCM, Seth L. Baker, W9NTA — Asst. SCM: George H. Graue, 9BKJ. SEC: QYQ. RMs: DGA, JBQ, TQC and UQP. PAMs: CMT, EQO, KOY and UXK. Appointments: KOY as PAM for s.s.b., NOK as Monroe Co. EC, VJX as Randolph Co. EC, EJW as OPS and VGD as OES. K9BLK, AJC, CBQ and EEZ are now Gen. Class. QZC is on 6 meters with a 6146 and Cubical Quad antenna. The Fayette County RC, Connersville, and the Circle City RC, Indianapolis, have affiliated with ARRL. New calls in Lafayette are KN9s DHK, DHL, DEB, DFI, DCU, DUZ and DCN and new in Connersville are KN9s DZN, DZQ, DZL, DZI, DZK, DYZ and DZP. Operation Alert in the State showed much progress over last year. About 70 per cent of c.d. traffic was handled on the amateur bands. The C.W. Net on 3656 kc. was very efficient. Much traffic was routed on 6 and 2 meters. The 3910-kc. frequency was kept busy although quite a bit of relaying was necessary because of bad conditions. The messages were mostly in standard form and this was a big help. EQO reports IFN evening traffic as 294, morning 233, total 527. UQP gives QIN as 197. RFN had 164, as reported by TQC. EHZ gives 31 for CAEN. A training net for s.s.b. and a.m. stations has been started on 3910 kc. at 1800 EST. Fri. KOY is in charge and YOU are invited to check in. Those making BPL were NZZ, JYO and KTX. The Outstanding Amateur Award for Indiana was won by EGQ. MHP won the V.H.F. Contest. AYW won Worked All Counties and KN9BQN the Novice WAC Contest. Nine clubs submitted Field Day scores. ALL is on 6 meters. JGS is building a 4-250-A final. EJC is mobile on 80 through 10 meters. FHA, in Evansville, wants 6-meter contacts with Up-State stations. HSG will be on with a pair of 6146s soon. Muncie had 6 mobile and 8 fixed in use for the C.D. Alert. Ex-BFW now is K8CAS in Hamilton, Ohio. PMT, FST and PRO served on the Powder Puff Derby Relay in Ft. Wayne. VMG, EOG and BKJ, at Baer Field, used 147.3 Mc. from field to town. A DX-100 was used at the field for stand-by. Every flier was welcomed in and wished luck on departure. Over 500 transmissions were handled. Our State RACES plan has been approved by FCC. Traffic: (July) W9NZZ 847, ZYK 437, JYO 338, EHZ 254, KTX 217, TT 210, EQO 200, SVL 144, AB 141, UQP 133, TQC 124, SWD 74, WBA 63, NTA 62, PQZ 56, EJW 52, VNV 50, BKJ 45, WHL 37, WTY 33, DKR 30, CC 29, EGV 28, FGX 28, QYQ 28, CMT 27, QR 24, ALL 21, BDP 21, CDW 18, BVR 16, VPJ 16, HSG 14, DOK 12, SYM 12, BUQ 11, YB 11, DGA 10, KRJ 10, WRO 10, JGS 7, NSY 7, IGZ 6, FJI 5, WAU 5, DZC 4, ZSW 4, KN9AYH 2, W9FHA 2, HUF 2. (June) W9VNV 36, YB 13, AZF 5, LDB 3.

WISCONSIN — SCM, Reno W. Goetsch, W9RQM — SEC: OVO. PAM: AJU and NRP. RMs: KQB and BVG. Nets: WIN, 3535 kc., 7 P.M. daily; BEN, 3950 kc , 6 P.M. daily; WPN, 1215 Mon.-Sat., 0930 Sun. Wisconsin mobile and c.d. frequency: 29,620 kc. CXY installed a new B&W TR switch. ADM and LGR held down the heavy end of the RACES traffic load at Watertown in the July Test. MCK contemplates a full break-in system for fall. KQB reports current NCSs on WIN as follows: DKH Mon., KZZ Tue., CXY Wed., LGR Thurs., EIZ Fri., RTP Sat. and KQB Sun. Stations are desired who can act as liaison between WIN and WPN or BEN nets. Contact KQB. JCL is going to 50 Mc. with a converted AT-1. DVM is MARS operator at Travis AFB (AF6FDG), where he is permanently stationed. KJJ is back after being off for 3 months. YZA reports his new QTH is a 1st-class spot for DX and general receiving conditions. DIK is working out FB with QRP mobile. SDK's activity is down because his job keeps him out of town. Officers of the Waukesha County Radio Club, now ARRL affiliated, are HAT, pres.; MMA, secy.; RUJ, treas.; CWK, program chairman; WEN, act. chairman; HIF, publicity chairman. DPN has a new HQ-129X. The M & M Club held its annual picnic July 29th, the Green Bay Mike & Key Club held its on Aug. 5th, and the Northland Amateur Radio Club held its Aug. 12th. 3PTU/9 is new in Milwaukee. CFP is now K4HOE and looking for the Wisconsin gang. PQA, former Indiana OPS, is now in Milwaukee. GFL is planning some 144-Mc. activity again. OVO reports Wisconsin AREC now has 603 members, 225 mobiles, and 93 Emergency Radio Units. KZZ received his 35-w.p.m. Code Proficiency certificate. KXK now has 176 countries with 161 confirmed. CFL and BCC were active during Operation Alert. HQJ has a new 21-Mc. beam. NIT will be in school in W1-Land. VBZ is in the Army. FDX and GIL are busy chasing DX. Traffic: W9CXY 449, ADM 108, MCK 108, KQB 102, SAA 80, JCL 70, DVM/6 65, ZAD 64, EIZ 33, FFC 20, AZN 17, RQM 17, KJJ 14, LGR 14, AFT 12, LPU 8, AJU 7, SQM 7, IZD 6, RTP 5, YZA 5, DIK 4, SDK 3.

DAKOTA DIVISION

NORTH DAKOTA — SCM, Elmer J. Gabel, WØKTZ — On Sunday, July 19th, our Division Director, PHR, was in Portal visiting an old friend, GWH. Kenny invited the local hams to come and meet Al and discuss their problems. KØCND and GGH, of Stanley, WVR, of Wildrose, and the Portal hams, GWH, DMK, KØDBE and KNØs DID and GRJ were present at a nice hamfest, lunch being served by GWH's XYL. KØEFF is attending school in Illinois and assembling a Ranger as time permits. KØGGH is mobile with 20 watts. Thanks to KØCND for all the above news items. Local news from club secretaries, ARRL appointees, etc., are greatly appreciated but must reach me not later than the 5th of the month to be included in the following

(Continued on page 84)

FOUNDATION OF THE FINEST AMATEUR RIGS...

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Typical Operating Conditions
(Frequencies to 110Mc Per Tube)

	CW	AM	SSB
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monthly report. KØATK reports very excellent results with his new 15-meter beam. Traffic: WØMQA 17, KØCNC 16, WØKTZ 10, IHM 9, HVA 8, NPR 6, KØADI 4, ATK 4, WØBFM 2.

SOUTH DAKOTA — SCM, Les Price, WØFLP — SCM assistants: YKY, HOH, FKE, GQH, RMK, TI, MZJ and GDE. PAM: UVL. RM: SMV. The South Dakota 75-meter Phone Net reports 27 sessions: RMK 15, SCT 12; QNI 475, high 30, low 8, average 17.59; traffic 64, high 14, low 0, average 2.37; informals 47, high 4, low 0, average 1.47. DTB was sent to California for schooling by IBM. Home from vacations are RRN with GWH at Portal, BQS Custer Canada, GCP Oregon, HYQ Florida. BNA was at a church camp at Placerville. EUJ was on a vacation in northeast South Dakota. 4OSP, from Alexandria, Va., was on the net at Huron. KØGGB is back on the net after rig trouble. Delmer Hybertson, formerly of Centerville, now of Rapid City, received the call KNØGDS. DIY is off the air as he is living at the lake and has no rig. GWS built a new modulator. QGZ, formerly of DeSmet, now is at Belle Fourche. ZWL received her medallion. On July 15th the hamfest was held in Custer State Park for hams in this 3-state area. KNØDIH was home on leave and is going to Ft. Morocco, where DTB came from in May. NWX joined the Navy at Omaha. OII has been working this summer at NEO ranch. TAS is in the process of getting a new receiver for his mobile. NEO has his mobile repaired and practically ready to go. SWH returned to Rapid City. We have a new ham at Winter, KØBMN. Blue Cloud Abby now has 3 operators, 4 transmitters and 1 antenna. The two calls are KØGDR and WØYEJ. RSP has his new home 813 on the air. Traffic: WØSCT 123, ZWL 45, CTZ 14, RSD 7, BQS 6, FLP 5, OOZ 2, QKV 2.

MINNESOTA — SCM, Charles M. Bove, WØMXC — Asst. SCM: Vince Smythe, ØGGQ. SEC: GTX. RMs: RLQ, DQL and KLG. PAMs: JIE and LUX. RLQ is the new manager of MSN and has been appointed Route Manager. FHH and his XYL have been vacationing in Florida. UGG is buying a new DX-100 transmitter. The St. Cloud picnic is now past and it certainly was a big success. Everyone who was anyone in ham radio was there. Hope they have one every year. DJ2GQ, of Germany, is preparing to work for Univac in St. Paul. OPA is trying to sell his six-band 274N units with a 50-watt modulator. NGF has to date worked his 121st DX station. PDN has now worked 100 countries and is entitled to a DXCC certificate. ALW is now working out on 15 meters. Traffic: WØKJZ 374, KLG 171, GTX 145, DQL 143, ZLV 67, ALW 61, RVO 59, UMX 54, RLQ 49, WMA 45, ACF 39, NNG 36, DNM 35, UMJ 34, LST 30, OJG 25, TCK 24, IRJ 17, KNR 16, PBI 14, NTV 10, FGP 8, BUO 6, KXW 6, VOA 6, MXC 4, LIG 3, OPA 2, WDW 2.

DELTA DIVISION

ARKANSAS — SCM, Owen G. Mahaffey, W5FMF — Asst. SCM: D. C. Watts, 5NIR. I wish to thank NIR for his help as Asst. SCM during my illness. Also I want to thank all fellow amateurs and friends for the many cards, letters and gifts sent me while I was in the hospital and since I have returned home. I will never forget your many kindnesses. I have enjoyed being your SCM but it is time for another SCM election. DAE writes that Walnut Ridge's new hams are KN5GOF and KN5GOU. K5GUM moved from W4-Land and HLY and his XYL, ISH, recently moved from Houston. YHC is installing an all-band antenna. KN5GOT is a new ham in Warren. KRO is taking graduate study work this summer at S.M.U. in Dallas. Traffic: K5DKT 2.

LOUISIANA — SCM, Thomas J. Morgavi, W5FMO — A single sideband dinner recently was held at Baton Rouge with UKQ as master of ceremonies and KYC, ZMI, ZNI, BOT, K5BIR, SWQ, YIW, KC, DGB, TST, ex-K5WBN and FMO attending. The new EC for Lake Charles is SKW. MWE has been reappointed EC. A new OPS is DP, who is back after a lapse of 31 years. WQX is getting on with a completely new ham outfit. EPC has a new jr. operator. TRQ is back on after getting the bugs out of the rig. KN5GUU, with a one-month-old ticket, had 25 states worked. KC, off the air because of a defective relay in the transmitter, reports he is ready to go again. K5ARH reports a club station now at the Lake Charles High School with the call K5ARH. WHO is pres.; HNS is vice-pres.: KN5EAW is secy-treas. KN5GGT monitored the c.d. frequency during the test and made a running log of all participating stations. The Monroe ARC had good activity during the recent Field Day with 20 operators working on 3 bands for a total of 493 contacts. EGK is back on with a Viking Ranger driving a Viking KW on 20 meters and is chasing DX. EB rebuilt his 20-meter beam just before the old one fell down. YAD is building an amplifier for his 10B. PZL and K5BMG are looking for DX on 20 meters. GQZ put a new p.p. 813 on the air. MWE is trying to get his new 813 final going. FYZ is active on s.s.b. The New Orleans ARC had a week end in old New Orleans Labor Day week end. Louisiana MARS showed very good organization in furnishing communications for the state c.d. and later on MARS frequencies for G-2. There participating were HVY, PXV, ONM, YRU, APH, POB, GPR, FMO and others

Continued on page 86)

who just monitored the frequency. Throughout the State stations reported Conelrad observance. Traffic: K5AGJ 96, W5NDV 58, EA 20, TFQ 19, Y8N 8, BSR 5.

MISSISSIPPI — SCM, Julian G. Blakely, W5WZY — The Jackson Hamfest proved to be bigger and better this year, with a record attendance, super chow and scads of prizes. The 'fest started Sat. with an "ice cream social" at the Park. Thanks to the Jackson hams who make this the highlights of the 'fest season. Director Canfield attended and made an excellent speech concerning our need for unification. As soon as conditions permit state-wide coverage on 75-meter phone we plan to set up a "Miss" night, a sort of forum, and get Director Canfield to keep us right up to the minute on what we can do as individuals to insure keeping our ham bands. The Sweepstakes is just around the corner. Clean the rig up and plan to participate. Traffic: W5IGW 50, JHS 22, RIM 5, WZY 3.

TENNESSEE — SCM, Harry C. Simpson, W4SCF — SEC: RRV. PAM: PFP. RM: IV. A very fine postcard was received from YPG in Barcelona, who extols the virtues of Spain, but says he will be glad to get home. FEB suffered a heart attack but is now recovering nicely. SCF had wonderful visits with K4s WBF and WCL, and W4s BQG, CVM and WQT. HUT and HSX vacationed at Ft. Jackson. HEZ is back from the National Guard encampment. DSI served a two-week stretch in Atlanta. (AOD, not federal prison.) ARW, the FCC man, visited with SCF, TIG, EWC and DCH. A new OPS is K4DIZ, Theda, who has done such a wonderful job with the new Tennessee Night Owl Net on 3970 kc. A new Conditional Class license in Sparta is K4HJA, who reports that BSA has a new shack nearly completed. WQW visited HIH, the grand old beard of the mountain, and embarrassed SCF, who didn't recognize his fist on HIH's rig! The same guy, 3AKJ/4, K4GFL, K4BMC and many others are sporting new emergency generators ranging from 1.5 kw. to 10 kw., compliments of Military Amateur Radio Supply. GFL finally moved into his new QTH. A wonderful Field Day bulletin was received from the Knoxville Club, which had great fun. Congratulations to DDF, a new SRO, for the fine operation during the C.D. Alert. Many RACES members participated throughout the section. Your SCM spent three weeks in the North Carolina mountains. Traffic: K4DIZ 362, W4WQT 71, HIH 67, TZD 65, SCF 63, PAH 35, VJ 27, OGG 26, UVL 14, K4HJA 7, W4WGJ 7, K4GFL 6, W4DMIU 2, K4AMC 1, W4WQW 1.

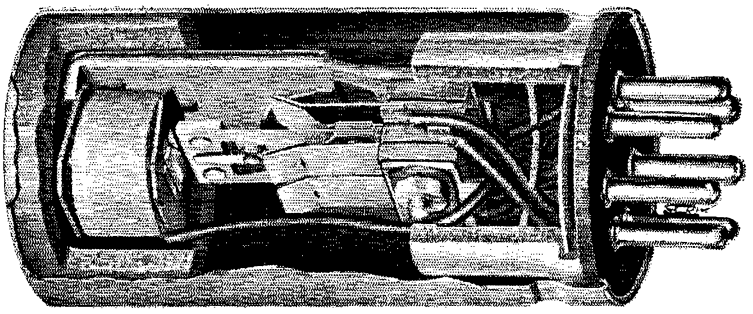
GREAT LAKES DIVISION

KENTUCKY — SCM, Robert E. Fields, W4SBI — SEC: CDA. PAM: YYI. RMs: ZDB and ZDA. Traffic for the last two months has fallen off some largely because of summer-time heat and vacations. KRC and 8TIS tried to keep you informed of my condition while I was in St. Mary's Hospital. Thanks to both of them. OMW has been painting up the shack and has not been very active for awhile. KKW is using a new all-band antenna which he says works FB. QCD says vacation hurt his traffic total for the month of June. SZB says he is having modulator or mike trouble. Hope you get it cleared soon. Please NOTE that the traffic shown is for two months as the SCM was in the hospital. For the same reason I will not be able to attend the KPN Picnic at Danville or the hamfest at Lexington on Sept. 30th. Traffic: (June and July) W4KKW 219, QCD 157, NIZ 91, CDA 84, RPF 61, K4AIS 57, W4SBI 40, SZB 23, ZLK 15, K4DTI 10.

MICHIGAN — SCM, Thomas G. Mitchell, W8RAE — Asst. SCM (phone): Bob Cooper, 8AQA; Asst. SCM (c.w.): Joe Beljan, 8SCW. SEC: GJH. Vacations, yard work, construction, and the like seem to be the activities to report this month, and they have taken their toll in the traffic department. ILP says that with the troubles encountered by the Edison gang during Field Day, either QRN or Field Day should be made "illegal." Some others might well agree, according to reports, but each year brings a new set of conditions that make Field Day one of the best activities on the calendar. HSG has his new beam elevated, thanks to help from the Lansing gang — even the neighbors helped! There's an 8-9 public relations man for you. DAP is rigging "V" beams. DLZ hopes that his new three-element three-bander will stay up there for the DX season. NOH has his 2-meter kw. final underway. ESR has bagged 101 countries in ten months. So much for the constructive reports. Now comes FX with the story that his multiband tank "blew up" during the last CD Contest and it was only 100 per cent overloaded. Even rotary gaps must have had their limitations, Tate. HKT is taking training duty at Point Hueneme, Calif., to brush up on disaster relief. Perhaps he will be able to supply this department with some words of wisdom in the future. The Michigan RACES progress is continuing and some station authorizations have been granted. It is encouraging to see such action, as it indicates the desire on the part of the MOCD to integrate our services into their plans. In the meantime, our efforts toward improving the Michigan AREC organization will make us all better qualified to step into the RACES plan as it develops. Question of the month: Where are most of the Michigan appointees during the ARRL CD Contests and LO Parties? Let's have more representation in these

(*Continued on page 88*)

MALLORY HAM BULLETIN



NEW

Mallory Heavy-Duty Vibrator

features unique design for longer life, constant output

The internal mechanism in the new Mallory Series 1700 vibrator is so different from any other that we thought you should have a close look at it. Notice that there are *no* conventional button contacts. Instead, the make-and-break action is done by special alloy leaves, which serve both as contacts and as spring elements.

This construction provides a contacting area *as wide as the spring leaf itself.* It also eliminates the extra weight of the usual button contacts, making a lighter, simpler assembly for the driving coil to move. The result is a considerable improvement in vibrator performance.

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More constant voltage. The larger contact area reduces the rate of erosion of metal. Contact spacing stays more constant . . . output voltage holds steadier.

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High uniformity. The new, simplified design uses fewer parts . . . is made to exceptionally uniform characteristics.

You'll find the new Mallory vibrator just right for powering two-way mobile rigs and other heavy-duty battery operated gear. This design is available in the split-reed type shown here for 6/12 volt service*, and in a Duplex heavy-duty model without the split-reed construction. Your local Mallory distributor is stocked to serve you promptly. See him soon . . . and write to us for a complete catalog of all Mallory precision components for amateur experimental use and repair work.

**Use dropping resistor in series with drive coil for 12 volt operation*

Your ideas may win money in the new Mallory Contest

Have you ever put Mallory components to work in unusual ways in your experimental circuits or amateur rigs? Send us details about applications you have made of Mallory components to simplify equipment, make it more useful or versatile. The most interesting entries will receive an award of $25.00. Winning entries may be used as the subjects of "Mallory Ham Bulletins." Just send details of your application to the address below.

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events. They are fun. Traffic: (July) W8ELW 175, QQO 62, RVZ 62, DAP 60, NUL 60, ZLK 57, FX 25, IUJ 21, NOH 21, TIN 19, WXO 18, AUD 14, TBP 12, TIC 11, PHM 9, DLZ 6, QIX 6, DSE 4, HKT 4, FGB 3, EGI 1. (June) W8ELW 214, ZLK 96, ILP 60, NUL 53, QIX 30, SHP 27, IKX 24, TBP 17, WXO 17, TQP 16, SCW 8, HSG 2, SJF 2, FGB 1, MAI 1.

OHIO — SCM, Wilson E. Weckel, W8AL — Asst. SCMs: J. C. Erickson, 8DAE; and E. F. Bonnet, 8OVG. SEC: UPB. RMs: DAE and FYO. PAMs: HPP and HUX. During the vacation season ARO saw Frontier Days at Cheyenne, Wyoming.; HXB toured Yellowstone, Montana, the Dakotas and Minnesota; and QXB spent two weeks in Florida. Our deepest sympathy to LAB on the death of his wife, Dorothy, as reported in Q-5. The Massillon, Louisville and Canton Clubs held a joint meeting discussing Field Day, for all had violent windstorms both days. GFE spent six weeks on the West Coast and visited many stations. KIX is in Japan with the Navy. BKP worked VK9TW for his 250th country. WTO received his WAS and worked 19 countries, including UB5 and ZD1, on 40 meters. UPH has worked 41 states. SWZ has a new short beam. CPU's XYL is feeling much better after an operation. PEN's frequency measuring business was knocked out for two days by lightning. New appointees are YCP and CUJ as OOs; WTO and YCP as ORSs. PLQ worked Illinois for his 7th state on 147 Mc. Your SCM attended the Hocking Valley RC's picnic held at Burr Oak Lake Park with about 85 amateurs attending. ZQJ was a DX-35 and 4BCO won the 40-ft. Televue tower. Toledo's Ham of the Month honors LO, QK, AEE, ZO, BO and ARS, all of 1915 vintage. KGK was presented a jr. operator by his XYL. EPO, IAA and family spent a week in the Smokies. SDM spent a week at Bear Lake in Michigan. ROI has his v.h.f. tower up. BBO, HUX and KN6APX and their families had a two-week vacation at the Lake. Your SCM attended the Cleveland Area Council of ARC's picnic at Granger Lake, with 120 amateurs attending for a total attendance of 245. Prizes won were an SX-38D by UWM and a Heath Q Multiplier kit by HKG. GBH has his General Class license and 20-w.p.m. CP award now. DTW is home from the hospital after an auto accident and is on the air again. The Springfield RC's code class is unusually large for the summer time. YMB and TMA helped KDL move into his new home in Warrensville. YMB is in a new home in Brecksville. 9BFW now is K8CAS in Hamilton. Traffic: W8UPH 469, VTP 336, OPU 167, WTO 152, DAE 94, GFE 47, AL 30, BEW 20, EEQ 15, HXB 15, IIR 14, CVZ 8, RN 8, LMB 6, JHH 4, KN8BIZ 3, QIE 2.

HUDSON DIVISION

EASTERN NEW YORK — SCM, George W. Tracy, W2EFU — SEC: KGC. RM: BXP. PAMs: GDD, IJG and NOC. Section nets: NYS on 3615 kc. at 1900 hours, NYSPETN on 3925 kc. at 1800 hours, SRPN on 3980 kc. at 1100 hours. Eastern New York stations frequently heard on the NYS include ATA, BE, BXP, EFU and PHX. On the NYSPETN are heard EFU, GDD, KGC, NOC, ZBS, K2AWA, BBJ, CXO, EHI, GCH, HJX, MBF and PPB. If you have never tried traffic-handling to improve your operating ability during an emergency, why not report into one of the nets listed at the top of this column. K2PPB made WAS on phone and also operates mobile on 10, 20 and 75 meters. New appointment: K2PIC as OO. Endorsements: K2EIU as ORS; ZTZ, ITF, NOY, CXO, CYW, AAR, WWK, HZZ, IRT, VRE, PIE, GTI, PCQ, VPG, HO, AWF, HIQ, JJO, RTE and K2GCH as ECs. PHX reports a new rig operating on 220 Mc. GTC operated /2 fixed from car battery while camping in the Adirondacks. BGO reports two RACES channels handled 13 per cent of all traffic at State Hq. in competition with 36 wire circuits during Civil Defense Operation Alert. High praise was extended to all radio amateurs by the New York State Civil Defense Director. The Albany Club held a picnic at the Warners Lake camp of APF on Aug. 3rd. Eastern New York stations that received ARRL Public Service Awards for 1955 hurricane traffic-handling are requested to notify the SCM. 1ZZG/2, recently discharged from the Coast Guard, is living in Scotia and hopes to be signing W2 soon. Traffic: (July) W2EFU 152, BXP 130, K2HPQ 71, PHX 56, K2PPB 45, EHI 32, W2ATA 26, K2QIX 25, BBJ 23, W2GDD 21, K2LKI 15, W2GTC 8, KGC 8, K2AWA 5, HJX 3, W2AWF 1. (June) K2PPB 35, LKI 11, BBJ 7.

NEW YORK CITY AND LONG ISLAND — SCM, Harry J. Dannals, W2TUK — SEC: ADO. PAM: OBW. RM: WFL. Section Nets: NLI, 3630 kc. nightly at 1930 EST and Sat. at 1915 EST; NYC-LIPN, 3908 kc. Mon. through Sat. from 1730 to 1830 EST. WFL reports that NLI operated very successfully through the summer on a full schedule, with 132 messages handled during July. OBW and NYC-LIPN also worked a full schedule with good attendance. K2KXZ made WAS. Ditto TUK, who visited ARRL Headquarters with all 48 cards in hand. A new YL harmonic arrived at K2AMP. K2s KUM, LQL, PLC, QDD, QOV and QPT received their General Class licenses. The station at K2QDD is an SX-99 and a DX-100. BO has installed an all-band trap antenna. A new Communicator II is in use at K2RJO on 144 Mc. Alan also is increasing power to 350 watts on 75 meters after his move to Bellport.

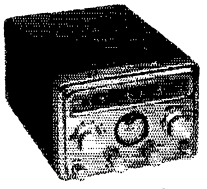
(*Continued on page 90*)

MOBILE TWINS

GONSET G-77 G-66

Gonset's new Mobile Twins, G-66 Receiver and G-77 transmitter, represent the perfect mobile combination. Outstanding multi-band performance—beauty of appearance—finger-tip control—6 and 12 volt operation—compactness without compromise! Typical Gonset dollar-for-dollar value—real "owner satisfaction".

G-66 RECEIVER



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STEEP SKIRT SELECTIVITY: 265 kc 2nd I.F. 8 high Q tuned circuits. 3.5 kc I.F. bandwidth at 6 db down.

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"3 way" (6V-12V-115V AC) Universal power supply/speaker..net 44.50

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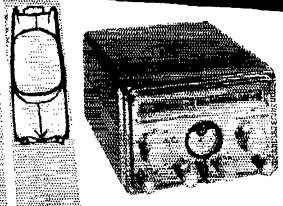

FREQUENCY RANGE: 80-40-20-15-10 meters. VFO or xtal, switchable. Highly stable VFO, each band spread over most of slide rule dial.

FULL BANDSWITCHING: Exciter ganged with VFO, pi network output.

POWER INPUT: 50-60 watts, modulated. CW provisions, 6146 tube in output. New modulator has integral speech clipping. High gain speech for PA-type dynamic, reluctance or xtal mikes.

POWER SUPPLY: Heavy-duty, vibrator, 6 and 12V DC. Output voltage 500-600V full load, Selenium rectifier, low drain both on standby and transmit. Power supply is a separate compact unit.

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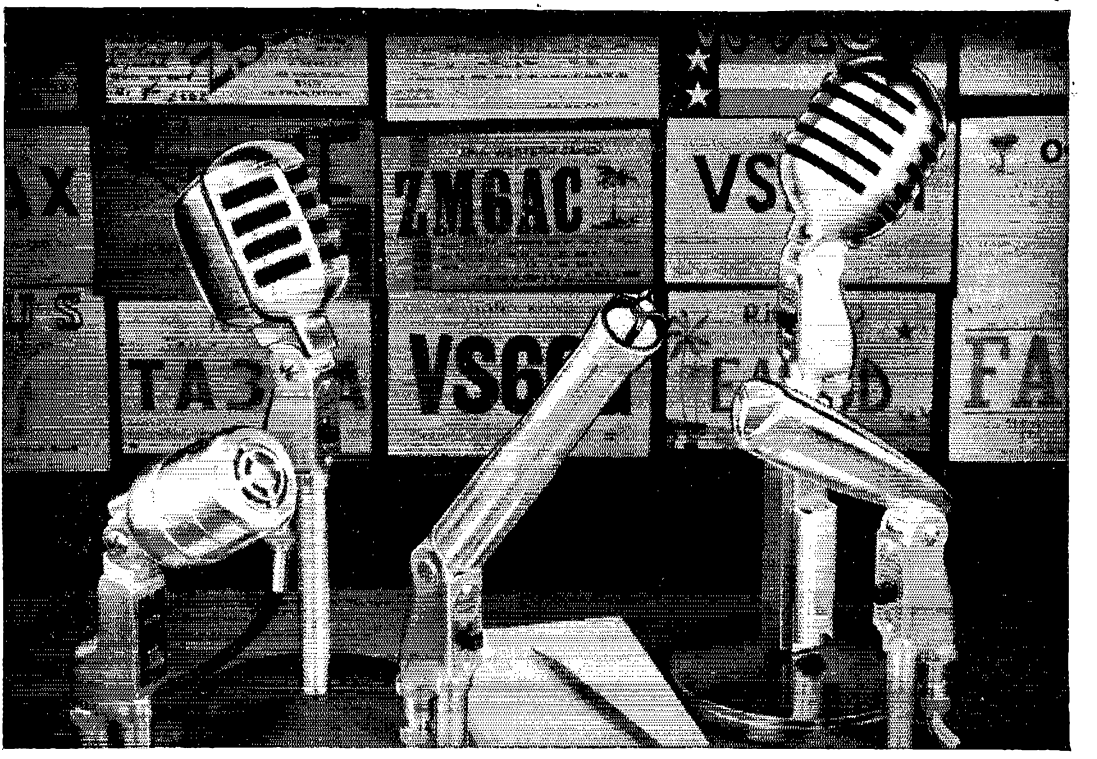
K2DEM is on 144 Mc. from his new location at Kings Point. A new 10-meter converter is under construction at K2KRJ. K2s GLP and OPJ completed DX-100 rigs. K2CMV received a Worked-Delaware certificate. Ex-ZFK, now signing ØLCB, sends regards to his Long Island friends. PF added a B&W 51-SB to his 32V-2. GP/2, while vacationing at Wading River and using a 30-watt portable rig, worked a VK3 on 7 Mc. BQM was the first W2 phone contact for YV0AA on 14 Mc. HQL received his DXCC-130 sticker. New stations on 50 Mc. in Nassau are IPB and K2s IPH and MUA. LCF resumed m.c.w. code practice on 6 meters. NEG has a new 75A-4 and installed a sequence keyer in his Viking II. A fourth harmonic, a girl, arrived at WMG. Bill received his WAC phone certificate, too. K2CTK moved to Woodmere and is on the air with an HQ-129X and an SRT-120P. K2JTS installed a Conelrad monitor. K2DDK has 10 states on 144 Mc. with his Communicator II. Al has received his Extra Class license. MDM is building a modulator for his half-kw. KEB finds time to act as national secretary for TCPN and once again passes the 1000 mark to make BPL! The OM, KFV, is director of the 2nd Call Area TCPN and also made BPL again! If you have never originated or relayed an ARRL radiogram, drop in on our section nets and join the boys and girls. UGF vacationed in W1-Land and reported into NYC-LIPN with his mobile from Massachusetts. EIT, a charter member of the North Shore RC, moved to Florida. Officers of the newly-formed club, AMPS, in Levittown are K2AVB, pres.; K2GXL, vice-pres.; JUN, trustee. KN2PTS moved to W6-Land, where he will be active on 50 Mc. with a Communicator and a 20-watt rig on 220 Mc. After 25 years away from amateur radio, K2QXG returned with a B&W 5100 and a 75A-4 and has worked more than 180 VKs in 3 months. K2OPT is now on active duty with the Navy. K2AIFN has a new Ranger. AEV moved to Farmingdale. KW6BV visited with the Levittown RC. K2HZC and his XYL, K2LUR, joined the vacationing mobileers with a trip to Vermont. UAL modified his old HRO per a *QST* article and reports fine results. KN2RLI has been DXing on 21 Mc. KN2ROH snagged 21 states and Canada in 3 months. K2MWR is going mobile on 10 and 75 meters. KN2PTY is on the air with a 6L6 rig. QPQ vacationed up-State with his Communicator on 144 Mc. K2PWH added a Gonset Linear for 6 meters. K2s GQX and PSV, using an AT-1 and HQ-140X, kept K2GQX/1 on the air from camp in Maine. Our QSL Manager, JIL, asks all stations expecting DX QSLs via the Bureau to register their calls with him and please have patience. The volume of QSL cards has been tremendous and the Bureau is revamping its system to insure faster service. With the fall season around the corner, let's check the rigs for correct performance before we sit down for our fireside chats. Traffic: (July) W2KEB 1101, KFV 839, JGV 151, K2KXZ 128, W2BO 80, TUK 79, WFL 74, K2AMP 66, DVT 66, W2AEE 55, OME 35, K2RJO 32, W2PTV 19, K2DEM 17, W2UGF 13, K2CRK 12, W2DSC 11, K2KRJ 8, W2VNJ 8, K2CMV 7, W2EC 7, K2MQV 6, W2YBT 5, K2KSP 4, LEP 4, W2PF 4, GP 3, K2ADL 2, IHD 2, W2MDM 2, W2JCA 1. (June) W2OME 39, LGK 22, GXC 20, K2KSP 5, W2DSC 4, K2ITZ 4. (May) W2GXC 9.

NORTHERN NEW JERSEY — SCM, Lloyd H. Manamon, W2VQR — SEC: IIN: PAM: CCS, RMs: MLW, NKD and CGG. K2GFX will be at Troy, N. Y. during the coming school season and hopes to be on the air from SZ while at college. We welcome back KTR to Northern New Jersey. He is back on the air after a long lay-off. K2BWQ is doing a fine job phone-patching on s.s.b. for the boys in Labrador and Newfoundland. OKG operates GSB at Union College, Schenectady, during the school year. KN2QWS recently took the General Class exam. OKG took a crack at the Extra Class. BRC vacationed in New York State. CFB is back from a vacation in Maine. KN2SLL has passed the General Class exam. NIIY says he is in his annual summer slump and will not be active until cooler weather is here. K2HRO is active on 144 Mc. K2MTL has a new 20-meter doublet for a crack at some c.w. DX. He also is very active on 2 meters. The Raritan Bay Radio Amateurs Club is 100 per cent ARRL membership. TTM is having a bit of channel 2 trouble while on 50 Mc. K2GE has the new all-band 813 rig ready to go. KN2RJD is ready to drop the "N" any day now. K2EQD has the s.s.b. rig all fired up with 813 final. K2DSW finished second in the April CD Party. He also finished first in the latest YL/OM scramble and won a silver cup. Our thanks to RBRA for its monthly report via *Sideband Splatterings*, the official club paper. SUG is doing a very excellent job of organizing RACES in Hunterdon County. A very good showing of amateur cooperation in RACES was displayed during the recent Operation Alert. Your efforts were sincerely appreciated by the state director. NIE has added an 813 final to the 20-A exciter. CCO operated from Normandie Beach during the summer. ENM was heard on 144 Mc. working from an aeroplane to ground stations during the RACES drill. During July NJN held 26 sessions, with attendance 319 and traffic 187. MLW is to be congratulated for his efforts as net manager for NJN. In spite of the hot summer weather the traffic count in the section was exceptional for the month of July. Good going, fellows, and luck to you all. Traffic: (July) K2EB 272, EQP 162, W2MLW 139, K2BWQ 129, BHQ 36, W2BRC

(Continued on page 92)



A good microphone can improve your results as much as a high gain antenna

Ever notice that two signals of the same "S meter" intensity sound differently? One is muddy, dull, a little hard to read—the sibilant letters like S and F almost alike. The other signal is sharp, clean and readable even in QRM and QRN—because there's usable intelligence. No mistake about the call or comments.

The greatest variation is in the microphone. A sharp peak adds no intelligibility but limits the modulation to that value. A peak of, say 6 db, which is usual in many ordinary microphones, will reduce voice power by HALF. Don't be fooled by a microphone that sounds "louder"—loudness by itself is not a criterion of performance; quite the contrary since it may indicate undesirable peaks.

An E-V microphone with smooth, peak-free response, replacing an inferior instrument, often will do more for a phone signal than a new antenna or increased power. As a further *plus*, of course, you get well-known E-V durability, style and performance. An E-V microphone, to raise stations, to carry through a QSO, is your best station investment.

Shown above are a few of the E-V microphones designed for effective communications. Amateur discount applies.

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28, K2GFX 28, W2VMX 20, ZVW 18, K2SKK 15, W2DRV 12, OXL 11, SUG 9, K2EMJ 8, W2CFB 3, CVW 1. (June) W2VMX 10.

MIDWEST DIVISION

IOWA — SCM, Russell B. Marquis, WØBDR — New appointments: KØBEC as OPS; GXQ as OBS; RMG, IVR, KØDBW and AVM as ECs. WØLCX renewed his ORS appointment. EIF and NXW have moved to Florida. KVJ, DUN and NTB vacationed in Colorado. UCE has joined the Navy. QVA worked LGG for his 25,000th QSO. PKT and UTD have received 2nd-class commercial tickets. FDM added a sequence-keying kit to his Viking. NWX is using a lazy quad antenna on 80 meters. A new net has been formed in Des Moines on 40 meters with the hope of getting QNIs from the rest of the State. The Iowa-Des Moines Net (IDM) meets at 2000 CST on 7137 to 7140 kc. A board of directors has been elected, with KØCLS as NCS; CVI, Publicity; BWN, secy.; EHE, treas., and SMS, board president. BLH, BJP and LGG have received 2500 Traffikers Club certificates. KØANL has a new 400-watt s.s.b. final. On June 28th YPT and GUD heard a strange signal on 2 meters. It seemed to be f.m. and got weaker, went higher in frequency and moved from north to west as the morning went on. The Waterloo and Creston Clubs had their annual picnics with good attendance. BDR spoke to the Waterloo and Marshalltown Clubs. NTA worked back to Iowa on 40-meter s.s.b. from his fishing trip to Canada. GJN is now board chairman of the 75-Meter Phone Net. Traffic: (July) WØPZO 975, BDR 957, SCA 948, LCX 618, LGG 236, QVA 128, CZ 102, LJW 50, BLH 44, PKT 42, RQW 31, UTD 28, CXQ 25, KØDBW 19, CFB 18, WØNGS 18, NYX 16, KØCLS 10, WØZPM 9, KVJ 8, KØAVZ 6, WØFDM 1, FMZ 1, HNE 1. (June) WØBLH 29.

KANSAS — SCM, Earl N. Johnston, WØICV — SEC: PAH. RM: QGG. PAM: FNS. The Johnson County Radio Amateur Club has cancelled all plans for the Division Convention this year but is holding its annual banquet or hamfest Nov. 10th. Six-meter activity is increasing in the Kansas City Area. Four fixed stations, KØESW, WØWRC, QPY and TBP, as well as OMY/M and KØGPS/M are quite active. KØFEI has added some mobile gear, an Elmac AF67 and an Elmac PRM-6A receiver. KØGKD and CRI, of Arkansas City, have new DX-100s and CJI has finished a new c.w. rig with 813s that runs with one kw. input. ZUX, of Scott City, has moved the rig out of the basement to take advantage of air conditioning. UAT, of Ft. Scott, has a new SX-100 that will help his traffic total from now on. DXE is the new director of activities for the Jayhawk Amateur Radio Society. Because of adverse radio conditions the Kansas 75-Meter Phone Net has changed the schedule of its 1230 session on Wed. to 0630. Remember AAJ? He is now at New Orleans looking for you fellows on 10 and 20 meters but hasn't got a W5 call yet. This change should give many a chance to report in who otherwise are unable to make the noon sessions. Traffic: (June) KØFEI 521, WØBLI 401, QGG 198, NIY 173, YVM 82, FNS 68, DEL 63, SAF 54, KØAHW 50, WØABJ 40, IHN 39, MXG 37, KØBIX 28, WØFCE 26, WWR 25, TOL 23, ONF 21, FDJ 20, QGB 20, TNA 12, JDX 8, THX 5, UAT 5, VZM 5, ICV 4, LQX 4, TSR 4, YIP 4, ECD 3, LIX 2, HAW 1. (May) WØIHN 25.

MISSOURI — SCM, James W. Hoover, WØGEP — CPI has returned from a two-week vacation. KIK reports that MON could use more traffic. MON meets Mon. through Fri. on 3580 kc. at 1900 CST. HUI has final amplifier trouble and is operating with 60 watts temporarily. YKC has just completed a vertical ground-plane antenna for 75 meters. ZQV has contacted over 100 countries on 15 meters. BVL was off the air for a month with Army Reserve training and vacation. JHY has a new DX-35 and NC-98. MNW has just returned from a 6400-mile vacation trip. IJS has received a Traffikers 5000 certificate. FIN has a new DX-100 and a multiband Z-match antenna tuner. *Sidebands*, published by the St. Louis Amateur Radio Club, Inc., shows the schematic for a 6-meter tunable converter which was designed by QHL and built by KØABK. Net control stations for the Missouri Emergency Net are WØs ORF, OMM and OHC with alternates VPQ, BUL and KØCTG. NUE and GEP have completed installation of Morrow mobile converters. EXN has a new Gonset mobile receiver. PME has returned from a 3400-mile vacation trip. MFB, the Section Emergency Coordinator, is leaving the State. The SCM wishes to take this opportunity to thank Mac for his vigorous efforts in building a better AREC organization in the Missouri section. Traffic: (July) WØGAR 640, CPI 347, GBJ 319, VTF 117, KIK 111, OMM 98, HUI 51, OUD 46, VPQ 46, CKQ 38, EBE 28, KØACK 20, WØIIR 20, WFF 18, RTW 16, YKC 13, ECE 10, BUL 8, ZQV 8, VFP 6, KØAWC 4, WØOIV 4, BVL 3, EEE 1. (June) WØVPQ 101, CKQ 43, KA 20, OHC 9, BVL 7, VTF 1.

NEBRASKA — SCM, Floyd B. Campbell, WØCBH — SEC: JDJ: PAM: MAO. The Western Nebraska Net had 26 sessions, with 40 pieces of traffic handled for July, and an average of 11 QNIs each session. KØAKW has a new HQ-140X. The C.D. Net of Omaha has regular meetings Mon. evenings on 29,500 kc. The new president of the Grand Island Amateur Radio Society is LEP. CC is the new secretary-treasurer. YXV has 20 states worked on 6 meters

(*Continued on page 94*)

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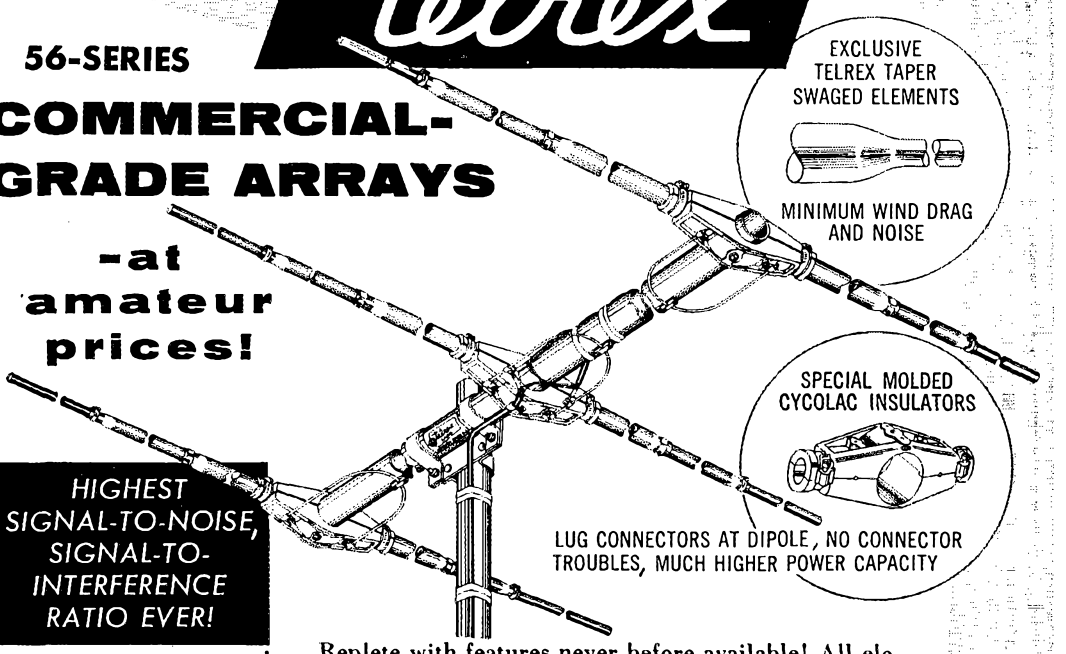

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with 13 confirmed. The box score for the Nebraska 75-meter Emergency Phone Nets are: Morning Net (3983 kc., 7:30 A.M. CST) QNIs 440 with an average of 14.2, QTC 58 with an average of 1.8. Time in minutes 762, with 24.5 average. The Noon Net (3983 kc., 12:30 P.M. CST) QNIs 689 with an average of 22.2, QTC 51 with an average of 1.6. Time in minutes 756, averaging 24.4 each session. The Morning Net has 31 on roll call with 53 for the Noon Net. Twenty-three reports were received, totaling 560 traffic count. TIP is working at a BC station in Kearney and missed on the nets. FLF is filling in for VYX while Tom is getting the new skating rink in shape. VZI has been absent from 80 meters trying to get DXCC on 15 meters with 7 watts. Reports on c.d. Operation Alert are very scanty at this time. We understand that only 4 messages were not delivered. The boys at the State House had antenna troubles and MAO had to do most of the relaying. They lost contact with Omaha on 2 meters only once in 36 hours. Traffic: WØZJF 143, UJK 87, MAO 81, DDT 73, NIK 47, ORW 40, SPK 36, VGH 36, EGQ 30, ZWG 26, CBH 15, PDJ 10, ZOU 9, BTJ 8, FTQ 7, BOQ 4, BTG 4, HQN 4, PQP 4, FPT 2, KFY 2, KØBYK 1, WØZWF 1.

NEW ENGLAND DIVISION

CONNECTICUT — SCM, Milton E. Chaffee, W1EFW — SEC: LKF. RM: KYQ. PAM: YBH. Traffic Nets: MCN: Mon.-Fri. at 0645 on 3640 kc.; CN: Mon.-Sat. at 1845 on 3640 kc.; CPN: Mon.-Sat. at 1800 on 3880 kc. and Sun. at 1000 on 3880 kc. The SCM's list of former ORS is long. CN and MCN could use better coverage. How about it, old-timers? Newcomers are just as welcome and don't worry about code speed as the net will accommodate you. The CN report from KYQ shows 26 sessions and 162 messages handled with KYQ (24), AW and RGB (23) and LV (16) holding QNI honors. YBH reported for CPN, covering 31 sessions and a stepped-up traffic total of 321. Bill noted FEA, GNS, HQM, UCG and VIY as new members and DHP, EOR, VWL (30), YBH (28) and TVU (25) as most consistent. Early birds being scarce, MCN showed only 51 messages in 22 sessions with most frequent QNI by IBE, RVB and RFJ. AYC/4 is active on 40 and 80 meters from Chilesburg, Va., following his retirement and relocation. EFW operated while on vacation from Maine (York County if any need it). FDJ journeyed to San Francisco and took in part of the National Convention. The Waterbury Club was active in Field Day and the C.D. Test. Same for the Middlesex and Southington Clubs. LIL is a new Novice in Middletown. MEZ and MFB form a father-and-son team at Southington and furnished a new meeting place for the local club. WHL visited 4YTD and also attended the Grave Yard Net Picnic in Virginia. DHP has added a Heath VFO and has applied for OBS appointment. A nice OES report was received from FVV. QUJ, OFV, WHO and ULY are conducting a radio class at Rockville HS. HTK has dropped the "N." EZM is active on several 7-Mc. phone nets. YBH made BPL again. BDI continues RTTY work and is working on a new beam. APA skeds VE8MC daily to furnish them with traffic outlet, baseball scores, etc. APA also asks

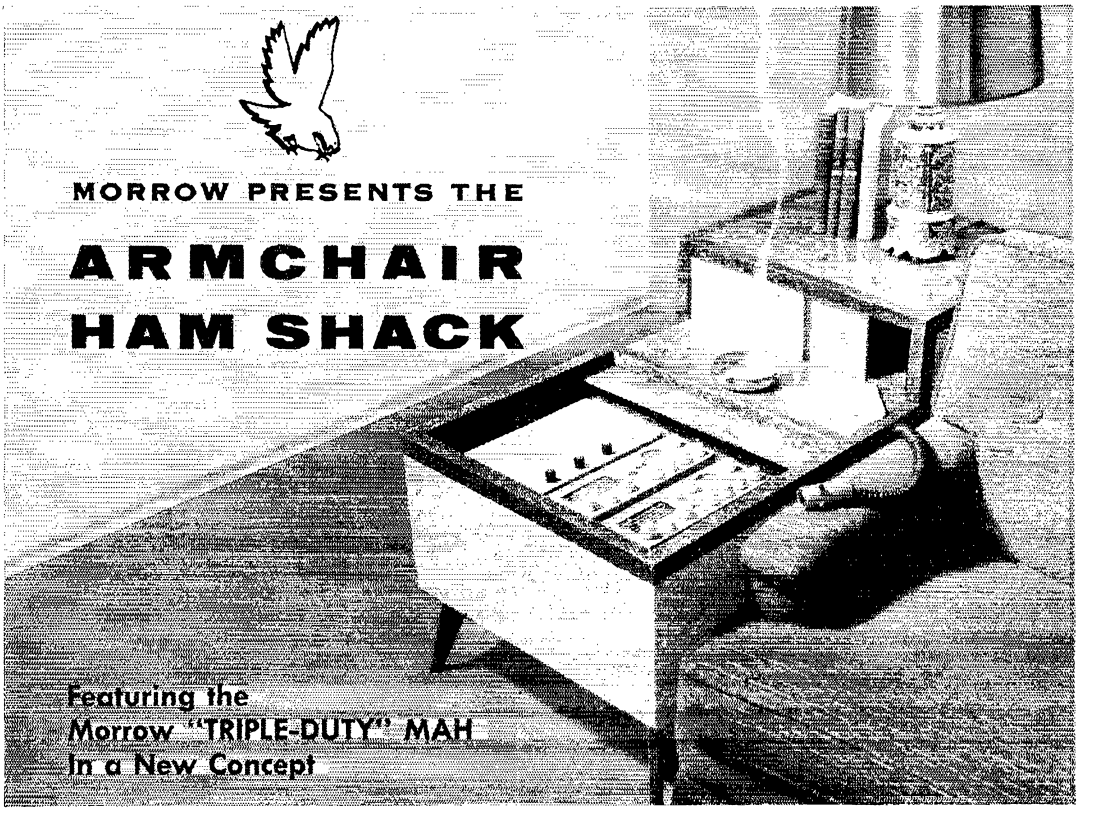
(Continued on page 96)

C-W.A. NINTH ANNUAL CONNECTICUT QSO PARTY OCTOBER 6-7, 1956

All Connecticut amateurs are cordially invited to take part in the Ninth Annual Connecticut QSO Party to be sponsored by the Connecticut Wireless Assn., Inc.

Rules (1) The party will begin at 5:00 P.M. EDST October 6th and end at 11:00 P.M. EDST October 7th. (2) Any and all amateur bands may be used, and either phone, c.w., or both. C.w.-to-phone and cross-band contacts are permitted, but no extra credit is allowed for such QSOs. (3) The general call will be "CQ CN" on c.w. and "CQ Connecticut" on phone. (4) The same station may be counted but once regardless of band. Mobile, portable and home stations covered by the same station license all constitute the same station. (5) Exchange names of town areas. (6) Score one point per contact; multiply contact points by number of town areas worked for final score. (7) Reports must show times of QSO, call of stations worked, town area of station worked. All reports must be postmarked no later than November 15th and should be sent to Phil Simmons, W1ZDP, Box 1, West Hartford, Conn. (8) Special recognition to the high scorers *and to the highest-scoring Novice.* All decisions of the C. W. A. Contest Committee will be final.

Here is an opportunity to see how many Connecticut stations you can work in a 30-hour period. Get on the air October 6th and 7th and meet the gang in your section!



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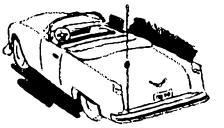

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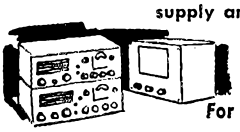

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when a State Convention will be scheduled. Anybody know? HYF visited several hams during vacation. BFS is QRL with IBM electronic work. Traffic: W1YBH 409, KYQ 151, AW 145, EFW 111, DHP 107, TYQ 107, IUC 81, RGB 72, ULY 62, LV 43, APA 39, BDI 39, CUH 27, BVB 26, RFJ 23, GIX 9, KV 6, HYF 3.

MAINE — SCM, Allan D. Duntley, W1VYA/BPI — SEC: TVB. PAM: FCS. RM: EFR. The Barn Yard Net meets Mon. through Sat. from 0800 to 0930 on 3960 kc.; the Sea Gull Net meets Mon. through Sat. on 3940 kc. from 1700 to 1800; the Horse Traders Net meets Sun. from 1700 to 1800 on 3940 kc. This new and most interesting net is meeting with very good results. Our new PAM is doing a bang-up job. ZAL and his XYL have made the "trio" a "quartet." Congratulations! Did NFQ ever catch any fish at Carratunk? Don't see how he could — he spent most of the time QRMing the boys on 3960 kc. We sure missed LYR and SIL at the Dexter Hamfest. They say time heals everything but Hazel will never be replaced in the hearts of many. Has TVB a kilowatt in the mobile? ISF has a new DX-100 and is keeping Bangor very much on the map. 3TCL, in Hartley, Del., wants to be remembered to all the gang. We sure miss him and Hopie. The Remondis are pretty near a 100 per cent ham family. Wonder if IKW's gear ever caught up with him in Ohio. Polly, KNV, has dropped the "N" and she and PIX are building a boat for transmitter hunts at Casco. GFP also would like a set of waterwings. We think TVB was "fishing" without a license. VXU is not going to renew his ticket. Why? A lot of 2-meter activity was heard this summer. This winter we expect the band to sound like 75 meters on a busy Saturday afternoon. ZME has traffic for Bangor. Traffic: W1LKP 153, CEV 85, UDD 43, ZME 31, FZK 24, WTG 23, BCD 21, EFR 18, BDP 17, BX 16, BBS 13, FCS 11, JIS 10.

EASTERN MASSACHUSETTS — SCM, Frank L. Baker, jr., W1ALP — New appointments: FZJ Medfield, ZNG Wakefield, LOS Sharon as ECs; GNX as OPS; EAE as ORS. Appointments endorsed: EMG and LMU as OESs; WU and DWO as ORSs; WK, BPW and BGW as OOs; BFV Wrentham as EC, BPW and LMU as OBSs; LLY Arlington as EC; MD as OPS. ZQO and FRR are on 75 meters. Boston has its RACES license. TVY has a DX-100. WN1LDK is on 40 and 80 meters. ALP has a new grandson and his father passed away. Thanks for the many cards, gang. Our sympathy goes to DXG on the death of his boy. ILE, ILA and IKZ are all one family. CLF will have a kw. on 10 meters. QGG is on the air again with an SX-99 receiver and is active on the Barnyard Net. HWE has been on the air for 50 years. SMO operated from Provincetown on 75 meters. The Framingham Club worked all bands on Field Day. KCC and LHM are new Novices. MEG is portable from his cottage in Hopkinton. RKD moved to Vermont. Framingham has RACES and the club has a certificate for working 10 stations. NF says he is checking sun spots at his QTH. Randolph has RACES. LSR, QWB and YYZ helped out in the C.D. Test. JOT got married and will live in Needham. ZWQ got married and went to Bermuda on a trip. Sector 1-B, station ALP-1, was on most of the three days during the C.D. Alert. Operators were AJU, ALP, IPE, HSN, CNX, WFQ, HBE, GSK, UOZ and GNK. The following of the Quincy group, IA, were on: DXQ, ACB, FSZ, VJC, AJU, WK, EVX WFQ, LQ, IS, ZSS, FBT and LHJ. The Scituate High School Club is now affiliated with ARRL. YTM is on 6 meters. VUH, now KP4VUH, has a KWS-1 and a 32V-3 with a 75A-3 receiver on all bands and is looking for W1s on 21,400 kc. each Mon. at 8:30 P.M. GDR, in Swansea, is on all bands with a Globe Scout. IHZ now is in the Air Force. IOA has his General Class license. FJI, CGR and GYL have Tech. Class licenses and are on 6 meters. The New Bedford gang is waiting for UQH to go mobile in his new car. We hope MHN's XYL is coming along well after an auto accident. AZU has a new 15-meter four-element beam. ZE has a B&W 5100B transmitter. DIR spent two weeks at Camp Drum and AVY handled traffic. Active traffic nets in this section are the Eastern Mass. Net on 3660 kc. at 7 P.M. Mon. through Fri., and TCPN on 3970 kc. daily at 1700. Refer to Jan. '56 *QST* for many other nets that are on during the week. EAE is active on the c.w. traffic nets. FZU is R.O. for Middleboro and FEC is Alternate R.O. The Nemasket Net is on Sun. at 9 A.M. on 28,712 kc. BY was endorsed again as ORS and PXH was endorsed as OES. SMO went to Niagara Falls, met HEY, and took part in the C.D. Alert. BPW has a folded dipole and is up to 47 countries. IBE is busy at work. EPE had a major operation but is coming along well. NF has worked 60 countries since Christmas and relayed a message from DL4RF to Syracuse, N. Y., in 6 minutes. EEE is mobile on 75 meters. MP is mobile marine in his boat down on the Cape. BNS is very active on 75 meters. WK worked ex-1DVC, now a W6 on 15-meter s.s.b. PO says he is secretary of the Boston-Providence Chapter of the QCWA. BOE is on s.s.b. only. HIX has a 6146 c.w. rig on 40-80. WN1MDD is new in Hudson on 2-80-meter c.w. ADL has an 829 on 2 and 6 meters. Traffic: (July) W1BPW 167, AUQ 107, AVY 60, IBE 36, TY 27, UE 22, EAE 14, GNX 14, WU 13, BGW 10, EMG 10, AHP 6, UKO 6, BY 4, NUP 4, EPE 2. (June) W1EPE 116, KBS 10, AHP 3, ATX 3, BY 2, CZW 2, NF 2. (Dec.) W1IBE 130.

(*Continued on page 98*)

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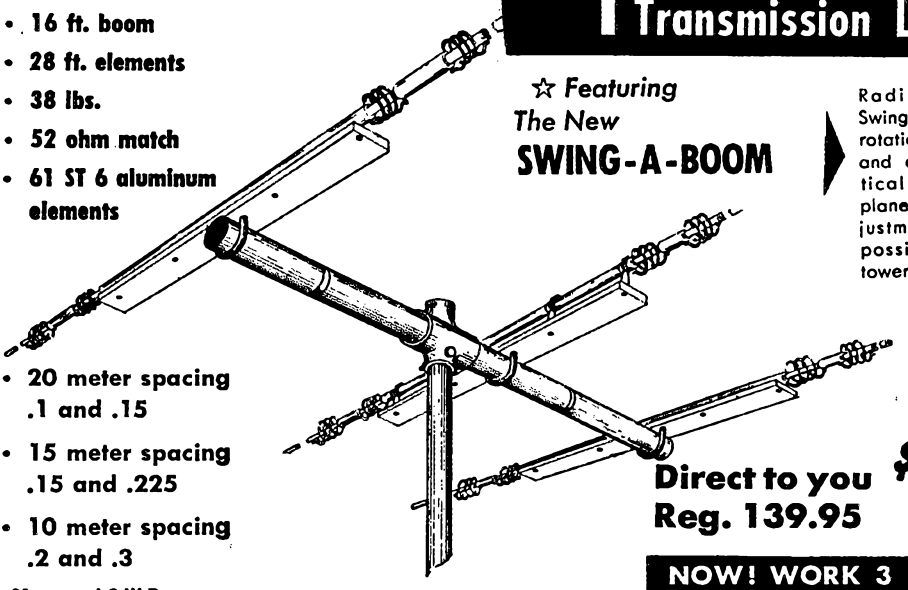

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NORTHWESTERN DIVISION

Alaska — SCM, Dave A. Fulton, KL7AGU — We had the pleasure of having Northwestern Division Director Roberts up for a visit again this year. Rex came up to attend the ARRL Alaskan Convention. A few more visits and a few more years to observe and we will make a Scourdough out of Tex yet. Well, we heard from Southeastern for a change. Glad to hear from you fellows and hope it won't be the last time. BPK is on the air with a Viking II, a 183-D and a Windom antenna. He is on mostly on 10-meter phone when the band is open; otherwise he is on 40- through 15-meter c.w. Also BPK wonders about a "QSO Party" for Alaska. BKZ and BUH have graduated from Novice to General Class. BLU now is using a DX-100. BBK's silence is attributed to his oyster-farming. He should get on between oysters though. We hear that s.s.b. is about to make its debut in Ketchikan. Ex-CP from Juneau, is back on the air from W7-Land; Tacoma, Wash., to be exact. W4STM, at Kenai, hopes to have his KL7 call before long.

IDAHO — SCM, Alan K. Ross, W7IWU — Pocatello: EC BDL (WNE) reports on Operation Alert. There was a 75-meter link from the down-town sheriff's office to WNR, out of town where conditions were good, and a 2-meter link is planned for next time. Those taking part were BDL, QIS, CDA. AGA and YBA. Gifford: VWS is rebuilding a newly-acquired BC-455 and plans to attend college in Ar-

(Continued on page 100)

WESTERN MASSACHUSETTS — SCM, Osborne R. McKeraghan, W1HRV — SEC: RRX. RM: BVR. PAM: QWJ. The WALCW Net meets on 3500 kc. Mon. through Sat. at 1900 EDST. AJX has a new Collins 310B and is looking for DX on 20-meter c.w. DWA is looking forward to handling traffic again. WN1KGJ has passed the General Class exam and is operating on 80, 40 and 15 meters with a Globe Scout and an SX-99. WN1JOF is operating portable in Eastern Massachusetts. DGL has a new VFO and is reporting into WMN regularly. WPW is spending most of his operating time on 6 meters with a new Consolette Communicator. ZEO is busy as OBS and is doing a fine job as EC for Hoosac Valley Radio Club has code classes in full swing at 5 and 13 w.p.m. DZV needs but one state, Nevada, for WAS and has worked over 30 countries with his Globe Scout and SX-99. Code classes are held each week at the c.d. communications room in the Town Hall in Easthampton. HRV, ZWZ, SRD and VSX are coaching a group of 8 prospective hams. One has passed the Novice Class test and is waiting for his ticket. Several others are about ready for their tests. Last month's somewhat abbreviated report was made in the middle of your SCM's vacation during a short break at home between automobile trips. During the July c.d. alert the hams in the section were very active. C.d. stations were manned many hours and the operations, coverage and excellent participation were a tribute to the hams who have wholeheartedly entered the c.d. groups. Each test gets better with more activity and smoother operations. Traffic: WIBVR 117, HRV 32, TAY 31, DVW 21, NY 12, ZEO 8, DGL 5, BYH 4, DZV 4, AJX 2, DWA 2, KGJ 2.

NEW HAMPSHIRE — SCM, Harold J. Preble, W1HS — SEC: BXU. RM: CRW and COC. PAM: CDX. AREC and RACES groups were well represented in the July C.D. Tests with all counties but one actively participating and furnishing communications for State Headquarters and County Chairmen. More stations are needed for operation within the counties at local levels. Contact your EC. It is important that your community have radio communications in case of an emergency. ARR gave our traffic count a big boost in July. He is putting up a Windom. FAU made BPL with 101 originations. HOU is manager of the Barnyard Net. New Hampshire hams will miss ANS, who passed on in July. It's good to hear GMH on occasionally. The doctor says he still must take it easy. JNC is back from vacation in the Sunny South. He reports many personal contacts with hams and lots of good southern fried chicken. FAU operated portable from Wells Beach, Maine, during August. EVN is experimenting with home-built 10-meter beams. HZH spent an enjoyable evening with hams in Keene. Welcome to Novices KMO, KND, KOL and KVG. Quite a number of OPS-ORS certificates are due for endorsement. Please send them in. Traffic: (July) W1ARR 214, FAU 108, HOU 71, COC 38, EVN 28, QGU 19, HS 8 (June) W1EVN 18.

VERMONT — Acting SCM, Mrs. Ann L. Chandler, W1OAK — SEC: SIO. RM: OAK. VTN, 3530 kc. (1830 Mon. Wed. Fri. and Sat. summer schedule); VTPN, 3860 kc. (Sun. 0930); GMN, 3860 kc. (Mon. through Sat. 1200-1300). GMN Mgr. VMC reported 587 stations checked in during July, clearing 39 messages and 13 bulletins. JLZ is the new District No. 5 R.O. with WYQ as his Alternate. BNV is the first local in Middlebury on s.s.b. with a B&W 5100 and exciter, also an NC-300. EIC has gone v.f.o. using a Heathkit and is doing very nicely on 75-meter phone. WOO is on the air again. WPS is having transmitter troubles. WOD and WOC were at Squam Lake in New Hampshire for the month of July and had their rigs with them. EIB took her rig to Sharon for the week she was there with the 4-H camp group. Sorry to report the passing of Nelson Fowler, DQK, of North Troy. Traffic: (July) W1OAK 56, AVP 40, VZE 28, IT 13, ZNM 11. (June) W1AVP 30.

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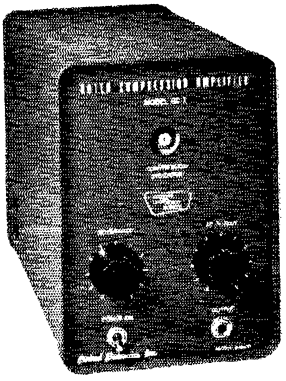

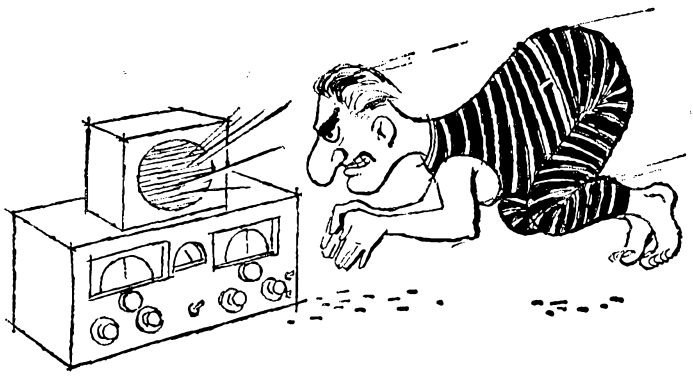

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kansas this fall. Idaho will lose a good OO for a while. He has certainly cracked down on those Novice harmonics falling within the 7.4-7.5-Mc. region. Lewiston: GMC attended the ARRL Convention in San Francisco. Boise: Sorry to have to report the passing away of LSQ. Operation Alert was handled smoothly with a 2-meter (FM) link from the c.d. headquarters to FIJ, ASA and IWU. At the c.d. end was YON, with ZBQ assisting. FIJ was on 3997 and both ASA and IWU were on 3509.5 kc. ASG, the new W7 QSL Manager, says he has hundreds of unclaimed DX cards on file, many from Idaho. Send him your No. 10 self-addressed stamped envelope with your call in the upper left-hand corner. Traffic: (July) W7GMC 101, VQC 16, LQU 1. (June) W7VQC 18.

MONTANA — SCM, Leslie E. Crouter, W7CT — On July 15th ASG took over the W7 QSL Bureau and reports hundreds of unclaimed DX QSLs for Montana stations. Send a No. 10 self-addressed stamped envelope with your call letters in the upper left-hand corner to Joe at 3599 Karen Ave., Salem, Ore., if you are interested. The 21st Annual Glacier-Waterton International Peace Park Hamfest was held at Apgar Camp Ground in Glacier Park with a total registration of 189, which included 54 XYLs and with OYP, of Wolf Point, winning the major prize of an NC-300. Contest prizes were won by GFT, PAF, KL7AVE/7, VE6OF, NPV, CAL, BOZ, QPK, KUH and YCQ. All officers for 1956 were reelected for the 1957 hamfest to be held at the same place. The Great Falls Radio Club is now an official ARRL Affiliated Club. In Missoula there are 12 new Novice calls as the result of a class sponsored jointly by the Hellgate Amateur Club and the City Recreation Department. Another class will be held by the same sponsors in the fall. RZY and KJX have new beams. DOV is a new Novice in Helena. Your SCM is receiving letters crying for Montana 20-meter c.w. for WAS. No traffic was reported for this month.

OREGON — SCM, Edward F. Conyngham, W7ESJ — QNI is expecting his brother, JQS, up for a visit and has the new modulator almost finished. KTG has been too loaded with summertime work to get much operating done. TSH also has been snowed under with summertime work. TLC has added MARS to his many activities. AQK has moved to Albuquerque, New Mex. VIL has been working 40 meters lately. UJL reports poor condition in the last CD Party. DH is getting excellent DX performance from his new DX-100. While on vacation PRA ran into the Tillamook Club's Field Day set-up. TMF reports the c.d. drill went off smoothly. OMO is house-painting and plastering. JCJ is back from a tour of duty. ABJ has moved to The Dalles. VXC acquired a new 30-kw. emergency power plant, 850 pounds of it! APF spent too much time in the hospital to hit his usual traffic score. AMF cleared most of his traffic on 15 meters this month. TBG has a new Gonset 20-meter beam and rotator with which to chase 20-meter DX. ENU put the home rig on a 3-kw. emergency power plant for the c.d. drill. ATQ has a new scope for more modulation experiments. RGS is working 6 meters and contacts W6s, W7VMP and W5VVW/Ø. SEZ was in the hospital with a broken rib from a motor scooter accident. WBG was in the hospital for a spinal fusion. QF is building a new rig for MARS work only, a modified Navy TCS. MTW is active on MARS. OHK is working MARS to improve c.w., along with QBO. PFA has a new job. VLE was QRL with Mount Hood summer activities. WHE is mobiling a lot. LT still is on the Dew Line project. WAT is firing up in Rosburg. FQI was slowed down with shop work. NTI is QRL the phone company and u.h.f. work. Traffic: (July) W7QKU 406, AMF 261, TLC 98, GUR 94, APF 50, ENU 46, PRA 45, OMO 34, TMF 31, VIL 20, HJU 17, UJL 17, TBG 11, AQK 9, BVH 9, KLE 7, VXC 6, ABJ 2, JCJ 1. (June) W7APF 665, TLC 35, QYS 12, QNI 4.

WASHINGTON — SCM, Victor S. Gish, W7FIX — ASG, the new W7 QSL Manager, advises he has hundreds of cards on hand for the Washington section. Send him a No. 10 self-addressed and stamped envelope with your call in the upper left-hand corner for yours. See QTH page 132 August *QST*. PGY is moving into a new shack — son-in-law JPH was home for a visit. VAZ has a new all-band flat-top and is looking for a new final for his s.s.b. WAH is on the phone and c.w. nets. AIB is a new MARS member. APS is getting in net time when he is not painting the house. AMC still is buying type for QSL printing. LVB is in a summer slump — working on audio amplifiers. HDT is proud of his little Elmac and reports that UJA is rebuilding his final so his all-band 75-meter transmitter will work better than 75 miles. FM is getting out with his 813s. PUA spent his summer vacation in South Dakota. CZY is going mobile to Jasper and Banff in VE6-Land. New on 6 meters in Seattle is WUM/7 from Spokane. WYC has a 300-watt grounded-grid linear building for 40 meters. MQD is taking a long look at 6 meters before moving there. BDK is building a "solar flare indicator." AVM is too QRL for traffic. CWN is working 20-meter c.w. and 75-meter phone and is building a grid-dipper. WLK was out of town on vacation. BEC dropped the "N" and wants a day with a limit of 50 watts. KTL made his last report before heading for West Virginia. BA is handling traffic on 40-meter c.w. with ØBLI using a new doublet. The Spokane boys are sponsoring the License Plate Bill. They need donations, and will give out some nice

(Continued on page 102)

certificates. Mail your request for stock to: License Plate Bill Trust Fund, Ken White, Treas., N. 102 Monroe, Spokane, Wash., if you want to help support the drive for auto license plates. Traffic: (July) W7PGY 1405, BA 1051, VAZ 856, K7FEA 651, W7WAH 136, TH 51, AIB 50, APS 30, JEY 22, EVW 18, AMC 11, WQD 11, LVB 2. (June) W7TH 36, BXH 30, EYF 24, KTL 2.

PACIFIC DIVISION

HAWAII — SCM, Samuel H. Lewbel, KH6AED — The big news for July was the Maui Convention. The Maui Club did an outstanding job with over 100 hams and guests participating. The ham who traveled the greatest distance to the convention was YLRL member Rosella Hansen, W7ULK. The Honolulu Amateur Radio Club announced that it would sponsor the next Territorial Ham Convention in Honolulu during the summer of 1957. Operation Alert 1956 found the hams in Hawaii better prepared than ever before. In the Islands the exercise was more of a headquarters drill and so all RACES members were not called on. The overall plan was tested and though the system proved sound it was shown that several equipment changes are necessary and the addition of teletype for inter-island and HQ to HQ traffic carries top priority. Traffic: KH6QU 1103, KP6AK 129.

NEVADA — SCM, Ray T. Warner, W7JU — ASG, of Salem, our new W7 QSL Manager, advises that there are hundreds of unclaimed DX QSLs on file for Nevada stations. A large self-addressed stamped envelope with your call in the upper left-hand corner will do the trick. Even though you don't work DX regularly see what Joe may have for you. PC has been appointed EC for the Reno Area. SHY, of Winnemucca, is now an ORS. YNO continues to report regularly and is on the air whenever work permits. VYC, Las Vegas EC, hopes to be on 2 meters shortly. AZF, of Reno, received "Worked 25 Nevada" certificate No. 40. RBV, of Las Vegas, is on 14,020 kc. daily, from 2230 to 0100 MST. DX stations desiring skeds should contact him direct. VIU made WAC. The following of the Nevada gang were seen at the National Convention in San Francisco: NW, PC, JU, CNG, OLF, LHQ, PWE, RSY, VVL, SHY, TKV and K7MAH.

SANTA CLARA VALLEY — SCM, R. Paul Tibbs, W6WGO — SEC: NVO. K6DHO is on the air with OB skeds on Tue., Fri. and Sun. at 2100 on 7260 kc. YHM is back after a trip to Alaska. While there, Don worked 40 and 80 meters with TCS on a 52-foot cruiser and reported aurora flutter so bad on 80 that not much was worked on that band. K6DYX has been appointed OBS; he enjoyed working in the CD Contest. K6SVK, ex-1VYB, now is located in Mt. View. Jim moved here from Palmdale. He would like to get together with the local gang working 6 meters and also would like to join a local club. YBV still is QRL on the traffic nets. PBC has finished putting up a 432-Mc. beam 60 feet up. He is building a 220-Mc. receiver and transmitter and has worked seventeen states on 56 Mc. this year. NX spent a week camping in the Sierras. Frank and his party packed in many miles from any roads and were caught in thunder showers almost every day but withstood the weather in great shape. Fishing was reported to be very good. K6IMI is selling his mobile rig. The c.w. gang in the section is doing a very swell job on the NTS nets, working in NCN, RN6, PAN and as TCC stations. There still is room for stations wishing to work one or more nights a week. There are openings as NCS and liaison stations, as well as TCC alternate stations. Contact HC for details. Traffic: K6DYX 400, W6BPT 185, YBV 80, HC 69, AIT 46.

SAN FRANCISCO — SCM, Walter A. Buckley, W6GGC — First, for the benefit of the fellows in the San Francisco section who hold appointments, I would like to make a listing of my change of address. Please mail all data to 901 Grafton Ave., San Francisco 12. The 8th National Convention has come and gone with many comments, pro and con. I personally enjoyed meeting many of my old friends. The main issue of the chairman was that all the ladies have a good time and much time was put into making plans for their visit to be a pleasaut one. From most of the reports I have heard I think the "Swoop" and dance was enjoyed by most of them and that the majority of the women went home with the idea that much time and effort was put into making the OM's hobby one of interest to the wife, even if she does not hold a "ticket" in her own right. After all, if the XYL enjoys the social part of her husband's hobby I feel that it makes the ham in general that more satisfied as a whole. When the "Swoop" is happy that is half the battle. GCW now boasts a new honor. He has certificate No. 100 as proof of radio communication with one hundred licensed women amateur radio operators and is now an official member of the "Y.L. Century Club." It took Bill six years to win this membership. K6SGO, who is in the Navy, says he would like to work in the 420-450-Mc. and 1215-1300-Mc. bands. Tune up the rigs, boys and gals, and listen in for him. PHW, who is the administrator at the "Maimonides Hospital," set up an antenna for RBQ during Bill's recent return visit to the hospital, and even though the former Director of the ARRL Pacific Division was flat on his back he was able to listen in on 20 meters. UIT visited British Columbia and met some of the VE7s. GHI's young YL won a color TV set recently and Bill talked her out of

(Continued on page 104)

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Peak Envelope Power Input SSB-1000 Watts		
Peak Envelope Power Output SSB-625 Watts		

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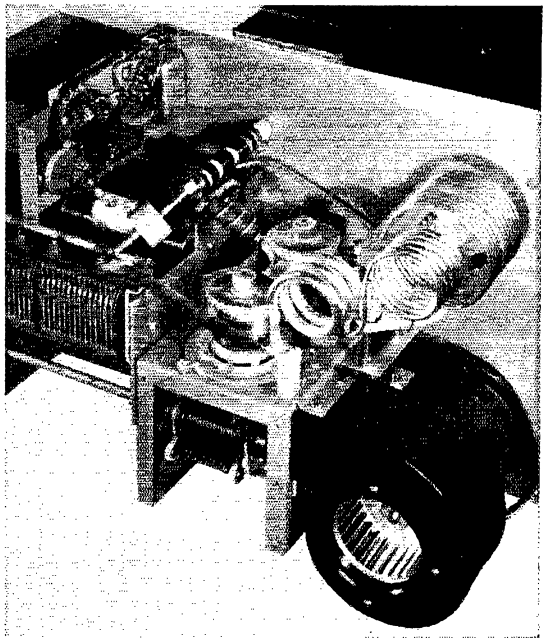
5 Bands:	80m	3.500 to 4.000 Mc.
	40m	7.000 to 7.300 Mc.
	20m	14.000 to 14.350 Mc.
	15m	21.000 to 21.450 Mc.
	10m	28.000 to 30.000 Mc.



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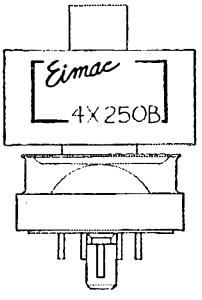

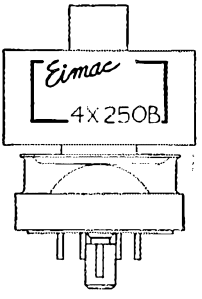

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the set in exchange for two new dresses. Congratulations to K6GWS on receiving his 35-w.p.m. Code Proficiency sticker. Local Novices, contact HJU if you wish help on learning code and theory. K6HIA was speaker at the June meeting of the Sonoma County Radio Club. The Marin Amateur Radio Club has two new YLs as members. Both live in Mill Valley. KN6SFI and KN6PPK also joined up. OST was net control for the 10-meter hunt conducted by the 29ers. CBE reports that DX on 14 Mc. still is wonderful. His new 20-meter beam works fine. The Cathay Club reported that the members had a grand time up on Mt. Tamalpais on their first Field Day and are looking forward to a repeat next year. K6IMZ, Parkey; KN6OBB, his XYL, Lee; KN6OSO, Bill; KN6OSQ, Ken; and another jr. operator, Bert (who was awaiting his Novice call) all attended the National Convention. Congrats to Parkey on his 100 per cent ham family. BIP listed 285 contacts in the recent C.W. Contest. He has a daily schedule with K6HWI in San Diego. Traffic: W6FEA 259, PHT 23, GGC 18, GHI 12, BIP 6.

SACRAMENTO VALLEY — SCM, Harold L. Lucero, W6JDM — The Grand Pappy's Net held its annual meet and it was learned that K6AKF is now trying to obtain his retirement long before the age limit. What and how could you do such a thing, Harry? Anyway all enjoyed the outing. In a nice letter HJP writes that he will be signing KR6RX, but is eagerly anticipating signing W6HJP upon completion of his tour of duty. Luck, Art, and we will be looking for you at both places. The Sacramento Amateur Radio Club, Inc., held a family potluck July 21st at the Land Park Clubhouse Patio and a fine time was had by all. Ed Tilton was guest of honor at a special meeting of the SARO July 5th and gave a nice talk. K6IYC should be an official station soon. K6EHT is back from a nice vacation in W7-Land and is now building a new final and will run about a half gallon. Will surely look you up on our next trip to Sacramento, Neil. The Mt. Shasta Radio Club supplied communication during the dedication of the Everett Memorial Highway on Mt. Shasta, just in case of any accidents. Public Service certificates for work during the floods at Christmas time have been received by those who participated. Fellows, that's it for this month and I hope to hear from you soon.

SAN JOAQUIN VALLEY — SCM, Ralph Saroyan, W6JPU — K6GOX has an NC-300 receiver and likes it very much. DIY and ADB handled much traffic on 40-meter c.w. for the Methodist Youth Fellowship Camp. K6KQM got his General Class license. SMS has a new Valient transmitter. UBK went fishing in the Sierras, got stuck in a creek and walked a total of 25 miles to get a tow truck. OUX has 500 watts to a pair of RK65-A tubes. OWL lost his mobile antenna on a tree and now has one that works better. ZFN thinks s.s.b. is here to stay, and is looking for an exciter. DVL got the bugs out of his s.s.b. rig and it sounds fine. IFE was a recent visitor in Fresno, and he has cracked the 3300-Mc. record, which is 190 miles. KN6MHC, the daughter of JPS, is getting lots of fan mail. K6GHC is being transferred to the Bay Area. The Fresno Amateur Radio Club's 2-meter repeater is off the aid because of a legality in licensing. This is being taken care of. Because of the use of the 2-meter repeater during the C.D. Test July 20th, perfect coverage was obtained in Region 3C between all operational areas. PPO is on the Buzzard's Net on s.s.b. with a new Phasemaster. IMZ and son are flying radio-controlled model airplanes. SUV has 11 months to go to get the new final on the air. K6HWL was a recent visitor here in Fresno. All appointees are requested to turn in their reports every month. See you at the club meeting. Traffic: W6ADB 221, EBL 23, K6CQT 3, W6GGS 3.

ROANOKE DIVISION

NORTH CAROLINA — SCM, B. Riley Fowler, W4RRH — SEC: ZG. PAM: DRC. Please allow me to thank the very fine Emergency Coordinators for the excellent way in which they have conducted their recruiting campaign. North Carolina now has more AREC members than ever before. Your SCM and SEC attended the amateur meeting in Charlotte, along with 12 ECs, ZQB, EC for the district and president of the Mecklenburg Club, presided. These boys had a well-planned and executed meeting. Thanks to the club for an excellent meeting. The Catawba Valley Club keeps busy. That is the secret of a good club. These boys keep your SCM informed of their activity. The Fayetteville fellows also keep busy. Their EC, VTP, sends information that they put on a TV program demonstrating their c.d. net. EC DRC has completed the registration of all amateurs in his district and has worked out a splendid plan of operation. Any EC interested in District 5 Plan, send me a card and I will mail you a copy. The MARS operators drilled with emergency power July 31st. In many ways the plan was a success. Uncrate those generators, boys, and put them in service. Only 30 per cent had them in operation. If you don't need or want the generator, let someone have it that will put it in service. All OBS are getting the ARRL Official Bulletins on the air and on schedule. Traffic: W4GXR 85, FTE 77, DSO 33, RRH 27, FDP 21, K4BQE 20, W4DRC 12, ZWF 12, VBO 9, AKR 4, AJR 2.

SOUTH CAROLINA — SCM, Bryson L. McGraw, W4HMG — TWW is back on after nearly being killed via a 110-a.c. water pump. Welcome to Columbia, K4HLY,

(Continued on page 106)

Study these specifications—compare them—and you too will agree, along with thousands of hams, that GOTHAM beams are best!

TYPE OF BEAM. All Gotham beams are of the full half-wave plumber's delight type; i.e., all metal and grounded at the center. No wood, tuning stubs, baluns, coils, or any other devices are used.

GAIN. Gotham beams give the maximum gain obtainable. Our 2-element beams give a power gain of four (equivalent to 6 db.); our 3-element beams give a power gain of seven (8.1 db.); and our 4-element beams give a power gain of nine (9.6 db.)

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ASSEMBLY AND INSTALLATION. No special tools are required for assembly and installation. Entire job can be done by one man in less than an hour. Full instructions are included with each beam.

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STANDING WAVE RATIO. A very low SWR of approximately 1.5 to 1 will result from following the instruction sheet, depending on the height above ground and the surrounding area. If an SWR indicator is available, Gotham beams can be quickly and easily adjusted to 1.1.

STANDARD AND DELUXE BEAMS. Standard beams in the 6, 10 and 15 meter bands use ⅝" and ¾" tubing elements; the deluxe models for these bands use ⅞" and 1". In 20 meter beams, the standard has a single boom, while the deluxe uses twin booms.

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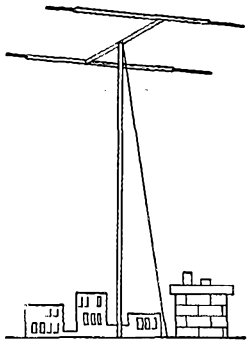

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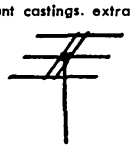

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KØCPR and K4IRX. DYG is on with FB mobile signals K4s EGI and GAT are doing FB traffic work for the SCANG Squadron. GNA/4 is back in South Carolina (near Orangeburg). K4GQG dropped the "N" and now is heard full blast via 75-meter phone. K4JFN now is mobile with 15 husky watts. AXV and VJI were mobile with FB signals from Myrtle Beach vacations. KN4IIE now is 2-meter mobile with 25 watts f.m. Congrats to YAA on making BPL. UNO (Jane) and UFP (Jim) report FB results with a 10-watter for c.w. traffic, also good 20-meter DX. CTX, with a new 7-over-7 beam for 2 meters along with 100 watts, does a nice job in the Charleston Area. AIM and TWW are new DXCC members via phone. FM and his 304TL are getting results via 20 meters. Congrats to ZIZ on USO traffic-handling. HDR (fixed) QSOs with nearly 30 mobiles daily via 3930 kc. The Columbia Club picnic was a fine affair with 150 attending. AVU/MN did an FB job directing mobiles to the area in the state park. Thanks to ZVY for his excellent job as OO. New ECs are K4GLV, Hemingway, and HAQ, Darlington. JGM with his new 10-over-20 array works the hard ones, with 95 confirmed. TYS has a very FB s.s.b. custom job. GQO, Windy Hill EC, put out nice signals with the emergency-powered Elmac. K4JIY, the Aiken Club, did a nice job on Field Day. The *Rock Hill Bulletin* needs your support. Traffic: (July) W4ZIZ 192. (June) W4ZIZ 75, FM 3.

VIRGINIA — SCM, John Carl Morgan, W4KX — The Shenandoah Valley Club had another fine 'fest at Dickey Ridge, despite big rains fore and aft. (SCM and UHS, who flew up, were weathered in at Front Royal overnight!) Operation Alert found the Virginia gang hard at it. If all involved haven't done so already, please let Headquarters have participation reports for the official records. K4AET reports the new procedures for VFN seem to be meeting with good response. QRN and new power restrictions have run VON from 160 to 10 meters. The Graveyard Net had a fine hamfest near Appomattox. RSS, the Norfolk Naval Shipyard Club, now is packing a KWS-1 and 75A-4. We regret losing one of VN's stalwarts, CZB, who is moving to Ohio. K4BBR is going to Florida. Welcome to W1AYC, from Connecticut and now in Chilesburg, and to KN8BJO, visiting the Arlington Area. CVO at the present writing is in dry-dock at Bethesda Naval Hospital. Les was a recent honor guest of the Newport, R. I., Club, of which he's ex-president. JUJ racked up country No. 135 with 121 confirmed. BIJ now is up to 97. TFX has 96 confirmed out of 122! K4EZL finally got his ticket. 19 days after the exam! KN4IYE is about ready for the General Class exam. ZM says it isn't only QRN but Daylight Time in some areas that plays hob with net attendance. Your SCM would appreciate a note from club secretaries, listing meeting nights, so he can make an effort to visit more of you. Traffic: K4AET 118, W4IA 58, K4DBC 45, W4FKP 39, K4BBR 36, DKA 30, W4TNQ 29, BYZ 28, K4ASU 24, BUI 15, W4TYC 14, CVO 11, BIJ 8, KX 8, K4EAQ 6, DWP 4, W4OFR 1.

WEST VIRGINIA — SCM, Albert H. Hix, W8PQQ — SEC: GEP. PAMs: FGL and GCZ. RMs: DFC, GBF, HZA and JWX. The state civil defense RACES station is now in operation using a KW Johnson final and an NC-300 receiver. This station did a good job during the recent tests. The following were known to have participated in the alert test: DFA, BWK, DIE, EMQ, KXD, TPW, PBO, HZA, CLX, AVS, WSL, RXP, WVF, CCF, BRM, ETF, UYR, TVO, IRN, ZJS, LSG, SNP and PQQ. Your help was greatly appreciated by HZA, the State Radio Officer. BWK visited HZA and CSF in Charleston recently. KN8BUN is a new Novice in St. Albans. WN8DEY took his General Class exam recently and is expecting his license soon. KN8AGA plans to go to the Univ. of Florida this fall. KN8AXU moved to a new QTH. GIU will be active on WVN this season. Officers of the Clarksburg Club are ESQ, pres.; CCR, vice-pres.; and SEV, treas. This club is very active; meetings are held at 7:30 the first Tue. of each month in the American Legion Building. The c.d. station was used recently for a chess match between Charleston and Wheeling. 4URF/8 is now out of the service and is in Charleston. KN8BIT has a new three-element 21-Mc. beam. WHQ continues to do a good DX job on 14 and 21 Mc. NYH renewed ORS and OPS appointments. PQQ worked SM8KV/LA in Spitzbergen on c.w. and phone for a new one. Traffic: (July) W8PBO 130, KXD 70, HZA 29, BWK 10. (June & July) W8NYH 20.

ROCKY MOUNTAIN DIVISION

COLORADO — SCM, James B. Simpson, WØHEM — NUY worked KØDXD/VE8 Resolution Island, also OA5G, Lima, Peru, on 20-meter folded dipole. Aug. 1st was Beam Day at Dick's QTN when up went a WRL 20-15-10 on a 40-ft. tower. VYP is in business again after a gang of the fellows got his beam fixed up. He is recuperating after being involved in an aircraft crackup and spending weeks in the hospital. He hopes to get in lots of air time in the meantime. KØWBB left a large-sized hole in TCC when he shifted jobs. DRY and HOP operated /Ø at Beaver Lake Youth Camp and had lots of fun. TWI received his ORS appointment. PVM has been a great help during these trying days. QTI has transferred from Alamosa to Gunnison.

(*Continued on page 108*)

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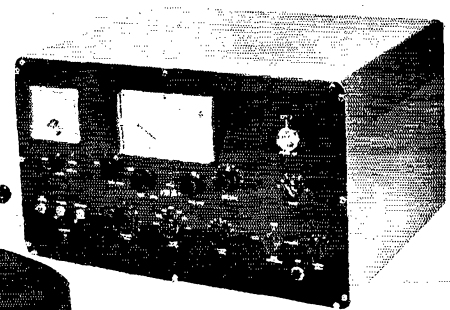

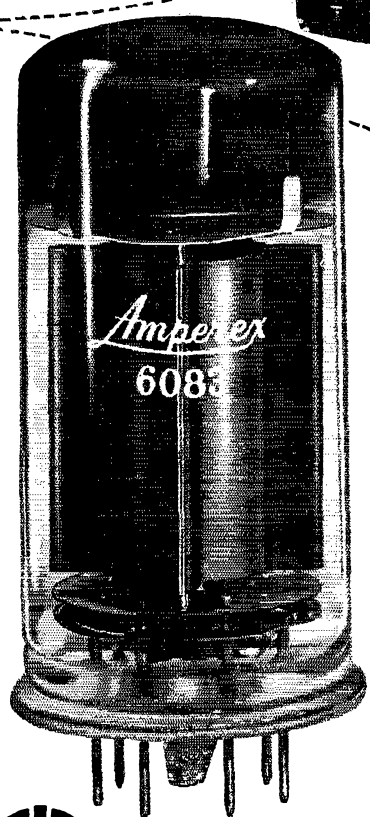

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TVI spent twelve hours at the c.d. post. LVS, TWA, BAG, DLZ, EBW, DCT, AVP and BGN handled most of the communications for Pueblo during the July alert. Headquarters c.d. station was LVS at the City Park. Contact was maintained with Canon City and Denver. The traffic handled was as follows: 33 sent, 60 received and 5 relayed. Traffic: WØKQD 341, EKQ 94, KØDXF 88, WØTVI 31, PGY 28, AGU 21, DGP 19, NIT 18, JHI 17, HOP 15, CDX 8.

UTAH — SCM, James L. Dixon, W7LQE — OCX has OBS skeds on 3636-kc. c.w. at 1730 MST Mon., on 7111-kc. c.w. at 1900 MST Fri. and on 3838-kc. phone at 1900 MST Wed. ZSW is on 75-meter phone with a screen-modulated ARC-5, a 100-foot-long wire antenna and an SX-25 receiver. CCC says he has a traveling-consulting job between the California and Rocky Mountain Areas. GPN, NIA, CCC, JOE, OOK and FRN (temporarily W6KSM) attended the 8th National Convention in San Francisco, with CCC winning a B&W KW bandswitch. The RN6 and PAN Nets from California need Utah check-ins badly. The URAC of Salt Lake was honored by having 111DQ from ARRL Headquarters as a speaker at its July meeting. The W7-K7 QSL Bureau reports there are many unclaimed DX cards for Utah hams. Novices: WN7EHY is on 80 and 40 meters with 35 watts to a 6L6, 32-foot vertical and an SW-54. CWD has 23 states confirmed. DLW is the father-in-law of WBK. How about some reports from the south end of the State? Traffic: W7CCC 13.

SOUTHEASTERN DIVISION

ALABAMA — SCM, Joe A. Shannon, W4MI — SEC: TKL. RM: KIX. PAM: K4AOZ. Activity in the July C.D. Party was very good, and judging from reports the scores were above average. All station appointees should begin preparations for the next one *now*. Congratulations are in order to the following new appointees: ZSQ and HHG as ECs; K4ANB as ORS; ZUP as OPS; FSW as OES; K4ANB as OBS; K4CFD as OO. A new Novice in Northport is KN4KFD, the XYL of HFK. Also new in Tuscaloosa is KN4KFE. DX activity is picking up with reports showing that GUV, WOG and GJW have made the grade for DXCC except for confirmations! WHW reports that the Azalea City Mobiliers held an emergency drill and transmitter hunt. WPS/YAI have a new Globe King going and CSA is building a new home. K4EEH is the new trustee of the Mobile Club. The Mobile Club made 385 contacts during Field Day with two stations in operation. KN4ISD says that his 30 watts and homespun regen. two-tuber has netted him five states on 80 meters. HON claims good results with a new Ranger. K4AJG is going on 2 meters and reports receipt of a 3-kw. generator from MARS. TOI has a new antenna and is building a new shack. The Montgomery Club reelected all its officers. Anniston reports the following new officers: SVM, pres.; UHA, vice-pres.; OAO, secy.-treas. Demopolis boasts four 6-meter mobiles. YFN received a new Morrow converter for his birthday. K4DFU and W4ZSH are sideband. Traffic: (July) K4AOZ 170, W4RLG 151, HON 149, K4BRS 128, ANB 111, AJG 109, W4KIX 92, AVX 87, GUV 37, TOI 34, EJZ 28, DXB 20, ZUP 17, TXO 14, OAO 13, CRY 11, RTQ 10, HHG 9, TKL 9, ZSH 8, MI 7, K4ACO 6, W4WHW 6, K4DFU 5, W4YFN 5, K4CTC 4, W4EWB 4, NIQ 3. (June) W4DXB 34, K4AJG 31, W4SXS 1, WOG 1.

EASTERN FLORIDA — SCM, Arthur H. Benzee, W4FE — Asst. SCM: John F. Porter, 4KGJ. SEC: IYT. We welcome to the section JCR (Nita) and OM JCS (Frank), located at Reddick. Nita is a past secretary of the YLRL. Meet them on 75 meters and get acquainted. K4AHW cooperated in the Conelrad Test and is rebuilding his mobile equipment. A new Novice at Lake City is KN4JUM. The Miami Springs Radio Club has started a 2-meter mobile project headed by ZXL and his XYL, ZXK, who are new members, coming here from Virginia. The Club had its first annual picnic at Crandon Park. Members are 100 per cent AREC and their services have been offered to the Town in cooperation with inter-county network. There was excellent participation of the gang at Orlando in Operation Alert. K4AHA was operating portable in N.E. Georgia with a DX-100 and an S-85 borrowed from AES and found some activity on 6 meters. Broward: AHZ is busy with traffic nets. EF reports an FB c.d. set-up. EVU took a 5000-mile vacation. Dade: YJE reports there are 195 AREC members. The Flamingo Net held another transmitter hunt, and also handled communications for the annual Gold Coast Marathon. We are glad to hear that GHA is out and about again. The Graveyard Net rattles its bones at midnight on Sat. BTM vacationed in Virginia. New ECs: WRT, Suwannee; ZJZ, Gainesville; TZ, Indian River; RWM, Acting EC Flagler. We need only 8 ECs for 100 per cent coverage of the section. Anyone who will serve counties not covered, please contact IYT, Lake: The LARA's bulletin is entitled *Ham Salad*. New calls are K4JBS and KN4JSH. While trying to get his new home in shape K4IXG (ex-W2DLO) found time to assemble a 200-watt 2-meter rig which was in bad shape because of shipping. SJZ did a two-week stretch with the Air Force in Tennessee. Traffic: W4WS 155, ZIR 77, IYT 76, K4AHA 52, W4EHW 48, BWR 41, AZJ 38, PJU 34, FSS 24, BKC 17, GGQ 10, LMT 10, FFZ 9, YNM 8, K4AHW 7.

(*Continued on page 110*)

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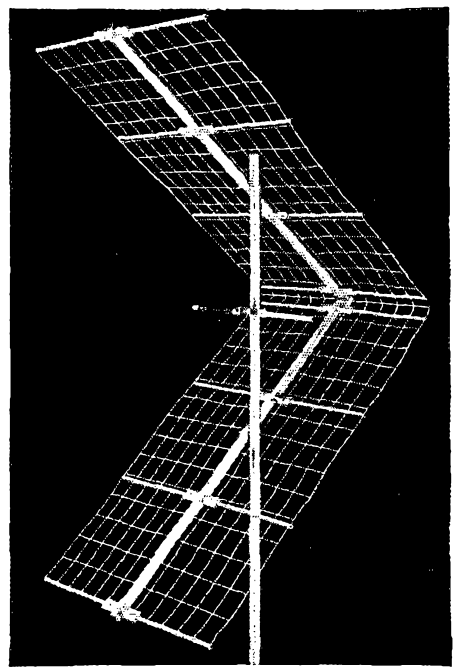

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(Exclusive Tri-Boom and Quad-Boom Construction)

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10-Meters—Cut to 29 mc. Covers 28.5-29.7 mc.

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WESTERN FLORIDA — SCM, Edward J. Collins, W4MS/W4RE — ECs: HIZ and MFY. RMs: K4AKP and AXP. K4DKG handles the majority of his traffic via phone patch. CCY keeps changing antennas and is planning an all-purpose kw. UCY is looking for more power. K4DDD has the beam down and is mobile. DAO/DAE keeps the air hot with the Ranger. HBK works the DX with the DX-35. GMS (30 feet away) wants more power and higher beams. BGG is getting set for college. ZFL is sporting an NC-125 receiver. K4AGM has 14 states on 6 meters. K4ECP, KN4IVE and K4EHI are studying for General Class. UUY is pushing the Tallahassee gang for the fall activity. The Pensacola Club runs transmitter hunts nearly every week end. JPD, ZPN, HIZ, PQW and HQ manned the c.d. station during the C.D. Test. KN4IVD took the Tech. Class exam. MS is completing the 70-foot tower at RE. JLW is having rotator trouble. PAA calls CQ Dog Xray on top of DX. HI. FHQ and VR remain 7-Mc. c.w. stalwarts. AXP is busy with speed boats. K4AH has moved to the new QTH and has a new RME receiver. HJA has complete new mobile gear in the car. PQW is curing TVI "in the neighbor's set as his own rig is clean. Hi." UUF combs 144 Mc. for DX. KN4CLJ is going into the Air Force. 6TOR/4 is building a new QTH for the gear. PTK-TTM keep entirely too quiet. K4DKG is building 811s to go with the Quad. ACB is stirring up things to get the Tallahassee Club perking. K4BCF is keeping Panama City represented in this column. RDC meets round tables on 10 meters. KN4IYQ is going after Tech. Class ticket. NJB is building a new receiver. ART is QRL TV. I would appreciate more reports from other parts of the section. Traffic: K4DKG 47.

GEORGIA — SCM, William F. Kennedy, W4CFJ — SEC: K4AUM. PAMs: LXE and ACH. RM: W4PIM. The GCEN meets on 3995 kc. at 1830 EST Tue. and Thurs. and at 0800 EST Sun. The ATLCW meets on 7150 kc. at 2100 EST Sun. The GSN meets on 3590 kc. at 1900 EST Mon. through Fri. The 75-meter Phone Mobile Net meets each Sun. at 1330 on 3995 kc. UUH is N.C. The Ten-meter Mobile Net meets each Sun. at 2200 on 29.6 Mc. VHW is N.C. Many members of RACES and civil defense participated in the National Civil Defense Exercise, Operation Alert. Amateurs who were members of RACES in Atlanta worked many hours at the State Civil Defense Headquarters, handling about 2500 messages during the exercise. Georgia is very proud of the way its radio officers conducted this drill. Augusta held its first picnic this year, which everyone enjoyed. KN4DKM, KN4JSQ and KN4IOV dropped the "N" in their calls. K4JSQ is planning on a 20A. WKP heard the good news that he too soon will receive a 20A. The PMJ's are expecting their 5th junior operator. BXV has purchased a new 20A kit so look for him on s.s.b. soon. We understand K4AFP has been on the sick list but has made a fast recovery. His Pop is doing an FB job as OBS. The ATL Teen-age Radio Club now has 24 active members and also a club bulletin. HYW has 150 countries confirmed. K4CFO and K4CFN now have a 240-ft. antenna. The OM of BWD, Helen, is now ZWT. EQT. K4BFB feels that lightning is against him. It knocked his transmitter out and almost got him at the Rome, Ga., Picnic. Many hams renewed old acquaintances at John Sesslers Lake on Aug. 5th at the North Georgia Amateur Radio Club Picnic. Traffic: W4PBK 47, PIM 46, ZD 33, YR 28, K4CZR 25, W4CFJ 14, K4AFP 9, W4BXV 9, K4CFO 8, W4HYW 8, K4CFN 7.

CANAL ZONE — SCM, Roger M. Howe, KZ5RM — A recent tropical storm caused considerable damage to the antenna arrays of four of the KZ5 gang. GD and GF lost their stacked beams and HA and LB had theirs very badly bent. GD had a 10-over-15 back up the next day. GF still is off the air at this writing. He says he is waiting for FL to get back from the States to make some changes in the tuning of his beams. The CZARA will say goodbye to club prexy CF soon. Fred is returning Stateside on rotation but does not know yet where he will be stationed. PB reports working W5WEH on 160-meter and on 75-, 40-, 20-, and 15-meter phone from FA. What, no 10 meters, Andy? The local MARS net has been reactivated on 20.994 Mc. at 1900 EST on Mondays. Ike, ex-KZ5IP, is now W8BQV and has been worked recently on 15 meters from club station W8TPY. He sends his regards to the gang. Traffic: KZ5DG 38, CF 33, RM 26, HA 10.

SOUTHEASTERN DIVISION

LOS ANGELES — SCM, William J. Schuch, W6CMN — Asst. SCM: Albert F. Hill, jr., 6JQB. SEC: LIP. RMs: BHG, TDO and GJP. PAMs: PIB, MEP and K6BWD. Field Day notes show some of the clubs did more than well, among them the Downey Club, which had a visit from the Law which thought they were a tribe of Gypsies moving in. GYH is skedding the MARS station in P.I. Everybody is going on vacation it seems. K6COP is net control of the MCAN-7 net. TDO is a new RM. K6BWD is a new PAM. KN6OZJ is 100 per cent check-in for 4 months on the 246 Net. K6EJT is coming back to W6-Land. VSH is QRL the 246 Net. BHG has his hands full running SCN, and needs help. LIP is taking a vacation under the doctor's orders. UED has 116 confirmed for DXCC. The gang turned out great guns for the recent CPX drill in c.d. K6GUZ still is

(Continued on page 112)

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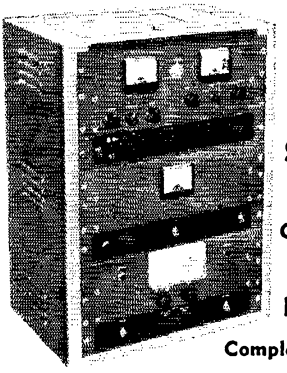

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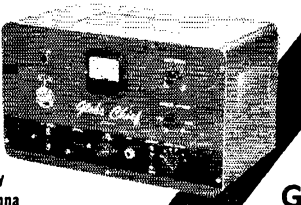

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- ★ Completely band-switching, 160-10M
- ★ Built-In Power Supply
- ★ Provisions for antenna changeover relay, external Speech Modulator*, and VFO input
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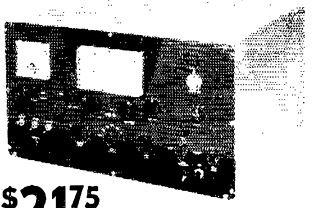

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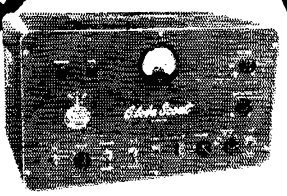

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- ★ Popular high-level modulation, with full modulation of Final
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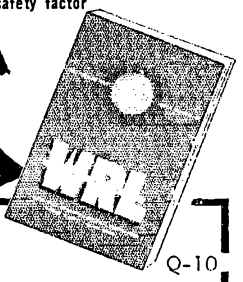

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busy with traffic. USY skeds KC4USA. MEP has a sixteen-element 144-Mc. beam. GJP was Field Day at Huntington Lake. BUK is on s.s.b. K6BEQ took the 144-Mc. rig on a vacation. K6EA is getting ready for his yearly trek to WØ-Land. ORS is taking a vacation from WCHA. If you folks don't get the news in we can't print it. Thanks to HFA for substituting for me during my vacation. He did a swell job. Traffic: (July) W6DDE 551, GYH 411, LYG 284, K6COP 173, KN6OZJ 151, W6VSH 138, BHG 113, ORS 77, TDO 76, LIP 61, CK 54, K6MON 54, LVL 48, GUZ 47, W6HJY 44, USY 33, MEP 30, INH 18, GJP 16, K6BWD 6, W6CMN 6, K6HOV 2, PLW 2. (June) W6MEP 56.

ARIZONA — SCM, Cameron A. Allen, W7OIF — Asst. SCM: Fred W. Wilgus, 7LJN. SEC: JYH. PAM of AEN: ASI. The AEN meets Tue. and Thurs. at 7 P.M. on 3865 kc.; the Grand Canyon Net Sun. at 9 A.M. MST on 7210 kc. Phoenix and Tucson took part in Operation Alert with a good turnout from both cities. JYH had a station on at State C.D. Headquarters near Phoenix and LAD set up a base station in downtown Tucson with both 75-meter and high-frequency equipment. The Maricopa County V.H.F. Club has erected an antenna system on top of the Phoenix Red Cross Building. A ground plane on 10 and a 40-meter dipole were erected on one tower. The overall height is ninety feet above ground. Six meters is quite active in Maricopa County. Stations to be heard are QNO, ZIA, ANC, OUP, YKK, VYZ, AYU, DIQ, VMP, EED, MHP, SLU, CBK, POS, WPE, KYE, YWD, W5KPR/7 and K5CUI/7.

SAN DIEGO — SCM, Don Stansifer, W6LRU — Much concern has been shown by some amateurs in the area over the number of small clubs having poor attendance and slim budgets. It has been suggested that the consolidation of some smaller clubs into larger units would be healthy. This matter will be considered at the next meeting of the San Diego Council of Radio Organizations to be held Oct. 11th at 7:30 P.M. at Red Cross Headquarters. All clubs and groups, please see that your group is represented for this meeting. It was pleasing to note the cooperation in the City of San Diego between amateur radio participants and the c.d. people in Operation Alert. Much was learned, and EWU is to be congratulated on a job well done. HU vacationed in VE3-Land. Amateurs in the Alpine Area are urged to contact K6DWH about the Alpine Club, which is now doing paper work for ARRL affiliation. The Annual Orange County Picnic was held. K6BTO is experimenting with in-phase Yagi antennas on 420 Mc. YDK reports an s.s.b. rig for 10-meter traffic-handling. K6LXL, in Encinitas, checks into the SCN on 3600 kc. for those with traffic for that area. K6LIV, in Nestor, has worked all states and 26 countries. K6BPI has the bugs out of his teletype and is using it to handle traffic where possible. The Coronado Club served as radio coordinator for the 4th of July parade in that city. Congratulations to KN6MTN, a blind member of the Coronado Club, who passed his General Class exam. A new club, the Silver-Circle, has the following officers: K6AXU, pres.; K6MZL, vice-pres.; K6LYZ, secy.-treas. BAM upped to 200 countries with EA9DF, CEØAC and XE4A. During the Operation Alert in Vista the facilities were utilized to report a traffic accident noted by HAW. He contacted headquarters in the County Sheriff's Office and the law was summoned. K6JPI is now communications officer for the City of San Diego. K6HS is the new call of the FCC Radio Engineer in San Diego. 1KUH/6 is the proud father of a YL. LWT is active on amateur TV. The Helix Club on Aug. 8th announced its 25th anniversary as an organized and continuously-operating club. KL7MF, ex-W6MI/SIG, was contacted the other evening for over an hour and sends his regards to his many friends in the area. SYA is now a grandfather. K6BEC made WAC while home for the summer vacation. K6ESO and W6MIT were married in August. MGT had a bout at the hospital, but is reported OK and back to work. Official Relay Station and Official Observer appointments in the section are open. If interested, contact your SCM. Reports of interesting happenings and news for this column are always welcomed by the SCM to reach me prior to the 7th of each month. Traffic: W6YDK 850, K6BPI 63, LXL 47, DBG 16, LIV 4, W4UOA/6 4.

SANTA BARBARA — SCM, William B. Farwell, W6QIW — Asst. SCM: Dorothy E. Wilson, 6REF. The Oxnard Radio Club now has headquarters in the new police building in Oxnard. Congrats to the Ventura Club on its new newspaper, *Over Modulation*, Vern Craw, K6IVB, editor. KCD is the father of a new girl. BOK is going hi fi. YK is after DX. QIW, TZL, REF and KCD monitored the Conelrad Alert. KN6PPR has moved to Los Angeles. Results of the PRRC classes are new calls KN6THH, KN6TIA and KN6THT. Congrats to Bert Farwell, who was married June 16th. Maybe he will have time to get that ham ticket now. Phillip Farwell is now in the Air Force and assigned to radar school in Mississippi. He will have to get his ham ticket now if he wants to talk to his OM, QIW. WDS is attending summer school at U.S.C. Traffic: W6QIW 58, REF 22, PWK 2, JPP 1.

WEST GULF DIVISION

NORTHERN TEXAS — SCM, Ray A. Thacker, W5TFP — SEC: PYI. PAMs: TFP and IWQ. RMs: KPB and PCN. YPI is off the panhandle of Oklahoma in a

(*Continued on page 114*)

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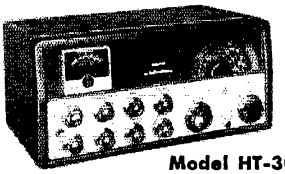

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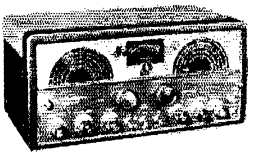

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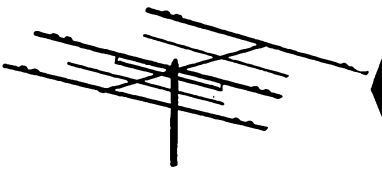

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RG 11/U Coax ..... **$0.13** per ft.
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change of QTH, BTH reports BBO and WNJ, in Texon, soon will be active again. DTA/5 is running a pair of grounded-grid 803s. DFB advises the Ft. Worth AREC group was very active in July, having a c.d. drill with the Haltom City Fire Dept., and a c.d. RACES drill with the city set-up. KN5HBP is a new Dallas Novice. Final figures indicate there were 687 registrations at the 26th Annual West Gulf Division Convention held in Galveston! K5BZS, AYX, AHC, YKT and K5EMR handled in a very efficient manner the problem of tracking down a family en route to California in order to advise them of a death in the family. KIS is "settlin' out" in his new home over Ft. Worth way. VEZ and family enjoyed a flying vacation on the East Coast. Several of our active OOs in this section report they have received letters of appreciation from fellow hams they have notified of infractions, etc. I think it is thoughtful and indicative of the right spirit for these folks to do that. Many thanks to those of you on whom it has been necessary to call from time to time for your cooperation and assistance. Hope to run into you on the air! Traffic: (July) W5DTA/5 524, K5FFB 518, W5UBW 320, BTH 199, AHC 171, K5EMR 142, W5KPB 119, BKH 66, TFP 36, YKT 19, AYX 16, CF 14, GOS 10, ZTG 3, DFB 2. (June) W5RP 67.

OKLAHOMA — SCM, Ewing Canaday, W5GIQ — Asst. SCM: James R. Booker, 5ADC. SEC: KY. PAM: MFX. RM: GVS. New officers of the Bartlesville Radio Club are YKB, pres.; K5AUX, vice-pres.; K5BSU, secy.-treas. The club recently received two used 500-watt portable generators. With a 3-kw. trailer unit already on hand the Bartlesville gang is in good shape for emergency work. A new club is being organized in Duncan. K5CAY provided a phone-patch contact recently between a woman in Watonga and her son at a weather observation station near the North Pole. QNP has moved to Tulsa from Texas City, Tex. K5BIG has moved to Evansville, Ind., and BBB to Victoria, Tex. GXH is going to Arkansas U. and UFC to Colorado U. BXO will be out of the State several months on work for the Air Force. SLS has returned from a month in Illinois for the Air Force. KN5BXZ passed the General Class exam and is building a new 814 rig while awaiting his ticket. K5BOM has a new 813 rig and K5AOV a new DX-100. HCC is rebuilding and air-conditioning his shack. K5EMY has a new 52-foot vertical. PGN lost his 65-foot pole with a beam in a wind storm. MQV reports good mobiling while on a vacation in California and MRK tried out the new mobile while on his vacation. K5CBA has received his General Class ticket and is making the nets regularly. The Washington County Emergency Net on 3825 kc. at 1330 Sun. reports good participation. Traffic: W5GVS 88, K5CAY 58, W5GIQ 53, K5BIG 51, W5ADC 31, EHC 25, QAC 25, MFX 17, PNG 12, K5DUJ 2, W5GXH 2.

SOUTHERN TEXAS — SCM, Morley Bartholomew, W5QDX — SEC: QEM. Do not be surprised if the Highway Department refuses to issue call letter plates for 1958. The officials are fed up with the numerous gripes and nasty letters they have received concerning the 1956 plates. They also are well aware that many operators have obtained plates who are not, and never intend to be, mobile. If and when they decide to discontinue this privilege, those who have played square will know the reason why. QZZ was back in Austin and Laredo for a visit before moving to Canada. TQL is stationed at Gary AFB. SYN is out of the service and getting ready to make the fatal plunge. GQ has a new 20-meter beam. URN is back on the air after some new construction. LUU has his DXCC certificate. The 144 and Up Club had its annual picnic and meeting at Victoria July 29th. Over 55 were present. LFG is out of the service. K5GUH is mobile on 75 meters. CE and his XYL enjoyed a vacation trip to Florida. WIS is operating s.s.b. with a 20A. JRY has his General Class license. BPF is in the Navy. K5CRJ is operating from her new home in Alvin. RPH has a new G-66 receiver. K5GIG is on 2 meters with a Gonset Communicator. EPB has an indoor 2-meter antenna. The SA Radio Club recorded its Field Day activities with a color movie. This sounds like a good stunt for future enjoyment. Ray Williams, of the Houston FCC office, visited some of the Austin hams, socially, that is. Wonder what has happened to Grandma? The SA Radio Club racked up 1469 contacts on Field Day. HHO is building a new exciter. Traffic: W5DTJ 37, K5AJP 32.

NEW MEXICO — SCM, Einar H. Morterud, W5FPB — SEC: FHP. RM: RKS. PAM: DVA. The NMEPN meets on 3838 kc. Tue. and Thurs. at 1800 MST, Sun. at 0730; NM Breakfast Club meets on 3838 kc. daily except Sun. at 0700-0800. RKS transmits Official Bulletins at 1930 MST on 7100 kc. on Mon., Wed. and Fri. K5GYZ is the XYL of TPB. PXN is home after four years in the Navy. BMA moved to Arizona. Our sympathy to RMJ on the passing of his father. LEF and RKS received certificates for copying the Armed Forces Day message. BNZ is receiving nice reports from the new tri-band beam. NTN, QNT and PBV are reported to be working too hard to get on the air. SGC and family visited with several VE hams while on vacation. POI has completed his 100-watt transmitter and monitors the 4-Corners Phone Net frequency of 3885 kc. NSV made the local newspaper for his outstanding work with c.d. and GOC. CIN and family spent a week vacationing in the Denver Area and didn't make a contact on the

(*Continued on page 116*)

mobile rig. Traffic: (July) W5FPB 21, FHL 6, K5DAA 5, W5BIH 3. (June) W5NQG 10.

CANADIAN DIVISION

MARITIME — SCM, Don Weeks, VE1WB — Asst. SCMs: F. A. Webb, 1DB; Aaron Solomon, 1OC. SEC: RR. WL is sporting a new NC-300 receiver. ABT reports excellent conditions on 20-meter c.w. for contacts with western states. (WAS seekers, please note.) ES has completed a new modulator. ADF now has phone endorsement. W4ZUS/VO2 is doing a fine job as OO. Nova Scotia amateurs are discussing the formation of a Provincial Association. Good luck, fellows. A new addition to the teaching staff at Dalhousie University is VE3AKR. A hearty welcome to the many mobile amateurs visiting the Maritimes from W and other VE call areas. ACJ has reinstalled mobile equipment in his new car. PF reports good mobile DX on the higher frequencies. C.d. officials requested a two-station amateur hook-up between Moncton and Saint John for the Alert of July 21st. EE and YM supplied stations and were ably assisted by FN, UY, AAT, IZ, FC and ACW. This test was an efficiency comparison check between amateur radio and land-line. Reports on results were very favorable. Traffic: (July) VE1OC 91, UT 50, FH 45, VN 32, ADM 31, BN 13, ME 13, PF 5. (June) VE1FQ 170, W4ZUS/VO2 15.

ONTARIO — SCM, Richard W. Roberts, VE3NG — Many of our section are on well-earned vacations at this writing, thus there is not too much activity. DSM will enter the half-gallon class soon. BPF, a popular ham in Western Ontario, had a heart attack on Aug. 6th and became a Silent Key. HE, AEJ and AAW have received their OPS certificates. HK is missed by the Ontario Phone Net. Test Alert III was very successful. Over 100 VE3s took part. Ontario civil defense officials extend thanks. AJA works VKs and ZLs from his 20-meter mobile. BIV is back on the deep sea again. His regrets are that VEs cannot work MM. It's over 20 years since Ontario has had an ARRL Convention. Word from the SCM has it that Toronto will have one in 1957. AML keeps the N.W.T. VE8 boys happy with his daily 14-Mc. skeds. GG is in Timmins Hospital for a long session with a broken leg. Please QSL. DEX and GH have moved to Hanover from Collingwood. The North Bay fellows must be played out after their traffic hamfest. There has been no news about it yet. BLY reports his call is being bootlegged. OOs please note (7 Mc.). CCV is OBS in the Ottawa Area. BHW has a five-element beam on 144.12 Mc. and was active in the V.H.F. Party. 6GC is now with the Quinte Club. AJR was third in the c.w. section of the OM/YL Contest. VZ reports for OSN, TRN and TCC. AOE and his XYL visited AVS en route to VE2-Land. KM enjoyed a well-earned vacation. TX has antenna trouble. TL is vacationing at Key Harbour. GK is portable from Lake Simcoe. DYL is recovering from a serious operation. Traffic: VE3DQX 76, CDX 69, NO 58, KM 44, AUU 38, AQB 37, DSM 31, DPO 23, EAW 15, AVS 4, CJM 2.

BRITISH COLUMBIA — SCM, Peter M. McIntyre, VE7JT — The doldrums of summer are on at time of this writing. Three of you, AIO, AKG and DH, sent reports. Thanks, fellows. AKG is heading for VE5-Land for a trip. I heard some visiting mobiles, VE6s and W7s, check into 3755 recently but didn't get their calls. AD and an unnamed 807 expert took a rapid trip through Vancouver in the wee small hours of the morning recently and ended up in Merritt. It sounded like a good trip! DZ won a Q multiplier at the International Hamfest in July south of the border in Washington. KX is now OBS on RTTY, the first in the West that we know of. Quite a number of VE7s got to the Convention at San Francisco but we have not heard from any of them so there are no gleanings there except by the grapevine. Hope you all enjoyed good holidays. "Gone fishin'" days are over for this year so by now we are all back to the grind for another year.

(See page 142)

Dr. Lee De Forest had the "final word"
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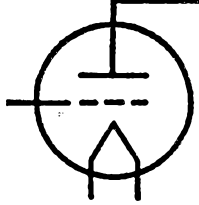

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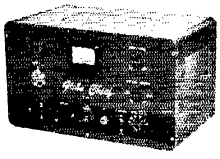
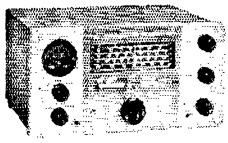


WRL GLOBE CHIEF
90 Watt Xmtr (75 watts for Novice)
Amateur net: $49.95 (kit)



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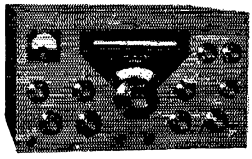
Amateur net: $179.50 (wired)



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W6OYD K6BSB W6VBN K6DPH W6YPA K6CRD KN6JJM W6VBY
W6YML W6VCR K6PMU W6LTY W6QJI W6EBG W6KFS K6GLH

"Fred" W6VCR

WHAT DO YOU WANT FOR CHRISTMAS ?

It's about time to start dropping a hint of what you want in the way of ham gear for Christmas. Tell 'em to get it at Valley and be sure it's the "final word!"

VALLEY *electronic supply company*

Two Western Locations

1302 W. Magnolia Blvd., Burbank, Calif.
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17647 Sherman Way, Van Nuys, Calif.
• Phone: Dickens 2-5143

Some prices slightly higher west of the Rockies

FREE Novice Classes at Both Stores • W6LTY and W6QJI Instructors • 315 Novices licensed through our classes to date

144-Mc. Beam

(Continued from page 17)

portion of the harness, as shown in Fig. 3, being certain that the outer conductors do not come in contact with the supporting structure here. Tape all exposed portions generously and tightly, and the harness job is completed.

The RG-8/U from the feed point is run through a hole in the main vertical support at a point about 15 inches below the crossarm. The coax at the feed point is then formed into a semicircle, keeping the feed point approximately 6 inches away from the crossarm and the skirt section well away from the mast. A loop of the coax sufficient to allow for rotation of the array is left at the point where the line emerges from the mast, at the rotator. When the Type N fitting is attached to the RG-8/U and the connection is made to the Styroflex, the tower is ready to be cranked up and the array put into service.

Reducing Spurious Receiver Responses

Earlier we mentioned the trouble encountered with spurious receiver responses when the 2-meter array was raised to the point where the New York TV station arrays were in line of sight. The fellow who lives out in the wide-open spaces may not appreciate how troublesome nearby TV transmitters can be, but getting rid of these unwanted signals is a problem more v.h.f. men are encountering all the time. With broadband crystal-controlled converters even one strong TV signal can cause a lot of trouble.

In most v.h.f. converters with coaxial input the inner conductor of the coax is tapped directly onto the coil in the input circuit. Inserting a 3–30-$\mu\mu$f. trimmer between the coax input and the coil tap may be very helpful in reducing spurious responses. Ours was set by tuning in a weak but readable signal, and then reducing the capacitance of the trimmer until a reduction in signal strength begins to show. Run the trimmer at the lowest setting that can be used without affecting the weak-signal sensitivity adversely.

Performance

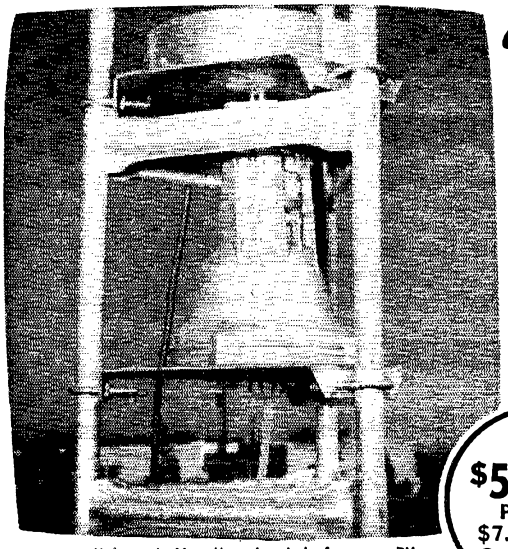
A considerable amount of experimenting was done with the driven elements before the s.w.r. was brought down to a satisfactorily low figure. Readings with a Model MM562 Micromatch, left permanently connected in the line, show an s.w.r. of about 1.05 at 144.07 Mc., the usual operating frequency. Near the high end it is under 2. Results obtained indicate a gain of about 17 db. in the main lobe. Two minor lobes, about 35 degrees to either side are down at least 15 db., and the front-to-back ratio is at least this figure.

Use of this array has extended the range of W2AMJ in all types of 2-meter work. The location of the home station is good, but not outstanding, as the elevation is only 100 feet above sea level. The 440-foot Palisades are in the way in the direction of W1-land, though they are some 3 miles distant, and readily hurdled with the beam

(Continued on page 120)

The Ultimate Answer

To Hamdom's Most Discouraging Problem!



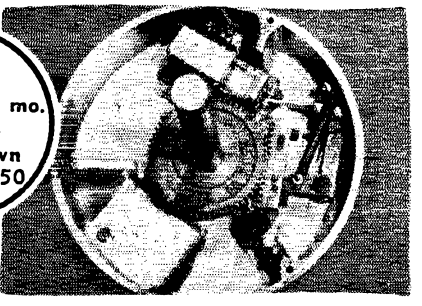
WRL's Newly Perfected Roto Brake

- ★ Converts any TV or other type rotator into the lowest-cost, finest ham antenna rotating assembly available!
- ★ Will support 150 lbs. of antennas against 5000 inch.-lbs. of torque! Equal to the average Christmas tree array in a hundred mile an hour wind.
- ★ Brake is released automatically when rotator is energized.
- ★ Positive braking action prevents coasting and damage to rotator.

Only $5.93 per mo.
Pay Just $7.45 Down
Cash: $74.50

Universal Mounting bracket for any TV rotator: $7.95

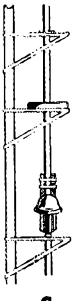
Heavy duty thrust bearing for internally mounted brake and loads heavier than 150 lbs.: $29.95



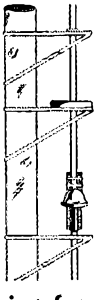
Positive gear and rack braking action cutaway

The RotoBrake is a spring-actuated, solenoid-released braking unit, mounting between the rotator and antenna (in most cases without having to take antenna down). It performs two basic functions: provides positive braking action and thrust and radial bearing surfaces to convert any TV or other type rotator to the finest ham antenna rotating assembly. The heavy brake protects the rotator against damage by winds up to 100 mph., or max. of 5000 in.-lbs. of torque, and eliminates all beam coasting. The CDR Model AR-22 TV Rotator is particularly adaptable by test, and therefor recommended. Available complete with automatic indicator at $31.17.

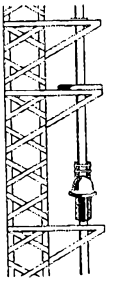
Kits for Adapting RotoBrake for Side Mountings!



Kit for Masts up to 2" diameter
Kit includes thrust bearing and bearing bracket, brake bracket and universal bracket for any TV Rotator: $47.85



Kit for Telephone Pole mount
Kit includes thrust bearing and bearing bracket, brake bracket and universal bracket for any TV Rotator: $33.16



Kit for Towers less than 10" in diameter
Kit includes thrust bearing and bearing bracket, brake bracket and universal bracket for any TV Rotator: $47.85

Special heavy duty thrust bearing for dead weight loads exceeding 150 lbs. for use with side-mount kits only; — add $10.00 to above Kit prices.

Special 8-conductor cable (4 for rotator, 4 for brake): 6c per ft., $5.10 per hundred
Present 4-conductor Rotator cable owners, order 4 wire cable for brake only: 4c per ft., $3.30 per hundred

For Further Information:

WORLD RADIO LABORATORIES

3415 West Broadway **Council Bluffs, Iowa**

at 55 feet above ground. Stations like W1OOP and W1FZJ, in the Boston area nearly 200 miles distant, are worked with ease, as is W3TOM, 150 miles or so in the opposite direction. W2OPQ, Amsterdam, N. Y., 150 miles to the north, is also a regular. W8KAY, Akron, Ohio, nearly 400 miles to the west, was heard regularly through the winter, on his schedules with W2CXY, and contacts were made with him on numerous occasions. All this work was done with 140 watts input to a 5894 final stage.

But who is ever satisfied for long? Trigonal reflectors are in prospect for a later project, the aim being to improve the front-to-back ratio. They will also provide additional perches for this year's swallows. Last fall 147 were observed at one time, taking a free diathermy treatment before departing for Capistrano!

Multiband Antenna

(Continued from page 19)

A transmitter using pi-network output tuning will feed the antenna on all bands with good results. Link-coupled output transmitters may require an antenna coupler to obtain suitable loading on all bands.

It certainly gives a great deal of satisfaction to present this data and enable many amateurs to construct this multiband antenna simply and inexpensively.

In conclusion, credit should be given to W2ATT who made the excellent photographs.

"Novice Special"

(Continued from page 26)

reset the band-set capacitor of the receiver slightly away from maximum capacitance and check again.

To tune to the 10-meter band, plug in the 40-meter coil in the receiver. Set the band-set capacitor to about 50 on its dial. Then search with the converter input capacitor for a peak in noise near minimum capacitance. If the 10-meter band is open, signals in this band should be heard. In adjusting L_5, follow the procedure outlined previously in connection with L_4. There may be some interaction between the adjustment of the two slugs, but it will be slight. However, it might be advisable to juggle the adjustments of the slugs while listening alternately on 20 and 10 meters to make sure that you have arrived at the best possible adjustment for both bands.

If you are not interested in the 10-meter band, L_5, L_7, C_3 and C_5 can be omitted if a higher-inductance coil (North Hills type 120-G) is substituted at L_4. L_6 would then be connected directly to J_2, of course.

In tuning over a band, maximum signal will be obtained by keeping C_1 peaked. However, most signals across the band will be satisfactory without further adjustment if C_1 is left peaked at the center of the band. Strong signals that are too

(Continued on page 122)

FERRITES-*a milestone in communications engineering!*

In today's communications engineering, ferrites are ranked with transistors in importance. Ferrites, modern cousins of the ancient lodestone, have more than doubled the efficiency of radar and microwave operations.

The ferrites are magnetic but, unlike natural ferromagnetic materials they resist electrical current. Replacing one of the iron oxide molecules in the lodestone formula with the oxide of any one of a number of metals results in a product which is similar in chemical and crystal structure to the lodestone but is resistant to electric current.

A few of the achievements for these strange new substances are:

1. *Simultaneous sending and receiving on a single microwave antenna.*
2. *Full-power transmission in microwave ranges with no power loss or interference.*
3. *Elimination of frequency drifts in microwave transmission.*

This new group of solid state materials makes possible the continuous search by radar, instead of the intermittent "pulse" sending and receiving of World War II. To fully understand all the implications and probable uses for ferrites, reserve your copy of this special October *Proceedings of the IRE* ferrites issue. It will take its place in the history of radio-electronics along with the transistor issue of November, 1952, and the solid-state electronic issue of December, 1955. You will want to read and refer to it for years to come!

SPECIAL OCTOBER ISSUE CONTAINS 27 IMPORTANT ARTICLES ON FERRITES:

"Resonance Loss Properties of Ferrites in the 9KMC Region" by S. Sensiper, Hughes Aircraft Co.

"Magnetic Resonance in Ferrites" by N. Bloembergen, Harvard Univ.

"Methods of Preparation and Crystal Chemistry of Ferrites" by Donald Fresh, Bureau of Mines

"Topics in Guided Wave Propagation in Magnetized Ferrites" by Morris L. Kales, Naval Research Lab.

"Frequency and Loss Characteristics of Microwave Ferrite Devices" by Benjamin Lax, Lincoln Lab., MIT

"The Non-Linear Behavior of Ferrites at High Microwave Signal Levels" by H. Suhl, Bell Telephone Laboratories

"Dielectric Properties and Conductivity in Ferrites" by L. G. Van Uitert, Bell Telephone Laboratories

"The Elements of Non-Reciprocal Microwave Devices" by C. L. Hogan, Harvard Univ.

"Fundamental Theory of Ferro- and Ferri-Magnetism" by J. H. Van Vleck, Harvard

"Ferrites as Microwave Circuit Elements" by G. S. Heller, MIT

"Radiation from Ferrite-Filled Apertures" by D. J. Angelakos, Univ. of Calif., Berkeley, Calif.

"Anisotropy of Cobalt-Substituted Mn Ferrite Single Crystals" by P. E. Tannenwald and M. H. Seavey, MIT

"Birefringence of Ferrites in Circular Waveguide" by N. Karayianis and J. C. Cacheris, Diamond Ordnance Fuze Labs., Washington, D. C.

"Ferrite-Tuned Resonant Cavities" by C. E. Fay, Bell Telephone Laboratories

"Ferrite Tunable Microwave Cavities and the Introduction of a New Reflectionless Tunable Microwave Filter" by Conrad E. Nelson, Hughes Aircraft Co.

"Permeability Tensor Values from Waveguide Measurements" by E. B. Mullen, G. E., Syracuse

"A New Ferrite Isolator" by B. N. Enander, RCA Labs.

"Ferrite Directional Couplers" by A. D. Berk and E. Strumwasser, Hughes Aircraft Co.

"Intrinsic Tensor Permeabilities on Ferrite Rods, Spheres, and Disks" by E. G. Spencer, L. A. Ault, R. C. LeCraw, Diamond Ordnance Fuze Labs., Washington, D. C.

"Magnetic Tuning of Resonant Cavities and Wideband Frequency Modulation of Klystrons" by G. Jones, J. C. Cacheris, C. Morrison, Diamond Ordnance Fuze Labs.

"Microwave Resonance Relations in Anisotropic Single Crystal Ferrites" by J. O. Ortman, Harvard Univ.

"Anomolous Propagation in Ferrite Loaded Waveguide" by H. Seidel, Bell Telephone Laboratories

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☐ Enclosed is $3.00
☐ Enclosed is company purchase order for the October, 1956 issue on FERRITES.

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All IRE members will receive this October issue as usual.
Extra copies to members, $1.25 each (only one to a member).

loud or which tend to block the detector can be reduced by detuning C_1.

With the antenna disconnected, the converter may show a tendency toward a spurious oscillation at certain settings of C_1. This will usually disappear when the antenna is connected. If it persists, connect a resistor of 47K to 100K (use the highest value that will suppress the oscillation) between the rotor and stator terminals at the rear of C_1.

After these initial adjustments, the unit can be placed in the box. In doing this, keep the unit high enough to clear the lower lip of the box until the unit is all the way in. Then push the panel downward, and the lip should slide up between the panel and the chassis.

Results

The combination of the converter and regenerative receiver constitutes a very simple form of superheterodyne and will exhibit the usual weaknesses associated with such a system in its simpler forms. When you are listening over the first 50 kc. at either end of the 15-meter band you may have interference from high-power commercial signals (i.f. image) that are actually outside the ends of the 20-meter band. Complete suppression of these signals would require the addition of at least one good stage of r.f. ahead of the mixer. It was not felt that the considerable complication such a stage would involve was warranted in a simple system of this type.

When the converter is being used, a few of the stronger signals from station operating on the frequency to which the regenerative receiver is tuned (80 meters or 10–12 Mc.) may leak through. You can identify them because they will not peak up with the converter tuning control.

On the whole, however, you will find that the converter provides a vast improvement. It adds a fair amount of gain ahead of the receiver, so there should be no difficulty in getting plenty of volume. Selectivity is remarkably good for a receiver having only two stages working at radio frequencies. The improvement in frequency stability at the higher frequencies is tremendous. Antenna and body effects are eliminated entirely.

V.F.O. Driver

(Continued from page 52)

voltage for both sections of the 12AT7 is regulated by a VR tube. Further isolation between the oscillator and output stages is provided by a 6AG7 doubler to 3.5 Mc. The output of this stage is broadbanded so that it does not require more than an initial adjustment.

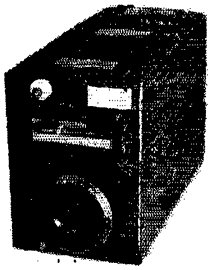
The final is a 6CU6 operating as a doubler to 7 Mc. With efficiency normal to a frequency doubler, it will handle an input of 15 to 20 watts at 275 volts. The simple pi-network output circuit is designed to feed into a 70-ohm resistive load.

It will be noticed that the cathodes of the three amplifier stages are not bypassed, and that the screen bypasses of the last two stages are returned to cathode, rather than to chassis.

(Continued on page 124)

RADIO SHACK

Boston, Mass. • New Haven, Conn.



Clearance! ARC-5 7-9.1 MC Transmitter!

Popular ARC-5 features a variable frequency range 7 to 9.1 mc.; can also be used as VFO on 40, 20, 10, 6 and 2-meter transmitters. Operates with input up to 120 watts. 24 volt filaments easily rewired for 12V operation. Front panel locking-type controls for variable frequency setting, antenna coupling, antenna inductance. Black crackle case: 5¼ x 7 x 12¼". Less power supply. Ship. wt. 12 lbs. Order No. R-9912-Q.

WORTH OVER $150 — **$9.95**

Filament and Continuity Checker!

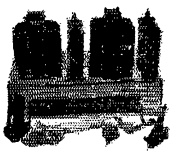
Brand new pocket-sized double-duty checker has built-in 7 pin, 9 pin, octal, loctal, and CRT(TV) tube sockets, 15" leads, neon glow lamp, cheater cord socket; hammertone gray metal case. For 115V AC-DC. Ship. wt. 1 lb. Order No. R-9109-Q. Cheater cord, Order No. W-11-Q, 39c.

LIST $4.95 — **$1.95**

All-Purpose Radio-TV Alignment Tool Kit!

All insulated with clear polystyrene rods and unbreakable tenite handles. Carrying case holds 8" aligner with long rod, recessed blade; 7½" deep nib aligner for No. 6 studs and for tuning IF, RF shielded coils, trimmers; 7" aligner with extra thin extended blade; 4⅝" aligner with recessed blade. Ship. wt. ½ lb. Order No. R-9805-Q.

$2.98 VALUE — **99c**



Power Supply Kit: 350V @ 90 MA!

Kit #3 includes careful selection of: 2 oil-filled condensers, filter choke, 5T4 rectifier tube, heavy wattage bleeder resistor, sockets, switch, lamp cord, 7x12x3" chassis, diagram, and POWER TRANSFORMER rated for 350-0-350V @ 90 ma., 5V @ 3A, 6.3V @ 3.5A, 2.5V @ 10A CT. Transformer rated for 1500V insulation. Ship. wt. 20 lbs. Order No. R-9200-Q.

$30.00 VALUE — **$10.95**

Sonar Low-Pass Filter!

Designed to work into 52-ohms impedance and to handle a full 1 kw 100% modulated. Type LP-7 will attenuate all harmonics starting at 44 mcs., approx. 75 db. Has adjustable input and output for better matching, and chassis coax fittings on both ends. Completely shielded and compact. Ship. wt. 1 lb. Order No. R-9812-Q. 83-1SPN coax male connector, Order No. R-4300-Q, 49c.

REG. $12.95 NET — **$8.95**

Crystal Microphone: 70-7000 CPS Response

Top quality construction: gray metal case, aluminum diaphragm, shock-proof mounting, wind and blast proof; output level — 52 db. For hand, desk or stand use — has standard ⅝" — 27 thread adaptor, 6-ft. cord with strain relief. Ship. wt. 1 lb. Order No. R-5193.

LIST $10.85 — **$3.95**

10 Fifty-Ft. Rolls of JAN Hook-Up Wire!

All JAN spec including SRIR with plastic jacket, cotton braid, WL with nylon jacket. Mostly stranded and color-coded. Rated from 600V-1000V. Order No. R-5058A-Q.

WORTH $9.90 — **$2.95**

Transistor Interstage Driver Transformer!

Most widely used transistor interstage, driver transformer! Features high-quality steel laminations, wound-on nylon bobbins, and mylar outer wrap. 2½" flexible color-coded leads eliminate danger of breakage. Pri. imp. 20,000 ohms; 400 ohms DC res.; secondary 1,000 ohms; 50 ohms DC res. Size: ⅝" high, ⅝" wide, ¾" long. Made in U.S.A. Ship. wt. ¼ lb. Order No. R-6400-Q.

LIST $4.95 — **$2.69**

USE RADIO SHACK ORDER NUMBERS; ADD EST. POSTAGE: NO C.O.D.'S!

FREE RADIO SHACK CATALOG—57

To: Radio Shack Corp 167 Washington St., Boston 8, Mass.

NAME _____

STREET _____

TOWN _____ STATE _____

The slight amount of degeneration thus introduced helps the over-all stability.

The simple VR-tube time-sequence keying system described in the ARRL *Handbook* [1] provides clickless chirp-free break-in keying.

The built-in power supply includes a separate selenium rectifier to supply the required bias for the keying system.

The unit using this circuit was built up from junk-box parts and put into a well-perforated steel box that had served for several previous lash-ups. While the finished product isn't too photogenic, it performs beautifully. And, after all, that's what counts! Shielding isn't of too much importance, because no two stages are on the same frequency. Almost any conventional layout should be satisfactory. Power wiring should be shielded and bypassed for TVI according to accepted practice.[2]

At W8QFH, this unit is used to drive a final through a low-pass filter, and another low-pass filter is used in the coax feeder to the antenna. There have been no complaints of TVI or amateur-band interference in a residential section in the midst of several hundred hams, and there have been many fine QSOs with the convenience of break-in. The signal is stable enough to stay put on a sharply-tuned receiver, and it doesn't bother the ham down the street, whether he's on the air or watching the fights on TV.

[1] 1956 edition, keying chapter; *QST*, July, 1956, p. 27.
[2] ARRL *Handbook*. TVI chapter.

V.H.F. Party

(*Continued from page 64*)

W1PHU.... 24- 6- 4-A
W1RFU (W1s FAB RFU) 10,520-248-40-ABC
W1UIY/1 (W1s HXD LGE RGM UIY WRG) 5516-194-28-ABC

New Hampshire

W1FZ/1...6372-223-27-ABCD
W1AZK...2047- 84-23-ABC
W1JTB.... 896- 64-14-B
W1RMH... 342- 35- 9-ABC
W1MHL/1 [3] (8 oprs.) 31,344-621-48-ABCD
W1FZJ/1 (W1s FZJ VXW WN1HIV) 119- 17- 7-AB
W1NXY/1 (W1s NXY OAI) 35- 7- 5-B

Rhode Island

W1KCS...3248-106-29-ABCD
W1AJR....2575-103-25-AB
W1UHE....1064- 67-14-AC
W1WED... 378- 42- 9-AB
W1WTR.... 30- 16- 5-A
W1FEO (W1s FEO HXL) 175- 25- 7-B

Vermont

W1UIZ/1 13,904-301-44-ABCD
KN2RDT/1 1212-101-12-B
W1FMK/1 384- 48- 8-A
W1QKJ/1 (W1s QKJ ZXN) 495- 45-11-B

NORTHWESTERN DIVISION

Oregon

W7INX.... 456- 57- 8-AB
W7HBH... 220- 55- 4-AB
W7NGW.. 32- 16- 2-A
W7SPF.... 30- 10- 3-A
W7OTV/7 (10 oprs.) 594- 99- 6-AB

Washington

W7UFE... 972- 81-12-AB
W7PUA/7. 711- 79- 9-AB
W7LHL... 511- 72- 7-ABD
W7WSP/7. 250- 50- 5-A
W7PRW... 230- 46- 5-A
W7BSJ/7... 110- 55- 2-AB
W7JHX.... 76- 18- 4-ABD
W7KO..... 60- 30- 2-AB

PACIFIC DIVISION

Hawaii

KH6OS.... 7- 7- 1-B

Santa Clara Valley

W6AFC...1575-105-15-AB
W6PBC.... 810- 76-10-AD
K6DTR... 671- 61-11-AB
W6IWR... 494- 38-13-AB
K6HYX/6. 140- 28- 5-B
W6SSA/6 (W6s SSA YGX K6CZJ)..1045- 95-11-AB
W6KFS/6 (W6KFS K6s HHL HYW JFS QMD) 954-106- 9-A

East Bay

W6SUE.... 720- 80- 9-A
W6ASH/6. 300- 60- 5-B
W6UPD... 225- 45- 5-B
K6CMG... 30- 10- 3-A

San Francisco

W6AJF....2538-133-18-ABCD
W6BAZ....2436-111-21-ABCD
K6JKQ.... 210- 42- 5-AB
W6MFI (6 oprs.) 2088-174-12-AB

Sacramento Valley

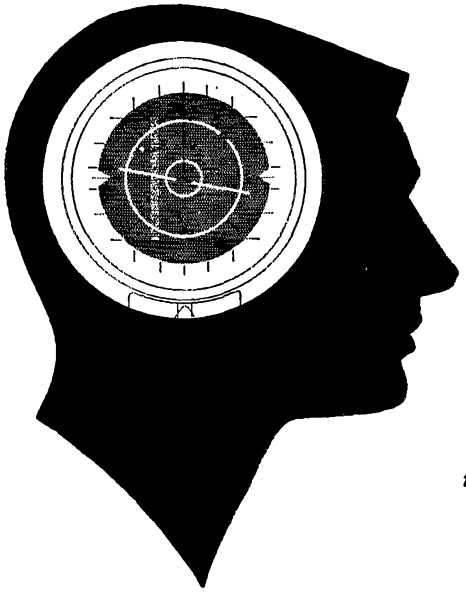
W6LSB....1134- 81-14-AB
W6PIV.... 414- 46- 9-AB
W6HIR.... 150- 25- 6-B
KN6QIF... 33- 11- 3-B
KN6PWA. 5- 5- 1-B

San Joaquin Valley

W6NDP... 420- 35-12-A

(*Continued on page 126*)

Systems Career: a laboratory for learning



. . . an exciting and rewarding career awaits the E.E. or Physics graduate who joins this highly respected Engineering team.

As a Field Engineer at Hughes, through training and assignment you will become familiar with the entire systems involved, including the most advanced electronic computers. This knowledge will broaden your experience and learning for future application in either the military or commercial field.

The national respect which Hughes commands in the field of advanced electronics is in no small part due to the technical support provided by the Field Engineers. Other contributors to the success of the Field Service and Support Division are the Technical Manuals Engineer, Training School Engineers, Technical Liaison Engineers, and Field Modification Engineers.

This Hughes activity is a highly trained organization of expert engineers, giving support to the armed services and airframe manufacturers using the company's equipment. Locations are in Southern California, continental U.S., overseas. We invite you to join this team. For further information write us at the address below.

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W6GQZ.... 390- 39-10-AB
KN6BNA... 160- 32- 5-B
K6GOX[1]... 128- 21- 6-A
W6TZJ.... 120- 20- 6-A
K6OZY.... 48- 12- 4-A
K6REQ/6 (W6ORR K6REQ) 1190- 85-14-AB
W6HAB/6 (W6s GYN HAB SKH).... 301- 43- 7-B

ROANOKE DIVISION

North Carolina

W4CYQ... 370- 37-10-AB
W4ACY... 96- 32- 3-B
W1HDQ/4[4] 92- 23- 4-AB
W4NHW... 90- 30- 3-B
W4BUZ.... 69- 23- 3-B
W4EKB... 60- 20- 3-B
K4DJC.... 52- 26- 2-B
W4IHO.... 13- 13- 1-B
K4DVE/4 (6 oprs.) 132- 33- 4-B

South Carolina

W4CPZ.... 147- 21- 7-AB

Virginia

W4UMF... 1695-108-15-ABC
W4JCJ... 1665-111-15-AB
W4DWU... 1284-107-12-B
W4UCH[1]... 924- 84-11-A
W4EMN... 222- 37- 6-A
W3YQD/4... 12- 6- 2-A
W4UGX... 3- 3- 1-A

West Virginia

W3KDZ/8... 258- 43- 6-AB
K4BRK/8[4] 245- 49- 5-A
W3DHQ/8... 88- 22- 4-A
W3YQD/8... 48- 12- 4-A

ROCKY MOUNTAIN DIVISION

Colorado

W0FKY... 95- 19- 5-A

SOUTHEASTERN DIVISION

Alabama

W4AZC.... 180- 18-10-A
W4TLV.... 40- 8- 5-B

Eastern Florida

W4GJO.... 855- 57-15-AB
W4AYV... 260- 26-10-AB

Georgia

W4FWH... 152- 19- 8-AB
W4IKK... 128- 16- 8-AB
W4GIS... 48- 16- 3-B
W4VZR.... 20- 10- 2-AB
K4AFP.... 14- 7- 2-B
W4ISS..... 2- 2- 1-B

West Indies

CO2ZX.... 6- 3- 2-A

SOUTHWESTERN DIVISION

Los Angeles

W8MMU... 612- 52- 9-BDE
KN6RCV... 210- 70- 3-B
W6BWG... 204- 34- 6-AB
K6HPZ.... 171- 57- 3-A
K6OVN.... 108- 27- 4-AB
W6EHZ.... 33- 11- 3-B
K6OEE/6[2] (11 oprs.) 11,520-527-20-ABCDE
K6LQM/6 (3 oprs.) 1008-144- 7-AB
K6GUA/6 (K6s GUA OKW KN6RCN) 348-116- 3-B

Arizona

W7VMP[7]... 1748- 92-19-A

San Diego

K6COE/6... 435- 87- 5-A
W6RRZ (W6s CGM RRZ K6s HMS L8F) 2470-247-10-AB
W6RDF (10 oprs.) 2304-181-12-ABDE

Santa Barbara

W6ORS/6... 195- 37- 5-BE
W6VIX/6... 105- 7- 7-BE
W6QED/6 (7 oprs.) 10,933-355-29-ABCD

WEST GULF DIVISION

Northern Texas

W5LFQ.... 600- 60-10-A
W5GMA... 228- 38- 6-A
W5SFW... 210- 21-10-A
W5FEG... 155- 31- 5-A
W5SWV... 100- 25- 4-B
W5BXA... 84- 12- 7-A
K5DCQ... 28- 14- 2-A

Oklahoma

W5DFU... 80- 20- 4-B
W5VKH... 68- 17- 4-B

Southern Texas

W5HFF... 180- 18-10-A
W5GHL... 70- 14- 5-A
W5FYW... 64- 16- 4-A

New Mexico

W5KWP... 88- 11- 8-A
W5FPB.... 5- 5- 1-B
W5GRI.... 3- 3- 1-B

CANADIAN DIVISION

Ontario

VE3DIR...1066- 82-13-B
VE3AIB... 936-104- 9-AB
VE3HQN... 544- 68- 8-B
VE3DNE... 288- 17- 4-B
VE3BOW... 240- 48- 5-AB
VE3DUU... 153- 51- 3-B
VE3D8U... 124- 31- 4-B
VE3AZV... 105- 35- 3-A
VE3AET... 30- 15- 2-A

British Columbia

VE7A8M/7 (VE7s AFB ALJ) 351- 39- 9-AB

[1] Technician award winner. [2] Multiple-operator award winner. [3] Novice award winner. [4] Headquarters Staff, not eligible for award. [5] W1WPR, opr. [6] W1EUJ, opr. [7] W7VMQ, opr.

World Above 50 Mc.

(Continued from page 67)

s.s.b. family, is running an 829B, Class AB_1, at about 100 watts peak. The rig is along the lines of the simple s.s.b. job by W2EWL in March *QST*. A 32.5-Mc. crystal oscillator-tripler, 2C51, delivers 130-Mc. energy to a 2C51 with the elements paralleled, serving as a mixer. The s.s.b. signal is fed into the cathode. The r.f. section on 144 Mc. consists of a 6AU6, a 5763, and the 829B. As an aid to stability, the oscillators run continuously, with only the mixer being cut off during stand-by periods.

As a means of promoting interest in 220 and 420 Mc. in the New York area, the V.H.F. Institute of New York is encouraging use of these bands at specified times. Tuesday and Thursday are 420-Mc. nights, with 2100 the time to shoot for when you want to try out something on that band, or just make some routine contacts. Users of 220 Mc. are urged to get on nightly at 2200. In addition, there is the long-standing 1000 get-together on 220 Mc. each Sunday morning.

(Continued on page 128)

What Are They Talking About?

W3YDF I formerly stacked 10-15-20 M beams on one tower and ran individual feed lines to each but it was inefficient and expensive. The Triple Spanner out performs my former stacked arrays.

VE3CI/4 The beam is a dream. It is simply terrific in every way. Hard to believe it. It seems I can work everything with it.

W6GKM . . . out performing the average home-built and commercial beam in this area . . . most happy ham in California . . . would recommend this antenna to any amateur as the best $99.75 I ever spent on Radio Gear.

W9FNS DX Stations I have never heard before come in now . . . complete but simple instructions . . . assembly of the beam is no task . . . sturdy, well-balanced and moderately priced.

W8WHQ . . . consistantly getting S9 plus 20 to 30 db reports on all three bands from all continents. Of the $3000 that we have invested in ham gear, I feel that the beam is the best investment.

KØDWC SWR thoroughly checked: - negligable on all bands! Well-engineered, no tuning necessary, best beam I've ever used.

TI2RC Am ordering two more spanners for friends down here. Terrific for DX. Outperforms anything I've ever used.

WRL's New Globe Spanner Beams, of Course!

THE ONLY FACTORY PRE-TUNED TRI-BANDERS

Guaranteed To Operate As Specified With No Further Adjustments!

1 BEAM — 1 FEED LINE — 3 BANDS, FOR 10, 15 & 20 METERS

2 ELEMENT TRI-BANDER **$69.50** 3 ELEMENT TRI-BANDER **$99.75** 5 ELEMENT TRI-BANDER **$349.50**

Here are truly the "wonder beams" for hams! They include so many top features, we hardly know where to begin! Are you looking for top-notch construction, durable yet light equipment? Is your main interest in minimum SWR and Front-to-Back Ratio? Do you insist on the most reasonable price? Or is ease in assembly, absence of home-tuning and tool-tussling important? You'll find all these features and more in WRL's New Globe Spanner Series . . . truly the "wonder beams" for hams!

SEND FOR COMPLETE INFORMATION ON WRL'S TRIPLE GLOBE SPANNERS PLUS DETAILS ON THE COMPLETE LINE OF GLOBE SPANNER BEAMS!

Please rush your brand new brochure on the complete line of Globe Spanner Beams! S-10

☐ **Also include the 1957 WRL Catalog**

NAME: _____

ADDRESS: _____

CITY & STATE: _____

Fall activities of the V.H.F. Institute will get under way with the Oct. 5th meeting. Your conductor will be on hand for this one. Anyone interested in v.h.f. is welcome. Meeting place is the station building of WEVD, 47-01 Maspeth Ave., Maspeth, L. I.

Good Times Coming Up

When the summer sporadic-*E* season has run out in August, and the fall inversion season is tottering in late September, the DX-minded in the v.h.f. fold begin to look for greener fields. But if the predictions issued by the Central Radio Propagation Laboratory mean anything they need not look farther than 50 Mc. this fall. The F_2 DX may have started breaking before this appears in print, but if it hasn't, the prospects certainly are bright that it will shortly.

XE1GE, Mexico City made his first South American contacts Aug. 16th and openings between Argentina and the more southerly parts of our country were frequent last spring. This should be getting under way again in September, and by October and November it would appear at least possible that any part of the country will be within range of the rising m.u.f. to the south. Northern stations should watch the mid-morning and mid-afternoon hours, concentrating particularly on the days following magnetic disturbances. Last spring a few contacts were made at night, when auroral effect was observable on 50 and 144 Mc.

There has never been a 50-Mc. contact between North America and Africa, but it appears within the realm of possibility on this cycle. No money-back guarantee, but don't pass up any bets during the mid-morning hours.

Westerners may have a shot at Japan, mid-afternoon Pacific time being a likely period for trying. W5 to KH6 appears better than a long shot, with 1100 to 1300 CST the recommended hours. The important thing is — try anything! Remember that by no means all is known about this business of maximum usable frequency. Watch the frequencies just below the 6-meter band for signs of DX at any hour, and keep the band alive any time signals appear higher than 48 Mc. or so.

If you're not a 6-meter man, the rising solar activity curve means good news for 2-meter operators, too. The spring season saw more and better aurora DX than any similar period in years. It covered more of the country, too. It may not happen often, but we feel that just about any part of the country, including the Deep South and Southwest, many have a few chances for work via the aurora. Stations in the middle latitudes, and the Northwest, should have the best season for aurora DX ever.

Fall, 1956, is no time to be deserting the v.h.f. bands!

OES Notes

W1AHE, Stow, Mass. — New 48-element 2-meter array being tested at 30-foot height seems superior to previous 24 at 50 feet.

W4IKK, Rome, Ga. — W1HDQ worked regularly each week end via ionospheric scatter on 50 Mc. Results during Aug. 4th, 5th, 11th and 12th (Perseids) excellent. Now have list of 46 50-Mc. stations that can be worked regularly via groundwave. This with 75 watts input, c.w. and phase-modulated phone. Territory covers from Nashville, Tenn., to Travelers Rest, S. C.

W4VTJ, West Palm Beach, Fla. — Plans under way to establish a 2-meter net in Southeastern Florida. Will use frequency between 145 and 145.5, to include Novices. Traffic was handled on 2 during Gold Coast Marathon, far more expeditiously than had been possible previously on 10 and 75.

W5JXU, Pottsboro, Texas — 1956 sporadic-*E* season inferior to 1955. May was best 1956 month, whereas July was tops in 1955. Several new 6-meter stations around Durant, Okla.

K6BTJ, Glendale, Cal. — Transistor v.f.o., using 2 SB-100 transistors, and tuning 24 to 27 Mc., now in use on 6 and 2. Works into Millen exciter. VQ8AL reported heard on 50.017 Mc. Anyone know about this one?

W6SOD, Torrance, Cal. — New stations on 220 Mc. include W6GOM, K6EWS, W6ONE, and K6JOR. Activity good on Monday nights.

W7QDJ, Clearfield, Utah — 50-Mc. ionospheric scatter contacts made with several Bay Area W6s. Schedules kept each morning through Aug. 19th, 0535-0800 MST. Now running pair of VT127As and 4/4 beam.

(Continued on page 150)

A "CRACKER BARREL" in NEW YORK CITY?

Here, in the World's greatest trading center, you naturally expect to find all the advantages that make the Big City the Mecca of smart shoppers from everywhere . . .

The wide assortment of all the very newest equipment—the up-to-the-minute information—the efficient, business-like service—the factory-fresh stock—the quick, easy terms to fit any budget.

Here, you can actually get the biggest values at lowest prices, because our tremendous volume results in truly lowest overhead cost per sale!

And here, at "HAM HEADQUARTERS, USA," you do get all these benefits, PLUS the friendly, "home town" feeling that is best symbolized by the cracker barrel of the village General Store! We welcome you, not just as a customer, but as a friend. We are interested in you, your plans, your problems. We sincerely want to help you and to please you. Maybe we are the biggest Ham store in the whole world just because of that!

Nowhere but at Harrison's can you see such a display of all the newest things, and the vast array of bargain price tagged used gear! Nowhere but at Harrison's are such touches as the "YF NOOK," where your lady can sit in comfort, and relax while her OM shops.

So, come on in! With the new highways it's less of a drive than you might think. We're only 12 short blocks downtown from the Holland Tunnel. Plenty of parking space. By IRT subway we're two express stops downtown from Penn. R. R., three stops from Grand Central.

Bring along your trade-in, for a deal that will send you home real happy!

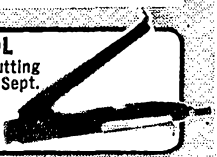
Tnx, BCNU, 73 *Bil Harrison*

HAMMARLUND HQ-100

Traditional Hammarlund quality and performance now available in the moderate price class! Jam-packed with valuable features, but only **$169!** (With control clock, $10 extra.)

Want to be enjoying yours sooner? Rush your order to Harrison, today! (We've reserved plenty, but they should go fast.) It can be yours, on our Easy Terms, for as little as $12.00 a month. (Harrison Charge Account customers can get it with no down payment!)

HAND NIBBLING TOOL



Here's the sensational new metal cutting tool they're all raving about! (See Sept. QST page 60, CQ, Electronics, etc.)

A real bargain at only **$3.85**

Replacement punch assembly—$1.70

CLEARANCE SALE

To make room for a tremendous lot of new Ham gear, we're emptying out two whole floors of one of our buildings! Our stores are knee-deep in close-out bargains! Come, wade thru them, and pick up plenty of good parts and equipment at ridiculously low slashed prices!

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120-B	3- 5	120-H	105- 200
120-C	5- 9	120-I	200- 500
120-D	9-18	120-J	500-1000
120-E	18-36	120-K	1000-2000
120-F	36-64		

EACH — 95¢

SERIES 700, Ferroxide Cup (Pot) Core Adjustable Coils. Magnetically and electrostatically shielded. (July QST page 34, etc.) Ranges from 1.5 to 1000 MH. Q of better than 100.

EACH — $3.95

Ask for new literature on these and other nh Coils, Coil Forms, and Shields.

HARRISON HAS IT!

CENTRAL ELECTRONICS 600-L BROADBAND LINEAR AMPLIFIER

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WRL Globe Champion	**399**
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JAMAICA STORE Hillside Ave. at 145 St.

W9HPO, Marion, Ind. — Experiments with 50-Mc. mobile whip show considerably better results with a length of about 68 inches, instead of the usual quarter wavelength. (Conductor's note — Optimum length varies in different installations, depending on position on car.)

W9GAB, Beloit, Wis. — Trying to stir up more interest on the part of 2-meter operators in the Plains States, to get them on for aurora openings. Much more territory could be covered on 144 Mc. via aurora if areas to the west and southwest were represented when these openings occur.

W9IZD, Pewaukee, Wis. — Completed TVI-proofing TBS-50 transmitter on 50 Mc. Louvres in cabinet were covered with screening, power leads filtered and by-passed, and output connection changed to coaxial fitting.

W9KLR, Rensselaer, Ind. — Worked 21 states on 144 Mc. via aurora in April, May and June.

Technical Correspondence

(Continued from page 47)

What good does he think this "whistle blowing" does? I can assure him that the occasions when I have serious QRM on my many Stateside contacts (on s.s.b.) are when an A3 phone comes on a channel within the 3-kc. pass band of my receiver. I can tune the top 10 kc. of the 14-Mc. phone band and *listen to at least 6 separate s.s.b. stations.* Can he imagine the *noise* created by 6 carriers in 10 kc.?

I think Mr. Neil's research into the maximum usability of audio frequencies most commendable, but please use this knowledge to give even more channels by using s.s.b. Using a.m. with restricted band width will tend to make even more apparent the heterodyne interference between channels that s.s.b. so successfully eliminates.

I cannot seriously believe that a ham who would take the trouble to pursue the problems in band-pass filtering would find the construction of a side-band rig either complex or uninteresting but, in any case, he can buy one ready-made. The same comments apply to the remarks about receivers without an AGC OFF switch. I have never read of anyone being electrocuted by a.g.c. voltages (but beware of a.c./d.c. receivers), so try wrapping a wire around some convenient point on the a.g.c. line and bringing the other end out of the receiver, so that when necessary the a.g.c line can be grounded . . . to the case. This way the resale value of that "chrome-plated miracle" will remain the same.

Someone should correct the erroneous statements of this gentleman, as otherwise there may be some of the unenlightened (those who have not discovered s.s.b.) who will be misled. . . . The days of A3 in our crowded l.f. bands are numbered; "die-hards" like W6PNW cannot save the carrier. It must go!

— *R. J. Price, AP2BP/G8ECH*

YL News & Views

(Continued from page 56)

method which worked so well that they won the praise of the entire country for their efficient operation.

Quoting from W5PCN's report to W2JZX: "The mobile stations at the airport transmit on 75 meters — we used 3900 kcs. Fixed stations transmit on the 40 meter net frequency and use two receivers — one tuned to the mobile frequency, the other on the 40 meter frequency. The 75 meter receiver is left on continuously. The mobile station receives on the 40 meter net frequency and can break or transmit information at any time, even while the fixed station is transmitting. Mobile transmissions contain only essential data as "#14 arrived 1620". When the 40 meter net frequency is idle, the mobile transmissions are acknowledged by a voice "Roger." If the net is in service, they are acknowledged by a short unmodulated carrier. When conditions permit, the mobile receives data direct from the net with the fixed station copying for possible fills.

Two fixed stations were used with duplicate facilities, one serving as a fall-back in case of rig trouble and to relieve each other at intervals to reduce fatigue and dodge local intermittent noise. This also left one station always available to provide liaison between the working net and the CAA, Radio-TV stations, newspapers, etc.

(Continued on page 132)

Messages from contestants and race personnel destined to an official point on the race route were efficiently and promptly handled."

Amateurs who assisted in the radio net were:

California — W6FEA, Chairman, San Carlos: W6QGX, Chairman, Bakersfield; K6JZD, Chairman, Needles; *K6s* GSB, KJQ; *W6s* ARI, AVF, BDE, BVH, BVM, EJU, EWV, EXB, GRO, HT, IKF, MSW, QPV, RWI, TRF, WJF, WRL and the American Legion Net, Kern Country Radio Club, Paso Robles Radio Club.

Arizona — W7BFA, Chairman, Prescott; *W7s* OPY, RUK, and VKP.

New Mexico — W5LFT, Chairman, Albuquerque; K5ADE and W5OIA.

Texas — W5PCN, Chairman, Amarillo; *W5s* IGU, HWK, LPI, UBW, and VUW.

Kansas — KØACC, Chairman, Wichita; *WØs* OMM, PBU, VZM, and ZSZ; *KØs* BFH and CKB.

Missouri — WØAOP, Chairman, Columbia; *WØs* IYF, NJR, ORL, PWJ, RMF, VJD, VWN, YOR; KØCTG; *KNØs* ECI, EMY; K9AMD; *W9s* FLL, PWI.

Illinois — no report.

Indiana — W9BKS, Chairman, Ft. Wayne; *W9s* CLF, FJT, PMT, PRO.

Michigan — *W8s* ATB and GJH, Co-Chairman, Flint; W8QBO.

— • • • —

The list of YLs who are Registered Nurses published in the August column brought more to the fore. KN2TJY, W5YKE, W6UKI, K6LXP, W7CPV, W8JXJ, and K9BOC also wear nurses' white.

— • • • —

SFTDAPOTFANLORHW — Translation: The Society for the Defense and Protection of the Forgotten and Neglected League of Radio Ham Widows. Any XYL who feels she qualifies as a member is invited to send a card with the name and call of the OM who is "forcing her into membership" to Mrs. Helen Narrow, 1120 S.W. 13th Ave., Miami, Fla. Dues are one tube a month from the OM's transmitter, and when those are depleted, a tube a month from the receiver until there are none left.

But, girls, first why not try the "if you can't fight 'em, join 'em" theory. Unhappy XYL to enthusiastic YL is not such an uncommon story among our ranks.

— • • • —

Keeping Up With the Girls

Clubs:

Los Angeles YLRC: Harryette, W6QGX, is the new "Queen of the Clan" (Pres.) but QSLs for the LADS 'N' LASSIES certificate should continue to be sent to Gilda Shoblo, W6KER, 3715 Liberty Blvd., So. Gate, Calif.

Ladies Amateur Radio Klub: New officers are Pres. W9LDK; V. P. W9UON; Secy. W9IWP; Treas. W9YWH; Publicity W9BCB; Editor W9UON; Novice Rep. KN9CZQ. The Klub's nets are phone: Friday, 10:00 P.M. CDST, 29,640 kcs, W9LDK NCS; c.w.: Thursday 2:00 P.M. CDST, 3750 kcs, W9YXK NCS with W9MYC alternate. Will tune for novices.

Washington YLRC: The July meeting was spent "shack visiting" at *W4s* DEE, FNC, and ETR. Pres. W3MSU reported her observations of the ARRL National Convention at San Francisco. As the founder and first president of the YLRL, Ethel was interviewed on three successive programs of the Voice Of America.

Philadelphia YLRC: At the organizational meeting on June 8th W4VCB/3 was elected President; W3SLF, Secy; and W3FTP, Treas. All interested YLs are invited to meet with the 16 charter members on the first Friday of the month.

Rhode Island YLC: W1WED, Ruth, custodian of the R. I. YL Award reports that the following certificates have been awarded to date: #1 W1CEW, #2 W1ZPG (OM), #3 W1ULS (OM), #4 W1WPX, #5 W2QHH (OM), #6 W1VAY (OM), #7 W1CCN (OM), and #8 W4VCB/3.

Women Radio Operators of New England: W1RLQ, Chata, is NCS of the club's 10 meter net which meets Monday at 8:00 P.M. EST at 28,800 kcs.

Get-Togethers: K2IYP reports the YLs at the Rochester hamfest were W1HOY, *K2s* CUQ, DJN, DXD, GOM, JIR, LTN, and UPP; *W2s* JZX, RUF, SCI, and UTF.

Forty-seven YLs and some 200 XYLs registered at the West Gulf Division Convention in Galveston. Ladies Chairman W5VNI, Bettye, declared the special "Letter to Long-

The Equation that Shook the World!

A hasty scrawl on a scrap of paper ushered in the Atomic Age. Through this equation, Dr. Albert Einstein revealed to mankind the awesome secret of atomic fission, with all of its tremendous power for good or evil.

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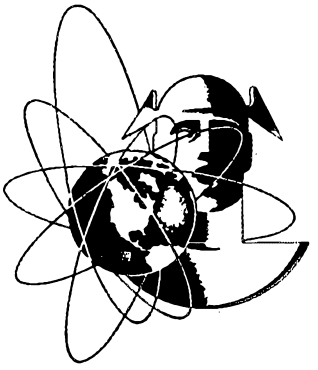

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Suffering XYLs" contest an "overwhelming success." Forty-two entrants selected their category — "Why I am glad my husband is a ham" or "Why I wish my husband were not a ham" and then took up to three pages to elucidate. KN5AHP's letter won first prize for the sympathetic category, and Dot Miller, XYL of W5AFY took first honors for the opposition.

Operating: Using an 813 rig she built herself, in little more than a week Carol, W7TQP, worked 23 countries. . . . KN6OQD, Jean, was appointed Traffic Manager of the Glendora CD Net. . . . W3WML, Babs, was NCS of the Montgomery Co. Pa., Emergency CD net during Operation Alert, July 20. . . . Sister Charlotte is active on 3245 kcs. as A7MUT. . . . If you are looking for a Delaware YL, W3CTM, Eleanor, will be glad to work you around 3640 kcs. on 80 and 7060 kcs. on 40. . . . W3UKJ's new KSW-1 provided Mena with a contact with KC4USA at the South Pole. . . . W5EGD, Lillian, and W5WXY, Bernice, meet at 8:00 P.M. Tuesday on 7136 kcs. They're interested in starting a YL c.w. net. . . . W8MDK, Ruby, has been operating 20 at K8FDU, Gentile AFB in Dayton, while getting settled in a new QTH. . . . Taking time out from Ohio State U. summer school, W8OSD, Virginia, has been using campus station K8WAA. . . . Carol, W6WSV, caught up with XE4A and XB6CA. . . . Dee, W7ZKY, is looking for YLs on 3900 kcs. s.s.b. during the day.

Awards: YL Century Certificate — New recipients: *W1s* CEW, VXC, *W3s* YTM, ZFB, W5RZJ, K6EXV. Endorsements: W3OQF-300; W7HHH-250; W4VCB/3-150.

WAS to W1FTT.

25 w.p.m. Code Proficiency Certificate to W8SPU.

We regret to report the passing of three well-known YLs. Jane Rainie, GM3AKR, of Ayr, Scotland, on March 31st. Hazel Kempton, W1LYR, of Presque Isle, Maine, on June 8th. Lavina P. Allen, WØMTC, of Wichita, Kansas, on July 23rd.

Miscellaney: *W3s* CDQ, MSU, and *W4s* ETR and TVT demonstrated amateur radio to the viewing public when they appeared on TV's "Ask-it-Basket" program. . . . W3UTR received gifts from YLs all over the country in a surprise "shower-by-mail" given by Barbie, W3OQF, on the occasion of Meg's departure for Fisherville, Va., where she will study at the Woodrow Wilson Rehabilitation Center. . . . Another receiver shrouding a dead mouse. This time it was W3WRE's HRO. . . . W7PTX, Betty, is wiring a 5 inch scope, a tube-tester, and a signal generator. . . . At the National Photography Society Exhibition, W3CDQ received a certificate for one of her color slides adjudged the second best color slide of the year (a shot of the Matterhorn taken at sunset on one of Liz' European trips). . . . W7ITZ, Ruth, is the new president of the Southern Oregon RC. . . . Putting in her sixth summer as lookout for the State Forestry Dept., WN7DHK, Ollie, hopes to have a little rig on 40 with her soon for company. . . . Head of her local Ground Observer Corps, Lydia, W7NTT, has put in nearly 5000 hours of sky-watching. . . . W7ZPS, Dot, and her OM W7ZOW have been conducting study classes weekly for a year. Average attendance has been twenty, with the majority of students getting first their novice then general class licenses. K6HVC, Marge, has been teaching four nights a week and has graduated several novices. . . . ZS1MU, Pat, was elected to serve as Secretary along with three OM officers of the South African Radio League. . . . While waiting for her general class license to materialize, KN4IRZ, Janice, wired a DX 35 Heathkit transmitter. . . . High-schooler KN5EYR put together a little 4-watt rig for 80.

ARE YOU LICENSED ?

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

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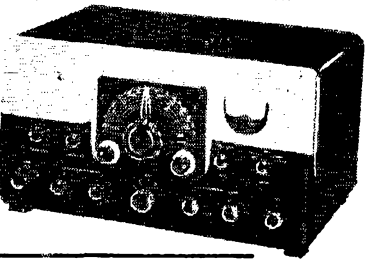

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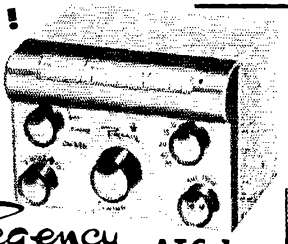

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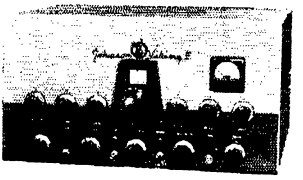

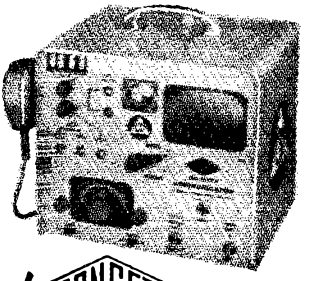

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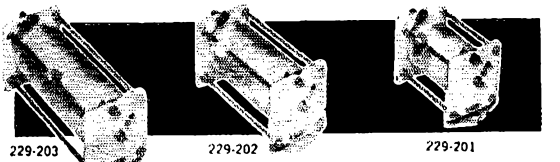

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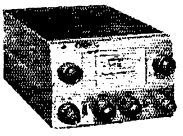

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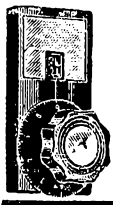

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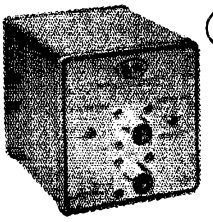

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Correspondence

(*Continued from page 54*)

BEACH COMBER

Warrenton, N. C.

Editor, *QST*:

I am thinking of organizing a DXpedition called Ham Explorations which will do the preliminary work for regular operating expeditions to follow.

The first project of my DXpedition will be to comb by ship and plane the Caribbean area and mark every unsubmerged sand bar so that a following party can set up a transmitter and thus give to the world a "new country."

Seriously, I believe DX and DX manners will improve if ARRL reverted to its original DXCC idea of giving a certificate of merit for one hundred confirmed countries and let it go at that. I was glad to see in *QST* that the Board voted down a proposal to award some kind of Super-DXCC to those confirming 200 countries.

The countries-worked score of an amateur station is somewhat like an individual's golf score. Both are personal achievements and really do not need to be proven by confirmations in the amateur's case or a CPA audit in the golfer's.

Oh, yes, I am still working hard at moving my DXCC position from grade 160 to grade 170!

— *Hugh W. Holt, W4TP*

EQUIPMENT REVIEWS

16 Pearl Avenue
Oil City, Penna.

Editor, *QST*:

For some time *QST* has been running articles on new equipment. These articles give only the good points of the equipment but not the bad points. As a friend of the amateur *QST* should give all the bad qualities of the equipment as well as the good points. There are trade magazines and testing labs that are impartial and do not hesitate to give the good and bad. So let's protect the ham and tell him the facts.

— *Joe Szabat, W3LST*

[EDITOR'S NOTE: *QST* does not attempt to "break down" equipment described in "Recent Equipment" articles. The articles are written to inform amateurs of equipment features and to call to their attention commercial methods of construction and design. The unfairness, to the amateur and the manufacturer, in the procedure that OM Szabat proposes would be apparent in the case of a receiver manufacturer who might submit a "hot" receiver, other models of which would not compare with the resultant enthusiastic *QST* review. Since most good or bad points about a particular piece of equipment may be reduced to personal opinion, the reviewer endeavors to keep his opinion from flavoring the report.]

ANNUAL REPORT

Box 107
Lihue, Kauai, Hawaii

Editor, *QST*:

. . . As a newspaperman, I see many corporation reports, but I have yet to see any as detailed as the annual report offered members of the ARRL. The ARRL staff is to be congratulated on the thoroughness and care with which this report is prepared. In many ways it is a real eye-opener for us kauainas so far from Hartford.

— *C. J. Fern, Jr., KH6ARL*

[EDITOR'S NOTE: Annual reports continue to be available to members at 75 cents.]

QST COMMENTS

741 Highland Avenue
Kenmore 23, New York

Editor, *QST*:

Any similarity between July *QST* and a publication de voted to amateur radio is certainly obscure.

Listing the Technical Correspondence items separately in the index failed to make the issue even appear attractive from the very first page.

As usual, Recent Equipment (describing commercial products that the amateur can buy) took a couple of pages.

(*Continued on page 138*)

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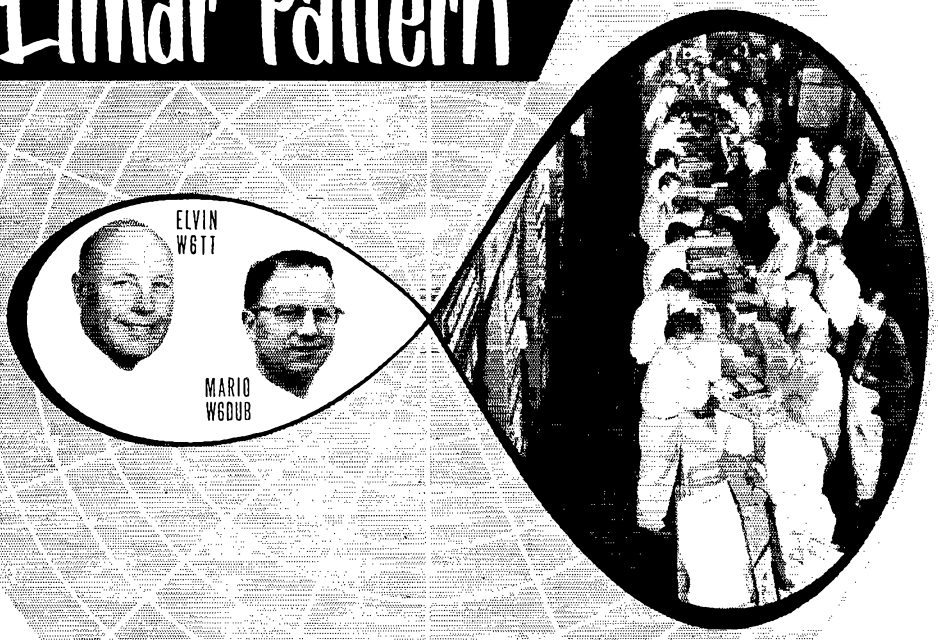

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Approximately ten more pages in the issue were devoted to articles only mildly related to amateur radio. (Some of this, yes, but within reasonable limits.)

Another article "revived" an antenna system described twice before, as recently as December, 1954!

Instructions on artificial respiration are certainly valuable . . . in a Red Cross or similar publication.

In addition to rejecting many motions worthy of extensive consideration, please note that the Board of Directors also rejected item number seventeen requesting *only* the *investigation* of an incentive program for articles in *QST* on radio subjects.

— *J. Bruce Siff, W2GBX*

2818 Avenue "Y"
Brooklyn 35, N. Y.

Editor, *QST:*

I wonder how many hams just found out about the "Neilson" or the "back pressure arm lift method" of artificial respiration in the article in July *QST* entitled, "Saving a Life"?

The ARRL should print copies of the article and should make it an operating aid. I know that the Red Cross has copies available in their book, *First Aid.*

It has been proven that the "Schaefer" method is not very good. All radio amateurs and their families should know how to give artificial respiration in case of an accident i their shack.

— *Jackie Frisch, K2ITZ*

3000 No. Murray Avenue
Milwaukee 11, Wisconsin

Editor, *QST:*

I thought I'd write to you and let you know about my success in building the 6U8-6146 6-meter TVI-proof transmitter described in January *QST.* I had so much luck with it that I've made another one for W9MPZ. We're both using a.m. without a trace of TVI, and have to chuckle every time we hear a fellow say that he's having trouble with the "Indians."

Certainly was a pleasure to build and get going. Let's have more of the same.

— *Bob Whitcomb, W9UZK*

ON THE WAY

4708 Mackenzie Street
Montreal, Que., Canada

Editor, *QST:*

After reading *How to Become a Radio Amateur,* I decided to build the simple regenerative receiver shown there. I have recently finished it and believe me it works far beyond my expectations. The other night, I received Mexico. Also, one morning at 4:00 I received Alberta, not too clear, but understandable.

Because of these and other events, I am studying for a license, and I hope to get it by the end of the summer.

The other day I went down to the district Superintendent of Radio and asked what would be the best book to study from and he mentioned *The Radio Amateur's Handbook.* Thanks to your publications, I am really interested in amateur radio.

— *Gordon Peffer*

LITERAL TRANSLATION

P. O. Box T
Lakehurst, N. J.

Editor, *QST:*

A few days ago, a bright young lady just out of high school was telling me how well she had learned shorthand and typing. She went on to some length so, finally, to test her, I picked up one of my notes and read off the following:

"In the superheterodyne receiver, connect a one-tenth microfarad condenser from the screen pin to the cathode return point, and an isolation resistor of about 4700 ohms in the B-plus line, to discourage regeneration."

She took it down a little slowly but with an air of considerable self-confidence. When I had finished dictating, she went to the typewriter, rattled away for a few minutes, and then presented me with the following typed proof of her ability:

"In the superior cat-o-nine receiver, connect a one-tent mackerel head dispenser from the green pit to the cat-toes return point, and an occupation-free list of about 47 hundred homes on the flea bus line, to discourage three generations."

— *Frank H. Tooker*

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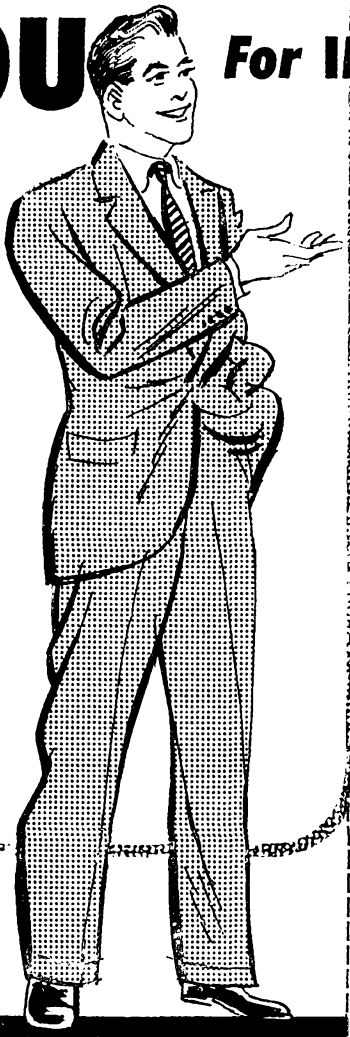

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How's DX?

(*Continued from page 61*)

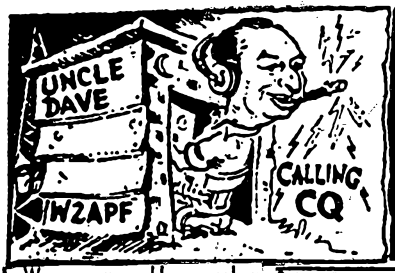
In view of inquiries received, be it known that the prefix VK9 now represents four countries: P. T., T. N. G., Norfolk Island and Nauru. (This at least until Australia juggles VK call areas anew.) . . . . . W7LNG, with 95 countries confirmed, is one of those rare birds who have Kermadecs QSLs. A 1948 contact with ZL1UO did the trick . . . . . Ex-YJ1DL is in Alaska on a 6-month stint and gets in occasional mike work at the shacks of KL7s BFW and BGA. Dave also visited among the Seattle DX gang in midsummer . . . . . VK1ZCA passes the word on demonstration station VK1ACA, activated in mid-August at the Canberra Annual Hobbies Exhibition in Australia's capital. Special QSLs are destined for all contacts . . . . . According to WGDXC, VK9LW is a permanent Nauru licensee.

Europe — K5GOL, K6s CWG SSR, K9DPP, WØRKS, KØGLR and KNØDHS are stationed at the Azores site of CS3AC, one happy ham family. Trouble is, there no longer is authorization for amateur-band work by CS3AC . . . . . W9LYA, ex-DL4TM, returned to Germany as DL4SD. In a few short weeks of 50-watt DXing Dave managed some 40 countries. His intended 1956 DXcursion to Monaco now is in considerable doubt . . . . . DL7AA confirms via W1VG that DARC's WAE substitute countries list is invalid as of May 30, 1956. I.e., the full "regular" list is back in the saddle. Credit for WAE substitute countries will be given for QSOs dated prior to May 30th of this year but must be filed with DARC before May 30, 1957 . . . . . Another item for the attention of wallpaper men is described by SP6BZ. It's "S6S" — *Diplom za Spjeni se 6 Svetadily* — a dilly sponsored by CRA (Czechoslovakia). The award stresses single-band all-continent work. Write CRA, P. O. Box 69, Praha I, Czechoslovakia, for the fine points. Incidentally, SP6BZ is confident that Poland and other countries in eastern Europe soon will file for IARU membership . . . . . LA1AD was a 400-watt s.w.b.c. "special" operated on 7210 and 11,850 kc. by University of Oslo students in conjunction with Oslo Student Week last month. No two-way work was attempted but reception reports are solicited . . . . . F9MS, who recently applied for DXCC certification, laments a poor QSL-returns percentage for communications with W/Ks. On the other hand, Claude received about two dozen ARRL DX Test QSLs from Yank stations not recorded in his log . . . . . W6ZZ checked his yellowing W1WV archives and finds 64 British countics represented among his old G QSLs. That's 14 more than Miles has accumulated at his present location . . . . . SM8KV/LA/P, manned on Spitzbergen by SM5KV in the company of a Norwegian scientific exploration party during August, was grabbed by hundreds of 14- and 21-Mc. W/K/VEs, phone and c.w. A sleeper with plenty of punch! . . . . . ZB2s Q R and T desire more response on 20 from the U. S. 7th and 10th call areas. WAS, you know . . . . . WGDXC's grapevine grapples with Vatican City licensing requirements: (1) citizenship, (2) residence for at least three weeks, and (3) the passing of a prescribed ham exam. ON4QX, said to have qualified on the first two counts, now is trying for the 64,000-QSO questions.

Hereabouts — RCP (Paraguay) makes available *El Diploma Paraguay*, a DX certification based on confirming QSOs with five ZP stations. The contacts must date subsequent to May 15, 1952, phone or c.w. allowed. Check RCP, Casilla de Correo 512, Asuncion, for full details . . . . . August 4th-12th saw accelerated HK activity in the Leticia Amazon region of Colombia. The deal, promulgated by LCRA, resulted in collector's-item confirmations for all stations worked . . . . . KG1BO is organizing a 7250-kc. net for polar amateurs. W2WHB keeps KG1AX workable around 14,100 kc. while neighbor KG1AG (K4IWH) takes care of Camp Tuto phone work near 14,201. W2WHB writes, "Twenty meters seems to be the only band that is usable with any degree of reliability up here. On the lower frequencies there is no noticeable difference between the performance of a half-wave antenna high on masts and one lying on the ice!" Camp Tuto is situated 14 miles inland from Thule AFB at the edge of Greenland's vast ice cap . . . . . A midsummer cresting of the Belize River's eastern branch flooded VP1HA's domicile to a depth of three feet . . . . . Poetic justice, or, it couldn't have happened to finer fellows: K2BZT overheard a definitely phony PK5 working a definitely phony M1, each heatedly proscribing the other's illegitimacy. *Hi!*

Ten Years Ago in "How's DX?" — Full October, 1946, returns now pour in from 20-meter polling places and the turnout of voters is impressive. Fully exercising their new 14-Mc. franchise, W1s CH HKK JJL KFV OKU ONV TS, W2s IOP MPA, W3VES, W4s BPD BRB ITR, W5s ACL ASG IOA KUC LDD, W6s ITH KIP PBV VFR WN, W7EYS, W8s HGW PMJ TOB, W9s IHN VDA, G6RH, VP5AD and W6TZB/K6 report casting ballots for such worthy candidates as AC4YN, EQ4DC, ES5K, ET3Y, EZ4X, PKs 1RI 5JN 6AW 6HA 6TC 6UA, SU1US, TA1DB, UAs 9CB ØKAA, VQ8AE, VS4JS, W6JIM/C1, XUs 1MB 1YK 4B 8NR, ZC1AR and ZD8A, all c.w.; ACs

(*Continued on page 142*)



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1 SX28A Hallicrafter (an old standby—excellent condition)	150.00
1 S53 Hallicrafter (fine for novice or 6 mtrs.)	50.00
1 SX25 Hallicrafter (with pm23 spkr – perfect shape)	125.00
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1 6V amp.& power supply Gonset	25.00
1 Superceiver Gonset	95.00
1 10 meter converter Gonset	20.00
1 Mobile transmitter Johnson.....	95.00

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SONAR SRT 120P
wired and tested
Orig. $289.50
Demo price – ***$199.50***

HALLICRAFTERS HT-31
Power amplifier
Orig. $395.00
Demo price – ***$340.00***

BARKER AND WILLIAMSON
5100 S
Orig. $467.50
Demo price – ***$397.50***

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5100 B
Orig. $475.00
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••••
51 SB
SS adapter for above
Orig. $279.50
Demo price – ***$237.50***

Remember, we carry NEW merchandise. We have all popular brands of amateur equipment in stock. Immediate delivery

24 HR. SERVICE on stock items

3SS 4YN, FN2A, K6SCJ/KP6, LX1AX, PK1AM, PZ1A, W2LFI/FF8 and W9CAC/TF on phone . _ . _ . _ Some among the electorate split their tickets, nominating KS4AA on 80 meters; FM8AC, LX1BG, W1DTS/CT2 on 40; VP8LK and YI2CA on 10 . _ . _ . _ The countries race swings into higher gear, W1FH claiming 114 (83 on phone), W3BES 111, W1CH 104 and W9FS 93 . _ . _ . _ In closing, W1JPE quotes W2MPA's classic QSP from Confucius: "DX station transmitting on honorable rhombic and receiving on 2-meter 'J' should blow fuse."

A.R.R.L. QSL BUREAU

The function of the ARRL QSL Bureau system is to facilitate delivery to amateurs in the United States, its possessions, and Canada of those QSL cards which arrive from amateur stations in other parts of the world. Its operation is made possible by volunteer managers in each W, K and VE call area. All *you* have to do is send your QSL manager (see list below) a stamped self-addressed envelope about 4¼ by 9½ inches in size, with your name and address in the usual place on the front of the envelope and your call printed in capital letters in the upper left-hand corner.

W1, K1 — D. W. Waterman, W1IPQ, 99 Flat Rock Rd., Easton, Conn.

W2, K2 — E. F. Huberman, W2JIL, Box 746, GPO, Brooklyn 1, New York.

W3, K3 — Jesse Bieberman, W3KT, P.O. Box 400, Bala-Cynwyd, Penna.

W4, K4 — Thomas M. Moss, W4HYW, Box 644, Municipal Airport Branch, Atlanta, Ga.

W5, K5 — Robert Stark, W5OLG, P.O. Box 261, Grapevine, Texas.

W6, K6 — Horace R. Greer, W6TI, 414 Fairmount St., Oakland, Calif.

W7, K7 — Joseph P. Vogt, W7ASG, 5399 Karen Ave., Salem, Oreg.

W8, K8 — Walter E. Musgrave, W8NGW, 1245 E. 187th St., Cleveland 10, Ohio.

W9, K9 — John F. Schneider, W9CFT, 311 W. Ross Ave., Wausau, Wisc.

WØ, KØ — Alva A. Smith, WØDMA, 238 East Main St., Caledonia, Minn.

VE1 — L. J. Fader, VE1FQ, 125 Henry St., Halifax, N. S.

VE2 — Harry J. Mabson, VE2APH, 122 Regent Ave., Beaconsfield West, Que.

VE3 — Leslie A. Whetham, VE3QE, 32 Sylvia Crescent, Hamilton, Ont.

VE4 — Len Cuff, VE4LC, 286 Rutland St., St. James, Man.

VE5 — Fred Ward, VE5OP, 899 Connaught Ave., Moose Jaw, Sask.

VE6 — W. R. Savage, VE6EO, 883 10th St. N., North Lethbridge, Alta.

VE7 — H. R. Hough, VE7HR, 2316 Trent St., Victoria, B. C.

VE8 — W. L. Geary, VE8AW, Box 534, Whitehorse, Y. T.

VO — Ernest Ash, VO1A, P.O. Box 8, St. John's, Newfoundland.

KP4 — E. W. Mayer, KP4KD, 1061, San Juan, P. R.

KH6 — Andy H. Fuchikami, KH6BA, 2543 Namauu Dr., Honolulu, T. H.

KL7 — Box 73, Douglas, Alaska.

KZ5 — Catherine Howe, KZ5KA, Box 407, Balboa, C. Z.

COMING A.R.R.L. CONVENTIONS

Sept. 30 — New Hampshire State, Concord

Oct. 21 — New England Division, Providence, Rhode Island

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Your future at Raytheon includes attractive salaries – regularly reviewed for merit increases; relocation expenses; paid life and accident insurance; company-paid educational plan – other benefits and allowances. Write to E. K. Doherr for information.

Excellence in Electronics

RAYTHEON

RAYTHEON MANUFACTURING COMPANY

Government Service Department

100 River Street, Waltham 54, Massachusetts

Happenings

(Continued from page 49)

Novice licensees may use the following frequencies, transmitters to be crystal-controlled with a maximum power input of 75 watts.

3.700–3.750	A1	21.100–21.250	A1
7.150–7.200	A1	145–147	A1, A2, A3, f.m.

Technician licensees are permitted all amateur privileges in 50–54 Mc. and in the bands 220 Mc. and above.

RULES CHANGES

FCC has made several changes in the amateur rules which are termed "editorial," but a couple of them will be of special interest.

1) In Section 12.156, which deals with procedure in the event of communications emergency, the FCC man to contact in case a "declared" emergency appears in order is now the district Engineer-in-Charge. (It has formerly been the Regional Manager, but that post is now abolished in FCC organization.)

2) A very minor change of wording in Section 12.27, to define a license modification as a change of address, actually has greater significance than it indicates. Up until recently, a "modification" of license came about either because of a change of address, or passing of the examination for a higher grade. Under rules put into effect in 1951, such modifications did not extend the term of the license. FCC has now decided to consider an advancement to a higher grade as actually a new license. A change of address will remain a modification, and will not extend the license term. Advancement to a higher grade will put the license in the "new" category, and it will be issued for a new five-year term.

FCC OPENINGS

FCC has announced that it badly needs radio engineers with experience in the broadcast field. Positions are Civil Service, with salaries from $4,480 to $7,035 (Grades 5 to 11), with the greatest need in the higher brackets. For Grade 11, a degree plus a minimum of four years professional experience is required; however, additional professional experience may be substituted for the educational requirement. Qualifications for lower-salaried posts are proportionately less. Write the Director of Personnel, FCC, 1204 New Post Office Bldg., Washington 25, D. C.

Strays

W6APQ reports that it is possible to receive a free copy of a booklet entitled "Fluorescent Lamps and Radio Reception," booklet No. LS-121A, by writing to General Electric Co., Application Engineering Dept., Lamp Division, Cleveland 12, Ohio. It deals with the elimination of radio interference from fluorescent lamps.

FREE! LAFAYETTE CATALOG

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Packed with the largest selection of Electronic, Radio and TV Parts, and equipment, PA, Hi-Fi systems, tubes, antennas, Transistor Kits, parts and components, Test Equipment, new build your own kits, tools, books, Microscope, drafting equipment, Binoculars, Telescopes, All Radio, TV and Ham supplies — ALL AT GREAT SAVINGS — For the economy minded servicemen, dealer, engineer and technician. CHUCK FULL OF BUYS! SEND FOR YOUR FREE COPY TO-DAY.

VOCALINE RADIO TRANSCEIVER
Model JRC-400

First really low-priced 2-way radio available. Provides satisfactory communication at a distance of 10 miles or more—depending on location and terrain. Amplitude modulated radio telephone operates on fixed frequency of 465 megacycles (Citizens Radio Band). RF power input is 2 watts; power output is ½ watt. Power supply operates on any 115 volt AC outlet or a 6 volt DC power source. Tubes: 6AV6, 6AF4, 6A85. Weight: 4 lbs. Dimensions: 9" x 6" x 5". FCC approved.

Single unit, complete with mike....68.36
Pair 136.71
Also available for 12 volt DC (plus 115 volt AC) at same price.

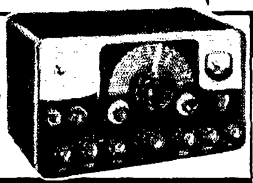
HAMMARLUND PRO-310

- **THE LAST WORD IN COMMUNICATIONS RECEIVERS!**
- **AM—CW—SSB**

Features exceptionally high stability; dual conversion with second conversion oscillator crystal controlled; ruggedized—sectionalized construction; instrument-type tuning with Scanspread; ultra-high signal-to-noise ratio; extremely high image rejection; built-in crystal calibrator; coil turret band-switching; highly effective series-type noise limiter. Designed for the modern ham.

PRO-310—Complete 595.00

New!



JOHNSON VIKING "PACEMAKER"

SSB — CW — AM TRANSMITTER

- **BRAND NEW!**
- **90 WATTS P.E.P. INPUT SSB**
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High selectivity and rejectivity; easy tuning and smooth operation; mechanical and thermal stability; structural rigidity and strength.

MODEL 4300—Complete.....194.00

YES—WE HAVE THEM IN STOCK!

NATIONAL NC-300

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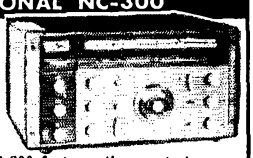

National NC-300 features the greatest sensitivity of any ham receiver at any price (3—6 db noise figure on all amateur bands). Has 10 dial scales for coverage of 160 to 1¼ meters; 3 position IF selector provides super selectivity, gives optimum band width for CW, phone, phone net or VHF; separate linear detector for single sideband; giant, easy to read "S" meter. Muting provision for CW break-in operation, and a host of other outstanding features that make the NC-300 the "dream receiver" of every ham.

NATIONAL NC-300—Complete...399.95

HALLICRAFTERS MODELS S-102 and S-106

- **COMPLETE RECEIVERS FOR 2 and 6 METER BANDS**

Excellent for VHF operation by novice, technician or CAP. Supersensitive, low frequency drift, built-in 5" PM speaker, 7 tubes plus rectifier, coax and twin-lead antenna input, standby terminals.

MODEL S-102—143-149 MC 2 Meter band and CAP (148.14 MC).....59.95
MODEL S-106—49-55 MC 6 Meter band 59.95

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We carry a complete line of all the famous Communications Transmitters, Receivers and Accessories.

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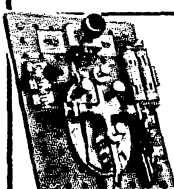

TRANSISTOR CODE PRACTICE OSCILLATOR KIT

For those interested in mastering the international code, an audio tone oscillator is essential. The circuit of this transistorized feedback oscillator has the simplicity of the neon glow, the signal strength of the vacuum tube, and requires only two penlite cells for weeks of service. It may be used for solo practice, or two may send and receive with the same unit. Kit comes complete with Transistor, Telegraph Key, Resistors, Condensers, Masonite Board, etc., and Schematic Diagram.

KT-72 ..... Net 2.99
Cannon ECI—Single Headset ..... Net 1.13

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Hints & Kinks

(Continued from page 39)

ALUMINUM WORKING HINT

RUBBER FEET for chair legs, which can be purchased cheaply at any variety store, are very handy in working aluminum.

When fitted over a hammer head, as illustrated in Fig. 3, the foot enables aluminum to be bent and shaped without scarring or ruining the

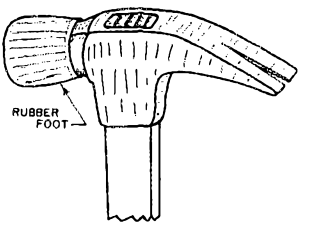

Fig. 3 — W5YVQ slips a "rubber foot" over the head of the hammer when the tool is used for forming aluminum.

finish. The small initial cost will be repaid many times over in neater work.

These rubber feet also make a handy hot tube puller, and they are flexible enough to be used for several sizes of tubes.

— *Bob Ellis, W5YVQ*

A TWO-STATION TRANSISTORIZED CODE-PRACTICE OSCILLATOR

THIS code-practice oscillator embodies such features as compactness, economy, simplicity, tone control and dual-position operation. The unit can be built for approximately $7.00, takes up no more space than that occupied by a pair of surplus keys and may be keyed and monitored at both the "main station" and "remote" operating positions.

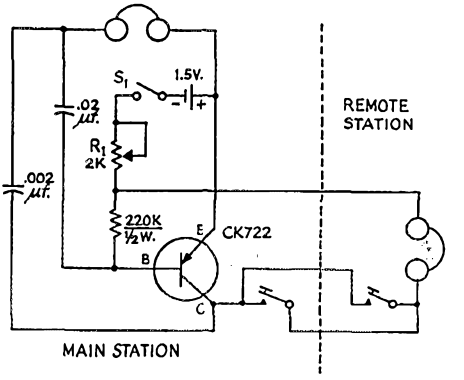

Fig. 4 — Circuit of the two-station transistorized code-practice oscillator.

The circuit of the oscillator is shown in Fig. 4. The parts for the main station may all be mounted on the base of a surplus type J-38 key.

(Continued on page 148)

The Defense Projects Division of

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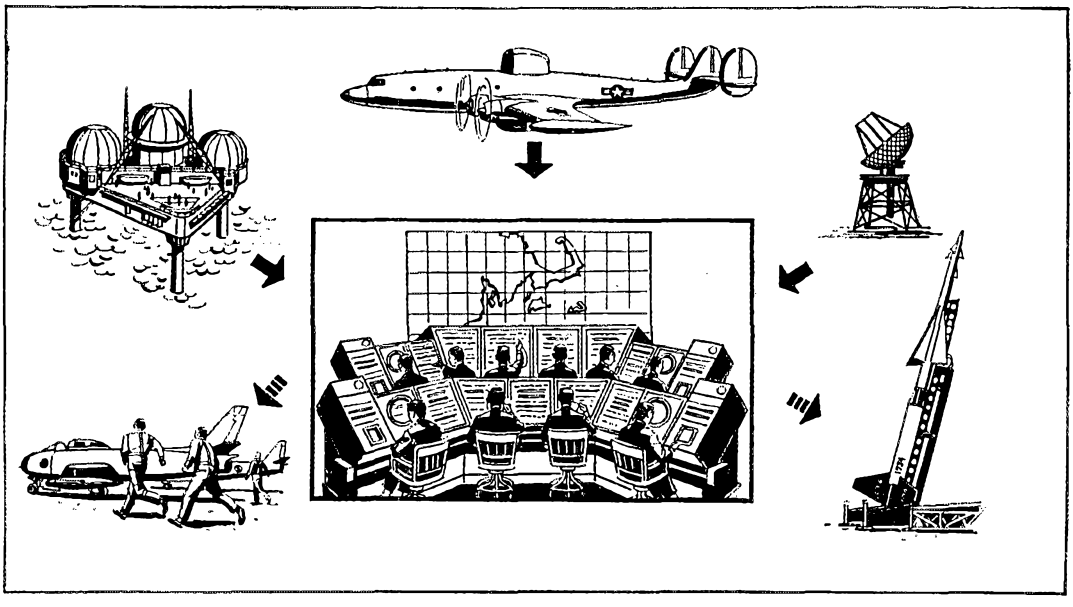
has opportunities for Engineers, Physicists, Mathematicians and Technicians for field work in testing the new Air Defense System.

SAGE

(Semi-Automatic Ground Environment)



Recently developed digital computer techniques and their application to radar data processing and weapons control have opened a new and expanding field of automation. The extensive classroom and laboratory training which precedes job assignment affords an excellent opportunity to enter this new and challenging electronics field as a part of the Bell System team.

FOR FURTHER INFORMATION CONTACT:
D. P. Wilkes, W2LNC, Superintendent, Systems Testing
Western Electric Company, 220 Church Street, New York 13, New York
or Telephone Collect to: WOrth 4-0277

R_1 is a 2000-ohm potentiometer (tone control) equipped with a s.p.s.t. switch (S_1). The phones at both positions should have an impedance of 1000 to 2000 ohms. Battery potential may be increased to 3 volts if the 1½-volt source gives less than the desired amount of audio output.

A 3-wire cable connected between stations will permit two operators to work "break-in." The operating positions may be separated by any reasonable distance.

— *William W. Clarke*

USING RUBBER GROMMETS AS RUBBER FEET

AN EASILY INSTALLED substitute for bumper feet is a set of rubber grommets mounted in the usual manner where the feet are desired. This idea works well on metal cabinets, chassis bottom covers, etc. Frequently, the grommets will give more "slip-proofing" than standard rubber feet!

— *Merritt F. Malvern, W2ORG*

October 1931

Twenty-five years ago this month the lead article in *QST* described a simple receiver for beginners using a couple of dry cell tubes and covering the frequency range from 20 to 190 meters. George Grammer, then the Assistant Technical Editor, was the author. Real genuine breadboard construction was used.

— • • • —

Ed Glaser, W2BRB, discussed two novel schemes for improving the voltage regulation of rectifier-filter systems, using voltage-regulating chokes and transformers. Voltage-regulating chokes are still very much with us, now being called swinging chokes.

— • • • —

"The Traveling Man's Portable" described a suitcase station used by Don Wallace, W6AM, to keep schedules with his wife, W6MA, while he was on the road. W6AM is still very much in evidence, being one of the high stations on the DXCC Honor Roll.

— • • • —

Also in the October, 1931, issue of *QST* is the first of a two-part series on passing the government amateur license exam, an article on the Mechanics of modulation, and some three pages of ideas for the experimenter.

— • • • —

Finally, one of the more interesting letters to the editors read as follows: ". . . *QST* has been harping on 5-, 10-, and ¾-meter stuff for the last six years or so, and of what use are they? No one seems to care or use these bands, so why not leave these articles out. . . . The amateurs will never use these bands, so why waste all the time on these useless bands? . . ."

MEMBERSHIP CHANGES OF ADDRESS

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

Why wait longer for your... "DREAM RECEIVER"

tuned to tomorrow

National NC-300

Ideal for single sideband operation

Decreases distortion by allowing AVC "on" with single sideband. Will not block with RF gain full open. Dual conversion on all bands. Crystal filter with phasing control and three-position band-width control. The ham receiver with exceptional calibration accuracy.

Selectivity at 6 db down 500 cycles, 3.5 kc. and 8 kc. Selectable from the front panel without additional accessories . . . and nothing extra to buy! This receiver has ten dial scales for coverage of 160 to 1¼ meters, with National's exclusive new converter provision with the receiver scales calibrated for 6, 2, 1¼ meters using a special 30-35 mc tunable IF band.

Has an image rejection of not less than 50 db. Gives amateur band coverage from 160 through 10 meters. Converters available for 6, 2, and 1¼ meters. All these features in one receiver, and it's yours for..... **$399.00**

(Matching speaker: $17.00 extra)

Get yours from Brown

$39.90 down and 18 monthly payments of $21.75 per month. Or use your trade-in for your down payment and figure your own deal at 6% interest.

Brown offers: **Immediate response to inquiries. Immediate shipments. We finance our sales—fast credit service. Liberal trade-in allowances. Many nationally known lines of amateur equipment in stock. Bargains in used, trade-in gear. Write, phone or wire . . .**

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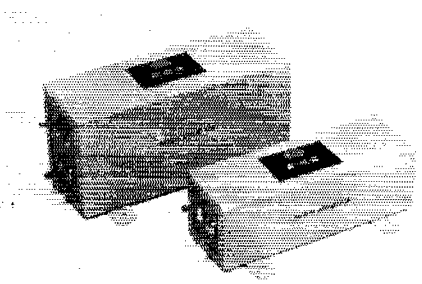
PHONE - EASTBROOK 4136

New Apparatus

Filament Chokes for Grounded-Grid Amplifiers

THE SMALL boxes shown in the accompanying photograph should provide an easy way out for those who have been looking for some way to get the filament of a grounded-grid amplifier "up



in the air" for r.f. Each contains a pair of filament chokes designed expressly for the purpose, usable without tuning over the 3.5- to 30-Mc. range. Two current ratings are available; the larger unit will carry up to 30 amperes and the smaller up to 15 amperes. Dimensions are $2 \times 2\frac{1}{2} \times 5$ inches and $1\frac{1}{2} \times 1\frac{1}{2} \times 4\frac{1}{2}$ inches, respectively.

The new chokes are made by Barker & Williamson, Upper Darby, Pa. The 30-amp. unit is type No. FC-30 and the 15-amp. unit is type No. FC-15.

NEW BOOKS

Transistor Applications, published by Raytheon Manufacturing Company, 55 Chapel St., Newton 58, Mass.; 116 pages, 8½ by 11 inches, paper cover. Price, fifty cents.

A collection of articles taken from the popular magazines, describing over fifty items of equipment using transistors. The applications range from current amplifiers for milliammeters through broadcast receivers of simple design, including audio amplifiers, monitors, control devices, oscillators of various types, and numerous special gadgets. Practically all material is written around the CK722 transistor and so is applicable to junction types designed for use in the audio and i.f. range. Anyone with an urge to get acquainted with transistors will find plenty of things to try in this book.

Basic Vacuum Tubes and Their Uses, by John F. Rider and Henry Jacobowitz. Published by John F. Rider Publisher, Inc., New York. 208 pages, 5½ by 8½ inches, available in paper and cloth. Prices, $3.00 in paper, $4.50 in cloth.

(Continued on page 152)

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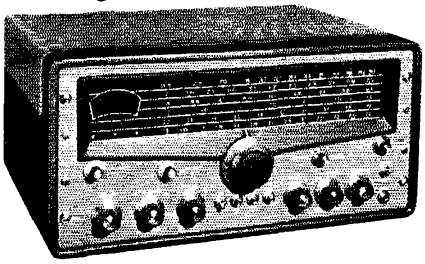
You get better service, more liberal trade-ins and greater satisfaction when you do business with an authorized, experienced distributor.

TAKE HALLICRAFTERS, for instance. We stock the entire line, can help you select the model which most suits your requirements and your purse — can also supply you with the correct associated equipment, such as antennas, relays, microphones, etc., etc. Whether you pay us a visit in person, call us on the phone, or write us a letter, you can be assured of prompt service and a square deal.

and NOW we proudly present a few outstanding Hallicrafters values including the **NEW SX101**



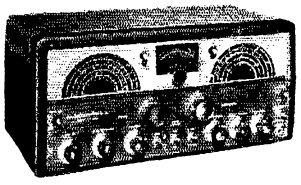
Seven Ham bands on large slide rule dial. Special 10 Mc. position for W.W.V. Exclusive Hallicrafters upper/lower side band selection. Second conversion oscillators quartz crystal controlled. Tee-notch filter. Full gear drive. 50:1 tuning ratio. Built-in precision 100 kc marker crystal. Five steps of selectivity from 500 cycles to 5000 cycles. Precision temperature compensation. Individually illuminated band-in-use scales. S-meter functions with A.V.C. off. Direct coupled series noise limiter. Sensitivity — one microvolt or less on all bands. Heaviest chassis in the industry — .089 cold rolled steel. 14 tubes plus voltage regulator and rectifier. And only

$395.00

For 2 or 6 meters new — inexpensive — complete Models S-102 and S-106 Receivers.

S-102, 143-149 MC
$59.95
S-106, 49-55 MC
$59.95

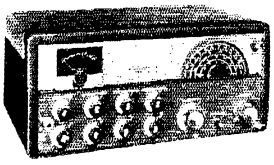
Versatile, self-contained with 5" PM Speaker — 7 tubes plus rectifier, low drift, high sensitivity —



Model SX100 SSB Receiver

"Tee-Notch" Filter provides a stable non-regenerative system for the rejection of unwanted heterodyne in SSB. Upper or lower side band selectable fy front panel switch. Notch depth control for maximum null adjustment. Frequency range 538kc-1580kc; 1720kc-34mc.

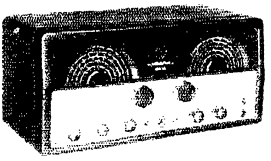
$295.00



Model HT-30 Transmitter

Built in V.F.O. reads directly in kilocycles. Stability equal to most crystals — .009%. Voice control system built in with adjustable delay and anti-trip features. Front panel controls allow selection of AM, CW, and upper or lower side band.

$495.00



Model S-85 Receiver

Coverage: Broadcast band 540-1680 kc plus three S/W bands 1680 kc — 34 Mc.
This newly engineered Hallicrafters receiver has the 10, 11, 15, 20, 40 and 80 meter amateur bands calibrated on large easy-to-read dial. Over 1000° of calibrated bandspread for better selectivity on ham bands. Husky, full sized unit features separate bandspread tuning condenser and built-in PM 5" speaker.

$119.95

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Write, wire, or phone ERNIE BONO (W1QBP) *for immediate service*
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LIBERAL TRADE-INS, LOW DOWN PAY — EASY TERMS. Send for LIST of used Equipment Values!

BETTER STILL, COME IN — PLENTY OF PARKING SPACE

Elementary, nonmathematical and easily understandable discussion of the operation of the fundamental types of vacuum tubes, yet with a great deal more detailed information than one usually finds in a "beginner" type book. Recommended for those who want to get a better-than-average picture of how and why tubes work without taking the more difficult step of serious study of one of the many available engineering-level texts.

Advanced Television Servicing Techniques, by RETMA Pilot Training Course Teaching Staff, published by John F. Rider Publisher, Inc., 480 Canal St., New York 13, N. Y. 176 pages, 8½ by 11 inches. Price, $3.60. Also, accompanying *Laboratory Workbook*, same format, 48 pages; price, $.95.

A few years ago the television receiver manufacturers, through RETMA, set up the project of developing a course of advanced training for TV service technicians. Course outlines were prepared and two "pilot" classes were conducted at the New York Trade School. *Advanced Television Service Techniques* and the associated *Laboratory Workbook* incorporate the authors' experience in operating and teaching the courses, having been prepared with the class lecture notes as a basis.

The material covered in the book includes test equipment, the various sections of the television receiver, antennas and transmission lines, and customer relations. There is a chapter on TVI in which the circular prepared by the Washington TVI Committee (see July, 1954, *QST*, page 52) is reprinted. The *Laboratory Workbook* outlines thirteen jobs, with special sheets for recording data, representing a graduated shop course in practical servicing.

Rider Review Series, by Alexander Schure, in six volumes. Published by John F. Rider Publisher, Inc., 480 Canal St., New York 13, N. Y.; 5½ by 8½ inches, paper covers. No. 1, *R-C/R-L Time Constant*, 48 pages, 90 cents; No. 2, *F-M Limiters and Detectors*, 48 pages, 90 cents; No. 3, *Frequency Modulation*, 48 pages, 90 cents; No. 4, *Crystal Oscillators*, 72 pages, $1.25; No. 5, *A-M Detectors*, 64 pages, $1.25; No. 6, *Limiters and Clippers*, 64 pages, $1.25.

A collection of monographs on the subjects listed above, done in readable style and concentrating on the highlights rather than going into great detail. As a help when the books are used for home study, each chapter is followed by a set of review questions. Nos. 4 and 6 probably are of greatest direct interest to the amateur; the volume on crystal oscillators covers crystal principles as well as the familiar varieties of oscillator circuits, and the one on

(*Continued on page 154*)

limiters will provide basic information for those who are interested in noise reduction and like subjects. Volumes on additional subjects are in preparation.

Basic Synchros and Servomechanisms (Vols. 1 and 2), by Van Valkenburgh, Nooger & Neville, Inc. Published by John F. Rider Publisher, Inc., 480 Canal St., New York 13, N. Y. 272 pages. 5½ x 8½ inches. Price, paper cover, $5.40 per set of two; $2.75 each, individually; cloth cover, $6.95 both volumes within same cover.

This is the third in the "basic" series by the same authors (the other two cover basic electricity and basic electronics) with their characteristic pictorial treatment. Vol. 1 treats synchro fundamentals, generators, motors, differentials and control transformers, plus servo fundamentals. Vol. 2 covers servo error detectors, motors and amplifiers, and various control systems.

WWV-WWVH SCHEDULES

FOR the benefit of amateurs and other interested groups, the National Bureau of Standards maintains a service of technical radio broadcasts over WWV, Beltsville, Md., and WWVH, Maui, Territory of Hawaii.

The services from WWV include (1) standard radio frequencies of 2.5, 5, 10, 15, 20 and 25 Mc., (2) time announcements at 5-minute intervals by voice and International Morse code, (3) standard time intervals of 1 second, and 1, 3 and 5 minutes, (4) standard audio frequencies of 440 cycles (the standard musical pitch A above middle C) and 600 cycles, (5) radio propagation disturbance warnings by International Morse code consisting of the letters W, U or N, together with digits from 1 through 9, indicating present North Atlantic path conditions and conditions to be anticipated. (See ARRL *Handbook* for details on interpretation of forecast symbols.)

The audio frequencies are interrupted at precisely two minutes before the hour and are resumed precisely on the hour and each five minutes thereafter. Code announcements are in Universal Time using the 24-hour system beginning with 0000 at midnight; voice announcements are in EST. The audio frequencies are transmitted alternately: The 600-cycle tone starts precisely on the hour and every 10 minutes thereafter, continuing for 3 minutes; the 440-cycle tone starts precisely five minutes after the hour and every 10 minutes thereafter, continuing for 3 minutes. The fourth minute of each 5-minute period is silent, and voice announcements are made during the fifth minute. The one-second intervals are heard as a clock-like tick; the tick at the beginning of the last second of each minute is omitted.

Beginners, novices, and oldtimers alike know that the place to go for all their amateur needs is Walter Ashe. Whether you are looking for inexpensive gear for a starter, or a shack full of the best there is, Walter Ashe has it in stock for immediate delivery.

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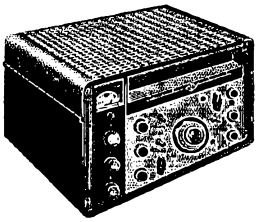

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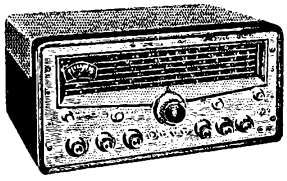
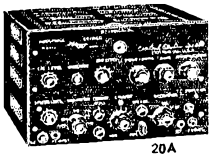
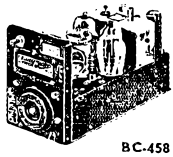




20A



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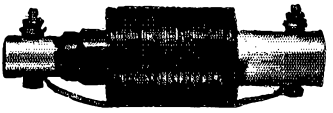

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MGP3	650 ct	245	.150	6.3	5	5.	3	KB
MGP4	800 ct	318	.175	5.	3	6:3	8	LB
MGP5	900 ct	345	.250	5.	3	6.3	8	MB
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MGF2	TF1A01GB003	2.5	10.0	2,500	GB
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MGF4	TF1A01HB005	5.0	10.0	2,500	HB
MGF5	TF1A01FB006	6.3	2.0	2,500	FB
MGF6	TF1A01GB007	6.3	5.0	2,500	GB
MGF7	TF1A01JB008	6.3	10.0	2,500	JB
MGF8	TF1A01KB009	6.3	20.0	2,500	KB
MGF9	TF1A01JB012	2.5	10.0	10,000	JB
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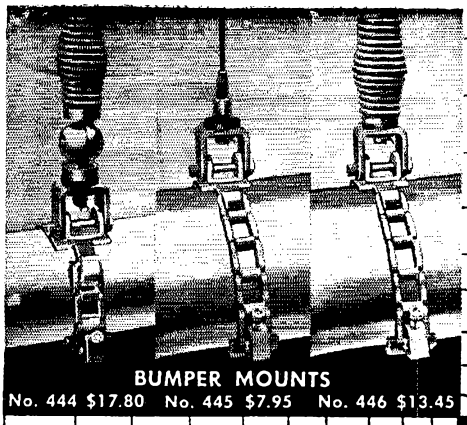

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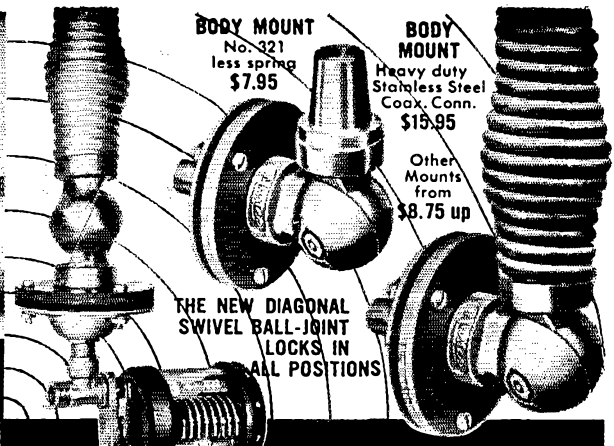

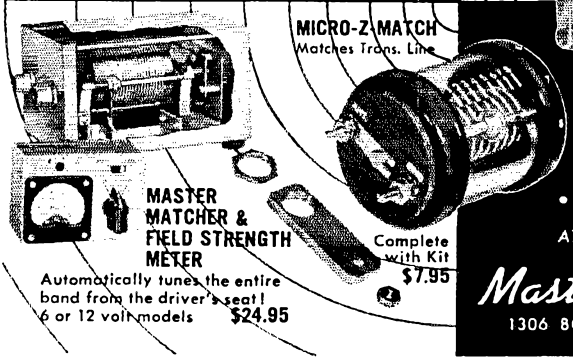

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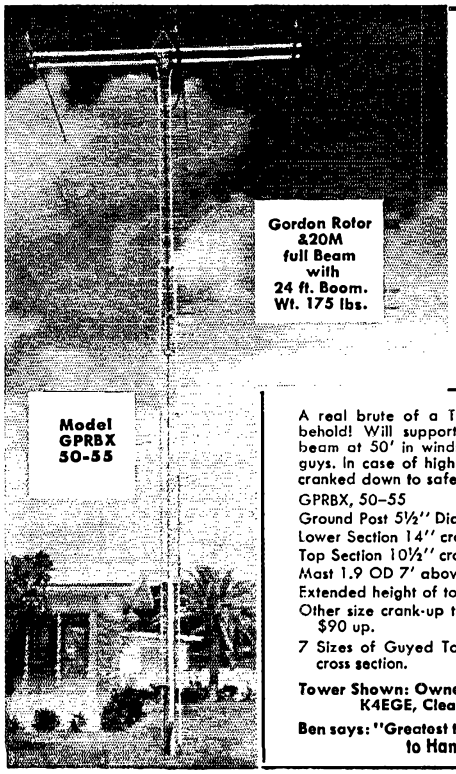

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Built Especially for Ham Beams

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(THESE MUST BE GUYED)

A real brute of a Tower—yet a beauty to behold! Will support a 4 elem. 20 M full beam at 50′ in winds up to 70 MPH without guys. In case of high winds it can be quickly cranked down to safety.

GPRBX, 50–55
Ground Post 5½″ Dia. 10′ high.
Lower Section 14″ cross section, 31′ high.
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Mast 1.9 OD 7′ above tower.
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HEATHKIT

DX-100

PHONE AND CW

transmitter

KIT

The Heathkit Model DX-100 Transmitter is rapidly becoming the "standard" ham rig in its power class. The high quality and outstanding performance it offers can be matched only in equipment costing many dollars more. It features a built-in VFO, modulator, and power supplies, and is bandswitching for phone or CW operation on 160, 80, 40, 20, 15, 11, and 10 meters. The kit includes a detailed construction manual, the cabinet, all tubes, prewound coils, and all other parts necessary for construction.

Push-pull 1625 tubes are used to modulate parallel 6164 tubes for RF output in excess of 100 watts on phone, and 120 watts on CW. May be excited from the built-in VFO or from crystals. Features pi network output circuit, illuminated VFO dial and meter face, and 5-point TVI suppression. High grade, well-rated parts supplied. Schematic diagram and technical specifications on request.

FEATURES

Design proven through actual signal reports.

★

Only top-quality components used throughout.

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5-point TVI suppression, and pi network output to match 50 to 600 ohms.

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Detailed construction manual for simplified assembly.

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

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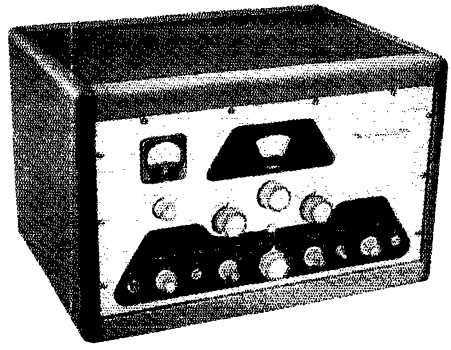
Attractive and functional physical design.



MODEL DX-100

$189.50

Shpg. Wt. 107 Lbs.

Shipped Motor Freight unless otherwise specified. $50.00 deposit required on all C.O.D. orders.

HEATHKIT

antenna coupler

KIT

MODEL AC-1

$14.50

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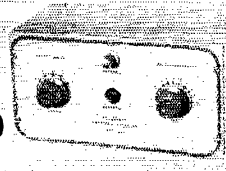

In addition to matching a low power transmitter to an end-fed long wire antenna, this antenna coupler incorporates a 3-section low-pass filter, to attenuate output above 36 mc and reduce TVI. Handles up to 75 watts, 10 through 80 meters. 52 ohm coaxial input—tapped inductor and variable capacitor—neon RF indicator. Ideal for use with the Heathkit AT-1 Transmitter.

HEATHKIT

grid dip meter KIT

The Model GD-1B is a time-proven instrument. It will enable you to accomplish literally hundreds of jobs on all types of equipment. Frequency range is from 2 mc to 250 mc. A 500 ua meter is employed for indication, and a sensitivity control and headphone jack are provided. Includes pre-wound coils and rack. Indispensable for the ham, serviceman, and engineer. Extra coils available to extend frequency down to 350 kc.

MODEL GD-1B **$19.50**

Shpg. Wt. 4 Lbs.

HEATHKIT

antenna impedance meter KIT

Used with an RF signal source, the AM-1 will enable you to match your antenna-receiver-transmitter system for optimum operation. Will double as a phone monitor or relative field strength meter. Uses 100 ua meter, and covers 0 to 600 ohms. Frequency to 150 mc.

MODEL AM-1

$14.50

Shpg. Wt. 2 Lbs.

HEATH COMPANY

A Subsidiary of Daystrom, Inc.

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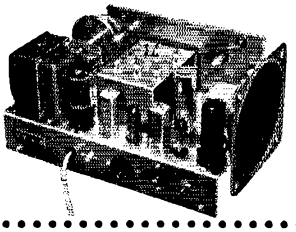
HEATHKIT communications-type all band receiver KIT

Slide-rule dial — electrical bandspread—ham bands marked.

Slug-tuned coils and efficient IF transformers for good sensitivity and selectivity.

Transformer-operated power supply for safety and high efficiency.

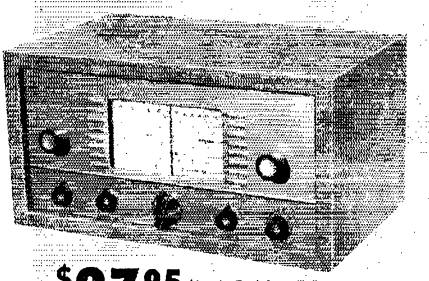


The Model AR-3 receiver features new high-Q slug-tuned coils, new layout, and new-type IF transformers. The result is high sensitivity and selectivity and better image rejection on all bands.

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

SPECIFICATIONS:

Frequency Range—550 kc to 30 mc on four bands.
Tube Complement—1—12BE6 oscillator and mixer • 1—12BA6 IF amplifier • 1—12BA6 second detector, AVC, first audio amplifier and reflex BFO • 1—12A6 beam power output • 1—5Y3 full wave rectifier



$27.95 *(Less Cabinet)*
• MODEL AR-3
Shpg. Wt. 12 Lbs.

CABINET: Fabric-covered cabinet available. Includes aluminum panel, speaker grille, and protective rubber feet. Measures 12¼" W. x 6¾" H. x 7¾" D. No. 91-15. Shpg. Wt. 5 Lbs. **$4.50.**

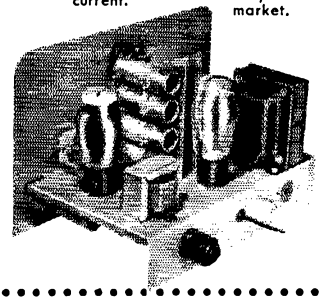
HEATHKIT CW amateur transmitter KIT

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

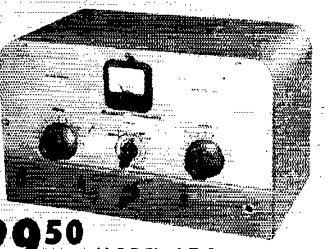
Panel meter monitors final grid or plate current.

Plate power input 25-30 watts.

Best dollar-per-watt buy on the market.



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



$29.50 **• MODEL AT-1**
Shpg. Wt. 15 Lbs.

SPECIFICATIONS:

RF Amplifier Power Input	25-30 watts
Output Connection	52 ohms
Band Coverage	80, 40, 20, 15, 11, 10 Meters
Tube Complement:	
5U4G	Rectifier
6AG7	Oscillator—Multiplier
6L6	Amplifier—Doubler

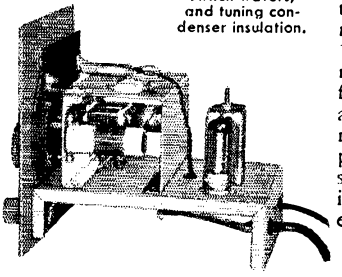
OA2 voltage regulator tube for stability.

Covers 160-80-40-20-15-11-10 meters.

Smooth-acting, illuminated and pre-calibrated dial.

6AU6 electron-coupled Clapp oscillator.

Copper plated chassis—aluminum case—profuse shielding—ceramic coil forms, switch wafers, and tuning condenser insulation.



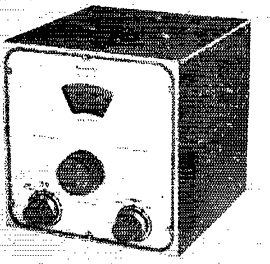
HEATHKIT vfo KIT

The Model VF-1 features illuminated and pre-calibrated dial scale. Cable and plug provided to fit the crystal socket of any modern transmitter. Covers 160-80-40-20-15-11 and 10 meters with 3 basic oscillator frequencies. Better than 10 volt average RF output on fundamentals. Derives operating power from transmitter power supply. Has VR tube for stability. Go VFO for more operating enjoyment.

MODEL VF-1

$19.50

Shpg. Wt. 7 Lbs.



SPECIFICATIONS:

Output Frequencies—1750-2000 kc, 7000-7425 kc, 6740-6808 kc. **Calibrated Bands**—160-80-40-20-15-11-10 meters. **Tube Compliment**—6AU6 Oscillator OA2 Voltage Regulator. **Power Requirements**—250-350 VDC @ 15-20 ma. and 6.3 VAC @ .45 A.

ORDER DIRECT FROM THIS AD . . . OR WRITE FOR FREE CATALOG. Describes more than 65 interesting "build-it-yourself" projects. Amateur equipment, hi fi amplifiers, and the complete Heathkit line of test instruments. Get yours today!

HEATH COMPANY
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HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others. No Box Reply Service can be maintained in these columns nor may commercial type copy be signed solely with amateur call letters.

(3) The Ham-Ad rate is 30¢ per word, except as noted in paragraph (6) below.

(4) Remittance in full must accompany copy, since Ham-Ads are not carried on our books. No cash or contract discount or agency commission will be allowed.

(5) Closing date for Ham-Ads is the 20th of the second month preceding publication date.

(6) A special rate of 7¢ per word will apply to advertising which, in our judgment, is obviously non-commercial in nature. Thus, *advertising of bona fide* surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, takes the 7¢ rate. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising so classified takes the 30¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply.

(7) Because error is more easily avoided, it is requested signature and address be printed plainly. Typewritten copy preferred but handwritten signature must accompany all authorized insertions.

(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

Having made no investigation of the advertisers in the classified columns, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

QUARTZ — Direct importers from Brazil of best quality pure quartz suitable for making piezo-electric crystals. Diamond Drill Carbon Co., 248 Madison Ave., New York City 16.

MOTORLOLA used FM communication equipment bought and sold. W5BCO, Ralph Hicks, 204 E. Fairview, Tulsa, Okla.

WANTED: Cash or trade, fixed frequency receivers 28/42 Mc. W9VIV, Troy, Ill.

MICHIGAN Hams! Amateur supplies, standard brands. Store hours 0800 to 1730 Monday through Saturday. Roy J. Purchase, W8RP, Purchase Radio Supply, 605 Church St., Ann Arbor, Michigan. Tel. NOrmandy 8-8696. NOrmandy 8-8262.

WANTED: Early wireless gear, books, magazines, catalogs before 1922. Send description and prices. W6GH, 1010 Monte Dr., Santa Barbara, Calif.

WANTED: All types aircraft & ground transmitters, receivers, ART-13, RT18/ARC1, R5/ARN7, BC610E, ARN6, BC788C, ARC3, BC342. Highest prices possible paid. Dames, W2KUW, 308 Hickory St., Arlington, N. J.

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

ATTENTION Mobileers! Leece-Neville 6 volt 100 amp. system alternator, regulator & rectifier, $45.00. Also Leece-Neville 12-volt 100 amp. system, alternator, regulator & rectifier, $85.00. Good condition. H. A. Zimmermann Jr., K2PAT, 570 Jamaica Ave., Brooklyn 8, N. Y. Ulster 2-3473.

CASH for your gear. We buy as well as sell. Write for cash offer or trade. We stock Elmac, Gonset, Hallicrafters, Hammarlund, Johnson, Lysco Master Mobile, Morrow, National and other ham gear. H & H Electronic Supply, Inc., 506 Kishwaukee St., Rockford, Ill.

MIAMI and vicinity: Communications receivers repaired. Bryant Electronics, 13341 N.W. 7th Ave. Phone 84–4001.

URGENTLY need AN/APR-4 items particularly tuning units for important defense contracts. New high prices. Engineering Associates, 434 Patterson Rd., Dayton 9, Ohio.

HAM Guest Register Books, $2.00 in U. S. A.; $2.25 in Canada postpaid. Gratton George, W4PJU, Clewiston, Fla.

MEDICAL Hams! Swap Burdick EK-2 for Globe King, 500-A, C. R. Faulkner, M. D., K4AXE, 106 No. Main, Somerset, Ky.

OUTSTANDING ham list revised monthly. Our prices are realistic and attractive. Standout values in used Barker & Williamson, Collins, Central Electronics, Elmac, Gonset, Hallicrafters, Hammarlund, Harvey-Wells, Johnson, Morrow, and National units. We deal easy and offer time payments tailored for you. All leading brands of new equipment always in stock. Write immediately for this month's Bulletin and our new exclusively amateur catalog just out. Stan Burghardt, W9BJV, Burghardt Radio Supply, Inc., Box 746, Watertown, S. Dak.

WANTED: Two-way FM equipment. Ronald Phillips, Communications, 1312 McGee, Kansas City, Mo.

PLASTIKASE rubber stamp, your call name and address. Economy with pad $1.00. Top quality with handle, $1.50, pad 35¢. El-Kay Stamps, Box 5-WT, Toledo 12, Ohio.

WANTED: Receiver R5/ARN-7, MN-62A transceivers, RT18/ARC-1, AN/ARC-3, BC-788C, 1-152C, Collins, Bendix equipment, *test sets, dynamotors, inverters. We pay highest prices.* Advise quantity, condition, price in first letter. Aircraft Radio Industries, Inc., 15 East 40th St., New York City. Tel LExington 2-6254.

FOR Sale: 500 watt Hallicrafters HT-4, all band xmitter. Professional version of the U.S. Army BC-610. Complete with BC-610-D speech amplifier, tubes, coils, manuals, dolly, interconnecting cables. Cabinet is black wrinkle with chrome strips and power deck is chrome plated. Utilizes six 3-in. meters. In excellent condx and in working order. No reasonable offer refused. W1RMI, John Salsgiver, W1RMI, Box 8, Egypt, Mass. Telephone SCituate 1036-W.

QSLS? SWLS? Finest and largest variety samples 25¢ (refunded). Callbooks (latest) $4.50. "Rus" Sakkers, W8DED, Ham Print Shop, P.O. Box 218, Holland, Mich.

QSLS-SWLS. Meade WØKXL, 1507 Central Avenue, Kansas City, Kans.

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

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

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

QSLS-SWLS. Samples free. Bartinoski, W2CVE Press, Williamstown, N. J.

QSLS "Brownie," W3CJI, 3110 Lehigh, Allentown, Penna. Samples 10¢; with catalogue, 25¢.

QSLS-SWLS. Samples 10¢. Malgo Press, 1937 Glendale Ave., Toledo 14, Ohio.

WOODY'S QSLS. Box 164, Asher Sta., Little Rock, Ark.

QSLS. Western states only. Fast delivery. Samples 10¢. Dauphinee, K6JCN, Box 66009, Mar Vista 66, Calif.

QSLS. Taprint, Union, Miss.

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

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

QSLS Samples10¢. Bob Morris, W2IHM, 230 Rose St., Metuchen, N. J.

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

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

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

QSLS-SWLS. Reasonable. Catalog, 25¢. Speedy delivery. Dick, K6GJM, 10558 E. Olive, Temple City, Calif.

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

QSLS-SWLS. 1¢ each. Letterheads, envelopes. Samples 10¢. Rusprint, Box 7507, North Kansas City 16, Mo.

NOVICES! Generals! Old Timers! Want reasonably priced "tacked on wall type" different, comic, sedate, curious, extraordinary, incomparable, infrequent, odd, peculiar, precious, remarkable, scarce, singular, strange, uncommon, unique, unusual QSLS? SWLS? YLS? Doubles? Samples 13 cents. Rogers, KØAAB, 737 Lincoln Ave., Saint Paul 5, Minn.

QSLS-SWLS. Samples free. Backus, 703 Cumberland St., Richmond, Va.

QSLS. Samples, dime. Printer, Corwith, Iowa.

QSLS. Twenty exclusive designs in 3 colors. Rush $3 for 100 or $5 for 200 and get surprise of your life. 48 hour service. Satisfaction guaranteed. Constantine Press, Bladensburg, Md.

QSLS. Cartoons, colors, etc. Samples 15¢ (refunded). Chris, W9PPA, 365 Terra Cotta, Crystal Lake, Ill.

QSLS, Mobiles, Novices, DX, YL, YL-OM, Gil cartoons. Samples dime. Robinson, W9AVH, 12811 Sacramento, Blue Island, Ill.

QSLS. Samples free. Radoprint, Ojai, Calif.

QSLS. Glossy. Samples 10¢. W1OLU Press, 30 Magoun, Medford, Mass.

QSLS. Samples free. Jones, W3EHA, 840 Terrace, North Hagerstown, Md.

GLOBE-King 400-B, 80, 40, 20 & 10 coils, $350; National 183-D $250. Both in excellent condition. No shipping. Randolph, WØCQS: 2260 12th Ave., Marion, Iowa. All inquiries answered.

WANTED: Hammarlund HQ-129X receiver. State price, condx. Mark Fowler, 7 Broadway Ct., Orlando, Fla.

SELL: NC-240D recvr with spkr/instr. $150; also RME HF-10-20 converter (10-15-20) with instr., $40; provides excellent bandspread on 15 meters plus gain. Both units in excellent condx. Will sell both for $180. Will deliver anywhere in New England or NYC-North Jersey area. D. B. Lovis, W1OG, Bedford, Mass. 321 Old Billerica Rd.

FOR Sale: BC610E with 614E speech amplifier. Very gud condx. Coils and tuning units for 80-40-20 and 10. First $350 takes all. You pay freight. WØNJR, A. R. Brown, 1123 Prospect Ave., St. Joseph, Mo. Tel. 4-9751.

FOR Sale: Collins 310-C2 VFO (built-in power supply); perfect condx, $115 or best offer. Julian M. Sobin, W1UWB, 83 Arnold Road, Newton Centre 59, Mass.

HIGH Power Rotary inductors for KW pi network. $19 F.o.b. Gets descriptive flyer. Paulson Electronics, 138 E. 6th St., Clifton, N. J.

COLLINS 75A3, perf. condx, $400; Viking Ranger, $180; Three element 15-meter beam, $15; heavy-duty rotator, $20; 15-watt exciter, $15; Ten watt 10-meter phone $40; 150-watt amplifier $20; six foot open rack, $12; *new 3E29, $5. More information on request.* WØGSV, 798 Sherburne, St. Paul, Minn.

WANTED: ARC-3, ARC-1, BC-610, BC-312, BC-342 and other military or aeronautical surplus. We pay freight and C.o.d. James S. Spivey, Inc., 4908 Hampden Lane, Bethesda, Md.

SELL or Trade: Radio magazines. Bob Farmer, Plainview, Texas.

MULTI-BAND Antenna, 80-40-20-15-10, $19.95. Patented. Send stamp for information. Lattin Radio Laboratories, Owensboro, Ky.

WANTED: BC-221 frequency meters, ARC-1 and ARC-3 transceivers. Cash or swap against any new National receivers. Lectronic Research, 715 Arch St., Philadelphia 6, Pa.

SELL: Several good clean schematic diagrams of ART-13, BC-610, BC-348, ARC-5, 25¢ each. S. Consalvo, 4905 Roanne Dr., Washington 21, D. C.

COMMUNICATIONS receivers repaired and realigned, using factory methods. Associated Electronics, 167 So. Livermore Ave., Livermore, Calif.

ILLUMINATED "S" Meters for Communicators. No cutting, soldering, or disassembling to attach. Also new and used Gonset Communicators, linear amplifiers, V.F.O.'s, G-66s, mobile converters and transmitters, etc. Graham Company, Bob, W1KTJ, Stoneham, Mass. Tel: ST — 6-1966.

STUDY at home for commercial radio licenses. Free sample lesson, very reasonable fee. Write Radio License Aids, 275 Dayless, Ft. Worth, Texas.

DX'ERS Notice! Save money? Save Time? Free info. DX QSL Coop, Box 5938, Kansas City 11, Mo.

TREMENDOUS Bargains: New and reconditioned Collins, Hallicrafters, National, Johnson, Elmac, all others. Completely reconditioned with new guarantee. Hallicrafters S38 $29.00; S40A $69.00; S40B $79.00; S85 $89.00; S76 $119.00; SX71 $149.00; SX42 $149.00; SX96; SX100; National SW54 $29.00; NC88 $79.00; NC98 $99.00; NC125 $129.00; NC183 $189.00; Super Pro $99.00; HQ129X; Collins 75A1; 75A2; 75A3; 75A4; 32V3; Viking Ranger; Viking I.I AF-67; mobile receivers, transmitters, converters, many other items. Easy terms. Shipped on approval. Write for list. Henry Radio, Butler, Missouri.

SYRACUSE VHF Round-up. Second annual Syracuse VHF Club round-up being held Saturday, October 6, 1956 at Martin's Restaurant, Liverpool, N. Y. Pre-registration only. $3.75 per person. YL's and XYL's welcome. For tickets write J. V. O'Hern, W2WZR, Nedrow, N. Y.

WANTED: ARC-3, ARC-1, ART-13, BC-312, BC-342, BC-610, RC-788 and other surplus. Advise what you have and price. W4VHG, Box 5878, Bethesda, Md.

MOBILEERS: Have for sale a complete 12V. rig consisting of Viking Mobile xmitter, Viking VFO, Gonset Super-ceiver and Super Six converter, Electro-Voice 600D dynamic mike, a PE-101C dynamotor, Dow 12V relay and other extras. A $419 value for only $200 or best offer. All gear in gud condx. W1FGF, c/ ARRL

TAPE Recorded code courses, same system used by U. S. Navy in WW2. Send for particulars. Tapedcode, Box 31, Langhorne, Pa.

SELL: 500 watt SSB, AM, CW linear amplifier made by Hallicrafters, Model HT-31, $265. Patterson, K2CIV, 50 Crescent Lane, Roslyn Heights, L. I., N. Y.

MULTIBAND Antennas: Work all bands the quick low-cost way. The "Six Bander", 6 through 80, only $3.25. Open wire folded dipoles, $4.95 up. Many other models. Write for free literature. R. J. Buchan Co., Bricelyn, Minn.

SELL: NC183, 100 watt phone/c.w. rig, ARC-5's, 75–40 meters. Arthur Merdinger W2MEE, 137 Lorraine Ave., Mt. Vernon, N. Y.

PANORMAIC Adapter AN/APA-10 Tech. Manuals $2.75 postpaid in U. S. A. Electronicraft, 27 Milburn St., Bronxville 8, N. Y.

FOR Sale: Scott receiver model SIRM, 110 volts, $75; 8 dynamotors 6 volt in 425v. outp. at .375 amp., $12 each; Collins 75A-1, $225; Panadaptor, $40. Robert D. Mersey, W2TXI, 118 Franklin Ave., Lynbrook, N. Y.

WANTED: DX-100 transmitter. Will pay cash or trade. J. M. Fraser, VE4MF.

COOL Kilowatt, pair 304TLs in final, 304TLs' modulator, Lambda modulation 'scope, all power supplies, extra tubes, built by German engineers with American components, $375. Col. M. B. Chatfield, Ord Corps, Ordinance Missile Labs, Redstone Arsenal, Huntsville, Ala.

MARINE Crystals. New manufacture. Discounts to service agencies and manufacturers. Airmail service. Crystals since 1933. C-W Crystals, Box 2065, El Monte, Calif.

W5ATQ cleaning house! one 5-36 rcvr, $100; one 5X-25 rcvr, $65; two 6 volt input, 600 volt 170 mil output Carter dynamotor, $12; two 6 volt input, 620 volt, 370 mil output ditto, $15; one 400 volt 150 mil Carter dynamotor, $7.50; two 4006's, $5 each; two Kenyon filter chokes K.W. size, $7.50 ea.; two 2μfd 5000 volt cond., $4 each. Send for list. W5ATQ, H. W. Childers, 1322 Eastus Dr., Dallas 8, Texas.

FOR Sale: 6V6, 6L6 80 M. xmittr, with pwr. supply, $20; Knights Ocean Hopper rcvr, $10; Heath AT-1 xmitter and AC-1 coupler, $35. Robert Soley, RD #3, New London, Ohio.

RANGER Kit, less tubes and timed sequence keying. Complete, never removed from factory carton, $125. Heath WA-P1 preamplifier, $10. Collaro 3/554 turntable and G-E RPX-050 cartride, $15. All F.O.B. Consider trade for VHF gear. W8SQS, 3826 Strandhill, Cleveland, Ohio.

FOR Sale: Complete station now operating. Viking II with Viking VFO, push to talk, and coax antenna relay, $250; NC183, $150; 3 element 20 M. Shortbeam, $20; Crystal mike and coax for antenna free with complete station. F.o.b. Fresno, Calif. E. B. Edwards K6DKL, 4115 E. Fedora, Fresno, Calif.

MUST Go: Viking I wid TVI kit, Matchbox, Viking VFO, Sonar L.P. filter, Johnson signal sentry, all in excellent condition, $199. "Bud" Southard, W9ZPU, 2428 Fox Ave., Madison, Wisc.

PAIR Gonset Communicators 2 meter deluxe, excellent, $300. Bob Puryear, Millington, Tenn.

FOR Sale: 813, 811, 807, pair 6AG7's, pair 6L6's, pair 6V6's, pair 6AK5's, pair 6C4's, pair 6AC7's. All postpaid: $20 takes the works. W9DVN, Tagan, Box 5938, Kansas City 11, Mo.

FOR Sale: PP 812A transmitter racked separate modulator, exciter, and power supplies, features Kenyon and Thordarson transformers, $150 for all. Other miscellaneous equipment. Send for list. M. W. Houghton, 46 Meyer Ave., Valley Stream, L. I., N. Y. Tel. VA 5-2604.

COOL 300 watts. Millen 90881 amplifier converted to 813's with tubes and coils. HV supply 1500 v. 300 Ma. All in enclosed steel cabinet, $125. Fair? W1TIN, Box 112, So. Hamilton, Mass.

SELL: Power supply, deluxe on steel chassis, 550 v. d.c. at 300 mils, plus various filament voltages, $30; Oscilloscope, 2" G-E, $10; Drake TV-52-40 LP filter, $10; Harrison antenna tuner with B & W coils 10, 20, 40, 80, $20; Workshop Assoc. beam 10 meter, 3-element, RG-8U fed $10; two G-E thermocouple R.F. ammeters, $6 pair, $80 for lot. Will ship express C.o.d. if desired. All F.o.b. W3KB.

FOR Sale: 10B exciter with 458 VFO in deluxe case, $150; NC-88 rcvr with Heath Q mult., $75. H. M. Ash, K2KPH, 443 Eastgate Rd., Ridgewood, N. J.

SELL: 350-watt xmitter; pair of T55's, final, TZ40 modulators, Meissner Deluxe VFO set in panel, all enclosed in 5 ft. Bud cabinet. Need money. Asking $275. W8UAG.

SWAP or sell: Hi-Fi outfit including Electro-Voice 15TRXB spkr, Heath W5M amplifier with preamplifier, Viking RP75 tape deck, Hickok signal generator model 288X, 55 ft. steel tower, SX28 receiver. Want bench saw, Collins 75A3, drill press, 30-50 Mc VHF FM 6 volt 2-way units. Make offer. Leo Liebl, 143 State St., Medford Wis.

SELL-Trade: Newly built unused modulators and supplies, 5 modulators 40 watt p.p. 6L6's, $18 each; 100 watt p.p. 807's and 100 watt p.p. 1625's, $24 each. 5 modulators for Heathkit AT-1 xmitter, $10 each. Supplies: 5 Command xmitter supplies 750v., 275 Ma., 24v. fil., $20 each; 1000v. 275 Ma., $22; dual: 900v., 275 Ma., 375v. 125 Ma., 6.3-24v., $25; 10 watt P.A. system, $15; 400 v. 90 Ma. Vibrapack, $7; dual 400v., 130 Ma., $15. Need: Grid dipper, receiver or?? W8QKU, 2748 Meade St., Detroit 12, Mich.

SELL: 75A4 with speaker, 3 k.c. filter No. 1582, $485; 32V3 No. 1391 $475 in original cartons with instruction books. Cash. W4YZ M. H. Edwards, 1855 Orchid St., Sarasota, Fla.

20 Meter cubical qual, all aluminum, tuned, $35; Zenith 20J21TV; remodeled S72 portable and 3¼ x 4¼ German view camera, complete. Best offer. Want 75A2. Chester Benson, W9IFB, #311 So. 5th, Richmond, Ind.

FOR Sale: MC55 converter, used less than ten hours. 6 or 12 volt operation, $45. Laine, W2NXP, 222 East 7th St., Brooklyn, N. Y.

SELL: Pr. vacuum cond., R9'er with coils, xfrmr 2500-0-2500, 600 mills, meters, KW LP filter. Will consider trade. Need 810's, etc. W0SVA.

HT-9 coils, Nr. 51-1512 and 51-510, both $6.00. W5APM.

FOR Sale: Collins 310B3 complete with all coils and manual. Unmodified: $180 F.o.b. Crawfordsville, Ind. Marsh H. Jones, Jr., Marshland Farms, RR #5, Crawfordsville, Ind.

WANTED: Coils A,B,C,D. Any one or more for HRO-5. W4WXX, 203 Sycamore Dr., Paducah, Ky.

FOR Sale: Eldico TV-75 complete with two xtals for 80 mtrs. All tubes: $20.00. Richardson, 102 S. Peach, DuQuoin, Ill.

20 Meter cubical qual, all aluminum, tuned, $35; Zenith 20J21 TV; remodeled S72 portable, best offer. Want 75A2. Chester Benson. W9IFB, 311 So. 5th, Richmond, Ind.

MATCHED Stancor pwr. supply components with Variac. 0-2000 volts at 625 Ma., $135; 300 watt 811's modulator custom-built. Write for details, $120; 4E27/HK257B's, make offer; Triplett illum. meters, 1-0-3000 volts D.C., 1-0-500 Ma., D.C., and 1-9-150 Ma. DC. Make offer; 80 & 40 ARC-5 with P.S., $30. Also 10% off on items in July QST. C. G. Smith, 183 McLaughlin, Muskegon, Mich.

VIKING II with Johnson VFO and low pass filter. In exc. condx, $230. Also Babcock MT-5A mobile xmitter with LS-1 antenna tuner, Gonset Tri-Band converter, and 6V dynamotor 425V, 375MA, all for $75. Earl Cowden, W8EIA, 132 N. Columbus, Galion, Ohio. Phone 3-5664.

WANTED: The 9050 to 15800 kilocycle tuning unit for the ATD Bendix transmitter. Ray Hefferlin, Box 2073, Collegedale, Tenn.

CENTRAL Electronics 10B, $120; 2400 VCT 300 Ma. Stancor, $12; 300 Ma. choke, $3.00; 866 fil. transf. $3.00, all in like new condx, postpaid. Ray Lewis, W1AEX, 4 Hope Ave., Newburyport, Mass.

SALE: S76 rcvr., in like new like new condx, w/spkr, $100; 2M Tecraft converter, $20; 30-watt mod. with 500/375v. supplies, $40; 2M R.F. unit, 829 outp. $25. J. E. Bright, 131 Nugent St., New Hyde Park, L. I., N. Y.

BEST Offer over $200 takes Communicator II, Gonset VFO and Kreco ground plane antenna. Will deliver within 50 miles. W2GUR, 54 Camden Pl., New Hyde Park, L. I., N. Y. Phone PI 2-5297.

SELL: Mobile 6-volt trunk mount complete with PE-103 mike, antenna, cables, Leece-Neville regulator and rectifier. Trunk mount 12-volt mobile including transmitter, receiver, cable and power supplies. Hallicrafters HT-9 transmitter with coils and mike. QSTs going back to 1929. W8RXU, 4668 Kunz, Muskegon, Mich.

WANTED: Schematic on improved HRO5 noise limiter (6J5-6H6). Wm. Jackson, 4719 Telegraph Rd., Los Angeles, Calif.

FOR Sale: QST 1932 to 1947, 25¢ ea. Four or more. W0MCX, Art Jablonsky, 1022 N. Rockhill Rd., Rock Hill 19, Mo.

SALE: Unused tubes: 4E27's, $5.00; 8005's, $3.50; 809's, $1.95; 211's, 3/$1; Triplett mod. indicator, $8.00. List available. W8RHP, Manning, 2710 Lakeview, Rocky River, Ohio.

BARGAINS! Reconditioned! 90-day new set guarantee! SX-43, $129.50 (4); SX-71, $149.50 (3); SX-96, $199.00 (4); S-76, $135.00 (3); S-82, $29.50 (3); HT-9, $130.00 (3); HT-18, $49.95 (4); HT-20, $285.95 (3); NC-98, $120.00 (7); NC 183, $190.00 (5); HRO-50T1, $299.00 (10); HRO-60, $399.00 (4); 32V2, $375.00 (2); TR75TV, $49.50 (5); HQ-129X, $149.50 (3); HQ-140X, $189.50 (4); SP400X w/P.S. $265.00 (2); Harvey Wells VFO, $32.50 (4); TBS-50, $59.50 (4); TBS-50C, $79.50 (3); TBS-50D, $89.50 (7); APS-50, $24.50 (5); Viking I, $179.50 (6); Lysco 600-S, $119.95 (4); Messner EX, $39.50 (6); Morrow FTR, $89.50 (2); PR-31A, $29.50 (4); Sonar SRT-120, $169.00 (5); Gonset Superceiver, $79.50 (4). Send for complete list. Easy pay terms. Allied Radio, Chicago 80, Ill.

FOR Sale: New, used and surplus test equipment, receiving tubes and parts, books and magazines. Everything must go. Need the money. Write for list. Cecil Baumgartner, Box 343, Milton, Pa.

WANTED: SX-96 or 100 rcvr with or without speaker. Quote best price in first letter. W0MDS, 4155 East Dartmouth, Denver, Colorado.

FOR Sale: NC98 receiver with speaker, excellent condx, $115. William Christie, 15 Drowac Ave., Islip, N. Y.

SELL: BC474A, 80 mtr. AM/CW transmitter, receiver, $45; Millen VFO #90711, $55; Millen exciter, $20; G-E, FM xmitter, rcvr, 30-45 Mcs., 25 watts outp., 110V AC, complete with control, mike, speaker, $55. Old model Super Pro, .54-20 Mcs., $115, etc. All in excellent or like new condx. W2UPN, A. Margolis, 190-43 69th Ave., Flushing, L. I., N. Y. Phone OL 8-7419.

WANTED: Genuine pair of Baldwin mica diaphragm headphones in A-1 condx. W1BB.

HALLICRAFTERS SX-88 in excellent condx, $425. F.o.b. Chicago. W9DHT, R. H. Karl, 2836 Leland Ave.

COMPONENTS for 500 watt 813 xmitter with pwer pack, best offer. Letter for list. A71 with coupler, xtals and R.F. meter, $50; Q5er converter, complete, $25; misc. parts list, f.o.b. Want HQ-129X spkr, WN8AUX, 295 Biltmore, Inkster, Mich.

SELL: 813 power amp. kw pwr., amp. kw-plus pwr supply; much miscellaneous equipment. Xmitters excellent condx, TVI suppression. Need cash. Any offer considered. W2INE.

COLLINS 70E-8A VFO, McMurdo Silver transmitter, rack-mounted with power supply. Trade for receiver. Leo Severe, 2211 Windsor Rd., Decatur, Ill.

SELL: Super generators, Bosch, 6 volts at 55 amps, complete with regulator, in excellent condition, $35. Ronald Phillips Communications, 1312 McGee, Kansas City, Mo.

WANTED: Viking II, factory-wired. State condx, price. Jim Higgins, W2CWK, 307 Wayne, Highland Park, N. J.

VIKING Ranger; factory-wired, push-to-talk, in excellent condx, $200. Joe Henry, 4 Wilson Road, Valley Stream, L. I., N. Y.

SELL: DX-35, VF-1 used two hours, first $50 takes both. K2MRU.

BARGAINS: With New Guarantee: S-38C $32.50; S-40B $75.00; S76 $99.00; SX-62 $179.00; S-27 VHF $79.00; Lysco 600 $69.00; Sonar VFX-680 $12.50; Eldico TR75TV $35.00; HT-17 $24.50; Meissner EX VFO $25.00; HQ-120X $99.00; National HRO-60T $299.00; NC-173 $125.00; NC-183D $265.00; HRO-50T $199.00; HRO-50T-1 $245.00; Johnson 122 VFO $24.95; Ranger $195.00; RME-84 $65.00; HT-18 VFO $39.00; Babcock MT-5A $75.00; Sonar SRT-120 $99.00; Globe Trotter 40 $39.00; Scout 40 $49.00; Scout 40A $59.00; Scout 65 $69.00; Globe King 275 $225.00; Globe King 400 $249.00; Elmac PMR6A $89.00; Elmac A54H $89.00; PSA 500 $19.95; Central Elect. 10A $79.00; Collins 32V1 $249.00; 32V3 $495.00; 70E-8 PTO $45.00; 75A-1 $265.00; 75A-3 $349.00; and many others. Free trial. Terms financed by Leo, W9GFQ. Write for catalog and best deals to World Radio Laboratories, 3415 West Broadway, Council Bluffs, Iowa.

FOR Sale: DX100, wired and tested, in perf. condx, $189; SX-96 purchased in April, $195, with spkr and Astatic D-104 mike (new), $398 complete. S. Stern, K2DWH, 43-24 Smart St., Flushing, L. I., N. Y. Tel. IN 3-0206.

GONSET 6M Communicator for sale, 6vdc/110vac, perfect in all ways. Less than a *month* old, in original carton, $180. G. Thome, 20373 Mack Ave., Detroit 24, Mich.

FOR Sale: Collins 30K-1 transmitter in good condition, $500 f.o.b. Sewanee, Tenn. A bargain if you can send for it. R. L. Petry, Sewanee, Tenn.

FOR Sale: SuperPro SP-400X with matching speaker. Latest model with engraved panel. Best offer. Bill Harper, W9BWM, 4132 W. Barry Ave., Chicago, Ill.

MULTIBAND Antennas. As designed by W3DZZ. See *QST* March 1955 and Radio and TV News December 1949. Write for details now! Frederick Tool & Engineering Corp., 414 Pine Ave., Frederick, Md.

NOVICES! Viking Adventurer, $49.95. In perfect condx. Complete with Novice crystal. Owner going to college. Thomas Webb, W4YOK, 207 So. Alves St., Henderson, Ky.

SELLING Globe Scout 65A, $84.95; Heath VFO, $14.90; UTC-19 modulation transformer, $6.30; pair balun coils mounted, $6. All inquiries answered. Millard Fitzsimmons, W4FDC, 208 West Elk, Elizabethton, Tenn.

FOR Sale: Two exciters similar to 10B and 20A, best components, LP filter, Vox, qt., VFO, $75 and $85 respectively; KW linear, PP 813s, B&W butterfly tank, HDVL coils and mount, fully metered, regulated bias built-in, $95. Here is complete KW SSB rig with reputation on 75; rack-mounted, black crackle finish on all units. If linear with either exciter purchased will throw in 36" Per-Metal cabinet. Prefer equipment hauled away. W8FSA, Don Kinney, Ithaca, Mich., 107 No. Pine, Tel. 4221.

FOR Sale: National 2-meter converter and matching cabinet for NC300, in first class condx. Both for $42.50. Reason for selling: no 2-meter activity here. Also a McMurdo Silver Q-5'er, $10. W4KFK.

SELL: Collins 75A1 with speaker, perfect condx, $210; Stancor 203A 10-meter mobile, $25, complete Gonset 3-30 converter with clipper, $17.00; Radiart 6 volt 400 175 Ma. Vibrapack, $16. K2IQZ, Joe DiLiberti, 290 Greve Dr., New Milford, N. J.

TV Camera tube type 5527; will provide data on building closed circuit station. Like-new, $100. Regular list, $150, tube alone. WIKWV, Thomas Cianciolo, 8 Lupine Rd., Danvers, Mass.

FOR Sale: Triangular aluminum tower, 30 feet, in ten-ft. sections with tilt-base, $30; pick up deal only. Prop pitch motor, $15; 832A, $5; 813, $6.00, pair 35Ts, $3.50; B&W turret BTCL, new, $7.00. John Nixon, W2IMG, 95 Haddenfield Rd., Clifton, N. J.

W6WIF selling out: SX28 with matching speaker, Millen exciter with heavy duty 600/750 volt DC supply, PP T40 amplifier with 1500 volt supply. Antenna coupler with 2 RF meters, transformer bias supply. All panel mounted. New — small prop pitch motor, BC221 frequency meter and voltage regulated power supply, pr. 813's tubes, Vibroplex, pair 3000 volt 4 μfd G-E condensers, 8-4 in., square meters. Instruction books and miscellaneous parts: $400 cash and carry deal only. M. Jackowski, W6WIF, 41 Nelson Ave., Mill Valley, Calif.

COLLINS 32V3 in top condx and appearance, complete with instruction book in original carton, $420. F.o.b. Wichita, no trades. WØVBK, L. M. Divinia, 115 South Battin, Wichita, Kansas.

FOR Sale: Modulation xfrmr RCA KW job, Thordarson 300 w. MultiMatch, 90 watt job also; 50 w. 6L6 mod., 100 watt booster amplfr, $35; UTC S9 driver, $3; 6U6 to 811's, $2; also 3200 CT 300 Ma $15, others; VFO HT18 $35 and Sonar CFC $15 while Meissner VFO is $15; Billey CCO $5 pair 450THs, $20; pr. 861s, $15 and 860, 50¢ @ 810's, $5; 20A, VFO and 3-837s final for $195; 12 VDC to 125V AC inverter for $5; UTC Varitran, $8; BC375, $15; RCA FM (pr. 4-125's) amplfr. $50; rotary coil $2 and $6; Panoramic Adapt., $35; T-17 mike, $1.50; Meissner 150B $125; W2OTI, D. Vettese, Box 4, Pomona, N. J.

FOR Sale: BC-221-0 freq. meter with AC power supply and original calibration book, $70 F.o.b. Coraopolis, Pa. W3ZDW.

FOR Sale: 40-watt Lettine phone and c.w. xmitter, w/coils and tubes, used very little, $50; 400 mil 805's modulator, w/tubes, 0-500 milliammeter, Thordarson modulation xfrmr, $25; 12 volt DC, G-E dynamotor, 1000 volt DC outp., $12; 400 mil Thordarson choke, $8; Large 75-75, .200 spacing final condenser, $10; 100-100 .110 spacing final condenser, $8; pair neut. condensers, 2¾", $4; 100TH tubes, $4.50; 805 tubes, $3.50; some new, others used little. J. C. Whittington, Ware Shoals, S. C. W4FNC.

WANTED: RME-53,2,6,10, 6V converter or equivalent. Cash, Swap or trade. G. A. Hewitt, K2QCI, 243 Monroe St., Brooklyn, N. Y.

FOR Sale: 72 ft. steel triangular tower, crank-up type. Complete with antenna rotor and guy-wire: $195. New Gonset Communicator, 2 meters, $165. K6DTX, 26100 Elena, Los Altos, Calif.

SELL: DX-100, wired, tested, used one month: $225. F.o.b. Dan Belin, WØGXI, 3441 Douglas, Sioux City, Iowa.

SELL: Adventurer, to first $40. Dick Kirkpatrick, W1FSJ, 41 East, So. Hadley, Mass.

SELL: Collins 310B1, $069; Viking II with Johnson keyer and VFO, $249; Elmac AF67, $149; GPR-90 rcvr, $349; Morrow 5BR converter, $49; National 6 and 2 meter converters, $32 each or $60 for both; BC610 tuning units, $2.50; aluminum tubing, misc. power supplies and components including guaranteed perfect, reasonable offers and all inquiries ans'd. Baker, WØFIR, Rte 9, Box 395, St. Louis 23, (Oakville), Mo.

SELL: Eldico TR-75-TV, $30; Bud CPO-128A, Codemaster $10. Will ship. KØBJG, J. M. McCormick.

SELL or swap for test equipment 813's, $10 ea; $17.5 pr.; four 833A's, $30 ea; $50 pr.; 4X150A, $20 ea., $35 pr.; 829-B, $7.50, 3E29, $7.50. John R. Klobas, W7MSW, 2260 W. Grant St., Corvallis, Oregon.

FIVE Pair chinchillas, proven breeders. Will swap for ham gear, recorder, etc., W3CJI, 3110 Lehigh, Allentown, Pa.

FOR Sale: all like-new, hardly used, S40B, manual, $80, HQ-129X, w/matching spkr, manual: $200; SX-71, $160. W. G. Horn, W5GSF, Box 206, Bay Springs, Miss.

2 Meter final amplifier, 100 watts inpt. phone 150 watts c.w. Uses 5894/AX9903, silver-plated lines, clamp tube, plate meter and other features on attractive, shielded aluminum chassis. Drive required: approximately one watt. $32.50 less tubes; $49.50 with tubes. Wired and tested. Literature on request. Amplex Radio Products, Inc., 1195 Westlake Dr., Walled Lake, Mich.

2 Meter gear, new Crico mobile rig; transmitter covers 140-156 Mc., uses 6AQ5 modulators, 5763 final; receiver covers 130-175 Mc., 6 volt power supplies; complete for $75. Brand new xmitter ARC-5 w/tubes, covers 100-156 Mc., $15; Mobile Motorola FM xmitter and rcvr, like new condx, $65; new Warner Mod. 69 electric-eye burglar alarm system. Stops the gear snatchers! Only $15; new plate xfrmr 2000-0-2000 volts 400 mils, 220 primary, $30; like-new Army O.S.I. small bettery rcvr, covers 2 5 to 12 Mc. Really hot. $18. Bill Slep, W4FHY, Box 178, Ellenton, Fla.

CLEANING Shack: 75A3 spkr, 3 and 6 Kc. filters, calibrator; $375; 32V3, exc. condx, $450; Central 20A QT1, 458 VFO, $225, Central Slicer "B", AP-1, $75; Temco 75GA, final 4-65-80-10M, $150; BC-1004C, pwr supp. spkr, $125; RME-DB22A, $45; RME-VHF152A, $45; Temco 1000 GA w/75GA exctr, pr. 4 250 final -80-10M, complete, $750; Johnson KW MatchBox, $90; Johnson 20M — 3 Ei. beam, boom, balun, unused, $80; LM15-AC supply, book, $115; Amphenol, Mims rotator, limit switches, selsyn indicator, $175; TR4 Trans. 2 meter tubes, less supply, $20; Write for complete list, equipment, tubes, parts, meters. All f.o.b. Oakdale, L. I., N. Y. Ted Whildin, W2HS.

VIKING Ranger, late model, factory-wired, with time sequential grid block keying. Clean, used very little. $199.50; Gonset DeLuxe 6 Meter Communicator, 6vdc/115 VAC, with squelch and noise clipper, $179.50. Will ship either unit c.o.d. on receipt of 10% deposit. W4SUF, 1030 Johnston Drive, Anniston, Alabama.

SELL or swap: 2800 VCT 600 Ma. xfrmr, Stancor P6166 xfrmr, 2-829B's, 2- 10 μfd 1000 W DCV oil caps, 2-ATR 548 Vibrators, Simpson 100 Micro amp. and 0-150 VAC meters, Philco 2" 'scope. Al Gantcher, K2AAZ, 1973 81st, Brooklyn, N. Y. Tel: TE 7-1354.

SELL: Collins 75A1 receiver, new condx. and appearance, calibra. perfect, $260. F.o.b. Phila. Joe Bennett, W3DJC, 160 Edge Hill Rd., North Hills, Pa.

RME Model MC-53 converter for 10, 6, and 2 meters, $40; Master Mobile 60", 96" and number 114 coax antennas with body mount, $20. Also Precise wide-band oscilloscope Mod. 300 series B, $75 (new). L. A. Kenna, W7NLR, 522 Warren Ave., Winslow, Ariz.

QUICK Sale: Gonset R.F. Linear amplifier mod. 500-W; factory-wired 20A exciter with QT-1; Eldico 10/20A VFO; B&W TR switch. All for $400. Equipment is in excellent condition. Rev. A. J. Tamulis, W9PQS, 2101 State St., Granite City, Ill.

WANTED: New 4D32 tube, coax relay, S.W.R. bridge, G-E Ham News file, (bound Vol. 1). Roy Sawdey, 5255 Harper, Solon, Ohio.

SELL: HRO50T1, coils A/AC thru F (7 sets), $250; Matchbox never used, $30; Q5'er with power supply, $15; Millen R9'er with 10-15-20 m. coils, $15; SWR bridge, complete, $7; D-104 xtal mike, chrome floor stand, $10. All perf. condx. 4D32, used, $8. Miscellaneous list. W2EQS, O'Brien, 48 Prospect, Westwood, N. J.

TRADE Brand new Eimac 4X250B and socket and cash for Elmac AF67 trans. O. Tupaney, W8QBR, Detroit, Mich.

NEON-GLO desk call-signs, $2.00. Write: Hulvey, W9PLW, 4325 Johnson St., Gary, Ind.

PRICED for quick sale, following used excellent condx: G-E YRS slicer, $38; Hallicrafters S-39 portable rcvr, 55-30 Mc., $38; oscilloscopes, Dumont 3", 164E, $42; 5" 274, $69; G-E CRO-3"A", $39; Sonar Mobile rcvr 3-bands, $32; Eldico 2-meter transmitter rcvr, power supply, loudspeaker, $59; RCA 1 Kw. modulation transformer, $14; Carter dynamotors, 6-400 volts 375 Ma. (new), $18; 12-300 volts 200 Ma., $14 B&W audio oscillator, $95, Panadaptor, 3" BC 1031-A, $39; Hammarlund BC-779-A .540-20 Mc., best offer. Following new Gonset 2-meter converter, $19.00; RCA 833A $22, General Radio Variac, 2 Kw., $24; National HFS rcvr, $115. Write for miscellaneous list. D. B. Whittemore, W2CUZ, Mastertown Rd., Bronxville, N. Y.

FOR Sale or trade: ART-13 with AC power supply (in exc. condx), 250 w. phone, 300 w. c.w. or trade towards: 32V2 or 3. Sell: Subraco 10M mobile xmitter and dynamotor unit complete; 500 w. AC 110V 60 cycle generator and Clinton 4 cycle gas entine, housed unit. Would trade toward good comm. rcvr. Will deliver larger units to within 250 miles. W8YMG, C. L'Esperance, 826 Lane Blvd., Kalamazoo, Mich.

PERFORATED Aluminum sheets .051, 5/64" OD holes, ½" centers, $1.20 sq. ft., cut to size. Send for listing on beams, aluminum tubing, etc. Radcliff's, Fostoria, Ohio.

FOR Sale: Used equipment and new and used parts. Free list. Wanted: Used laboratory type parts and equipment. Clarence Bigelow, 105 North Main, Bluffton, Ohio.

WANTED: Conversion material for the AN/ARC4, pair of Nat. SW3 20 meter coils and a gud used Millen 9028, power supply. W2COG, R. Jugenheimer, 213 So. Third, Highland Park, New Brunswick, N. J.

FAMOUS 6 meter "Lunenburg" Beams, 5 element, $14.95; 3 element, $10.95 postpaid. 6 meter horizontally polarized Mobile antenna. Wholesale Supply Co., Lunenburg, Mass.

MULTITESTER and radio course, 100 booklets. Write Lesinski, care ARA, 5 Beekman, NYC.

FOR Sale: Meissner signal shifter, TVI suppressed, power-boosted, drives AM kilowatt 10 to 160 meters, complete, $38; 5" laboratory 'scope, separate power supply, unitized matching construction throughout for all ham and most lab applications, like new, $46; 100 Kc. calibrator-oscillator, complete, $8; Gordon 1 Kw antenna changeover relay, solenoid type, $7; Mallory Vibrapack 12v to 300 v., $4; pair G-E selsyns perfect beam indicators, pr, $10; Hearing aid xtal mike, $3; Thordarson C.H.T. MultiMatch 15 watt hi-fi output xfrmr, $8. First check buys. S. Tucker, W2HLT, 51-10 Little Neck Parkway, Little Neck 62, N. Y.

FOR Sale: 75A3 with matching speaker, crystal calibrator and 800 and 3RC mechanical filters, $450; factory-wired Viking Ranger with Bud low pass filter, $150; Vesto 50 ft. tower, $100; Model CAFC 66AGE ant. rotator with two sets of slip rings (used originally to rotate radar ant.) 2 RPM. Weighs 175 lbs. complete with selsyn indicators, $125; 20 M and 10 M interlaced beam, full size, $25; $700 takes the whole station. Will deliver tower to within 40 miles radius of this QTH, otherwise deal is F.o.b. from Valhalla, N. Y. Frank Fetzer, 16 Shelley Ave., Valhalla, N. Y.

FOR Sale: Gonset 2-meter Communicator, like new condx, 6 volt model, $150. Also 7 inch Sylvania 'scope, $50. Gordon Hopper, W1MEG, 75 Kendall Ave., Framingham, Mass.

NC-183D, less speaker, like-new condx, $250. Will accept a less expensive receiver, plus cash. Heathkit DX-100 none cleaner, $200 plus crating and shipping; going SSB. BC-221A, fair, $50; National MB-40-SL, all-band tank, unused, $12. Wharfedale Super 5-CS/AL tweeter, unused, $10. All inquiries will be answered. W2PIE, Robert Lewin, 28 Fenimore Dr., Harrison, N. Y. Tel. Rye 7-3733.

SELL Your way to Wealth! Wanted: Surplus military and commercial aircraft electronics: BC-788, I-152 ARN-7, ARC-1, ARC-3, transmitters, receivers, test equipment, etc! Wanted: Electronic tubes: Broadcast, transmitting, receiving, Magnetrons, Klystrons, miniature, sub-miniature, ruggedized, etc! Top prices paid! For fattest checks sell to Rex! Write or phone description for immediate action: Bob E. Sanett, W6REX, 1524 So. Edris Drive, Los Angeles 35, Calif. Phones: REpublic 5-0215, CRestview 1-3856.

WANTED: BC-221, BC-348, BC-312, BC-342, BC-610-E, ARN-7, BC-788, ARN-6, APR-4, APN-9, ART-13. All types surplus or amateur transmitters, receivers, test equipment taken in trade for New Johnson Viking Ranger, Pacemaker, Valiant, Hallicrafters, Hammarlund, National, B&W, Gonset, Elmac, Telrex, Fisher Hi-Fi, etc. Write Tom, W1AFN, Alltronics, Box 19, Boston 1, Mass. Tel. Richmond 2-0048.

REAL Bargains in new and used gear: AM — SSB-CW — RTTY. High trades. Bonus for cash. Easy budget terms. Lowest finance rates anywhere. Get the whole story from the Yellow Flyer. Free. Write: Marshall Electronics, 855 Burlington, Frankfort, Ind.

FOR Sale: My 833A ice-cold kilowatt, 80 through 20; crystal or ultra stable built-in VFO control, pi-network output. Completely self-contained, 34" high. $525. W2ZOL.

CENTRAL-Electronics "A"-Slicer $49.95, "B"-Slicer $74.95, 10-B $139.95, 20-A $199.95, 458-VFO $49.95; Collins 32V1 $395.00, 32V2 $450.00, 32V3 $550.00, 75A2 $299.95, 75A3 $399.95; Elenco SS-75 $175.00, PA-400 (new) $199.95; Gonset Super-celver $79.95 2M Communicator-II $179.95, 2M Linear-amp $129.95; Hallicrafters SX-62A $250.00, SX-88 $429.95, S-40A $69.95, S-40B $79.95, HT-17 $34.95, HT-18 $49.95; Harvey-Wells TBS-50D $79.95, TBS-50JR $39.95, Heath AT-1 $24.95, QF-1 $5.95; Johnson Viking-II $249.95, Adventurer $44.95, VFO $39.95; National NC-183D $275.00, HRO-60 $399.95, NC-300 $295.00, NC-125 $129.95, HRO-50T1 $325.00, NC-173 $129.95; Sonar MR-3 $24.95, SRT-12OP $129.95. Many other used items available; write for latest list. Evans Radio, Box 312, Concord, N. H.

STANCOR P-8034 plate transformer, $30; Elmac 4-125A, pair, $16; BC-610 modulation transformer, $12; miscellaneous tubes and parts for sale. Joe E. Whisnant, W9EB1, 842 23rd St., South Bend, Ind.

HQ-129X in excellent condx! $129; RME-70, $115 likewise A-1; Jackson CRO-2 'scope, $139; Jackson TVG-1 sweep generator, $129. Both units factory-new condx. WØZHJ, 2444 D, Lincoln, Nebr.

SELL New DX-35 professionally wired, $76.95; new SX-99, $134.95 or best offers. John Bradley, General Delivery, Montclair, N. J.

FOR Sale: Johnson Matchbox, $35; Johnson SWR Bridge, $7.50 or $40 for both. Must sell Model 12 teletype page printer. Will take best offer. Write for details. All inquiries answered. G. Turner, WIQWI, P.O. Box 1198, Nantucket Island, Mass.

STEEL Cabinets, 12½ high by 19 wide x 11¼ deep, $5.00 each; RME-69 with DB-20, $50. James Devlin, West Mountain, Ridgefield, Conn.

SELL: RCA UHF Signal Generator, 370–560 Mc., $35; BC-1031A Panadaptor (3"), $75; PCA 2T200 Panadaptor (2"), $45; CE Slicer, AP-1 Adapter, $50. G. H. Goldstone, W8MGQ, 25416 Parkwood, Huntington Woods, Mich.

WANTED: V.F.O. State make, condition and ur rock bottom price. Si Zaval, K2AWX, 38 Hegeman Ave., Brooklyn, N. Y.

TRADE: Ithaca trap repeater Model 37T, 12 ga., full choke, 30 in. barrel, cost $225 in vy gud condx, for radio gear. Blum, 396 E. Whittier St., Columbus 6, Ohio.

HIGH Power rotary inductors for kilowatt pi-networks. Worth 3 times price. Get flyer, details. Guaranteed. Paulson Electronics, 138 E. 6th St., Clifton, N. J.

NOVICE needs help to get General License. Someone in Sacramento area. Douglas Ryno, 3730 44th St., Sacramento, Calif. GL 7-3278

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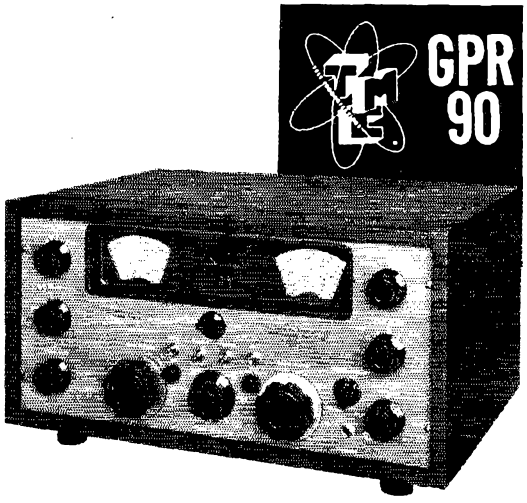

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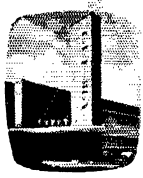

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BOB GRENELL (W8RHR)

has equipped his shack with, among other gear, a National NC-98. Here's what he thinks of it . . .

26 Corona Ave.
Dayton 9, Ohio
June 29, 1956

National Company, Inc.
61 Sherman Street
Malden, Massachusetts

Gentlemen:

I have been the well-pleased owner of a National NC-98 for nearly three years. During this period I have logged nearly 700 stations in 52 countries on the short-wave broadcast bands and many more amateur stations in 83 countries - a total of exactly 100 countries overall to this date. For the most part this was not accomplished by searching for DX; the majority of these loggings, which include rare ones such as Afghanistan, Luxembourg, Zanzibar, and Albania, were made while tuning across the band.

I have often used various VHF converters ahead of the NC-98, always with excellent results. For example, I recently logged 13 states within three days on six meters using a 6AK5 to 6J6 converter, while I was sitting around waiting for a new transmitter to arrive.

I have found the image rejection on ten to be amazingly good when the antenna trimmer is carefully peaked on the band, especially since the NC-98 is a single conversion receiver with 455 kilocycle if's.

I can heartily recommend the NC-98 as being the most receiver for the money available anywhere. Even now its performance delights and amazes me. It is ruggedly built and has one feature which sets it in a class far beyond other receivers in its price class - durability. Since I have owned my '98 it has required no realignment and there has been no perceptible deterioration of performance.

I purchased the NC-98 because of National's reputation - and I have found it to be a receiver which proves that reputation is well-founded.

Yours truly,

Robert L Grenell

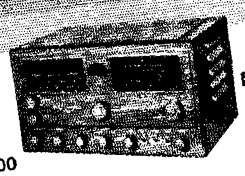
Thank you, Mr. Grenell

National

61 SHERMAN ST., MALDEN 48, MASS.

Geared to tomorrow

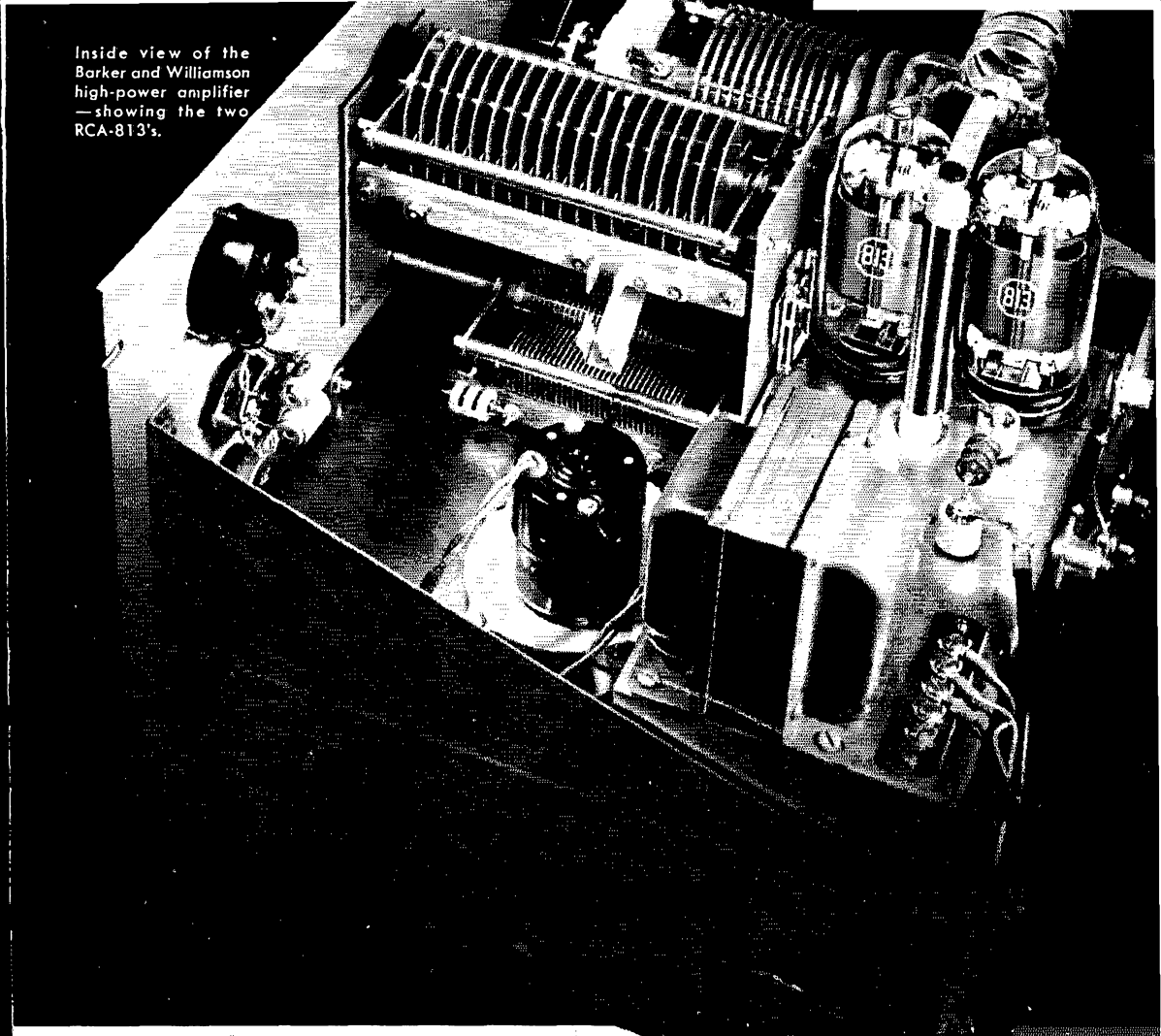
NC-300



NC-98

National Company has immediate openings for junior and senior electronic engineers with experience in communications.

Contact Mr. John Bigelow, Director of Industrial Relations.



Inside view of the Barker and Williamson high-power amplifier —showing the two RCA-813's.

Capable of handling up to the "legal limit" in single-side-band operation, this outstanding grounded-grid linear by Barker and Williamson has what it takes when it comes to power. Two RCA-813 Beam Power Tubes deliver the wallop.

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(1) High-perveance tube design enables you to get high power output at lower plate voltages. (2) Unique internal design makes possible a 500-watt tube only 7½" high and only 2½" in diameter. (3) Low price offers more watts per dollar than other beam power tubes of equivalent power.

There's a pair of RCA-813's at your RCA Tube Distributor's—ready to go to work for you right now in that new "power-pushing job". For technical data on the RCA-813, write RCA, Commercial Engineering, Section J37M, Harrison, N. J.

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