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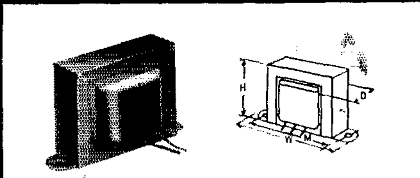
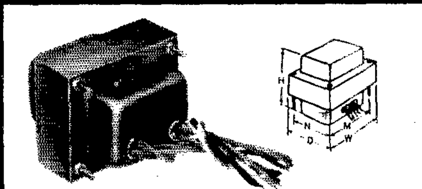
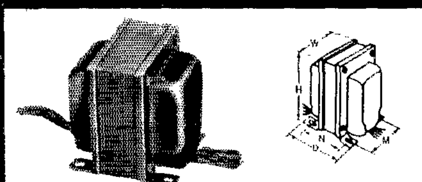
UTC replacement type transformers, [illegible] (Pri. 117 V. 50/60 cycles) provide the highest reliability in this field. All units are low temperature rise, [illegible] humidity with [illegible] materials to prevent [illegible]. Shells are finished in [illegible] black enamel.



CHANNEL TYPE



DOUBLE SHELL TYPE



VERTICAL SHELL TYPE

CHANNEL FRAME FILAMENT/TRANSISTOR TRANSFS.

Pri. 115 V 50/60 Cycles—Test Volts RMS: 1500

Type No.	Secondary	W	D	H	M	Lbs.
FT-1	2.5 VCT-3A	2 7/8	1 1/2	1 11/16	2 3/8	3/4
FT-2	6.3 VCT-1.2A	2 7/8	1 1/2	1 11/16	2 3/8	3/4
FT-3	2.5 VCT-6A	3 5/16	1 7/8	2	2 13/16	1
FT-4	6.3 VCT-3A	3 5/16	1 7/8	2	2 13/16	1
FT-5	2.5 VCT-10A	3 3/4	2 1/8	2 5/16	3 1/8	1 1/2
FT-6	5 VCT-3A	3 3/4	2 1/8	2 5/16	3 1/8	1 1/2
FT-7	7.5 VCT-3A	3 3/4	2 1/8	2 5/16	3 1/8	1 1/2
FT-8	6.3 VCT-8A	4	2 1/2	2 5/8	3 5/16	2 1/2
FT-10	24 VCT-2A or 12V-4A	4	2 5/8	2 5/8	3 5/16	2 1/2
FT-11	24 VCT-1A or 12V-2A	3 3/4	2 1/8	2 5/16	3 1/8	1 1/2
FT-12	36 VCT-1.3A or 18V-2.6A	4	2 5/8	2 5/8	3 5/16	2 1/2

Taps on pri. of FT-13 & FT-14 to modify sec. nominal V, −6% +6%, +12%

Type No.	Secondary	W	D	H	M	Lbs.
FT-13	26 VCT-.04A	2 1/8	1 3/8	1 1/4	1 3/4	1/4
FT-14	26 VCT-.25A	2 7/8	1 5/8	1 11/16	2 3/8	3/4

DOUBLE SHELL POWER TRANSFORMERS

Type No.	High V.	DC ma	5V. Fil.	6.3 VCT Fil.	W	D	H	M	N	Wt. Lbs.
R-101	275-0-275	50	2A	2.7A	3	2 1/2	3	2 1/2	2	2 1/2
R-102	350-0-350	70	3A	3A	3	2 1/2	3 5/8	2 1/2	2	3 1/2
R-103	350-0-350	90	3A	3.5A	3 3/8	2 7/8	3 15/16	2 13/16	2 1/4	4 1/2
R-104	350-0-350	120	3A	5A	3 3/4	3 1/8	3 7/8	3 1/8	2 1/2	5 1/2
R-105	385-0-385	160	3A	5A	3 3/4	3 1/8	4 5/16	3 1/8	2 1/2	7

VERTICAL SHELL POWER TRANSFORMERS

Type No.	High V.	DC ma	5V. Fil.	6.3 VCT Fil.	W	D	H	M	N	Wt. Lbs.
R-110	300-0-300	50	2A	2.7A	2 5/8	2 13/16	3 1/4	2	1 3/4	2 1/2
R-111	350-0-350	70	3A	3A	2 5/8	3 3/16	3 1/4	2	2 3/8	3 1/2
R-112	350-0-350	120	3A	5A	3 5/16	3 11/16	4	2 1/2	2 5/16	5 1/2
R-113	400-0-400	200	3A	6A	3 7/8	4 5/16	4 5/8	3	3 1/8	8

CHANNEL FRAME FILTER REACTORS

Inductance Shown is at Rated DC ma—Test Volts RMS: 1500

Type No.	Induct. Hys.	Current	Resistance Ohms	Dimensions, in. W	D	H	M	Wt. Lbs.
R-55	6	40ma	300	2 3/8	1 3/8	1 3/8	2	1/2
R-14	8	40ma	250	2 7/8	1 1/2	1 11/16	2 3/8	3/4
R-15	12	30ma	450	2 7/8	1 1/2	1 11/16	2 3/8	3/4
R-16	15	30ma	630	2 7/8	1 1/2	1 11/16	2 3/8	3/4
R-17	20	40ma	850	3 5/16	1 5/8	2	2 13/16	1
R-18	8	80ma	250	3 5/16	1 5/8	2	2 13/16	1
R-19	14	100ma	450	3 3/4	1 7/8	2 5/16	3 1/8	1 1/2
R-20	5	200ma	90	4 1/8	2 1/4	2 5/8	3 5/16	2 1/2
R-21	15/3	200ma	90	4 1/8	2 1/4	2 5/8	3 5/16	2 1/2
R-220	100/8 Mhy 25/2 Mhy	2.5A 5A	.6 .16	3 3/4	2	2 5/16	3 1/8	1 1/2

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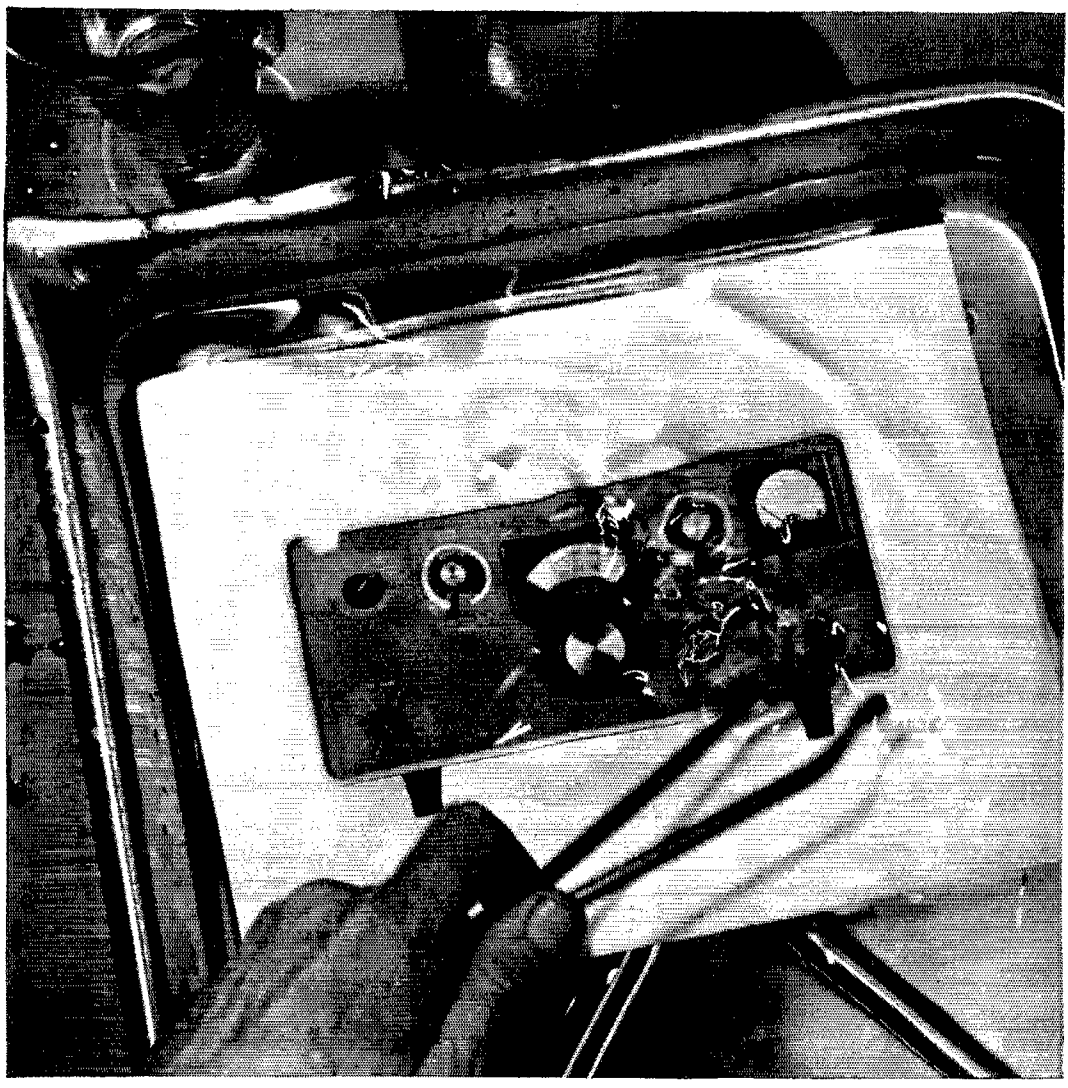

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COLLINS

QST

MARCH 1962

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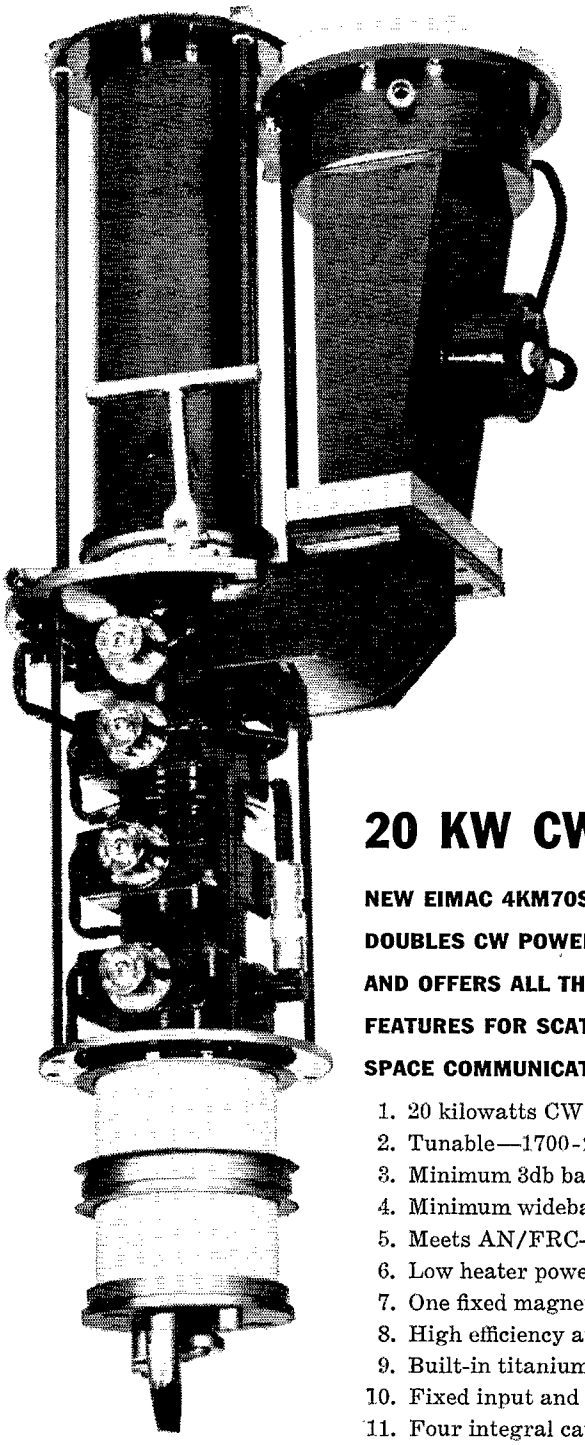

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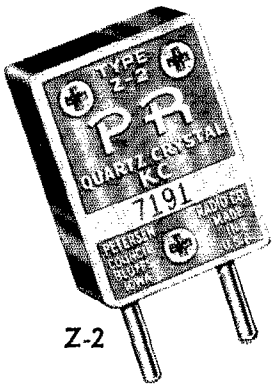

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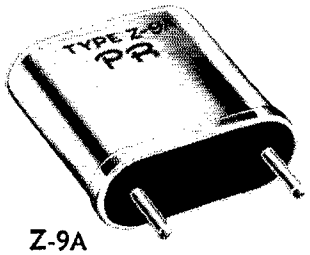

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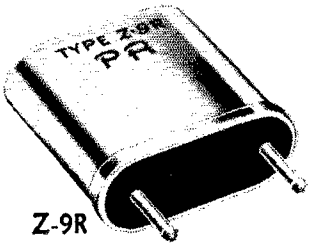

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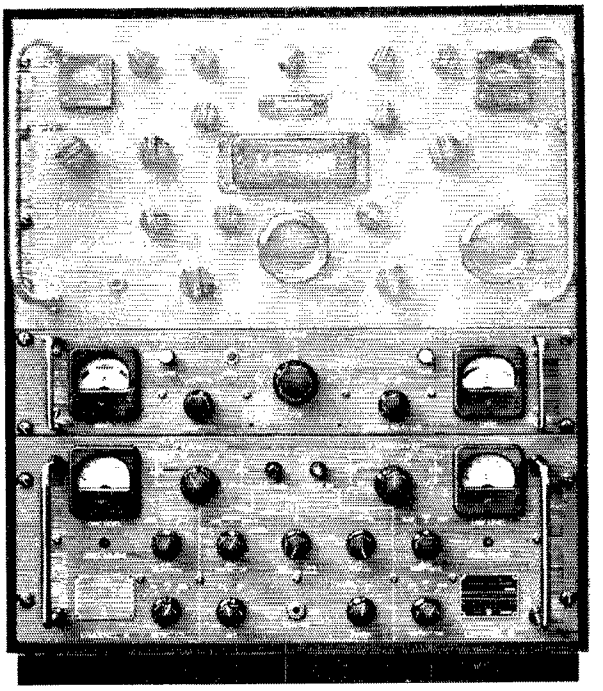

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It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors.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

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

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

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Vice-Director: Harry J. Dannals W2TUK
RFD 1, Arbor Lane, Dix Hills, Huntington, L. I.,

Midwest Division

ROBERT W. DENNISTON . . . . . WØNWX
Box 631, Newton, Iowa

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

New England Division

MILTON E. CHAFFEE W1EFW
28 Reussner Rd., Southington, Conn.

Vice-Director: Bigelow Green W1EAE
12 Gloucester St., Boston 15, Mass.

Northwestern Division

R. REX ROBERTS W7CPY
837 Park Hill Drive, Billings, Mont.

Vice-Director: Robert B. Thurston W7PGY
7700 31st Ave. N.E., Seattle 15, Wash.

Pacific Division

HARRY M. ENGWICHT W6HC
770 Chapman, San Jose 26, Calif.

Vice-Director: Ronald G. Martin W6ZF
1573 Baywood Lane, Napa, Calif.

Roanoke Division

P. LANIER ANDERSON, JR. W4MWH
428 Maple Lane, Danville, Va.

Vice-Director: Joseph F. Abernethy W4AKC
768 Colonial Drive, Rock Hill, S. C.

Rocky Mountain Division

CARL L. SMITH . . . . . WØBWJ
1070 Locust St., Denver 20, Colo.

Vice-Director: John H. Sampson, jr. W7OCX
3618 Mount Ogden Drive, Ogden, Utah

Southeastern Division

JAMES P. BORN, JR. W4ZD
25 First Ave., N.E., Atlanta 17, Ga.

Vice-Director: Thomas M. Moss W4HYW
P.O. Box 20644, Municipal Airport Branch,
Atlanta 20, Ga.

Southwestern Division

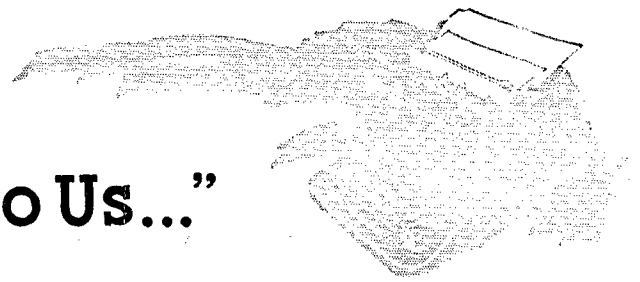
RAYMOND E. MEYERS W6MLZ
Box R, San Gabriel, Calif.

Vice-Director: Howard F. Shepherd, jr. . . . W6QJW
127 South Citrus, Los Angeles 36, Calif.

West Gulf Division

ROEMER O. BEST W5QKF
P.O Box 1656, Corpus Christi, Texas

Vice-Director: Ray K. Bryan W5UYQ
2117 S.W 61st Terrace, Oklahoma City 19, Okla.

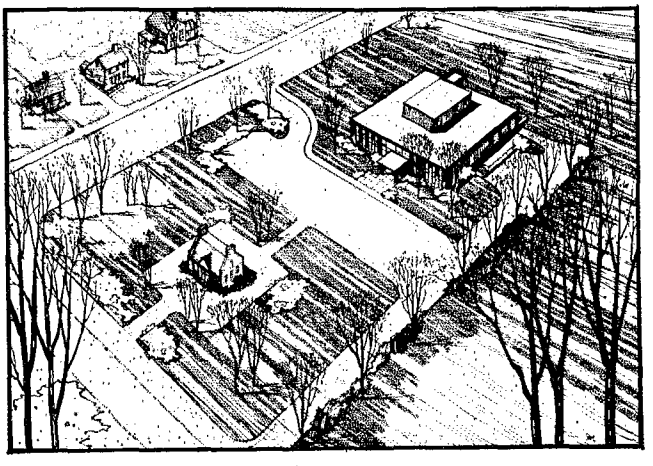


"It Seems to Us..."

A Building Fund?

OUR cover this month shows an artist's sketch of a new building scheduled for construction this year to house expanding ARRL headquarters activities. A separate article in this issue, pp. 46–47, brings a general description for the information of members.

There is one remaining question — finance. A choice of several possible methods will be made by the Board of Directors after careful examination. As one of the alternative choices involves the membership, the Housing and Finance Committees have asked your editor to seek an expression of opinion.



First let us say that the League has a comfortable financial reserve. One plan, then, is simply to convert investments into cash. Preliminary discussions by the Board seem to have put this method at the bottom of the list, however, for it would strip the League of virtually our entire resources, built up slowly and carefully over the 48 years of our existence. Directors have expressed the view that maintenance of a healthy reserve is vitally necessary, as a secondary source of income and — much more important — a "war chest" ready for any legislative or regulatory battle, or natural disaster, or other emergency we may have to face in the future.

Other possibilities to be evaluated as to their impact on League finances include a mortgage, or the issuance of bonds.

One plan, new to League customs but commonly used by other nonprofit groups, is to invite gifts to a Building Fund. Several ARRL directors have informally discussed the fund idea with individual amateurs as well as club groups, and were pleasantly surprised at the enthusiastic response. Many said, in effect, "This is a chance for me to do something personally, in addition to my regular membership, to show my appreciation of and support for the League and what it has done for amateur radio."

Amateurs put considerable sums into equipment. In comparison, a donation to the fund would be small; if every League member participated, an average of less than $4 each would put the drive well over the top. Looking at it another way, it would amount to 2 cents for each watt of transmitter input power used by the average ham! Some would not participate, of course—either through lack of interest, or inability to find even a few dollars of excess cash. More ardent members would make up for the nonparticipants by larger contributions than the rule-of-thumb indicated. (Contributions are U. S. tax-deductible.)

Exploratory conversations by directors with individual members have already produced tentative commitments for donations amounting to some $40,000, comprised largely of substantial gifts from prominent amateurs. To be wholly successful, however, in spirit as well as in dollars, any such program should have widespread membership endorsement. Should the League undertake this project? Would a majority of members be willing to support such a drive? Would *you?* The Housing and Finance Committees would appreciate your view, on a card or QSL to Hq. QST

Hamfest Calendar

New York — An RTTY dinner will be held at the White Turkey Towne House, 260 Madison Ave., New York City, at 7 P.M. on Monday, March 26. Charles R. Peters, W2DHE, from the Signal Corps Laboratories at Ft. Monmouth, will demonstrate miniaturized RTTY equipment. Reservations, $6.00 each, are available from Elston H. Swanson, W2PEE, 101 New South Road, Hicksville, L. I., N.Y.

New York — The 11th annual Sideband Dinner and Hamfest will be held at the Hotel Statler-Hilton, 33rd St. and 7th Ave., New York City, at 7:30 P.M., on Tuesday, March 27. Equipment displays will have been open since 10 A.M. Bill Leonard, W2SKE, will be master of ceremonies. Tickets are $10 in advance ($11 at the door), available from Stan Rosenberg, WA2GFV, 1385 Richmond Court, East Meadow, N.Y. Make checks payable to SSBARA.

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Both of the above events are being held, as usual, during the annual IRE show.

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Pennsylvania — The 7th annual banquet of the Reading Radio Club, Inc., will be held at 7 P.M. on March 31 at the Crystal Restaurant, 545 Penn St., Reading. Tickets are $5.00 prior to March 26, $7.50 thereafter. This includes dinner, speaker and dancing. For further info and reservations, contact the Banquet Committee, c/o Reading Radio Club, 133 Thorn St., Reading, Pa.

Editor, *QST*:

The holidays are over — the Hope troupe dispersed — and everyone has settled down to the old routine. However, we have great memories of our Christmas tour along the dew-line to the service bases in the Far North — Newfoundland, Labrador, Baffin Island and Greenland.

However, this year we added a new experience — we were able to talk with members of our families during our absence. It made it so much easier to be away from home at this very special time. Our sincere thanks go to those who made this possible — the ham operators throughout this area and, especially, K5JHR/VO2, K8WKY/VO2, K4HGJ/VO2, K6ZTC/VO1, K8EFK/VO1, K1NPS/VO1, KG1AA and KG1BX. We are most grateful to you for your wonderful cooperation in handling our many messages and calls.

Many thanks from all of us to all of you and our very best wishes for a great year.

BOB HOPE
North Hollywood, California

Strays

In Louisiana not too long ago they held a Tourist Appreciation Day, and each town chose at random a passing tourist and gave him special honors. Gifts, hotel accommodations, and a call to home via ham radio.

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The Navy in San Diego was recently host to a group of science fair award winners known as Navy Science Cruisers. In the group of 100 there were some 14 hams, including W4KJA, K5AQI, K5CSH, K5DQY, KN5KIU, KN5LXY, K5RFM, K7ABB, K8UEL, KØFMU, KØJPC, KØPYB, KØWNL, plus ex-KNØYIJ.

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Last month's issue demonstrates that a *good* managing editor would have checked his sources more carefully. We received several rocket photos from the Project Oscar gang, each purporting to be of the firing of Oscar I into orbit. We recognized that these photos weren't all of the same rocket, but finally elected to use the one which made the best-looking cover from an artistic point of view. We've been hearing about it ever since! Dozens of well-informed readers have pointed out that the rocket pictured on our February cover is an Atlas — which is *not* used in the Discoverer program.

And, one well-read correspondent points out that the quotation from Thoreau on page 18 of February is not exact. The correct quotation is, "If a man does not keep pace with his companions, perhaps it is because he hears a different drummer. Let him step to the music which he hears, however measured or far away."

NEW ENGLAND DIVISION CONVENTION
Swampscott, Massachusetts — April 7–8

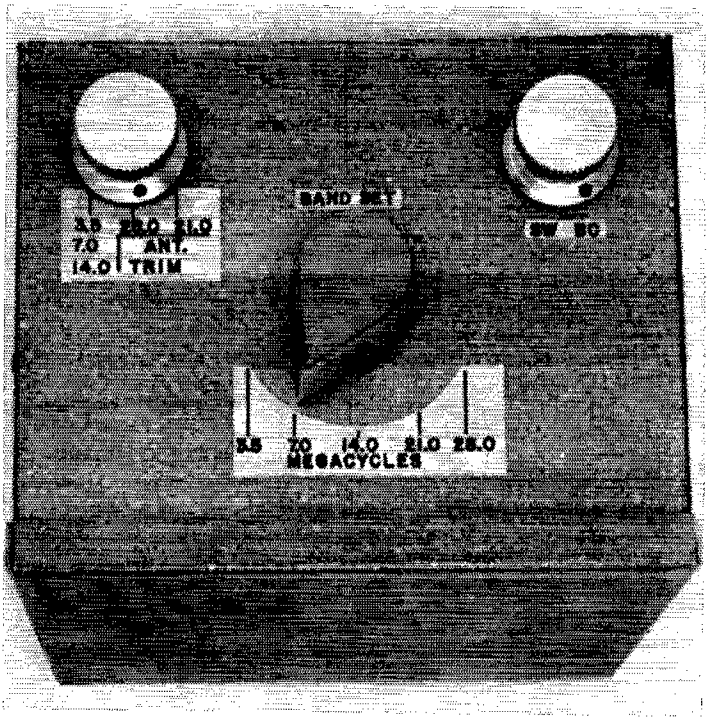
The New Ocean House at Swampscott will again be the scene of the New England Division Convention on Saturday and Sunday, April 7–8. Special features include a Saturday night dutch-treat dinner (5:30 P.M.), followed by dancing from 8 o'clock until midnight. Five night-club acts from New York and Las Vegas will provide entertainment.

Convention activities resume Sunday at 10 A.M., with FCC exams, illustrated talks by equipment manufacturers, military personnel, League officials, Federal Information Agency, Project Oscar and space communications discussions. There will be exhibits by major ham equipment manufacturers, QSL contests, mobile hunts and installation contest, YL activities, and net meetings. The convention winds up with a roast beef banquet at 5 P.M.

Overnight hotel reservations should be made directly with the New Ocean House, Swampscott, Mass. (single, $8.50; double, $13.00). Early Bird convention registrations should be sent with check or money order made payable to FEMARA, with stamped, self-addressed envelope to Radio Convention, 15 MacArthur Blvd., Danvers, Mass. Individual registration, $3.00; banquet tickets, $5.00 each. Early Bird registration ends March 25. Tickets at the door $4.00 each.

COMING A.R.R.L. CONVENTIONS

April 13-14 — Michigan State, Grand Rapids, Michigan.
May 19-20 — Roanoke Division, Roanoke, Virginia.
June 1-3 — Southwestern Division, Anaheim, California.
July 21-22 — Rocky Mountain Division Denver, Coloradio.
September 1-3 — ARRL National, Portland, Oregon.
September 1-3 — Delta Division, New Orleans, Louisiana.
October 13 — Hudson Division, New York, N. Y.
October 19-20 — Ontario Province, Toronto.



A bandswitching mobile converter. The three preset-type controls are the antenna trimmer, bandswitch and converter in/out switch.

A Crystal-Controlled Converter With Bandswitching

Faced with the problem of shifting from a 6- to a 12-volt car system, the owner of the average junk box may find it cheaper to build this mobile converter, which operates directly from the car battery, than to buy or make a new power supply. W5QZK did.

Five-Band Mobile Unit Using Hybrid Tubes

BY DON MEREDITH,* W5QZK

RECENTLY the author swapped automobiles and, as a result, swapped himself out of a mobile rig. This came about because of the change to 12 volts in the electrical systems of recent-model cars which made it necessary for me to seek an inexpensive way of providing receiving equipment for the new voltage. The choice was between a new power supply for the old converter and a new converter that would operate directly from 12 volts. A check on the contents of the junk box (founded primarily on TV salvage), favored the latter, as I discovered very little in the way of components that could be made to serve in a high-voltage power supply.

Circuit

The unit shown in the photographs is a bandswitching crystal-controlled converter using a 12EK6 r.f. amplifier followed by a 12AD6 crystal-oscillator/mixer. These tubes belong to the so-called hybrid variety used in many

* 5954 Beldart, Houston 33, Texas.

late-model car receivers. They are unusual in that they require no high-voltage supply, the 12-volt car battery furnishing plate voltage as well as the heater supply. These tubes were decided upon after a few unsuccessful attempts with junk-box transistors bought at bargain prices.

The circuit was made as simple as possible consistent with satisfactory performance. The Pierce oscillator in the mixer circuit requires no tuned circuit. Simple capacitive coupling is used between the r.f. and mixer stages, and the output circuit of the mixer is untuned. C_1 is merely an antenna trimmer to be set once when bands are changed. One arm of S_1 turns on power to the converter when the antenna is switched from the broadcast receiver to the converter.

Construction

The enclosure is an LMB 4 × 5 × 6-inch aluminum utility box with removable top and bottom. This size was the smallest that would accommodate the components I found in the junk box. (Also, it was the only one in stock at the nearest store.) A chassis to fit the box was made from sheet aluminum. Lips are bent down on all but the panel side of the chassis so that it may be attached to the box with sheet-metal screws. A cutout at the center of the chassis provides space for the band switch. Short lips are bent down along the edges of the cutout to eliminate the sharp corners. The photographs show the location of the main components quite clearly.

Crystals

The oscillator was checked first, using a home-brew grid-dip meter to make sure that the oscillator would function reliably with all crystals.

TABLE I

Coil Dimensions

Band	L (μh.)	L_2 Diam. (in.)	L_2 Wire	L_2 Length (in.)	L_2 Turns	L_1 (turns)
75	35	½	32	1½	60	10
40	10	⅜	32	⅜	30	10
20	2	⅜	28	11/32	24	5
15	1.2	¼	24	5/16	20	4
10	0.6	¼	24	5/16	15	4
75	85	½	32	5/8	70	
40	25	⅜	32	7/16	50	
20	5	⅜	28	11/32	24	
15	2.8	¼	24	11/32	24	
10	1.5	¼	24	½	20	

Coils are wound with enameled wire on adjustable iron-slug forms; dimensions are approximate. L_1 coils are wound with No. 32 wire as described in the text.

To convert amateur phone-band frequencies to the broadcast-frequency range, oscillator frequencies should lie within the following ranges: 2450 to 3250 kc. for 75 meters, 5750 to 6650 kc. for 40 meters, 12,800 to 13,650 kc. for 20 meters, and 19,900 to 20,700 kc. for 15 meters. With an oscillator frequency of 27,950 kc., the range of 28,500 to 29,500 kc. will be covered; an oscillator frequency of 28,150 kc. will provide coverage from 28,700 to 29,700 kc. Oscillator frequencies closer to the *high*-frequency ends of the above limits will place the amateur bands closer to the low-frequency end of the broadcast dial where the bandspread is greater. However, I used 50-cent surplus crystals, so my choice of frequencies

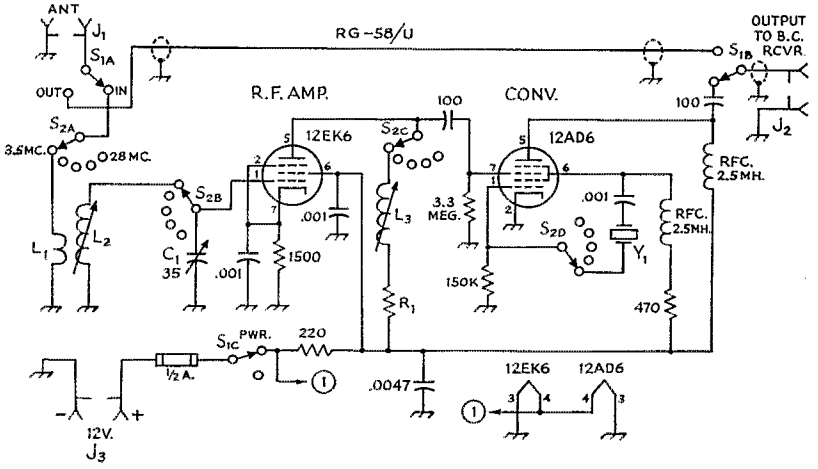


Fig. 1—Circuit of the 12-volt high-frequency mobile converter. Fixed capacitances less than 0.001 μf. are in μμf. and capacitors are mica; others are disk ceramic. Resistances are in ohms and resistors are ½ watt.

C_1—Miniature 35-μμf. variable (Hammarlund MAPC-B-35 or similar).

J_1, J_2—Auto-radio antenna connector (Cinch-Jones 81F) or other chassis-mounting connector for coax cable.

J_3—Any 2-terminal connector or connector strip.

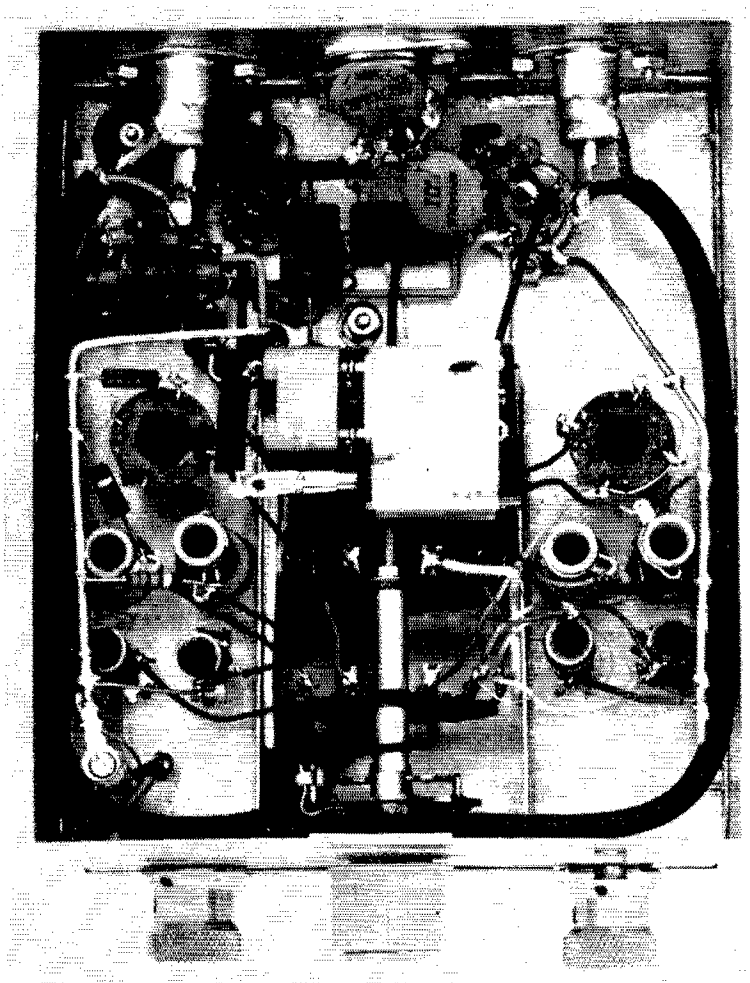
L_1, L_2, L_3—See coil table.

R_1—See text.

S_1—Three-pole two-position rotary switch (Mallory 3234J or similar).

S_2—Two-section four-pole five-position rotary switch (Centralab PA-2012, PA-1012 or similar).

Y_1—See text.



Bottom view of the five-band mobile converter. S_{2A} and S_{2B} are on the front wafer. The crystals are clustered around the rear wafer S_{2C} and S_{2D}.

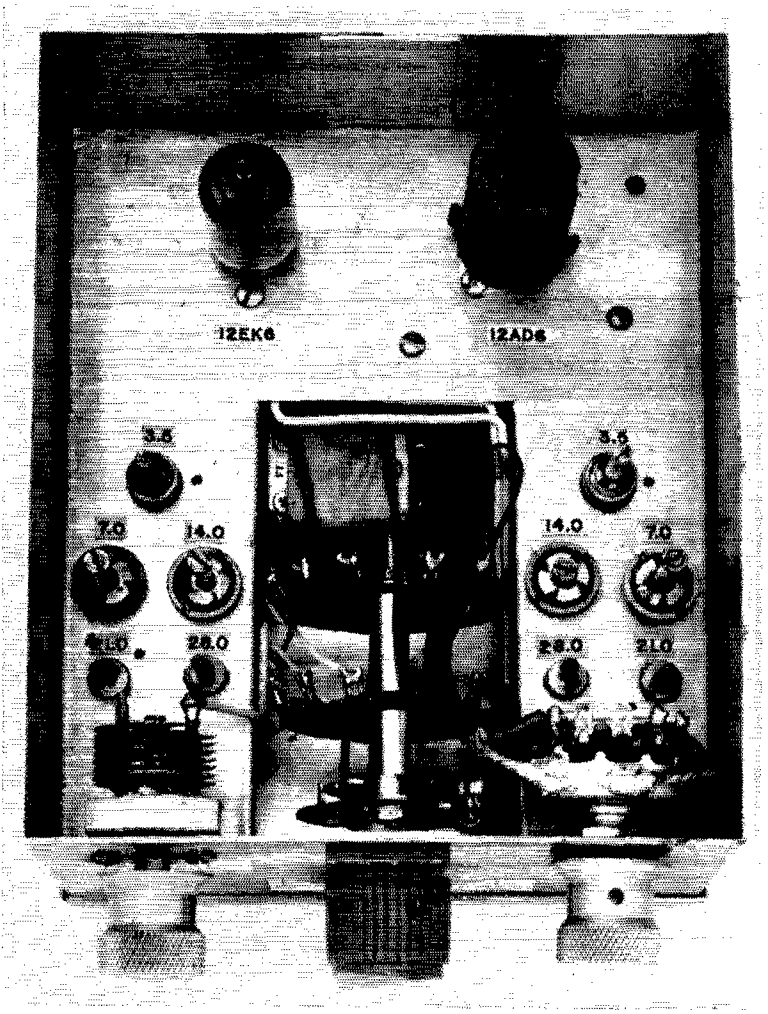
was rather limited. I use a 2894-kc. crystal for 75, and a 6350-kc. unit for 40 meters. On 20 I use the second harmonic of a 6700-kc. crystal, and the third harmonic of the same crystal is used on 15 meters. On 10 meters, the fourth harmonic of a 7000.1-kc. crystal is used.

Oscillator frequencies on the high side of the signal frequency may also be used, provided that you don't mind tuning in reverse; that is, with the high-frequency ends of the amateur bands appearing at the low-frequency end of the broadcast band. For this type of operation, oscillator frequencies should lie within the following limits: 4550 to 5350 kc. for 75 meters, 7850 to 8750 kc. for 40 meters, 14,900 to 15,750 kc. for 20 meters, and 22,000 to 22,800 kc. for 15 meters. An oscillator frequency of 30,050 will provide 10-meter coverage from 28,500 to 29,500 kc., while an oscillator frequency of 30,250 kc. will provide coverage from 28,700 to 29,700 kc. In this case, oscillator frequencies closer to the *low*-frequency ends of the ranges specified will place the amateur bands closer to the low-frequency end of the broadcast band.

Adjustment

Starting with the 80-meter band, the coils were wound, one set at a time, according to the dimensions given in the table, and installed in the converter. To provide a means of adjusting the antenna coupling to the optimum value, a narrow strip of paper was wound snugly (not tightly) over the r.f. amplifier grid winding and held there until the adhesive used to join the overlapped ends of the paper dried. The antenna coil was then wound over the paper. When the job is finished, the antenna coil can be moved up and down for final coupling adjustment. If desired, ready-made coils, adjustable to the approximate inductance values given in the table, may be substituted.

Resonances were first checked out roughly with



Top view of the mobile converter showing the layout of the slug-tuned coils. R.f. amplifier coils are to the left, mixer coils to the right.

(Photos by Jerry Whitehurst.)

the g.d.o., and then final adjustment was made on received signals. A small a.c./d.c. broadcast receiver was used as the tunable i.f. amplifier for these tests.

Resistor R_1 is primarily for the purpose of stabilizing the r.f. amplifier, but it also has some broad-banding advantage. Its minimum value was determined for each band by temporary use of a variable resistor, adjusting it to the minimum value that would stabilize the amplifier. In my particular case, 820 ohms was sufficient for 80 meters, 220 ohms for 40 meters, and 120 ohms for 20 meters. Resistors were not necessary on 10 and 15 meters. Then the resistance was measured and a fixed resistor of the measured value was substituted.

The final product is a well-performing converter built at low cost and easy to operate. QST

Strays

Air Force MARS Eastern Technical Net schedule for March. Sundays 1900Z 3295, 7540, and 15,715 kc.

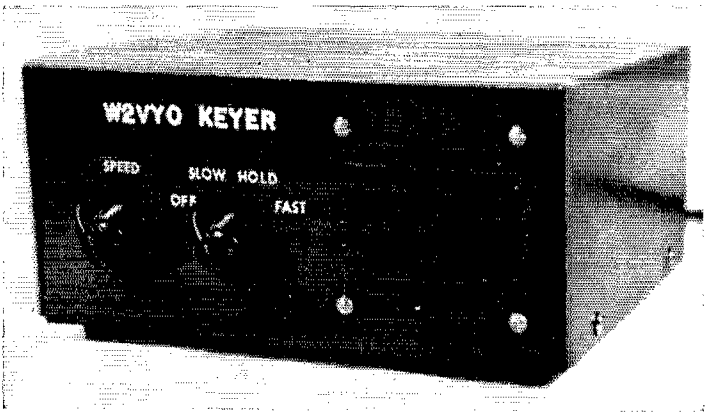
March 4 — Tunnel Diodes; What They Are and Do.

March 11 — Tunnel Diode Circuitry.

March 18 — Applications of Drift Transistors to Radio Receivers.

March 25 — Transistorized Voltage Regulators.

April 1 — The Advantages of Compactron Multi-Function Tubes in Electronic Equipment.



The Penultimate key has two speed ranges selected by the switch to the left of the monitor-speaker grille. The control farther to the left varies the speed within either range.

The Penultimate Electronic Key

BY DAVE MUIR,* W2VYO

Habits acquired through long use of a bug-type key are often hard to shake off when shifting over to an electronic key. This key has been designed to provide some tolerance toward these habits to make the change-over easier. The unit also includes an audio monitor and a connection for receiver muting.

A GREAT many articles about electronic keyers have appeared in amateur-radio literature in recent years. But, in spite of the great interest shown in these circuits, there seems to remain a large gap between relatively simple circuits and the very ambitious Ultimatic[1] design. The purpose of the unit presented here is to fill this gap with a single-paddle keyer specifically designed to make the operation as easy as possible for those graduating from a bug key.

Myself being one of those accustomed to sending 20-w.p.m. code with 50-w.p.m. dots, I found that one of the most annoying mistakes in operating an electronic key was the dropping of single dots. For example, in the letter K, I would key the first dash, then go to the dot contact and back to the dash contact before the completion of the first dash. The result was a dropped dot and a perfect letter M. To have "rng 1 kw hr om" come out "rng 1 mw hr om" must have been rather surprising to the op at the other end! Similar experience in dropping final dots on letters such as G led to the provision of dot memory in this keyer circuit. Once a dot has been selected (dot flip-flop set), the dot will be completed automatically, and will be inserted in a string of dashes as soon as the current dash is completed. Similar memory could have been provided for dashes, as in the Ultimatic, but the longer duration of dashes makes their timing relatively easy, so this feature was not considered worth the additional cost and complexity.

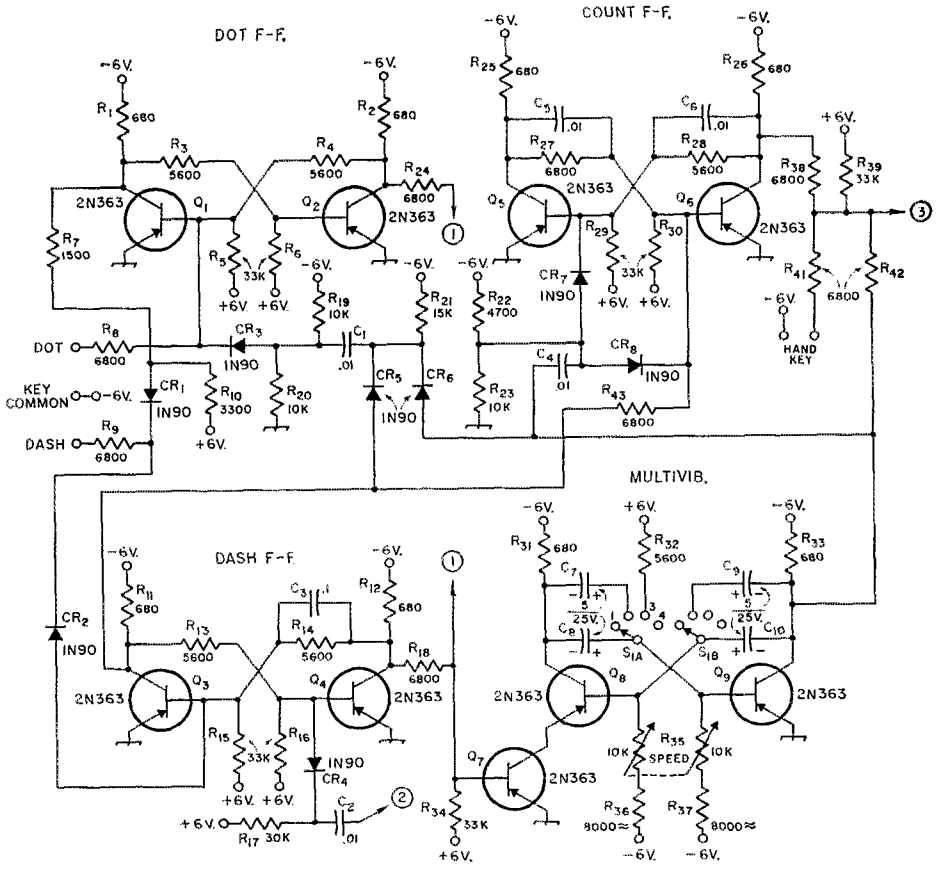
It was considered highly desirable, from the standpoint of ease of operation, to have each letter emerge with identically the same timing each time it is keyed. Hence, a controlled multivibrator is provided which is turned "on" only when a character is initiated. A character, then, starts immediately upon closure of the appropriate contact, without awaiting a clock pulse from the multivibrator. This does require that the operator set his own spacing between letters and between words, but this is not really asking very much and it does allow a small amount of personal identity to be preserved.

Components

Once the above logic had been decided upon, a prototype keyer was constructed with high-quality transistors and was operated for a period of several months. The results were so sufficiently gratifying that work was then begun on the version presented here, where a serious effort was made to reduce the cost to a bare minimum. Ten 2N363 transistors are employed which currently sell for 72 cents each, together with one 2N229 at 60 cents and nine 1N90 diodes at 40 cents each.

* 16 Meadow Way, Red Bank, New Jersey.

[1] Kanda, "The Ultimatic Transistorized," *QST*, Sept.-Oct., 1960.



The entire cost of the keyer (less transistor sockets and cabinet) was under 40 dollars. Of eleven 2N363s purchased, the minimum beta was 30 (measured at 10-ma. collector current in a circuit similar to the W2TGP tester[2]). All circuits should operate with betas as low as 25. No selecting of transistors should be required but, if means are available for checking them, it is suggested that the poorest transistors be used at Q_1 and Q_6 and the best ones at Q_7 and Q_{10} (Fig. 1).

To be able to operate the transistors at current levels where their gains are the highest and, at the same time, not be concerned about battery drain, an internal power supply was provided to produce plus 6 and minus 6 volts d.c. for the keyer. This feature is well worth the investment in the capacitors, two 49-cent diodes and an 89-cent filament transformer.

A 500-ohm keying relay is called for so that the operating current is better than twice the pull-in current. This overdrive is required to assure reasonably fast operate time for the relay. A Kurman relay was used because it proved to be more readily available, although the Sigma type 41F500SK/TUN is specifically designed for keying service and therefore would be preferable. With the more-sensitive Kurman relay, it might be advisable to increase the return tension slightly to assure a clean break (a small amount of current flows through the relay in the "off" condition).

The logical design of the keyer was dealt with rather freely. A variety of logic circuits are used with the emphasis on minimizing the cost. Wherever possible, transistor-resistor logic (TRL) was used (such as in the base circuits of Q_7 and Q_{10}) because of the saving in cost over diode circuitry.

Before discussing the operation of the keyer circuit, it might be helpful to note that, in the unkeyed condition, transistors Q_2, Q_4, Q_6, and Q_9 are "on" while all other transistors are cut off. The collector voltage of an "on" transistor will be referred to as ground or "zero" volts and that of an "off" transistor as "−6" volts even though precisely these voltages may not be observed in the operating circuit.

Multivibrator

The multivibrator is the heart of the keyer. Timing may be varied by adjustment of R_{35} and S_1. In Position 1 of S_1, the key power is off. Position 2 is for slow speeds. Position 4 is for the high-speed range. In Position 3, a positive voltage at R_{32} is placed on the base of Q_9, turning

[2] Priebe, "Checking Transistors," *QST*, April, 1958.

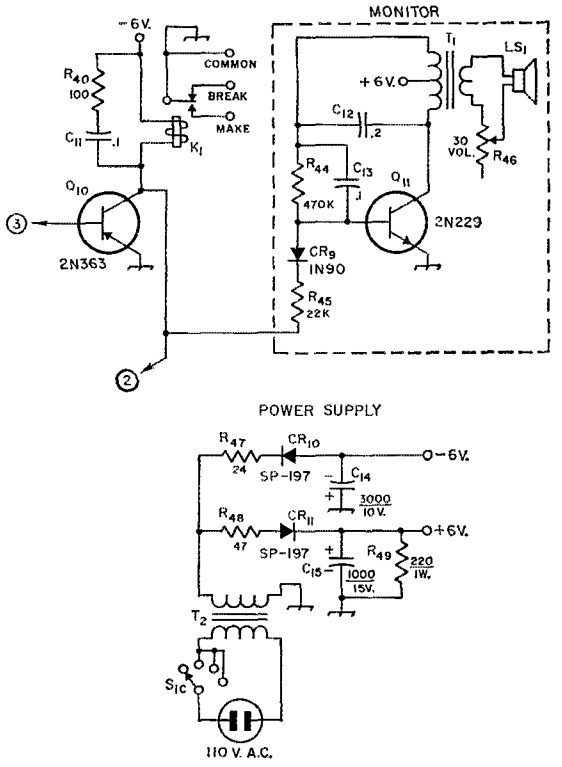


Fig. 1—Circuit of the Penultimate key. Capacitances are in μf. and resistances are in ohms. Capacitors marked with polarity are electrolytic; others are disk ceramic. Fixed resistors are ½-watt unless indicated otherwise. Component designations not listed below are for text-reference purposes.

C_7, C_8, C_9, C_{10}—Subminiature electrolytic (Sprague TE-1202 or similar).
C_{14}—Electrolytic (Aerovox AFH1-01 or similar).
C_{15}—Electrolytic (Aerovox AFH1-02 or similar).
CR_{10}, CR_{11}—Silicon, 200 p.i.v., 500-ma. (Lafayette).
K_1—500-ohm s.p.d.t. relay (Kurman 51CA37D or Sigma 41F500SK/TUN).
LS—2-inch speaker.
Q_1—Q_{10} inc.—Raytheon; Q_{11}—Sylvania.
R_{35}—Dual control, linear taper (IRC PQ-11-116 plus M-11-116).
R_{16}—Rheostat (Mallory C30R).
S_1—3-pole 4-position rotary switch (Mallory 3134J).
T_1—Transistor output transformer: 500-ohm, c.t. primary; 3.2-ohm secondary (Lafayette TR-95 or similar).
T_2—6.3-volt 1-amp. filament transformer (Lafayette TR-11 or similar).

Q_9 off and holding the output relay closed for transmitter tune-up purposes. In the low range the speed may be varied from about 6 to 16 w.p.m., while speeds of 15 to 35 w.p.m. are available in the high range with the component values specified.

When either a dot or a dash is selected, either Q_2 or Q_4 will turn off and the resulting −6 volts at either collector will cause sufficient current to flow through R_{18} or R_{24} to turn on Q_7 and start the multivibrator. The resistor logic at the input to the relay drive stage, Q_{10}, is similar and is such that either the collector of Q_9 or the collector of Q_6 going to −6 volts, or closure of the hand-key contacts, will drive Q_{10} into conduction and operate the keying relay. With the collectors of Q_9 and Q_6 at ground (and the hand key open) a positive voltage appears at the base of Q_{10}, turning it off.

Dot/Dash Generation

For the generation of dots, the count flip-flop is not operated, and the multivibrator square-wave pulses at the collector of Q_9 alone drive Q_{10}. When generating dots, the dash flip-flop is always reset with the collector of Q_3 at −6 volts. This drives the base of Q_6 through R_{43}, holding that transistor on and disabling the count flip-flop.

When dashes are selected, however, the collector of Q_3 goes to zero volts, allowing the leading edge of the square wave on the collector of Q_9 to drive current through C_4 and the steering diodes CR_7 and CR_8 to alternately change the state of the count flip-flop. As is shown in Fig. 2, the result, so far as the conduction of Q_{10} is concerned, is for the count flip-flop to "fill in the spaces" between alternate dots to form dashes.

The "ringing" on the collector of Q_{10} at the end of each character is caused by the magnetic energy stored in the relay coil. The resulting negative pulses are used to advantage to reset the dash flip-flop. This reset circuit is through C_2 and CR_4.

Dot Memory

To provide the dot-memory feature, two actions are required. First, it must not be possible to set the dash flip-flop while the dot flip-flop is set. This inhibiting action is performed by R_7, R_{10}, CR_1, and CR_2. When a dot has been selected, the collector of Q_1 goes to ground and a slightly positive voltage appears at the junction of R_7, R_{10}, and CR_1. This will not allow the junction of R_9 and CR_2 to go negative when the dash contact is closed, keeping CR_2 back-biased and inhibiting the setting of the dash flip-flop. After completion of the dot, however, the collector of Q_1 returns to −6 volts and the dash flip-flop may then be set by current through R_9 and CR_2. The second required action is to reset the dot flip-flop only upon completion of a dot and not at the end of a dash. This is done through an "or" gate formed by R_{21}, CR_5, and CR_6. When the collector of Q_3 or Q_9 is at ground, the voltage at the junction of R_{21}, CR_5, and CR_6 is also at ground. When a dash is in progress, Q_3 is "on" and the

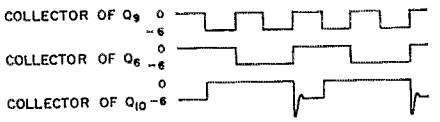


Fig. 2—Dash generation. Q_{10} conducts, bringing its collector to ground whenever the collector of Q_6 or Q_9 is at −6 volts.

aforementioned voltage remains at ground; for dots, the collector of Q_3 is at −6 volts and the waveform follows the multivibrator transistor Q_9. The pulse created by Q_9 going from −6 volts to ground at the completion of a dot is differentiated by C_1 and resets the dot flip-flop through CR_3.

Wave Forms

Fig. 3 indicates the various waveforms which would be observed in forming the letter K making use of the dot memory. A "race" condition exists in the logic at the time marked "A." At this point a dot has been completed, and the dash selection contact is closed. The dot flip-flop resets, enabling the dash flip-flop to set. This, in turn, removes the inhibiting action (through R_{43} on the count flip-flop). If all of these actions are completed very rapidly it is possible for the count flip-flop to be switched at the same time, and the dot which should be produced will be "stretched" into a dash. C_3 serves to slow the set of the dash flip-flop slightly to solve this problem. If it is found that a single dot can not be consistently inserted in a string of dashes, a 0.1-μf. capacitor across R_{10} will provide additional margin against this race condition.

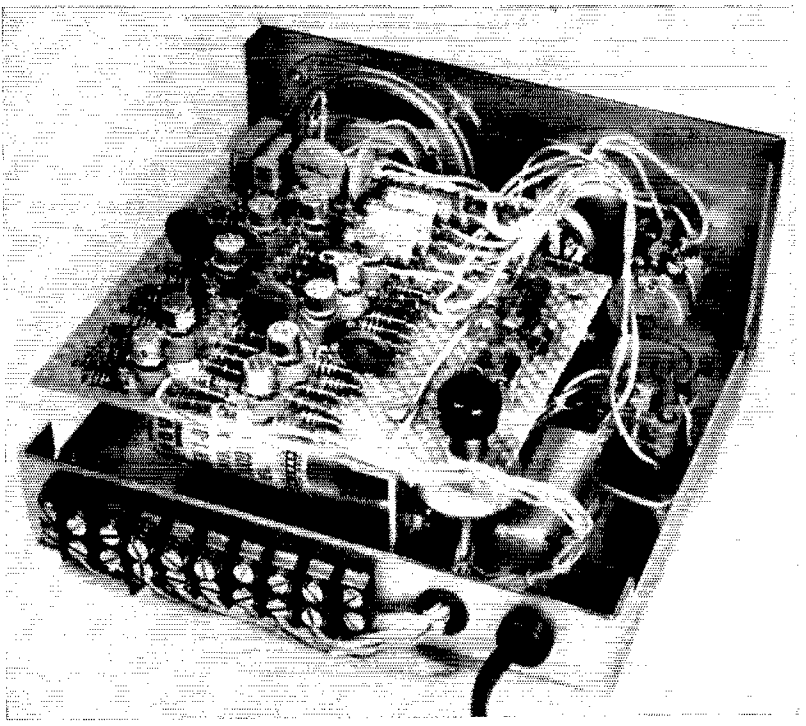
Resistor R_{40} and capacitor C_{11} act to limit somewhat the inductive kick of the relay K_1. The inductive surge is still sufficient to exceed the junction breakdown voltage of Q_{10}. However, it is not great enough to "punch through" the base region, and Q_{10} suffers no permanent damage. A diode should not be used to clip this surge for this would slow the release of the keying relay.

Monitor

The component values in the monitor circuit can be changed to suit the individual taste as to the tone generated. Resistors R_{44} and R_{45} should be as large as possible, however, to keep the "off" current through the relay at a low value. If diode CR_9 were ideal, it would serve no useful purpose but, since it is not ideal, its forward voltage drop helps to isolate the monitor transistor base when the collector of Q_{10} goes to ground and the monitor is turned "on." The break contacts of the keying relay could be used to run the monitor if they are not needed for receiver-muting purposes.

Construction

The keyer is housed in a home-brew cabinet measuring 3 × 6½ × 6 inches and folded up from 1/16-inch aluminum sheet, although any convenient enclosure would do as well. Vector per-



The use of perforated component board facilitates mounting and wiring and results in attractive appearance. Behind the dual-section speed control mounted on the panel are the keying relay and the filament transformer that supplies power for the unit. The interior control in the foreground is the monitor volume control.

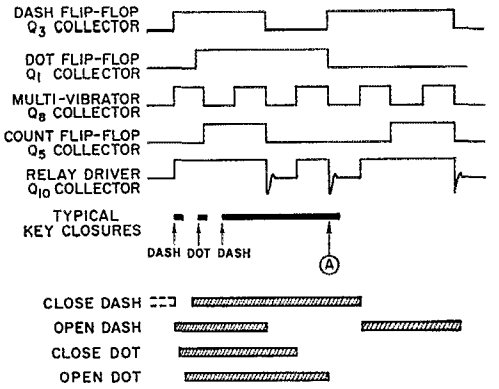


Fig. 3—Waveforms for the letter K using the dot memory. Below is a timing diagram indicating the amount of freedom in timing contact closures for the letter K.

forated board was used as a base for all of the smaller components with the leads merely pushed through the holes in the board and soldered on the reverse side. For a one-of-a-kind job, this technique is much easier than using a printed-wiring board and also results in a more compact layout because leads can easily be crisscrossed, if need be, by the appropriate application of short pieces of spaghetti. The power-supply filter capacitors and wiring board are both mounted on the same U-shaped bracket.

The layout, in general, follows that of the schematic drawing with the dot and dash flip-flops toward the rear and the monitor circuit forward. The monitor volume control, R_{46}, is just above the power transformer and the labeling for the terminal strip is on the underside of the chassis. The relay is shock-mounted on rubber grommets to reduce the noise of its operation.

Check Out and Adjustments

After checking the wiring for errors, turn on the power and see that the power-supply output voltages are plus 6 and minus 6 volts. Adjustments can be made in R_{47} and R_{48} to bring the voltages to these values if need be. Proper operation of the dot and dash flip-flops can be checked conveniently by removing the collector lead of Q_7 and then setting and resetting the flip-flops with a clip lead and a 6800-ohm resistor connected from −6 volts to the flip-flop base terminals. Using the key contacts, it should not be possible to set the dash flip-flop (Q_3 conducting) with the dot flip-flop set (Q_1 conducting). With the collector of Q_7 reconnected, proper on-off control of the multivibrator can be confirmed. The count flip-flop can best be checked by merely seeing that it changes state when dashes have been selected and does not change state for dots. In all but extreme cases, the troubleshooting of the circuit can be accomplished with nothing more than a volt-ohmmeter.

The balance of the multivibrator is not at all critical, but if the conduction period of one of the multivibrator transistors is consistently longer than the other, R_{36} and/or R_{37} may be varied accordingly.

Although this keyer requires only a single transfer contact for operation, a two-paddle key, such as the Nikey[3], with separate levers for dashes and dots, may be used. A reasonable amount of overlapping of dash and dot contact closures does not adversely affect the keyer's operation and prolonged closure of both contacts merely results in continuous dots.

I think that anyone will find the operation of this keyer much easier to master than it would be for simple, self-completing, free-running multivibrator types. Slight variations in letter and word spacing will make the output sound more like a well-adjusted bug than a tape machine, but one does not have to match the relentless rhythm of a multivibrator in order to get any sensible code at all. People who have heard W2VYO recently on 40 or 80 c.w. will attest that mistakes can still be made, but it takes a heap more trying than it used to with the old bug.

QST

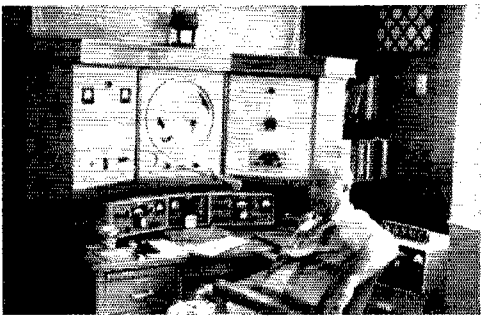
[3] Lefor, "The Nikey," *QST*, July, 1961.

Strays

A new radio club has been formed in Miami, its 65 members being CO/CM hams now living in the United States. Other Cubans residing here are invited to write the activities manager, Rafael M. Estevez, CO2ZQ, 1177 Brickell Ave., Miami 32, Florida, for information about the club.

—•••—

Global Zobel is the name of a syndicated TV show *and* W6NMC. Myron Zobel is an avid ham who has journeyed all over the world with a camera, recording sports car races, bull fights, the Spanish Foreign Legion, and enough other exciting stuff to make up 60 ½-hour shows. This show has been running on WPIX in New York City and if you'd like info on seeing it on a local channel in your area, write directly to W6NMC, Myron Zobel, 8831 Sunset Blvd., Hollywood 69, Calif. Incidentally, Myron's (woops) Global's ham console, a thing of beauty, appears in at least one sequence in every episode.



Global Zobel himself — W6NMC.

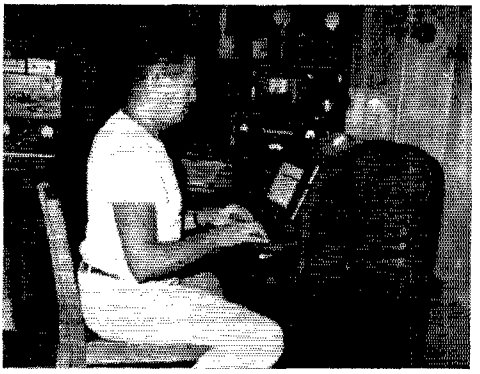
Never before, in the past, have we presented the story of one state's Simulated Emergency Test, except in the body of the annual SET writeup. This year, Florida's SET was preceded by such intensive planning, strictly along AREC lines, that we asked W4MLE who, along with W4IYT, engineered the well-known Florida AREC plan, to give us the lowdown in a special article. Every state is not like Florida, but we hope this article will give emergency-conscious amateurs some ideas applicable to their own AREC groups.

Hurricane SET

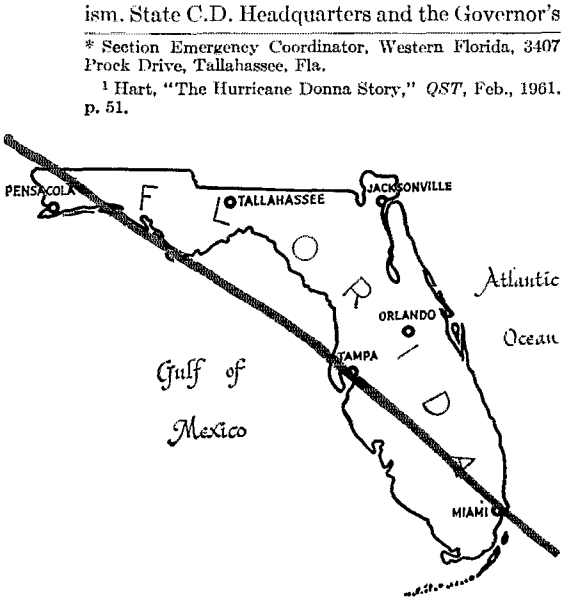
BY GEORGE THURSTON,* W4MLE

THE Florida AREC Communications Plan grew out of our experience with Hurricane Donna in 1961,[1] when no such system existed. Like most plans, it looked fine on paper but was practically untried. The 1961 Simulated Emergency Test gave us the first opportunity to test it "under fire" on a statewide basis.

The most common hazard of statewide proportions in Florida is the tropical hurricane; so one was "fabricated" to our specifications. The specs were simple. We needed a path which would inflict at least gale winds on every county in the state, dump in flooding rains, high tides and, just to add variety, a few tornadoes. The aid of the U. S. Weather Bureau National Hurricane Center at Miami was enlisted to add realism. State C.D. Headquarters and the Governor's Office agreed to originate a pile of traffic. Red Cross at both regional and chapter levels participated extensively. Officials at all levels of state and local government were extremely helpful and cooperative. The Coast Guard even merged its annual hurricane exercise with our Hurricane SET.



W4IET was key RTTY station for Miami. Contact was maintained with thirteen other RTTY stations and 55 messages were handled. Liaison with other Miami stations was maintained by a "party line" 6-meter link.



The route of Hurricane SET, showing key cities. Such a hurricane actually did hit Florida many years ago. This one was dug out of the Weather Bureau's historical files.

To make the SET realistic, the Hurricane Center started issuing simulated advisories beginning October 2, nearly a week before the SET, so Hurricane SET wouldn't just "hit" Florida, it would approach in the normal way and we would get the normal warnings. The advisories were put on all nets to help build amateur participation. After the exercise, which lasted for three days, a review and critique were conducted which pointed up the facts that properly organized amateurs have the ability to handle a large volume of traffic smoothly in a limited time; and have room for much more. Probably more Florida operators made BPL in October than ever before in history. Although Hurricane SET detected some soft spots in the Florida AREC Plan, it proved that a statewide system of emergency communication

* Section Emergency Coordinator, Western Florida, 3407 Prock Drive, Tallahassee, Fla.

[1] Hart, "The Hurricane Donna Story," *QST*, Feb., 1961, p. 51.

is not only desirable, it is also possible and practical. Hurricane SET was an outstanding success.

The Florida Plan

Nets. Before we go any further with the details, perhaps it would be appropriate to outline the salient points of the plan on which this SET was based.[2] The plan consists of five statewide h.f. nets, each with alternative 40- and 80-meter frequencies. During a major alert, all five of these nets are monitored on a 24-hour basis in six key cities: Pensacola, Tallahassee, Jacksonville, Orlando, Tampa and Miami. Within each of these Key cities, each key station can talk to all other stations on a local v.h.f. or 10-meter net, eliminating the need for local telephone lines and liaison stations.

Each of the five high-frequency (80 and 40 meter) nets has a special purpose, as follows:

Net A: a.m., a "command" net for coordinating the over-all operation. Control for all h.f. mobiles.

Net B: a.m., for personal welfare traffic and all higher priorities. Hurricane Donna demonstrated that unless this huge volume of welfare traffic is handled in an orderly fashion, stations will break into other emergency nets and hamper their operation. A.m. stations with personal welfare traffic are thus directed to this net.

Net C: s.s.b., general coverage, picks up traffic from other nets, distributes to destination point. Handles much traffic from Net B during lulls in higher priority traffic. Originates c.d. and weather traffic.

Net D: c.w., principal liaison net for out-of-state traffic, both incoming and outgoing. Maintains liaison with NTS region nets, the National Calling and Emergency Frequencies and Red Cross Regional Headquarters stations in Richmond and Macon.

Net F: RTTY, intended for handling bulk traffic, such as welfare, and direct liaison with Red Cross Regional Headquarters stations.

Nets E through G are v.h.f. and 10-meter nets on statewide frequencies on 10, 6 and 2 meters.

Traffic Priorities. One of the most controversial features of the Florida Plan has been its traffic priority classification system. This was designed to provide certain categories of precedence and to define each category clearly. The priority designator is inserted into the preamble of the message following the station of origin and before the check. It indicates two things about each message: first, its relative importance, guiding the NCS in dispatching it; and second, which AREC net should handle it. The two Florida SECs were under constant pressure to abandon or shorten the 8-category priority system, but it turned out to be one of the happy surprises of SET–1962.

Alerts. To permit SECs to implement the state plan to any degree required by a particular emergency, a system of "alerts" was devised. These are designated as Condition 1 through 4, which start with "stand by" and progress through "limited emergency," "full emergency" and "aftermath," in that order. Each condition can be smoothly expanded as or if the emergency situation becomes progressively worse.

How It Worked

In order to work at all, a plan as comprehensive as this has to be fully understood by all concerned. It was therefore published twice in *Florida Skip* and two printings totalling over 6000 copies have been distributed. Some publicity was also given in *QST* and the League's *(D Bulletin.* As a result, W4CMG, Tallahassee key station for Net "A," said that "all stations in Florida were well informed of the plan." Collier County EC, W4ACT, said "the flood of information reaching us in the mails was responsible for a big percentage of this SET's success."

[2] Send a self-addressed stamped envelope to W4IYT if you want a copy.

Red Cross station K4IWT in Miami was manned by a c.w. team for 161 man hours and handled 439 messages during the 48-hour test. This station was manned continuously for 52 hours, never with less than two operators on duty. In photo, left to right, K4JWM operates on Net "D" (c.w.), K4YSN holds down the 6-meter intercity link and Team Captain K4FMA monitors the Dade Emergency Nets on 2 and 6. These young operators hold up like iron in such tests.

K4YSN, aged 13 and blind, manned the six-meter link in Dade County for about 20 hours in four shifts, handling intercity to and from the Weather Bureau. All traffic was transferred to key station for Net "A", located in same room.

The unique priority system received special attention, and this turned out to be one of the most successful innovations. It was completely understood by almost every operator and correctly used on all AREC nets. Control operators said that during peak periods it was very helpful, and during light periods it was no handicap. Several operators rated it "the most outstanding improvement" over Hurricane Donna operation.

The Key City system performed well, despite vacancies on some nets in some cities. Key City stations manned around the clock accepted traffic listed if there were no immediate takers for it and held it until a station came on the net who could handle it, or used the v.h.f. liaison. Single operator stations in smaller towns picked a single net and stayed there; stations with traffic for that town were then referred to that particular net.

Because of the traffic distribution system in which nets specialized in type of traffic, none of the nets was overloaded. All circuits could have handled a 100 per cent increase without becoming clogged — but none was idle.

Organized v.h.f. nets turned out to be one of the brightest spots of the whole exercise. Central and South Florida v.h.f. nets racked up enormous traffic totals for a 48-hour exercise (800 for one station in Miami alone). These nets served as local distribution systems throughout the lower east coast for traffic dumped into them from the h.f. nets.

Critique

All was not glory and unqualified success. As we expected, Hurricane SET was a good wind which blew some ill. Some messages, like music, kept going 'round and 'round but never came out. Instead of coming to rest at a key station to await clearance, they floated from net to net like lost souls. Propagation conditions were unfavorable at times, too. Western Florida stations were sometimes unable to read controls in Central or South Florida; and such stations for the same reason, often had trouble getting into the net.

Net "B" chose a bad frequency and was not kept busy enough to provide a fair or realistic test of this circuit. The sideband net suffered for lack of representation from some areas, but experienced no communications difficulty and handled a big load of traffic. Much the same can be said for the c.w. net, which handled a lot of traffic but had inadequate geographical coverage. The RTTY net could have handled a great deal more traffic than was offered.

Summary

In summary, Hurricane SET pointed the way to many improvements: more regular drills for Net "B" on a better frequency and with permanent net management; recruiting and promotion must be stepped up for more c.w. operators, more RTTY stations, more North Florida s.s.b. stations, vastly extended v.h.f. coverage, increased emphasis on regular participation in emergency nets and drills.

Hurricane SET also demonstrated rather conclusively that we are on the right track. Despite expected flaws, the revelation of which is one of the principal reasons for *having* a SET, the really surprising thing is that such an enormous operation came off so smoothly and revealed so few major faults. At the most conservative estimate, over 1000 amateurs took part, and many of them really "gave." It "ain't easy" to run 48 hours in a *real* emergency, let alone a test. Thanks without limit go to all those who participated. QST

Amateurs Attend Youth Conference on the Atom

BY CHARLES F. ELLERMANN,* KØFBI

THE 3rd Annual National Youth Conference on the Atom was held in Chicago November 9 to 11. Attending this conference were 297 of the nation's most able high-school science students and their teachers. The National Youth Conference on the Atom presents an authoritative and inspiring picture of the promise of the peaceful atom in its various applications and furthers interest in the study of science in the United States. Among those attending were thirteen radio amateurs who won their right to attend this conference through high scores in tests covering physics, chemistry, math, and nuclear energy. They also entered winning essays on economic problems associated with nuclear physics and the peaceful use of the atom. Two of the 169 teachers attending were also amateurs.

Winning delegates included: Tom Berson, WA2ASJ; Wayne Crosslin, KØSTM; Bruce Donecker, K9QFA; Charles Guenther, KØVSH; Sam Hazlett, K3DOH; Barry Jensen, KØZCU; Ronald K. Masson, KJØBH; Kent Reed, K5UVW; Paul Snopko, ex-KN9VUD; James Sylivant, K4CPW; James E. Westmoreland, III, K4TKN; Tom Wulling, K9APS; and WN8AEE. Paul F. Denson, K9VGD and Charles Ellermann, KFBI were the two teachers.

Delegates attending the three-day conference were addressed by such well-known scientists as Dr. R. Christian Anderson, Assistant Director,

*7239 Moller Ave., Maplewood 17, Missouri

(*Continued on page 130*)

As the radio amateur enters the space age, he finds many terms and concepts that are as strange and unreal to him as "sideband suppression," "front-to-back ratio," and "diode ring modulator" would have been to the well-read, intelligent radio amateur of 1927. A practical, working knowledge of space terms, and the orbital mechanics of a satellite, are of immense help in understanding the antics of Oscar I and II, and will be a "must" if use is to be made of future amateur repeater-type space satellites. This article covers the ABCs of orbital mechanics in simple language and shows how these parameters may largely be determined from the universal tool of space scientists — the Doppler curve. A second article will deal with actual creation of the Doppler curve — something you can do with home-brew Doppler equipment!

Making Your Own Orbital Predictions From Doppler Measurements

BY EDGAR A. HILTON,* W6VKP

From Doppler data, each radio amateur can determine the *time of closest approach* (t.c.a.) and the *slant range* (or straight-line distance) from satellite to receiving station. From this, orbital predictions can be easily made with reasonable accuracy. When data are available from two tracking locations, the satellite *height* and *position* can be determined. The equipment necessary for the Doppler measurements is simple, and directional antennas and frequency standards are not necessary.[1]

As a satellite beacon approaches a receiving station, the apparent transmitted frequency is raised. This is because the velocity of the satellite adds to the velocity of wave propagation. As the satellite passes the point of closest approach to the receiving station, its motion is perpendicular to the path of signal reception and the true transmitted frequency is received. Similarly, as the satellite recedes, the apparent transmitted frequency will be lowered, as the velocity of the satellite subtracts from the velocity of wave propagation. This apparent frequency shift of the received signal is termed the *Doppler shift*, and when plotted against time produces the typical S-shaped curve.

A Satellite's Orbit

Before dealing with the Doppler calculations, let us look briefly at a few properties of the orbit of a satellite. If the earth were a perfect sphere the orbit of a satellite would be essentially fixed in space while the earth rotated within the orbit. In addition, the satellite would follow a path such that the plane of the orbit would pass through the earth's center. The path as projected on the earth's surface would be a great circle if the earth did not rotate.

To be in orbit, a satellite must have an average orbital velocity such that its centrifugal force just balances the force of gravity. The orbit can also be considered as a ballistic trajectory, with the satellite always "falling" toward the center of the earth. As it falls, the earth curves away and the satellite therefore continuously falls around the earth.

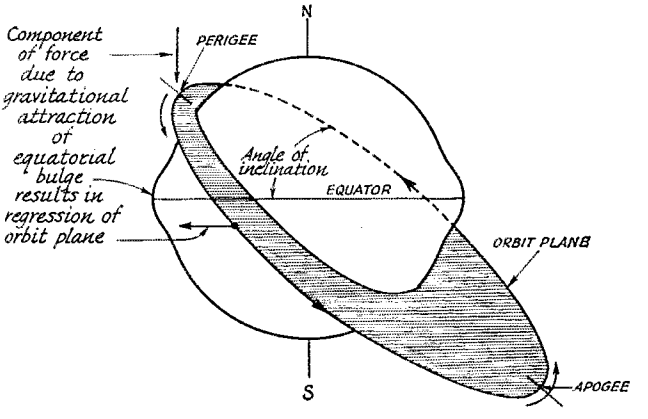


Fig. 1—The plane of the satellite orbit regresses in a westward direction due to the earth's equatorial bulge. The apogee and perigee swing around the orbital plane in an easterly direction.

* Hewlett-Packard Company, Palo Alto, California.

[1] Methods will be described in an article by D. E. Norgaard, W6VMH, to be published in a subsequent issue of *QST*.

The orbit of a typical satellite is more likely to be elliptical than circular. The closest approach to the earth, which is the point of minimum height, is the *perigee*. The farthest distance, or maximum height, is the *apogee* (Fig. 1). At perigee, the satellite has its greatest orbital velocity, which carries it to apogee, the point of lowest velocity.

The earth is not perfectly round and has, in addition, a bulge around the equator due to the rotation. This oblateness of the earth results in greater gravitational attraction in the equatorial regions than at the poles. The enhanced equatorial gravitation attracts the satellite toward the equator and tends to tip its orbit plane as shown in Fig. 1. The orbiting satellite, acting like a gyro, reacts at right angles, which results in a movement of the plane of the orbit to the west. This is the westward *regression* of the orbit plane. The bulge of the equator also causes the orbit to turn on its own plane, swinging the apogee and perigee in an easterly direction. Orbits, of course, are not all inclined as shown in Fig. 1, but may range from full equatorial to full polar orbits. The regression of the plane of the orbit increases as the angle of inclination [2] decreases. The easterly swing or movement of the perigee increases as the angle of inclination increases.

You should now have a picture of the path taken by a satellite as it travels endlessly but not aimlessly through space. Let's look at our own satellite, Oscar.

The Orbit of Oscar I

Oscar I was launched around noon in the month of December in a near-polar orbit. Its direction was *south* from the launching site. After passing over Antarctica it entered the darkness of the earth's shadow and traveled northward. As it crossed the equator in this *south-to-north* direction, orbit No. 1 began. Upon crossing the north polar region, Oscar again entered daylight and proceeded southward to the latitude of the launching site. During this time of flight, however, the launching site moved east because of the earth's rotation under the satellite's orbit. Thus the satellite path, as viewed from the launching site, appeared to have moved to the west. Continuing the flight, Oscar again crossed Antarctica following in its own previous path. However, orbit No. 1 (the first revolution of Oscar) was not completed until the satellite again crossed the equator traveling from south to north. Thus, all revolution or orbit numbers are started on the equatorial crossing of the south-to-north pass.[3]

About 10 hours (several revolutions) later, Oscar crossed the equator going from south to north in darkness, and was again observed in the vicinity of the launching site. This night observation, however, viewed the satellite from the opposite side of the orbit, as the earth had rotated in the interim.

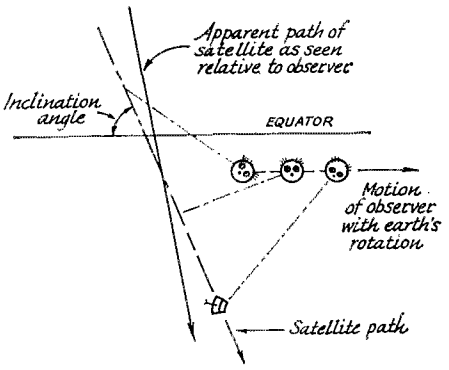


Fig. 2—The apparent path of the satellite as seen by an observer differs from the angle of inclination. The motion of the observer caused by the earth's rotation tips the angle as plotted on a map.

Let's look closer at a portion of the satellite orbit. Oscar was launched at an *angle of inclination* of about 82 degrees (Fig. 1). Therefore, the satellite crossed Antarctica to the east of the south pole as viewed on a world map looking down at the launching site. During a pass, the observer sees an apparent angle of inclination which differs from the true angle because of the observer's motion with the earth's rotation, as shown in Fig. 2. This difference varies with latitude, inclination angle, and the satellite velocity. For Oscar I, this difference was about 3.5 degrees at the equator, which places the *apparent* track (angle of inclination) on the map at about 85.5 degrees. For other locations on earth the difference is less. For high-altitude satellites this effect will be greater.

Doppler Measurement

Let us assume it is possible to place your receiving antenna within a few feet of the beacon satellite's orbit. In this case the received frequency, as the satellite approaches the antenna, will be raised, and as the satellite passes by the antenna the frequency abruptly lowers. Plotting this frequency change graphically against time produces a step function as shown in curve *A* of Fig. 3.

However, your receiving antenna cannot be placed in the path of the satellite, and the Doppler shift as observed from the ground will appear more like curves *B* and *C* of Fig. 3. Curve *B* illustrates a near pass and curve *C* shows a more distant pass. It should be noted that the greatest rate of change of frequency occurs in all three cases when the satellite is closest to the receiving antenna and its path is perpendicular to the path of the received signal. This is the *point of closest approach* (p.c.a.). The *time of closest approach* (t.c.a.) can be determined then as the time when the frequency was changing the fastest. For

[2] The angle of inclination is the angle in degrees made by the intersection of the orbit plane and the plane of the equator, and is also the highest latitude that the satellite will reach.

[3] The portion of Oscar's voyage from time of launch, across Antarctica and north to the equator may be thought of as "Orbit No. 0."

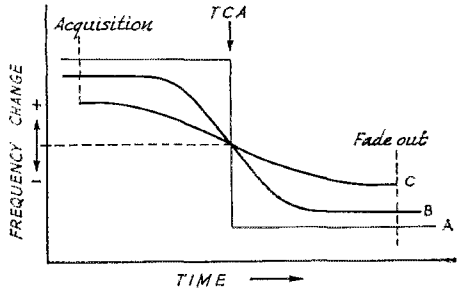


Fig. 3—Graphical plot of the Doppler shift for different distances from the satellite path. A assumes an antenna placed in the path of the satellite, while B and C are for near and distant passes, respectively.

practical purposes, the time of closest approach (t.c.a.) is also the middle of the Doppler curve or a point equal to one-half of the total Doppler frequency change.

Doppler data received from a passing satellite and plotted in graphical form similar to Fig. 3 permit the amateur to get a rough idea of the accuracy of the data, since all the plotted points should lie on a smooth uniform curve. This Doppler curve reveals p.c.a. and t.c.a., and will also be useful in the calculations of slant range as covered later in this article.

The Satellite Period

An *approximate period,* which is the time required to complete one revolution, can be calculated from the t.c.a. of successive passes. As an example, the t.c.a. of pass No. 134 of Oscar I was measured as 92 minutes 9 seconds later than that of pass No. 133, which would indicate an approximate period of 92 minutes 9 seconds. Bear in mind that this is computed from times of closest approach, not latitude crossings, and is only approximate and not the true period. Since the satellite orbit is inclined as shown in Fig. 4, the t.c.a. measurements are perpendicular to the orbit path; this gives a time difference between t.c.a.'s which is greater than the true period. The period observed in this manner should be corrected to the latitude crossings to be of maximum use. The true period is always calculated from some latitude line, usually the equator.

If the period is computed over a day's time – that is, from a pass today to a like pass tomorrow — the error in the period is reduced for two reasons. First, like passes a day apart (pass No. 133 and No. 149) will have less longitudinal separation than successive passes (No. 133 and No. 134) by one-half or less, as shown in Fig. 4. Second, the resulting computed period will be averaged by the total number of passes during that day. In the case of Oscar, the t.c.a. of pass No. 149 was 24 hours 25 minutes later than that for pass No. 133. It was also 16 orbits later. This gives a period of 91 minutes 34 seconds, which is substantially different from the period calculated from successive passes. Similarly, the period can be obtained even more accurately by averaging over longer intervals of time. However beware of a changing orbit! Oscar I was in a decaying orbit, accelerating and coming closer to the earth. This resulted in a continuous shortening of the period as the days went by.

Making Your Own Orbital Predictions

Once the period of an orbit has been established, you can make fairly accurate orbital predictions for your location. Two items are desired in the predictions, the t.c.a. for future passes and the approximate position of the satellite at t.c.a. As mentioned in the previous section, passes No. 134 and No. 149 for Oscar I were approximately one day apart, or 24 hours and 25 minutes apart. Therefore, a pass which is 16 orbits later than No. 149 (pass No. 165) will be 24 hours 25 minutes later, or to say it another way, 25 minutes later the following day. (This is, for the moment, neglecting any changes in the satellite orbit.) Generally, a pass earlier or a pass later can also be received. This is convenient when it comes to checking out your crystal ball. Pass No. 164 in the preceding example would be approximately one period earlier than the computed t.c.a. of No. 165. Likewise, pass No. 166 would be about one period later. If you can pinpoint a few successive passes "on the nose," you are in business!

A Changing Orbit

A low-altitude satellite may be subject to drag from the earth's atmosphere, which causes it to circle closer and closer to the earth. The time of each revolution, or period, then will be continuously shortening. When this occurs the progressively shorter periods should be taken into account in the orbital predictions. If the period is calculated each successive day it will soon be evident that each period reading is less than the preceding one and that the orbit is *decaying.* The amount of decay or rate of change of the period can easily be seen graphically by plotting periods against orbit number as you

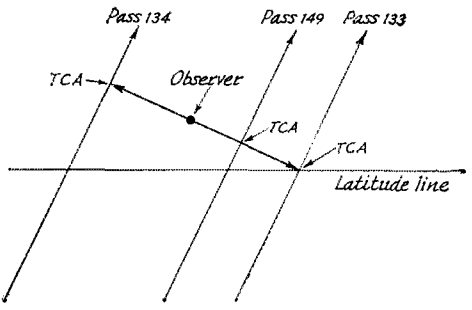


Fig. 4—The time difference between t.c.a.'s of successive passes, such as Nos. 133 and 134, is only an approximate period since it is measured perpendicular to the orbit rather than along a latitude line. More accurate results can be had from day-to-day passes such as Nos. 133 to 149. The smaller error here is further divided by the number of orbits during the day.

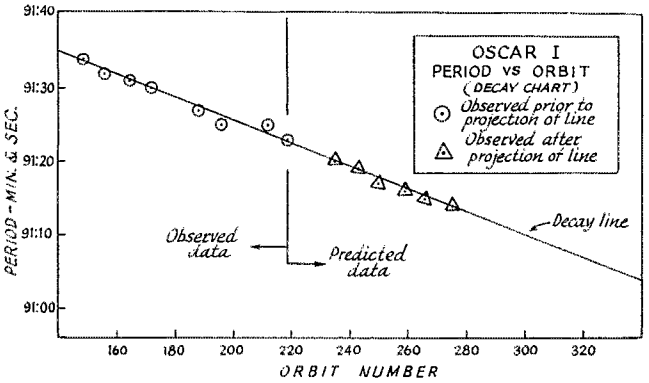


Fig. 5—The orbit of Oscar 1 circled closer and closer to the earth, resulting in continuously-shortening periods. This type of decay chart is helpful in making time predictions.

collect additional data. Fig. 5 shows this plot for Oscar I. This chart was made up at about the time of orbit No. 220, the decay line drawn in and projected to the right of orbit No. 220. The following six measurements fell reasonably close to the line. In making predictions this sort of decay chart will be an aid in predicting the period of future passes.

The Position of the Satellite

The expected position of the satellite at your t.c.a. can be computed from the rotation of the earth and the satellite's period. This is *expected* position, since the satellite may deviate slightly from your prediction because of the regression of the orbit plane. The earth revolves through 15 degrees of arc per hour or ¼ degree of arc per minute. During one satellite revolution the earth rotates through an arc equal to ¼ degree multiplied by the satellite period expressed in minutes. Each successive pass then will be farther west by ¼ period. For example, if Oscar passed 120 degrees west longitude during revolution No. 149, its next pass is expected at ¼ × 91:34 (period) or approximately 23 degrees farther west, or 143 degrees west longitude.

The satellite's orbit is not necessarily an even submultiple of a day, and it has already been determined that Oscar's 16th pass after No. 149 was 24 minutes later the next day. During this 24 minutes, the earth revolves through ¼ degree of arc per minute, which places the next day's pass 6 degrees west of this day's pass. Thus Oscar I's track upon the earth progresses westward on each succeeding day because its period is slightly greater than 90 minutes. If the period were 89 minutes, for example, the track upon the earth would progress eastward each day. If the period were exactly 90 minutes, the track on each successive day would fall upon the same location at equivalent times.[4]

The angular displacement of each day's corresponding pass and the displacement of successive revolutions, together with the time projections, can yield predictions several days in advance with good reliability. After several days of tracking you may notice a deviation between projected satellite position and the position established from measurements (to be covered later in this article). This is the regression of the orbit plane. Once known, the effect of regression can be included in order to correct your position predictions.

[4] There are other periods, of course, where this statement is true. A period of 96 minutes or 15 revolutions per day instead of 16 is an example.

Velocity of the Satellite

The velocity and height above the earth of a satellite are not necessarily constant as it revolves around the earth. The orbit is generally elliptical. At perigee, the velocity is greatest; conversely, at apogee the velocity is lowest. The velocity is important in computing the slant angle and the satellite's position and height. The eccentricity of the orbit is likely to be small compared with the size of the earth. For purposes of calculation, an assumed circular orbit will yield a reasonable average velocity. The velocity (V) then will be

$$V = \frac{D}{P} \text{ and } D = 2\pi(R + h) \qquad (1)$$

where D is the distance traveled during one orbit and P is the period of that orbit. R is the radius of the earth and h is the height of the satellite above the earth. You may not know the height during the first calculation and it will be necessary to assume a reasonable value. For low-orbit satellites an error in this assumption is not serious and can be corrected if the later solution for height differs greatly from that assumed. In calculating velocity, the greatest average velocity expected to be encountered is about 8 kilometers per second.

Calculating Slant Range

The minimum slant range, or distance between satellite and receiving station at p.c.a., can be obtained from your knowledge of the velocity, the maximum slope of the Doppler curve and the transmitter frequency. This is the only situation where the transmitter frequency enters into the calculations, and it need not be known to a high accuracy. For Oscar I calculations, a frequency of 145.0 megacycles was used. A 100-kilocycle error here will contribute less than 1/10 per cent error in the calculated slant range.

It would be nice if the rest of the measurements and calculations were this good! The maximum rate of frequency change or the maximum slope of the Doppler curve can easily be obtained graphically (Fig. 6). As explained in an earlier section of this article, a plot of the Doppler data will give an S-shaped curve with the t.c.a. at the mid-point of the frequency-shift range, or point of maximum slope. By placing a ruler through the t.c.a. point parallel to the slope at the mid-section, a line can be drawn which is the maximum slope. From the extension of this line construct a right triangle as shown in Fig. 6. From the two constructed sides you can read a frequency change and the time interval over which this change is taken. Dividing this frequency change by the time interval gives the maximum rate of change $\left(\frac{df}{dt}\right)$ of the received frequency.

The value of the maximum rate of change $\left(\frac{df}{dt}\right)$ will be under 100 cycles/sec./sec. for 2-meter signals. The accuracy of this figure will be directly dependent on the accuracy of the Doppler measurements, the plotted points, and the accuracy of the slope line drawn in. For best results, keep your pencil sharp!

The equation [5] for computing the minimum slant (r) is:

$$r = \frac{v^2}{\lambda\left(\frac{df}{dt}\right)} \qquad (2)$$

where v is the satellite orbit velocity

λ is the wavelength of the transmitted signal

$\frac{df}{dt}$ is the maximum rate of change in signal frequency as calculated above.

Watch the units on this one! If $\frac{df}{dt}$ is in cycles/sec./sec. and the wavelength (λ) is in meters, then the velocity (v) must be in meters/sec. The slant range will then be in meters, which can be easily converted to kilometers by dividing by 1000. It is suggested that calculations be done in the metric system because of the ease of making conversions. The final results can be converted to desired units.

Finally — The Satellite's Position and Height

Now with a little extra effort and a sharp pencil, it's possible to determine a few extra parameters about your satellite.[6] First, in order

[5] For the derivation of this equation see: Oliver, *Hewlett-Packard Journal*, November 1957, or Stahl, "Doppler Equation for Satellite Measurement," *Proceedings of the IRE*, May 1958, p. 915.

[6] The author is indebted to D. E. Norgaard, W6VMH, for suggesting this solution to the problem.

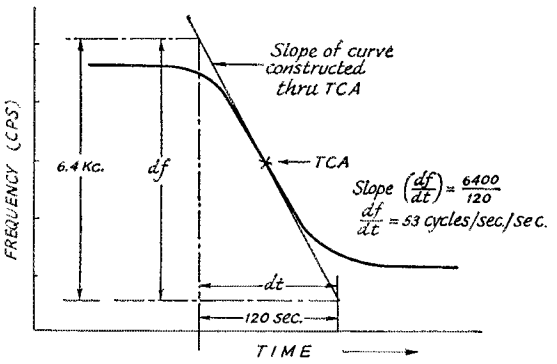


Fig. 6—The S-shaped Doppler curve. The time of closest approach and the maximum rate of change of frequency occur near the center of the curve. The slope is useful in calculating slant range.

to do what is to be proposed, a second tracking station will be necessary to obtain data for triangulation. This second station is best located at a ground distance of about 200 miles from your station to give a reasonable angle to the passing satellite. It is also desirable that the second station be located in an easterly or westerly direction from your station rather than north or south, if a polar-orbit satellite is expected. This may sound like a large order, but there is much interest in the Oscar program and all you need from the other station is his t.c.a. and slant range for the same pass that you copied. It is not necessary that the satellite pass between the two stations; it could be either side of both stations, but, of course, both stations must be able to copy the signal and obtain data from it.

The triangulation problem is shown in Fig. 7 in two sections, the plan view of the satellite path as it would appear drawn on a map, and the elevation view. The distance from station 1 to point x, $(a + b)$ as shown in both views, is

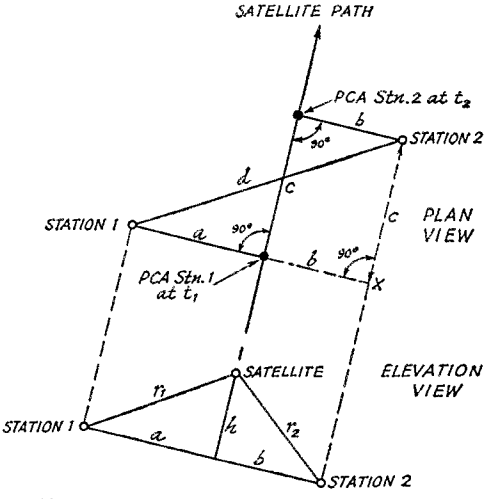


Fig. 7—Triangulation to determine ground distance from satellite path to two receiving stations.

in reality an arc having a radius equal to that of the earth's. (No attempt is made to correct for curvature of the earth's surface or for curvature of the satellite's trajectory.)

From the satellite's velocity (v) and the two times of closest approach (t_1 and t_2) the distance traveled (c) between the two p.c.a.'s is

$$c = v\,(t_2 - t_1) \qquad (3)$$

The time difference $t_2 - t_1$ should be in the same time units as the velocity. Knowing the distance c, it is now possible to solve the right triangle bounded by Station 1, Station 2, and point x, as pictured in the plan view of Fig. 7.

Then

$$(a + b)^2 = d^2 - c^2 \qquad (4)$$

$$\text{or } (a + b) = \sqrt{d^2 - c^2}$$

where d is the known ground distance between the two stations and can be computed from the latitude and longitude of each station or scaled from a map.[7]

In the elevation view two triangles are formed, one from each station. From these:

$$h^2 = r_1^2 - a^2 \text{ and } h^2 = r_2^2 - b^2 \qquad (5)$$

where h is the satellite's height above the earth,

r_1 and r_2 are the slant ranges observed at stations 1 and 2, respectively, at their respective t.c.a.'s (see formula 2).

a is the ground distance from Station 1 to the satellite's position at p.c.a.

b is the ground distance from Station 2 to the satellite's position at p.c.a.

By combining these equations:

$$r_1^2 - a^2 = r_2^2 - b^2$$

or

$$r_1^2 - r_2^2 = a^2 - b^2$$

then

$$a - b = \frac{r_1^2 - r_2^2}{(a + b)} \qquad (6)$$

By solving equations 4 and 6 simultaneously:

$$2a = \frac{r_1^2 - r_2^2}{(a + b)} + \sqrt{d^2 - c^2}$$

then

$$a = \tfrac{1}{2}\left[(a + b) + \frac{r_1^2 - r_2^2}{(a + b)}\right] \qquad (7)$$

$$b = (a + b) - a \qquad (8)$$

When solving these equations it is possible for the ground distance a or b to come out negative. If a should be negative, then the satellite passed to the left of Station 1 as viewed in Fig. 7, and conversely, if b is negative, it passed to the right of Station 2. When both a and b are positive, the pass was between the two stations. If both a and b are negative, it is best to start over! You goofed!

Now, having both distances a and b computed, the position of the satellite track is known and can be marked on a map. From equation (5) the expression for the satellite height is:

$$h = \sqrt{r_1^2 - a^2}$$

or

$$h = \sqrt{r_2^2 - b^2} \qquad (9)$$

There have been a few assumptions here other than that Oscar's path is a straight line and that the earth is flat. These other assumptions involve velocity based on an assumed height, and slant range based on this velocity. But all these assumed values have now been computed. For those who wish to go farther, the computed values can be "plugged in" in place of those assumed and the whole process done over again. If the errors in assumed value were in the order of 10 per cent, the corrected values will be much improved. In this fashion you can "zero in" on the correct answer. The limiting factors will be the equations based on plane geometry and the accuracy of the original input data.

Remember that most of the numerical figures shown in this article are for Oscar I and that the period, inclination angle, height, and velocity are likely to be different for other satellites. Those parameters dealing with the earth's rotation we dearly hope will remain the same.

We had a lot of fun following Oscar on those sleepless nights. We enjoyed trying to see how closely we could predict future passes and even tried to predict the time of acquisition and fade. In a few cases the signal was acquired within a few seconds of the estimated time and we were rarely off as much as a minute. It was felt others can have fun at it, too, and this has been the inspiration for this article.

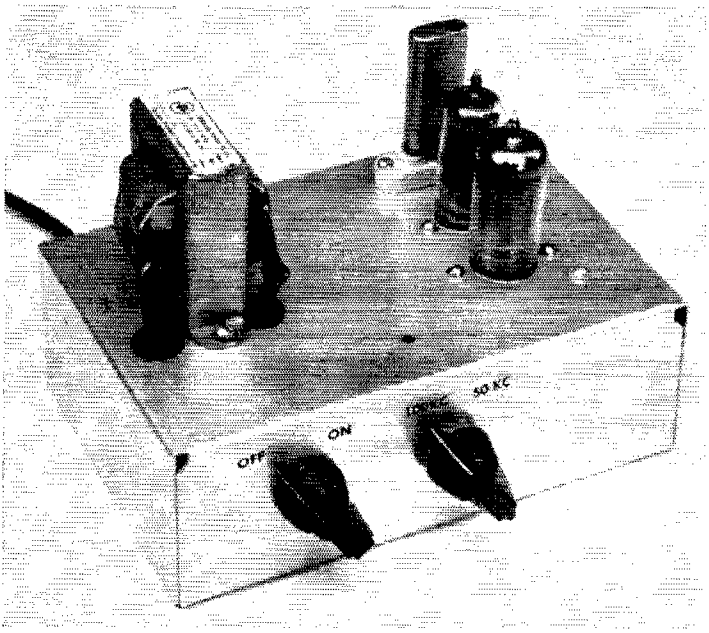
It is admitted that these calculations are only a first-order approach and that many refinements such as curvature of the earth, the orbit, and effects of propagation could be brought in to improve the accuracy. However, with this rough approach it was found that the t.c.a. can be predicted within a few seconds and slant ranges calculated to a probable 10 per cent. This is more than sufficient to prevent you from missing the next pass.

I would like to express my appreciation to Don Norgaard, W6VMH, for his participation and assistance in this program and the preparation of this article, to Dr. B. M. Oliver for his technical assistance and advice, and to the members of the HP Amateur Radio Club for their participation and support. QST

[7] FAA sectional charts available at your local airport or from FAA, Washington, D. C., are excellent for this purpose. The scale of these maps is ⅛ inch per statute mile.

Strays

W9ASO has called our attention to some county outline maps available from the Superintendent of Documents, Government Printing Office, Washington 25, D.C. Individual state maps (35¢ each) are on sheets 36 by 48 inches, each sheet containing one state except for Mass., Conn., and R.I., Vt. and N.H., and Md. and Del. A U.S. map is available for 50¢, printed either all in black or else state boundaries in black and county boundaries in blue, on a sheet 26 by 41 inches.



This is a view of the completed unit. On top, at the left, is the power transformer. At the right, from front to back, are V_2, V_1, and Y_1 in that order. The switch at the left front of the chassis is S_1 and S_2 is at the right.

A 50-Kc. Marker Generator

BY LEWIS G. McCOY*, W1ICP

QUOTING from the FCC regulations for amateurs, there is the following regulation that must be observed by all amateurs: "12.135. *Frequency measurement and regular check.* The licensee of an amateur station shall provide for measurement of the emitted carrier frequency or frequencies and shall establish procedure for making such measurement regularly. The measurement of the emitted carrier frequency or frequencies shall be made by means independent of the means used to control the radio frequency or frequencies generated by the transmitting apparatus and shall be of sufficient accuracy to assure operation within the amateur frequency band used." Using crystal control for a transmitter does not meet the requirements given in the above regulation. The means for measuring the transmitter frequency must be independent of the transmitter.

Naturally, the first question the amateur is going to ask is, "How can I measure my frequency, and do it in a manner that will satisfy FCC?" Actually, it can be done both simply and inexpensively. The station receiver can be used for the purpose if you have some means of accurately marking the band edges. You cannot depend on the band-edge markings of any receiver unless the calibration is checked against a frequency standard. For amateur purposes, a frequency standard usually consists of a crystal-controlled oscillator using either a 100-kc. or 1000-kc. crystal. The harmonics from such an oscillator will be generated every 100 kc. or 1000 kc., depending on which type is used. These harmonics can be used to calibrate or confirm the calibration on your receiver. About this point the reader will probably ask the one-hundred-dollar question, "How can a 100-kc. crystal oscillator be any more accurate than the crystal in my transmitter?" The answer is that the 100-kc. crystal oscillator can be checked against the U. S. Bureau of Standards radio station, WWV. More about this later.

The one difficulty in using 100-kc. markers is that not all of our bands and subbands start and end at 100-kc. points. We have several bands where a 50-kc. marker is needed, such as the 80-meter Novice band, 3750 to 3800 kc. For this reason a marker generator is needed that will put out signals at 50-kc. intervals. It is possible to use a 100-kc. oscillator to produce 50-kc. markers. What is required is a "multivibrator" oscillator. A multivibrator of the type used here consists of two resistance-coupled stages which

* Technical Assistant, *QST*.

are connected to each other so that the output of one stage is fed to the other stage, and the output of the second stage is fed back to the first. This leads to regenerative action and self-oscillation, but since there are no tuned circuits, the waveform contains many harmonics. Also, such an oscillator is rather unstable when running free. However, when the correct component values are used, and a stable signal (such as our 100-kc. oscillator) is fed into the circuit, the multivibrator can be made to "lock in" on certain submultiples of the stable signal. In this way we get stable 50-kc. markers from a 100-kc. signal.

Circuit Details

The calibrator uses a 6AU6 as a 100-kc. crystal-controlled oscillator. C_1 is a capacitor which is used to adjust the crystal frequency. S_2 is installed in the calibrator so that either 100-kc. or 50-kc. markers can be used as needed. When S_2 is switched in its first position, the plate voltage is removed from the 12AU7 and the output of the 100-kc. oscillator is fed to the output terminal. In the second position, plate voltage is connected to the 12AU7 and the 100-kc. oscillator is fed into the multivibrator, while output from the multivibrator is connected to the output terminal. This unit will produce harmonics of sufficient amplitude to be heard up to and including the 28-Mc. band.

The calibrator has its own power supply consisting of T_1, CR_1, and a filter network using capacitor input. Output voltage from the supply is approximately 130 volts d.c. If desired, the builder can eliminate the cost of the supply and obtain the necessary power from his receiver. Power requirements are about 130 volts at 15 ma. and 6.3 volts at 0.45 amp.

S_1 is a single-pole three-position wafer switch with an a.c. switch mounted on its back. In the first position the calibrator power supply is turned off. In the next position the power supply is turned on, but the positive B voltage is not fed to the unit, and in the last position the calibrator is turned on.

Construction Information

The unit shown in the photographs was built on a 2 × 4 × 5-inch aluminum chassis. This size could be reduced if a power supply were not built as a part of the unit. There is nothing critical about the placement of the parts. In our calibrator, the power supply was mounted on one side of the chassis and the oscillator on the other. Standard terminal tie points were used in both the power supply and oscillator sections to provide connection terminals for the various components.

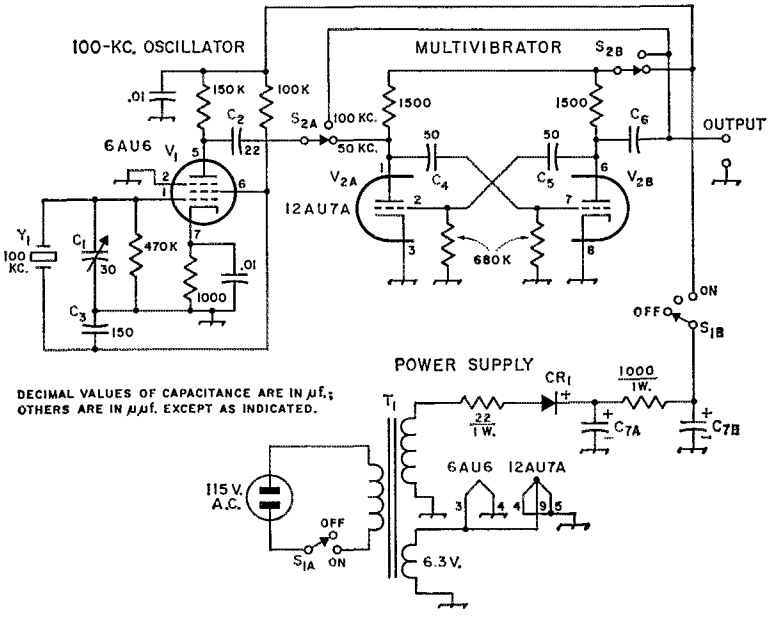
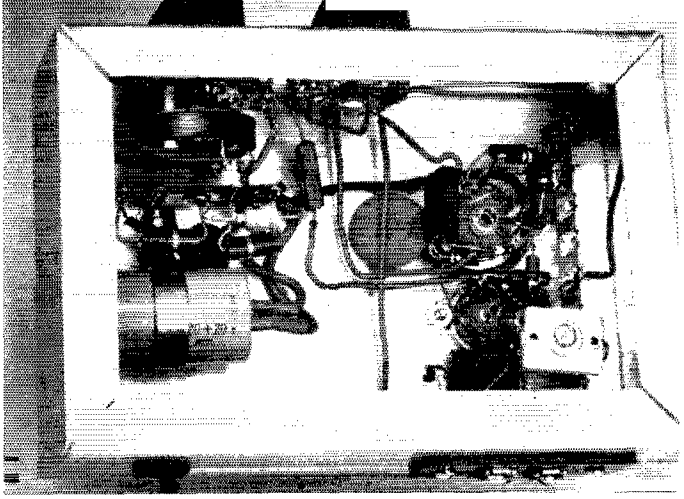


Fig. 1—Circuit diagram of the 50-kc. marker calibrator. Resistances are in ohms, resistors are ½ watt unless specified otherwise. Fixed capacitors with decimal values are disk ceramic, others are mica, with the exception of C_6 (see text) and C_7 which is an electrolytic.

C_1—3–30 μμf. mica compression trimmer.
C_2—22-μμf. mica.
C_3—150-μμf. mica.
C_4, C_5—47-μμf. mica.
C_6—See text.
C_{7A}, C_{7B}—20-μf.-per-section dual electrolytic, 150 volts.
CR_1—Silicon rectifier, 400 volts p.i.v. (International Rectifier SD94, Sarkes-Tarzian 1N1084, RCA 1N540, GE 1N1695).
S_1—Single-pole, three-position wafer switch with a.c. switch mounted on rear (Centralab 1465).
S_2—Two-pole, three-position wafer switch, two positions used (Centralab 1472).
T_1—Power transformer, 125 volts, 15 ma., 6.3 volts, 0.6 amp. (Stancor PS-8415).
Y_1—100-kc. crystal.



In this bottom view the power supply components are grouped at the left hand side of the chassis. At the right are the components for the 100-kc. oscillator and the multivibrator circuits. The capacitor at the lower right corner is C_1. A two-terminal binding post (on the chassis back) is used for the output connector.

C_6 is a "gimmick" capacitor consisting of one turn of insulated wire wound around the 1500-ohm resistor lead that is connected to Pin 6 of the 12AU7. We used Belden type 8491 hookup wire, which is a No. 20 solid tinned wire with cellulose acetate insulation. However, any insulated wire should work.

Adjustment Procedure

There is only one important point in setting up the calibrator for operation with your receiver and that is adjusting the 100-kc. oscillator. WWV is the primary frequency standard used by radio stations in the United States. WWV is located near Washington, D. C., and transmits on 2.5, 5, 10, 15, 20, and 25 megacycles. Also, WWVH in the state of Hawaii transmits on 5, 10, and 15 Mc. Tune in WWV on your receiver, selecting whichever frequency gives the best signal. Next, connect the output from the calibrator to the antenna terminal of your receiver. In listening to WWV you'll note that there are time-signal ticks accompanied by a modulated tone. The tone is on for three minutes in each five-minute period, followed by just the carrier modulated only by the time ticks for a two-minute interval. There is a voice announcement in the last ten seconds of each five-minute period. During the two-minute period when the tone is off, adjust C_1 (use an insulated screwdriver) and you will hear the harmonic from the calibrator as it approaches zero beat with WWV. The exact setting of C_1 can be found by observing the slow pulsation of the background noise as the harmonic comes close to zero beat. Adjust C_1 to where the pulsation ceases or occurs at a very slow rate. Don't try to adjust C_1 when the tone is on from WWV as it is difficult to determine exact zero beat. Once you have C_1 adjusted, the calibrator is ready for use as a standard.

In case you don't have a receiver that tunes to WWV and cannot borrow one, there is another way to check the accuracy of the calibrator. Nearly everyone has a broadcast receiver, and a.m. broadcast-station frequency assignments are at exact multiples of 10 kc. You should be able to find a station in your area whose frequency will be at either a 100- or 50-kc. point. Use the same method of adjusting C_1 as outlined for checking against WWV.

Even without adjusting C_1, about the most the calibrator can be off is 3 kc. at 21 Mc. Incidentally, if your receiver doesn't tune WWV you may want to fix it so it will. A recent *QST*[1] carried the construction details of a simple converter that will do the job.

Make sure in checking the calibrator that the 50-kc. markers are actually at 50-kc. intervals. It is possible for a multivibrator to lock in at different points such as 25 kc. or 33.3 kc. and even 10 kc. If this should happen, check values of C_4, C_5 and the two 680,000-ohm grid resistors for the 12AU7. If these component values are wrong, you can run into the problem of different frequencies than 50-kc. markers.

Checking Your Receiver Calibration

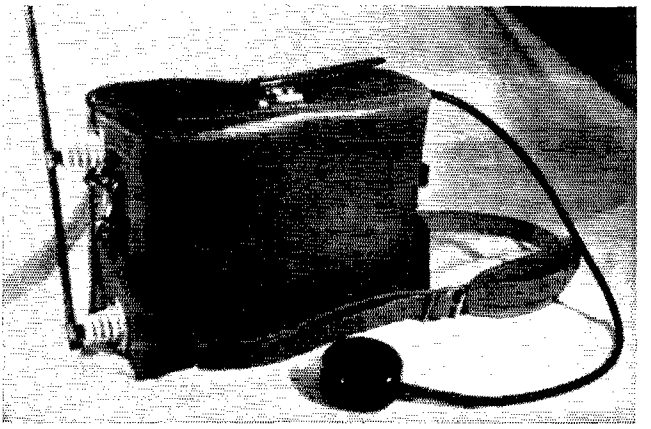
If you have a two-dial receiver, general coverage and bandspread, set the general-coverage dial to whatever setting is specified for the correct bandspread-dial readings. You'll find this information in your instruction manual. Turn on the calibrator and use the switch position of S_2 that gives 100-kc. markers only.

One difficulty with a two-dial receiver is that it may be difficult to determine which 100-kc. signal you are listening to. You can usually tell by listening to the stations near the frequency. For example, you can spot the edges of the phone bands by the phone stations. The low or high ends of an amateur band can be spotted by commercial stations. In this manner you should be able to spot the correct 100-kc. signal for the band edge.

By experimenting with the tuning of the general-coverage dial you should be able to bring the bandspread dial into correct calibration. Once you have set up the receiver for the correct 100-kc. markers you can switch S_2 for the 50-kc. signals for checking the sub-band edges. Make a note of the general-coverage dial setting so you can return to the same setting in the event you change bands. This adjustment procedure should not be a problem if your receiver is a ham-bands-only type. QST

[1] Grammer, "WWV on Your Ham-Band Receiver," *QST*, September, 1961.

While there may be areas in amateur equipment where a "So what?" attitude toward transistors is justified, this certainly doesn't apply to the portable and mobile field where transistors are virtually revolutionizing the art. Here's a complete "personal portable" 6-meter station weighing less than 13 pounds, including heavy-duty batteries. The receiving section makes use of units available on the market.



A camera "gadget" bag makes a convenient carrying case for the "Heavyweight." The antenna is a 44-inch loaded whip supported on standoff insulators. The microphone is an F-1 mounted in a plastic case.

The "Heavyweight"

2-Watt All-Transistor Portable 6-Meter Station

BY ROBERT W. VREELAND,* W6YBT

UNTIL recently, builders of transistor v.h.f. ham gear have had to be satisfied with power outputs of the order of 100 milliwatts. Recently-developed silicon mesa transistors are capable of outputs in excess of one watt.

The transmitter in the "Heavyweight" walkie-talkie unit shown in the photographs runs a little over two watts of input, puts out more than ¾ watt and weighs 12½ pounds. Its useful range is a couple of miles in the city or 20 to 30 miles from a hilltop. Power is provided by four inexpensive 6-volt lantern batteries. Construction of the unit is simplified by the use of a commercially-available 6-meter converter and a transistor broadcast receiver. All sections are combined in a package that fits into a 4½ × 8½ × 11-inch leather camera-gadget bag.

Transmitter

The transmitter circuit is shown in Fig. 1. A 2N696 (Fairchild or Pacific Semiconductors) n-p-n transistor serves as a 50-Mc. third-overtone crystal oscillator. The output was increased by using a fixed-tuned circuit (L_2C_2) instead of an emitter choke. The frequency-spotting switch S_1 removes power from the buffer and final and turns on the converter. In the transmit position, oscillator power is increased by paralleling R_1 with the 2200-ohm base resistor.

The oscillator drives three parallel 2N1396s (RCA) in a buffer amplifier. The 22-ohm resistors provide protective bias and help to equalize the load distribution. Since the stage is heavily loaded by the final, neutralization is not needed.

A 2N1505 (Pacific Semiconductors) serves as the final amplifier. The circuit is inductively neutralized. The emitter choke keeps r.f. out of the metering circuit. The output circuit is a conventional tuned tank with a coupling tap to the antenna.

The alternation of n-p-n and p-n-p types avoids the need for coupling capacitors and chokes.

Modulation is provided by Class B 2N270s (RCA) driven by a 2N363 (Raytheon). Speech clipping may be achieved by the simple expedient of overdriving the modulator. The high frequencies produced by clipping are attenuated by a

*36 Magee Ave., Mill Valley, Calif.

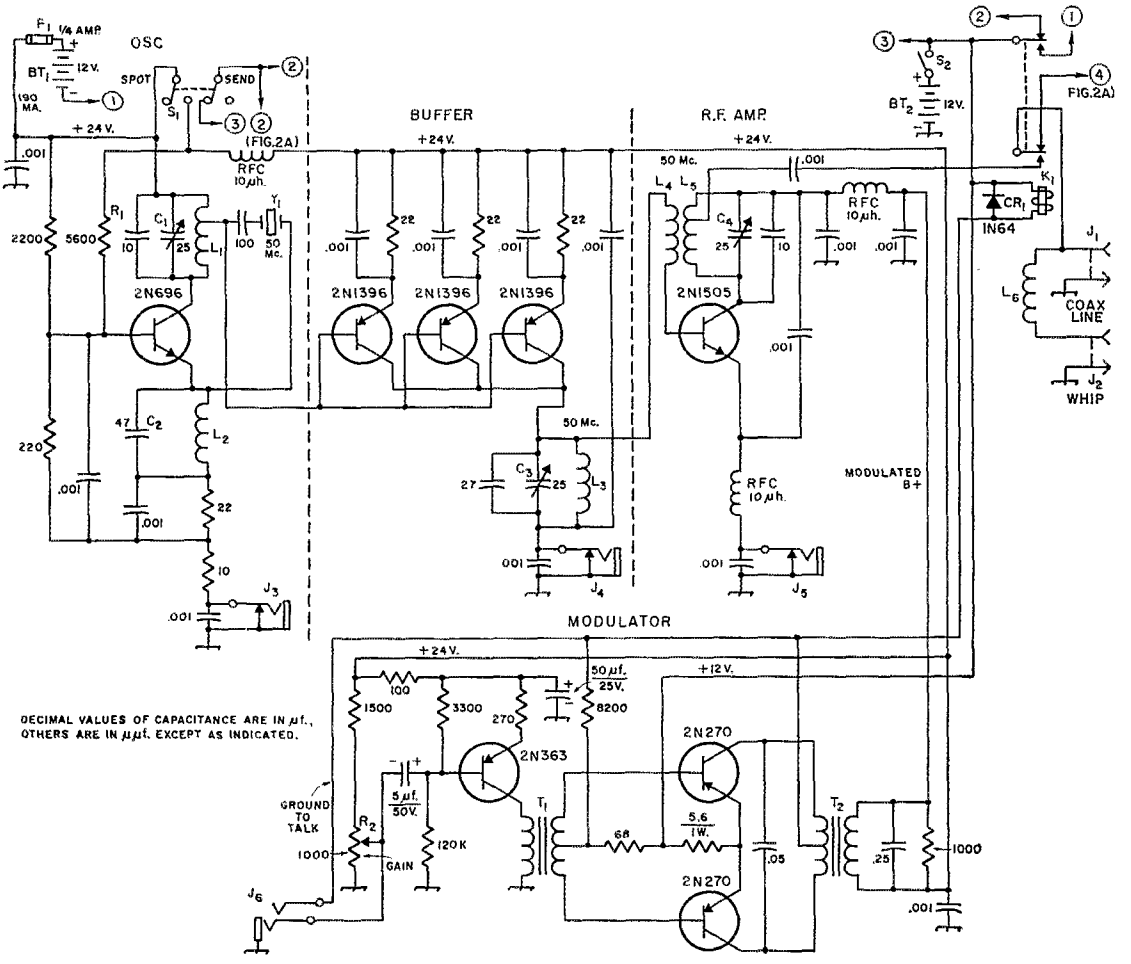


Fig. 1—Transmitter circuit of the "Heavyweight." Dashed lines indicate breakdown into individual units. Resistances are in ohms and, unless indicated otherwise, fixed resistors are ½ watt. Fixed capacitors of less than 0.001 μf. are mica or stable ceramic; others are disk ceramic except those marked with polarity which are electrolytic.

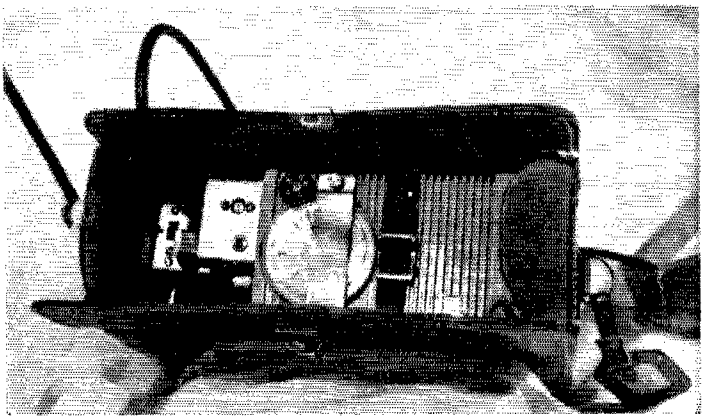
BT_1, BT_2—Two 6-volt lantern batteries in series (Burgess F4BP).
C_1, C_3, C_4—APC-type air trimmer.
C_2—See text.
CR_1—Germanium diode.
F_1—Slow-blow fuse.
J_1, J_2—Phono jack.
J_3, J_4, J_5—Closed-circuit jack. (Switchcraft Tini Jax)
J_6—Three-conductor jack.
K_1—D.p.d.t. 12-volt relay (Advance MK/2C/12VD).
L_1—5 turns, tapped at 3½ turns from collector end.
L_2—5 turns.
L_3—8 turns.
L_4—3 turns, plus 2 turns of plastic-covered wire wound over the 3 turns (see amplifier photo).
L_5—4½ turns, tapped at 2½ turns from collector end.
L_6—3 turns.
All above coils ½-inch diam., 8 turns per inch, No. 18 wire (B & W 3002 or Air Dux 408 coil stock.)
R_1—See text.
R_2—Miniature carbon control, audio taper. (Centralab B16-109).
S_1—D.p.d.t. slide switch.
S_2—S.p.s.t. slide switch.
T_1—Transistor driver transformer: 10,000-ohm primary, 3000-ohm c.t. secondary, 100 mw. (Argonne AR-108).
T_2—Modulation transformer: 100-ohm c.t. primary, 100-ohm secondary, 500 mw. (Triad TY-61X, secondary and primary reversed).
Y_1—50-Mc. crystal, third overtone, FA-5.

capacitor across the modulation transformer, and splatter is negligible. Diode CR_1 was placed across the change-over relay winding to absorb the inductive kick that would otherwise be transmitted back to the 2N270s in the modulator.

Construction

Careful shielding of all r.f. stages is essential. The oscillator and buffer are built into separate 2¾ × 2⅛ × 1⅝-inch boxes (Bud CU-3000). Boxes measuring 4 by 2⅛ by 1⅝ inches (Bud CU-3002) are used for the final and modulator.

The oscillator and buffer transistors are mounted in heat sinks made by soldering sheet-brass strips to grid caps. Heat transfer can be enhanced by filling the gaps between the transistor and grid caps with General Cement No. 21-1 silver printed-circuit paint. The manufacturer's heat sink is used with the 2N1505 in the final.



The metal strip across the face of the b.c. receiver dial is a dial lock. The small dial is for the 30-$\mu\mu$f. input trimmer. The strap binds the b.c. receiver to the batteries below. To the left is the end of the oscillator compartment where J_3 and screwdriver-adjusted C_1 are mounted.

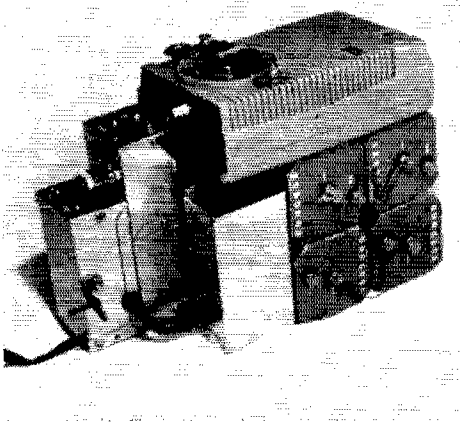
The 2N1396 and 2N270s cases are grounded; the other transistors are insulated from ground by mounting them on bakelite boards. In the modulator, the 2N270s are mounted in holes in a grounded aluminum heat-sink bar.

Transmitter Adjustment

The antenna is a 44-inch telescoping whip mounted on standoff insulators attached to the side of the carrying case. The whip is baseloaded by the coil L_6. The bottom of the whip is connected to J_2. J_1 is provided for feeding a coax line if desired.

The oscillator current should be about 40 ma. at J_3. With the antenna connected, C_1 and C_3 should be adjusted for maximum current at J_5, while C_4 is adjusted for the dip in current indicating resonance. The current at the dip point should be 100 to 125 ma. The current at J_4 should be near zero, since the buffer collector current and final base current flow in opposite directions.

Final-amplifier neutralization may be checked by disconnecting the antenna and pulling out the crystal. If the final emitter current is more than a few milliamperes (at J_5), connections to L_4 should be reversed.



This photo shows the various units grouped to fit the carrying case. From left to right are the r.f. amplifier, oscillator (above) and buffer (below), modulator, and the b.c. receiver and batteries. Hidden behind the modulator unit is the 50-Mc. converter. The crystal and S_1 protrude from the oscillator box. S_2, the modulator-gain control, and the microphone jack are mounted in the top end of the amplifier box, which also encloses the antenna relay. The buffer and final metering jacks and tuning controls are mounted in the bottom ends of the respective boxes. They are accessible through small holes in the bottom of the leather case.

Receiver

The receiving section consists of an International Crystal Co. "Mobilette 61" converter working into a Motorola portable transistor broadcast receiver which serves as a tunable i.f. section covering about 1 Mc. for each converter crystal. An antenna input trap was added to the converter, as shown in Fig. 2A, to reduce interference from f.m. broadcast stations. The 20-μf. capacitor originally across the power input was

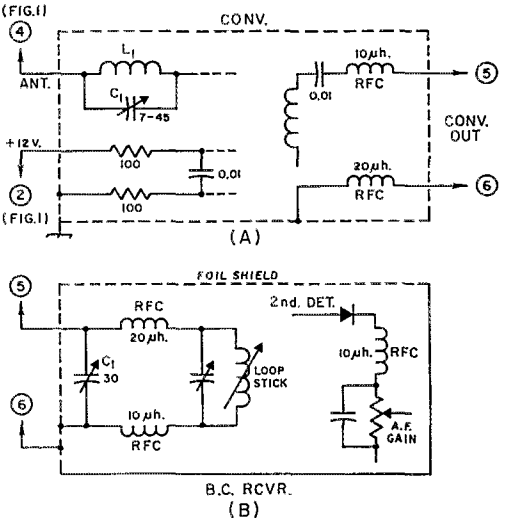
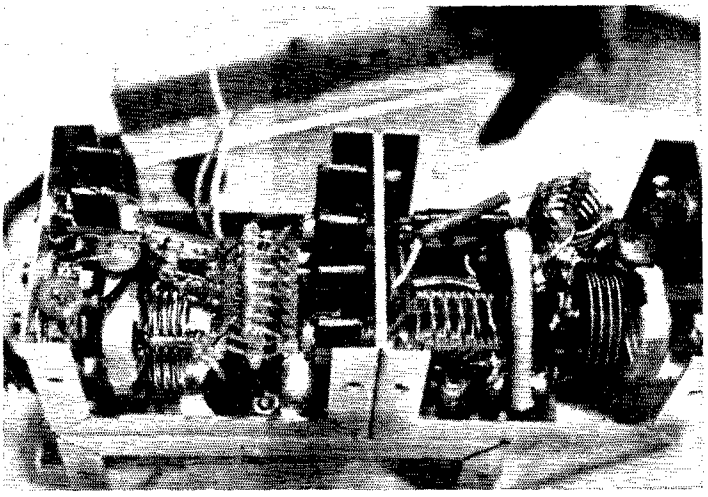


Fig. 2—A—Converter modifications. C_1 is a ceramic trimmer. L_1 is a 5-turn winding 3/8-inch diam., 3/16 inch long. B — Broadcast-receiver modifications. C_1 is a 30-$\mu\mu$f. miniature air variable. Components not labeled are original.



The oscillator compartment is to the right and the buffer section to the left. The several metal fins are heat sinks (two fins to each sink) made as described in the text. All air trimmers are mounted on spacers to recess the shafts.

changed to a 0.01-μf. disk for fast push-to-talk operation.

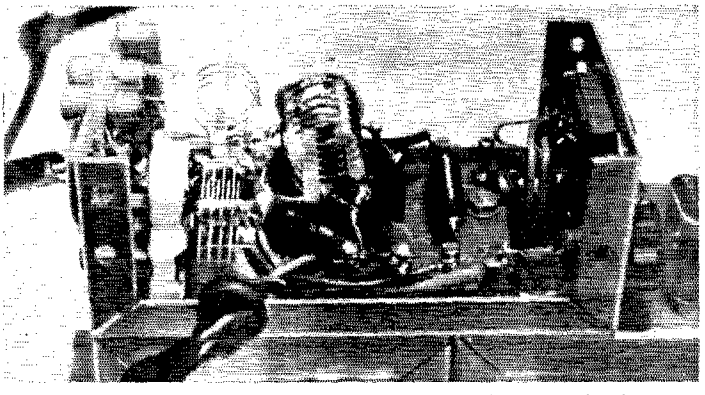
The broadcast receiver is left on during transmissions, so it was necessary to take rather drastic measures to eliminate interference. R.f. chokes were inserted in the output of the converter, as shown in Fig. 2A, to prevent 50-Mc. feedthrough from the converter. They are mounted inside the bottom of the converter box. Additional isolation is provided by chokes at the input of the broadcast receiver as shown in Fig. 2B. A 30-$\mu\mu$f. trimmer was also added at this point. Another r.f. choke was inserted, as shown, to prevent 50-Mc. rectification at the second detector. A shield was made by lining the bottom cover of the b.c. receiver with aluminum foil, and extending the foil up along the input side of the case and anchoring it to the b.c. input connector. This problem could be avoided by using a 12-volt broadcast receiver operating from the converter supply. The Motorola receiver operates from a 6-volt center-tapped battery which makes it difficult to switch along with the converter.

Operation

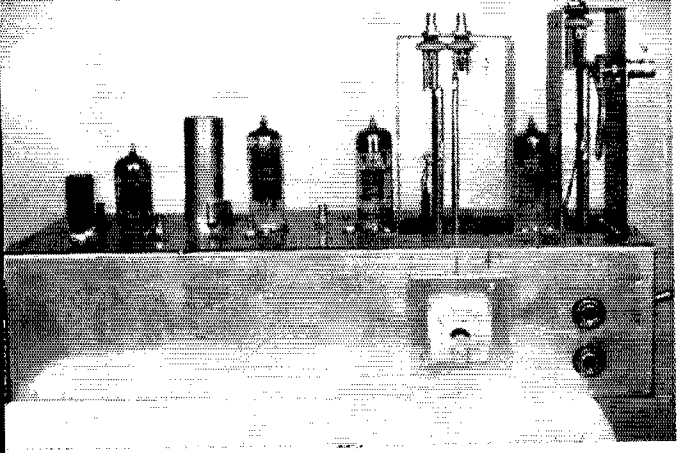
Battery drain from BT_1 is zero for receiving, and 190 ma. for transmitting. The load on BT_2 is 7 ma. while receiving, and 270 ma. while transmitting the unmodulated carrier. Maximum modulation increases the drain to 380 ma.

From a good hilltop location we have had solid contacts with stations 20 to 30 miles away. The only problem has been to convince the receiving operator that we are really operating walkie-talkie.

Experimentation has led to a "counterpoise" arrangement that greatly reduces fading while the operator walks around. The unit is normally used with a sling over the operator's right shoulder that brings the unit to the operator's left hip, with the whip slightly to his rear. The "counterpoise" consists of two pieces of test-prod wire. One of these is cut to a length of 42 inches. One end is wound around the lower antenna standoff insulator to form three turns and then attached to the unit "ground." The other end of the wire drops straight down. The second piece of wire is 59 inches long. One end is attached to the unit "ground." The other end is then brought around the operator's rear waist, tucked through his belt at the right hip and then dropped straight down along the right leg. QST



The final amplifier. The antenna loading coil is behind the tank capacitor. The tank coil with its neutralizing winding is to the right, suspended above the 2N1505 and its heat sink.



Reasonable U.H.F. Efficiency in a Small Package

The 432-Mc. transmitter is built on a sheet of copper screwed to an inverted chassis. Housings for the tuned circuits at the right are also of flashing copper. The milliammeter is permanently connected in the amplifier grid circuit.

The choice of tubes available to the amateur working in the 420-Mc. band is very limited, particularly if he is interested in low power at moderate cost. The 6939 twin pentode is one of the few tubes that work well at this frequency. Here are ideas for its use in a small transmitter or exciter.

Five Watts at 432 Mc. With the 6939 Dual Pentode

BY J. M. FILIPCZAK,* K2BTM

THE 6939 is a twin-pentode tube designed especially for u.h.f. service. It is similar to the 6360, but more compactly built, for a higher upper limit of frequency. Two of them are used here, one as a tripler and the other as an amplifier, to give an output of about 5 watts at 432 Mc. The tube has built-in neutralization for stable operation in the u.h.f. range. Frame-type grids contribute to the tube's high power sensitivity. At 500 Mc. the 6939 requires 1.2 watts of drive for 5 watts output. Those accustomed to tube performance at lower frequencies may not tend to think of this as high power sensitivity, but few tubes will do as well at 500 Mc.

Circuit Details

An exciter of somewhat more complexity than is common in v.h.f. design is used in the interest of stable operation and adequate drive at 432 Mc. The crystal oscillator is the triode unit of a 6EA8, V_{1A}, an overtone oscillator with crystals intended for fundamental operation in the 8-Mc. range. Oscillator output is on 24 Mc., and overtone crystals for this frequency range may also be used. Output from the oscillator is coupled to the pentode unit of the 6EA8, V_{1B}, which acts as a doubler to 48 Mc.

A 6AQ5, V_2, is used as a buffer-amplifier at 48 Mc., to provide adequate drive for the following stage with light loading on the oscillator-multiplier. A shield between the control grid and plate pins of the 6AQ5 socket is used to reduce feedback in this stage. Inductive coupling in this and succeeding stages holds down the possibility of radiating energy on unwanted harmonics or exciter frequencies. Next, a 7558, V_3, triples to 144 Mc. The 7558 is an improved version of the 5763, for v.h.f. purposes, capable of full input to 175 Mc. In this application it is operated slightly below maximum CCS ratings, for long tube life.

The two 6939s, V_4 and V_5, are tripler and straight-through amplifier, respectively. The tripler plate and amplifier grid and plate circuits are half-wave lines, each tuned at the far end from the tube by a small split-stator capacitor Voltage is fed to the plate lines through r.f. chokes connected at the point of lowest r.f. voltage. Note that the tripler plate and amplifier grid capacitors have their rotors grounded, but the rotor of the amplifier plate capacitor is insulated with washers. This was done to prevent parallel oscillation, which may occur if both grid and plate circuits are grounded in an amplifier at this frequency. A series-tuned pick-up loop couples the output to a coaxial connector.

Mechanical Construction

The transmitter is built on a sheet of flashing copper 5 by 13 inches in size. This is fastened to a

* RCA Electron Tube Division, Harrison, N. J.

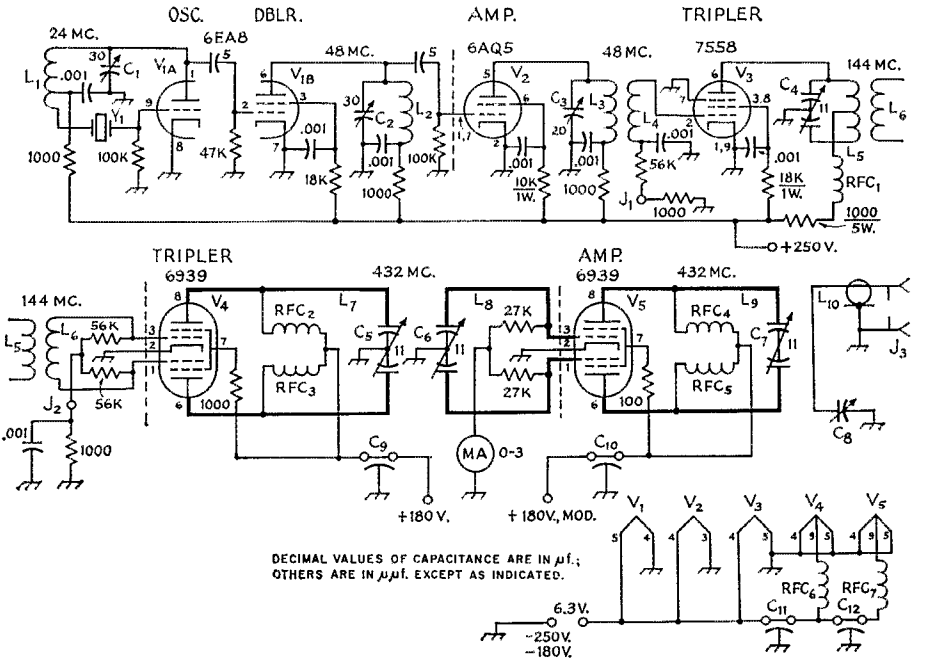


Fig. 1—Schematic diagram and parts information for the 432-Mc. transmitter. Resistors are ½-watt composition, fixed capacitors are ceramic unless specified.

C_1, C_2—30-μμf. miniature variable (Johnson 30M8 or 160-130).

C_3—20-μμf. miniature variable (Johnson 20M11 or 160-110).

C_4, C_5, C_6, C_7—11-μμf. miniature butterfly (Johnson 11MB11 or 160-211). Insulate rotor of C_7 from ground.

C_8—5-μμf. miniature variable (Johnson 5M11 or 160-102).

C_9, C_{10}, C_{11}, C_{12}—0.001-μf. feedthrough bypass.

J_1, J_2—Insulated tip jack or test point.

J_3—Coaxial fitting.

L_1—18½ turns No. 20, ½-inch diam., 16 t.p.i., tap at 4 turns from crystal end.

L_2—8 turns like L_1.

L_3—6 turns like L_1. L_1, L_2 and L_3 B & W Miniductor No. 3003.

L_4—2 turns insulated hookup wire around L_3.

L_5—3 turns No. 16 enamel, ½-inch diam., ⅜ inch long, c.t.

L_6—2 turns No. 16 enamel, between turns of L_5.

L_7—2 pcs. ¼-inch copper tubing 4½ inches long. Bend 90 degrees at 1 inch.

L_8—2 pcs. No. 10 wire 5 inches long. Bend 90 degrees at 3¼ inches.

L_9—2 pcs. ¼-inch copper tubing 4⅝ inches long. Bend 90 degrees at ¾ inch.

L_{10}—No. 16 enamel, U-shaped loop, 2 inches long, ⅝ inch wide.

RFC_1—1.8-μh. r.f. choke (Ohmite Z-144).

RFC_{2-7}—0.2-μh. r.f. choke (Ohmite Z-460).

Y_1—8- or 24-Mc. crystal.

standard chassis of the same dimensions, 3 inches high. Notches are cut in the lips of the chassis to pass the three interstage shields, the latter also being made of flashing copper. Cutouts are made in the copper for the three lines, and these are supported on U-shaped partial shields of the same material. Dimensions for the line housing parts are given in Fig. 2.

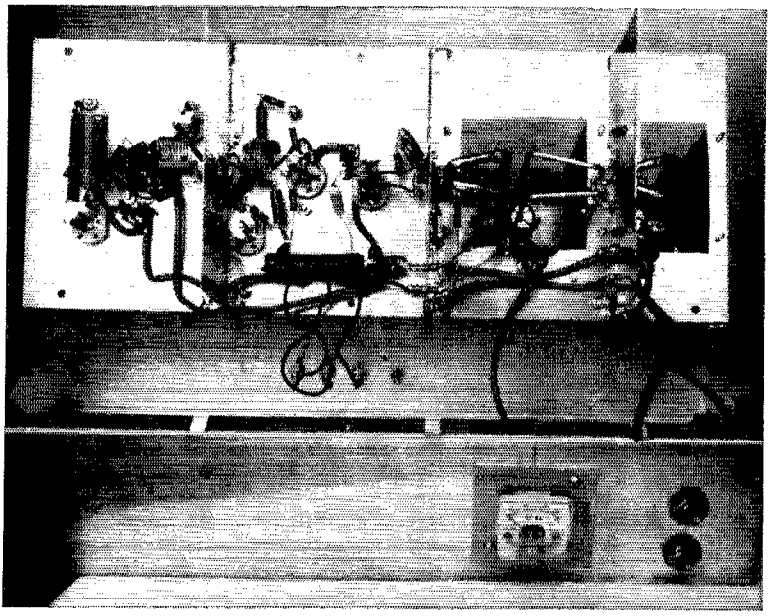
Heater and plate voltages are brought in on feedthrough capacitors (not shown in Fig. 1) on the rear wall of the chassis, and thence to a terminal strip in the left-center compartment, as seen in the bottom-view photograph. Heater and plate-power leads thereafter are of shielded wire, and these enter the two right-hand compartments on feedthrough capacitors, C_9 through C_{12} in Fig. 1.

The position of the shields with respect to the pins of the 6939 sockets is such that the shield passes between heater Pins 4 and 5 and between Pins 1 and 9. The cathode pin, 2, and Pins 4 and 5 are bent against the shield and soldered to it. The shield is also soldered to the small cylindrical tube at the center of the 6939 socket.

Adjustment Procedure

When assembly and wiring have been completed, insert only the 6EA8 in its socket. Disconnect the 18,000-ohm resistor from the pentode screen, Pin 3, temporarily to keep the tube from drawing excessive current while the oscillator is being checked. Temporarily connect a milliammeter (10 ma. or more) in series with the 1000-ohm resistor feeding plate voltage to L_1. Apply 250 volts or less and tune C_1 until a quick downward kick in the plate current is observed. This indicates that the circuit is oscillating.

Check the frequency roughly with a grid-dip meter or wavemeter. It should be approximately three times the marked frequency of the crystal, if an 8-Mc. fundamental crystal is used. If a 24-Mc. crystal is used, the oscillation should be on



Bottom view of the 432-Mc. transmitter. Note the copper shields, mounted across the sockets for the 6AQ5 buffer, 6939 tripler and 6939 amplifier sockets.

the marked frequency. It is well to check the nature of the oscillation on a calibrated receiver at 24 Mc., to see if it is crystal controlled. Too much feedback (tap too high on L_1) may make the oscillator take off without crystal control. Too low feedback (tap too low) will result in no oscillation, or sluggish starting under load. Pulling out the crystal is not a test for self-oscillation, as the crystal is part of the feedback circuit.

Reconnect the pentode screen resistor and remove the milliammeter from the oscillator plate circuit. Apply power to both stages and adjust C_2 for maximum output at 48 Mc. This can be checked by coupling a grid-dip meter (in the output-indicating condition) to L_2. Be sure that the frequency is twice the output frequency of the oscillator.

Insert the 6AQ5 and 7558 tubes in their sockets. Before applying plate voltage, disconnect the screen resistor of the 7558, the 18,000-ohm resistor connected to Pins 3 or 8 of V_3. Connect the milliammeter at the test point in the grid circuit of V_3, to measure grid current in this stage. Apply plate voltage and adjust C_2 and C_3 for maximum grid current. This should be at least 2 ma. If it is less, go back over previous adjustments carefully. Adjust the coupling of L_4 to L_3, retuning C_3 with each change, for maximum grid current.

Insert the first 6939 in its socket. Reconnect the screen resistor of V_3. Disconnect the screen resistor of V_4 temporarily, and insert the milliammeter at the test point in the grid circuit of V_4. Apply power and adjust C_4 for maximum grid current, which should be 2 to 3 ma. If it is less, adjust the coupling between L_5 and L_6, retuning C_4 each time for maximum grid current. Be sure that the frequency here is 144 Mc.

Reconnect the screen resistor of V_4. Insert V_5 in its socket. Disconnect the screen resistor from V_5 temporarily. Apply power, 250 volts to V_1, V_2 and V_3, and 180 volts to the 6939s, and adjust C_5 and C_6 for maximum amplifier grid current. This should be at least 2 ma., as it will drop slightly when the final stage is loaded. Make sure that the frequency is 432 Mc. If available frequency-checking devices do not go to 432 Mc., Lecher wires may be used. A precise check is not important, so long as it is possible to determine that the right harmonic is being fed to the amplifier grid circuit. The 432-Mc. segment normally used for crystal-controlled operation is in the middle of the band, so band-edge frequency checks are not a problem. A temporary Lecher-wire setup that can be made in a few minutes is adequate for this purpose.

If the drive is insufficient to produce at least 2 ma. grid current in the amplifier, the point of connection of the r.f. chokes on the tripler plate line may require adjustment. With the plate power on, watch the grid current indication in the amplifier while touching the tripler plate line with the lead of a pencil, or with the metal part of some small tool with an insulated handle. The plate power is involved here; be sure the test device is insulated. Touching the point of connection of the r.f. chokes should result in little or no change in grid current. If it does change, run the test device up or down the line until points are found where there is no reaction on the grid current. Connect the chokes at these points and retune. The same test may also be made in the amplifier grid circuit, in order to find the best point of connection for the two 27,000-ohm resistors, though connection at the socket produced satisfactory results in the original model.

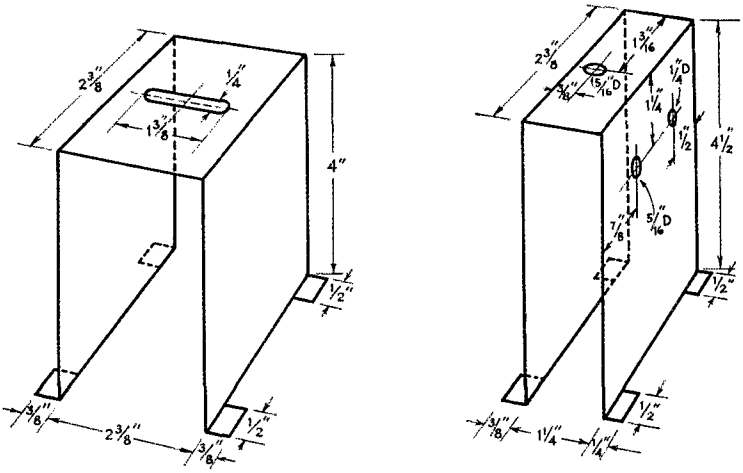


Fig. 2—Details of the tuned-circuit housings in the 432-Mc. transmitter. The slotted hole in the top of the one at the left enables the operator to adjust the coupling between the tripler plate and amplifier grid lines. The shaft of the amplifier plate-tuning capacitor should be insulated from ground with fiber or teflon washers.

The spacing between L_7 and L_8 may also be varied for optimum coupling.

The final stage may now be tested. For this a properly matched antenna may be used as a load, but a 50-ohm dummy load is preferable. This can be any number of carbon resistors connected in parallel, so long as the combination results in about 50 ohms and is capable of dissipating at least 6 watts.[1] An instrument in the transmission line capable of indicating relative power, forward and reflected, is also helpful.[2]

Reconnect the screen resistor of V_5. Apply power to all stages and tune C_7 and C_8 for maximum power output, which should be at least 4½ watts. Remove drive momentarily by lifting the crystal from its socket. Drive to the final stage and output therefrom should both drop to zero. This check should be made only briefly, as the input to the 6939s rises above a safe value when drive is removed. Check the point of connection of the r.f. chokes on L_9 in the manner detailed for L_7, and adjust if necessary, to achieve maximum output. Recheck all adjustments, and set the position of the output coupling loop, L_{10}, at the point of lowest coupling that will give maximum output.

Input to the amplifier should run no more than 10 watts for plate-modulated voice. Maximum ratings for c.w. or f.m. are 250 volts on the plates and 100-ma. plate current. Typical operation on voice calls for 50 ma. at 180 volts, and 60 ma. at 180 volts for c.w. or f.m. For a.m. service, plate and screen current of the amplifier should be run through the secondary of the modulation transformer of an audio system capable of at least 5 watts output.

The author wishes to thank Irving Bittman, K2ARL, for his work on the photographs. QST

[1] "V.H.F. Dummy Loads," *QST*, March, 1960, page 28.
[2] The s.w.r. bridge described in *QST* for September, 1961, page 34, should work satisfactorily at 432 Mc.

Strays

A "must" for Canadian students of amateur radio and a useful reference for any amateur is the *Radio Amateur Licensing Handbook* by Jim Kitchin, VE7KN, Regional Supervising Radio Inspector, Department of Transport. Jim discusses in conversational style the Canadian regulations, examination procedure, typical technical questions and miscellaneous information such as color codes, standard amateur message form, and electrical wiring hints. The Fourth Edition, *Radio Amateur Licensing Handbook* can be obtained from Dept. Q, Radiotelephone Directories of Canada, Ltd., 119 West Pender Street, Vancouver 3, B. C., Canada for $2.00.

Hams *are* nice people! A local ham was confined to the hospital and his wife, also a ham, mentioned on the air that she was getting behind in her farm chores. The next week end a car-load of hams showed up at the farm and got everything caught up. — *W0RRN*

Attending the Southwestern Division ARRL Convention in June? If so, you'll see the Convention Queen, WV6RXU, pictured above. Miss Amateur Radio Queen Marilyn Meyers was selected from a group of candidates that included WV6RTZ, W6UHA, and WV6RMG. The impartial judges pictured above (none of them have ham tickets) are Mr. Ross Mason, Miss Rosejane Rudicel, and Mr. Charles Broz.

• Technical Correspondence

ON NYLCLAD WIRE

Belden Manufacturing Company
P.O. Box 5070A
Chicago 80, Illinois

Technical Editor, *QST:*

I would like to correct one statement made in W6BNK's letter which was printed on page 178 of the October issue of *QST*. The letter referred to was entitled "75–40-Meter Dipole in Less Than 80 Feet."

Belden "Nylclad" enameled wire is not the same as other enameled wire. Nylclad is our trade name for an enameled wire that has a nylon coating over a primary insulation of "Formvar." This type of enameled wire is superior because it combines the high mechanical strength and inert chemical activity of nylon with the excellent electrical characteristics of Formvar. Nylclad magnet wire will withstand much more winding abuse and outperform other insulations most amateurs are familiar with. I believe, in the long run, Nylclad will do a better job than many other types of magnet wire insulations.

— *Richard E. Jack, K9CWB*

ON TRACKING DOWN NOISE SOURCES

1432 Third St.
Whittier, California

Technical Editor, *QST:*

George Rand's recent article ("The Case of the Mysterious QRN," *QST*, September, 1961) prompts me to relate my experiences with man-made interference. My noise difficulties started during my vacation, a time when I expected to do a little operating during QRM-free hours. As fortune would have it, I was presented with a noise level covering all but the strongest signals.

A plan of action was necessary to correct the assumed power leak, and the thing to do was to call the power company. The local service department was sympathetic, and I was informed that noise problems of this type came under the jurisdiction of the Communications Department, and that this service would call for the details on the following day.

You guessed it: Not a sound was heard when the communication manager called. Nevertheless, the power company promised full cooperation should the interference occur again.

It was not observed again for almost three weeks, when it started again with sufficient intensity to cut up the TV picture. This situation called for drastic action, particularly with the probability that the neighbors were screaming about the ham next door. The scientific approach would be to cruise around with noise-detecting and direction-indicating equipment. The normal shack does not have this type of equipment. On the spur of the moment, I flew out of the house with my XYL's transistorized radio and cruised the streets in the family car, tuning both radios to a frequency clear of broadcast stations to monitor the noise interference. I could generally isolate the area of maximum audible intensity from the car radio, but soon discovered that the transistorized radio was more sensitive to this particular interference. So I finished the job on foot, moving from light standard to utility pole to determine maximum noise intensity.

Perhaps it was just luck, but when I was in a position of maximum noise intensity I looked up at the top of a nearby utility pole and observed the most beautiful arc one could imagine. The arc was intermittent, and for periods up to 10 minutes no noise could be detected; then breakdown would occur again.

The culprit had been located, and a call to the power company resulted in prompt action. The service men climbed the utility pole to find a loose transformer-wire connection to the 11,000-volt feed line. The wire clamp was faulty. The transformer-wire connection was flapping in the breeze, causing an intermittent arc whenever it partially broke away from the high-voltage feed line. The noise problem was solved, and my appreciation is given to the Southern California Edison Company for their prompt action.

The transistorized radio has served me well for locating QRN sources. On another occasion, when man-made interference caused reception difficulties, the interference had an off-on time cycle suggesting a thermal operating device. Scientifically armed again with the transistorized radio, earphones, a trailing antenna for increased sensitivity, and looking like a man from Mars, I walked the neighborhood. This noise safari led me to the house across the street, where a defective heating-pad bimetallic switch was arcing to generate the interference. Chalk up another solution to a severe noise problem. — *Warren S. Lincoln, W6EYP*

HANDI-TALKIE REVISION

811 Densmore Road
Philadelphia 16, Pa.

Technical Editor, *QST:*

In the interim since publication of the article on the transistorized 28-Mc. handi-talkie in the February, 1960, issue, a number of letters have been received expressing disappointment in the operation of the detector circuit. Fig. 1 shows a new type of detector, along with some modifications in the receiver audio section, that I have found to be superior. This detector operates reliably with practically any transistor designed for this frequency range, and delivers superior performance. The tap on the coil is eliminated and feedback is supplied by a 10-$\mu\mu$f. capacitor from emitter to collector.

The audio revision eliminates some bias resistors, changes the values of others, and eliminates one amplifier stage. At the same time there is better protection from overload at high signal levels. — *William J. Engle, jr., W3KKO*

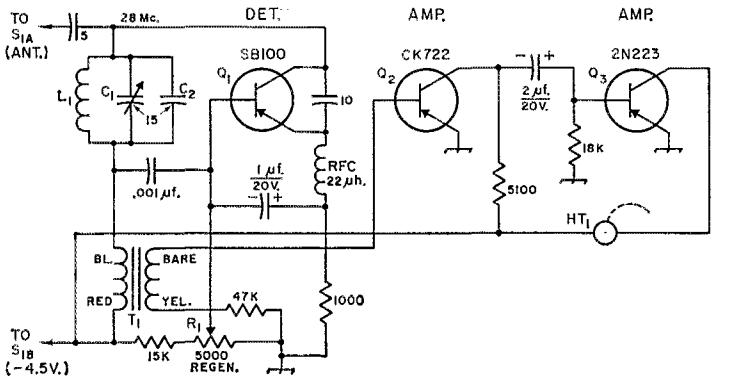


Fig. 1—Revised receiver circuit for the 28-Mc. handi-talkie originally described in QST for February, 1960. Circuit designations (C_1, T_1, etc.) refer to corresponding components on page 21, February, 1960, QST. Capacitances are in $\mu\mu$f. except as indicated; capacitors with polarity marked are electrolytic; fixed resistors are ½ watt.

7360 DEFLECTOR CURRENTS AND LARGE SIGNAL OPERATION

Coordinated Science Laboratory
University of Illinois
Urbana, Illinois

Technical Editor, QST:

In some recent experiments the 7360 beam deflection tube was operated as a balanced modulator near its maximum ratings in an attempt to obtain large double-sideband power output. With a plate voltage of 300 and a screen voltage of 200, operation was quite successful, and more than enough double-sideband power was obtained to drive a 6146 to 50 watts p.e.p. output when operating straight through on 28 Mc.

However, an anomaly of operation occurred when the deflector electrodes, which were being fed with push-pull audio, were momentarily driven to an unusually high level by an occasional loud syllable or speech peak. When a large peak occurred, the circuit shifted to an unbalanced mode of operation and no modulation was possible. Measurements showed that the deflector electrode voltage had increased to about 60 volts d.c., where it remained until the B+ power was interrupted. On reapplication of power, the deflector voltage returned to 25 volts, and circuit operation was again normal until the next high peak of deflector drive voltage occurred. Apparently, nonlinear deflector currents were causing this runaway condition with a resultant blocking or "hang up."

Some effects of deflector electrode current have been discussed previously. Knight[1] has recommended that the deflector d.c. return resistance be limited to about 50,000 ohms, and that the a.c. driving source impedance be held to somewhat less than this value. He points out that plate voltage affects deflecting-electrode current appreciably, and that deflecting-electrode current is about 0.5 per cent of beam current at a plate voltage of 300 volts, one per cent of beam current at a plate voltage of 150 volts, and 5 per cent at a plate voltage of 50 volts. (The current referred to is apparently the positive deflector current shown in Fig. 3, not the negative current.)

A low value of load impedance in the plate circuit decreases the plate voltage swing, and by preventing it from reaching a low value on negative peaks will help minimize deflector current.

Also, Vance[2] has pointed out that matched *RC* constants, seen looking out from each deflector, are advisable to prevent shift of carrier balance point with modulation level.

Matching the time constants of the two deflector circuits minimizes the average difference voltage between the deflectors, and helps maintain carrier balance as the modulation level changes. The above recommendations were made concerning operation at very moderate power levels, and attention to them becomes quite important when operating at higher levels.

[1] Knight, "A New Miniature Beam Deflection Tube," *RCA Review*, Vol. 21, No. 2, June, 1960, pp. 272, 283.

[2] Vance, "S.S.B. Exciter Circuits Using a New Beam Deflection Tube," *QST*, March, 1960, p. 37.

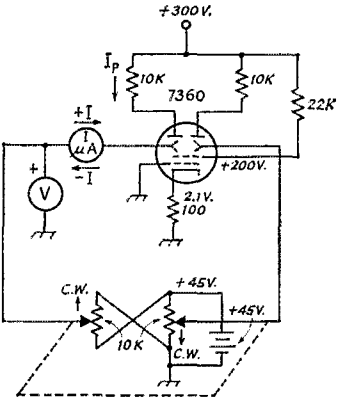


Fig. 2—Setup for d.c. measurement of 7360 deflector current.

To investigate current occurring with operation at large dissipation ratings, the circuit of Fig. 2 was used to measure static d.c. values of deflector current in a "worst case" of large cathode current and high screen voltage. For this test the d.c. values of voltage and current applied to the tube were equal to the peak values that occur in large-signal balanced-modulator operation. These operating conditions exceed the tube rated dissipation and were used only to investigate conditions at control-grid drive peaks. In the usual balanced-modulator operation, the control grid is biased near cutoff and reaches −2 volts from the cathode (the voltage used in the test) only on drive peaks. D.c. currents in balanced-modulator operation are instantaneous currents averaged over the r.f. drive cycle, and are about one-third the representative peak currents shown in Fig. 3.

The deflector-electrode current *vs.* d.c. deflector voltage plotted in Fig. 3 is the average of measurements made on four tubes. From this it can be seen that when the deflector is driven above about 26 volts, current begins to flow out of the electrode, and increases (negatively) quite rapidly as the deflector voltage is raised. Outward flow of current is attributed to secondary electron emission occurring from the deflector electrode. When each arriving electron at the deflector "knocks out" more than one secondary electron, the electrode is left with a net positive charge, and current flows out from the deflector to ground. This direction of flow is indicated by negative current values in Fig. 3.

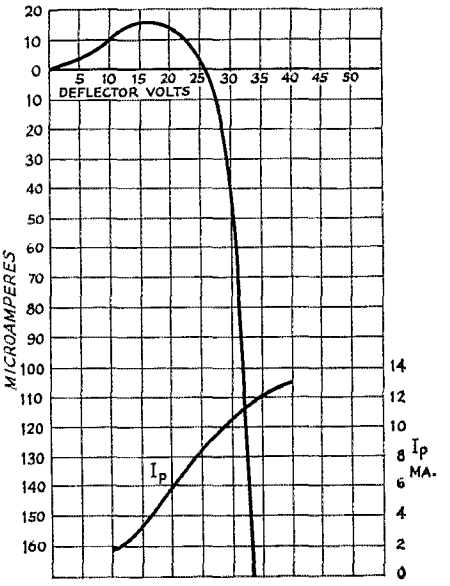


Fig. 3—Deflector current *vs.* deflector voltage, 7360 with 300 volts on plate, 200 volts on screen.

A flow of negative deflector current produces a voltage drop in the deflector return resistance (to ground) of polarity which further tends to increase the deflector voltage. This regenerative situation aids the positive travel of the deflector and can lead to runaway and the resultant "hang up" or blocked condition where the deflector remains at a large voltage independent of any drive.

Since this condition is due to excessive *IR* drop in the deflector return resistance, lowering either the deflector current or the deflector return resistance will decrease the regenerative effect. Vance[3] recommends lower screen potential to reduce initial electron velocity. This is accomplished by use of a 100,000-ohm screen resistor. Also, he recommends limiting control-grid drive to keep the cathode current under 10 ma. Since this eliminates the possibility of large double-sideband power output, operation with reduced deflector return resistance and lower deflector signal source impedance was tried. The regenerative property of the negative resistance can be canceled by shunting it with an equal or smaller positive resistance. The negative re-

[3] Private correspondence with H. C. Vance, sr.

sistance presented by the deflector, and therefore the maximum resistance that can be used in the deflector return, can be approximated using Fig. 3. Here the d.c. input resistance (which is negative above about 26 volts) is equal to the reciprocal slope of a chord drawn from the origin to the deflector current curve. The a.c. small-signal input resistance is equal to the reciprocal slope of a tangent to the curve, and is negative above about 17 volts.

As the deflector voltage becomes more positive the two slopes approach the same value. The a.c. slope (slope of the tangent) represents the smaller negative resistance and gives a maximum allowable deflector return resistance which includes a safety margin.

At a deflector voltage of about 35 volts the reciprocal slope of the tangent to the curve corresponds to a negative resistance of approximately 15,000 ohms, and must be shunted by a resistance of this value or smaller to stabilize the deflector circuit under these conditions. If all currents are decreased to one third of the plotted values, corresponding to typical balanced-modulator operation, the maximum deflector return resistance allowable increases to 45,000 ohms. Experimental results show about 27,000 ohms is the maximum value to be used, probably because occasional deflector voltage driving peaks exceed 35 volts.

The negative resistance input characteristic of the deflector also showed up when the deflectors were driven with a plate to push-pull grid transformer (UTC type A-19). A high-frequency audio oscillation occurred at the self-resonant frequency of the transformer secondary, the parallel-resonant circuit being shunted by an a.c. negative resistance presented by the deflectors. This was cured by shunting each half of the transformer secondary with a 17,000-ohm resistor. — *J. D. Gooch, W9YRV*

AN UNEXPECTED OSCAR DIVIDEND

ARLIS II
77° 22′ North
179° 35′ East
January 1, 1962

Technical Editor, *QST*:

I just got my first night's sleep since Christmas Eve, having been listening to and recording each pass of Oscar, up to last night. In all, I recorded 42 passes, but was a bit late in my first acquisition due to some wrong information as to frequency of transmission by the satellite.

I was fortunate in being so near the polar axis (nearly 600 miles north of Bering Strait — *Ed.*) and copied 7, 8 or 9 passes in sequence several times, my only interruption of reception coming from frequent auroral activity. I now have a pretty good aurora activity indicator, and it gave excellent correlation with my inability to receive Oscar. I run an Esterline-Angus recorder on a 40.5-Mc. beacon near Anchorage, Alaska, on the other side of the "auroral mirror."[1] When the "mirror" is working on this frequency I get good signals, up to 20 or 30 db. above background, on my chart. When even only weak bursts came through from Anchorage on 40.5 Mc., I failed to detect Oscar. (Anchorage-to-ARLIS II distance: about 1300 miles — *Ed.*) Apparently the boys at Oscar Headquarters were not expecting anything like this to happen. I suggested that they read January, 1960, and February, 1961, *QST*[2] for clues!

One interesting observation here was that while the total Doppler shift was about 8 kc., the angle of my antenna, aimed at the North Pole, made the time for the 8-kc. shift vary from 2 to 6 minutes. With this information I was able to determine where the equatorial crossings took place. I usually got this dope from other sources later, and found my estimates to be in good agreement.

We used to wonder where our 2-meter signals went when we tried to make 2-meter contacts during periods when auroral-bounce signals were S9-plus on 50 Mc. Now, thanks to Oscar, we can assume that absorption or scattering is taking place, for the signals surely do not go through, as we once believed. I hope they get another Oscar up soon, before I have to leave ARLIS II. The first one was a good drill, and I'm sure that we can learn much more from another try.

— *Carl Milner, W1FVY/KL7FLC*

[1] Mellen, Williams, Milner, "Hams on Ice," *QST*, January, 1960.

[2] Mellen, Milner, "Ice Island Revisited," *QST*, February, 1961.

Happenings of the Month

WB6ABC DE WB2ACB

The FCC will soon begin issuance of a new series of calls in the second and sixth call areas, with the prefixes WB2 and WB6 being assigned to Technician and higher class licensees. The Novice equivalent for this series will be WN2 and WN6.

There exists here a possibility for confusion. The prefix KB6 is assigned to amateurs in the Baker, Howland and American Phoenix Islands. Should there be a Novice licensee there at some future time, his call would be WB6 followed by *two* letters. Any WB6 followed by *three* letters will be a Californian holding a class of license higher than Novice.

LICENSE SUSPENSIONS

The General Class licenses of Earl H. Plummer, WA2HSW, and Bruce B. Montgomery, W2FMC, both of Neptune, N. J. were suspended by FCC for violations of the Communications Act and Part 19 of the FCC regulations. These amateurs were cited for operating Citizens Band transmitters without licenses, and for making false statements to the Commission. Mr. Plummer's suspension, for six months, went into effect on January 12, 1962. Mr. Montgomery, who continued his operations in the Citizens Band after he had received a warning from FCC, drew a one-year suspension, which became effective on November 20, 1961. [*Sections 301 and 308 (b) of the Communications Act; Section 19.11 of the Rules Governing the Citizen's Radio Service*]

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Charles R. Goss, K6YBH of San Carlos, Calif., had his Technician Class license suspended for two months for operating in the 80- and 40-meter bands, using A-3 emission; the suspension went into effect on December 19, 1961. [*Section 12.23(d) of the Rules Governing the Amateur Radio Service.*]

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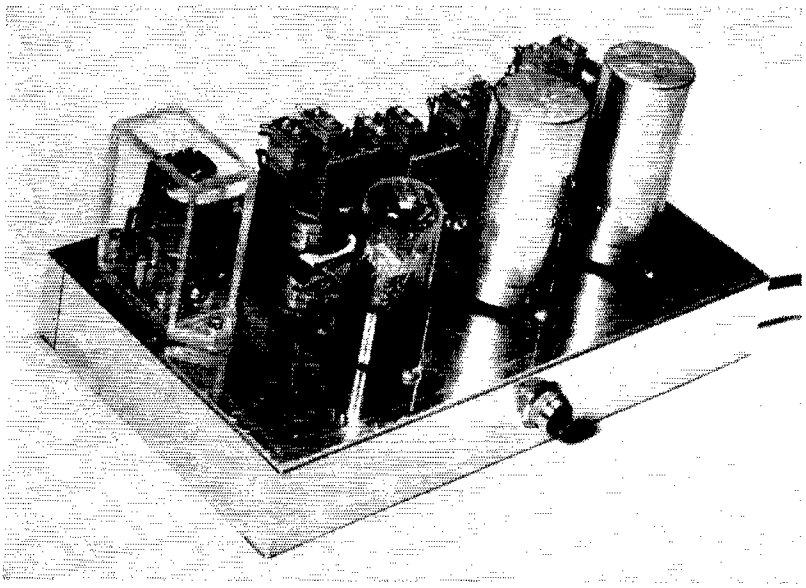
A Seattle, Washington, Novice, James L. Hall, KN7OET, had his license suspended for the remainder of the license term, (that is, until January 5, 1962) for transmitting by voice on 7282 and 3920 kc., and for transmitting call signs not properly assigned to his station. Though the suspension didn't go into effect until December 27, 1961 and therefore the licensee only lost nine days of potential operation, the actual effect is much greater. For instance, the FCC has already turned down, under its administrative authority, an application by Mr. Hall for a Technician Class license by mail, ruling that he must appear in person for an FCC supervised examination (in effect, for General Class only). [*Sections 12.23, 12.28 and 12.158 of the Rules Governing the Amateur Radio Service.*]



The coded signaling unit is built on a small chassis. The four-pole resonant relay is in the rear left-hand corner. The four magnetic relays are strung out to the right. In front are the thermal relay K_6 and the electrolytic capacitors shunting the relay windings.

Selective Signaling Device

The signaling or control system described here responds only to a specific sequence of four selected audio tones (24 different sequences are available). The particular application discussed, in which a transmitter carrier modulated serially by the four audio tones serves to operate a signaling device at the output of a remote receiver, is only one of many interesting possibilities.

BY LEON LINN,* W9LHF

I AM sure that many of us have had occasion to grow weary while waiting for a schedule to show up, and have felt that we could spend the time to advantage while waiting. With the introduction of an economical resonant relay, waiting by the receiver is no longer necessary. Just tune to the other fellow's frequency and, when a light goes on, or a bell rings, answer him. The circuit shown in Fig. 1 represents only one of the many uses of this device and hams, being as ingenious as they are, can probably vary the adaptation to suit many other requirements.

The Resonant Relay

The resonant relay K_1 (Fig. 1) has four poles (K_{1A}–K_{1D}), each resonant at a different frequency. In the case of the relay used, these frequencies are 75, 95, 115 and 135 c.p.s. Each individual pole will operate only when the common energizing coil (K_1) is supplied with half waves of voltage at the resonant frequency. Thus, if a transmitter carrier is tone-modulated [1] at any one of the specified frequencies, the audio output of a receiver picking up these signals may be used to operate the corresponding pole of the relay. By successively modulating the transmitter with the four different frequencies, the relay may be made

* P. R. Mallory & Co., Inc., Indianapolis 6, Ind.

[1] At present, 6A2 emission is permitted in the amateur bands only at frequencies of 50.1 Mc. and higher. However, the principles discussed here should have many applications in remote control over wire circuits, as well as radio circuits operating at the higher frequencies. — *Ed.*

to perform a variety of functions. The only additional requirement is a means of supplying half waves of the receiver output signal. In Fig. 1B, this is accomplished by the use of a transistor biased to cutoff. The diode CR_1 eliminates the inductive reaction of the relay coil on the "off" halves of the audio cycle.

Signaling System

The application in this particular instance is to an arrangement where supplying the relay with the four tones *in proper sequence*, all within a specified time limit, causes an alarm or calling device, such as a lamp or bell, to operate. By altering the sequence, any one of 24 calling combinations or codes may be set up.

In the circuit of Fig. 1, K_1 is the resonant-relay actuating coil, the four resonant poles being designated as K_{1A}, K_{1B}, K_{1C} and K_{1D}. Assuming that K_1 is energized momentarily by the resonant frequency of K_{1A}, contacts K_{1A} will close. This causes K_2 to operate. Pole K_{2B} immediately closes a circuit through K_{6A} and K_{5B} which keeps K_2 energized after K_{1A} has opened. At the same time, K_{2C} (Fig. 1D) energizes the thermal elements of K_6. But contacts K_{6A} do not open immediately because K_6 has a 10-second time delay. Also at the same time, K_{2A} in series with K_3 closes, but K_3 will not operate until K_1 is energized at the resonant frequency of K_{1B}.

When the second tone is transmitted momentarily to K_1, K_{1B} closes, and K_3 is energized. Pole K_{3B} closes a circuit through K_{2B} (now closed), K_{6A} and K_{5B}, which keeps K_3 energized after K_{1B} opens. K_{3A} in series with K_4 closes, but K_4 will not operate until K_1 is energized at the resonant frequency of K_{1C}.

When the third tone is transmitted momentarily to K_1, K_{1C} closes and K_4 is energized. Pole K_{4B} closes a circuit through K_{3B} (now closed), K_{2B} (now closed), K_{6A} and K_{5B} which keeps K_4 energized after K_{1C} has opened. K_{4A} in series with K_5 closes, but K_5 will not operate until K_1 is supplied with voltage at the resonant frequency of K_{1D}.

When the fourth tone is transmitted to K_1, K_{1D} closes and K_5 is energized. K_{5A} closes a circuit directly back to the supply-voltage source which keeps K_5 energized after K_{1D} has opened. K_{5B} opens the holding circuits of K_2, K_3 and K_4, and these relays return to their original unenergized condition. (K_6 is also de-energized when K_{2C} opens.) K_{5C} opens the other side of the K_6 energizing circuit and closes the 115-volt a.c. circuit to lamp I_1 (or other device). Momentarily opening S_1 de-energizes K_5, and the entire circuit is once more in its original unenergized condition.

It will be observed that no other sequence of applying the four tones to the circuit will enable the circuit to complete its function. Also, since the 10-second time-delay relay K_6 is energized on application of the first tone, and de-energized only after K_5 has operated, K_{6A} will open and

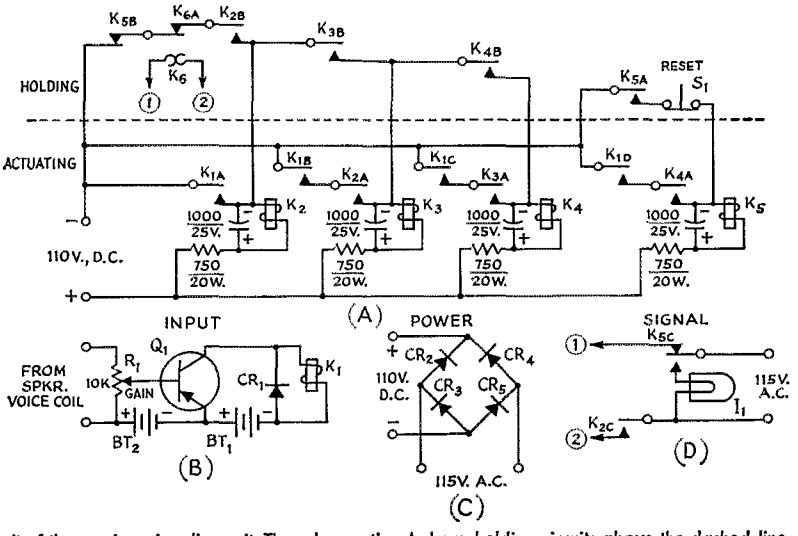


Fig. 1—Circuit of the receiver signaling unit. The relay section A shows holding circuits above the dashed line, and actuating circuits below. B shows the driving circuit for K_1, C shows the circuit of the d.c. power supply for K_2, K_3, K_4 and K_5, and D the output or signaling section.

Capacitances are in μf. and capacitors are electrolytic. Resistances are in ohms. Relays are shown in the unenergized condition.

BT_1—12-volt battery.
BT_2—6-volt battery.
CR_1—400 p.i.v. (Mallory T-400 or equiv.)
CR_2–CR_5—Silicon or selenium rectifier, 380 p.i.v., 200 ma.
I_1—115-volt lamp or other signaling device.
K_1—Four-pole single-throw resonant relay (Mallory RRD-001).
K_2–K_5—24-volt d.c. relay (Potter & Brumfield KA14D, or surplus similar). Minimum requirements are 3 poles for K_2 and K_5; 2 poles for K_3 and K_4.
K_6—Single-pole, normally-closed 10-second-delay thermal relay (Amperite 115C10).
Q_1—2N255, 2N307, or equiv.
R_1—Composition control, linear taper.
S_1—Push-button spring-return switch, normally closed.

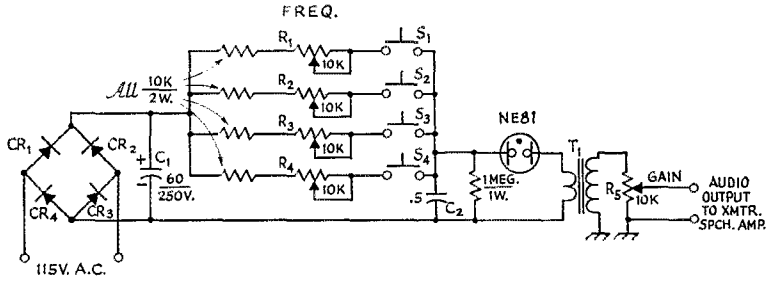


Fig. 2—Tone generator at the transmitter. Resistances are in ohms and capacitances are in μf.

C_1—60-μf., 250-volt electrolytic.
C_2—0.5-μf., 250-volt paper.
CR_1–CR_4—Silicon or selenium rectifier, 380 p.i.v., 50 ma.
R_1–R_5—Wire-wound control.
S_1–S_4—Push-button spring-return switch, normally open.
T_1—Output transformer, 10,000 ohms to voice coil, voice coil connected to NE-81.

break the holding circuits of K_2, K_3 and K_4 if the entire correct sequence has not been completed within 10 seconds. Other sequence combinations may be selected simply by interchanging the positions of the four resonant poles of K_1 in the circuit.

Fig. 1C shows the circuit of the full-wave bridge rectifier that supplies operating d.c. for K_2, K_3, K_4 and K_5. The "over-voltage" scheme described by W8CBM [2] is used. The components for the unit diagrammed in Fig. 1 may be laid out on a small chassis as shown in the photograph.

Fig. 2 shows the circuit of a tone generator for modulating the transmitter. This is a standard neon-bulb relaxation-type circuit using an NE-81 with provision for selecting any one of four time constants.

Adjustment

The transmitter and receiver should be separated sufficiently so as to avoid blocking of the receiver. At the transmitter, one of the push buttons of the tone generator should be pressed and R_5 (along with the speech-amplifier gain control) adjusted for 100 per cent modulation. This adjustment should serve for all four frequencies.

With the receiver set up and operating, and the transmitter running, one of the buttons on the tone generator should be held closed while the frequency-control potentiometer in that circuit is varied until the pole of corresponding frequency on K_1 closes at the receiver. The gain control (R_1) at the receiver should be simultaneously adjusted as necessary to provide the required operating signal. The tone-generator potentiometer should then be adjusted back and forth to determine the frequency range over which K_1 will operate. The potentiometer should be set at the middle of this range. Similar adjustments for the remaining three frequencies should follow. If these adjustments are made with the transmitter and receiver in close proximity, some slight readjustment may be needed later for more distant transmitters.

The original tests were conducted using a 5-watt citizens'-band transmitter, and good consistent signaling was obtained as far as 50 miles from an airplane at a 10,000-foot altitude. The unit works remarkably well through either QRM or QRN. If you have a friend who owns a tape recorder, you can transmit your "number" to him, and then he can call you back by playing the tape into his modulator. A little pencil work shows that with two resonant relays and eight ordinary relays, a total of 40,320 signaling combinations is possible! QST

[2] Blett, "Using Those Surplus Relays," *QST*, May, 1956.

Strays

Reports received from 47 countries indicate that the fourth world-wide Boy Scout Jamboree-on-the-Air, held last October 21–22, was an overwhelming success. The event will be repeated in 1962, from 0001Z October 20 to 2359Z October 21, and Scouts and their leaders around the world are invited to participate. Amateurs may also use the Jamboree as an occasion to demonstrate amateur radio to Scout troops in their neighborhoods. The call of the Headstation for the Jamboree, VE3JAM, has been changed to VE3WSB, signifying World Scout Bureau. VE3EWE has joined the permanent staff of the Bureau, so it is likely that the new call will be heard from time to time the year around.

The Amateur Radio Editor's Association, AREA for short, has been formed to arrange an exchange service for club papers, to assist writers desiring to write a column in their local paper, and to furnish an editing service by a panel of experts to improve papers submitted. Present roster consists of 28 well-known writers of amateur papers. For further information, contact the secretary, Harry Tummonds, W8BAH, 2073 West 85th Street, Cleveland 2, Ohio. — *W8AEU, AREA President*

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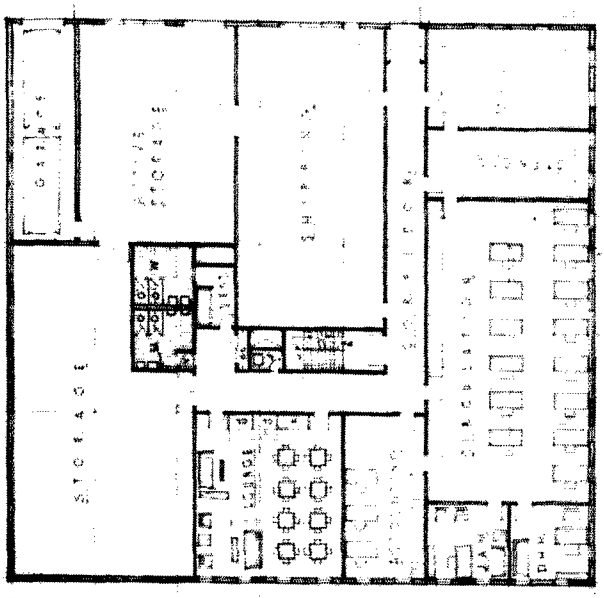
Calling all Phi Kappa Sigmas — please contact Norman A. Fishel, K2KXZ/8, 236 North Harrison, East Lansing, Mich.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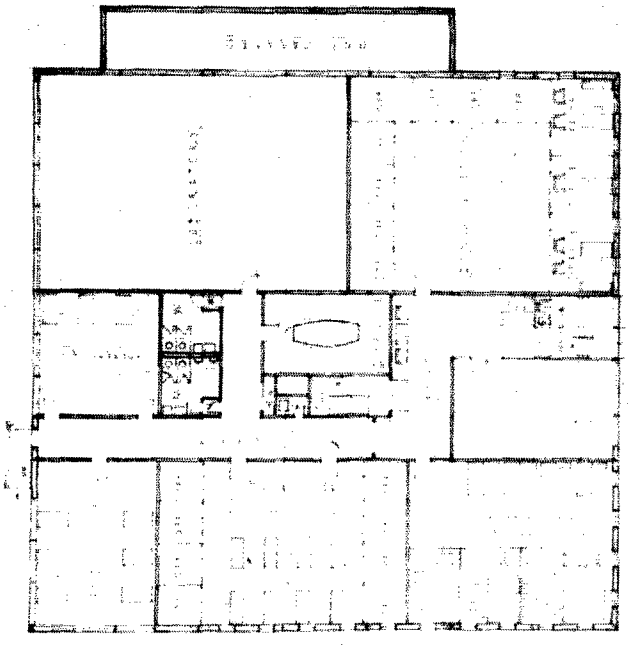
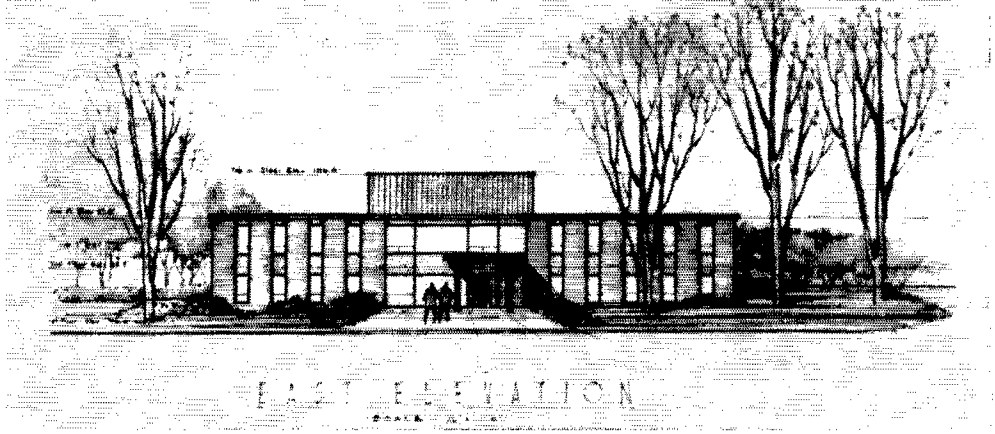




New League Headquarters Building Scheduled

Expanded Facilities Planned for 1962 Construction

TIME was when the League's headquarters operated effectively from the attic of its Secretary's home. *QST*, then a privately published magazine, was wrapped and addressed by hand on a kitchen table by its owners — Hiram Percy Maxim and Clarence D. Tuska — who were also the officers of ARRL and its entire, unpaid, office staff. That was a long time ago — December, 1915, to be exact. The League was only 19 months old, and its membership roster showed 635 names!

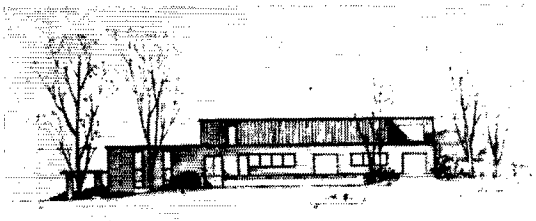
Today there are 100,000 of us all told, including more than 80,000 Full Members in Canada and the U. S. Now there are 65 employees working full time at ARRL Hq. — and a need for more. The number of amateurs and the number of ARRL Full Members has doubled in the past eight years, yet there has been no increase in Hq. working space since 1945. The League has a 32-year-old building comprising some 14,000 square feet of floor space, filled to overflowing with Addressograph machinery and stencils, desks and people, cartons of *Handbooks* and boxes of stationery, test equipment and chassis and electronic components — all needed to carry out those services we have come to regard as necessary to the preservation, progress and enjoyment of amateur radio.

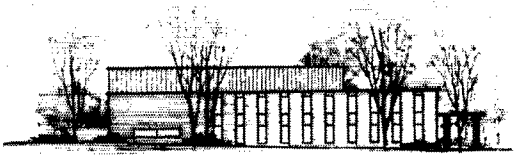
The Board of Directors, concerned with present crowded conditions and also looking to the future, recently appointed a Housing Committee to explore the matter of additional headquarters facilities. After examination of a number of possibilities, the Board has now approved a plan to construct a new building of about 25,000 square feet on the seven acres of antenna farm in back of W1AW — about four miles from the present office, in the suburban town of Newington. Zoning approval has been granted, and architects are now preparing working drawings.

The design is attractive and functional, tailored to the specialized needs of the League, but neither ostentatious nor elaborate. The adjacent floor plans illustrate the general layout, though they are initial sketches and may change in minor detail as working drawings are completed. Construction will be slab on grade, brick walls, painted finished cinder block for interior partitions, acoustic ceiling, asphalt tile floors. The building will be air-conditioned except for storage areas.

The present schedule calls for breaking ground this Spring, and occupancy before the end of the year. *QST* will bring you further reports on construction as it progresses.

The subject of finance is treated separately in this month's editorial. Please read it and express your opinion! QST





Small-Space Low-Cost Antenna

The Trap Vertical

BY CHARLES C. TIEMEYER,* W3RMD

WHO doesn't have a bandswitching transmitter these days, and who doesn't entertain the idea of a multiband antenna to go along with such a rig? Quite a few excellent articles have been written by various amateurs on the subject of multiband trap antennas which have proved their worth. The author speaks from experience and, were it not for the elements and a bit of hindsight, my original antenna, based on an article by W2CYK,[1] might still be doing an excellent job.

The hindsight mentioned was in imbedding a center support for this antenna in cement and not making provision for lowering either the antenna or mast for occasional servicing. Hence, after surviving several severe storms over a period of a year or so, one half of the antenna came down. This left me with a choice between sawing the mast down at the base and reinstalling it correctly, and trying something else. Since antenna experimenting is one of my virtues, the latter course was followed.

The Trap Vertical

With the multiband feature of the trap antenna still in mind, the idea hit me that I might take half of W2CYK's antenna, stand it on end, and feed it with 50-ohm coax. I am partial to vertical antennas anyway, and I still had a trap from the old antenna.

* 2515 Linwood Road, Baltimore 14, Maryland.

[1] Greenberg, " Simple Trap Construction for the Multiband Antenna," *QST*, October, 1956

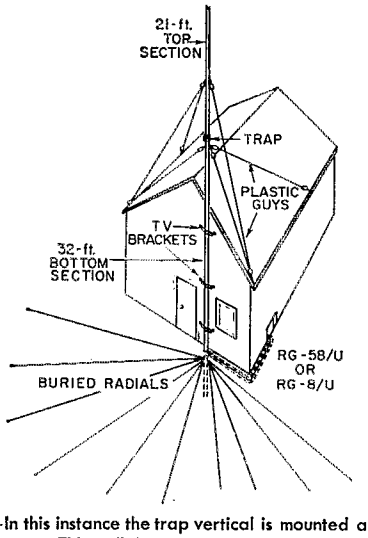


Fig. 1—In this instance the trap vertical is mounted against the house on TV wall brackets and guyed with plastic clothesline. Where space is restricted, ground radials may be bent and spread along the sides of the house.

The result is shown in the sketch of Fig. 1. The trap, tuned to 7 Mc., isolates the 32-foot antenna section below it so that it operates as a quarter-wave antenna at 7 Mc. At 3.5 Mc., the trap is inductively reactive and loads the complete 53-foot length so that it works as a quarter-wave radiator on this band. In spite of the fact that a considerable portion of the radiation is supposed to take place at relatively high angles when a vertical antenna is operated at its harmonics, I have been entirely satisfied with the results obtained in practice when using this antenna on 10, 15 and 20. They have compared very favorably to those customarily experienced with any other simple antenna I have used.

At least on the two lower-frequency bands, a low-resistance ground connection is essential for good efficiency. This was accomplished in my case by driving a ground rod into the earth and extending from it wire radials (the more and the longer, the better) buried to a depth of a few inches.

Construction

The bottom 32 feet of the radiator is made of thick-wall electrical conduit having an inside diameter of 1 inch. The top section is a 21-foot length of thin-wall conduit of the same inside diameter. Either section may be made up of shorter lengths spliced together with short pieces of smaller-diameter tubing inside or larger-diameter tubing outside. Wind resistance could be reduced by graduating to smaller diameters in the top section.

The two sections of the mast must be insulated from each other, of course, to provide for the trap. Probably the simplest method is to use a 1-foot length of 1-inch-diameter polystyrene rod between the sections, as shown in Fig. 2.

The trap inductance and capacitance values are the same as used by W2CYK. The coil (approximately 5 μh.) has 9 turns of No. 12 wire 2½ inches in diameter, 6 turns per inch, and is cut from B & W 3905-1 coil stock. The capacitor is a Centralab high-voltage fixed ceramic unit of 100 $\mu\mu$f. (type 850SL-100N). The coil and capacitor are connected in parallel and the combination is connected across the insulated gap between the two antenna sections. The polystyrene insulating rod may be run through the coil, or the coil and capacitor may be placed to one side.

In my installation, the bottom section of the antenna is fastened to the side of the house on TV standoff brackets, using electrical tape to insulate the conduit from the brackets. The bottom end is only an inch or two above the surface of the ground. Plastic clothesline guys are attached near the top of the bottom section and

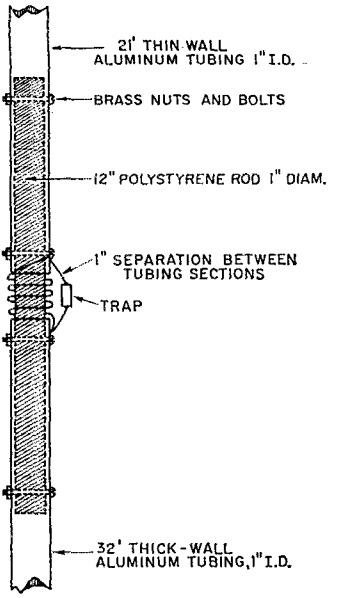


Fig. 2—A 1-foot length of 1-inch polystyrene rod is used to insulate the two antenna sections. Alternatively, the coil may be mounted to one side.

about halfway up on the top section. These guys are anchored to points along the edges of the roof. If the antenna must be mounted without benefit of the house support, a short wood stake topped with a glass furniture rest will insulate it from ground.

Results with this antenna on all five bands have been most gratifying. With a 33-foot length of coax as a feed line, no loading difficulties have been encountered. In addition, it has stood up well mechanically through several severe storms. Last, but not least, it takes up little real estate.

QST

Strays

A recent Silent Key was Dr. Albert Hoyt Taylor, a pioneer in the field of radar research, who passed away on December 11, 1961. He was head of the physics department at the University of North Dakota until he became associated with the U. S. Navy in 1917. After World War I he became head of the Naval Aircraft Radio Laboratory in Anacostia, where he pioneered in radio broadcasting techniques, radio facsimile, and television. Here also he performed the famous 1922 observation, with Leo Young, W3WV, of the reflection of radio waves from passing ships. When the U. S. Naval Research Laboratory was established in Washington in 1923, he became superintendent of its radio division. During his lifetime he was the author of 35 papers on scientific subjects and the holder of 54 patents. He had begun his radio experimenting in 1899, being an active amateur for a while, and he did not retire from active civil service until 1948.

Silent Keys

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

W1AQJ, *Doris J. Dominy*; Rockland, Mass.
W1ZDZ, Hilton W. Long, Dover, Mass.
W2AOL, Harry Steenberg, Merrick, N. Y.
W2AUX, Irwin Moison, Blauvelt, N. Y.
WA2AWY, John D. Skeer, Albany, N. Y.
W2BYC, William B. Schaum, Newark, N. J.
K2GF, Charles Y. Houck, Rochester, N. Y.
W2OHE, Preston C. Yeomans, Brooklyn, N. Y.
K2OKX, Edwin J. Manheimer, Belle Harbor, N. Y.
W2OZ, Karl 1. Knudsen, Brooklyn, N. Y.
K3GJV, Leonard M. Dub, Kensington, Maryland
W3KFW, Russell H. Wagner, Lewistown, Penn.
W3MIE, Henry J. Bourquin, Meadville, Penn.
W4AJA, Carl F. Probst, Hampton, Va.
W4DOC, William E. Coogler, jr., Atlanta, Ga.
W4IOU, *Friedrich G. Von Saurma*, Huntsville, Ala.
K4IXE, Jack B. Clements, Boynton Beach, Fla.
K4TYF, Arthur B. Malkin, Memphis, Tenn.
W5AO, Prentice C. Lackey, Altus, Okla.
K5BEY, Fuller L. Barnett, Bethany, Okla.
W5HXJ, Fred F. Zelinger, Oklahoma City, Okla.
W5IZB, J. Alton Mauer, Houston, Tex.
W5PCQ, Rue S. Webb, Enid, Okla.
K5WXE, Martin P. Schroedel, New Orleans, La.
W6BBJ, Edgar L. Rockwood, Menlo Park, Calif.
ex-6BY, Robert W. Thorson, Richmond, Calif.
K6DTD, Lyle W. Larrabee, Palm Springs, Calif.
WA6FZC, E. Irene Doramus, McCloud, Calif.
W6IHX, Chester E. Daniel, Sacramento, Calif.
W6JHO, William L. Krause, Glendale, Calif.
WA6ORA, John A. Chumley, San Bernardino, Calif.
WA6PAA, John J. Messina, San Bernardino, Calif.
W6QPR, Edward J. Page, Santa Monica, Calif.
K6RVY, Bruno R. Plitzko, Pomona, Calif.
W6SVU, Edward R. Smith, La Crescenta, Calif.
W6WJF, Clarence H. Cassady, San Anselmo, Calif.
W7RML, George M. Bain, Vancouver, Wash.
WN8DSK, Jerome E. Davis, Princeton, W. Va.
W8HLY, Rayburn H. Griffin, Lawrence, Mich.
W8OQF, Ralph H. Summers, Pleasant Ridge, Mich.
KN9EDX, LaVerne E. Perkins, Newburgh, Ind.
W9ODI, Andy B. McCowan, Indianapolis, Ind.
WØHST, Clark M. Varnum, Tama, Iowa
KØJLJ, Chalmer R. Ethington, Powersville, Mo.
WØRBS, Darrell J. Palmer, Bismarck, N. Dakota
KH6CLF, Frank H. Miyahara, Honolulu, Hawaii
VE3ALU, H. T. Barker, Kirkland Lake, Ont., Canada
VE3AX, W. P. Roberts, Seaforth, Ont., Canada
VE3PH, F. Gordon Browne, Kirkland Lake, Ont., Canada
VE7FJ, Austin B. Doyle, New Westminster, B.C., Canada
VE7RU, A. J. Ober, Vancouver, B.C., Canada

Dr. A. Hoyt Taylor

There arrived here at Hq. the other day a book listing diodes and transistors by type numbers, and giving the names of manufacturers producing each type. No technical data, just the manufacturers' names. It's a fairly thick book — because it lists 6600 different diode and transistor numbers!

In the face of such an aggregation, how can the uninitiated ham hope to decide what transistor to get when he wants to experiment a bit? To get a start at answering that question, we asked one of the prominent manufacturers to make up a "recommended-type" list for us. As you will see on looking it over, it is no more formidable than a comparable tube list. This is the result of setting it up on the basis of amateur needs.

If you already know what you want and where to get it, you won't need such a list as this. Most of us, however, will welcome a little help in making our selections.

Transistor Types Recommended for Amateur Applications

BY KENNETH M. AITKEN,* W2OUY

My attention has been called repeatedly to a 1958 *QST* article covering recommended tube types for amateurs,[1] with a suggestion that something similar be done on transistors. This article is an attempt to present similar recommendations for transistors in the RCA product line, based on good reference sources for device application information, and an up-to-date price list. The table below should help the reader select the most economical suitable transistor for his particular applications.

Transistors started out as essentially audio-frequency devices or low-frequency r.f. units for use in the broadcast band. They also began as "small-signal" devices similar to the original miniature receiving tubes. Research since that time has continued to increase their frequency and power capabilities. Research has not only increased the industry's knowledge but also its manufacturing techniques to the point where some of the old and recognized type numbers are now being replaced by newer units having better capabilities and lower prices. For example, the 2N109 has been a well-recognized unit for years for use in preamplifiers or low-level audio stages. At least one small amplifier used two 2N109s in push-pull to provide Class B speaker output, and many small transistor receivers still do. Although this device will probably be available for many years, a newer type, the 2N408, which is a slightly lower-voltage unit, can provide comparable performance at lower cost.

In considering reasonably-priced units for amateur use, the simplest thing to do is to categorize transistors into low-frequency, medium-frequency, and highest-frequency units by type number. The same technique can also be applied to power output at r.f. and audio. Unfortunately, there is a gap in frequency/power characteristics in the area of the ham bands, and higher-frequency and higher-power units are still somewhat higher priced. However, increased applications and use should lower these prices within a reasonable time.

The selection of devices, tube or transistor, for the various circuits described in the amateur press has not always been a matter of free choice. Often, the device selected for a particular circuit was the one that happened to be on hand or the one most readily available from a friend or from the local parts house. The ingenious application of what's on hand has always been one of the attractions of amateur radio, and no recommended list will ever change the breed. For these reasons a list of alternate types has been added to the recommended types. The alternate types are not directly interchangeable with the recommended ones, but with suitable modification of the operating conditions they can be used very satisfactorily. In any event, the listings narrow down the possible choices for a particular application and provide the average ham who would like to experiment with the new solid-state devices a good place to begin. Heat dissipation or transfer is a problem which I will not cover here. It is a subject for a separate discussion. It is, however, a very important consideration in the use of transistors. When there is any indication for a need to use a "heat sink," do so; it can make a big difference in the power-handling capability of a transistor.

The following table, then, is intended to show: (1) the least expensive unit that will do the job, (2) the lowest-power unit that will do the job, and (3) the lowest-cutoff-frequency unit that will do the job. The latter two considerations always affect the first.

* Semiconductor and Materials Division Radio Corporation of America, Somerville, New Jersey.

[1] Aurick and Boivin, "Recommended Tube Types for Amateur Short-Wave Receivers," *QST*, November, 1958.

Semiconductor Devices Recommended for Amateur Applications

	Recommended type	Alternate Types		
Receiver or Small Signal Applications:				
R.F. Amplifier or Preamplifier				
to 100 Mc.	2N1177	2N1613	2N384	
		2N706	2N1023	
to 30 Mc.	2N370	2N955	2N2102	
		2N371	2N372	
to 7 Mc.	2N1632	2N274		
I.F. Amplifier	2N1524	2N1637	2N711	
		2N218	2N2102	
		2N1180	2N1023	
		2N1638	2N274	
Mixer	2N411	2N1613	2N384	
		2N219	2N384	
		2N1179	2N2102	
		2N372	2N1023	
		2N706	2N274	
Local Oscillator				
High Frequency	2N1178	2N955	2N706	2N384
Medium Frequency*	2N371	2N274	2N1023	2N1183
Converter	2N1526	2N1639	2N219	2N411
Transmitter Applications:				
Oscillator — Low Power				
High Frequency	2N1178	2N955	2N706	2N384
Medium Frequency*	2N371	2N274	2N1183	2N1023
Oscillator — Medium Power and intermediate power amplifier	2N1905	2N1700	2N1701	2N1702
		2N1703	2N174	2N1100
Output Power Amplifier				
to 100 Mc.	2N955 (50 mw.)	2N706 (200 mw.)		
to 30 Mc.*	2N697 (1 watt)	2N706 (½ watt)		
to 10 Mc.*				
to 1 watt	2N1491			
to 10 watts	2N1492			
above 10 watts	2N1493			
to 4 Mc.*				
to 15 watts	2N1905			
Audio and Special Applications:				
Preamplifier	2N408	2N109	2N270	
		2N2102		
Intermediate Power and Drivers	2N301	2N406	2N591	
High Power	2N441	2N301	2N1906	
		2N174		
Inverter and D.C./D.C. Converter:				
	2N441	2N301	2N174	
Voltage Regulator:				
	2N441	2N174	2N1905	
		2N1100	2N1184	
Rectifiers:				
Peak Reverse Voltage	500 Ma.	750 Ma.		
50		1N2858		
100		1N2859		
200		1N2860	1N3193	1N3253
300		1N2861		
400	1N1763	1N2862,	1N3194-1N3254	
500	1N1764	1N2863		
600		1N2864-1N3195-1N3255		
800	1N3196-1N3256			

* Higher-frequency units may also be used.

NOTE: The 1N3253, 1N3254, and 1N3255 have a sleeve-insulated case.

The 1N3193, 1N3194, and 1N3195 do not. They are in a small cylindrical case with pigtail leads.

The 1N1763, 1N1764, 1N2858, 1N2859, 1N2860, 1N2861, 1N2862, 1N2863, and 1N2864 are in top-hat cases.

Looking Forward to Oscar II

OSCAR I, the first amateur radio space satellite, operated from about 1 P.M. (PST), December 12, 1961, until nearly noon December 30. The 10-pound package travelled 312 revolutions about the earth and covered approximately 7,400,000 miles! Quick estimates reveal that over 3000 separate reports from over 450 tracking stations have been studied to date by the hardy and dedicated amateurs comprising the Data Reduction and Analysis groups of the Project Oscar Association. Heartfelt congratulations are due to all who participated in the space experiment, and a complete summary of results will be presented in a forthcoming issue of *QST*. QSLs will be forthcoming shortly.

Preliminary inspection reveals that *all* data submitted by radio amateurs (even the simple "I heard it!!!") are of great value. In addition, the data proved conclusively that a large group of radio amateurs can gather significant information and make worthwhile contribution to the art. Because many hams were caught with their "antennas down" when Oscar I went into orbit, and because a broader base of knowledge can be gained from a second satellite, it is planned to orbit Oscar II this Spring.

Three types of reports are requested for Oscar II. The first (and simplest) report is merely your QSL card, mailed to the Association, Box 183, Sunnyvale, California. Note the time first heard and the time it faded out. Also, if you have a stop-watch or watch with a second hand, count the number of seconds it takes the satellite to send 10 HIs. Jot this data on the QSL and mail it in. You will help the program and receive an Oscar II QSL card from outer space!

The second, more advanced, report makes use of the form printed in July, 1961 *QST*, page 59. Read this article for full particulars, or write to the Association for a reprint. Finally, a special tracking form has been printed by the Association, together with full information concerning Doppler measurements. Those amateurs having advanced tracking experience with Oscar I are requested to write the Association for this data.

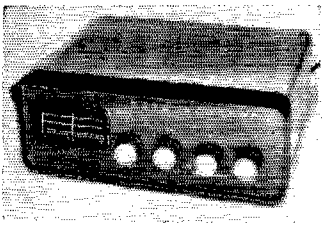
Remember — this is *your* satellite! The time of acquisition and fade-out of Oscar II, plus the number of HIs transmitted in ten seconds — jotted down on your QSL card and mailed to the Association — will be of great assistance to this radio amateur space experiment! Launch information for Oscar II will be carried by W1AW, the various press services, and by the Voice of America. Make sure you are QRV on 145 Mc! Get your QSL from outer space! Read *QST* for additional Oscar II information! — *W6SAI*

Strays

WA2OZV tips us off to something the gals have probably known about all along. To keep the ends of nylon guys from unraveling, singe them with a match or lighter.

• Recent Equipment —

Radiaphone Band Scanner Panoramic Receiver



THE Radiaphone Band Scanner is a station accessory for panoramically reproducing received signals in visual form on a cathode-ray tube. Unlike conventional receivers that present one narrow band of audio frequencies at a time to the speaker, the panoramic receiver allows simultaneous observation of individual signals over a wide frequency range — as much as 200 kc.

In conjunction with the regular station receiver, the Band Scanner can be used for such things as visual monitoring of a band segment while operating on a specific frequency, for spotting replies to CQs off your own frequency, for selecting QRM-free areas, or for locating stations whose exact frequencies are unknown. It's also useful for spotting splatter, carrier shift, key clicks, and so on. The Band Scanner also includes provision for inserting r.f. and audio from a transmitter directly on the vertical and horizontal deflection plates of the c.r.t., so that r.f. envelope or trapezoidal waveforms can also be viewed.

The Band Scanner is attached to the receiver through a coaxial cable furnished with the unit. Connection is made to the plate of the first converter tube (if the receiver has a crystal-controlled first converter the lead must be connected to the second converter stage), which must have the same output frequency as the input frequency of the Band Scanner. The standard model is supplied for use with receiver i.f.s of 455 kc., but models are available with front-end assemblies for other intermediate frequencies. Those who are afraid to remove the bottom plates of their receivers will be interested to know that the manufacturer can supply a special plug-in adapter cable; this allows connecting the Band Scanner to most receivers simply by inserting the adapter between the converter tube and its socket.

A block diagram of the Band Scanner is shown in Fig. 1. It is similar to that of most superheterodyne receivers in that it has an r.f. stage, converter, i.f. amplifier and detector, but it departs somewhat in other respects and involves circuits that are not too familiar to most amateurs. Signals from the mixer or converter of the communications receiver are applied to the 6AH6 r.f. amplifier, V_1, through two tightly coupled tuned circuits, T_1. These circuits are peaked above and below the center frequency (455 kc.) to give a more-or-less flat response across a 200-kc. band. After amplification, the signals feed into a 6BE6 converter, V_2, whose output is tuned to 262 kc. With an input center frequency of 455 kc., the oscillator portion of the converter tube (which is on the high side of 455 kc.) is swept over an adjustable frequency range of up to 100 kc. either side of 717 kc. (455 kc. plus 262 kc.) by the reactance modulator, V_5, a 6AH6. The sweep rate is about 120 times a second. The reactance modulator and horizontal sweep for the c.r.t. are driven in synchronism by the 12AU7 sweep generator, V_6, which operates as a 120-cycle cathode-coupled free-running multivibrator.

If you aren't familiar with panoramic reception, it can be simplified by thinking of the Band Scanner as if it were a conventional receiver to which automatic tuning has been added. Instead of the reactance modulator tuning the converter oscillator, think of an operator tuning his re-

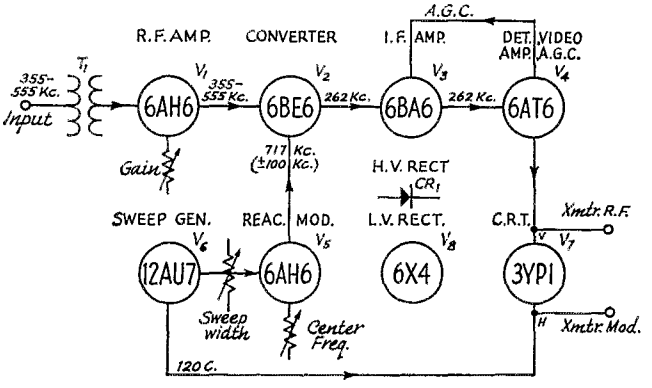
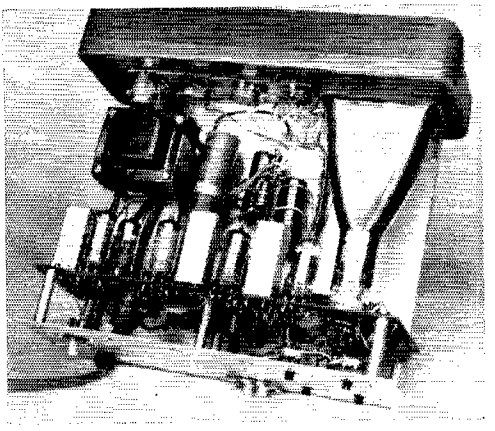


Fig. 1 — Block diagram of the Band Scanner.



Because of its unique construction, only one out-of-the-cabinet view of the Band Scanner is necessary to show just about everything. The tubes and most of the components are mounted on a printed-circuit board which is attached to the chassis by spacers. Rear-apron connections and controls from right to left are four potentiometers (SWEEP, FOCUS, HORIZ, and VERT), two phono jacks for r.f. and audio input from an external transmitter, the line cord, and a connector for receiver input.

ceiver back and forth over a 200-kc. range. Instead of a sweep generator, think of the same operator doing the tuning at a rate of 120 times a second.

Getting back to the block diagram, the 262-kc. intermediate-frequency signals are amplified in V_3, a 6BA6, and then detected in a diode section of V_4. A.g.c. voltage is also produced in V_4 and is applied to the grid of i.f. amplifier V_3. The triode section of V_4 amplifies the detected video, which is then applied to the vertical deflection plates of the c.r.t.

Two phono jacks at the rear of the cabinet connect by way of a panel MODE switch to the vertical and horizontal deflection plates of the c.r.t. These allow the Band Scanner to be used as a transmitter monitor. The MODE switch has three positions. In position 1, the unit operates as a panoramic receiver; in position 2, r.f. from the external transmitter is applied to the c.r.t. for r.f. envelope patterns; in position 3, both r.f. and audio from the transmitter are applied to the c.r.t. for the trapezoidal pattern.

All of the necessary power for the Band Scanner is furnished by a self-contained supply. Plate voltage for all tubes except the c.r.t. is furnished by a full-wave 6X4 rectifier. An extra winding in series with one side of the h.v. secondary of the power transformer gives the higher voltage needed for the c.r.t. The c.r.t. uses a semiconductor diode rectifier, CR_1, and has its own filter.

The Band Scanner is housed in a modern, two-tone gray cabinet. The 3YP1 cathode-ray tube is rectangular in shape and so gives maximum viewing area in minimum vertical space. On the front panel, in addition to the tube, there is the MODE switch, a GAIN control which also doubles as the on-off switch, a SWEEP control and a CENTER FREQ control. The GAIN control is a potentiometer in the cathode of the r.f. amplier. The SWEEP control, which determines the deviation of the converter oscillator, can be adjusted from a full sweep of 200 kc. down to zero, at which point just the normal audio output of the signal will be seen. The CENTER FREQ control moves the entire display across the face of the c.r.t. so that any signal within the frequency range of the Band Scanner can be moved to the center of the screen and then, if desired, expanded by the SWEEP control.

If you have never seen or used a panoramic receiver, you are probably wondering what you see on the screen. Suppose you have the companion receiver tuned to 7.1 Mc. The Band Scanner is turned on, the GAIN control is at maximum, the SWEEP at 200 kc. and the CENTER FREQ at zero. On the screen will appear several "pips" of different heights. If there happens to be a signal on 7.1 Mc. you will hear it in the speaker or headphones, and its pip will be at the center of the screen. The other pips on the screen are also signals, scattered through 100 kc. on either side of 7.1 Mc. Since the screen has a calibrated scale (+100 through 0 to −100), the other stations can be identified as to frequency merely by adding or subtracting their positions on the screen from 7.1 Mc. If you have a v.h.f. converter ahead of the receiver, this is a good feature when you're looking for satellites whose frequencies are known only approximately. If you tune the receiver, the pips will move across the screen. With the CENTER FREQ control set at zero, the pip that appears at zero on the scale always will be the station heard in the speaker.

After some practice, you will be able to identify the various types of signals from their shapes. This will come in handy when you're trying to avoid short-wave commercials and teletype stations!

If you want to observe a particular signal a little more closely, rotation of the SWEEP control to 100 kc., 50 kc., or all the way down to zero will decrease the r.f. sweep and expand the display to those values. You don't have to be listening to the signal in order to scrutinize it. Suppose you want to expand a signal that is 50 kc. up the band. Just rotate the CENTER FREQ control until the desired signal moves to the center of the screen. Then adjust the SWEEP control to the appropriate value.

Combining, as it does, panoramic reception with phone-transmitter scope checking, the Band Scanner would appear to be a highly useful station accessory. — *E. L. C.*

Radiaphone Band Scanner Model 44
Height: 4½ inches.
Width: 11¼ inches.
Depth: 10 inches.
Weight: 9 pounds.
Price Class: $180.
Manufacturer: Radiaphone Company, Inc., 600 E. Evergreen Ave., Monrovia, California.

The Hallicrafters SX-115 Receiver

THE SX-115 is an 18-tube, 5-semiconductor, triple-conversion ham-band (plus WWV) receiver that tunes the bands from 80 through 10 meters in nine 500-kc. segments. It has a crystal-controlled front end, and a dial and drive mechanism that gives direct frequency readout to better than one kilocycle.

As the vital-statistics box at the end of the write-up indicates, the SX-115 is just as deep as it is wide, giving it a rather cubical appearance. However, even though the receiver looks heavy and rugged, the use of aluminum for panel and chassis construction limits its weight to 45 pounds. The receiver cabinet is predominantly black with an aluminum-finish perforated lift-up lid. The panel is black crackle with gray trim and the knobs are black with chrome centers.

The SX-115 is the top amateur receiver in the Hallicrafters line and it combines several circuit features found in other Hallicrafters receivers that have been covered before in this column. Footnotes are given for reference to the original equipment.

A block diagram of the SX-115 is shown in Fig. 1. Signals arriving from the antenna are amplified in the 6DC6 r.f. amplifier and then passed on to the 6BA7 first mixer. The input stage to the r.f. amplifier can be peaked up by a front panel ANT TRIM control. The r.f. amplifier gain can be controlled manually (also the gain of the second i.f stage, V_8) by the panel RF GAIN control.

The injection voltage for the first mixer, V_3, comes from a crystal-controlled oscillator, V_4, which always operates on the high side of the signal frequency. Nine crystals are necessary for the five amateur bands and the 10-Mc. WWV frequency (ten meters is tuned in four 500-kc. segments). The proper crystal, along with the tuned circuits in the crystal oscillator, r.f. amplifier and first mixer, are switched into the circuit by a panel-actuated BAND SELECTOR. The nine 500-kc. band segments are 3.5 to 4.0 Mc., 7.0 to 7.5 Mc., 14.0 to 14.5 Mc., 21.0 to 21.5 Mc., 28.0 to 28.5 Mc., 28.5 to 29.0 Mc., 29.0 to 29.5 Mc., 29.5 to 30.0 Mc., and 9.5 to 10.0 Mc. The band covered by each position of the switch is indicated in a window just above the BAND SELECTOR knob.

Output from the first mixer varies over a 500-kc. range, 6.005 to 6.505 Mc. This signal is fed into a tunable i.f. amplifier, V_5, and then to a second mixer, V_6, whose grid circuit is also tunable. A v.f.o., V_7, provides the injection for the second mixer. It is gang-tuned along with the tunable i.f. amplifier and second mixer by a panel TUNING control. The entire tuning mechanism is gear driven.

The v.f.o. is the same unit used in several Hallicrafters transmitters.[1] Its dial is shaped like a half moon, and rising from the hub, which is calibrated in 100-kc. increments, is a red pointer

[1] "Recent Equipment," *QST*, May, 1957, p. 38.

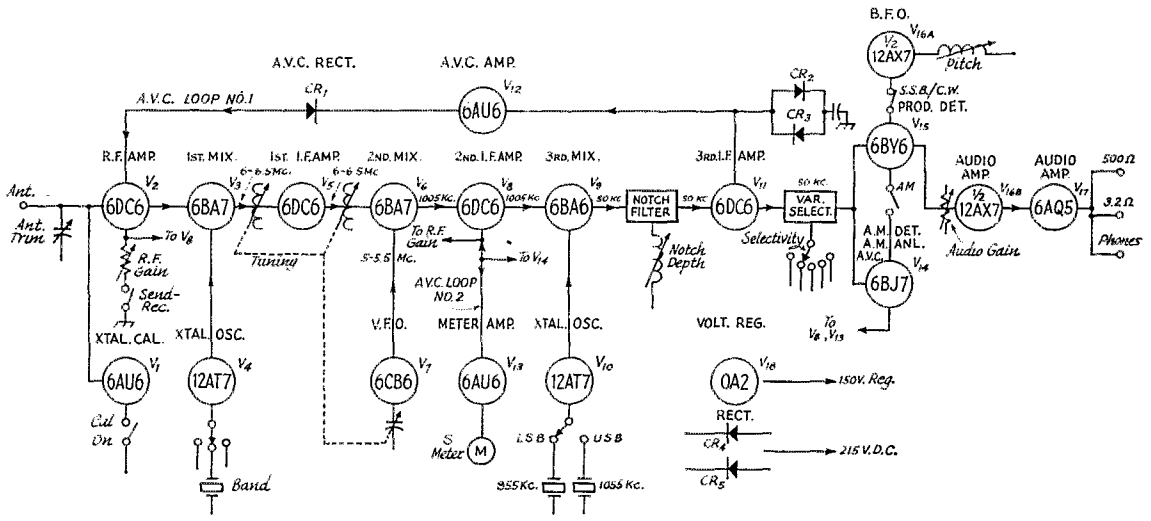
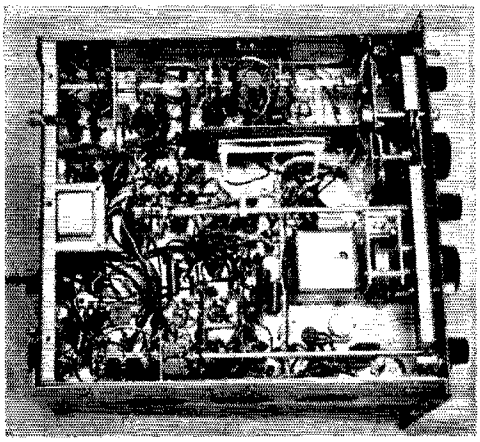


Fig. 1—Block diagram of the SX-115 receiver.



Bottom view of the SX-115 receiver. The shielded box just behind the flywheel at the lower right of the photograph contains the v.f.o. circuitry. The power-supply filter choke is mounted on the chassis wall at the left.

which shows the scale in use. The outer rim of the moving dial is marked in 25-kc. segments, and a fixed pointer hangs over the rim for reading the 25-kc. increments.

Also on the front panel and located just above the TUNING knob is another window with a dial marked from 0 to 25 kc. One rotation of the TUNING knob changes the receiver frequency 25 kc. and the dial can easily be read to less than 1 kc.

The v.f.o. uses a differential temperature compensation circuit to give an over-all receiver stability rating of better than 300 cycles after a 15-minute warm-up.

Tuning range of the v.f.o. is 5.0 to 5.5 Mc., and it is combined with the tunable first i.f. signal to give a second i.f. of 1005 kc. The 1005-kc. signal is amplified in V_8. This stage has some a.v.c. applied (a.v.c. loop No. 2 in Fig. 1) and has its cathode returned to ground through the RF GAIN control.

The 1005-kc. signal is converted to the third i.f. of 50 kc. in the third mixer, V_9. A panel switch marked FUNCTION selects either of two crystal-controlled oscillators to provide the proper injection frequency for selectable-sideband [2] reception.

Fifty-kilocycle output from the third mixer is amplified in V_{11} after passing through a bridged-T notch filter.[3] The NOTCH control on the front panel varies the notch frequency within the 50-kc. i.f. passband. An a.g.c. line (a.g.c. loop No. 1) originates in the 50-kc. amplifier, V_{11}. Signals are picked off the plate of V_{11}, amplified in the a.g.c. amplifier, V_{12}, rectified in a semiconductor diode, CR_1, and applied to the grid of the r.f. amplifier, V_2. In addition to this a.g.c. circuit, there is a shunt i.f. noise limiter,[4] using semiconductor diodes CR_2 and CR_3 in the plate circuit of V_{11}. This limiter is useful in s.s.b. and c.w. reception. The diodes are automatically back-biased to the peak amplitude of the signal being received, and when noise pulses reach an amplitude higher than the bias they are clipped and do not appear at the detector circuit.

A panel SELECTIVITY control gives five degrees of selectivity: 0.5, 1, 2, 3, and 5 kc. The selectivity is varied in about the same way that it was in the SX-88,[5] by switching in different values of resistance and capacitance in the 50-kc. tuned circuits.

Signals are detected in either a product detector, V_{15}, (s.s.b. and c.w.), or in an envelope detector, V_{14} (a.m.). In a.m. operation the product-detector stage is used as an additional audio amplifier. B.f.o. injection for the product detector is furnished by one section of V_{16}; its frequency is controlled by the front-panel PITCH control. A diode section of the 6BJ7 a.m. detector also develops a.g.c. voltage (loop No. 2) which is applied to the second i.f. amplifier, V_8, and to the S meter amplifier, V_{13}. The S meter indicates relative strength and is calibrated in S units 1 to 9, and in db. to 60 db. above S9.

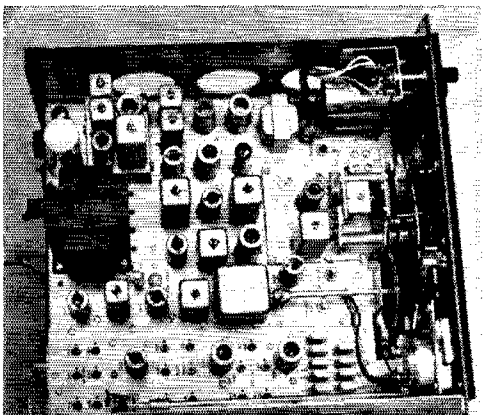
There is a four-position a.g.c./a.n.l. switch on the panel. When the switch is in the AVC OFF position, a.g.c. voltage is removed from all stages except the meter amplifier, V_{13}. This allows the S meter to continue operating without a.g.c. In the AVC ON position, both a.g.c. loops are in operation. In the SSB-ANL position, the a.g.c. circuit is in operation along with the i.f. noise limiter, CR_2 and CR_3. The AM-ANL position places the carrier-operated series noise limiter, V_{14}, in the circuit.

[2] McLaughlin, "The Selectable Single-Sideband Receiving System," *QST*, June, 1941. Also, "Exit Heterodyne QRM," *QST*, October, 1947.

[3] "Recent Equipment," *QST*, December, 1955, p. 53.

[4] Bishop type limiter as described in Stiles, "I.F. Noise Limiter," *QST*, June, 1960, p. 16.

[5] "Recent Equipment," *QST*, June, 1954, p. 43.



Part of the gear mechanism of the tuning control is visible in this top view of the SX-115 receiver. In addition to being ganged to the indicating dial, the tuning knob is also linked to tuned circuits in the grid of the first i.f. amplifier and in the second mixer. The variable tuned circuit for this stage is contained in the square shield can in the lower center of the photograph. The crystals at the bottom right belong to the crystal-controlled first oscillator. They are selected by the panel BAND SELECTOR.

Detected signals are amplified in V_{16B} and V_{17}, giving a maximum of about 1½ watts output with less than 10 per cent distortion. Three output impedances are available, 500-ohm and 3.2-ohm taps at a terminal strip at the rear of the receiver, and a headphone jack on the front panel. The 3.2-ohm tap is automatically disconnected when headphones are inserted in the PHONES jack.

A power supply using semiconductor diodes supplies 215 volts d.c. and 150 volts regulated d.c. for operation of the receiver. An 8-watt heating element ("Dampp Chaser") connected across the a.c. line keeps the chassis at a more-or-less constant temperature, which helps reduce warm-up drift.

Also included in the SX-115 is a 100-kc. crystal calibrator circuit. A front panel XTAL CAL switch turns it on and off.

Arranged along the rear apron of the receiver are several connectors and components. A coaxial connector (mates with a PL-259) is provided for the antenna connection. There is also a line cord, a fuse holder, speaker terminal strip, a ground stud, and an eight-pin auxiliary plug. The auxiliary plug allows for disabling the receiver by connecting a remote s.p.s.t. switch or relay between two of the pins. Two of the pins also connect to a front panel RECEIVE-STANDBY switch. This switch may be used to actuate a remote relay for station control. Fifty-kilocycle i.f. output from the plate of the third i.f. amplifier, V_{11}, is also available at the auxiliary plug.— *E. L. C.*

Hallicrafters SX-115 Receiver

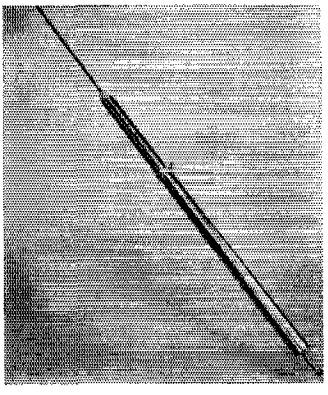
Height: 10½ inches.
Width: 16 inches.
Depth: 16 inches.
Weight: 44 pounds.
Power requirements: 105 to 125 volts, 50/60 cycles, 85 watts.
Price class: $600.
Manufacturer: Hallicrafters Company, Chicago 21, Illinois.

• *New Apparatus*

The Polytronics 2-Band V.H.F. Mobile Antenna

HERE is an idea so simple that you wonder why it hasn't been used more in the past: a mobile antenna for 50 and 144 Mc. that requires only one feed line, one mount and no adjustments in changing from one band to the other. The advantages of such an arrangement for use with this manufacturer's 2- and 6-meter transceiver, or for any mobile installation for these two bands, are obvious.

The sketch shows how it works. The entire antenna is a quarter-wave whip for 50 Mc. The lower portion is a coaxial sleeve at 144 Mc., which makes the portion above the sleeve work as a half-wave radiator at this frequency. The sleeve and whip are electrically connected at the bottom, but insulated by a teflon insert at the top of the sleeve. Provision is made for adjusting the length of the sleeve to achieve the optimum match at the most-used frequencies in the two bands. Adjustment with a bridge in the 50-ohm line showed that a satisfactorily low s.w.r. can be achieved readily.



The Polytronics mobile antenna for 50 and 144 Mc. Only a portion of the whip is shown, in order to picture the adjustable sleeve section clearly.

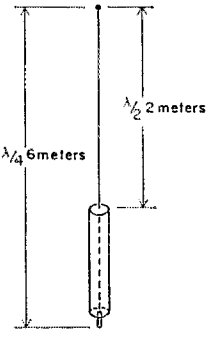


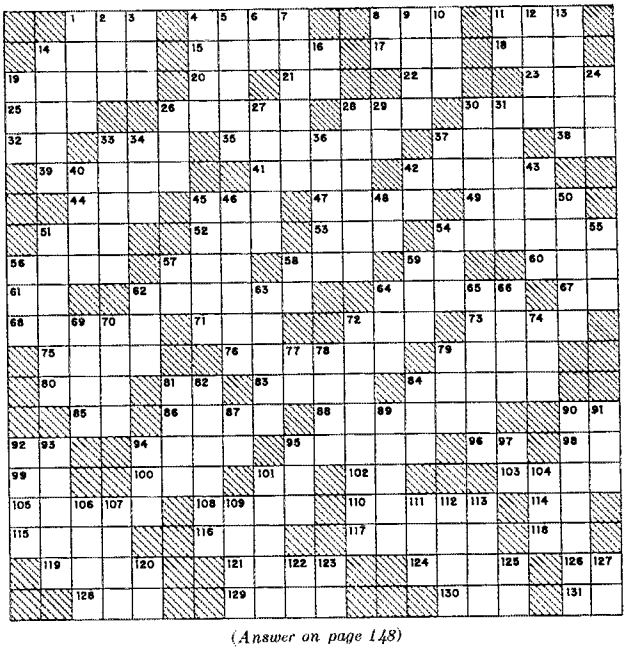
Fig. 1—Details of the two-band mobile antenna. The bottom portion is a coaxial sleeve or bazooka for 144 Mc., permitting the whip portion to act as a half-wave radiator at that frequency. The entire assembly is a 50-Mc. quarter-wave radiator.

A point noted by W1CUT who ran some tests with his 2-meter mobile installation: After a heavy rain the sleeve section was full of water. Some small drain holes at the bottom of the sleeve would prevent this, and have no adverse effect on the antenna's performance.

The antenna is available in three forms: PCA-251, whip and sleeve as illustrated; PCA-249, with cowl mount, 15 feet of RG-58 U cable and all connectors; and PCA-250, with standard stud, ball mount and cable and connectors. Price range is approximately 14 to 24 dollars, depending on model. — *E. P. T.*

Crossword Puzzle

BY DOROTHY SAUNDERS
W4UF



(Answer on page 148)

HORIZONTAL

1. Needed to send code
4. Part of vacuum tube between cathode and plate
8. A measure of resistance
11. A measure of electric current (abbr.)
14. Important part of non-beam antennas
15. Frequencies that you should be able to hear
17. Exclamation
18. Pass between peaks in mountain chain
19. Stories
20. Into
21. Pulse modulation (abbr.)
22. Show-me state (abbr.)
23. Dash
25. Type of oscillator (abbr.)
26. Prefix, to or in
28. Help
30. Mediterranean island
32. That is (abbr.)
33. Sky hook (abbr.)
35. Necessary for good electrical connections
37. Enemy
38. Measure of type
39. Our hobby
41. Sea bird
42. How some hams like to get their equipment
44. Connecting fitting for plates of some transmitting tubes
45. To and ———
47. The ——— of March
49. XW8
51. Peak envelope power (abbr.)
52. What a ham is on
53. Type of antenna
54. Human soul or vital principle
56. Type of antenna (abbr.)
57. Globe or sphere
58. Poetic over
59. Laughter
60. Common Korean name
61. Honduras
62. What all v.f.o.'s should be
64. Adjusted to match a frequency
67. French West Africa
68. They blow all too often
71. Female deer
72. Female parent, usually a dear
73. Salamander
75. Frequencies produced by modulation
76. ——— band f.m.
79. Navy term for equipment
80. Finish
81. Female operator
83. What your receiver is when a tube burns out
84. Speed
85. Blue-grass state (abbr.)
86. Not so much as
88. Regulation
90. General call
92. The successor to spark telegraphy
94. Part of some antennas
95. The soft palate
96. Yugoslavia
98. Thailand
99. Aland Islands
100. Ancient
101. Point of compass (abbr.)
102. Where a thing is or occurs
103. Type of antenna
105. Two-element vacuum tube
108. Electrified particles formed when a molecule of gas loses an electron
110. What should be carried on with a dummy load
114. Male title (abbr.)
115. Repetition of a received radio signal a perceptible time after the signal was first received
116. Point of compass (abbr.)
117. To make an effort to perform
118. Armenia
119. Strikes
121. They get tired of earphones
124. Male deer
126. Ifni
128. Generator of r.f. current (abbr.)
129. Something which, if made, should be kept
130. Of the d.c. input to a tube is 100 watts and that r.f. power output is 10 watts, the efficiency in terms of ·· is ———
131. Chased by many people

VERTICAL

1. Prefix, one-thousand
2. Poetic before
3. Affirmative
4. Power output: power input
5. The smaller ones
6. A diameter, but not o.d.
7. Popular type of antenna
8. Exclamation of surprise
9. What we all are
10. Unit of conductance
11. Type of current (abbr.)
12. Control on front panel of Valiant
13. A tube part that receives electrons
14. Part of a decked switch
16. Male operator
10. To be avoided like the plague
24. Old chicken
26. Int. Trade Organization (abbr.)
27. Nice to have with a beam
28. A radio transmitter
29. Conjunction
30. Spirals of wire
31. Any device with which the input controls another circuit
33. Alter for a new use
34. A little bite
36. Input voltage or power
37. New Hebrides
40. Genus of maple
42. College degree
43. Pier
45. Fundamental unit of capacitance
46. Kind of microphone
48. Engineering degree
50. What a rock-bound can't do to a frequency
51. To read carefully
54. Part of tube base
55. Electric potential that causes current to flow (abbr.)
56. Reception and transmitting at 50 Mc or higher frequencies (abbr.)
57. Long time radio operator (abbr.)
58. Austria
59. Undesirable in a relay
62. Point of compass (abbr.)
63. Found between parts of antennas and transmitters
64. To pull along
65. Capacity for performing work
66. Costly
69. Depression
70. Type of loss currents when a.c. flows thru a coil wound on an iron core
72. To vary frequency or amplitude, etc.
74. Twisted or contorted
77. Useful sort of engineer to be (abbr.)
78. What the best DX is
79. Type of soldering iron
81. Popular female organization
82. Part of an antenna
84. Male pronoun
87. Poland
89. Stringed instruments
90. Good battery condition
91. Your keying is defective
92. What most beginners struggle with
93. Pronoun
94. Pedal extremity
95. Our neighbors to the north
97. Latvia
101. Type of movie review
104. Native earth-baking pit (Polynesian)
106. Buckeye state
107. Dits
109. New England residents
111. A mode of transmission (abbr.)
112. Tight
113. Indian groom
120. Coastal state (abbr.)
122. Regarding
123. Rather rare midwestern state for WAS (abbr.)
125. Novice prefix
127. Cutting implement

Hints and Kinks For the Experimenter

RTTY POLAR-RELAY ADJUSTMENT

THE following method of adjusting the type 255 polar relay for RTTY purposes simulates operating conditions and shows the results on an oscilloscope.

Loosen the knurled lock nuts and back off the pole pieces several turns each. Back off the contacts so they can be examined and c'eaned and burnish them if necessary. Burnishing is best done with the special tool made for the purpose, but it can be done with crocus cloth or some other very fine abrasive. Be sure the contacts are clean before proceeding further.

Place a 0.005-inch spacer between the leaves of the armature. Connect one lead of an ohmmeter to Pin 1 in Fig. 1, and the other lead to one contact support arm. Advance the corresponding contact until the ohmmeter shows a closed circuit, then carefully back off just enough to open the circuit. Do the same with the other contact, and hereafter do not touch these adjustments. Remove the spacer from the armature.

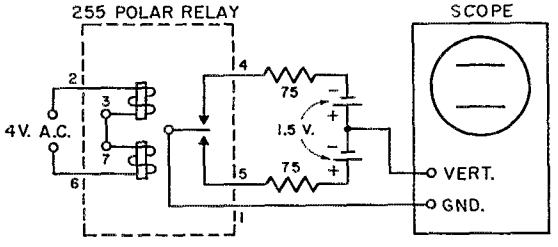


Fig. 1—W8QMI's circuit for adjusting the type 255 polar relay.

Refer to Fig. 1 and connect the relay, batteries, a.c. source, resistors, and oscilloscope as shown. The 75-ohm resistors establish a contact current of 20 ma. The resistor values can be changed for other currents.

Turn on the scope and set it for 60-cycle sweep and 60-cycle sync; adjust the vertical and horizontal gain controls so that an approximation of the pattern shown on the scope in Fig. 1 is achieved. With a nonmagnetic tool, such as a soldering aid or a wood stick, adjust the pole pieces toward the armature. In their final position they will almost touch the armature; adjust until the scope shows two horizontal lines equal in length. To compare the lengths of the two lines, lower the vertical gain until the lines overlap. The pattern in Fig. 2A shows uneven dwell, in Fig. 2B contact bounce, and in Fig. 2C arcing. In some cases it may be necessary to make a very minute adjustment to one contact or the other, but this should only be done if further adjustment of the pole pieces will not produce the desired pattern.

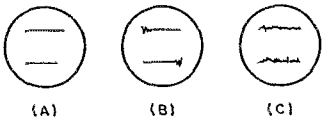


Fig 2—The pattern in A indicates uneven dwell, in B contact bounce and in C arcing.

The last step is to carefully tighten the lock nuts without changing the final settings of the pole pieces.

— *E. W. Koch, W8QMI*

TIRE-STATIC ELIMINATION

THE traditional cure for tire static is to inject antistatic powder into the tire tubes. However, after exhaustive checks with garages and radio-parts distributors, I just couldn't find any of the powder or even an injector for getting the powder into the tube.

I did find out, however, that antistatic powder is nothing more than graphite powder such as that used to lubricate locks. It wasn't any trouble to find the dry graphite powder and it came packaged in a small plastic tube that looked somewhat like a small toothpaste tube. I deflated the tires and squeezed the graphite into the tires and then inflated them. After a few turns of the wheel, the powder will distribute itself throughout the inside of the tube. After this project was completed, all of my tire static was gone. A local tire man assured me that the powder would have no adverse effect on the tires.

— *Ralph J. Cramer, K3CKV*

SHORTENING QUAD ELEMENTS

TO tune quad elements, make them a little large to start with and then tune them by shortening after the antenna has been erected. To shorten the element, merely twist the egg insulators at the two bottom corners of the element, as shown in the sketch. Of course, the supporting wire on the other end of the insulator will probably have to be let out as the element is pulled in An s.w.r. bridge in the antenna feed line will aid in tuning the elements.

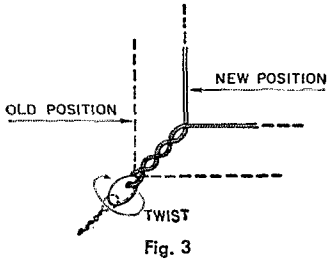


Fig. 3

— *Irvin D. Kridler, W7BTB*

TRANSMISSION LINE SPACERS

VERY good antenna spacers can be made from the handles of old toothbrushes. Cut off the head and round off the stub to match the other end. Grooves can be made in the ends by heating a length of wire and pressing it into the spacer ends.

— *Dr. Myrton J. Billings, W2BIV*

HI-FI INTERFERENCE

INTERFERENCE to hi-fi amplifiers is very often caused by r.f. picked up by the speaker leads. Most modern amplifiers use negative feedback around the output transformer, as shown in Fig. 4. The r.f. picked up on the speaker leads is

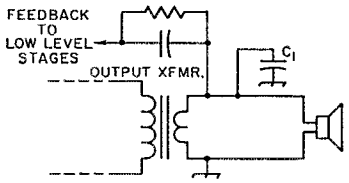


Fig. 4

fed back to the low-level audio stages of the amplifier where it is rectified and the resulting audio is amplified by the succeeding stages. The usual cure of inserting a resistor in series with the control grid of the low-level stage will not work with this type of interference. In my case, 2-meter interference was cured by simply bypassing the ungrounded side of the speaker at the chassis with a 47-$\mu\mu$f. capacitor, C_1, using the shortest possible leads. At lower frequencies, it may be necessary to use a larger capacitor; but this should not affect the audio-frequency response because of the low-impedance level involved.

— *F. W. Brown, W6HPH*

TREATING BAMBOO QUAD ARMS

TO preserve bamboo spreaders for my cubical quad antenna, I first wrapped each of the bamboo arms with overlapping surgical gauze bandage. This provided a double thickness of gauze which I then treated with "Sea-Jay" resin. After the first coat had been applied with an old sponge and allowed to dry thoroughly a second coat was then brushed on. The ends of the bamboo poles were plugged with corks and also given a treatment with the resin. Each ten-foot bamboo arm took about 12 yards of 2-inch gauze and required about 1½ quarts of the resin. The total cost of the project was less than ten dollars.

— *Capt. H. S. Walling, W6PPO*

PRESERVING UNUSED DECALS

DECALS used on the panels of radio equipment tend to dry out in the package, making them difficult to apply. The decal seems to break into several pieces and it is only with the greatest patience that it can be applied and made to look presentable.

To restore the entire decal sheet to its new condition, spray the sheet lightly with Krylon Crystal Clear (No. 1301) spray coating. It is important that the entire decal sheet be treated rather than an individual decal, since spraying a single word binds the "film" to the paper backing, making it difficult to separate.

After the decals are applied to the panel, a light spraying with the Krylon will protect the panel surface and insure that the decals will stay in place.

— *Fred R. Herr, W3WPV*

MINIATURE PILOT LAMPS

SUBMINIATURE lamp bulbs, which measure about 1/10 of an inch in diameter, are available in most hobby shops catering to model railroaders. The lamps are inexpensive and are tiny enough to fit inside most meters for illumination. A really compact pilot light can be made by cementing one of these lamps inside the jewel of a regular pilot light assembly. They can be used as is since the lamps are designed to operate between 12 and 16 volts, which makes them ideal for mobile use. However, they give sufficient light even on 6 volts. The lamps are available in white, red and green.

— *Melvin Leibowitz, W3KET*

MINIATURE WIRE CUTTER

THE small squeeze-type nail clippers can also be used as cutters for fine wire, coax shielding, and other delicate leads. They are especially handy in chassis tight spots and can also be used for stripping wire if a "V" notch is filed in the clipper jaws.

— *Richard A. Drew, K9PJB*

USING SPRAY PAINTS

I FREQUENTLY wish to paint small chassis, panels, etc., with canned spray paint. However, the XYL has rather strong feelings about the resulting cloud of fine spray which covers far more than the intended object!

By placing the item to be painted in a large cardboard box, it is possible to spray paint without having to perform the work out-of-doors. After painting the object, close the box quickly to prevent any of the excess paint spray from escaping.

— *Carl A. Emerson, W2RWH*

REMOTE TUNING SLUG-TUNED COILS

HAVE you ever tried to adjust a slug-tuned coil that is located inside equipment and, at the same time, observe a meter on the front panel? It is practically impossible to keep the tool in the slug slot while concentrating on the meter at the other side of the panel.

I solved the problem by placing a piece of neoprene tubing snugly over the tuning tool tip so that it extends out over the end of the tool. When making an adjustment, slip the free end of the tubing over the slug tuning screw and you will always make a positive connection.

— *L. Gregory Tullo, WA2QAQ*

VE/W Contest—1961 Results

THE Montreal Amateur Radio Club put on another humdinger of a contest, the annual VE/W Contest last September 23–25, where the VEs and Ws swapped contacts fast and furious. VE2OC reports 257 valid entries representing all eight Canadian and 57 U.S. sections.

Top honors and the 1961 trophy (after last year's stay with Canadian VE2NI) went to a U.S. station, W4SVJ, with 106,730 points. High VE scorers from each district were VE7EH 104,718, VE2NI 101,716, VE3DUS 95,200, W9NLJ/VE1 66,468, VE6ADA 54,900, VE4NR 40,014, VE5JI 27,666, and VE8RW 15,996.

The following tabulation was prepared by VE2OC and VE2AVR, this year's MARC Contest Committee. The figure after the call is the final score with the amateur heading each ARRL section listing earning a certificate.

Maritime

W9NLJ/VE1 66,468
VE1IV 60,600
VE1ZZ 38,114
VE1EK 29,436
VE1MX 21,033
VE1ON 20,952
VE1DB 13,161
VE1AHK 5184
VO1DZ* 4680

Quebec

VE2NI 101,716
VE2YA 38,880
VE2AGM 36,180
VE2GP 31,992
VE2AYU 25,950
VE2BCB 16,632
VE2BV 12,160
VE2BFE 6080

Ontario

VE3DUS 95,200
VE3BLU 60,876
VE3BOG 47,318
VE3EMA 46,809
VE3MI 37,352
VE3CER 32,103
VE3BLY 31,050
VE3ETC 30,968
VE3DDU 29,106
VE3DXD 26,712
VE3EBS 25,992
VE3AWE 23,192
VE3DH 22,944
VE3CZG 22,704
VE3ECA 21,942
VE3EQZ 18,354
VE3EGG 18,240
VE3BWL 15,498
VE3ON 15,120
VE3EZI 11,400
VE3AO 11,132
VE3DU 9348
VE3BXX 8400
VE3AUU 1610
VE3EWD 1300

Manitoba

VE4NR 40,014
VE4GS 18,914
VE4ZX 10,260
VE4RE 4950

Saskatchewan

VE5JI 27,666
VE5FN 9266

Alberta

VE6ADA 54,900
VE6BR 50,655
VE6SF 50,220
VE6UW 36,624
VE6ABV 12,510
VE6AEH 2205

British Columbia

VE7EH 104,718
VE7XD 86,022
VE7AOI 80,820
VE7AAF 77,172
VE7APU 43,725
VE7AC 38,688
VE7JO 7296
VE7BFG 3350

Yukon/N.W.T.

VE8RW 15,996
VE8BC 6816

Eastern Pennsylvania

W3AIZ 52,634
K3JJG 34,656
K3MNI 30,324
K3JNP 26,642
K3DPA 19,963
K3LSC 15,595
W3DJE 13,808
K3OWE 10,830
K3ANU 10,289
K3MNJ 9422
K3BPQ 7581
K3KTE 2599

Md.-Del.-D.C.

W3MCG 14,621
K3JOZ 7076
W3MSR 6715

Southern New Jersey

W2EXB 55,450
W2QDY 12,092

Western New York

WA2LDC 8881
WA2CUZ 3682

Western Pennsylvania

K3HTJ 21,227
W3LOS 12,707
K3DFU 7364
W3IYI 3087

Illinois

W9NLQ 63,356
W9CLH 62,868
W9PNE 49,674
W9QQG 47,219
K9DWG 26,534
W9SFM 20,090
W9YDQ 7581
W9KXW 4549

Indiana

K9LIO 56,533
K9KJE 26,317
K9SGZ 17,545
W9YDP 162

Wisconsin

W9WEN 54,583
W9CHD 38,122
W9DYG 31,100
K9UWY 11,696
W9YAE 10,686
K9YZA/9 3682
W9JQE/M 487
K9GDF 144

North Dakota

K0OSW 22,743
K0OSV 19,963

South Dakota

W0QKY 1136

* Newfoundand/Labrador Winner

To help the WAVE-seekers, W9NLJ made his second sojourn (first in 1957) to Prince Edward Island in time for the 1961 VE/W Contest. Being rare really paid off as W9NLJ/VE1 won the VE1 certificate. From the expression on Pete's face it looks like he just nabbed North Dakota or Nevada!

Minnesota

W0PAM 14,863
W0RLI 27,797
K0BIO 19,350
K0ZXE 10,108

Arkansas

K5WTB 16,173

Louisiana

W5KC 69,691
W5BUK 35,739

Mississippi

W5AMZ 31,190
K5SVC 8881
K5FNV 4224

Tennessee

K4RIN 90,972
W4ZJY 6065

Michigan

W8APN 42,075
W8ONS 19,332
K8SHQ 8664
K8QHM 5054
W8TRN 1191

Ohio

W8CJN 53,717
K8IPS 17,057
K8VSL 5415
K8GKF 3898
K8MZT 3032
K8PYD 433

Eastern New York

W2TER 26,657
K2HVN 10,613
WA2HLH 10,397
K2EIU 5198
W2PKY 4386
WA2KHV/2 3249
WA2PDU 2437

N. Y. C.-L. I.

K2UVV 55,553
W2DUN 13,646
K2OSA 10,613
WA2MDJ 8881
W2DID 4224
WA2KYF 2762
WA2MPP 980

Northern New Jersey

K2KFP 48,735
WA2DEC 40,450
W2KHT 32,346
K2UUT 21,660
WA2JAM 15,884
WA2ONH 2762

Iowa

K0VEJ 32,165
W0EQN 27,616

Kansas

K0BHM 33,356
K0THN 27,725
W0GAX 25,992
W0VBQ 23,970
K0ELZ 18,953
K0PFV 7707
K0GZP 1300

Missouri

K0VXU 46,298
W0FLN 40,450
W0KCG 39,421
W0YJM 32,490
K0VSH 21,931

Nebraska

K0PDM 27,292
K0PTL 2437

Connecticut

W1TS 52,146
W1WY 46,352
K1LBH 23,682
W1EQV 15,162
W1BIH 5068
K1RJV 3520

Maine

W1GKJ 34,115

Eastern Massachusetts

K2AXA/1 17,111
K3ICY/1 9603

Western Massachusetts

W1UUK 13,862
K1IJV 7798

New Hampshire

W1ZQR 39,421
K1BCS 27,292
W1FZ 8122
K1OWV 3249

Rhode Island

K1LPL 40,288
K1BBK 11,480

Vermont

W1QMM 12,888

Montana

K7CTI 33,790
K7NHV 14,729
W7EWR 11,047
K7KOK 133

Oregon

W7UAB 12,130
W7LD 7473

Washington

K7KGP 7581

(Continued on page 146)

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

How?

"CQ DX," said the VR3 —
"I'm tuning near this frequency."
And as his relay chopped the juice,
On 20 phone all heck broke loose.

Toward his bearing beams were placed,
While through those beams great power raced;
Kilowatts were opened wide,
And every tactic known was tried.

"Texas first," I heard a drawl;
With confidence he signed his call.
"No, *no*, ME first," yelled some K9.
And then and there each state did sign.

That W5 kept right on sending —
The whole U. S. was now tail-ending.
Finally, though, the calling ceased.
At last on silence did we feast!

What became of our DX friend?
He couldn't fight that QRM.
No more calls from VR3 —
He pulled the switch, went QRT.
— *WA2PIP*

When you encounter (1) three or more stations, (2) on or near the same frequency, (3) at the same time, (4) in common cause, (5) led by one or more of their number, you perceive what is termed, in amateur radio parlance, a *net*. It may be a spontaneous 75-phone round table, it may be the classic example of a systematic ARRL traffic network, or it may be a riotous rare-DX pile-up; the criteria are met.

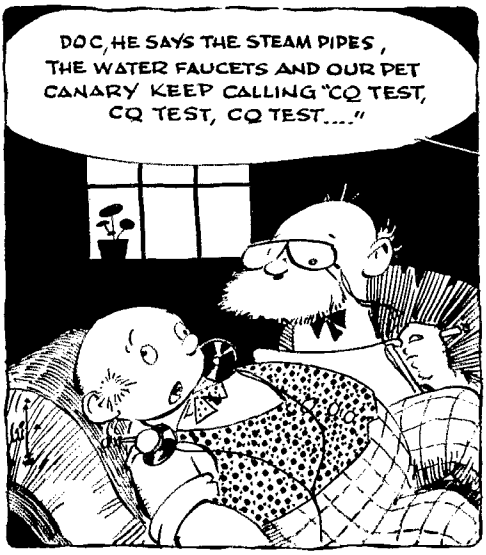
Large nets generally must be directed (QND) to accomplish their objectives. A typical traffic net, for instance, normally depends on a predesignated control station (NCS) as master of ceremonies to expedite its function in orderly fashion. The rag-chew net, or round table, is less formal; a fellow with a good signal who hears everybody okay often finds himself serving as impromptu NCS by tacit mutual consent. (This natural phenomenon, by Yak's Law, can occur at any conversational gathering on or off the air.)

The DX pile-up is an even more interesting proposition. It's a traffic net with three unique features: (a) each self-invited net member has a rush-rush first-party message for the NCS (the rare one) requiring immediate response; (b) relay of this message, or the NCS's reply, by other net members is ethically forbidden; and (c) the beleaguered NCS often has the poorest signal and the most remote location of any station in the net. Obviously, even if he's a superb operator, the NCS's vital net-control status is horribly handicapped. Punch line: When the rare one finds himself unable to exert sufficient control over the net, as very often happens, he may abruptly QRT and go away, as very often happens.

The *Call Book* is jammed with juicy calls you will never hear, simply because the operators refuse to submit themselves to wireless anarchy. The recent trend of volunteer Stateside QSL agents, acting individually in behalf of rare overseas DX stations, has gone far toward licking the QSL-debt bugaboo that once kept so many choice catches out of our logs. Now we badly need an answer to the pile-up problem, another fearful DX-limiting factor. Oh, it's easy to scoff at someone else's inadequate attempts to solve this puzzler (by "MCing") but derision is in questionable taste if not accompanied by constructive criticism, or at least some understanding of the essence and magnitude of the problem. Can *you* suggest a workable solution?

What:

This column, as a matter of fact, is a sort of literary DX pile-up, Jeeves & Co. gladly serving as NCS. . . . "Things are grim," records W8YGR. "The hordes of beam-plus-QRO boys seem to multiply inversely as the sunspot count declines. Let a DX station dare open up and he is immediately set upon by a howling, starving wolf pack." The trick, therefore, is to get there ahead of the mob, catch 'em reaching for their keys or mikes. Our mail indicates there's just as much DX being worked as ever, however, so there must be increased effort all around. Much *more* DX than ever on **160 c.w.** and **phone**, to be sure! The bulletins and dispatches of W1s BB HKK, W2FYT, WA2KWB, K4KSY, KØs JPL VSH, International Short Wave League and Polar Bears Radio Club mention the 1.8-Mc. availability of dozens of Gs, **CO**s 2QR 7SW, **EL**4A, **GB3MSA**, **GD3UB**, **GM3**s EHI PBA, **HC1AGI** (1807 kc.), **HK1QQ**, **HR3HH**, **KH6IJ** (1999) 0900 GMT, **OK1**s ACC DQ UG, **PY2BDZ**, **UA3DD**, **UB5**s KBB WF, **UO5AA**, **VP9** 3AD 7NY 8GQ 9NM, **WØVEH/VP9**, **XE1OK**, **YU1**s GM HK HV and **ZL3JT** on c.w. . . . . Neat "first" recounted by W2FYT: "G3CHN and myself had been scheduling nightly in an attempt to score a 1.8-Mc. single-sideband QSO. We were able to make it quite regularly on c.w., but the night of December 21, 1961, at 0100 GMT, was the first time we could do it sideband." W1HKK joined Tony's DXclusive club by sidebanding with G3CHN on 1803.5 kc. January 8th and also catching G3FPQ. Other British s.s.b. men working 160 are **G3MZW**, **GD3HQR**, **GI3**s GRY NRY and **GM3FSV**. On our side you'll also find Ws 1BSY 1FRR



*7862-B West Lawrence Ave. Chicago 31, Ill.

2LYE and 3FBV lurking around 1804 kc. . . . . DHJ's 1830-kc. kilowatt and WCC, 2035 kc., continue to serve as handy markers indicative of transatlantic DX conditions. We understand that Australian amateurs soon will be appearing between 1840 and 1860 kc. Old debbil QRN will be rearing its irksome head on 160 in the weeks ahead — gather ye 1.8-Mc. DX trophies now while ye may, OMs!

75 phone followers are having a figurative field day on the DX scene. W5KNE/5, K5ALU, ISWL, PBRC, West Gulf DX Club and Holland's VERON report these sidebanders active, mostly just below 3800 kc.: **CN8IK** 23 GMT, **EI6W** 22, scads of Gs, **GB2MT** 23, **GDs** 3GMH 0, 6IA 22, **GIs** 3CDF, 4RY 21–23, 6TK 8, **HRs** 3HH 6, 5LA 23–0, **I1AIM** 23, **KG1GC** 23, plenty of KH6-KL7-KP4 brethren, **KZ5SW** 4, **OK3**KAB 15, **OY7**ML 23, **PJ2AA** 8, **PY7**VBR 8, **PZ1AX** 7, **TGs** 5HC 8, 9AD 6, **UB5UW** 21, **UG2AA** 20, **UR2AO** 21, **VK3s** AHO 19, BM 19, HG 19–20, VE3BQL/**SU** 20, VO1s DN EC, **VPs** 5CH 0, 7BP 6, **VS9AAC** 23, **YV5ANS** 3, **ZC4**PC 22, **ZLs** 1AAX 1ACG 1ATQ 1OF 2AAG 2API 3GF 4OD, **ZS6s** AKO ASY 23, **3A2**DE 20, **3V8CA** 20, **4X4s** DK IX 20 and MG.

80 c.w. enables K1MZB, WA2KWB, K3s JIQ KHK, W4MLE, W5KNE/5, K5JVF, K6MQG, WA6s IVM ORS, W7s DJU YAQ, W8EXZ/4 (28 fast countries on 3.5 Mc.), KØJPL, ISWL, PBRC, VERON, WGDXC and Florida DX Club to deal with **CO2CT**, **CT1HX**, **DMs** 2XLO 3PDA 3VED, **EI9J**, **FA8BG** (3505 kc.) 7 GMT, **GC3KMV**, **GD3UB** (5) 2, **GI5UR**, **GW5TW**, **HC1AGI** (1) 4, **HKs** 1QQ 3AH (1) 5, **IT1TAI**, **JAs** 1BBN 1BRK 1FAQ 1GGA 1IMZ 1ON 1YL 2DN 2UJ 2WB 3DDF 3CAF 4AQS 4GD 4IO 5LQ 5YAP 8LN ØACO ØNW all near the low edge 13–14 hours, an ample sample of KH6-KL7-KP4 specimens, **KGs** 1AA (3), 1FD (5) 7, 4CW (21) 5, **KV4s** AE (1), CI, **LZ2s** KCS KDK, **OHØNF** (10) 6 of the Alands, plenty of OKs, **OX3**DL (9) 3, **PJ2ME** (1) 1 of St. Martin, **SPs** 2CO 8AC 8CK 9KDE, **TF5**TP, **TG9**BG, **UAs** 2KAW 9CM 23, ØMX (13) 13, **UB5s** FJ 19–20, UW, **UD6**AM, **UF6**FB, **UG6**KAA, **UM8**KCA, **UO5**KAB, **UW9**KAC, **VK5**KO (1) 19–20, VO2BZ, **VPs** 5MJ (9), **6PV** (18) 2, 7BP (52), 7NP (2) 2, 7NQ, XE1AX, **YN1AA** (3) 3–4, **YU3FS**, **YV5DE**, **ZIs** 2BAH 15, 2PM (5) 9, 3FZ (2) 8, 3JT 7–8, **4X4WF** (12) 22, **5As** 1TW 23–0, 4TC and **7G1A**.

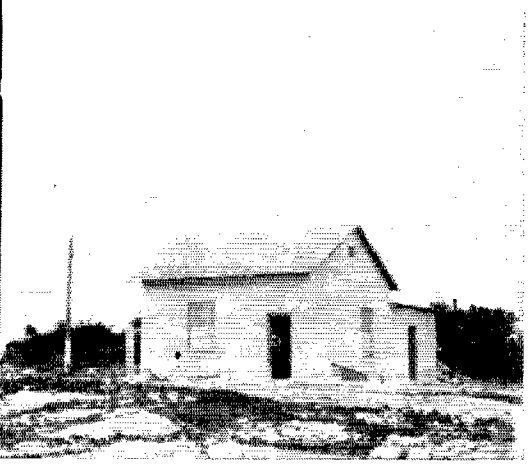
40 c.w. finds W1OPB, K1s JFF (98/87 countries worked/confirmed), MOD MZB, WA2s LHH (15/8 on forty), KWB LDC, W4MLE, K4s FRM SQS ZRA, K5ALU, K6MQG, WA6s DNM GUY IQM IVM, W7s DJU LZF POU YAQ, W8s EXZ/4 YGR, K8IVO, KØJPL, VE7BBB, and the aforementioned clubs quite conversant with **CN8**s CC MZ, **CP1**DA, **CT3**AV (36) 0, numerous CEs and CXs, **DM3**WOK, **DU7SV**, **ET3AZ** (13) 12, **FAs** 3CT 8DA 22, **FG7**XI (17) 9–11, **HA5**KFR 18, **HCs** 1DC 1AGI 10, **HH2**AID (15) 2, a flock of HKs, **HM1AA** 18, **HP1s** IE 4–5, LM, **HZ1**AB (25) 1, **IT1**s AGA (27) 4, TAI, three dozen JAs in all call areas except the 4th, **KAs** 2KS 8AM, **KC6**BD (10) 8, **KG1**s AA (10) 8, FD 9–10, **KR6**NW 13, **KW6**DG (8) 11, **KX6s** AJ 9, BU (30) 10–12, **KZ5**TD 5–10, **LAs** 1NG and 2NG of Svalbard regions, **LZs** 1KAA 2KBA 2KRS, **MP4**QAO (40) 0, **OD5**BG (18–25) 16, **PJ2s** AE 5, ME (30) 1–2, **PY9**DM 8, SM5ZS/**ZC6**, **SVØs** WC WI (35) 0, WZ 5, **TU2AL** 8, **UAs** 1KAE (30) 19–20 of Antarctica, **2AB** 9KAG 9KGD 9KJD 9KOA 9KTB ØAG ØBL 1–2, ØCC 11, ØKFG ØKIA ØKJA ØKKM ØKYK (15) 23–0, ØKZA 12, ØLJ ØLU (1) 15, ØLV, **UB5s** FP KAB VU WF, **UD6**KAB, **UF6AU**, **UG6s** GD 22, KAA (2) 17, **UH8s** BI (25) 3, KAA, UI8s AP (25) 23, KAD KIA KTA (50) 7, LB 22, **UJ8**KAA, **UL7s** CI FA GM 4, JA KAA LE 4, **UM8s** KAA (35) 23, KAR 19, **UO5s** AA KAA, **VEs** 3BQL/**SU** (20) 20–21, 8RX (12) 8, ØNR (31) 4, **VKs** 6CW (18) 13, 9GP 9, ØPB (9) 11, ØVK (12) 17–19, VO1FP (10) 1, **VPs** 2DQ (5) 3, 2SH (1) 1, 3YG (30) 11, 5BH (12) 6, 5BL (10) 3, 7NP 7NQ 0, 8EJ 0, 8GQ (2) 0, 9BC (5) 22, VQs 2W (10) 4–10, 4RF (35) 0, **VRs** 1B 9, 2DK (21) 10, **VSs** 1KP 9AAC (15) 22, **VU2JA** 15, **WP4BDA** (191) 9, XE2AY (30) 3, **XZ2TH** 18, **YN1s** CAA RH, **YOs** 7DZ 18–20, 9HH, lots of YU-YV fellers, **ZB1FA** 21, **ZC4s** IP SG, **ZEs** 3JJ (15) 16, 7JV (15) 18–19, **ZK1**AR (27) 8, a logful of ZLs and ZSs, **3V8AM** (5) 1, **4X4s** DH (28) 5, DI KK LQ, **5A3CAD** 0, **5II3IID** (10) 19, **5N2JKO** (30) 0–6, **6W8DD**, 7GIA 3, **9M2FK** and **9Q5AAA** (3) 5 who is really DL7AH in disguise.

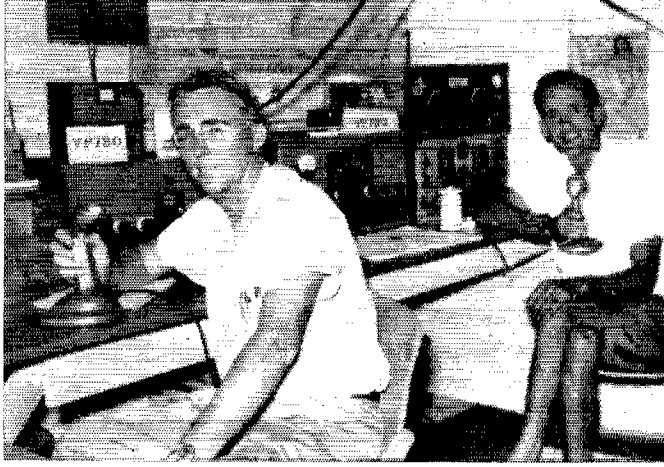
40 phone has **CN8FU*** 13, **DJ3VM**, **EA7GF**, **G3FPQ***, **HHs** 2JK 4VB (296) 4, **HC1AGI*** (215), **HR1BL**, **Hs** AIM* (95) 7, WMD, **JAs** 2BAY* (90) 9, 3AZY* (95) 9, KH6EGO/**KJ6*** (203) 6–7, **KG1FD***, **LZ2KWR**, **PZ1AX***, **OAs** 1W 4NOM* (205) 8, **OD5CS**, **TG5HC** (296) 6–7, **UA3KAH**, **UB5s** KFF UW*, VE3BQL/**SU*** (296) 2, **VPs** 5BL 9L, **XF2H**, YN9RD, **YO9HC**, **ZL3ID*** (95) 10, **ZS5JY*** (98) 4 and **4X4DK** in the listings of FDXC, ISWL, PBRC and WGDXC, those asterisks indicating known s.s.b. enthusiasts.

20 phone is an in-and-out sort of thing right now but the springtime 14-Mc. boom should solidify the situation somewhat. Anyway, K1MOD, W2KKT, K2s TDI UYG, WA2s LDC PCW, K3KHK, WA4DWN, K5ALU, K6MQG, W8KML, KØVSH, DL1FE and VE3PV made the grade with **EA8BA*** (320) 13, **EL6E*** (348) 21, **HH2s** AID* (290) 19, CE, Ks 4IRG/VO2 6CQV/**KS6*** (265) 5, **KC4AAE*** (310) 9 of Antarctica, **KG1BM***, **KJ6BV*** (315) 3, **LX2XG** (240), **LZ1s** KDP KPZ, **MP4s** BBW* (342) 14, MAH (203) 15, **OA4BR***, **PZ1BS***, **TL8AC** (205), UA4-KED, **UP2s** KAE KAS KBC, **UQ2KAX**, VE3BQL/**SU***, long-path **VK3HG***, **VPs** 2AB* 4BY* 9WB, **VQ2AB*** (335), W6QMN/**KB6*** (316) 3, XE2NF, **ZB1NZE**, **ZD1-JWC** (210) 5, **5A3CAD**, **9G1s** DN* and DP* (337) 20, the stars standing for single-sidebanders.

20 c.w. already is coming around, if we may judge from the observations of W1s HGT OPB (144/131), K1s MOD (172), MZB, K2s JUA TDI UYG, WA2s KWB LDC OCA PCW, K3s KHK MNJ (93/79), W4MLE, K4ZRA (95/64), K5ALU, K6MQG (129/90), WA6s DNM IVM ORS PMK, W7s DJU LZF POU (87/73), YAQ, W8s KML YGR (176/167), K8s IVO OKM, K9UIY, KØs BHM JPL RNK UJI VSH VTG, EL4s A and YL, VEs 3PV and 7BBB who shook the 14-Mc. code bush for **CE9AS**, **CN8s** IK MZ (90) 17, **COs** 2AP (12) 23, 2EV 6AH 6XZ 7AH 8HB, **CRs** 6CA 7IZ (10) 22, 9AH, **CT3s** AB AV, **DMs** 2ACO 2BCN 2XLO 3KUN 3RD (80) 15, **DU1OR**, **EAs** 8DL 18, 8DO, 9AY, **FAs** 2VK 3CT 3OA 3OR 8RJ (40) 16, **FG7s** XG XI (64) 22, **FP8AP** (18) 17, **FY7YI**, **GD3UB** (4) 17, **HAs** 2MJ 5FO, **HKØAI** (8) 23 of San Andre, a batch of HHs, **HP1s** IE (15) 18, LM, **HRs** 1MM 2FG, **HV1CN**, **IS1s** DKL SZU (21) 17, dozens of JAs in all call areas, **KA2s** AB AO JM MA NY (40), **KC6**BD 20–21, **KGs** 1AA 1BO (23) 20–21, 1FD 4AN 4CW 6AIG, **KL7**DNE of the Pribilofs, **KM6BI** (80), **KR6AD**, **KV4s** AA (81) 20–22, BO CI, **KW6**DG (18) 1–2, LA1LG/p of Jan Mayen, **LU8ZR**, LX2XG, many LZs, **OA8D**, **OE3VP**, **OD5CY** (20) 19, **OX3s** BL KL (60) 20, LM UD, **OY8RJ**, **PJs** 2CK 2ME (33) 18, 3AN, RAEM of Moscow, **SM2BCS** 16, **SVØs** WI WT, **TF2WFS**, **TI2s** galore, **TL8AC** (70) 21, **TN8s** AF AJ (70) 22, **TT8s** AA (41) 21, AG (35) 18, **TU2AL**, **UAs** 2AK (19) 13, 2KAA (30) 14, 9FJ 9FS 9FX ØBP ØIK ØIW ØKID ØKKD ØKKS ØLH 2, ØMO ØSK ØRD ØRV, **UB5s** XJ WF,

SVØWZ (left) keeps Crete available for the DX crowd, mostly c.w. with a 150-watter on 20. Sarge is W7FTU back home; you also may have worked him as KA2SH, 5A4TQ and D4ARJ. The OM at right is SV1AB who sends forth a familiar signal from an Athens location. (Photos via Ks 2UYG and 3CUI)





VP5s BB CH CW and GT propagate c.w., a.m. and s.s.b. from the Grand Turk Island hamshack at left, affectionately dubbed the Grand Turk Hilton. At right we have VP7s BQ and BO, busy with the DX gang on 10, 15, 40 or 75 phone. VP7BQ used to be W8UYX in Michigan and Ohio. All these VP fellers are associated with Missile Range work and have a common QSL address: c/o GMRD, Box 4187, Patrick AFB, Florida.

UC2s AR AZ BB BW, **UD6**AM, **UG6**AB (15) 15, **UH8**s BI KAA (13) 13, **UL7**KBK, **UM8**KAA, **UO5**PK, **UP2**s AX KAF (39) 13, NM, **UQ2**s AS CC FF KAN (31) 15, KBA (62) 04, **UR2**s AO BV KAT 17, **UT5**BX, **UW3**ME, **VE9**NR, **VK**s **9**AB (82) **9**PU **0**JB **0**TC (30) 8, **VP**s **1**AA (25) 22, **2**VJ 4BY (5) 19, **5**BF **5**BL **5**GT **5**MJ (21) 20–21, **6**GC **6**PJ **6**RZ (50) 14, **7**BP **7**NQ **8**GJ (62) 23–0, **9**AK **9**EP **9**EU **9**L **9**QQ (9) 17, **9**WB, **VQ**s **2**W **4**AQ (75) 20, 4DW (39) 20, 4HY 4IN (16) 20, 5IG (41) 19, **8**BC (63) 19, **8**BM (40) 73, **VR2**DK, **VS**s **1**KQ **4**RS (50) 0, **6**EN **9**AAC (1) 21–22, **9**MB of the Maldives, **VU2**CQ, **XE**s 1AZ (23) 10, 1OK 2TC (73), **YK1**AJ (81), **YN**s 3KM (21) 2, 6AH 6HH of Corinto, **YV1**DP (61), **ZB1**HC, **ZC4**FS (80) 15–16, **ZD**s **7**SA **8**JP (22, 64), **ZE**s 1AE 1AK 1AU (60) 21, 7JV 8JO 8JV 8JW 17, **ZK1**AK, **ZP5**CF (45) 2, **ZS3**EW, **4X4**s HC (68) 18–19, HV (69) 14, JO KK (47) 18, MZ NJ, **5A**s 1TW 3TR, **5H3**HZ (65) 22–3, **5N2**s IND JKO (5) 18, **5U7**AC (40) 20, **6W8**s DD (50), DE (70) 22, DF (21) 16, **9G1**s CW (60) 20, DT (6) 22 and ubiquitous **9Q5**AAA (15) 20.

15 phone is profitable for K1s MJT MOD, K2TDI, WA2s FQG KWB LDC, K3KHK, K4s FRM LRX, K5ALU, K6MQG, WA6s DNM IVM ORS, K8OKM, K9QMJ and DL4FE with a gross income of **CE1**AGI, **CO8**s JK RA, **CP5**EA, **CR7**s CK CZ (240) 19–20, **CT1**s GE JJ, **EL2**V, **FG7**XL, **GD3**UB (230) 16–17, **HC2**IU, **HH2**s BL V* (420) 19, **HK5**s DU DY, **HP**s 1AP 6MA, **JA**s 1CWZ 1CYZ 22–23, 3PL 9UU, **KG4**AI, **OA8**B, **OE2**FM, **PJ2**CF (240) 19, **PZ1**BE, **TG5**HC, **TI2**PT, WA6QPE/**KP4**, XE2s R TF and many XE1s, **YV**s 1DG 6CP, **YN**s 1LQ 3LBV 6AH 9DL, **ZS3**HT, **VP**s 2DX 2LA 2LS 2SQ **5**AH **5**BB 6WR, **VQ**s **2**JC (200) 19–20, 2WZ **5**AU, **5A**s 1TW and 3CAD, the lone (*) representing s.s.b. doings.

15 c.w. gets a dandy play — W1OPB, K1s MJT MOD, WA2s FQG KWB OCA, K3s KHK MNJ NWD, W4MLE (104), K4s FRM LRX (101/82), K5ALU, K6MQG, WA6s DNM IQM IVM ORS, W7POU, W8YGR, K8s IVO OKM PSV, K9UIY, K0s BHM JPL RNK VTG, VEs 3PV and 7BBB passed the time of day with a half dozen CEs, **CN**s 2BK 8BK (5) 6, 8BP, **CO3**NR, **CR**s **6**DA (50) 21, **7**CI **7**IZ (40) 18, **CT**s 1ID 1NT 2AI (40) 16, **3AV** (26) **0**, **CX**2s BT CO, **DL8**DX (60) 15, **DM**s 2AEB 3JBM, **DU7**SV, EL4A, **FA8**BG (2) 21, **FP8**AP, **HC**s 1AGI (20) 23, 2IU, **HH2**AID (12) 5, sundry HKs, **HL3**KO 15, **HM1**s AK AX, **HV1**CN, **IT1**s AC AGA (5) 0, sixty-three JAs in all call areas, Ks 6EJD/**KM6** 8WJY/VO2, **KB6**BS (61), **KC6**BD (4) 7–8, **KG**s 1FB (4) 8, 1FD (1) 0, 4AO, **KH6**EDY, **KJ6**BV (50), KM6CB/**KH6**, **KR**s 6AR 10, 6LJ 6NW 15, 8AI, **KV4**AA (5) 2, **KW6**DG (10) 20, **KX6**s AJ BU, **KZ5**s DF MQ TD, **LU1ZL**, **LZ**s 1KBA (5) 15, 1KSP 1KSP 2KST 15, **OA**s 4JH (90) 21, 4KF 8D, **OE1**FF, **PI**s LS/mm NTB (5) 8, **PJ2**AE 16, **PZ1**s BH (52) 15, BW 17, **SV0**s WI WZ (50), **TI2**s WA (55) 15, WR, **TT8**AE, **UA**s **2**BM 9GF (15) 0–1, **0**IK 1, **0**KCC 4, **0**KFG 1, **0**KZA **0**LH, **UB5**s KBA 15, WF (10) 15, **UC2**BB, **UP2**AO, UPOL-8 (5) 2 of the Russian arctic, **UW0**FC 17 on Sakhalin isle, VE8DM (1) 0, a few VK/ZLs, **VP**s **2**DQ (5) 3, **2SC** 3YG (30) 11, 4TR **5**BL **7**BZ **8**GQ (2) 23, **9**EB 9KL, **VQ**s **2**IE 4DW, **VR6**AC, **VS**s 1KF 0, 4RS 9AAC, **WL7**DWJ, **WP4**BDM, a dozen XE1-2s, **XW8**AL, YNs 1RH (18) 15, 9MQ 5, **YO7**DO YVs 1EM (55) 16–17, 3BH 4BE, **ZBs** 1HC (60) 16, 2AD, **ZC4**s SJ SS (50) 13, **ZK1**AR, oodles of ZSs, **3V8**CA (50) 14, **4S7**EC, **4X4**FU, **5A**s 1TW 3CAD 3TQ, **5H3**HD, **5N2**JKO, **6W8**s BQ 18, DD, **7G1**A, **9G1**DT, **9M2**s FK GJ 18, **9Q5**s AA and AAA.

15 Novice-rangers WV2s SIB (24/15), RTS, WN4CMW, KN5JIL and WV6SBO collect some cuties: **DL3**RK 16, **DU7**SV, **F9**MC, **HC2**CB, **HB9**PA, **JA**s 1CLW 1ISB 8AAC 8AH, **KL7**DPE, **KP4**s AXN 16, BDU, **KR6**s AR DI, OA4JH, **PY2**AY, **PZ1**BH 14, **SP2**AEG, VO1FK 15, **VP9**AK, **WH6**s EHR EIY/**KW6**, **WP4**s AVM 15, BAD 21, BAD BDG 14, **ZL**s 1ATH 1AWF and 2GH. Hang on, lads!

10 phone keeps making curtain calls, so K1MOD, K3KHK, K5ALU, WA6DNM, K8PSV, K0UPL and 18WL diggers do the honors with **CE1**AGI, **CO2**s JL XN, **CR**s **6**BY **7**CI **7**CH, **CX1**FL, **EA8**s BX CM, **EP3**RO, HI8s AT DGC JSM, **KG4**AO, **OA4**HK, **OD5**CS, **PZ1**BW, **TI2**s AW OA PT, **TU2**AH, UA6LDJ, **UB5**s BEP CNU FG LB, **UF6**PE, **UG6**ABD, **UO2**AGD, **UW3**RC, **VP**s **6**LM **7**BO **8**GE of So. Orkneys, **VQ2**AT (s.s.b.), XE1UC, YN1WW, YV5AGM, ZEs 2JA 8JJ, **ZP5**CZ, **ZS**s 6WS **7**L, **5A2**TO, **5N2**s BRG and JKO. We had hopes that the sideband gang would help to extend the DX life of 28 Mc. but they seem to have dropped it like a hot spud . _ . _ . _ Ten **c.w.**'s boosters also are chickening out, although K1MOD, K3KHK and WA6DNM stick around for the squeaks of **FA8**JO, **SV0**WZ of Crete, **VP5**GT, **XE1**OK, **ZL1**AH and **7G1**A. Barring a propagational pratfall, this month's closing week ends of the 1962 ARRL DX Contest should see a 28-Mc. resurgence by both mike and key. Be on hand to scan this band!

Where:

Asia — Burma Amateur Radio Transmitting Society announces a new XZ2 QSL bureau: BARTS, P.O. Box 800, Rangoon . _ . _ . _ G3NAC clarifies the QSL situation concerning last October's RAFARS Kamaran coup by seven operators using seven calls. Cards for G3NAC/VS9K (G3NAC/VS9A) go to J. Hern, G3NAC, 8 Keydell Close, Horndean, Hants., England; those for VS9s KAC KGA KPH, G3s GJQ/VS9K GPE/VS9K and OLV/VS9K are handled by G3GJQ. John declares, "All cards are now out via bureau, or direct where s.a.e.-IRCs were supplied." Quite a job, too — 5100 QSOs with 135 countries . _ . _ . _ "I'm having QSLs printed; sending out fifty in the first batch," states newly-licensed KA2LM (WA6BKQ). Neighbor KA2MA tells WA6DNM he operated KA2NA from January through March, last year, and can make good on KA2NA QSLs for that period . _ . _ . _ WGDXC hears that the 800 W/K-bound QSLs resulting from JY2NZK's recent 1300-QSO eruption were dispatched through ARRL channels . _ . _ . _ VERON of Holland hints that W8PQQ may be the fellow to see concerning confirmation of AC5PN's 1960 and '61 contacts . _ . _ . _ PBRC reports favorable QSL receipts from BVs 2A and 3HPT.

Africa — "I'm handling QSL chores for EL6E," confirms VE4OX. "The usual s.a.s.e. or International Reply Coupons and use of GMT are necessary. Cards bearing other time reference will be acknowledged later via bureaus when time is available for GMT conversion." . _ . _ . _ "My QSL from FB8XX took 82 days by surface mail," says VE7BBB. "The card is a bit larger than most, so a 4-by-6-inch s.a.e. is advisable." . _ . _ . _ Terminating his Ghana tour, 9G1DE records, "K8IQQ has kindly looked after my QSLs for the past six months or so. For W/K QSOs still unconfirmed, a QSL and self-addressed envelope to Joe will fix things up. . _ . _ . _ From K6EC: "I have a supply of cards and complete logs for FQ8HO's Stateside contacts from Tchad, plus world-wide logs after October 1, 1960. S.a.s.e., or s.a.e. plus IRCs, please." . _ . _ . _ WGDXC learns that ZD8JP desires s.a.s.e. bearing 7-cent U.S. postage to cover prompt QSL reply inasmuch as IRCs are useless on Ascension. The Gulfers also find that F9AH, doing FB8YY QSL tasks,

will forward via bureau unless IRCs are provided . . . . PBRC notes that ex-XT2A is standing by at the QTH given in January's "How's" for QSL inquiries bearing s.a.e. and Coupons . . . . ET2US's K1KOM notifies, "Due to the volume of business, we QSL on receipt of each card (GMT, please). S.a.s.e. from U.S.A., IRCs from non-U.S.A., will bring immediately reply. All others go via bureau on the 1st of each month (10th for U.S.A.). Local Ethiopian postage, incidentally, calls for four Coupons."

Oceania — K6QBJ/KG6 informs ARRL SCM W6OJW that Marianas Amateur Radio Club, P.O. Box 445, Agana, Guam, has agreed to act as QSL bureau for Pacific Trust Territory amateurs. Thus KG6 KC6 and KX6 stations now may be reached through that address . . . . K4LRX, VR2BC's QSL aide, points out that VR2BC does *not* work 14 Mc.; only 21- and 28-Mc. a.m. . . . . W1HGT straightens out QSL avenues for roving G3JFF. "All cards for VR2EA and G3JFF/mm should go via G3JFF; cards for VR1M, VR4M and YJ1MA should go to W1HGT for QSOs with KH6s and the western hemisphere, other regions via GW3LQP." . . . . KC6BD (W7FNK) tells WA6PMK that s.a.s.e. is required for prompt response . . . . VKØFZ's QSOs with North and South America are confirmed through W5WW for activity after May 25, 1961. The remainder can consult F. Stean, 32 Abbotsford Rd., Hornbush, Sydney, NSW, Australia, according to PBRC researches . . . . "ZK1AR's QSLs may boom the Cook Islands tourist trade," chuckles KØVTG.

Europe — Polar Bears Radio Club (SL3ZO) continues to offer interesting QSL/QTH data re Russian, Bulgarian, etc., amateurs, as well as other services associated therewith. Check with S. Elfving, Solgardsgatan 15, Ornskoldsvik, Sweden, for details . . . . SM5BXI is an unauthorized call, according to SM5AZO. Swedish suffixes are unduplicated; the real one is SM2BXI . . . . "It's never too late to QSL," opines W4MLE, who overlooked his 1949 QSO with GC5OU until last December, then sent for confirmation he quickly received. Gee, GC5OU's swingy sideswiper has been silent since '55 . . . . VERON hears from W2BIB that a large load of contest-type HV1CN QSLs began disseminating before mid-January.

South America — W9EVI throws light on HKØTU Malpelo QSLs or the lack thereof: "All incoming QSLs to K9DVF were mailed to HK3LX. Three shipments went down; one did not get there — lost in transit — containing perhaps a thousand received cards. Those who still haven't gotten their HKØTU confirmations should send s.a.e. and postage defrayal to HK3LX or LCRA, Box 584, Bogota. Logs are in GMT, not Japanese Daylight Time, etc. Also, certain cards sent individually to Colombia have been lost. The only set of HKØTU logs is in Bogota." Mac also points out that W9JUV holds the logs and plenty of QSLs for KS4BB operation — s.a.s.e. a must . . . . W3AYD illumines another catchy QSL situation: For VP8EG (So. Orkneys) QSOs through October 5, 1961, QSL via G8KS; for VP8EG contacts thereafter, QSL via G3PAG. All VP8GQ QSL matters are handled by G3PAG as previously specified . . . . "I've been in correspondence with G3TA who operated from Tobago as VP4WD from August, 1959, to January, 1960," notifies W3NOH. "Jack mentions quite a backlog of W/K cards to be handled. I offer to take care of W/Ks upon receipt of self-addressed stamped envelopes."

HA9OZ, Attila, lately active in single-sideband DX doings, is about to replace this phasing outfit with a crystallized arrangement. (Photo via W2RHX)

Hereabouts — All hail our "QSLers of the Month"! Namely, HK3VV, JA5MZ, LZ1KSF, MP4BBE, SVØWZ, TL8AC, UA2BD, UR2BU, VQ5IG, YV5s AEJ BKA and 9Q5AAA. Their unfaltering QSL response is applauded by W2CUE, K2UYG, WA2s JLM KWB, K3KHK, K4ZRA, WA6s DNM ORS, W8YGR, K8SQK, K9s VSH and VTG. QSL agents also mentioned enthusiastically in dispatches include W2CTN (three votes), W2HMJ (two), K4LRA and W8KML. Here's one example described by W2CUE: "Sent an airmailed QSL to SVØWZ January 5th with s.a.s.e., and received his airmailed reply January 10th. Poor service over the week end must have caused the delay — hi!" . . . . WN4CMW (WA4CMW) disclaims any VP5 QSL connections . . . . S.w.l. J. Elias finds many amateurs curious about the origin of such listener identifications as WPE3CKI. Those WPE registrations originate with *Popular Electronics* magazine . . . . WA2OCA is game to take on some deserving rare DX station's QSL chores . . . . W1RAN's February St. Pierre propagation will be QSLd through bureaus . . . . S.w.l.s are invited to consult with LeRoy Waite, NNRC editor, 39 Hannum St., Ballston Spa, N. Y., concerning his SWL/QSL Bureau. Roy's efforts to relieve the ARRL Bureau of the s.w.l.-card jam should be welcomed by the transmitting crowd as well . . . . Help! W1OPB needs info on old FQ8AF, VQs 4EZ 6NG; W2GHK thirsts for the whereabouts of any 1947 MB9AJ operator; WA6DWV needs the scoop on KG1DT op Al of '58; and K9UIY could use up-to-date data on VKØJB . . . . Our usual individualized QTH directory comes courtesy K1BDP, W2s DTE KKT, K2s TDI UYG, WA2s EFN FQG HLII KWB, W3AYD, K3s KHK MNJ, W4s AILE OPM, K4FRM, WA4DWN, W6OJW, K6s EC MQG, WA6s DNM ORS PMK, W7s DJU PGY UVR, W8s EMZ QNW YGR, K9s ECE UIY, K0s BHM VSH VTG, VE3PV, Far East Auxiliary Radio League *News* (KA2LL), Florida DX Club *DX Report* (W4CKB), International Short Wave League *Monitor* (P. Bysh, 1SWL Hq., 12 Gladwell Rd., London N. 8, England), Japan DX Radio Club *Bulletin* (JA1DMI), Newark News Radio Club *Bulletin* (L. Waite, address preceding), Polar Bears Radio Club *DXer* (SL3ZO), VERON (Holland) *DXpress* (PA0FX), West Gulf DX Club *DX Bulletin* (W5ABY), Western Washington DX Association *DX Northwest* (W7JPC), Willamette Valley DX Club *DX* (W7HKT) and K6BX's *Directory of Certificates*:

CE3NI, C. Browne Casilla 13573, Santiago, Chile
CO8HT, V. Esteve, P.O. Box 821, Santiago, Cuba
CR7IZ (via SARL)
DJ0GB (via DL7JK)
DL4FE, Capt. L. A. Whitney (K7IRO), U. S. Army Transient Billets, Hq. Nurnberg Post, APO 696, New York, N. Y.
EL6E, c/o D. McVittie, VE4OX, 647 Academy Rd., Winnipeg 9, Man., Canada
EP2BE, A. Alseus, Box 51, Tehran, Iran
EP2BK, R. Snyder, P.O. Box 224, Abadan, Iran
F2ZI, J. Evers, Rdo. Stn., La Crau (Var.), France
FH8YY (via F9AH)
FG7XN, D. Miath, Assainissement A88, Pointe-a-Pitre, Guadeloupe, F.W.I.
FM7WX, Grant, B.P. 137, Fort-de-France, Martinique
FO8AN (via W8EWS)
FY7YE (via W5JLU)
HC2AG, A. Coronel, Box 909, Guayaquil, Ecuador
HH2AID, c/o U. S. Embassy, Port-au-Prince, Haiti
HH2CB, C. Blanc, Box 235, Port-au-Prince, Haiti
HH2FA, Box 235, Port-au-Prince, Haiti
HK1AAF (via W2CTN)
HK0AI (via W9WHM)
HP1IE (via W2CTN)
JA5MZ, J. Kawakami, 2835 Ikenobe, Miki, Kita, Kagawa, Japan
KA2LM, L. Manson (WA6BKQ), Box 181, 6102nd Supply Sqdn., APO 328, San Francisco, Calif. (or via FEARL)
KH6DVJ/KH6, W. Oishi, 98382 Ponohales, Aiea, Oahu, Hawaii
KM6CB/KH6, G. Elliott, Navy 85, Box 50, FPO, San Francisco, Calif.
KP4AOO (via KP4YT)
KX6AI, Navy 824, Box 846, FPO, San Francisco, Calif.
OA4NOM, Box 1137, Lima Peru
OD5CY, F. Ledermann, Box 4946, Beirut, Lebanon
OK3KAB, Box C260, Bratislava, Czechoslovakia
OK3KAG, Radio Club, Kosice Tech. U., Kosice, Czechoslovakia
OX3JD, Station Nord, c/o Liaison Officer, APO 23, New York, N. Y.
PY2TT, N. de Barros, Box 970, Santos, S.P., Brazil
PY8YH (via PY8YJ)
PZ1BH (via WA6SBO)
PZ1CF, P.O. Box 222, Paramaribo, Surinam
SM5ZS/ZC6, R. Engren, P.O. Box 66, Soderhamn, Sweden
ex-SU1MS, M. Salam, DJ0FB, Siemensallee 59, Bei Klos, Karlsruhe, W. Germany
VP4PL (via VP4NC)
VP6PJ (via W2CTN)
VP6PV (via W2CTN)
ex-VP6WD (to ZL2IS)
VP0RT (to PJ2MC or FS7RT)

Some fine far-east DX attended Hongkong Amateur Radio Transmitting Society's 31st anniversary banquet in December. *First row*, left to right, VS6s EK ET EP EM DS, a guest, VS6DK; *second row*, guest, XYLs of VS6s ET EG EP, guest, Mrs. VS6EN, guest, Mrs. VS6DS; *third row*, XZ2AD, the ladies of VS6s EK EL and CR9AI, three guests, and Mrs. CR9AH; *fourth row*, guest, VS6EL, CR9s AI AH, VS6s EN AE, guest, VS6s EQ EB, VS1GC; *rear row*, VS6BH, two guests, VS6EG, XW8AS, five visitors, and VS6DJ. The trophy held by VS6EP was won by Paul as outstanding HARTS member of the year.

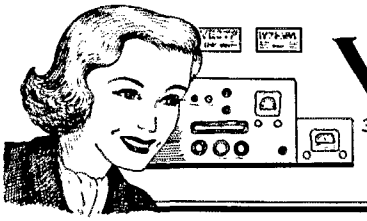
VQ1FU, F. Duckley, P.O. Box 84, Zanzibar
VQ5IG, W. Stevens, P.O. Box 59, Entebbe, Uganda (or via W2CTN)
VU2SO-VU2SOZ (via W8QNW)
W1TKL/VE8, c/o USCG, APO 228, New York, N. Y.
W2WSP/VP9, C. Costas, NASO, APO 856, New York, N. Y.
XE1CCP, A. Pita, Aptdo. Postal 19519, Mexico, D.F., Mexico
XE1UC, C. Miselem, Dr. Jiminez No. 33, Mexico 7, D.F., Mexico
YV1DG (via RCV)
YV5AYB, P.O. Box 5150, Caracas, Venezuela
YV5BFZ (via RCV)
ZB2AD (via W3AYD)
ZD7SA (via W9FJY)
ZK1AR (via K4LRA)
ZL2IS, G. McLean Wilford, Waimea West, R. O. Brightwater, Nelson, N. Z.
ZM6AB, Noel, Faleolo Airport, Samoa
ZS3EW (via W2CTN)
5A1TW, Box 4154, APO 231, New York, N. Y.
5A3CAD (via W2CTN)
5H3GC, N. Jackson, P.O. Box 111, Mbeya, Tanganyika
5R8AD (via W8QNW)
ex-9G1DE, W. Auty, 28 Eastbourne Rd., Aintree, Liverpool, England (or via K8IQQ)
ex-9N1s CJ MD, R. Dennis, 5232 Wentworth Dr., Austin Hill, Washington 21, D. C.

Whence:

Europe — PZK (Poland) recommends your participation in its *Millennium SP Contest* 1962, a DXish operating affair coinciding with celebration of the 1000th anniversary of the founding of the Polish state. The event comes off (c.w.) 2000 GMT April 7th, to 2000 April 8th; and (phone) April 14th-15th, same times. Serial exchange is to be the usual RS- or RST001, RST002, etc., and bands 3.5 through 28 Mc. may be used. Non-SP stations earn two points for each QSO with an SP colleague, and one point for each contact with a non-SP, each station worked but once per band. this point total to be multiplied by the number of different DXCC-type countries worked (for the purposes of this contest each SP numerical call area also counts as a country multiplier). Sample summary sheets are available from PZK, P.O. Box 320, Warsaw 10, Poland, and your results must be filed at that address no later than July 1, 1962, to qualify for certificate recognition available to high scorers. At the same time you might inquire regarding other certificate awards issued by PZK — g'luck! . . . . . "GD3UB is active on 40 almost every night," notes K2UYG. "Vic promises to hit all DX bands this year, especially 160." . . . . . "Fifteen meters seems to be the best band from this location," remarks DL4FE (K7IRO). "The east coast and midwestern U. S. A. can be reached consistently and are not bothered by commercial QRM so prevalent on other bands. Twenty-meter signals must be S9 to get through above 14,200 kc.; the same is true as a rule on all of 40 and 80. Poor ten is very dead, just a few short-skip openings. I normally operate around 21,195 kc. on week ends and holidays, 1400–1600 GMT, usually listening around 21,380 kc." Lee has a Valiant, HQ-150, triband quad and dipoles for 40 and 80. . . . . Multilingual K3CUI translates the postcard sent out by Moscow's CRC to each entry in last year's Russian DX test, a message over the signature of cosmonaut Y. Gagarin: "Very best of luck to all amateurs who took part in the international contest. I am sure that ahead of you are extremely interesting radio contacts with travelers of the boundless cosmic spaces."

Asia — Burma's responsible ham organization now is known as the Burma Amateur Radio Transmitting Society. The club's brass: XZ2s ST, pres.; AD and MM, veeps; SY, secy.; and BB, asst. secy. All correspondence should go to the address noted in "Where" . . . . . EP2BK, formerly Ws 6WHT and 9NJB, came to Iran from a stint in ham-starved Indonesia, so he's really living it up DXwise. "This is my first experience at being DX, and the results of my first week on the air have been both gratifying and exasperating. All I have to do is call CQ on 20 phone and ten stations come back to me on my frequency. This popularity seemed wonderful at first, but with so many calling at once you can't copy any of them properly. And they just *won't* give up. Even when you do pick out the loudest one, or the one you particularly want to talk to, other stations keep right on calling and QRMing. I shall be here till about the end of March, on the air almost every afternoon from 2000 to 2130 GMT, and for longer periods on Thursdays and Fridays. I work mostly 14-Mc. a.m. but try 21 Mc. occasionally, also 20 and 40 c.w. I use a 100-watt 813 rig, an AR-88D receiver and 15-meter Lazy-H." . . . . . Japan-type jottings: WA6IVM finds JAs 1YL and ØNW booming through regularly around 1300 GMT with 3509-kc. c.w. Lots of local commercial QRM on 80 in Asia, so the JAs advise W/Ks to QSY a few kc. if initial calls go unanswered. . . . W7YAQ exclaims, "The JA boys really dominate 7 Mc. here, staying in from 0600 to 2000 GMT on good mornings, many running as few as five watts." . . . JA9UU wants to work more W/K/VEs on 15 phone to add to his total of 100 or so already logged. Roy sticks pretty close to 21,210 or 21,225 kc. . . . KA8AM's first U. S. A. contact was WA6IQM on 40. . . . KØVTG finds KA2AB yearning for N. Dak. on 20 c.w. . . . KA2LM (WA6BKQ) just fired up a Ranger and NC-240D on 14-Mc. c.w. "DX has been slow

(*Continued on page 132*)



YL NEWS AND VIEWS

CONDUCTED BY ELEANOR WILSON,* W1QON

1961 BPL YLS

For the twelfth consecutive year, traffic-handler extraordinaire Mae Burke, W3CUL, added still more honors to her almost unbelievable traffic record. For eleven of the 12 months of 1961 Mae placed first among all Brass Pounders League winners (she placed second in the listing in October), and Mae has been placing first, second or third on the BPL list for 12 years! We curtsy in awe to the charming Mae and her fantastic record of public service.

For eleven of the months of 1961 Bertha Willits, WØLGG, placed either second, third, or fifth on the BPL list, continuing a record of excellence in traffic-handling for at least five years.

Clara Reger, W2RUF, Martha Shirley, WØZWL, and Louise Moreau, W3WRE, all BPL winners in past years, appear on the 1961 BPL YL list as well. Mary Schaub, K5SPD/1, Claire Hogeweide, K6ZCR, and Beatrice Dietz, WA2GPT, also merited 1961 BPL honors. (We hope we haven't missed anyone.)

The following is our tabulation of YLs who made the Brass Pounders League in 1961. The number in parenthesis following a call denotes 1st, 2nd, or 3rd place position in the monthly BPL listing, which appears in the "Traffic Topix" section. The information for any given month is for traffic handled during the month three months previous to publication. The BPL is open to all amateurs in the U. S., 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.

1961 YL BPL Certificate Winners

Jan.....W3CUL (1), WØLGG
Feb.....W3CUL (1), WØLGG (3)
March.....W3CUL (1), WØLGG (2), W2RUF, WØZWL, W3WRE, WA2GPT, K6ZCR, K5SPD 1
April.....W3CUL (1), WØLGG, W3WRE
May.....W3CUL (1), WØLGG (2), W2RUF, WØZWL
June.....W3CUL (1), WØLGG (2), WØZWL, W2RUF
July.....W3CUL (1), WØLGG (3)
Aug.....W3CUL (1), WØLGG (2), W3WRE
Sept.....W3CUL (1), W3WRE
Oct.....W3CUL (2), WØLGG (3)
Nov.....W3CUL (1), WØLGG, W3WRE, WA2GPT
Dec.....W3CUL (1), WØLGG, WA2GPT

100 or more originations plus deliveries
Feb.....W2RUF
May.....WA2GPT
June.....WA2GPT
Sept.....KP4WT
Oct.....KP4WT
Dec.....KP4WT

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

HOW MANY YLs?

That's always a good question — we wish we could give you a good, accurate, up-to-date answer all of the time. For an assortment of reasons we can't, and since literal nose-counting is impossible, we must be content with round numbers.

W1UED of ARRL headquarters considers it safe to assume that currently, round-number-wise, there are 225,000 amateurs, of which some 8000 are YLs. Percentage-wise we constitute about 3½% of the total ham population.

In 1959 the speculation was that there were then some 4500 licensed YLs. In 1956 the figure centered around 3000. Ten years ago when this column came into being, the percentage of YLs to the whole ham fraternity was only about one per cent, or about 1000 YLs.

So in 10 years we have multiplied our ranks eight times over. Not bad for a "minority group."

Net and Certificate for DX YLs

On Dec. 7, 1961, the YL FINS (Floridora International SSB'ers) inaugurated a new net for DX YLs, which meets weekly on Thursday, 1700–1900 GMT on 14,277 kc. (alternate freq. 21,395 kc.). Forty-seven YLs in 37 countries had been asked to express their views regarding the proposed net. Response was enthusiastic, and the net was launched.

A Special Award Certificate is issued to DX YLs who check into the net five consecutive times. DX YLs who contact five Floridora YLs are also eligible for the Floridora Certificate.

At the discretion of DX YLs, it is possible that stateside YLs other than YL FINS may participate sometime in 1962. Announcement will be given here of any such change in net rules. (Information via K4ICA.)

WRONE WEEK — March 19–23

Sponsored by the Women Radio Operators of New England

Object: A contest for members of the Women Radio Operators of New England YL club (WRONE) to contact as many YLs in New England as possible. YLs everywhere may participate, but the method of scoring given below should be noted. The primary purpose of this contest is to give the YLs of the six New England states a chance to get better acquainted.

Time: Contest begins at 1300 GMT Mon. March 19, 1962, and ends at 2300 GMT Friday, March 23, 1962.

Scoring: One contact with each station permitted (any band). Score 1 point if YL worked is YLRL member; 2 points if YL is WRONE member; 3 points if YL is both YLRL and WRONE member; ½ point if she is neither WRONE nor YLRL member.

Logs: Copy of regular log, with YLRL and WRONE member indication, must be received no later than April 7,

Add Harryette Barker, W6QGX, to the list of YLs who are pilots, or student pilots. After helping with radio communications for several Powder Puff Derbies, the flying bug bit and W6QGX now has 20 hours to her credit. Harryette reports that Dottie Chaffee, K6JZA, is another California YL who is well on her way to a pilot's license too.

The membership of the Los Angeles YLRC enjoyed their annual Christmas party at the home of Julie, WA6OKG (left). Lucky prize drawer (on right) is club president Maxine, WA6AOE. (Photo by W6QGX)

1962. Send logs to Edith McCracken, K1EKO, P.O. Box 285, Westwood, Mass.

Prize: High scoring WRONE member will receive 100 Miss WRONE QSLs.

Calling All Married OMs!

Your wife is not a licensed ham, but she does tolerate you and your license? Maybe it's about time to show her a little appreciation, and Andy Clark, W4IYT, Editor of *Florida Skip*, monthly ham publication, who sent the following release, is about to make it easy for you to surprise your good XYL in a new and novel way.

"To the ladies, God bless 'em — where would we be without them? They're expensive, exasperating and entertaining, especially when they don't mean to be. Fragile little things in two-inch heels bounce in humming with excitement after a 10 mile hike through the stores. An afternoon at a sentimental movie exhausts them.

"Armed with only twisted feminine logic they tackle anyone from a school principal to a highway patrolman and emerge triumphant and smiling. They burst into tears if the cake icing comes out the wrong shade of pink.

"They're afraid of grasshoppers but very brave about their own driving. They give a party for twenty-teen-agers without batting an eyelash but a crooked picture makes them nervous

"They join clubs to better the world and during the lectures they study each other's hats. They tell you all of your faults and feel sorry for the girls who didn't get you.

"They want to go out when you want to stay home, they're ready to go home when you are all set to make a night of it. They don't like to iron, they make faces when they brush their teeth and although they would like to own every electrical appliance invented, they're all afraid of electricity.

"Which brings us to this: don't try to understand them, just love 'em. One way to show your XYL that you harbor a tender feeling or two for her is to give her one of our *Florida Skip* XYL Awards. The certificate is a little something our "Dear Mabel" dreamed up so you know what to expect. Not only will it make a happy surprise for your deserving XYL, it will look impressive hanging in the shack or kitchen. This is an award for all wives, they don't need a license from FCC, just a marriage license. Tell your friends. The certificate is free but beautiful!

"All OM's are urged to get your nomination to Anne Pitcher, K4RDX, RFD 2, Stuart, Florida today. Get a real surprise and make the little lady delightfully happy!"

COMING EVENTS

YL-OM Contest — C.W. section, Sat. March 10, 1962, at 1300 EST to Sun. March 11, 1962, 2400 EST. (1800 GMT Sat. to 0500 GMT Monday. All licensed YLs and OMs are invited to participate in this contest, the 13th annual, conducted by the YLRL. See last month's column for complete rules. (Phone section was conducted in February.)

WRONE Week — conducted by the Women Radio Operators of New England, begins 1300 GMT Mon. March 19 and ends 2300 GMT Fri. March 23. See rules this column.

Annual All California YL Get-Together — The BAYLARC of San Francisco is sponsoring this year's all California YL get-together March 30, 31, and April 1, 1962, at the Whitcomb Hotel, San Francisco. See last month's column for details. (Banquet price, which includes tax and tip, should be $5.00 rather than $4.50.)

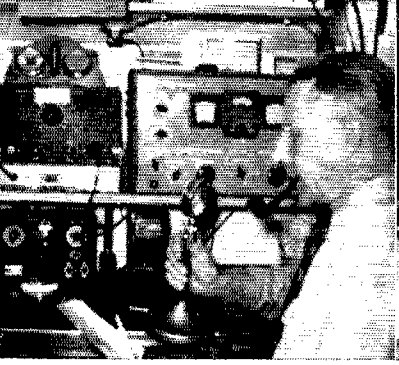
YL VHF Contest — the second annual, conducted by the YLRL. Starts Wed. April 11, 1962 at 1700 GMT (1200 EST) and ends Fri. April 13, 1962 at 0500 GMT (2400 EST, April 12).

12th Midwest YL Convention — May 18–19, Flint, Michigan.

(*Continued on page 136*)

Husband and wife team Bill, W1LIY, and "Chillie," K1JNE, Gleason of Hopedale, Mass., are both DXCC members and both have WAC and WAS certificates on 10-meter phone. Chillie has 128 countries confirmed, Bill has 126—almost total "togetherness" in ham radio, wouldn't you say?

The center bedroom of K9YIC's 10′ x 42′ mobile home is "all hamshack." With the rig so accessible to the rest of the house, Amy finds it convenient for extensive operating on 6 meters. Last October Amy initiated the Indiana Michigan Petticoat Sisters net (IMPS) on 50.4 mc, 1800 GMT (1300 EST) Mon. thru Friday. K9YIC and her OM K9RMI are "blue-ribbon" archers, having won many trophies and medals in the sport.



In the very first issue of *QST* (December, 1915) Rahma W. Pratt, 1AM, was listed as a member of ARRL. OM Pratt is still going strong, still a member of ARRL, and now signing W1FV. Above left we see him at his station in Westbrook, Me. . . . In the center above, *QST* author K9LKA receives a cover award plaque for his article on linears in the November issue, with Central Division Director W9GPI (right) doing the honors. (Each month the League's Directors award a plaque to an outstanding article in the current issue of *QST*.) . . . At the right is K3HGQ, winner of the Grand Prize, plus first prize in physics, at the 1961 Buhl Planetarium Science Fair. His exhibit demonstrated the polarization of radio waves.


Above left, WA6LWK is thirteen years old, licensed as a General when he was 12. He first got interested in ham radio while working for his Boy Scout merit badge in radio. . . . In the center photo, K8SSY is an 11-year-old General, while his 9-year-old brother is a Novice. . . . At the right is W4ANJ, 13 years old, who beat his father (WN4ANI) in dropping the "N". (Of course, poor old dad got no 10-week summer vacation!)



Above, left: here are a couple of good guys to know. Holding the bottle is K2MLT (Walt Taylor), who makes wine. With him is K1AYA (Pee Wee Hunt), who makes music. We haven't had a chance to sample K2MLT's product, but K1AYA is a long-time favorite around these parts. . . . In the center, W2APF receives a certificate of testimonial for his service to amateur radio from his friends in the Albany Amateur Radio Association. Left to right are K2YDO, WA2HFT, W2HUB, and W2APF. . . . In the photo at the right are three generations of hams in one family. Senior man is grandfather W3CPL, while standing are father WA2OKH and son WA2NKT.

There Oughta Be a Law . . .

BY JOHN G. TROSTER,* W6ISQ

W6YYY this is W6ISQ — you listening?"

"W6ISQ from W6YYY–yeah. I wasn't on our frequency. I was up on the high end. Heard your ahhhh — splatter. Not bad though tonight, considering we're pretty close. Anyway, sounds like the boys are playing cops and robbers up there. All excited about something. Some net control trying to talk to everyone at once. Mobiles shooting all over the place. W6ISQ-W6YYY."

"What's the trouble? Break."

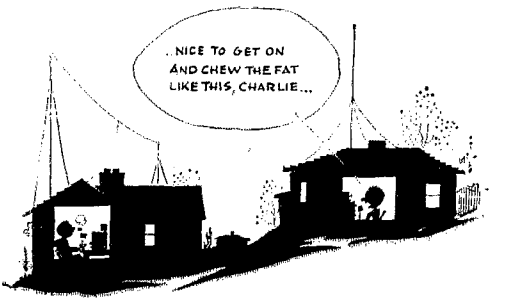
"Dunno. Theyre always practicing — cluttering up the band doing something. If it isn't some crazy contest or sidewinder, it's these guys playing boy scout. Always want everybody to clear the frequency so they can play their games. Far as I can see, the band is wide open for anyone what wants to use it. Ought to put all those guys off on some special frequency where they can fool around without bothering any of the guys who want to QSO. Maybe make 'em take a special test or something. W6ISQ-W6YYY."

"W6YYY from W6ISQ. I know, Charlie. But ya can't get too excited about those guys. If they weren't stirring up things here they'd be whipping up things on the School Board or City Hall or some Improvement Association or stuff like that. Special frequency would be good. Let them QRM each other. Best they ever do is turn out for Halloween to snitch on the kids. Maybe they ought to limit their power so they wouldn't louse up the band for the other guys who want a good QSO in the evening. Where was the bunch you were listening to? 6YYY-6ISQ."

"W6ISQ-W6YYY. Aw, they were up in Centerville, I think. They couldn't get half their people to check in, especially the guys with the handie-talkies. I could hear 'em all — but they couldn't even hear each other. Probably cheap, low-power gear anyway. They ought to have a decent net control or at least get organized before they go fooling around and fouling up the air for the other guys. I didn't see anything about any trouble in the paper yesterday except it was raining. But it always rains this time of year. Incidentally, there was another bunch messing around about 5 kc. below us. Hey, what are you doing tonight? W6ISQ-W6YYY."

"6YYY-6ISQ. Well, I saw that too about it raining up there, but if anything goes wrong they're supposed to have people warning everybody. Besides, they have dikes. They ought to let the Red Cross handle things like that, anyway, Naw, Charlie, we're not doing anything tonite. Might do a little on the kitchen cabinets. Probably watch television or fool around the shack. Nice to get on and chew the fat like this. There was a heterodyne on you last time, but you rode over him. Get your garden dug today? 6YYY-6ISQ."

*45 Laurel Street, Atherton, California.



"W6ISQ-W6YYY. No, I didn't get it dug. Ground too wet after the rain, and I see it's supposed to rain here again tomorrow; so that'll delay me again — never get my flowers in. I heard a heterodyne, too. That's one good reason to have a walloping good kw. Ride over those guys who try to crowd you off the band. Say, why don't you and the XYL come over? Break."

"Right. I guess I'll have to come over! Darn near impossible to QSO here tonite. Actually, I cut my power here tonite to 500 watts, but guess I'll have to kick it back to the full gallon. Takes all ya got to beat the QRM all right — even though it's just down the block. They oughta have some laws to make people spread out or something. See ya in about 5 minutes. W6YYY from W6ISQ."

—...—

"W6ABC. This is W6XXX, net control. Copy now?"

"W6XXX-W6ABC. Yes. Guess those fellows finally gave up. They seem to be the only two stations all the nets can copy 100%. Too bad they wouldn't let you break. Could use one of those good signals to help coordinate all the units in the valley. Well, if they won't help at least they won't bother any more — I hope."

"W6ABC-W6XXX. OK. Let's get back to work — see what we can do with what we have. Latest info is that we'll get more rain tonight and the river is still rising. All power failed. All mobile units stand by. This is W6ABC, emergency Red Cross headquarters. All stations not engaged in emergency work kindly QSY." QST

IMPORTANT NOTICE

Changes of Address

Important postal changes in handling second-class mail matter are now in effect. Please advise us *direct* of any change of address. Four weeks notice is required to effect change of address. When notifying, please give old as well as new address. Your promptness will help you, the postal service and us. Thanks.

The World Above 50 Mc.

CONDUCTED BY SAM HARRIS,* W1FZJ

A FEW months ago W1HDQ wrote an article on S meters. I have heard many comments on this article from operators on the 80-, 40-, and 20-meter bands. However, I have not heard any discussion of the article on the 6- or 2-meter bands. Very few articles written last year received so much on-the-air comment as this one. After listening to reports which people give out on the v.h.f. bands, I am inclined to think either that no v.h.f. men read the article or that none understood the article, or possibly that they are not interested in giving accurate reports (even though in the past v.h.f. men have been noted for their accurate signal reports). It just doesn't make sense to give a readability 5 and strength 9 report backed up by the statement that you missed part of that transmission because of QSB. Readability 5 indicates that the signal was perfectly readable with no difficulty. In this event QSB could not possibly have made it difficult to read, otherwise he wasn't Q5. And to give a report as I have heard many times in the past month of an S9 and fading into the noise is completely meaningless particularly when upon questioning you find that the noise is reading S8. If your noise level is reading S8 it is pointless to give an S9 report because his signal at your place and under your conditions with your noise level is not a very strong signal, and an S9 report indicates a very strong signal.

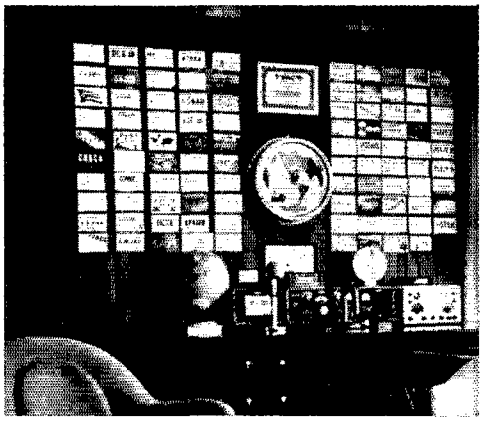
While we're on the subject of very strong signals I might quote a note I received from Dave, K3HNP, in which he took me to task for suggesting that there were no bad signals on v.h.f. Dave sez: "Maybe there are no bad signals in New England, but . . . ". A close examination of the signals on six and two meters in the New England area leads me to believe that I was possibly somewhat optimistic in saying that there were few badly modulated signals. In fact, I have found *many* badly modulated signals, enough so that it is obvious that the average v.h.f. man is not using any method of checking his modulation percentage. I realize that everyone can't have an oscilloscope connected to his transmitting equipment at all times. It is true, however, that anyone can ask his cohorts to examine his signal and give an honest report. Some stations are equipped to give very accurate modulation reports, but any station is equipped to know the difference between over-modulation or modulating beyond the capabilities of the transmitter, and a nice clean, undistorted signal. If you're not capable of checking your transmitter's modulation capabilities, you are not complying with the terms of your license. It occurs to me that I have never seen any rule about not modulating enough. In my perusal of the v.h.f. bands, I chalk up about 20 per cent of the phone stations I hear as being severely unmodulated. Such a signal is very exasperating when it's near the noise and you're trying to identify it.

Let us consider a signal which was fully modulated and not generating any splatter, such as we listened to during the last contest in January from K1AZO in Walpole, Massachusetts. Paul was using an 8-watt transmitter and a five-element beam about 25 feet off the ground. Working under a terrific handicap in that he only lives four miles airline from W1HOY, he nevertheless managed to contact 159 stations in 10 or so sections during the contest. I wouldn't say this was necessarily a record, but I would be interested to know who made a comparable score with comparable equipment. Of course, it's true that we heard of scores from down the coast in the 500 and 50 or more category but the station we heard was obviously running more than 8 watts, and probably more than one band — although we're not sure of that.

In New England the die-hards from W1KBN hauled their equipment to the top of Pack Monadnock during the somewhat encumbering ice storm and managed to turn in a reasonable score for their efforts. W1MHL's star operators drove to the top of Hogback Mountain in Vermont and turned in their customary top-notch operating and scoring effort. As usual, the New Englander's at least had an opportunity to work a little sporadic *E* into the midwest and southwest to fatten up the scores.

If you operated at all and got any reasonable

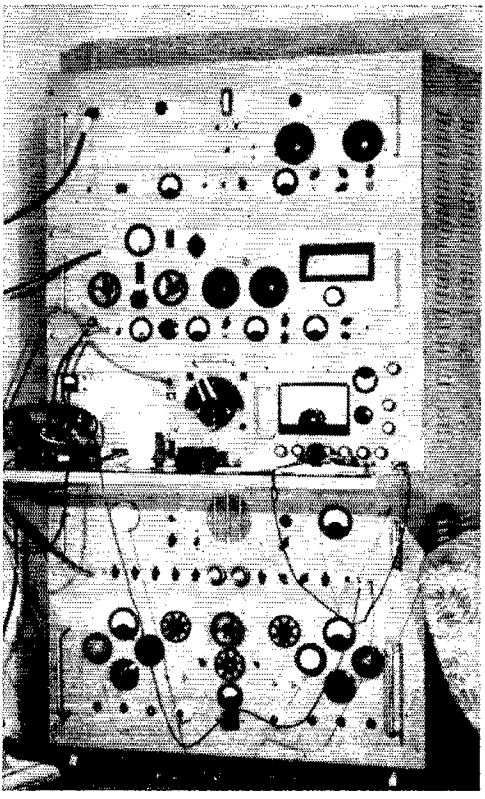
*P. O. Box 334, Medfield, Mass.



Those don't look like 50-Mc. QSLs, but just the same it's the shack of W5LDH, who recently worked HK5GZ on that band.

results, don't forget to send your log as this is the only way that an estimate of the activity countrywide can be obtained. Many stations are presently building and preparing for the June contest, and just to listen to some of the plans is enough to make you shudder at the work involved. The east coast clubs are all setting their sites on the trophy put out by the Syracuse VHF Society and presented each year at the Syracuse VHF Round-Up. W1MHL has won it many times but it is necessary to win it three years in a row in order to maintain permanent possession. The coming contest could possibly be their third win in a row. No one wishes them any bad luck but many groups are out to prevent this event from becoming a reality. Present odds in New England are 8 to 3 in favor of a repeat by the MHLers.

I was talking with Eddie, K1ISR, the other day and the subject of noise figure versus tubes came up. Having heard so many statements on the air that various people had improved their noise figure on two meters and on 220 Mc. using the new nuvistor triode, the discussion turned to how good could a nuvistor be as compared to, say, a 417A on 144 Mc. It seems like if you ignore the price involved and only talk in terms of performance, the best tubes for 144 Mc. are the 416B, the 417A, and the 6CW4. The 416B has an equivalent noise resistance of about 50 ohms, the 417A has an equivalent noise resistance of about

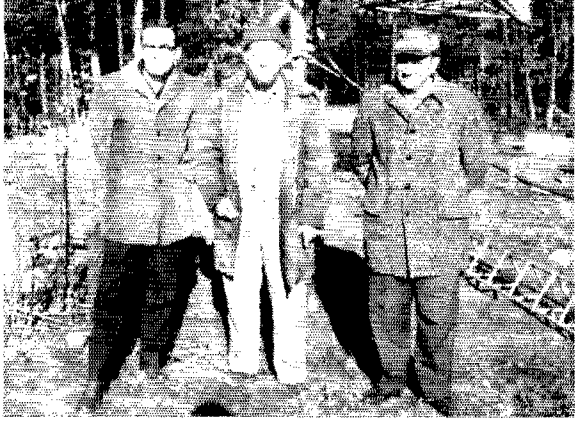


Neat installation at QTH of active v.h.f. man in Poland, SP6FZ.

W1TQZ and W1QXX lining up the mount for new dish at W1BU.

100 ohms, and the 6CW4 has an equivalent noise resistance of about 200 ohms. Equivalent noise resistance, of course, only tells you what the tube might be capable of if it is not being hampered by transitime effects or various other problems involved in making a low-noise amplifier. However, all these tubes are working well within their frequency rating at 144 Mc. and the likelihood of getting better performance with a 6CW4 as compared to a 417A is very remote. Now, the 6CW4 may possibly give results which are comparable to the 417 in terms of being only a db. worse and in view of the considerable difference in price might well be the best choice for a front-end tube. This still leaves no room for statements such as "the 6CW4 has a better noise figure than a 417." And as a matter of fact, I don't know why anyone is bothering with either one when he can build a parametric amplifier which will outperform all three of the tubes in cascade, parallel or otherwise.

Having decided that probably the best tube to use was the one you could get hold of the easiest, our conversation wandered on to what do you do when your receiver gets overloaded. It seems like Eddie lives pretty close to W1QXX who for some unknown reason is running in the vicinity of 600 watts. Eddie's new receiver had a tendency to drop dead whenever W1QXX turned on his transmitter. We suggested that he might install a separate r.f. gain control on the input r.f. stage of his receiver and thereby improve the situation. After doing so, he reported a reduction in overload of almost 30 db. from the previous operating condition. It appears that dropping the gain in the 1st r.f. stage reduced the system gain to the point where a weak signal was still perfectly readable but a strong signal did not overload the receiver. Eddie reports no more difficulty with W1QXX as far as overload is concerned. I would hesitate to attempt to print a modification for all the various receivers which are presently on the market. However, if you don't feel capable of designing your own, I would suggest writing to the manufacturer of your receiver and asking for suggestions. The importance of balancing the system gain in your station cannot be overemphasized. The majority of overload problems



Inspectors of location of new installation at Rhododendron Swamp VHF Society. From left to right: W2AZL, W1FZJ, K2HAC.

are caused by too much signal in the i.f. receiver. If you don't believe it, just ask Eddie.

50 Mc.

During the month of December there were several band openings on 50 Mc., so once again we received lots of correspondence. Martha, K8WPQ in Watervliet, Michigan writes that during the opening of December 28 she was hearing 1's, 2's, 3's, 4's, and 5's including the states of Massachusetts, New York, New Jersey, Pennsylvania, Delaware, and Maryland, Virginia, North Carolina and Texas. On the 29th the band was open to 2-land for about ten minutes and with very weak and very few signals coming through to Watervliet. K8NEY observed a good opening to Maine, Vermont, Massachusetts, Connecticut, Rhode Island and New York on December 16, and had a long chat with K5AKY in Houston, Texas, on December 12. George also noted the opening of December 28/29 when he was hearing North Carolina and Texas.

A "quickie" from W6IEY reports that W6CDQ was hearing Texas, Utah, Washington and Oregon on December 11, although Dick (W6IEY) was not fortunate enough to catch this one. W4ZGS reports nothing special heard during the month of December but Til did complete his miniature rhombic for six meters — results not good on six, sez Til, although it worked fairly well on two meters. Next experiment at his QTH will be the installation of "V" beams for six meters. K4KYL reports openings on December 12 to Minnesota and Wisconsin; on December 28 to VE2, VE3, Massachusetts, Rhode Island, Connecticut, New York, Vermont, Maine, New Hampshire and Michigan; on December 29 to Texas and Massachusetts. From Overland, Missouri and Clarence, WØCMI, comes word of hearing both sides of a QSO between KØAMI and WØITO on December 25; also a very good opening on December 28 to the northeast, and a poor opening on the 29th to the northeast. Clarence is planning to put up a 45-foot tower in the spring with a six-element beam on top. Amongst all these skip and opening reports, we have one from Dot Hall, KØGIC, in Wichita, Kansas, who sez: "No six-meter skip stations heard for month of December. Other locals report no stations heard. A real dry-run month." Included this report so that those of you having thought of moving to Kansas will realize that they too have their off times. On December 3 VE8BY had one more contact on 50 Mc. when he worked KØUDZ in South Dakota. Gene (KØUDZ) also had an almost contact on December 13 with K1I?R. December 12 was noted as a "good one" in South Dakota also, when the band was open to Ohio and Alabama. More from Michigan, Detroit area this time: According to Reg, W8MBH, on December 23 during the evening 1's, 2's, 3's, 9's and Ø's were heard; on December 24, 4's and 5's were heard for about an hour in the afternoon. On December 26 a KL7 was heard around 1400 on c.w. by K8TWW — KL not identified; December 28, 1's, 2's, 3's, 4's and 9's were heard. Reg also advises us that he has heard from W8OWE in Adak, Alaska, (via the postman) that he has built converters for 50, 144 and 220 Mc. These consist of 417A grounded grid in two 417A in cascade through a 6AK5 to a BC453 receiver. He'll also be using a beam. K6SIX in Los Angeles says that six-meter operation was very poor during December due to a very high noise level; at times as high as 5 db. over S9. However, Leo did have one very good contact with W6IUL maritime mobile 50 miles west of the coast of Ventura. W6IUL was operating a Gonset G76 to a horizontally polarized dipole and reports both ways were 5/7.

December 5 was good in New Jersey for WA2UGQ when the band opened to Tennessee, Georgia, Florida, Alaska, Louisiana, Arkansas and Texas. Dave sez he noticed "NO QRM," but the QSB was rough. (This I have to see!) Band opened again for him on December 28 to Ø land with KØEEQ being the strongest from Minnesota. Another New Jersey report (from WA2QPV) sez that six meters was open over the 2nd and 3rd weekends of December, when WA2UNQ worked KØKWB, W9YT and K8ES. WA2TQT in New York City sez: "Conditions on six meters normal, noticed good conditions to Pennsylvania. Slight band opening to 4's, 8's and 9's. December 13 to 31 a few band openings to 1's and 4's. Good groundwave to Pennsylvania and Connecticut." From Roanoke, Virginia and Bob, K4UMK, comes the word that on December 16 K4PGL/VP9 was heard by several stations in the Roanoke area at 1500 to 1530 and again at 1830 EST. Bob did not mention anyone making a contact with K4PGL/VP9 and we wonder if any contacts were made. On December 28 1's, 2's, 5's, 8's, 9's and Ø's were heard by K4KZX. K4UMK also mentions that WA4AYP has been worked on s.s.b., and WA4AET has been heard but not worked on s.s.b. Jim, WØPFP in Ames, Iowa sez that during the aurora of December 2 he got in a 5-way s.s.b. roundtable. He didn't mention the stations concerned but I take it they were not Iowa stations. Jim observed E_s on December 16, 17, 28 and 29, with December 28 being quite good. The band opened at 0900 CST with

(Continued on page 142)

220- and 420-Mc. STANDINGS

220 Mc.

W1AJR	11	4	480
W1AZK	9	3	412
W1HDQ	11	5	450
K1JIX	10	3	
W1OOP	12	4	400
W1RFU	15	5	480
W1UHE	11	4	385
W2AOC	13	5	450
K2AXQ	8	3	230
WA2BAH	4	2	167
K2CBA	13	6	650
K2DIG	4	3	140
W2DWJ	15	6	740
W2DZA	12	5	410
K2ITP	11	5	265
K2ITQ	11	5	265
K2KIB	12	4	300
W2LRJ	10	4	250
W2LWI	12	4	400
W2NTY	12	5	300
K2PPZ	11	4	190
K2QJQ	13	5	540
W2SEU	4	2	150
K2UUR	4	3	105
W3AHQ	4	3	180
W3FEY	10	5	350
W3JYL	8	4	295
W3JZI	4	3	250
W3KKN	10	4	255
W3LCC	9	5	300
W3LZD	15	5	425
W3RUE	9	5	450
W3UJG	13	5	400
W3ZRF	5	4	112
K4TFU	8	4	400
W4TLC	4	1	165
W4UYB	7	5	320
W5AJG	3	2	1050
W5RCI	8	5	700
K6GTG	2	1	240
W6MMU	2	2	225
W6NLZ	3	2	2540
K7ICW	1	1	250
K8AXU	10	5	1050
W8IJG	9	5	475
W8LPD	6	4	480
W8NRM	8	4	390
W8PT	10	5	660
W8SVI	6	4	520
W9AAG	9	4	660
W9EQC	11	5	740
W9JCS	5	2	340
W9JEP	9	4	540
W9OVL	6	3	475
W9UED	4	4	605
W9ZIH	10	5	500
KØDGU	5	3	425
KØITE	6	3	515
KH6UK	1	1	2540
VE3AIB	7	4	450

420 Mc.

W1AJR	10	4	410
W1HDQ	8	3	210
W1MPT	8	3	170
W1OOP	11	3	390
W1RFU	7	4	410
W1UHE	6	4	430
W2AOD	6	4	290
W2BLV	12	5	360
K2CBA	5	3	225
WA2DTZ	6	3	200
W2DWJ	10	4	196
W2DZA	5	3	130
K2KIB	4	2	100
W2NTY	3	2	100
W2OTA	10	4	300
K2UUR	7	3	175
K3CLK	9	4	
K3EOF	6	3	250
W3FEY	7	3	296
W3LCC	2	2	
W3RUE	2	2	96
W3UVG	6	6	4
W4HHK	6	4	550
W4VVE	7	4	430
W5HTZ	5	3	440
W5RCI	10	3	600
W6GTG	1	1	180
W7LHL	2	1	180
W8HCC	3	2	355
W8HRC	3	2	250
W8JLQ	4	2	275
W8NRM	3	2	390
W8PT	6	3	310
W8RQI	4	2	270
W8TYY	7	4	580
W8UST	3		255
W9AAG	5	3	375
K9AAJ	4	3	425
W9GAB	9	4	608
W9OJI	6	3	330

The figures after each call refer to states, call areas and mileage of best DX.

Correspondence From Members-

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

160-METER PETITION

I wish to express my gratitude for the League's request of expansion of our 160-meter band. I am happy to see this long-overdue action on behalf of the hams who enjoy and specialize in low-frequency work.

With the higher-frequency bands going out and the increased activity on the lower-frequency bands, this expansion is much in need. The re-opening of the 160-meter band could much relieve 75 and 40 meters of the high QRM from local round-table QSOs prevalent in the large cities. It increases the possibilities for expansion of the National Traffic System. Many of the old timers could renew the fun of operation on 160. For the younger set of hams (of which I am a part), there is the experimenting and exploring of the low frequencies.

I would also like to recognize Mr. Robert Booth, W3PS, our new General Counsel. It appears that he is really taking the bull by the horns in his newly appointed position.

Keep up the good work and let's see if we can get our 160-meter privileges restored. — *R.E. Good, K4VHC, Marietta, Georgia.*

Congratulations on your request for a hearing on reinstating 160 meters to amateur service! . . . May you succeed in your endeavor. — *John R. Harlow, W3KSP; Albert M. Schafer, W3MUC; Fred H. Stiening, W3FIP, Pittsburgh, Pennsylvania.*

GERMAN LICENSES

Before leaving for Europe last June, I wrote you for licensing information in West Germany. You instructed me to go to one of the large post offices, fill out a form, and pay a small fee. Upon inquiry, however, I found that this form is no longer to be had, since the demand for it is all but non-existent. The following information, therefore, should interest those hams who wish to obtain a ham license in the Bundesrepublik:

Inquire at the local post office where one must write to make a license application. You will be referred to the "Oberpostdirektion" of your particular area. (In my case the address was Oberpostdirektion, II A 3, Karlsruhe.) Enclosing a photocopy of your license, send a letter to that address containing the following information:

1) Name, address, and birthdate.

2) Place of business, school, university, or what-have-you.

3) Affirmation that you are acquainted with the "Bestimmungen über den Amateurfunk," the amateur regulations for West Germany. You can get a copy of this from the Oberpostdirektion, or possibly from a German ham, if you know one. If you can't read German, I suggest you have a German friend help you; otherwise your mastery of the material is somewhat questionable.

4) Affirmation that you have an "Aufenthaltserlaubnis," that is, that you are registered in the city hall of the community in which you live and have your passport stamped indicating that you have permission to stay.

5) Occupation.

6) Indication of the period of time you will remain in Germany.

If you should be under 18 years of age, don't bother to bring your equipment over, since there is an age limit here. (Unfortunately, this requirement precluded my own application from acceptance.) You will have to pay a small fee for the license itself and a monthly fee thereafter. — *Eric Holm, KØRLS, Happelstrasse 16, Heidelberg, Germany*

DX CONTEST

In view of the 1962 ARRL DX Contest in February and March, I just have to get two things off my chest: Please, Gang, let's do our testing the day before the contest and not right on some "hot" frequency. If your DX does not pick you to answer, let's not pick his frequency to check out the old rig. Secondly, let's shoot on sight the ham, who after making contact, goes "QRZ the frequency" or calls CQ right on top of the hundred guys that are waiting out his QSO. Few are "rock bound" these days; let's spin the v.f.o. Good luck in the contest. — *H. B. Manning, WA6AYF, Los Angeles.*

MAMMOTH ECHO CHAMBER

During the evening of Friday, December 1, 1961, the usual 75-meter s.s.b. group that operates around 3803 k.c. had moved up to 3820 for the s.s.b. emergency net roll call. After the net, the majority of the group remained on frequency for rag chewing. Various stations checked in and out until, at approximately 9 P.M., the following stations were in contact: W6ECC, Bishop; W6MIQN, Arcadia; W6QXR, El Monte; K6RQQ, Whittier; W6ONY, Downey; K6MVM, Van Nuys; W6ADO, Van Nuys; K6LFM, Lakewood; K7CRO, Tucson; WA6OYE, Oceanside, and W6CZF, Hollywood. Other stations checked in later, but the above stations made transmissions during the strange conditions.

About 9:05 P.M., K6RQQ made a short transmission and was informed by W6ONY (about 8 airline miles away) that his echo chamber sounded fine, but to turn it off. K6RQQ remarked that W6ONY was also using an echo chamber. Then W6QXR and W6MIQN (all stations within 15 miles) sounded like they were using echo chambers. W6LFM (also in the Los Angeles basin) had an echo to the other stations within the area. W6ECC in Bishop (about 300 miles north) could not hear an echo on any station, nor did he have an echo on his signal. The same was true for WA6OYE, Oceanside (about 90 miles south) and K7CRO, Tucson, Arizona (about 500 miles southeast). The echo effect then (about 10 minutes later) occurred on all stations within the Los Angeles area. The boys out of town thought we were affected by smog, fallout, traffic, booze, and various other environments.

Other conditions that could have caused the effect were observed. A weather front was moving over the Los Angeles area. It started raining in Downey, El Monte, Whittier, Arcadia, and Lakewood at approximately the same time that the echo effect started. Receiving conditions on the outlying stations were excellent in both directions. There was a noticeable absence of midwest and fifth district stations which are usually heard in the background. Static was nonexistent. Other than the slight rain, everything appeared normal.

The echo effect continued with the delay time increasing until approximately 9:25 P.M., at which time copy was extremely difficult, even though all signals were above S9. The delay was estimated from one-tenth to one-half of a second. This echo came in suddenly, but diminished slowly from 9:25 P.M. on, and was almost completely gone by 10:10.

This effect was never before heard on 75 meters by anyone on the frequency. W6ONY taped over an hour of the QSO and played a portion at the Sideband Breakfast on Saturday, December 2. Some of the breakfast crowd claimed that they were on at the time, working local, and did not notice the echo effect. Some claimed that they were listening around the band and that this effect was only on 3820 kc.

Form your own conclusions. We are wondering if this echo effect has occurred elsewhere on 75 meters. — *Brown Wiggins, W6ONY, Downey, California.*

"PATIENTS"

It sometimes happens that topographical errors lend extra emphasis to an otherwise well intended statement of fact.

Such seems to be the case in the very timely artical by Karl Keller "Protect That Invention". In the fifth paragraph he states "Patients are not issued for mental processes, ------, or for methods of solving mathmatical problems". How well we know that the first word should be "Patience". — *C. Everett Coon, W2KNU, Bloomfield New Jerscy.*

(Continued on page 138)

Operating News

F. E. HANDY, W1BDI, Communications Mgr.
GEORGE HART, W1NJM, Natl. Emerg. Coordinator
JOHN F. LINDHOLM, W1DGL, Ass't. Comm. Mgr., C.W.

ROBERT L. WHITE, W1WPO, DXCC Awards
LILLIAN M. SALTER, W1ZJE, Administrative Aide
ELLEN WHITE, W1YYM, Ass't. Comm. Mgr., Phone

City Commends Club. In December the City of New Rochelle, N. Y. adopted the following resolution commending the *Communications Club of New Rochelle* and the office of civil defense for their results and performance in the ARRL Field Day. The substance of the resolution, speaks for itself:

WHEREAS, the American Radio Relay League, in cooperation with local and national Civil Defense authorities, sponsor an annual exercise known as Field Day for the purpose of testing the readiness of amateur radio clubs to provide emergency communications, and

WHEREAS, the Communications Club of New Rochelle, serving the City's Civil Defense Organization, has been actively engaged in this competition for the past three years and has distinguished itself by placing first in 1959, fourth in 1960 and second in 1961, thereby bringing national acclaim to our City, now, therefore, be it

RESOLVED, that this outstanding performance from among more than 10,000 participating . . . reflects great credit on The Communications Club of New Rochelle, and the local Office of Civil Defense, and that they be hereby commended by the Mayor and Council of the City of New Rochelle . . .

Your Conelrad Provisions? If you pride yourself on compliance with FCC regulations — most amateurs do — you check your frequency with scrupulous care when near band edges, or those of phone sub-bands. You keep a meticulous log of every transmission including tests and CQs. You have a clean signal. But is your station setup such that when you transmit, a Conelrad monitor is activated?

Early 1957 issues of *QST* explained the rules that required this when they came into being. If you are new in amateur radio and interested in simple ways to comply with the Conelrad rules, we suggest you review the ways described for constant monitoring for a Conelrad Alert. The January 1957 issue gives a simple alarm circuit, an inexpensive system working on the b/c receiver i.f. This was described in detail in August 1957 *QST;* other references are available through the December *QST* index. We're not selling any particular gadget. Having just visited a station with no provision for Conelrad, we felt a reminder might be in order.

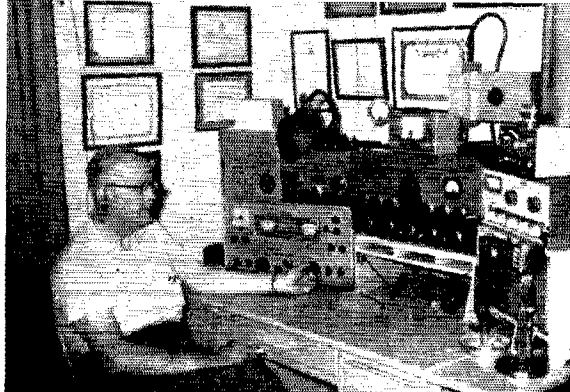
This is W4RTY, EC for Northeast Georgia who, on New Year's Day, obtained vital highway information for a local radio station when telephone wires were down. Up to 9 inches of snow and ice had covered everything the previous night. Kudos, W4RTY!

Results Outstanding Where AREC and RACES Work Hand in Hand. Linc Cundall, W2QY, is the ARRL Emergency Coordinator in an area given top rating in RACES preparedness. Charles Brelsford, W2CTA/WA2HUW, RACES RO of Monroe County, N. Y. in his excellent 1961 report summarizes steps taken there to make RACES outstanding. We list the items since they can well serve as a check list for other AREC and RACES groups.

(1) A special letter to all amateurs in the county brought the number enrolled to 202. (2) A survey of 6- and 10-meter mobile units was made to insure communications with the control center from hospitals and schools, 28 *places* of special significance to c.d. (3) Steps to improve mobile communication circuit capacity were taken. Coverage to needed points up to 35 miles was documented. Additional 6- and 10-meter mobiles were enrolled. (4) In April and May, competitive efficiency tests were run on mobile units. (5) Seventy operators handled stations in the national Operation Alert. (6) Mobiles provided necessary communications for the annual Memorial Day parade. (7) Local demonstrations and tests of RTTY etc. were made later in the year. AREC, the Red Cross and RACES worked closely together at all times with good support also for the New York State Command CD Radio Net. Recommendations for additional auxiliary power supply and antennas for portable use conclude the report. Fred K2DZV, Bob W2RUJ, and Linc W2QY, share the honors in W2CTA's report for excellent organization.

How Long to Call? Long-CQ artists got W1OD/4 sufficiently worked up that he started to count CQs consecutively sent by those supposed reasonably competent as operators. He reports one station as sending 157 CQs before signing his call. Think of the operators ready to reply who "turned the dial" instead of wasting time with such unintelligent operating. Jim remarks, "Who says lids, dopes, and poor operators are all Novices?"

ARRL for many years has stressed brief calls and frequent periods of listening, a repeat call if necessary, rather than long drawn out calls to get



Relaxing in the shack is W1BVR, SCM of Western Mass., New England Division Director from 1936–54, and a past vice president of ARRL. Perce, as manager of 1RN, is the sole original manager still at the helm of a region net since NTS's inception in 1949.

maximum results. Our standard operating procedure is to call three times or less, sign three times or less, and after contact has been established, decrease the use of calls to once or twice. Scientifically inclined amateurs, looking at two letter calls and analyzing those of more characters sometimes have urged "four times two" or variations of the formula. The principle of brevity of course is the thing. W1OD would use a 3 × 1, 3 × 2, and 3 × 3 sequence. He adds, "Any well timed 2 × 2 call will get more real DX than a thousand CQ DX calls. Operators calling CQ DX by any procedure automatically label themselves as too lazy to listen. The call sequence I have suggested should be repeated not oftener than once in five minutes."

What Makes for a Good QSO? A panel discussion on this subject was arranged not long ago by the Nortown Amateur Radio Club of Toronto. The major ingredients and importance of various elements were reported in "Key Klix," Bulletin of the Gateway Amateur Radio Club of North Bay, Ontario, and likewise evoked considerable interest. Space permits only of some of the high points.

(1) *Good listening* both before and during every contact is a first essential. Always listen first to minimize possible interference. Then pay attention and make all your answers intelligent; if you are called away this should be explained. Listen first, not just for two seconds. A local may be in contact with a DX station.

(2) On subject matter: the weather and equivalent are regarded only as "an opener," not the meat of the QSO. Strive for a social *exchange* of information unless there is traffic or a formal purpose to be served. Such non-routine objectives can make a contact memorable.

(3) Avoid "soapboxing"; make no speeches. The panel brought out that one's report, QSL card and other introductory items can be part of a QSO but such points should not be overemphasized. Name and report are preliminary for a new contact but are by no means the whole thing. Try to find a common ground to discuss. Mutual interest subjects or varying views and experience are helpful. One's type of work, or hobby, or reference to earlier contacts through keeping a card record are well received.

(4) Crisp to the point timing is preferred. If there are more than two stations it is especially necessary to keep remarks short. These *seem* short when you're speaking, but long when others transmit!

(5) Ask questions about the other fellow's city and activities. Avoid talking about things that would not normally be discussed in mixed strange company. Politics, sex, and religion are in bad taste. Try not to be dogmatic or provocative.

(6) Repeat the calls of newcomers and keep the order right in transferring the contact back to the stations worked, if more than one. Common sense and good taste make for an interesting contact.

(7) "This is my final" or like expressions should not be used until and unless they mark the end of the contact. It is in poor taste and inconsiderate of others waiting to call, to say you are terminating a contact and then continue holding down the frequency.

Addition to TVI Kit. All affiliated radio clubs are encouraged to maintain active TVI Committees. Every such club and/or committee may request ARRL's TVI Kit. This comprises a complete folder of forms, information, suggestions and policy-experience with instructions on exactly how to go about forming a new TVI Committee group where there has been none and problems are appearing.

Our sample publicity, service shop poster, and bibliography in this kit have been well received and continue to be the best guide to organization and operation of local TVI committees. Jack Boyce, WA2NDX, has generated an item that we feel a good publicity handout: "Who's That Talkin' On My TV?" This explains the mutual problem without oversimplifying it and in language that a TV viewer might understand. Most clubs already have ARRL's TVI Kit. The new lithographed addition to the Kit currently is available by itself on request. We mention its availability so clubs will request it to fill out the kit they now have and also as an excuse to let any clubs with a TVI problem *not* having the complete kit, to drop ARRL a line for the whole set of information on TVI.

DX Contest. The whistle for the second half of the ARRL DX Competition is blowing. Full announcement appeared in January *QST*. If you missed the two week ends in February, you still have two week ends in March. All scores large and small are welcomed to help us in cross checking and so you can credit your results in *QST*. Best of DX.

—*F. E. H.*

It's a little late for New Year's Resolutions, but then there is a restriction on the timeliness of the lead for this column because once in a while it gets chopped out to make room for other departmental truck. Some time late last year we received a letter from one of our more prominent ECs roasting us for a negative attitude in this column. Well, being roasted is no new experience for us; we've been worked over by experts. We usually consider the justification for the criticism and either reject it or acknowledge it. If the former, no action is taken. If the latter, we strive to mend our ways.

In this case, we neither rejected it nor acknowledged it, because whether or not any theme has a negative tone can be a matter of opinion. Or, if there is no doubt that it is negative, there could possibly be some justification for it — such as, maybe, results? So, this was a matter to be pondered, and we pondered it at length. Is it true that by trying to shame the do-nothings into doing something we are undercutting the active ECs? Is it best to accentuate the positive and ignore the negative? Will the things done wrong automatically correct themselves if we restrict ourselves to praise of the things done right? Do only the active ECs read the column, while the inactives we are trying to shame never receive the impact of the shaft?

The considered answers to these questions have resulted in our New Year's Resolution to accentuate the positive. This is a hackneyed phrase and we don't like hackneyed phrases. What we mean is that we are going to try to stop griping about inactive ECs and spend more time commending those who do a good job and do it right — because, after all, there *are* a lot of them. AREC is definitely on its way up, no question about it, and this largely because of the efforts of more than just a few dedicated ECs and SECs.

Of course you can't change a cynical old Scrooge into a back-slapping optimist overnight. Sometimes optimism can verge on hypocrisy, and at this point we will have to draw the line. Also, we may from time to time relapse, so keep an eye on us. We have an idea that the year 1962 is going to be the best ever in the AREC. How's that for a start?

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We have two new AREC forms. Lest you think this means we continue to pile forms on top of forms, it should be added that we have also eliminated a couple of things from our AREC stock to make room for these two new ones, both of which are much needed.

Form 34 is an application for EC appointment. We wish we had a nickel for every time we have been asked for such an application form, but we never got around to doing anything about it until Conn. SEC W1EOR made a specific suggestion which we could criticize, change until he wouldn't recognize it as his, and print. This form is available to SECs and SCMs in quantity or singly to anyone who wants to apply for EC appointment.

Form 35 is an AREC activities report form, to be used for reporting any kind of AREC activity from routine drill to real emergency for possible publication in this column or elsewhere in *QST*. If you could see the hodge podge of stuff we have been getting in lieu of information on emergency activities, you would realize how badly this form has been needed. It is available to *anyone* who has something to report, and ECs should keep a supply on hand. Also, when we receive a report with incomplete information we'll just bounce it back with a Form 35.

Discontinued are Form 32 (EC report for issuance of Official Mobile Unit and Emergency Radio Unit) and the small AREC membership stickers. — *W1NJM.*

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On Dec. 5 a hunter, reported to be diabetic, was reported missing in the mountains near Altoona, Pa., during cold, windy and wet weather. Radio Officer W3MBB asked EC W3LIV to assist and the Blair County AREC was alerted. In less than an hour 16 members with 11 mobiles were in action. The search went on all night, with mobiles covering every passable road (and some that weren't), while other amateurs manned stations at the temporary control base, maintaining contact between search units and keeping members of the family informed. The fire warden called off the search just before morning, because of worsening weather conditions, with plans to resume later, but the missing man was found unharmed by a passing motorist and returned to his home. — *W3LIV, EC Blair County, Pa.*

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On Dec. 27, HC1IF in Quito, Ecuador, contacted WA2COQ and explained that telephone communication was out between Ecuador and the U.S. and that a medical instrument called a lung ventilator was urgently needed for post-operative treatment in a heart operation. A two-day search was instigated by amateur radio and an instrument of this kind was finally located at a specialist's office in Atlanta, Ga. It was immediately flown to Ecuador by jet airlines. Thirteen amateurs participated in the search: *HCs* 1IF 1FG 2CB, CO8JK, KP4BAS, *K2s* SVM ICS, W2CJJ, WA2COQ, *K4s* JSS ZZP, W4TXB, K8ITH. — *WA2COQ.*

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Members of the Michigan Six Meter Club took part in "Operation Hospital" on Dec. 5, and again on Dec. 18, 20 and 22nd. On the first date, a rig was set up in the Veterans Hospital in Dearborn and operation demonstrated to the patients. On one occasion, a patient was able to converse by radio with his wife in another hospital in Detroit. On Dec. 18, 20 and 22 the rig was again operated from the Dearborn hospital to allow patients to send Christmas and New Year greetings to their friends and loved ones throughout the nation.

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With all the talk about the coordinated AREC Plan in Florida, we wouldn't want you to think that Florida is the only state with active AREC people. As a case in point, we have recently been receiving copies of "official bulletins" put out by Alabama SEC W4FQQ to radio clubs and ECs stating section AREC policies and procedures and outlining plans for future progress and activity — the kind of stuff that gives the gang ideas and spurs them on. Alabama has long been organized in a statewide system of integrated traffic and emergency nets.

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On Dec. 14, the Clinton County (N. Y.) AREC joined forces with the Salvation Army in "Operation Good Cheer," for the purpose of collecting food, clothing and toys for needy children. A control station was set up in the Salvation Army Building to dispatch mobiles to make the pickups. Over a ton and a half of clothing was collected, along with lots of food and toys during the one evening. Ten mobiles and seven fixed stations participated. — *WA2GCH, EC Clinton County, N. Y.*

Western Pennsylvania's new SEC, W3WRE, is shown above (right) with OM W3WRC (standing) and K3EDV (seated), key station operator for Cambria County RACES. W3WRC is president of the Conemaugh Valley Amateur Radio Club. (Johnstown Tribune-Democrat photo.)

Prior to Christmas, K2HSY, control station of Kings County (N. Y.) AREC nets, received calls from net stations with children who wanted to talk with Santa Claus. So EC K2OVN (right) dressed the part, to get in the mood, and with K2HSY (left) talked with children at fifty different stations, to their great delight.

Twenty-five SEC reports were received for November, 1961, representing 12,454 AREC members, compared with 31 reports representing 12,538 members for the same month in 1960. Quite a drop, men! The addition of North Dakota to the list of sections heard from in 1961 makes a total of 46 different sections, compared with 42 at the same time in 1960. Sections reporting: N. Dak., Mich., S. Dak., Colo., E. Fla., Ore., S. N. J., Utah, Minn., E. Pa., Alberta, NYC-LI, S. Texas, Ohio, Okla., Ga., Ind., Ala., Tenn., Nevada, Wash., E. Mass., Maine, Kans., S. C. V.

RACES News

Communications Officer W4BKC of Orlando, Fla., has notified us that the following equipment was stolen from the Orlando Communications Van between Dec. 10 and Dec. 20, 1961: Gonset 2-Meter Communicator, Model 2, Serial CD9627; Gonset 6 Meter Communicator, Model 3, Serial A2684; Johnson Viking Transmitter, Model CD2, Serial 13854; HQ140 receiver, Serial 5409; Gonset G77 Transmitter, Serial 143; Gonset G66B Receiver, Serial 1257. If any of the above is located, notify sheriff's or police department or get in touch with Hal Shea, W4BKC, C. D. Communications Officer, 7 West Columbia St., Orlanda, Fla.

GOTCHA NET DIRECTORY?

If not, you'd better drop us a line and get one before they're all gone. They became available shortly after the first of the year and many have already been distributed to those who had requests on file plus those who responded to the first notice by W1AW Official Bulletin. Directories are sent out *only* on request.

What *is* the Net Directory? Well, it's a 26-page document which lists in three different ways every public service amateur net known to us. The first is alphabetical by name of net, giving frequency, time, days, call of manager, purpose, duration, designation, coverage, and date of last registration for each of over 500 nets. The second is alphabetical by name of net within each state for nets whose coverage area is within a single state. And the third is by frequency of operation from low to high. The Net Directory is a valuable operating aid to nearly any active amateur.

If you want a copy, you may have it for the asking from the ARRL Communications Department.

RTTY NOTE

RTTY Magazine with results compiled by W6TPJ reports with much pride that the First World Wide RTTY Sweepstakes held Oct. 21-23, 1961, was a resounding success! Distinction of being the winner of this initial running goes to W0NFA with 31 states, 23 countries, and 6 continents. Of the 90 entries submitted the top ten scores follow:

W0NFA	33,738	I1RIF	25,040
W2RUI	32,714	W5BGP	24,684
W7ESN	30,270	KH6IJ	22,766
TG9AD	29,574	K3GIF	20,728
W6TPJ	28,319	KR6MF	18,135

Active during the contest were over 200 stations in 20 countries and all continents. Logs were received from no less than 18 DX countries with these stations tops in their respective countries: DL6EQ, G3BXI, GM3IQL, I1RIF, KH6IJ, KL7MZ, KM6BU, KR6MF, KZ5KR, LA6J, PA0FB, TG9AD, VK3KF, XE1BI, YV1EM, ZK1BS, ZL3HJ, ZS1FD. Let's look for even better results next year!

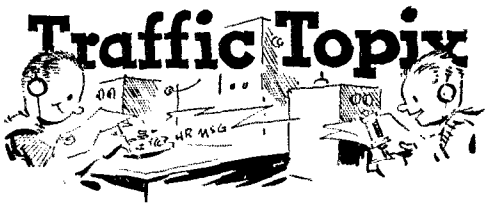
SUPPLEMENT TO NET DIRECTORY

The following list of nets will supplement and correct the listing on page 101, Nov. *QST* and page 86, Jan. *QST*. Most of these listings also represent corrections or additions to the printed net directory (see bottom left of page). This brings the record up to date as of Jan. 18, 1962. Nets which have already been listed in November and January *QST* are not repeated unless there are changes. Nets registered subsequent to Jan. 18 will appear in the final, May *QST*, installment.

The listing that follows is subject to the same provisions, notations and instructions specified on page 101, Nov. *QST*.

Name of Net	*Freq.*	*GMT*	*Days*
Ala. Emerg. Net D (AEND)	3725	2200	M-S
Apricot Net	51,000	0100	T
AREC Norwich Net	29,000	0100	M
Bexar Co. 80 Meter C.W. Emerg. Net (Texas)	3540	0030	Th
Bexar Co. 40 Meter Emerg. Net	7260	0100	T
Bexar Co. 75 Meter Emerg. Net	3980	0200	T
Bexar Co. 6 Meter Emerg. Net	50,820	0300	T
Cass County Six Meter Net (CCSMN) (Ind.)	50,500	2400	T
Colo. Emerg. Phone Net	3890	1500	Sn
DeKalb-Steuben Co. RACES Net (Ind.)	50,850	2315	S
Delaware Emergency Net — 75 Meter Phone	3905	2330	S
Delta Sideband Net	3905	000	M-S
Detroit Area Six Meter Sixer Net	51,100	1600	S
Duarte Emergency Net	29,400	0400	W
East Coast Traffic Net (ECTN)	7110	1700	Dy
Fla. Sidebanders Emerg. Net (FSBEN)	3940	0030	Th
Georgia SSB Net	3975	2000	Dy
Jefferson Emerg. Net (La.)	3950	1500	Sn
Kentucky C.W. Net (KYN)[1,2]	3600	0000 2200 1500	Dy SSn
Md.-Del.-D.C. Traffic Net (MDD)[1,2]	3650	0001	Dy
McDonough Co. 6 Meter Emerg. Net (Ill.)	50,350	0300	W
Midwest C.W. Net (Ill.)	7173	1430	S
Nassau Co. 6 Meter AREC Net (N.Y.)	50,250	0100	T
Prairie Traffic Net (PTN)	3600	0430	SWF
Putnam Co. Emerg. Net (Ohio)	50,250	0100	WS
Rice Net (Hawaii)[2]	7270	2000	S
Ross Co. C.D. Net (Ohio)	50,700	0000	F
Seneca Radio Club Two Meter Net (Ohio)	145,440	0130	Th
Texas Tower Net	3935	1730	Dy
Tri-County VHF Traffic Net (Ind.)	50,400	2330	M-F
US Coast Guard Auxiliary Net	7210	0200	3/Th
St. Louis Area	29,640	0200	1/Th
Va. Highlands Amateur Radio Club Net	146,980	1300	Sn
Westside Emerg. Net (New Orleans-Algiers, La.)	28,900	1400	M

[1] Correction from previous listing in Nov. or Jan. *QST*.
[2] Part of ARRL National Traffic System.



In this column in Sept., 1961 *QST*, we outlined the need for some test messages to determine what percentage of our traffic is garbled and or undelivered. The very few who responded to this request did so on a strictly negative basis — that is, they told us about garbled and undelivered messages but said nothing about those which were delivered promptly and correctly.

Now comes W9TZN with a real, live report based on origination of 26 messages from his station in Chicago. Thirteen of them were addressed to a person in Kansas, an additional 13 to a person in Missouri. All were placed in nets of the National Traffic System. Three of them were placed by W9TZN directly into the destination section net (presumably the remainder were put into his section net and went through the region and area nets to their ultimate destinations). We report the results without comment, for your information.

Of the thirteen messages sent to Kansas, eleven were ultimately received. Of the thirteen sent to Missouri, ten were received. Seven of the 21 messages received came through with no errors. Of the other fourteen which contained errors, the average number of errors per message was 3.2, the total number of errors 44.

Four of the messages were delivered in less than average mail time, three about the same as mail time. Of the other fourteen which were delivered, seven required from 48 to 69 hours, three required from 70 to 100 hours and four required over 100 hours to reach their destinations.

Thanks to W9TZN for this complete and informative report.

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Again referring to a subject previously mentioned in this column, we have pro and con arguments from two prominent amateurs regarding the use of the word "same" in sending messages which have identical parts. We would like to quote and paraphrase each herewith, again just for your information and again without stating any opinion of our own, although regular readers of this column will know what our sentiments are.

The argument in support of the use of the word "same" comes from Benton White, W4PL, about the oldest-time (not necessarily, but *maybe* the same as the oldest) traffic man around. This letter contained many other subjects, of which this controversial matter was but one, and not the major one at that. Says Ben, and we paraphrase: "Those who are 'wholesalers' in traffic have to use every short cut possible. The problem is to use them without impairing accuracy. Use of 'same' is but the extension of the use of abbreviations. For extreme accuracy, we would send 'MASSACHUSETTS' instead of 'MASS,' for fear it would be copied 'MISS.' An address usually sent as '2160 SW 189 ST NYC 21' would be completely spelled out. There is no difference in principle between these extreme examples. However, I would not think of advocating the use of 'same' with any but an experienced traffic man, nor is it much good to an operator who has plenty of time. For a busy operator, it enables him to copy the essentials and fill in the 'same' while off the air. If he copies his traffic on long, legal size sheets, as I do, he has no filling in to do; he just runs his eye up the page until he comes to the original. By single spacing, between 25 and 30 average-size messages can be put onto both sides of a legal-size sheet of paper."

On the "con" side is W7GMC, a member of TCC-Pacific and formerly PAN manager: "This 'ditto' operation using the word 'same' seems to border on both the dishonest and the illegal. It means a lot of extra work recopying in order to keep my file straight. I copy each message on a separate blank and enter thereon the servicing info for the message file portion of my log. If, on a sheet in the file, I find 'NR 123 SAME TO JOHN P HAM 456 SKYWIRE DRIVE ANTENNA FARM CALIF TEST ES SIG SAME,' it's beyond my meager extra-sensory capabilities to associate it with its proper reference. I believe an FCC

BRASS POUNDERS LEAGUE

Winners of BPL Certificate for December Traffic:

Call	Orig.	Recd.	Rel.	Del.	Total
W3CUL	404	4301	3505	787	8997
K6BPI	98	1358	1235	123	2814
W0LGG	267	1166	1130	34	2597
K4AKP	53	1039	990	49	2131
K2UAT	601	672	625	12	1910
W0OHJ	3	901	863	38	1805
W9MM	4	782	742	3	1531
W0SCA	14	747	740	1	1502
W7BA	12	671	618	51	1352
W4TUB	14	662	639	13	1328
K4SJH	53	678	585	16	1310
W6GYH	143	487	482	6	1118
W1SMU	36	562	503	13	1114
W8UPH	11	541	464	73	1089
W9VAY	22	529	507	3	1061
W7DZX	12	540	436	69	1057
W1TXL	87	476	396	80	1039
W9DYG	108	475	354	75	1012
W8DAE	56	483	277	180	996
W3EML	15	506	433	30	984
W9IDA	12	460	446	14	932
K2UBG	31	458	399	20	908
W3VR	67	391	384	2	844
W0BDR	10	459	370	3	842
W9JOZ	13	402	398	0	813
W0BES	61	345	328	78	812
WA6CDD	78	361	353	8	800
K6EPT	14	378	222	176	790
W3WRE	39	376	370	3	788
K3IMP	19	371	353	22	766
W4WHK	31	354	358	19	762
K0IVQ	31	372	358	0	761
K1NPS/VO1	430	155	113	42	740
W6EOT	3	373	338	26	740
K5EFK/VO1	330	201	195	6	732
W4SHJ	415	154	98	16	683
W0ZWL	2	488	2	189	681
K6KCB	13	351	273	42	679
K5USE	126	283	248	7	664
W4FOR	324	164	136	28	652
W5CEZ	28	347	230	42	647
K0YRQ	210	222	184	27	643
W2GKZ	8	316	41	272	637
WA6ROF	25	313	290	7	635
K7EWZ	20	296	186	113	615
W2EW	138	239	111	126	614
K5LBG	87	253	217	36	593
VE3CYG/WS	29	269	256	7	571
WA2QPT	20	274	244	32	570
K0BRS	6	271	267	4	548
W4FX	8	267	261	11	547
W2EZB	3	283	222	32	540
K4EHY	94	220	156	56	526
K8SQK	36	246	212	29	523
WA4BMC	309	99	70	43	521
W0KJZ	15	265	184	53	517
K2UCY	40	237	208	29	514
K4FMA	24	249	230	11	514
K0HGI	137	187	98	89	511
K6ZYZ	6	255	249	0	510
W1EMG	6	258	171	74	509
K0WWD	405	16	35	51	507
W0SCT	19	242	242	3	506
W9GGP	43	441	15	4	503
W4PL	15	243	230	13	501
Late Reports:					
W2OE (Nov.)	77	465	393	31	966
W6GYH (Nov.)	160	258	250	7	675

More-Than-One-Operator Stations

Call	Orig.	Recd.	Rel.	Del.	Total
W6YDK	1718	376	305	54	2453
W4PFC	31	549	532	10	1122

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

K3WBJ 336	K4FSS 136	W6BHG 113
K6GZ 283	K8JJC 134	W9RE/9 113
K9UOV 207	WA2EFN 131	W1HJG 108
K4COO 190	VE3CYR 130	K8KSN 107
K4EVY 173	W9RTH 126	K9CIL 107
K8KMQ 167	W3NEM 124	K0RTI 107
		W3RV 105
W4PIM 164	K4YZT 124	K4CSY 105
		WA2KWB 104
K3GMV 155	W7LND 123	K9OCU 104
W4LRN 154	K4GBS 120	W9SAA 103
W4HFD 150	W3UIU 117	W5AC 101
K3JYZ 146	W4BAZ 117	W7OCX 100
K4OZS 146	W9TT 116	Late Reports:
WA2CCF 145	K9OZM 114	K4DBT (Nov.) 151
W8EU 140	W3JKX 113	K9OZM (Nov.) 127
WA2JHQ 137	K4HOE 113	

More-Than-One-Operator Stations

W1AW 112

BPL medallions (see Aug. 1954 QST, p. 64) have been awarded to the following amateurs since last month's listing: WA2EFN, W3UHN, W4CGE, K5KTW, K6KCB, K9IVG, W9SVL, K9UGY, W9ANT.

The BPL is open to all amateurs in the United States, Canada, and U. S. Possessions who report to their SCM a message total of 500 or 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.

inspector checking my records would view it in a dim light. I'll wager that the operator who sent it to me included it in his traffic count in spite of the League requirement that 'All messages must be handled . . . *in standard ARRL form.*'" Dick goes on to plead for a change in credit for "book" messages to make this form more popular — but that's a different story.

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A minor point of procedure, in traffic and other work: Never use the signal R or its phonetic to mean anything but "received." It does *not* mean *yes, correct, I agree, I will comply,* or anything else except that you *received correctly and completely* what the other operator was transmitting.

— *W1NJM*

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December Net Reports.

Net	*Sessions*	*Check-ins*	*Traffic*
East Coast Traffic	28	176	875
7290	40	1609	699
Eastern Area Slow	31	102	44
20 Mtr. Interstate S.S.B.	22	711	2008
Early Bird Transcontinental	—	30	429
All Services	5	52	55
Mike Farad E & T	49	460	1564

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National Traffic System. Boy, wasn't that Christmas rush something, this year? Phew! We're always glad when it's over, and we always come up with some ideas that might make it a little easier next year, but next year it will be just as tough or tougher.

This year, of course, it was made even worse by the prevailing bad conditions which long skip is creating on 80 meters. Why is it that people wait until the last minute, then originate holiday traffic by the scad? It overloads all the nets, and NTS, a limited load system in normal times, founders and the traffic is delayed, so that messages saying "Merry Christmas" originated on Dec. 24 don't reach the addressee until after the New Year.

Things like this prompt our critics to say, "If a little temporary overload disrupts your system, what would happen to it in a real emergency?" This is very cagey of our critics, and it sounds like a good question until you stop and think about it. Many of us (myself included) aren't too keen on knocking ourselves out so that Christmas greetings *will reach their destination on time;* but if a real emergency occurs, there will be a great many avid traffickers available to handle such an overload. Section, region and area nets will operate simultaneously in all parts of the country affected. Traffic men who normally appear only on *certain nights to do certain jobs will show up ready for any* assignment the net manager has for them. Section nets will be crowded with stations to provide sectionwide coverage, region nets will have section representatives available at all times and area nets will have regional representatives available at all times, and in this way the traffic will be shuttled back and forth in a systematic way from origin to destination in the National Traffic System.

In normal times, NTS operates on a time schedule and has a flow pattern. During an emergency, normal time is *all* the time, and the flow pattern functions in both directions simultaneously so that traffic reaches its destination in a minimum of time *systematically,* in stride. If your NTS net is not now set up to function on this fashion, it should be, *so that our NTS* can be a part of the overall public service function of the radio amateur.

December reports.

Net	*Sessions*	*Traffic*	*Rate*	*Average*	*Representation (%)*
1RN	57	844	.505	14.8	56.4
2RN	58	700	.504	12.1	97.5
3RN	62	843	.403	13.6	100.0
4RN	60	1201	.593	20.1	90.5
RN5	62	1048	.431	16.9	77.9
RN6	37	727	.493	19.7	73.8
RN7	43	334	.185	7.8	45.7
8RN	69	505	.250	7.3	77.4
9RN	54	1435	.760	26.5	68.1
TEN	87	1272	.460	14.6	60.7
ECN	22	134	.219	6.1	80.3
TWN	40	583	.366	14.5	88.3
EAN	29	1594	.953	55.0	98.3
CAN	31	2034	.902	65.6	100.0
PAN	30	1761	.788	58.7	100.0
Sections[1]	1222	8188		6.7	
TCC Eastern	124[2]	1169			
TCC Central	93[2]	1442			
TCC Pacific	124[2]	1303			
Summary	1963	27117	EAN	12.8	CAN/PAN
Record	2045	44109	1.387	23.5	100.0

[1] Section nets reporting (39): ILN (Ill.); Wolverine (Mich.); WSSN, WIN & WSSB (Wis.); OSN (Ore.); BUN (Utah); NJN (N. J.); MDDS (Md.-Del.-D. C.); VSN, VN & VFN (Va.); NEB (Nebr.); QKS (Kans.); GSN (Ga.); TN (Tenn.); CN & CPN (Conn.); AENP, AENT, AENP Morn, AENB, AENO & AENM (Ala.); SCN & NCN (Calif.); WSN (Wash.); RISPN (R. I.); Fla. CW; POI & Rice (Hawaii); SCN (S. C.); NJQ & SDN (S. Dak.), S. Dak 75 Phone; MSPN Eve, MSPN Noon, MSN & MJN (Minn.); Texas.

[2] TCC functions reported, not counted as net sessions.

This was probably the lowest December in modern NTS history. The decline in conditions caused a drop in traffic total from over 39 thousands in 1960 to the above figure in 1961, although *more* net sessions were conducted. The figures show that traffic handling is more difficult, but they also show that the boys are still in there pitching.

W5GY has awarded an RN5 certificate to K5LBG. K6KCB thinks conditions on RN6 must be worse than in the other regions. W7BDU is resigning as RN7 manager and W7DZX is taking over temporarily until PAS can make a recommendation. 8RN is now conducting three sessions per night, the new one being at 2330, and it is working out well. ECN now gets regular liaison from Grey Bruce and through it to the Ontario Phone Net. TWN held 40 of 41 scheduled sessions in December, with representation highest ever but traffic much lower than December last year. CAN has worked out a system of NCS alternates which helps a great deal in clearing traffic while long skip conditions are prevalent. WØWHE.7 has been designated assistant PAN manager, replacing W7DZX, who now has RN7 duties and who recently received a special PAN certificate from Manager WA6ROF; K5VQU at W5PDO has also received a PAN certificate.

A.R.R.L. ACTIVITIES CALENDAR

(Dates shown are per GMT)

Mar. 2: CP Qualifying Run — W6OWP
Mar. 2–4: DX Competition (phone)
Mar. 16–18: DX Competition (c.w.)
Mar. 21: CP Qualifying Run — W1AW
Apr. 5: CP Qualifying Run — W6OWP
Apr. 14–16: CD Party (c.w.)
Apr. 19: CP Qualifying Run — W1AW
Apr. 21–23: CD Party (phone)
June 9–10: V.H.F. QSO Party
June 23–24: Field Day

OTHER ACTIVITIES

The following lists date, name, sponsor, and page reference of *QST* issue in which more details appear.

Mar. 10–12: YL-OM C.W. Contest, YLRL (p. 146, last issue).
Mar. 12: W1NJM High Speed Code Test, Conn. Wireless Assn. (p. 80, this issue).
Mar. 24–26: State of Maine QSO Party, Portland Amateur Wireless Assn. (p. 106, this issue).
Mar. 31–Apr. 2: Delaware QSO Party, Delaware ARC (p. 82, this issue).
Apr. 7–8: Millennium SP Contest, (c.w.), PZK (p. 65, this issue).
Apr. 14–15: Millennium SP Contest (phone), PZK (p. 65, this issue).
Apr. 14–15: The French Contest (phone), REF (p. 62, last issue).
May 5–6: International Telegraphic Contest, USSR Federation of Radio Sport (next issue).

About these long skip conditions that have everyone so worried: let's not panic, fellows. In the first place, the conditions are temporary; when days get longer, they won't be so bad. In the second place, CD-24 presents some alternate times for region and section net meetings which can help a lot. In the third place, there is very little long skip on 160 meters and it's easier than you think to get a signal up there, even with a short antenna. If you can't take advantage of the alternate times, get your 160-meter guys together and use them for QNY and QNB purposes.

Transcontinental Corps. Because the Pacific Area Staff is having difficulty deciding on a new RN7 manager to replace W7BDU, who wishes to resign, Pacific TCC Director W7DZX is taking over the reins of RN7 temporarily and K6DYX is assuming temporary TCC Director responsibilities. This should work out all right, until things can be straightened out on a permanent basis.

December reports:

Area	*Functions*	*% Successful*	*Traffic*	*Out-of-Net Traffic*
Eastern	124	83.1	3079	1169
Central	93	83.9	3032	1442
Pacific	124	82.3	2582	1303
Summary	341	83.0	8693	3814

The TCC roster: Eastern Area (W1SMU, Dir.) — *W1s* AW EMG NJM OBR SMU, WA2APY, *K2s* UAT UYW, *W3s* EML FAF WRE, K3IMP, *W4s* DLA DVT 3, *W8s* CHT ELW UPH, VE2AZI W1. Central Area (WØBDR, Dir.) — K4AKP, *W9s* JOZ DYG CXY ZYK, K9UGY, *WØs* DUA SCA BDR. Pacific Area (W7DZX, Dir.) — W5ZHN, *K6s* ZYZ DYX LKD GID, *W6s* EOT HC, WA6ROF, *KØs* EDH DTK EDK, *WØs* BES WAIE KQD WHE 7, *K7s* NHV NWP, *W7s* GMC DZX.

HIGH SPEED CODE TEST

This program, not a part of the ARRL code proficiency program but sponsored privately by the Connecticut Wireless Assn., Inc., continues with weekly code practice at speeds between 15 and 65 w.p.m. and semi-annual qualifying runs at speeds of 40, 45, 50, 55, and 60 w.p.m.

Results of last September's test were late coming through, but here they are at last. Nineteen copies were submitted, of which thirteen qualified and six failed. Those who qualified are marked with an asterisk (*). At 60 w.p.m. (man, that's copying!): WA6QIH*, W7FKK*, WØJZN*, VE3DSU. At 55 w.p.m.: no entries. At 50 w.p.m.: W2UAP*, WA2EDG, W6CLB*, K6GZ, W6OZ*, W9MIO EDO. At 45 w.p.m.: W3ECP*, K6SST*, W8DSX 6*, K8HKU*. At 40 w.p.m.. W4GYR, W6WAW*, KØORK, VE3BIA*, John R. Moore*. Congratulations to the winners, condolences to the losers.

The next code test is scheduled for March 12. (Note that this is March 11 if you use local time.) W1NJM will transmit simultaneously on 3637 and 7120 kc., along with other stations whose identity and frequencies will be announced at that time. Initial call-up starts at 0100 GMT and lasts until 0130, at which time detailed instructions are transmitted at 25 w.p.m. Promptly at 0145 the first speed transmission begins at 40 w.p.m. Subsequent speeds and times are 45 w.p.m. at 0155; 50 w.p.m. at 0205; 55 w.p.m. at 0215; and 60 w.p.m. at 0225. If you copy one minute consecutively solid of any of the five-minute transmissions at one of the above speeds, the Conn. Wireless Assn., Inc., will award you a handsome certificate attesting your extraordinary ability. All entries are strictly on the honor system. Send copy to W1NJM.

We hope you will tune in on 3637 or 7120 kc. at 0100 GMT on March 12, get the dope on other frequencies being used, find the best signal at your location and have a crack at this extraordinary code copying session. If you can copy 30 w.p.m. or better you owe it to yourself to try it.

DX CENTURY CLUB AWARDS

HONOR ROLL

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W2AGW....317
W8JIN....317
W4DQH....317
W8BRA....317
PY2CK....317
W2HUQ....317
W3GHD....317
W9RB1....316
W6CUQ....316
W1GKK....316
W6AM....314
W3KT....314
W7GUV....313
W5ADZ....313
W8DMD....313
W8BF....313
W9NDA....312
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W9YFV....312
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W2BXA....312
W6EBG....311
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W5ASG....310
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W8KML....309
W1CLX....309
W1JYH....309
4X4DK....309
W5MMK....309
G2PL....309
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Radiotelephone

PY2CK....317
W8GZ....314
W8BF....312
W9RB1....311
VQ4ERR....310
W3JNN....309
W4DQH....308
W7PHO....307
W6YY....307
W8KML....306
W8PQQ....306
4X4DK....306
CX2CO....306
W6AM....302

From December 1, 1961 to January 1, 1962 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.

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W9EGQ....155
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FK8AW....101
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WA2BGW....100
W4NJF....100
W6AF....100
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W8EVZ....100
K8RCD....100
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W3PGB....280
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K4EHQ....140
K4QBP....140
K5UXP....140
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W1BPW....130
K2ZRO....130
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WA2HXC....126
K9MGF....124
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W2LJF....110
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W2YBO....191
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VE3DIF....284
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VE6NX....256
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WØAIW....291
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VE4RP....102
VE5RU....203
VE6TF....190
VE7ZM....290
VE8AW....285
ZL1HY....296

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.

SUGGESTED RTTY OPERATING FREQUENCIES

3620, 7040, 14,090, 21,090 kc.

GMT CONVERSION

To convert to local times subtract the following hours:

ADST —3, AST —4, EDST —4, EST —5, CDST —5, CST —6, MDST —6, MST —7, PDST —7, PST —8, Honolulu —10, Central Alaska —10.

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 Mar. 21 at 0230 GMT. Identical tests will be sent simultaneously by automatic transmitters on 3555, 7080, 14,100, 21,075, 28,080, 50,700, and 145,800 kc. The next qualifying run from W6OWP only will be transmitted Mar. 2 at 0500 Greenwich Mean Time on 3590 and 7129 kc. *CAUTION:* Note that since the dates are given per Greenwich Mean Time, Code Proficiency Qualifying Runs in the United States and Canada actually fall on the evening previous to the date given. *Example:* In converting, 0230 GMT Mar. 21 becomes 2130 EST Mar. 20.

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

W1AW conducts code practice daily at 0230 GMT on all frequencies listed above with speeds of 15, 20, 25, 30, and 35 w.p.m. on Tuesday, Thursday, and Saturday, and at 5, 7½, 10, and 13 w.p.m. on other days. Approximately 10 minutes' practice is given at each speed. To check your copy, the texts used on several transmissions are listed below. The order of words in each line of *QST* text is sometimes reversed. To improve your fist, try to send in step with W1AW.

Date	Subject of Practice Text from Jan. *QST*
Mar. 7:	*The ACO Audio Filter*, p. 16
Mar. 10:	*Choosing An Antenna*, p. 25
Mar. 13:	. . . *Space Communication*, p. 42.
Mar. 16:	*Paul M. Segal—A Tribute*, p. 40
Mar. 23:	*A 160-Meter Converter . . .* , p. 55
Mar. 28:	*Protect That Invention*, p. 63
Mar. 31:	*More on the Electromonimuter*, p. 47

W1AW SCHEDULES

(March 1962)

Operating-Visiting Hours

Monday through Friday: 3 P.M.-3 A.M. EST.
Saturday: 7 P.M.-2.30 A.M. EST.
Sunday: 3 P.M.-10.30 P.M. EST.

The ARRL Maxim Memorial Station welcomes visitors. The station address is 225 Main St., Newington, Conn., about 4 miles south of West Hartford. A map showing local street detail will be sent on request.

Operating Frequencies

C.w.: 1820, 3555, 7080, 14,100, 21,075, 28,080, 50,700, 145,800 kc.
Voice: 1820, 3945, 7255, 14,280 (s.s.b.), 21,330, 29,000, 50,700, 145,800 kc.

Frequencies may vary slightly from round figures given; they are to assist in finding the W1AW signal, not for exact calibrating purposes.

Official Bulletins

Bulletins containing latest information on matters of general amateur interest are transmitted on the above frequencies according to the following schedule in Greenwich Mean Time.

C.w.: Monday through Saturday, 0100; Tuesday through Sunday, 0500.
Voice: Monday through Saturday, 0200; Tuesday through Sunday, 0430.

Caution. Note that in the U. S. and Canada, because times are GMT, bulletin hours actually fall on the evening of the previous day.

W1AW CONTACT SCHEDULE

Would you like to work W1AW? W1AW welcomes calls from *any* amateur station in accordance with the following schedule:

GMT	*Sunday*	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*	*Saturday*
0030–0100	.....	.....	7255	.....	7080	.....	7255
0120–0200 [1]	.....	.....	7080	3555	7080 [2]	3555 [2]	7080
0210–0230 [1]	.....	.....	3945	50.7 Mc.	145.8 Mc.	3945	3945
0330–0430	.....	.....	3555	3945	7080	1820	3555
0440–0500 [1]	.....	.....	3945	14,280	3945	14,280	3945
0520–0600 [1]	.....	.....	3555 [2]	7255	3555	7080 [2]	3945
0600–0700	.....	.....	14,280	14,100	3555	14,100	.....
0700–0800	.....	.....	7255	3945	7080	3945	7255
2000–2100	.....	.....	14,280	21/28 Mc. [3]	14,100	.....	.....
2100–2200	.....	14,280	21/28 Mc. [3]	14,100	21/28 Mc. [3]	21,330	.....
2200–2300	.....	14,100	14,280	21,075 [2]	14,280	14,100	.....

[1] General-contact period on stated frequency begins immediately following transmission of Official Bulletin which begins at 0200 and 0430 on phone and at 0100 and 0500 on c.w. Starting time is approximate.
[2] W1AW will first listen for Novices before checking the rest of the band for other contacts.
[3] Operation will be conducted on either 21,075, 21,330, 28,080 or 29,000 kc.

• 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, Allen R. Breiner, W3ZRQ—SEC: DUI. RM: EML. PAM: IVS. New section appointments: AHZ as EC for Montgomery County; K3CKB is EC for Tioga County; K3s MNT and JHT as OPSs; RV, an ardent EPA net member, as ORS; K3NPU and LNU as OESs. New gear dept.: CUL added a 6-meter job. K3NBU erected a 20-meter three-element beam. HNK is now using an HA-4 keyer. GJA went to 6 meters and added a five element beam. K3DSM put up an 80- and 40-meter doublet and is going into amateur TV on the high frequencies. MFW has his new 5868 k.w. perking nicely. Aside from school, FAF finds time to be NCS for the EPA Net. BNR will be moving from W6-Land about Apr. 1. K3OVI is getting his feet wet on 20-meter DX. K3JJG joined the Certificate Hunters Club. Commuting between Cleveland and traffic skeds kept K3MVO busy over the holidays. K3IMP took time out for a Florida jaunt. K3HTZ got his first African QSO as the year ran out. Philadelphia traffic is being relayed via K3NLW and also a 6-meter tie-in with the PFN via SAO and the Mt. Airy V.H.F. Net. AXA spoke to the Hilltop transmitting Society on "traffic handling." K3HAQ is now portable O in Iowa on 6 meters. RKP has been on the air with 35 watts for 20 years and is now constructing a 350-watt job. JYL became a grandpop for the first time—it's a YL. K3KFW, a former PFN Net member, is now a Silent Key. New club officers of the Lehigh Valley ARC: BOP, pres.; DCR, vice-pres.; K3LKQ, secy.; IGG, treas. ID has been tracking Oscar and is QRL with the Hatboro C.D. DUI is recuperating from eye surgery. If your SCM walks with a limp, it's because he had a tumor removed from his left foot—not QLF. K3KNQ is stationed in Turkey. Keep your eyes open for announcement of the Annual Eastern Pennsylvania Section Picnic. Please send activity reports to me no later than the 6th of the month. Traffic: W3CUL 8997, EML 984, VR 844, K3IMP 766, W3UIU 317, JKX 214, W4DVT 148, K3BHU 146, CAH 145, JSX 139, W3RV 131, MJM 125, NNL 92, K3HTZ 87, NLW 82, JHT 68, W3FAF 64, K3KTC 60, NBU 58, W3ZRQ 54, K3MVO 51, W3HNK 50, K3MNT 40, W3ITI 35, AXA 30, FEY 30, GJA 30, NQB 29, K3JJG 25, W3SAO 15, OY 14, TEJ 12, BUR 11, BNU 8, BFF 7, K3ADS 5, AKN 5, OVI 5, W3ADE 4, BNR 4, W3EEN 4, K3DSM 4, K3LKQ 4, W3IWO 2, K3LKR 2.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA—SCM, Andrew H. Abraham, W3JZY—Asst. SCM Delaware: M. F. Nelson, K3GKF. SEC: CVE. MDD Traffic Net meets on 3650 kc. at 0015Z daily; MDDS (slow) Net 3650 kc. at 0130Z daily; MEPN, 3820 kc. 2300Z week days and 1800Z Sat.-Sun.; Del. Emer. Net 3905 kc. 2330Z Sat. New appointments: K3LLR and K3DNO as OESs; DRD as OO. Delaware PAM K3LEC has been very busy getting traffic nets set in Delaware. Intra-state traffic is being handled via the 6-meter net daily also liaison with low frequency nets operating into the MDD Section Net. K3AXW passed the General Class exam. BKE is trying out a new SP-600 receiver. BUD will be making AREC and RACES stations "disaster proof" during 1962. K3CNI transmits OBs on 50.4 Mc. M.W.F. K3DCP reports the BARC had a surprise for ZCK. It ran a regular "This is Your Life" program with fifty or more friends and relatives present. DRD is getting fired up on 53.5 Mc. EEB is working for his 35-w.p.m. CPC and is working DX along with his traffic-handling on MDD and Delaware nets. 4EXM/3 is back on the air with a complete Collins S/Line type of equipment. K3EWK is using a new Ranger to check into the traffic nets. K3GKF finds time to work in the CD Parties. K3GMV made BPL for the third time. K3GZK is receiving signals on his new Drake 2B. HCE is operating RTTY on 80 and 40 meters. K3IWV will spend half his operating time on c.w. and half on s.s.b. with a new 200-V transmitter. K3IZM says propagations for DX are very poor. K3JIQ is working DX on 80 meters and has 15 new countries. K3JYZ made BPL and is the new manager of the MDD Net. KET gave an excellent talk and demonstration on printed circuits at the Delaware Amateur Radio Club. KHA is back on the air sending OBs. K3KPZ reports that the Baltimore County AREC provided communications for the Baltimore Toytown Parade. K3LEO is the new editor for *Modulator*, official organ of the Baltimore Amateur Radio Club. K3LLR is looking for c.w. and m.c.w. contacts on 6 meters to improve his code speed. K3LJB is busy with traffic skeds. K3LNH has a new s.s.b. rig and linear ordered. LQY is back on the air after being in the hospital. MCG will try 160-meter work from time to time. K3LWD says he has little time to operate; look at the traffic handled. K3OGA is now operating mobile. ZAQ sends in a very fine report. ZNW enjoyed a vacation in the sunny Southwest. KH6AED/3 will be settling down in the Md.-Del.-D.C. section and will be on 2 meters as well as the h.f. and RTTY. Sam has held appointments as Asst. Dir. of the Pacific Div., SCM of Hawaii and Radio Officer for the State of Hawaii. Traffic: (Dec.) K3WBJ 350, JYZ 230, LFD 165, GMV 161, W3IVC 146, W3TN 146, K3MDL 107, OGA 106, W3MCG 93, ZNW 48, K3EWK 39, W3EEB 32, K3NCM 22, W3BKE 15, BUD 15, K3AMC 14, LWD 12, W3OHI 8, K3AZH 6, DCP 6, W4EXM/3 6, K3OWX 6, AXW 5, W3HKS 2, K3LJB 2. (Nov.) W3HQE 61, K3GZK 19, KPZ 17, W3LQY 16, K3NPA 12, HDW 2.

(Continued on page 90)

SEVENTH DELAWARE QSO PARTY

March 31-April 2

The Delaware Amateur Radio Club of Wilmington announces its 7th Delaware QSO Party and invites all amateurs to participate. Delaware hams are urged to work as many out-of-state stations as possible, so that those interested can earn credit toward WAS and the W-DEL certificate. Here are the details:

(1) Time: 30-hour period from 2300 GMT Saturday Mar. 31 to 0500 GMT Apr. 2.

(2) No time limit and no power restrictions.

(3) Scoring: *Delaware stations:* 1 point per contact and multiply total by the number of states, U. S. Possessions, Canadian provinces and foreign countries worked during the contest period. *Outside stations:* 5 points for each Delaware station worked and multiply total by the number of counties in Delaware worked during the contest period.

(4) Credit for contacts with the same station on another band will be given.

(5) A certificate will be awarded to the highest-scoring station in each state, U. S. Possession, Canadian Province and foreign country (with 3 or more contacts) and to the highest-scoring station in each Delaware county. In addition, a W-DEL certificate will be sent to any station working all 3 Delaware counties. Party logs showing required data will be accepted in lieu of QSLs.

(6) *Suggested freqs.:* A.m.: 3905, 7250, 14,250, 21,400 kc., and 29.0, 50.4, and 144 Mc. C.w.: 3550, 7050, 14,050 21,050, 28,050 kc., and 50 and 144 Mc. S.s.b.: 3905, 7205, 14,300, 21,400, and 28,650 kc.

(7) General Call: "CQ DEL." Delaware c.w. stations should identify themselves by signing *de (call) DEL K.* Phones say, "Delaware calling."

(8) Contact information required: Delaware stations send number of QSO, RS(T) and county (New Castle, Kent or Sussex). All others send number of QSO, RS(T) report, and state, possession, province, or country.

(9) Logs and scores must be postmarked not later than Apr. 25, 1962, and should be sent to the Delaware Amateur Radio Club, c/o Jack Wilson, K3AMC, 1005 Greentree Road, Newark, Delaware. Applications for the W-DEL certificate should also be addressed there.

INVADER—More exclusive features than any other Transmitter/Exciter on the market today! Specially developed high frequency, symmetrical, multi-section band-pass crystal filter for more than 60 db. sideband suppression—more than 55 db carrier suppression! Instant bandswitching 80 thru 10 meters—no extra crystals to buy—no realigning necessary. Delivers solid 200 watts CW and P.E.P. SSB input; 90 watts AM (25 to 30 watts output—upper sideband and carrier). Built-in VFO—exclusive RF controlled audio A6C and ALS (limiter type) provide greater average speech power. Wide range pi-network output circuit—extremely smooth VOX and anti-trip circuits. Fully TVI suppressed. Self-contained heavy-duty power supply. Wired and tested, with tubes and crystals.

Cat. No. 240-302-2 Amateur Net.....**$619.50**

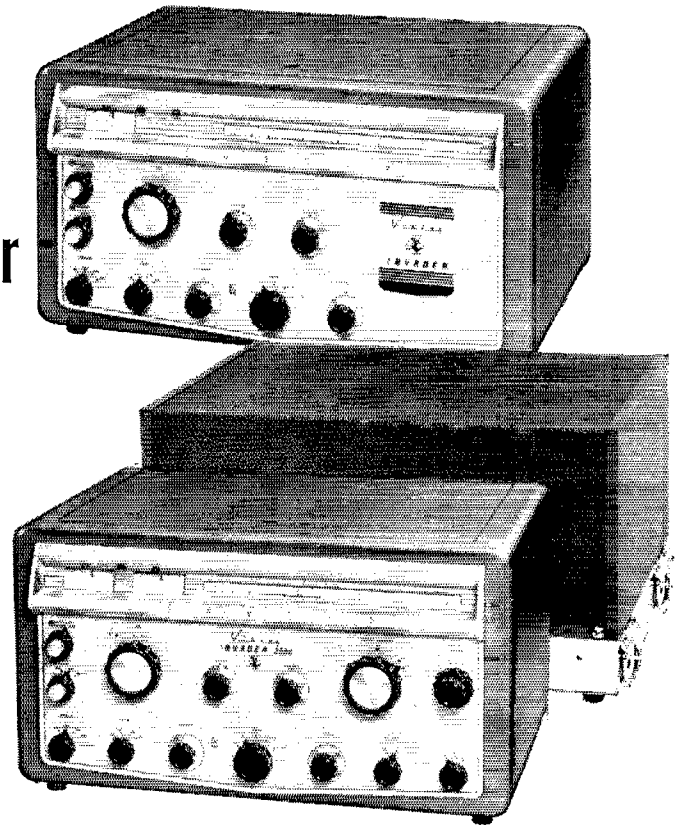
INVADER 2000—Here are all of the fine features of the "Invader", plus the added power and flexibility of an integral linear amplifier and remote controlled power supply. Rated a solid 2000 watts P.E.P. (twice average DC) input on SSB; 1000 watts CW; and 800 watts AM (250 to 300 watts output—upper sideband and carrier). Wide range output circuit (40 to 600 ohms adjustable). Final amplifier provides exceptionally uniform "Q". Exclusive "push-pull" cooling system. Heavy-duty multi-section power supply. Wired and tested, with power supply, tubes and crystals.

Cat. No. 240-304-2 Amateur Net.....**$1229.00**

HIGH POWER CONVERSION—Take the features and performance of your "Invader"... add the power and flexibility of this unique Viking "Hi-Power Conversion" system . . . and you're "on the air" with the "Invader 2000". Completely wired and tested, includes everything you need—no soldering necessary—complete the entire conversion in one evening.

Cat. No. 240-303-2 Amateur Net.....**$619.50**

choose your next transmitter from the feature packed Viking line!



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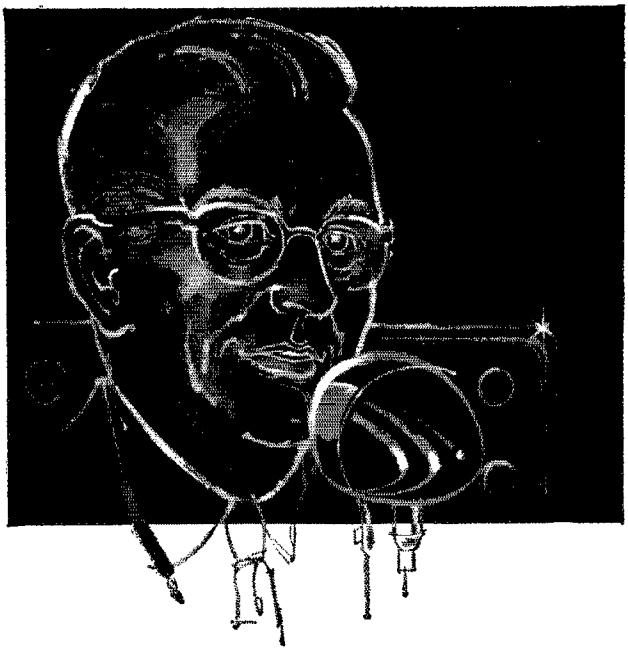
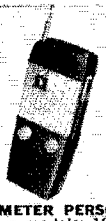
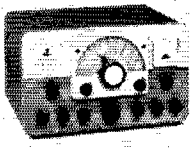




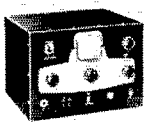
NEW! "10 METER PERSONAL MESSENGER" Two models: 100 milliwatts for short range; 1 watt for extended range—11 transistors and 4 diodes—super-heterodyne receiver with tuned RF amplifier gives excellent sensitivity—two stage transmitter punches signal home, delivers high power output—smooth operating "Quiet" control silences receiver on standby. With battery compartment for penlight cells (less cells) Rechargeable cadmium battery and other accessories available.

Cat. No.	Amateur Net
242-103 100 milliwatt	$109.50
242-104 1 watt	$129.50



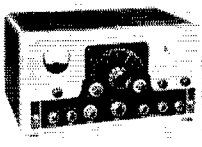
RANGER II—Now—a new version of the popular 75 watt CW or 65 watt AM "Ranger". The "Ranger II" transmitter also serves as an RF/audio exciter for high power equipment. Completely self-contained instant bandswitching 160 thru 6 meters! Operates by built-in VFO or crystal control. High gain audio-timed sequence keying, TVI suppressed. Pi-network load matching from 50 to 500 ohms. With tubes, less crystals.

Cat. No.	Amateur Net
240-162-1 Kit	$249.50
240-162-2 Wired, tested	$359.50



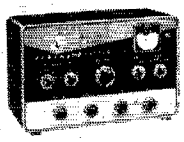
ADVENTURER—Completely self-contained single knob bandswitching 80 thru 10 meters . . . effective TVI suppressed . . . and puts 50 watts of power into a rugged 807 transmitting tube. Operates by crystal or external VFO control. Front panel meter switching permits monitoring of the final grid or plate currents . . . keying is clean and crisp. Wide range pi-network output. With tubes, less crystals.

Cat. No.	Amateur Net
240-181-1 Kit	$54.95



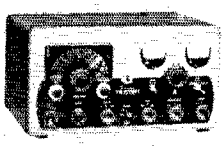
VALIANT—275 watts input CW and SSB(P.E.P. with auxiliary SSB exciter) 200 watts phone. Instant bandswitching 160 thru 10 meters—built-in VFO or crystal control. Pi-network output matches antenna loads from 50 to 600 ohms. TVI suppressed—timed sequence keying—built-in low pass audio filter—self-contained power supplies. With tubes, less crystals.

Cat. No.	Amateur Net
240-104-1 Kit	$349.50
240-104-2 Wired, tested	$439.50



6N2—Rated 150 watts CW and 100 watts phone—offers instant bandswitching coverage of both 6 and 2 meters. Fully TVI suppressed—may be used with "Viking I, II", "Range I, II", "Valiant" or similar power supply/modulator combination. Operates by crystal control or external VFO with 8-9 mc. output. With tubes, less crystals.

Cat. No.	Amateur Net
240-201-1 Kit	$129.50
240-201-2 Wired, tested	$169.50



FIVE HUNDRED—Full 600 watts CW—500 watts phone and SSB(P.E.P. with auxiliary SSB exciter). Compact RF unit designed for desk-top operation. All exciter stages ganged to VFO tuning—may also be operated by crystal control. Instant bandswitching 80 thru 10 meters—TVI suppressed—high gain push-to-talk audio system. Wide range pi-network output. With tubes, less crystals.

Cat. No.	Amateur Net
240-500-1 Kit	$749.50
240-500-2 Wired, tested	$949.50

FACTORY AUTHORIZED SERVICE

Instead of shipping to our factory, equipment to be serviced may also be sent to:

Empire State Elect. Service
139-140 Hillside Ave.
Jamaica, New York

Park-Armature Co.
1218 Columbus Ave.
Boston 20, Mass.

Heights Electronics, Inc.
1145 Halsted Street
Chicago Heights, Ill.

B and S Electronics, Inc.
6326 W. Roosevelt Rd,
Oak Park, Ill.

Radio Communication and Engr.
Pinehurst Place
Charlotte 9, N. C.

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SUPERB HEATHKIT SSB MARAUDER TRANSMITTER COMPARES FEATURE FOR FEATURE . . . WITH GEAR SELLING AT TWICE THE PRICE

First complete filter-type SSB transmitter in kit form . . . over two years in development. An outstanding array of features, combine with neat, functional styling, clean open circuit layout. Quality construction and materials bring you performance, convenience and dependability unheard of in this low price range! Special features include: Precision gear-drive tuning assembly with approximately 10 kc per turn for precise frequency settings . . . smooth action; a full-function accessory socket provides for receiver muting, amplifier cutoff bias, 117 vac antenna relay power, etc.; A switched 117 vac outlet powers monitor scope or other accessories; "Spot" control; Voice control (VOX); Drive level control and many, many more! All control functions are located on the front panel for convenience and ease of operation . . . no doors or hatches to open . . . no equipment to move! Here is a transmitter you will be proud to own and use for years to come! Allow 60 hours for assembly. Complete details available on request. 92 lbs.

Kit HX-10 . . . no money down, as low as $22 mo. . . . **$334.95**

SPECIFICATIONS—Emission: SSB (upper or lower sideband), CW, AM and FSK. **Power input:** 180 watts PEP—SSB and CW, 75 watts AM. **Output impedance:** 50 to 75 ohms with not more than approximately 2:1 SWR. **Frequency range: (MC:)** 3.5 to 4.1; 6.9 to 7.5; 13.9 to 14.5; 20.9 to 21.5; 27.9 to 28.5; 28.5 to 29.1; 29.1 to 29.7. **Frequency stability:** within 100 cps, overall. **Carrier suppression:** 50 db below peak output. **Unwanted sideband suppression:** 55 db below peak output. **Keying characteristics:** Break-in CW provided by operating VOX from a keyed tone using grid-block keying. **Audio output:** High impedance microphone. **Audio frequency response:** 400 to 3000 cps at ±3 db. **Power requirements:** OFF 4 watts; STANDBY—200 watts; KEY DOWN—400 watts at 117 volts, 50/60 cycles AC. **Cabinet size:** 19" W x 11¾" H x 16" D.

A FEW OF THE 32 FEATURES THAT MAKE THE MARAUDER AN AMAZING BUY!

- All crystals furnished for 80 through 10 meters
- Operates SSB (upper or lower sideband), AM, CW & FSK
- VOX controlled break-in CW operation
- Multi-section hermetically sealed crystal band-pass filter
- Dual conversion; crystal controlled heterodyne oscillator
- Preheated, temperature compensated VFO
- VFO or crystal frequency control
- Automatic level control for higher talk power
- 165 to 1 gear drive tuning assembly
- Air-cooled, shielded final amplifier

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GREAT NEW HEATHKIT COMBO . . . MOBILE AND PORTABLE SSB TRANSMITTER AND RECEIVER . . . AT THE LOWEST PRICE EVER

SPECIFICATIONS AND SCHEMATICS AVAILABLE FREE ON REQUEST

Heathkit HX-20 SSB MOBILE TRANSMITTER

• Same basic circuitry as Heathkit HX-10 • Complete bandswitching—80 through 10 meters • Hermetically sealed crystal bandpass filter • Crystal controlled dual conversion heterodyne circuitry • Automatic level control for maximum talk power, low distortion • Fixed 50 ohm loading for easy tuneup • VOX or PTT operation • Switch selection of USB, LSB & CW

Kit HX-20, 19 lbs., no money down, $19 mo. . . **$199.95**

GH-12: Microphone illustrated **$6.95**

SPECIFICATIONS—Types of emission: SSB (Upper or lower) and CW. **Power input:** 90 watts PEP, SSB and CW. **Output impedance:** 50 to 75 ohms with not more than approx. 2:1 SWR. **Frequency range** (MC): 3.5 to 4; 7.0 to 7.5; 14.0 to 14.5; 21.0 to 21.5; 28.0 to 29.5 (using crystals furnished; extra crystal required for 29.5 to 29.7 MC). **Frequency stability:** Overall frequency stability within 100 CPS after warmup. **Carrier suppression:** 50 DB below peak output. **Unwanted sideband suppression:** 55 DB below peak output. **Keying characteristics:** Grid block keying throughout. **Audio input:** High impedance microphone. **Power requirements:** 6.3 V at 8 amps. or 12.6 V at 4 amps.;—125 volts 20 milliamps; 300 volts 100 milliamps; 600 volts 130 milliamps (uses Heath.HP-20 or HP-10 power supplies). **Cabinet size:** 12¼" W x 6¼" H x 9¾" D.

Heathkit HR-20 SSB MOBILE RECEIVER

• Modern 8-tube superhet circuit • Tunes SSB, AM & CW signals—80 through 10 meters • Crystal I. F. bandpass filter • Crystal controlled BFO's for selectable sideband reception • Built-in calibrated "S" meter • 30-1 gear drive tuning • Fast or slow AVC selection • Series noise limiter

Kit HR-20 . . . 17 lbs.

no money down, $13 mo. **$134.50**

SPECIFICATIONS—Frequency range: 80 thru 10 meters in 5 bands-3.5 to 4.0; 7.0 to 7.3; 14.0 to 14.35; 21.0 to 21.5; 28.0 to 29.7 MC. **Intermediate frequency filter:** Center frequency, 3.0 MC; Bandwidth at —6 db, 3.0 KC; Bandwidth at —60 db, 10.0 KC Max.; Hermetically sealed. **Panel controls:** Sideband Select; R.F. gain; A.F. gain—Off—On; Noise Limiter; AVC select; main tuning; band switch; antenna trimmer; SSB, CW-AM switch. **Signal-to-noise ratio:** 10 db at 1 microvolt or less. **Output impedance:** 500 ohms and 8 ohms. **Power requirements:** 6.3 V at 8 amps. or 12.6 V at 4 amps. AC or DC, 300 volts DC at 120 MA. (Uses Heathkit HP-10 or HP-20 power supplies). **Cabinet size:** 6¼" H x 12¼" W x 19¾" D.

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GOTHAM VERTICALS DELIVER THE CONTACTS

IS K6INI THE WORLD'S CHAMPION DX OPERATOR?

Judge for yourself! Read his letter and count the DX he has worked—with only 65 watts and a $16.95 Gotham V-80 Vertical Antenna.

2405 Bowditch, Berkeley 4, California
January 31, 1959

GOTHAM
1805 Purdy Avenue
Miami Beach 39, Florida

Gentlemen:

I just thought I would drop you a line and let you know how pleased I am with your V-80 vertical antenna. I have been using it for almost two years now, and am positively amazed at its performance with my QRP 65 watts input! Let me show you what I mean:

I have worked over 100 countries and have received very fine reports from many DX stations, including 599 reports from every continent except Europe (589)! I have also worked enough stations for my WAC, WAS, WAJAD and ADXC awards, and I am in the process of working for several other awards. And all this with your GOTHAM V-80 vertical antenna!

Frankly, I fail to see how anyone could ask for better performance with such low power, limited space and a limited budget. In my opinion, the V-80 beats them all in its class.

I am enclosing a list of DX countries I have worked to give you an idea of what I have been talking about.

Wishing you the best for 1959, I am

Sincerely yours,
Thomas G. Gabbert, K6INI (Ex-T12TG)

OR IS K4ZRA THE NEW CHAMP?

Read his letter, and see his diagram of a typical installation and what it achieved:

2539 Christie Place
Owensboro, Kentucky

GOTHAM
Miami Beach, Florida

Gentlemen:

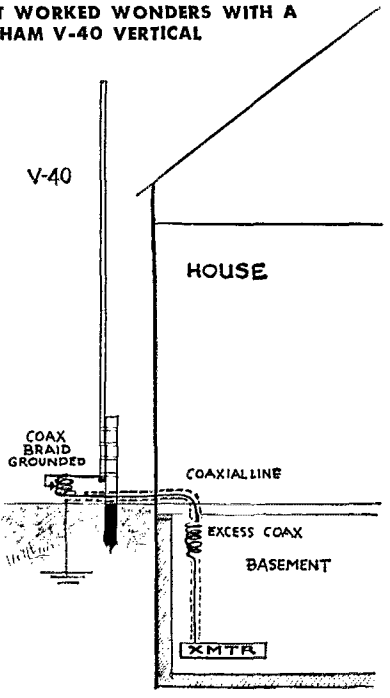
During the time I used this antenna, I worked well over 100 DX stations in 44 different countries, earned a WAS certificate, and worked the necessary stations for WAVE, receiving very fine signal reports from all. My rig ran from 75 to 100 watts plate input and the receiver was an old military ARR-7 (Hallicrafters reboxed SX-28.)

The above mentioned contacts were made with the vertical mounted several inches off the ground, without radials, with only a simple ground connection to the coaxial shield.

Daniel F. Onley, K4ZRA

K4ZRA's INSTALLATION

THAT WORKED WONDERS WITH A GOTHAM V-40 VERTICAL



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WHY

THE GOTHAM V-80 IS THE BEST ALL-BAND ANTENNA

- If K6INI can do it, so can you.
- Absolutely no guying needed.
- Radials not required.
- Only a few square inches of space needed.
- Four metal mounting straps furnished.
- Special B & W loading coil furnished.
- Every vertical is complete, ready for use.
- Mount it at any convenient height.
- No relays, traps, or gadgets used.
- Accepted design—in use for many years.
- Many thousands in use the world over.
- Simple assembly, quick installation.
- Non-corrosive aluminum used exclusively.
- Multi-band, V80 works 80, 40, 20, 15, 10, 6.
- Ideal for novices, but will handle a Kw.
- Will work with any receiver and xmitter.
- Overall height 23 feet.
- Uses one 52 ohm coax line.
- An effective modern antenna, with amazing performance. Your best bet for a lifetime antenna at an economical price. ONLY $16.95.

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2. LOADING COIL NOT REQUIRED ON 6, 10, 15 AND 20 METERS. FOR 40, 80, AND 160 METERS, LOADING COIL TAPS ARE CHANGED MANUALLY EXCEPT IF A WIDE-RANGE PI-NETWORK OUTPUT OR AN ANTENNA TUNER IS USED; IN THIS CASE BAND CHANGING CAN BE DONE FROM THE SHACK.
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☐ V40 VERTICAL ANTENNA FOR 40, 20, 15, 10 AND 6 METER BANDS. ESPECIALLY SUITED FOR THE NOVICE WHO OPERATES 40 AND 15..... $14.95

☐ V80 VERTICAL ANTENNA FOR 80, 40, 20, 15, 10 AND 6 METER BANDS. MOST POPULAR OF THE VERTICALS. USED BY THOUSANDS OF NOVICES, TECHNICIANS, AND GENERAL LICENSE HAMS... $16.95

☐ V160 VERTICAL ANTENNA FOR 160, 80, 40, 20, 15, 10 AND 6 METER BANDS. SAME AS THE OTHER VERTICAL ANTENNAS, EXCEPT THAT A LARGER LOADING COIL PERMITS OPERATION ON THE 160 METER BAND ALSO..... $18.95

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Address.....

City.....Zone.....State.....

Station Activities

(*Continued from page 82*)

SOUTHERN NEW JERSEY—SCM, Herbert C. Brooks K2BG—SEC: K2ARY. RMs: W2HDW, WA2VAT, W2ZI. Appointments: WA2VAT as OBS and RM. WA2KWB, Yardville, made BPL. He also received the South African Award. N.J. Emerg. Phone & Tfc. Net totals for December: 31 sessions, QNI 612, traffic 198. W2ZI, net mgr., was guest speaker at the Raditan Bay RC Annual Banquet. During "Operation Surprise" W2BZJ, Jeff Belton, W2BDS and W2ZI manned the State Hq. station. WA2AOX, No. Wildwood, promises to supply Cape May County news. W2GRC, No. Wildwood, is back on. Gloucester County ARC 1962 officers are K2SOL, pres.; W2MMD, vice-pres.; WA2FMO, secy.; W2CKX, treas.; W2AFZ, corr. secy. The club paper, *Cross Talk*, edited by K2AQL. K2SOL's new QTH is Mantua. WV2WNY is a new call in Haddonfield. K2UDA, Barrington, is doing FB with new mast and antenna systems. The SJRA's Christmas Party was a big success. K2DEI was chairman. The Levittown (N.J.) ARC meets in the town's c.d. headquarters the 1st Tue. K2MOV has joined K2ECY in KX6-Land. W2ZI and K2BG were reappointed Asst. Directors of the Atlantic Division by Director Crossley. K2ARY, our SEC, would appreciate reports of AREC activities in your area. Traffic: WA2VAT 282, W2RG 237 WA2KWB 130, K2RXB 77, W2ZI 30, WA2HJD 23, K2SOX 23, WA2MEQ 19, K2CPR 12, WA2WKU 4, WA2LBL 3, WA2ARJ 2, W2IU 2.

WESTERN NEW YORK—SCM, Charles T. Hansen, K2HUK—SEC: W2LXE. RMs: W2RUF, W2EZB, W2FEB. PAM: W2PVI. NYS C.W. meets on 3615 kc. at 1900. ESS on 3590 kc. at 1800, NYSPTEN on 3925 kc. at 1800. NYS C.D. on 3610.5 and 3993 kc. at 0900 Sun., TCPN 2nd Call Area on 3970 kc. at 1900. IPN on 3980 kc. at 1600, 2RN on 3690 kc. at 0045 GMT and 2345 GMT. (Note change in time on 2RN because of extended skip conditions.) Appointment: W2RQF as OO. Endorsements: K2KIR as ORS, WA2DAC, K2UOQ and WA2BPE as OESs. W2TPV is active on 20-meter s.s.b. and c.w. operating USAF Academy station KØMIC. He would like to hear from NYS C.W. W2RUF has his address. K2UOQ, WA2BPE and WV2RFK have built a receiver suitable for Novices that is selective, inexpensive and easy to build. W2RUI won the W.W. RTTY Contest. Stations actively participating in OSCAR: WA2DAC, W2RUI, W2ORI, W2ZOC, W2FAN, W2ALR and W2IEZ. K2UMY and W2YIF. New officers of the Ogdensburg ARC are WA2FJN, pres.; WA2FDJ, vice-pres.; WA2FUE, dir.; K2RUK, trustee; WA2FKK, secy.-treas. The club has 8 members attending Spanish classes so they can work DX. The club also sponsors code and theory classes. WA2LSJ made the Dec. '61 *Mechanics Illustrated* with his 6-meter bicycle mobile rig. WA2GCH reports that Clinton County AREC collected over 1½ tons of food, clothing and toys in conjunction with the Salvation Army for Christmas. Those participating were K1BVI/2, K2GJJ, WA2s DAC, JOH, JJY, MSA, SNW, QWY, THZ, WEI, GCH, HSB, JOI, LSJ, IBN, JOG and WV2UJI. NCS was set up in the S.A. building and mobiles were dispatched for pick-ups, with fixed stations extending the range. Erie County AREC operated in a two-day halloween patrol. Participants included K2KKA, K2QJJ, K2ZAB, K2DSN, K2TVB, K2BNO and WA2s, DGL, HBT, MVM, ETP, INR, PTL, KFH. Now is the time to make plans for Field Day activities. Appoint your committees now! Traffic: (Dec.) W2OE 1501, W2EZB 540, W2FEB 373, K2GAO 204, K2QDT 203, WA2OPG 180, W2KZQ 98, W2FCG 91, K2RTQ 86, K2OFU 67, W2MTA/2 57, W2PVI 31, W2RQF 23, K2BBJ 21, K2RYH 20, K2DNN 15, W2QQK 13, K2EE 11, WA2GLA 8, WA2HEC 8, K2HOH 8, K2PBU 7, K2AFE 6, K2QKK 6, K2TDG 5, WA2MJN 4. (Nov.) W2OE 966.

WESTERN PENNSYLVANIA—SCM, Anthony J. Mroczka, W3UHN—SEC: WRE. RMs: KUN and NUG. The WPA Traffic Net meets Mon. through Fri. at 2400 GMT on 3585 kc. The Keystone Slow Speed Net (KSSN) meets 2330 GMT on 3585 kc. Mon. through Fri. We regret to record the death of RED of Erie. The Conemaugh Valley ARC bought a new 2.5-kw. generator. Congratulations to WRE, NEM and KUN on making BPL again. Coke Center RC reports: K3BTF has been appointed County Radio Officer; K3HTG is out in Arizona. RTV is monitoring 52.525-Mc. wideband f.m. daily. SO, formerly W8SM, now is living in W.Pa. Up Erie way: K3JZJ is going mobile; K3PDA is attending St. Marys' Seminary at Baltimore; K3KNQ is in Turkey. The members of the WPA and KSSN traffic nets are to be congratulated on fine performances during the holiday traffic season. JT is very active on 6 meters. The Etna RC reports via *Oscillator*: K3ARZ is in the service; LKZ has a new Valiant; K3NFH is the call at the Veterans' Hospital in Pittsburgh. The Nittany and Huntingdon AR Clubs report: K3OOQ received a DX-60; SYY/3 placed fourth in the W.W. V.H.F. Contest; K3ONI has a new Ranger; ZZO has a new linear on 6 meters. K3AKR heard and reported on OSCAR, K3HID has an inverted "V" antenna. LIV got a 32B and SX-101A. NUG has the S/Line. SMW has taken over as manager of the Keystone Slow Speed Net (KSSN). Many thanks to W3MFB for organizing and getting the net started. The ATA of W.Pa. had VPK as its guest speaker at the January meeting. TOC has a new Apache that LMM wired up. Our thanks to all club secretaries for forwarding newsletters on their activities this past year. All material should arrive by the sixth of the month for publication. Traffic: (Dec.) W3WRE 788, NEM 388, MFB 216, SMV 134, UHN 117, K3DKE 57, W3LSS 49, RTV 8, 1DO 7, LOD 7, K3COT 3, W3OEO 1. (Nov.) K3HTJ 1.

CENTRAL DIVISION

ILLINOIS—SCM, Edmond A. Metzger, W9PRN—Asst. SCM: Grace V. Ryden, W9GME. SEC: W9PSP. RM: W9USR. PAM: W9RYU. EC of Cook County: W9HPG. Section Net: ILN, 3515 kc. Mon. through Sat. at 1900 CST. K9UWI was elected president of the Southern Illinois Ham Society. Other officers include K9GKR, K9RZP, K9HLM, K9GQM and K9MTW. W9BFO is recuperating from a shotgun wound sustained in a hunting accident. The Lyons Township High School Radio Club, W9MTJ, is on the air between 2100 and 2200 GMT on all bands operating c.w. and a.m. Our condolences to W9EET on the death of his mother and to the other members of his family. Many reports have been received confirming the hearing of the OSCAR signal. It seems that this was a club project and many tape recordings were made. W9KCR, K9QPJ, K9PPY and K9GTS were elected as officers of RAMS for the coming year. A new Novice call heard was WN9BFS. W9CYD is back on the air at his new QTH. W9PBY is on s.s.b. and RTTY with a new Mosley Tri-Bander. W9EU spent his Christmas handling messages for the overseas personnel of the Armed Services. W9TV has returned from W7-Land after many eyeball QSOs. Many new hams are expected to move into the Ottawa Area when the vast AT&T switching center is in full operation. K9QMJ is sporting a new operating desk which he received for Christmas. He also is the recipient of the South African KKK C.W. Award. A new Novice net can be heard on 7.173-Mc. c.w. Sat. at 0800 CST, according to NCS WN9ALT and WN9AEO. K9TOK's new antenna system includes a 32-ft. tower and 15-meter beam. W9GBT would like the Illinois gang to look for the f.m. boys on 147.06 Mc. Two former DeKalb hams are now WA6OQZ and WA6MLX. K9DDG is putting out with a new triband beam. New officers of the Joliet Amateur Radio Society, Inc., include K9PRB, pres.; W9YIG, vice-pres.; K9ATK, treas.; K9ICP, secy. New appointees are K9TVA as OO, K9VTK as OES and W9AKV as ORS. The traffic count for the ILN was 267 messages in 25 sessions; for the Chicago Area Emergency Net 126 messages in 31 sessions; for the North Central Phone Net 238 messages in 24 sessions. W9IMN, K9OCU, W9NPC and W9ALS were participants in the latest ARRL Frequency Measuring Test. W7CZL is now Fifth Army MARS Director located in Chicago. Armin H. Meyer, W3ACE, a charter member of the Lincoln Ill. United Wireless Assn., has been appointed to serve as the United States Ambassador to Lebanon. The newly-formed Midwest V.H.F.-U.H.F. Amateur Association elected K9RVG, K9VUX, K9UYG, WN9AHZ and K9VTT as officers. This is a 2-meter emergency net with a Monday night check-in at 7:30 CST on 145.42 Mc. W9VYB has been appointed communications director of Will County. W9MTW has a new SX-101A. WN9AMI is stationed at Fort Gordon, Ga. BPL awards for December traffic go to W9IDA, K9UOV, K9OZM, K9OCU and K9CIL. Traffic: (Dec.) W9IDA 932, K9UOV 493, K9OZM 353, W9USR 338, K9OCU 307, K9BTE 262, W9FAW 150, K9CIL 115, W9MAK 103, K9CRT 86, W9AKV 84, W9IMN 68, K9LXG 58, K9OAD 40, W9PRN 26, K9GDQ 12, K9QMJ 6, W9HPG 4, K9QVA 4, K9SRW 2. (Nov.) K9OZM 460.

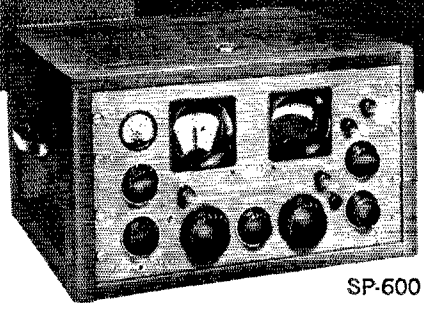
INDIANA—SCM, Donald L. Holt, W9FWH—Asst. SCM: Clifford M. Singer, W9SWD. SEC: W9SNQ. PAMs: W9MM, W9RVM, K9GLL. RMs: W9DGA, W9TT, W9VAY, K9OET. Net skeds: IFN, 0800 daily and 1830 M-F on 3910 kc. ISN (s.s.b.), 1930 daily on 3920 kc. QIN (training), 1800 M-W-F on 3745 kc. QIN, daily at 1900 and RFN, 0700 Sun. on 3656 kc. New appointments: K9KTL as PAM for IFN; W9BUQ as OBS for the ISSB Net; K9AEK as Blackford County EC; K9ZLA and W9QLW as ORSs; K9FEP as OES. New officers of the Seymour ARC are K9BGU, pres.; W9RTH, vice-pres.; John Charlton, secy.-treas.; K9BGH, W9YDP and W9BXP, directors. New officers of the DARA are

RIGHT ACROSS THE SPECTRUM!!

from 10 KCS

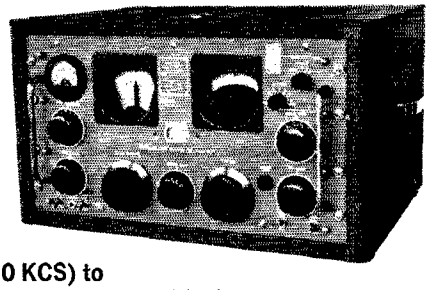
The widest frequency range parameter in the industry

to 54 MCS



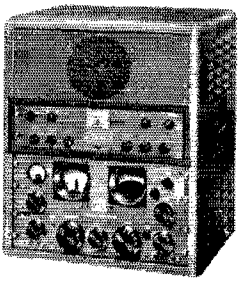
SP-600 JX

SP-600 VLF



This unique combination of two *matched SP-600 communications receivers* permits continuous coverage from audio frequencies (10 KCS) to VHF (54.0 MCS). Hammarlund SP-600 receivers have attained a world-wide reputation *for excellent stability and calibration and have seen continuous use as laboratory* and/or professional instruments for AM radio telephone, CW telegraph, AM-MCW telegraph, carrier-shift teletype, and in military communications.

HAMMARLUND SP-600 JX 6 bands provide continuous tuning from 540 KCS to 54.0 MCS. Stability of 0.01% or better at 540 KCS to less than 0.001% at 54 MCS. Sensitivity is 0.75 to 1.0 mv on CW and 1.5 to 2.3 mv on AM for a signal-to-noise ratio to 10 db. Provision for six crystal controlled fixed frequencies. **$1140.00**



HAMMARLUND SP-600 VLF 6 bands provide continuous tuning from 10 KCS to 540 KCS Low drift—between 0.05% and 1.0% depending upon frequency. Provision for four crystal-controlled fixed frequency channels. Available in rack mounted or cabinet model. **$1975.00**

FOR SSB Unexcelled SSB performance is yours through use of a Hammarlund SPC-10 converter and the SP-600 JX. The SPC-10 can be integrated with any standard communications receiver which has an IF of 450 to 500 KCS. It adds a degree of selectivity not found in commercially available receivers designed for AM/MCW. SPC-10 **$375.00**

WRITE FOR COMPLETE TECHNICAL BULLETIN ON COMMERCIAL COMMUNICATIONS EQUIPMENT

Join us at the Single Sideband Amateur Radio Association Hamfest and Dinner. Statler Hilton Hotel, N.Y.C. March 27, 1962.

Established 1910

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K9BPA, pres.; W9BZI, vice-pres.; the XYL of W9DOK, secy.; K9TNG, treas.; W9NOB and W9CVD, activities. K9PNR was one of 8 students recently honored by the Princeton Optimist Club celebrating its Youth Appreciation Week. W9IAN was honored for his outstanding service to amateur radio by the Tri-State Amateur Radio Society. Licensed in 1924 W9IAN has been instrumental in training approximately 200 hams. W9PUY now owns a 200V. *Amateur radio exists as a hobby because of the service it renders.* Those making BPL were W9MM, W9VAY, W9JOZ, W9TT, W9RTH and W9RE. 9. December net reports: IFN 285, ISN 577, QIN 362, QIN (training) 15, RFN 160, Hoosier V.H.F. Net 159. W9ZYK reports ninth region traffic total as 1435. Traffic: (Dec.) W9MM 1531, W9VAY 1061, W9JOZ 813, W9TT 323, K9OET 263, W9RE/9 247, K9SVZ 190, K9IVG/9 184, W9RTH 148, K9YIC 142, K9WET 132, W9NZZ 130, K9JSJ 117, W9QYQ 110, K9BUQ 85, W9UQU 83, W9FWH 82, K9GLL 81, K9LJP 70, K9SPH 53, K9HEL 46, W9OG 46, W9CJS 43, W9DOK 42, K9ZUP 39, K9CRS 37, K9ZZS 37, K9ILK 34, K9KTL 29, W9DZC 28, W9IDGA 27, W9JBQ 25, K9FVL 24, W9YYX 22, W9EJW 21, K9RPZ 19, K9WWJ 19, K9ARW 18, K9HMC 18, K9OG 16, K9QVZ 14, W9BSV 13, W9SWD 11, K9ABA 10, K9RCZ 10, K9RVD 10, K9ZLA 9, W9RDP 8, K9YJW 8, K9CMH 7, K9WJZ 7, W9IMU 6, W9JSV 6, K9DZW 5, W9DCA 4, K9FEP 4, K9JRF 4, W9AQW 3, K9FOZ 3, W9SNQ 3, W9JFF 2, K9TFJ 2, K9CBC 1, K9IXD 1. (Nov.) W9FJI 3.

WISCONSIN—SCM, Kenneth A. Ebneter, K9GSC—SEC: W9RCC. RMs: W9VHP, W9VIK. PAMs: W9NRP, W9NGT, W9SAA. New appointees: K9HBT as OES, W9LFK as OO Class I. The Side Band Net has changed its time to 2315 GMT. W9FXA has moved to Green Bay. The MRAC admitted 7 new life memberships on Old Timers Night. W9KQB, our past SCM, is under doctor's orders to take it easy. K9BSC has a new 40-meter antenna. Frequently Measuring Test results: W9AIW 13.2 p.p.m., W9LFK 44.6 p.p.m. K9EHS is on the air with the call KR6AR, and looking for Stateside contacts. W9YT was the first 80-meter contact for 9Q5AAA. W9EKZ is building a transistor v.f.o. for 6 meters. W9OTL is running 2 watts mobile. K9UJJ had to put a new power transformer in his transmitter during the Sweepstakes. KN9GTH worked his first Wyoming and Idaho on 40 meters. W9VSO would like to know if there is a better hobby of equal interest or challenge than amateur radio. The WSSN cleared 351 messages in 250 sessions during 1961; the WIN 2129 in 339 sessions; the WSBN 1622 in its 4 months of operation. Percentages cleared were: WSSN 79 per cent, WIN 67 per cent, WSBN 84.6 per cent. W9DYG had a perfect record of 12 BPLs during 1961. W9VIK would like a little more activity on the WSSN on 3535 kc. at 0030 GMT. W9RKP again is actively sending out OO notices after moving. New net certificates are being issued with an annual endorsement required. Please include in your reports what you think was the best article in *QST*. Traffic: W9DYG 1012, W9SAA 316, W9CXY 279, K9WGN 182, W9NQW 154, W9YT 87, K9BSC 81, W9WJH 73, W9KQB 60, W9VHP 54, K9GSC 37, W9NRP 36, W9VIK 27, K9HDL/9 25, W9CBE 23, W9OTL 20, W9LFK 18, K9VER 15, W9MWQ 10, K9OCA 6, K9UJJ 3. (Nov.) W9NQW 148, K9WGN 40, K9SQV 21.

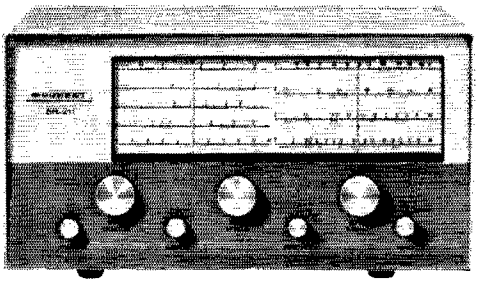
DAKOTA DIVISION

NORTH DAKOTA—SCM, Harold A. Wengel, WØHVA—SEC: WØCAQ. PAM: KØTYY. KØIVQ has built a 500-watt 813 final. He is an NCS on the Tenth Regional Net. The North Dakota 75-Meter Net report for November: 24 sessions with 549 check-ins, 31 maximum and 2 minimum; 77 pieces of formal traffic handled, 68 informal with 21 relays. The report for December: 22 sessions with 497 check-ins, 36 maximum and 14 minimum; 100 pieces of formal traffic handled, 37 informal with 22 relays. No reports were received from other nets this month. Three new EC certificates were issued in December. Traffic: (Dec.) KØIVQ 761, KØRSA 193, KØITP 99, WØAYJ 45, WØIRN 34, WØYCL 34, KØTYI 27, KØTPK 23, KØQWY 18, WØCAQ 15, KØTNI 13, WØMQA 12, WØAQR 9, KØIAB 9, KØTYY 7, WØIHM 4, WØBHT 3. (Nov.) KØIVQ 130, KØITP 120, KØRSA 57, KØTYI 39, WØYCL 29, KØQWY 26, WØIRN 18, KØDWX 13, WØAQR 12, WØAYJ 11, KØGGI 11, KØAJW 10, KØTYY 9, WØDNJ 8, WØBHT 6, KØIAB 6, KØTPK 5, KØTNI 4, KØGZI 1.

SOUTH DAKOTA—SCM, J. W. Sikorski, WØRRN—SEC: WØSCT. WØSCT and WØZWL made BPL. The Huron ARC meets the 1st and 3rd Thurs. of each month in CAP headquarters. WØILL and WØYBZ have a new HT-32 and WØTXK's Christmas present was a set of Gonset Twins. WØVMV received an EE degree. WØENC reports 144-Mc. activity with 20 states, 6 call areas and 1100 miles for his DX. KØUDZ has a new HQ-170C. WNØAOY dropped the "N". The Hi-Lo ARC, of Meade

(Continued on page 94)

GET THE MOST FOR YOUR MONEY WITH GONSET'S NEWEST RECEIVERS!



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GR 211

General coverage from standard broadcast through 34 mc band, including WWV, foreign & Voice of America.

- Printed circuit techniques and advanced design for extra sensitivity, better, quieter reception, even on highest frequency bands.
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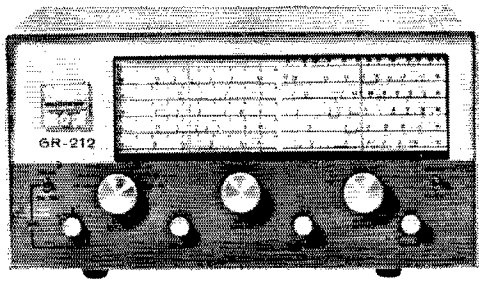
- Circuit features leading to higher sensitivity include quality, high-Q, permeability-tuned coils.
- Two full-vision, illuminated, slide-rule type dials provide instant identification of broadcast and short-wave frequencies.
- Vernier tuning knob counter-weighted for smooth, non-critical short-wave tuning.

Amateur net price **$73.50**



ONLY DUAL CONVERSION RECEIVER PRICED UNDER $115

GR 212

- Dual conversion for increased selectivity.
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- Sensitivity: At least 6 db $\frac{S+N}{N}$ at 1 μv (mod. 30% at 400 cps) input on all H.F. Bands.
- Two full-vision, illuminated, slide-rule type dials provide instant identification of broadcast and short-wave frequencies.
- Panel-mounted "S" meter.
- Band-spread tuning knob is inertia flywheel weighted for smoothest tuning.
- Separate band-spread dial for amateur bands.

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County, is operating a medium-speed c.w. net on 3717 kc. Sat. at 0830 MST with KØYBX as NCS. KNØHQD passed the General Class exam. WØPMA and his XYL, WØVTX, have "fixed up" their basement for a ham club. WØBXO, the club station at Brookings, is on 144-Mc. KØYAA and KØBRC have new towers. Other new equipment: WØYVF and KØDHA, a Viking 500. WØSCT was elected Centerville Saddle Club president. Traffic: WØZWL 681, WØSCT 506, KØBMQ 190, WØDVB 186, KØAIE 62, WØDIY 39, WØOFP 32, WØCTZ 30, KØVYY 29, KØZBJ 19, WØVQC 18, WØZLB 16, KØYJF 14, KØBSW 12, KØWJT 11, WØFJZ 9, WØPMA 8, WØGWW 7, KØJGM 7, KØYBX 6, WØCQN 5, KØTWT 4, WØYVF 4, KØTVJ 3, WØDJZ 2, KØMHF 2, KØPDW 2, KØTXW 2, KØYNS 2.

MINNESOTA—SCM, Mrs. Lydia S. Johnson, WØKJZ—Asst. SCM: Charles Marsh, WØALW. SEC: KØJYJ. RMs: KØAKM, WØKLG. PAMs: WØOPX, KØEPT. The Minneapolis RC's Annual Christmas Banquet was attended by 150 OMs and XYLs. The MSSB Net holds evening sessions Mon. through Fri. on 3812 kc. at 0045 GMT. KNØADM, age 14 and MHN's newest member, has worked 23 states on 15 meters. KØSBB has a BC-221 frequency meter. KØWLT has a Globe King and 20 A-LA1 s.s.b. transmitter on the air. OES KØVLD built a two-tube 6-meter converter using a 6J6 and 6AK5. He has a new Eico 710 6DO. EC KØMEQ is putting the finishing touches to his Apache TX. WOs WVT, DZZ, TOF and OET were guests at KØICG's shack. The Rochester ARC elected KØJXB, pres.; KØUKU, vice-pres.; Marge Balk, secy.; KØJRN, treas.; WØTJA, custodian; KØSAZ, editor. KØOTH spent the holidays skiing in Colorado. WØDOP can be heard on RTTY. OO WØKLG is wiring a Heath HX-10 exciter. OOs KØORK, WØKLG and WØWMA listed a total of fifteen violations. These Net Control Stations can be heard on the noon MSPN: KØVPJ, WØGCR, KØAKM, WØHEN, WØOPX, WØUMX. The newly-ARRL-affiliated Falls Junior High Radio Club elected KNØHJE, pres.; KNØHIE, vice-pres.; KNØHIJ, secy.; KNØCXT, treas.; KØVCC, trustee. WØBIV, Veterans Administration Club station, originated over a 1000 messages at the end of the year. WØIRD was admitted to St. Lukes Hospital for major surgery. WØOJG is in the Veterans Hospital recovering from surgery. WØKJZ made the BPL. Traffic: (Dec.) WØKJZ 517, WØISJ 260, KØAKM 139, WØHEN 136, WØKLG 122, WØUMX 115, KØZKK 102, WØLST 97, WØKYG 62, KØQBI 59, WØATO 57, KØPMIL 57, WØYC 57, WØOPX 55, KØSNC 54, WØRIQ 42, KØEPT 38, KØORK 36, WØBUO 34, KØICG 32, KØVPJ 31, KØJYJ 29, WØNYM 29, WØGCR 23, WØALW 22, WØSZJ 21, KØZRD 19, KØUBA 15, KØYGJ 14, KØSBB 13, KØZOH 13, KØAYU 12, KØLWK 11, WØSLD 8, WNØABU 6, KØIKU 6, WØHMV 4, KØGKI 2, WØFGP 1. (Nov.) KØSBB 32, KØIKU 11.

DELTA DIVISION

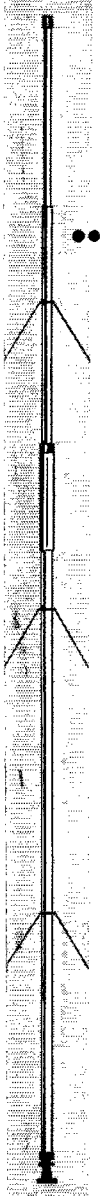
ARKANSAS—SCM, Odia L. Musgrove, K5CIR—SEC: K5IPS. PAM: W5DYL. RM: K5TYW. Two-meter activity continues to increase with more stations coming on all the time. All three of the local nets could use a little more help, especially from the counties in the southern part of the state where most of the traffic has to be mailed in. The RN5 Net meets on 3760 kc. at 2000; the OZK Net meets on 3790 kc. at 1900; the Arkansas Emergency Phone Net meets on 3885 kc. from 0600 to 0700 Mon. through Sat. The NCS for the c.w. nets will send as slow as you want or as fast as you want. W5KRO has a new Mosley 20-meter beam. K5ELW has a DX-35 on 6 meters. W4RHV is in the Memphis Hospital. K5USE spent his Christmas vacation handling holiday traffic. Traffic: K5USE 664, K5IPS 30, W5RYM 28, W5FPF 25, K5QBQ 15, K5CIR 12, K5UEK 10, K5CIX 8, W5NLL 8, W5HPL 7, K5YMU 6, W5DYL 4, W5KRO 4.

LOUISIANA—SCM, Thomas J. Morgavi, W5FMO—W5UQR reports hearing Oscar on Dec. 15 and 22. Signals were Q5 with a very noticeable doppler shift. Receiving equipment used was a 75A-2, homebrew 2-meter converter using 417A-6ES8-12AT7, eleven-element Yagi. W5GKP is on 6-meter s.s.b. with a CE exciter, homebrew mixer and linear. W5DNA and K5BES are on 2 meters. K5WWR, Shreveport EC, works a.m., s.s.b. and C.W. K5QXV has been endorsed as OPS. Our SEC, W5MXQ, is busy as chairman of the Metropolitan New Orleans Radio Clubs with the coming Delta Division Convention to be held in New Orleans on Labor Day week end 1962. KN5MPB had antenna trouble and receiver instability. K5OVR has been appointed OPS. W5CEZ, RM, is keeping a lookout for good c.w. operators for traffic-handling and Official Relay Station appointments. W5JGV is back in Metairie after his return from the service. Ralph has just finished a parallel 826 linear for 6 meters. W5EA has a ham rig going at the BC station as well as at home. W5JYA is a new call

(Continued on page 96)

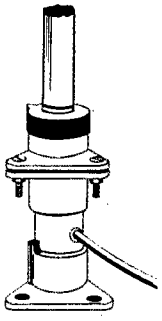
IF YOUR CHOICE IS A VERTICAL

Mosley will help you choose an antenna to fit your personal needs.



V-4-8 EQUIVALENT TO SEPARATE 1/4 WAVE-LENGTH VERTICALS!

For 40 and 80 meters, this heavy duty 100% rust proof antenna easily handles 1 KW (AM). The V-4-8 comes complete with cycolac base mount, polyethylene guy rope and hardware. Amateur Net, $85.00.



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V-5 MEETS HIGH AIR FORCE REQUIREMENTS!

Work 10, 15, 20, 40, and 80 with one antenna... one RG/8U feedline. The V-5 is 100% rust proof and performs brilliantly on each of 5 bands. Handles power of 1 KW to the antenna. Supplied complete with polyethylene guy rope, heavy duty base with internal coax fitting and all necessary hardware.

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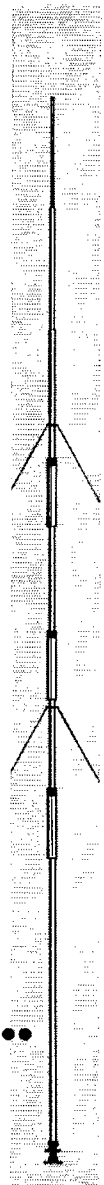
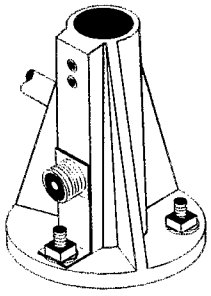


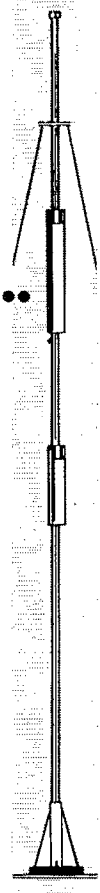
V-4-6 HIGH IN PERFORMANCE, LOW IN PRICE!

No bandswitching is necessary on this excellent DX antenna. Exclusive design provides low SWR with response exceptionally flat across full width of each band. Weather proof traps ...easy to assemble... the most popular vertical ever built for 10, 15, 20 and 40 meter operation.

Amateur Net, $27.95.



Base for V-4-6



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QST-32

in New Orleans. W5WZR is busy playing around with his new 75S-3. K5CTR is proud of his homebrew sideband exciter. K5ANK has been calling the Delta 75 Net when W5GKT goes out of town. W5SUM is building a new monster. W5DGB has been under the weather. W5KHC broke an ankle while painting. W5SKW has been endorsed as Emergency Coordinator for Lake Charles. Traffic: W5CEZ 647, W5MXQ 94, K5QXV 79, K5CZV 24, K5LZA 20, W5FMO 12, W5HHA 11, W5JYA 9, K5OVR 2.

MISSISSIPPI—SCM, Floyd C. Teetson, W5MUG—W5GUA has moved to Jackson from Oklahoma. I had an FB meeting with the Meridian gang recently. W5CUU was awarded the first annual "Ham of the Year" award. K5EYS reports that a new club is being started at East Central Junior College. K5GET has an Apache on the air. The Jones County Amateur Club is sponsoring Marathon QSOs. The latest record is 7 hours 47 minutes. The Keesler Amateur Radio Club has elected WØVJD, pres.; K5VHE, vice-pres.; K5VVY, secy. W8RMF reports the club has 40 active members. WN5ALL is on from Pontotoc with a Viking Adventurer. W5IHP, W5GRP and W5DYJ have been building electronic keyers. K5MDX reports working several more DX stations. K5PPI reports the Magnolia Net had 445 check-ins and that a good bit of traffic was handled. Traffic: W4WDR/5 104, K5RUO 76, K5EYS 5, K5MDX 2.

TENNESSEE—SCM, R. W. Ingraham, W4UIO—SEC: K4OUK. RM: K4AKP. PAM: W4PQP. New officers of the Mid-South Club in Memphis are K4FZJ, K4RKU, K4JIG, K4PPN, K4RGC, K4KYT, K4EQK and W4WBK. The club awarded K4QWV a trophy for scoring the highest total points in transmitter hunts for the year. W4OGG has gone s.s.b. with an HT-37. K4RIN has a new HA-5 v.f.o. W4TDZ and W4TDW made good scores in the November FMT. New appointmnet: W4OQG as ORS. Pat has taken hold of traffic work and has become one of the leaders in the C.W. Net. Renewed appointments: K4RIN as OO, K4AMC as ORS. Reports received: Net—K4AKP and W4UIO; OES—K4KYL; OO—W4TZG and K4EIN; OBS—W4SGI and W4VJ; Clubs—Mid-South Memphis, Loudon County, Oak Ridge, Chattanooga and Nashville. Thanks to K4AKP for another issue of *TENET*, the bulletin of the C.W. Net. Traffic: (Dec.) K4AKP 2131, W4FX 547, W4PL 501, W4OGG 285, K4CSY 115, W4VJ 68, W4OQG 64, W4UIO 40, K4AMC 31, K4LPW 25, W4TZG 21, W4TYV 20, W4ZJY 11, W4VNU 10, W4SGI 8, W4UVL 8, K4KYL 2, K4FJR 1. (Nov.) W4OQG 86.

GREAT LAKES DIVISION

KENTUCKY—SCM, Elmer G. Leachman, W4BEW—SEC: W4BAZ. PAM: W4SZB. RM: K4KWQ. V.H.F. PAM: K4LOA. W4JPV, grand OM of the Valley, keeps overseas traffic going for Eastern Kentucky with PP-250th finals in Class B to a 15/20-meter beam. He gives certifying c.w. tests to new hams and makes it tough. W4MVU (another old-timer) sold out to W4GLP and is rebuilding. Word also comes from W4JTB, an anchor man in emergencies. K4HSB is a new ORS (also OPS) from Maysville; also an NCS for KYN. K4NYO is General Class and soon will be on KYN to help W4CDA. Manuals of procedure on KYN and KPN are available from W4CDA. K4LOA wants to get a state-wide 6-meter net going. Your SCM does, too. W4JUI has maximum power on 421 Mc. K4HOE broke the 100 traffic total after thirty years on the air. A move is underway to form a Council of Radio Clubs of Kentucky. All clubs, please send your name and address to the SCM. W4SZB reports 30 sessions, 154 QTCs, 564 call-ins for MKPN—liaison 9R and MARS. WN4AGH reports 25 sessions, 48 QTCs for KNN. Traffic: K4KWQ 331, W4BAZ 300, K4HOE 119, W4ZDB 118, W4TRO 65, WN4AGH 45, W4YYI 40, W4CDA 34, K4VDO 30, W4BEW 28, W4KJP 27, K4HSB 27, W4SZB 26, K4TQZ 24, K4VHJ 16, K4LOA 14, W4RNF 5.

MICHIGAN—SCM, Ralpr P. Thetreau, W8FX—SEC: W8LOX. RMs: W8SCW, W8EGI, W8QQO, W8FWQ, K8KMQ. PAMs: W8CQU, W8JTQ. V.H.F. PAM: W8PT. To all ECs: W8ELR had to resign as SEC because of a job change and W8LOX is the new SEC. Send all AREC monthly cards, Form 5, to W8LOX. Appointments: W8DTZ, K8CHS, K8HCG, K8KCD, W8CKK as ECs; W8FDO, W8FX, K8IRC, W8IXJ, K8NHC, W8SCW, W8SJF, K8SHQ, W8WXO as ORSs; K8JED, K8PSV, W8SWF as OPSs; W8SWF as OBS; K8BGZ, K8JEE as OESs; W8EMD as OO Class I. W8FX renewed his ORS appointment for the 27th time. Old Timers' Night will be held Apr. 7 at Greenfield Village sponsored by the Catalpa ARS. W8COT, K8BGZ and W8BCI put on a 1225-Mc. show for the Albion ARC, says K8NEY. BPLers: VE3CYG/W8. K8KMQ. K8JJC, W8EU. W8JUJ is working Antarctica and Greenland on phone. K8SHQ got a HT-37, and K8VRF got a Drake 2A and an HT-37 from Santa. W8EMD wants c.w. skeds on 147.9 to 148 Mc. W8BAN had fun copying Oscar. K8PSV has been

(Continued on page 98)

EQUATION: 1+1=2 (or more!)

Why does an RME 6900 receiver in the field seem to consistently outperform the specifications obtained in the laboratory? Because this receiver extends your own abilities beyond their normal limits... limits imposed by other receivers. When you *add* the RME 6900, you actually *multiply* your effectiveness... instantly.

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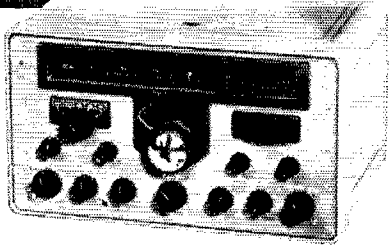

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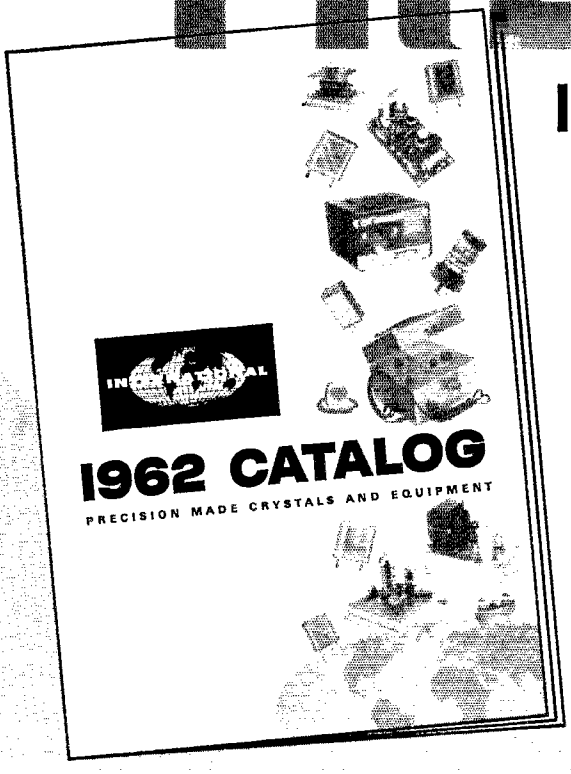
chosen as an exchange student to Germany. The MCRC bulletin published an excellent article on "Cerenkov Radiation." The City of Detroit now permits inspected 75-ft. towers so long as the FCC license is valid. K8PBA sent an Oscar tape recording to California. The Michigan 6-Meter Club took traffic at the Veterans Hospital, Dearborn. Credit for this fine work goes to W8ADR, K8JGF, K8LUY, K8OAG, W8PYN, K8QFK, K8QXU, K8RQX, K8SRH, K8TOI and K8YRF. The Ford ARL took on "Operation Missionary Contact" for the St. John's Lutheran Church. Credit for this good job goes to K8ADF, K8CRD, W8INC, K8JXW, K8LTU, W8PEF, K8PCD, K8PCR, K8SGH, K8UBV, K8UTT. OES reports were received from W8BAN, W8EMD, K8IEE, W8MBH, K8NEY and K8PBA; OO reports from W8EMD, K8LOS, K8RDE, W8RMH and W8VPC. The Michigan (*QJN*) Bulletin is doing well with W8RTN as editor. The Huron Valley ARA and the DARA already have Field Day sites. Traffic: (Dec.) VE3CYG/W8 571, K8KMQ 345, W8IXJ 307, K8JJC 291, W8ELW 190, K8IUZ 183, W8EU 167, K8QLL 164, W8OCC 161, W8IBB 123, K8HLR 111, W8WQH 92, W8FX 82, W8JYJ 79, W8RTN 74, W8DSW 72, W8ACW 69, W8HKT 62, W8FWQ 47, K8MEG 47, W8EOI 46, K8GJD 42, W8PXA 40, K8JED 34, K8PYW 34, K8BZL 33, W8MPD 33, W8BAN 32, W8DSE 26, W8ZHB 21, K8KQV 20, W8AUD 18, W8IUJ 16, K8IRC 15, W8MAI 15, W8AHV 10, K8GOU 7, W8ILP 6, K8LZF 6, K8TJH 6, K8OTJ 5, W8REZ 4, K8SHQ 3, KN8YKH 3, W8EGI 2, W8EMD 1, K8LOS 1, K8VRF 1. (Nov.) K8QBM 33, W8DSW 31, W8IBB 26, W8SWF 17, K8CIP 11, W8AHV 10, K8QKY 9, W8ZJE 3.

OHIO—SCM, Wilson E. Weckel, W8AL—Asst. SCM: J. C. Erickson, W8DAE, SEC: W8HNP. RMs: W8BZX, W8DAE, W8VTP and K8ONQ. PAMs: W8VZ and K8KSN. West Park Radiops 1962 officers are K8AAG, pres.; W8SDV, vice-pres.; K8HNX, secy.; W8ZER and K8IIO, trustees. W8IBX received R6K and WAMC Awards. K8WDO and K0SCI received their General Class licenses. New amateurs in the Cleveland Area are WN8ADY, WA8AFG, WN8AGT, WN8AGU, WA8AHO, WA8AHP, WN8AJJ, WN8AJS, WN8AJT, WN8AJV and WN8AJW. New officers of the Barberton Area Club, the Babcock & Wilcox ARC, are W8IKT, pres.; K8PNR, secy.; K8RGW, treas. The stork brought K8NQD a baby boy. W8BUL is a new Technician. KN8AYK and KN8CBN are new Novices. WA8ANT and WA8AHU are a man-and-wife team. Clermont County RC's officers are K8BJA, pres.; K8SYS, vice-pres.; K8ZFJ, secy.; K8OPB, treas.; W8ZRL, act. mgr. Parma RC's officers are W8CZM, pres.; W8ZAH, vice-pres.; W8SUS, secy.; K8BFT, 1st asst. secy.; K8EBF, 2nd asst. secy.; K8NCZ, treas.; and K8NXV, asst. treas. W8YGD is now K7QJI and W8YOB is now K7QMY. K8SUJ is now K1TSH. WN8AJU and K8WHM are Silent Keys. K8ONQ and his XYL spent the holidays in N.J. and Pa. The Ohio QSO Party will be held on Apr. 7 and 8. For further data see the April issue of *QST*. The Town RC of Akron issues a certificate, Worked All Tire Town, to those who work five Akron Area stations starting Jan. 1, 1961, on any band or combination. Send a post card with call, date and time to K8NYM. Canton ARC's *Feedline* informs us that W8BYK is in the Azores with the Air Force, K8's OBW and YPJ received their General Class licenses, K8ZCO's daughter received WN8BLD, KN8YVZ is in the hospital, the stork brought a baby boy to K8DGT and KN8DGZ W8WFE was promoted to capt. and K8AHI was promoted to 1st lieut. in the CAP. W8AL received WATT and W8ULY has a new HQ-170. Members of the Seneca RC made a tour of the *Advertiser-Tribune*. The Cuyahoga County AREC handled communications for the *Cleveland Press* Christmas Parade with W8SAEB, AZW, BDZ, GHO, LHX, SJX, SUS, TNB, K8s AAG, GBH, IPS, IZL, QXF, RFX, SCR and STK taking part. The Greater Cincinnati ARA's officers are K8HKP, pres.; K8OGH, 1st vice-pres.; K8MFY, 2nd vice-pres.; K8YJR, rec. secy.; K8NWV, corr. secy.; W8NCV treas.; W8ALW, club station administrator; W8MGP, editor. Dayton ARA's officers are W8PTF, pres.; W8SVI, vice-pres.; K8ERE, secy.; W8INQ, treas.; W8HB, director. W8RKL explained oscilloscopes and the clug held its annual Christmas Party. Inter-City RC's *IRC News Bulletin* informs us Joe Shafer displayed the new HX-10 s.s.b. transmitter and slides of tour through the Heath plant. K8LRN has a new Drake. Warren ARA's *Q-Match* says W8LCD joined the Army, and new hams are WN8AHI and K8ZXX. *Smoke Signals* from the Indian Hills RC tells us the Cleveland Area Council of Amateur Radio Club's officers are W8CZM, pres.; K8MVA vice-pres.; W8OIS, secy.; K8TSG, treas. New appointments are W8VZ as PAM, W8BVE as OO, K8MMM and K8QME as OESs. Toledo's *Ham Shack Gossip* names W8PXK as its Ham of the Month. Tuseo RC's 1962 officers are KN8ZJI, pres.; K8SMA, vice-pres.; K8RUU, secy.; K8RFU, treas.; W8BVE, act. mgr.; and W8EUK, director. Traffic: (Dec.) W8UPH 1089, W8DAE 996, K8SQK 523, W8CHT 352, K8KSN 265, W8RZX 247, K8RYU 134, K8ONQ 129,

(Continued on page 100)

FREE



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HUDSON DIVISION

EASTERN NEW YORK—SCM, George W. Tracy, W2EFU—SEC: W2KGC. RMs: W2PHX and K2QJL. PAM: W2OJG. Section nets: NYS on 3615 kc. at 0000 GMT nightly; NYSPTEN on 3925 kc. at 2300 GMT nightly; ESS on 3590 kc. at 2300 GMT nightly; Interclub on 28,690 Mc. Mon. at 0130 GMT; MHT (Novice) on 3716 kc. Sat. at 1800 GMT. Congrats to W2APF for "Operation Goodwill" over the holidays. He and a staff taped over 1000 messages from their families which were mailed to servicemen in all parts of the globe. An advance radiogram was forwarded indicating the tape was in the mail. New officers of the Communications Club of New Rochelle are K2SJN, pres.; K2IES, vice-pres.; WA2QEQ, secy.; WA2DST, treas.; W2RAE, trustee; WA2NRB, sgt. at arms; WA2FCR and WA2OBZ, directors. WA2SAO, of the New York FCC Office, was the December speaker. W2SZ, the RPI Club, reports all equipment has been installed in the new shack with plenty of room for workshop and test benches. Sorry to report the passing of WA2AWY in Albany Dec. 13. EC WA2DLD held a Sunday Morning breakfast with the AREC group to formulate plans for Mamaroneck emergency communications. W2ONE is recovering nicely after a trip to the hospital. W2JEB is organizing 6-meter service to upstate Red Cross Chapters with tie-in to AMCROSS leased wire at Troy Chapter. Success in his school work permits WA2AUC to resume duties as OO. Christmas parties were enjoyed by the Albany and Schenectady clubs. Traffic: W2THE 281, W2EFU 279, WA2HGB 186, K2TXP 82, WA2KUS 76, W2URP 63, K2SJN 49.

NEW YORK CITY AND LONG ISLAND—SCM, George V. Cooke jr., W2OBU—SEC: W2ADO. RM: K2UFT. PAM: W2UGF. V.H.F. PAM: W2EW. Section nets: NLI, 3630 kc. at 0015 GMT nightly; NLI (late) 3630 kc. at 0345 GMT nightly; NYC-LIPN, 3908 kc. at 2230 GMT nightly; V.H.F. Traffic Net, 146.25 Mc. at 0100 GMT nightly. For high scoring traffic-handling during December K2UAT, K2UBG, W2GKZ, W2EW and WA2GPT received BPL awards while WA2EFN earned his certificate on originations and deliveries. K2JWT tracked Oscar on two passes, recorded same and had the tapes used on a local radio program together with a running commentary. K2IPC and W1NOC are working together and have completed a 220-Mc. TV setup. New officers of the Levittown Radio Club are K2SDM, pres.; WA2OGU, vice-pres.; WA2GFH, secy.; K2YHD, treas. A new club in Lake Ronkonkoma, the Sachem H.S. RC has received its call, WA2WJZ. W6JWD, ex-W2FQW, returned to his former QTH on Long Island and visited old friend W2KTU, K4GG, formerly W2GG, spent the Christmas holidays with W2TUK, his son. WA2GPT received her YLCC certificate and was elected assistant manager of the V.H.F. Traffic Net. WV2VKK has a new Gonset III and spent the Christmas holidays playing ball with the U.S. All Star Little League team in Puerto Rico. WA2GJT converted an APX-6 for 1215 Mc. and also uses a 4-250 final at 500 watts s.s.b. on 50 Mc. WA2PMW is celebrating the arrival of a jr. operator and a 20-w.p.m. Code Proficiency certificate. K2KJH has a new 2-meter linear using a 4X250. WA2SNR is on 1296 Mc. with a new rig. WA2NUQ is on 432 Mc. and is looking for contacts. K2YSK modified his Seneca Transmitter to a pair of 4X250s instead of 6146s maintaining the screen modulation. W2LT has worked 6 (confirmed) members of one family in Africa, some 2000 miles apart; the father and mother holding the calls ZS6AUH and ZS6BDX, respectively. WA2BPK is on the air with a new Valiant and an SX-101A. WA2ICU is working DX with his new Ranger and a vertical. WA2FIT is very proud and pleased with his new RME-6900. WA2KER added a new 250-23 Matchbox, an AM-2 SWR bridge, a 75-meter inverted "V" and an HD-11 Q-Multiplier to his setup and announces that the Nassau 6-Meter AREC

(Continued on page 102)

NYC-LI QSO PARTY

Last month's announcement of the NYC-LI QSO Party held February 10-12 failed to mention where to send logs. Logs should go to the South Shore Amateur Wireless Assn., c/o T. Richard Bentley, K2UFT, 116 Locust Street, Valley Stream, New York. The deadline for sending in logs has been extended to March 31.

Net meets Mon. at 2000 on 50.25 Mc. The local Q5 Net has ceased operation until summer; according to WA2QJU, WA2MPP, 16 years old, wonders if he is the youngest ham on 160 meters. WA2KSP is a "project a month" enthusiast and completed a transistorized speech amplifier to use a crystal mike with an SCR-522 and plans to build his own Variac. K2AAS reports that the All Service Net meets at 1800GMT on 7270 kc. Sun. and is seeking new stations. WA2IFQ got a new bug and an HQ-100 for Christmas and now works into the Early Morning and Hit & Bounce Nets. WA2QAT did a masterful on the Friday before Christmas when 109 stations QNIed into the 2-Meter Net when John was NCS. Please check the endorsement dates on your appointment certificates and if due please forward to the SCM for signature. Bulletins from many clubs are gratefully acknowledged and are extremely helpful in preparing these reports. Keep them coming. Traffic: (Dec.) K2UAT 1910, K2UBG 908, W2GKZ 637, W2EW 614, WA2GPT 570, WA2EFN 289, WA2QAT 261, WA2BWO 244, K2UFT 193, K2KYS 181, K2CMJ 105, K2THY 87, WV2VKK 79, W2GP 59, K2QBW 52, WA2LJS 51, W2OME 42, WA2PUE 37, K2YQK 24, K2AAS 19, WA2NCE 18, W2JGY 16, W2EC 12, WA2FRW 12, WA2CZG 11, WA2FUL 10, WV2RUK 10, WA2QHT 9, K2SPG 7, K2PHF 4, WA2TQT 4, WA2BJK 3, WA2KER 2, WA2QJU 2, WV2TKS 2, WA2MPP 1, W2PF 1.

NORTHERN NEW JERSEY—Acting SCM, Daniel H. Earley, WA2APY—SEC: WA2APY. RM: K2VNL. PAM: K2KVR. Section nets: NJN daily at 2300 GMT on 3695 kc, NJPN Mon. through Sat. at 2200 GMT and Sun. at 1300 GMT on 3900 kc. NJ 6&2 at 0300 GMT Thurs. and Sun. on 51.15 Mc. and at 0200 GMT on Wed. and Sun. on 147.75 Mc. The NJN reports 31 sessions this month, 394 attended for 471 pieces of traffic. The NJPN had 31 sessions with 612 aboard for a total of 198. NJ 6&2 held 21 sessions with 152 attending for 20 messages. WA2QPV and WA2WEV have been appointed as OESs. WA2QPV says WA2TDY has a shiny new HQ-110. WA2EDG has moved to Red Bank, and he was so handy up north. W2EWZ says he completed 16,000 QSOs, 100 of them with K2VVL. W2CFB is thinking about getting a linear. Who sed that? WA2CCF made BPL every month of 1961. W2ABL is now on all bands but says 160-meter c.w. is tops. WA2JHQ is almost ready for the plunge on 220 Mc. K2UCY does a good job as OO, OBS and ORS and I hear he plays the organ too. W2BVE still is burning the midnight oil working on equipment. Last but not least, WA2GDP has a new QTH in West Paterson. Fellows, this is mighty small reporting for a couple of thousand hams in the NNJ section. The address is in front of *QST*. Let's hear from you, whether or not you are an appointee. W2DRV and WA2JHQ had their appointments renewed as ORS and OPS, respectively. The Christmas month gave us three BPLers: K2UCY, WA2JHQ and WA2CCF. Traffic: (Dec.) K2UCY 514, WA2JHQ 389, K2VNL 360, WA2CCF 332, WA2APY 238, WA2OQV 112, WA2EDG 73, W2EWZ 50, K2QGD 32, W2DRV 31, W2BVE 24, K2SLG 19, K2VNK 18, W2CFB 14, WA2UZH 11, K2YFE 9, K2EQP 7, K2ZFI 3, W2NIY 2, WA2QPV 1. (Nov.) WA2GQZ 59, K2ZFT 5, W2NIY 3, W2ABL 2, K2HFL 2.

MIDWEST DIVISION

IOWA—SCM, Dennis Burke, WØNTB—Asst. SCM,—Russell B. Marquis, WØBDR. SEC: KØEXN. PAM: WØPZO. RM: WØDUA. New ORS: KØUAA. Iowa 160-Meter Net officers are WØBTR, pres.; KØZCQ, vice-pres.; WØSJU, secy.; KØAHZ, act. mgr. Hamilton County Net officers are WØSRO, pres.; KØZCQ, secy.; KØAHZ, act. mgr. Ames Radio Club officers are KØKPG, pres.; KØYKA, vice-pres.; KØUAA, secy.; WØUGR, treas.; WØIII, Communications. Operation Oscar was rewarding but tiresome, the Story County group monitored four passes a day during the time the transmitter could be heard. In spite of the work and frustrations this group is anxious to track Oscar II when it gets into orbit. KØAZJ has made the grade as OO Class I. Net reports: Iowa 160 Meter Net—QNI 1010, QTC 41, sessions 31. 75 Meter Phone Net—QNI 1043, QTC 186, sessions 25, average 7.44. 75-Meter Teenage Net—QNI 61, sessions 24. Tallcorn Net QNS 207, high 14, low 3, average 9.86; QTC 222, high 33, low 0 average 10.04. Traffic: (Dec.) WØLGG 2597, WØSCA 1502, WØBDR 842, WØCZ 410, WØDUA 297, WØNTB 174, WØPZO 96, KØAUU 82, KØMMS 75, WØTEY 66, WØLJW 34, WØGQ 30, KØPOI 27, KØHBD 24, KØWVK 22, KØZCQ 21, WØJPJ 20, KØKAQ 16, KØAFG 15, KØAFI 15, WØFMZ 15, WØNWX 15, WØVWF 14, KØYDV 11, KØEVC 10, WØREM 6, KØUAA 5, KØVSV 5, KØQKD 3. (Nov.) KØVSV 15.

KANSAS—SCM, Raymond E. Baker, WØFNS—SEC: KØBXF. Asst. SEC: KØEMB. RM: WØQGG. PAM: KØEFL. V.H.F. PAM: WØHAJ. Nets: KPN,

(Continued on page 104)

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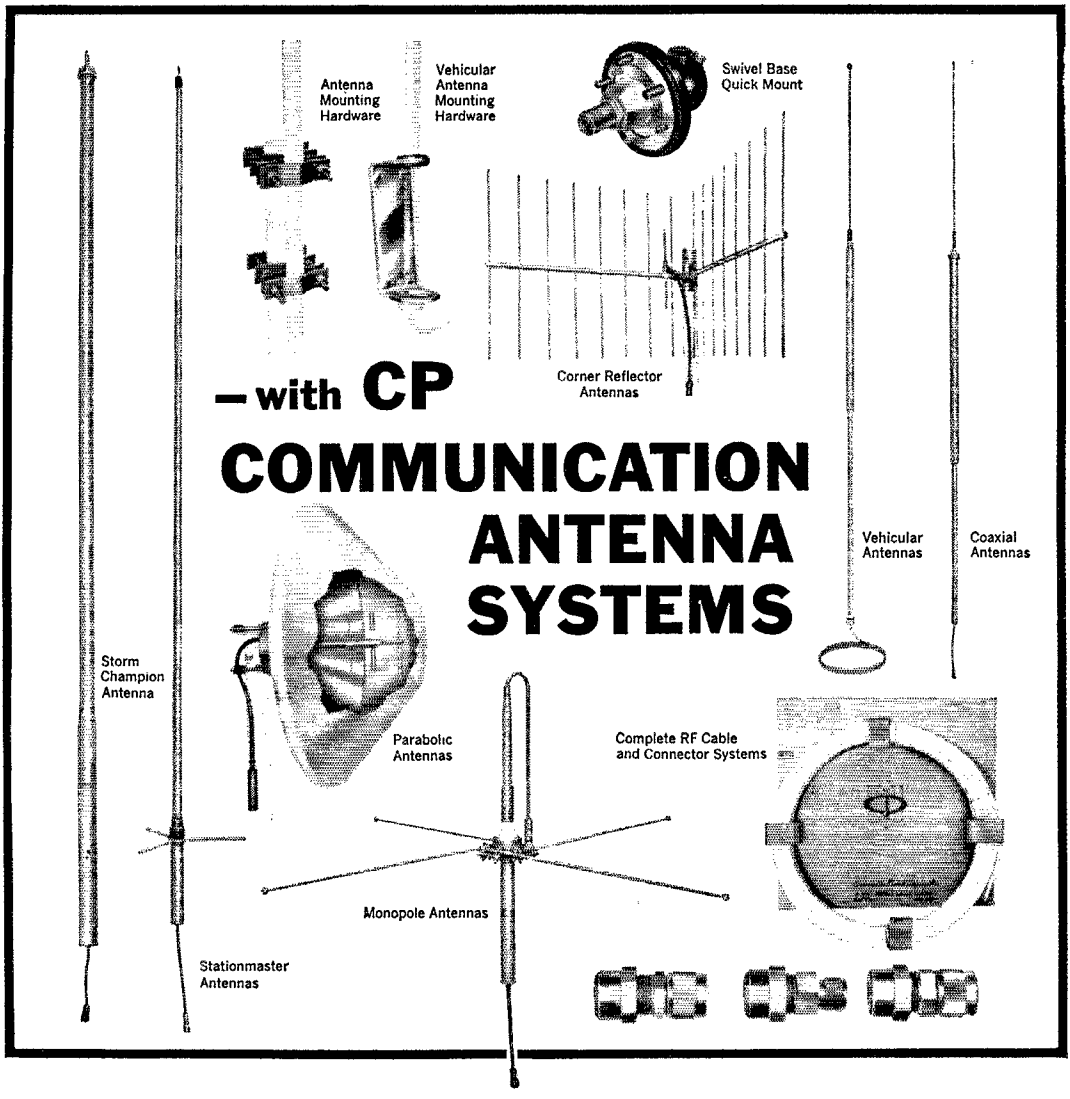

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3920 kc. Mon., Wed., Fri. 1245Z Sun. 1400Z. NCSs KOQKS, WØFHU, WØIFR, WØORB, 16 sessions, QNI 454, high 49, low 4, average 25.2; QKS 3610 kc, daily 0030Z, 31 sessions, QNI 261, high 13, low 3, average 8.77; QTC 293 high, 46 low, 2 average 9.45. NCSs KØBXF, KØIRL, WØBYV, WØFNS, WØTOL, WØQGG, KSN, 3925 kc. Mon. through Sat. 423 stations reporting no emergency sessions. NCSs KØEMB, OMM, LHF. Kansas Jayhawker YL Net, 3940 kc. Tue 1530Z Sun. 2200Z, KØHEU mgr. HBN Area, 7280 kc. Mon. through Fri. 1800Z. WØWNZ mgr.; QTC 642, QNI 534, NCSs KØYWT, KØHGI, KØLTP, WØANT, KØICB, KØWNZ, KØUHF, KØLTJ, WØQJU, WØBUL, KØWYT, KPN, QTC 155, high 26, low 0, average 8.6. The Wichita Amateur Club elected KØRVI, pres.; KØSMI, vice-pres.; KØAGL, secy.; WØRCS, treas. KL7EBA, now WØFOS, will take over the MARS station at Schilling. KØAYS is attending Wichita U, working at KAKE part time. The Scott County Amateur Club elected WØYLO, pres.; WØZUX, vice-pres.; KØOCD, secy.; WØMH, treas. Traffic: WØOHJ 1805, KØYRQ 643, KØHGI 511, WØBYV 129, WØQGG 160, WØFNS 142, KØBXF 127, WØABJ 112, WØSAF 48, KØYTA 42, KØUHF 31, KØHVG 28, WØIFR 23, WØGCJ 21, KØTCS 20, WØHS 17, KØGIG 13, KØQKS 13, KØEFL 12, KØEMB 12, KØJWW 11, WØDFD 7, KØLHF 7, KØPSD 7, KØZHO 7, WØFDJ 6, WØWFD 6, WØANZ 5, KØGII 5, KØJID 5, KØLPE 3.

MISSOURI—SCM, C. O. Gosch, WØBUL—SEC: KØLTP. Asst. SEC: KØLTJ. RMs: WØOUD, KØONK. PAMs: WØBVL, KØWNZ, WØLFE (v.h.f.). Net reports: (Dec.) MSN (3715 kc., 2200 GMT, M-F) 20 sessions; QNI 162; QTC 194; NCSs KØGOB 3, KØUDL 2, KØVPH 4, KØFPC 4, KØONK 7. Mo. S.S.B. (3885 kc., 2400 GMT, Tu-Th) 8 sessions; QNI 106; QTC 72; NCSs WØEEE 1, WØPXE 1, WØOMM 6. MEN (3885 kc., 2400 GMT, MWF) 12 sessions; QNI 300; QTC 200; NCSs WØOVV 1, KØMMR 3, KØONK 4, WØBUL 4. MON (3580 kc., 0100 GMT Tu-Su) 26 sessions; QNI 231; QTC 194; NCSs WØRTW 2, WØWYJ 2, KØVPH 3, WØKIK 6, WØOUD 13. SMN (3580 kc., 2200 GMT, Su) 5 sessions; QNI 14; QTC 17; NCSs WØWAP 1, WØKIK 1, KØFPC 1, WØOUD 2. There has been no time change for MON, as erroneously reported in last month's column. Appointments: KØWNZ as PAM/MEN mgr; WØCMI as OES. Endorsements: KØLGZ as ORS; KØVPH as ORS; KØONK as ORS. Cancellations: WØOVV as PAM/MEN mgr; KØPFF as ORS and OO (CLIV); KØKBD as ORS. It is with considerable regret that the SCM must announce that WØOVV has resigned as PAM/MEN mgr. Ernie has been very faithful and hard-working. KØWNZ, who has agreed to assume these duties, has had much experience as net manager. KØOLW has been selected as ANCS for MEN. KØJLJ must be reported as a Silent Key. Traffic: (Dec.) KØFPC 262, KØVPH 216, KØRPH 146, WØOUD 136, WØKIK 120, WØZVS 103, WØOMM 91, WØBUL 63, WØMKJ 63, WØWAP 55, WØANT 53, WØBVL 43, KØIHA 43, KØMMR 43, WØRTW 42, KØWNZ 38, WØPXE 36, WØAYB 19, WØTPK 15, KØVNB 12, KNØGFA 9, KØJPL 9, WØEPI 6, KØQCQ 5, WØOVV 4, WØKCG 3. (Nov.) WØEEE 152.

NEBRASKA—SCM, Charles E. McNeel, WØEXP—SEC: KØTSY. The Nebraska Emergency Net reports QNI 863, QTC 160 for November and QNI 768, QTC 135 for December. WØHXH was elected net manager for this net for 1962. The Nebraska Morning Phone Net reports QNI 535, QTC 149. The Western Nebraska Net, WØNIK NC, reports QNI 667, QTC 577, 100 per cent reporting WØAHB, KØBMQ, WØDVB, WØGGP, WØNIK and WØWYX. New officers of the Central Nebraska Amateur Radio Club are KØPZS, pres.; WØERW, vice-pres.; WØDLM, secy. The Lincoln MARS Club's 1962 officers are WØBRL, pres.; KØUWO, vice-pres.; KØHPT, treas.; KØEOS, secy.; KØRAU, publicity. The Nebraska Section C.W. Net reports QNI 207, QTC 124, 30 sessions. Traffic: (Dec.) KØBRS 548, WØGGP 503, WØNYU 167, WØOKO 124, KØRRL 124, KØOAL 123, KØDFQ 83, WØNIK 80, WØZJF 79, WØAHB 55, KØUWK 51, WØOCU 48, KØGAT 45, WØYFR 45, WØLDO 42, KØDGW 40, KØKJP 38, WØWUV 28, KØYDS 27, WØFGQ 26, KØLAL 25, KØOYN 23, WØDDT 21, WØRIH 21, KØSBP 20, KØFRU 19, WØVEA 19, KØELU 18, WØVZJ 18, KØFJU 17, WØFSX 14, WØLFJ 14, WØCIW 9, KØMSS 8, WØZOU 4. (Nov.) WØEGQ 42, KØBRQ 6.

NEW ENGLAND DIVISION

CONNECTICUT—SCM, Henry B. Sprague, jr., W1CHR—SEC: EOR. RM: KYQ. H.F. YBH. V.H.F. PAM: FHP. Traffic nets: CPN, Mon.-Sat. 2300Z, Sun. 1500Z on 3800 kc.; CN, daily 2345Z and 0300Z on 3640 kc.; CVN, Tue. Thurs. and Sat. 0130Z on 145.98 Mc.; CTN, 1400Z on 3640 kc. K1MVQ now has a DX-100B.

(Continued on page 106)

"MATT" MATTHEWS, K4KMF, enjoys occasional skeds with other members of the "Raytheon field team" and members of the headquarters staff.

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OJR worked his first DX on 160 meters and spent many hours OOing. K1JAD found the bug in the club's Apache's modulator. KN1RWH is a new ham in Waterbury. BDI reports the CWA auction held at AW was a great success. QV got a TA36 for Christmas. KYQ reports the CN had 31 early sessions handling 501 messages for a 16.1 average and 20 late sessions handling 24 for a 1.2 average. Attendance averaged 11.4 on the early and 3.1 on the late. High QNI: RFJ, K1s IFJ and JAD. RAN completed his Heath HG-60. ECH sold his DX-100 to K1HOP. QPD has a new fourteen-element 2-meter quarter atop a new 54-ft. tower and says K1NQJ is on 2-meter RTTY and K1CBV is operating a new Invader. K1IVR had receiver and transmitter trouble capped with the collapse of his 80-meter antenna in a storm. YBH says CPN had 30 sessions with 356 messages for an average of 12 per session. Average attendance was 22 with the leaders being DAV, VQH, ETF, YBH, NQO, THN, K1s DGK, PPF, PUG, AQE, ONZ, MBA and CFR who, with K1PKQ, is newly active on the net. LIG did well in the Nov. FMT. Reports received: OO from ZGO, OJR, EQV, K1s IFJ, IVR; OES from K1PTK. New appointments: PHP as OO. Appointments renewed: PRT as EC; K1HFJ as OO. Traffic: (Dec.) W1AW 454, K1IFJ 481, W1KYQ 313, K1AQE 262, W1EFW 243, W1FHP 222, K1JAD 176, K1PUG 180, W1YBH 163, K1PKQ 162, W1OBR 143, K1PPF 129, W1HJG 118, W1BDI 115, K1GGG 96, K1PQS 90, W1RFJ 74, K1DGK 56, K1PQN 51, W1ETF 51, K1HOP 41, K1MBA 31, W1KUO 30, K1EIC 28, W1QV 14, W1NTH 13, K1PRW 13, W1BNB 11, W1CHR 8, K1MVQ 6. (Nov.) K1QCR 9.

MAINE—SCM, Albert C. Hodson W1BCB—Project Oscar created considerable interest among v.h.f. addicts with ISO reporting tracking the satellite five nights in a row. 2-meter activity also showed considerable increase in Cumberland and York Counties with MBR, BCB, K1GSF, K1JDA, K1ANM and U2X getting on with "Twoers." K1LQZ is the new net manager for the Eastern Area Barnyard Net. K1ADY is the new president of WRONE for 1962. Congratulations to our YL operators. GFP is back on the air after a two-year absence. KN1-VAV is a new YL in Monson. EBJ has a new Johnson 500. FC again is on the road traveling over the entire U.S.A. Almost every evening FCS, RPH, KEZ, CBU, MFU, K1DYG and K1MJO can be heard on 2 meters between central and coastal Maine. K1MDM still is doing good service for patients at Togus with communications directly to wards. Walt also is Net Manager for the Section 1 Veterans Administration Radio Service. Now is the time to be planning your spring and summer activities. Be sure to give your SCM two months notice in order to get information listed in time for publication in advance of the activity date. Look for announcement of the Maine QSO Party. Traffic: K4BSS/1 200, K1MBM 116, K1DUG 67, K1MDM 65, W1OTQ 22, K1BZD 19, W1ISO 17, K1DYG 14, K1OAZ 14.

(Continued on page 110)

STATE OF MAINE QSO PARTY

March 24-26

The Portland Amateur Wireless Assn. invites all amateurs to participate in the Maine QSO Party.

Rules: (1) *Time:* 2300 GMT March 24 to 0459 GMT March 26. (2) Phone and c.w. are separate contests requiring separate entries. The same station may be worked on more than one band. (3) *General call:* "CQ ME" on c.w. and "CQ Maine QSO Party" on phone. Maine stations identify by signing "DE (call) ME K" on c.w., and "this is (call) in Maine" on phone. (4) *Exchange:* QSO number, RS(T), QTH and county. Outside stations do not send county but send their state, province, or country for QTH. Intra-Maine contacts do not count. (5) *Scoring:* Each completed contact counts 10 points. Outside stations multiply contact points by the number of Maine counties worked. Maine stations multiply by total number of states, countries, and provinces worked. Multiply by two (2) if input power remains under 150 watts during entire party. (6) Logs must show date, time, emission, input power, and contact information. (7) The Worked All Maine, WAM, certificate will be issued by the Portland Amateur Wireless Assn. to any station who succeeds in working all 16 counties using any combination of emissions. (8) Contest logs postmarked no later than April 4, 1962, should be sent to Albert C. Hodson, W1BCB, 370 Capisic St., Portland, Maine.

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Model PH—Uses 6CB6 tube—for any frequency or ham band, 2 to 27 MC. Wired & tested **$13.95**

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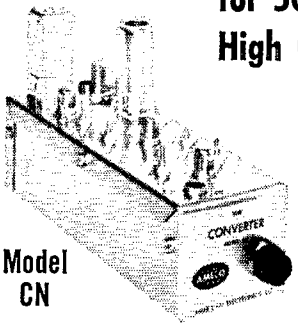

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(Specify IF output in order)

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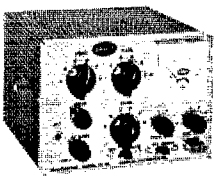

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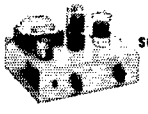

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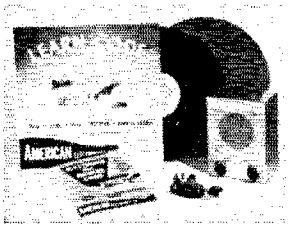

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EASTERN MASSACHUSETTS—SCM, Frank L. Baker, jr., W1ALP—SEC: AOG. K1JHR is Radio Officer and K1MBU is EC in Attleboro. K1OLN is a new OPS. BGW, K1IZM, FZJ, FRR and AYG took part in the Nov. FMT. COL and SAD are in Burbank, Calif. Ex-1GYZ is now W9EPH. On 75 meters: LYL, WYX, K1MLD, K1OPQ. KISTS has moved out West. The Lexington High School Radio Club is holding an auction at the school cafeteria starting at 7:30 P.M. Friday March 9; everyone welcome. K1BGK will be Cross Band Net mgr. on 6 meters. UVM is building a Heathkit rig. On 2 meters: JVZ, LDI, EPA, K1s AWP, QLA, OIX, QNZ, KN1TYG. WU is in Miami until spring. NF has an autronic keyer. New QRA officers: K1OCD, pres.; LEL, vice-pres.; IGK, secy.; OKB, EED, SPL, EYZ, AOG, K1IOA, directors. The Bedford Club visited Weston College. W8ARB is active on the nets. K1BUF and W1ZQM are engaged. WQH launched a balloon with a 2-meter rig telling the altitude and temperature to 120,000 feet. K1HWE has been in college. K1NTS says the N. Attleboro RACES group will have 60 watts on 6 meters. OSN has a DX-20, an NC-109 and is on 6 meters. HIV is N.U. ARC pres. EGZ is working for the County of Barnstable police radio system. K1GRP is the new Cape Cod & Islands ARA secy.-treas. The Framingham Club held a Christmas party at K1KMV's. K1LFE is the new Yankee Radio Club treas. The Mass. V.H.F. Society held a party at QXX's. K1MOC is secretary of the Maria Immaculata ARC at Oblate College & Seminary in Natick. KN1SER is on 6 meters. K1UAU went home for Christmas. FJJ/WK has a Drake receiver. K1HNP added the SB-10 to his Apache. OHA sent ACB a card from Dublin. ACB now is 251/246 on DXCC. CSZ has a Bravo. VMU has a new shack. The Clinton C. Brown Memorial ARS was dedicated by the Needham ARA and now has his call, W1LAD. New officers of Needham C.D.: deputy dir. of comm., K1KBB; asst. deputy, TMO; Radio Officer, NUF; alternate ROs, TMO and IBV; supply officer K1LKL; radio chief, OOP; station trustee, BDS. Appointments endorsed: LMZ, ALP, K1LJK as OBSs; EGZ Brewster, TRC Maynard, as ECs: K1LJK, WK, JNV as OOs; KBN and K1AII as OESs; EMG as ORS. K1CQD was made an honorary member of the Cape Cod & Islands ARA. BMW's XYL and EYK went to the WRONE Luncheon. BL is State Radio Officer and MKT and BSG are his alternates. Others on the staff are K1IZM, RGM and W8UDI/1. BL is on 6 and 75 meters. K1DRB tracked Oscar. KINNW has a DX-100 and a BC-348 on 10 and 80 meters. Traffic: (Dec.) W1EMG 509, ZSS 181, K1OCD 150, W1EAE 148, W8ARB/1 143, W1-OFK 129, DOM 75, AOG 53, K1GKA 52, W1SIV 34, LFA 30, AUQ 27, K1BUF 25, W1HGN 23, K1ROA 23, QOG 22, W1VYS 20, WQH 20, K1QLD 16, BGK 14, W1FJJ 12, K1LFA 12, CMS 11, IWE 10, W1GEK 8, K1GTX 8, W1KTK 5, K1NTS 4, DRB 2, LJK 2. (Nov.) W1EAE 80, K1BUF 50.

WESTERN MASSACHUSETTS—SCM, Perry C. Noble, W1BVR—SEC: BYH/K1APR. RM: K1IJV. PAM: DXS. For many months now I have been "padding" my reports by "stealing" information from bulletins sent to me by about three West. Mass. radio clubs. This month I am going to show you just how much material I receive directly from the amateurs of this section (and that, incidentally, is where the information for this column should come from). We are allowed about 35 lines for this section's monthly report. An excellent report, as always, was received from K1IJV, our Route Manager. She reports that WMN held 26 sessions, cleared 133 messages and had a rate of .204 messages per minute. AMI has a new rig on the air. ZPB and his XYL are the proud parents of a son, Nathan, born Dec. 9. Congrats! Traffic: K1LBB 210, IJV 175, W1BVR 106, DVW 36, MNG 25.

NEW HAMPSHIRE—SCM, Ellis F. Miller, W1HQ—SEC: K1GQK. PAM: K1JDN. RM: K1ITS. GSPN meets Mon. through Fri. at 2400 and Sun. at 1430 on 3842 kc. NHN meets Mon. through Sat. at 2330 on 3685 kc. CNEN meets Mon. through Sat. at 1145 on 3842 kc. Endorsements: BYS as OPS, K1NBN as OO, K1BGI as OBS and K1CIG as OES. For the second consecutive period TA is high scorer, earning the John W. Singleton Trophy. Our congratulations to Ray for outstripping the pack for the second time. How about the rest of you fellows? Ray says he'd be delighted to see some close competition. For the third month in a row we have shown a decline in traffic count and despite the Christmas traffic December indicates the poorest showing. We can attribute this to two factors, namely poor propagation conditions and to lack of reports from the traffic-handling stations. The former we cannot control, the latter, we can. So how about it, gang? K1KOB reports working eighth and ninth district stations ground wave on 50 Mc. Traffic: W1TA 86, K1JDN 77, W1PBE 42, PFU 38, K1BCS 30, WIHQ 18, K1GQH 10, W1CUE 9, YMJ 7, KN1TGZ 6, K1EEN 5, NXV 4.

(Continued on page 112)

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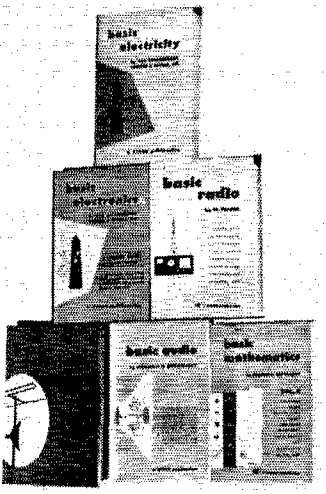

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RHODE ISLAND—SCM, John E. Johnson, K1AAV—SEC: PAZ, RM: SMU, PAM: TXL. RISPN report 31 sessions, 467 QNI, 129 traffic. The Blackstone Valley ARC of Woonsocket elected K1ORM, pres.; K1PRU, vice-pres.; K1LNS, secy.; K1LZW, corr. secy.; K1KEE, treas.; YRC, act. mgr. The club's new Novices are KN1TIR, TVO and VDC. The NCRC of Newport officers, WLG, pres.; JHF, vice-pres.; ETM, rec. secy.; JFF, corr. secy.; IAG, treas. were installed by TXL recently. Ex-pres. K1CUY was married recently and the club wishes her the best. AYZ who belongs to the Polar Bear Club, took a dip in the ocean New Year's Day. The PRA announces new officers as KKE, pres.; K1LRP, vice-pres.; K1NVS, secy.; HIK, treas.; K1LPL, corr. secy.; TQW, KKR and SGA, board of dir. The AQ Club of Rumford has completed installation of its tri-band beam complete with rotor and indicator. KUQ is the proud father of a new harmonic. K1KDI has 3 more states for WAS on 15 meters. K1KAR has a new Lettine transmitter. Traffic: W1SMU 1114, TXL 1039, K1NEF 155, PZY 53, DZX 46, GRC 46, JOD 20, GRA 10, PNI 9, KAZ 4, CRW 2, W1WED 2, K1JYO 1.

VERMONT—SCM, Miss Harriet Proctor, W1EIB—SEC: K1DQB. PAM: HRG. RM: KRV. Congratulations to amateurs in the Springfield Area who sent in colored slides of themselves and stations. We'd like every Vermont amateur represented in our collection, which will be available to anyone for a showing. The BARC announces International Field Day for July 15 at Cliffside Country Club in Burlington. Part of BARC's activity is a project to train a blind young disaster victim and help him get on the air. SET and NWW, of the Rutland Area, are on 75-meter phone. K1BQB reports good activity on 6 meters with more coming on 2. WPJ received a 2-meter rig a la Santa. KJG is having good luck with a pair of "J" Yagis slot-fed. K1OJC, of Worcester, has been giving a Vermont contact to many Novices. SCM certificates have gone to K1LJL, K1LEC, K1POA, K1GCX, K1MVV and K1OJC.

NORTHWESTERN DIVISION

ALASKA—SCM, John P. Trent, KL7DG—CDG, CAH, KL7BZO. ZIS, AEQ and DJI heard Oscar Dec. 19, 1961, at 8:27 P.M. and at 11:27 P.M. AST. AN and ZR were in the lower 48 Christmas visiting in Portland. CLA visited his mother in California. A new award for ADXC is being made by MF. The Anchorage Radio Club had a very good talk by Mr. Ralph Westover on the atom bomb and a film on the bombing of Japan at its January meeting. Amateurs in the state of Alaska should get behind their club and Races program. BJW now has his Extra Class license and his XYL, BLF, is now General Class. MF's son is working for the city of Anchorage. BGH got a new car for the XYL for Christmas but Les does all the driving. CHO, BDG and AKW got all the bugs out of their 2-meter home-brew and are about to make some smoke tests. BZO sent in the above report.

IDAHO—SCM, Mrs. Helen M. Maillet, W7GGV—K7GQE made a recording of Oscar with two dits on the letter "i" clearly heard. GDA and BMF and their tracking station appeared on local TV. QIS/6 took slides of the Sunnyvale tracking station during the launching and showed them to Pocatello hams while spending the holidays with his mother, K7JIL, and family. VQC organized the C.D. Net in Latah County. SGS and YBA have new sons. K7KBY and his XYL, K7KBZ were hosts New Year's Eve to W7s BSP, DHD, DMP, FMP, FSH, THB and K7s KBV, KRO, KXZ, QKV and their XYLs. JSY and GDA announced the Magic Valley Club's classes for Novice training through an interview on TV. DPD put up a 2-meter beam and now has direct contact into Pocatello, a distance of 70 air miles. FARM Net: check-ins 263, sessions 20, traffic 26. GEM: sessions 19, traffic 6. Traffic: K7KBY 134, W7VQC 23, GGV 6, K7HLR 6.

MONTANA—SCM, Ray Woods, W7SFK—SEC: BOZ. PAM: YHS. RM: K7AEZ. The MPN meets M-W-F on 3910 kc. at 1800 hours MSN meets T-T-S on 3550 kc. at 1830 hours. The TSN meets on 7230 kc. at 1200 hours Mon. through Fri. A new call is heard at Toston, K7QND. K7NDV mobiled to California. K7BVO is back from his tour of Europe, on a bike too. ZJZ, Mary, made a California trip in a hurry. TSB visited his mother, TNJ, and dad. We hear that DQX, a former Montana ham, passed away at Walla Walla, Wash. FFN has been called to active Army duty. Anaconda reports a class of 8 in radio. CPS is on the air again. MAK is working on a home-brew receiver. JIZ is building a 100-watt job. K7ISW is in his new fallout shelter with transmitter, receiver and all radio gear. K7BKH, Winifred, was awarded a plaque as the outstanding amateur from the Yellowstone Radio Club. YQZ is moving to Bingham for a while. RZY tracked Oscar on 2 meters. BPL goes K7EWZ the hard way. Traffic: K7EWZ 615.

(Continued on page 112)

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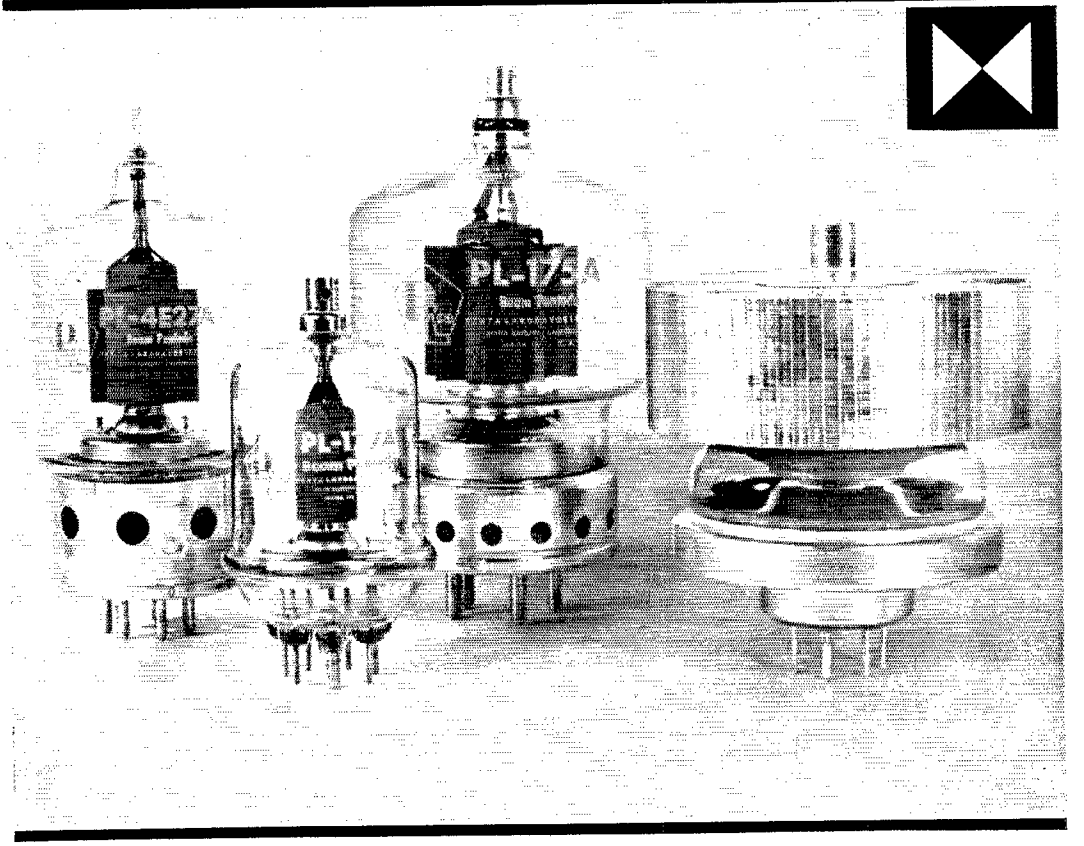

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OREGON—SCM, Everett H. France. W7AJN—Certificate endorsement: WKP as SEC. On Dec. 4 the Oregon Mountain Rescue Association requested communications of amateurs in the Portland Area. PJO acted as base station for approximately 30 hours. DWO, ALG and RVN furnished the mobiles for the first 18 hours K7PED took the mobile stand next day until a boy's body was located. Others assisting were K7PEE, K7ADI, K7AJC, EVF and HBO. K7IWD is trying to qualify for CHC and is also monitoring the bands as OO. K7KRE has a Model 26 TTY machine. K7DVK is now on the air with a v.h.f. band-switching rig. K7IMH and GUH held a 6-meter QSO from 1759 to 0010 on Dec. 31. MTW manager of Oregon State Net reports sessions 20, QNS 164, traffic 31. BRAT Awards went to BVH, MTW, ZFH and K7IWD. OSN 1961 activity is reported as: Sessions 257, QNS 2332, traffic 725. Honors go to the reliables, AJN, AYN, BNS, BVH, MAO, MTW, PRA, ZB, ZFH, K7AXF, K7CNZ, K7IWD and K7LNQ, the new net manager for 1962 will be ZFH. K7CNQ sends in a very nice report of the V.H.F. AREC Net. Oregon has made a good standing in ARRL activities during 1961. Many thanks to all SCM appointees who submitted regular monthly station activity reports. Traffic: (Dec.) K7AXF 193, KBK 110, W7BDU 100, ZFH 47, DEM 26, MTW 23, K7JVN 22, IWD 21, W7AJN 7, K7CLL 3, CJB 2. (Nov.) K7IWD 29.

WASHINGTON—SCM, Robert B. Thurston, W7PGY SEC: HMQ, RM: AIB, PAM: LFA. New officers of the Northeast Washington 7's Amateur Radio Club are K7JAR, pres.; RHX, vice-pres.; K7ORA, secy.; K7LAK, treas.; K7LNV, comm. off.; JTR, radio off. The club gives code and theory instruction one night a week at the Colville High School. CCY works for Boeing in Seattle. GYF was on vacation to New Jersey. KN7PVA is studying for the Conditional Class license. DTK has a new 40-meter skywire. FMJ is looking for a QSO on 2 meters. New officers of the Walla Walla Club are FMJ, pres.; EMP, vice-pres.; LJK, secy.-treas. RDL resigned as EC for King County and RPZ is the new EC. AMC and K7CWO renewed as OPSs; USO and JEY as ORSs. K7JRE earned WAS and CP-20 in one year of operating. New officers of the Tacoma Radio Club PWN, pres.; IKG, vice-pres.; RGD, treas.; K7NKZ, secy.; K7AYD and K7GPJ, board members. The club was visited by a group from the Bremerton and Puyallup Radio Clubs. In a home-brew equipment building contest K7s AYC and EVI tied for top honors with CZK second and KN7MXE third. The NSN Net had 143 QNIs and 43 QTCs during 26 sessions. PWA is the manager and president. K7BEZ has built an HBR-16 receiver and is QRL with an 813 final. FAS is designing a new QSL card for the Evergreen 50 and Up Club. New officers of the Boeing Employees Amateur Radio Society (BEARS) are K7KYG, pres.; NDP, vice-pres.; K7MBG, secy.; Carl Robinson, treas.; Don Nowak, trustee. K7IRO, now DL4FE in Germany, sent the SCM an interesting letter. Look for him week ends on or around 21,195 Mc. K7CWO received a new 24-hour clock from Santa. GYF was elected manager of WSN. K7PXV designed and built a 2-tube t.r. switch good for 50-db. attenuation with the key down also a key monitor and receiver muter for the Apache. SAB and XYL vacationed in the Southland. AMC and his XYL celebrated their 48th wedding anniversary Jan. 1. W7FPV joined the ranks of Silent Keys Dec. 30. VLC was on a short leave from Pensacola. FQD and his XYL visited from Fort Ord. K7PIY has a new QTH. MCU is attending school in Oklahoma. MPH is heard on 29.51 Mc. with new gear. The Skagit Club held its Annual Christmas Party at SMN's QTH. Traffic: W7BA 1352, DZX 1057, APS 84, OEB 72, GYF 71, GIP 70, AMC 43, K7PXV 37, W7BTB 21, QLH 19, IST 16, ACA 14, K7CWO 9, W7AXT 8, AIB 5, USO 5, K7CHH 2.

PACIFIC DIVISION

HAWAII—SCM, John Montague, KH6DVG—SEC: CQV, RM: DVD, PAM: EGL. With regret we note the passing of CLF, 1962 officers of the Maui ARC are BXH, pres.; CFM, vice-pres.; ATU, secy.; AUM, treas. C.w. is becoming more popular; DKD, EFO, EGL, DSE and ELA have new electronic keyers. BAS is Hawaii's only OBS. DVG is on 2 meters. WOFCL/KH6 makes his presence known on a.m. EGQ is sending frequency standard transmissions on 21.250 kc. at 2330Z, M-W-F., 14.200 kc. at 0130Z and 7150 kc. at 0230Z T-Th-S, with an accuracy of 1 part in 108. CB is starting classes for Novice and General Class licenses. IJ is testing a Mosley CM-1. The POI net, Hawaii section traffic net, is now on a M-T-W-Th-F-S schedule on 3750 kc. at 1900 HST. All are invited to join the fun. Traffic: KH6DVD 86, DVG 55, EGL 31, ARL 28, EFO 13, KR6MH 12, WA4CLK/KH6 11, KR6MA 10, 6MB 4, KH6BZF 1.

NEVADA—SCM, Charles A. Rhines, W7VIU—SHY is going to KG6-Land for six months. BYR gave a talk

(Continued on page 114)

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aided by films of his recent African trip to the NARA. MAH and family visited in Reno, QHH is active again with a half-gallon. KHU tried out his new KWM-2 aeronautical-mobile on a pheasant-hunting trip to South Dakota. CNG is ill in the hospital at Elko. K7ETN and his XYL GGE have moved to W6-Land. KLT now is living in a trailer. ANK now is a mechanic for the Reno Fire Department. FEM, club station at the Fallon Naval Base, is activated. KBN operated HYP on the first RTTY QSO. ICW has a new Hy-Tower. EC YKC has organized an AREC net in Las Vegas. K7RKH, K7ICW and K7KBN are new Asst. ECs in Las Vegas. K7KBN is the first OBS in our section. Present section appointees: SEC, JU; ECs, YKC; PC, HJ, AEC, K7KRH, K7ICW, K7KBN; ORS, YIU, OO, KHU; OO, W7YKC; OBS, K7KBN. Traffic: (Dec.) K7KBN 63, W7PBV 5. (Oct.) W7KHU 286.

SANTA CLARA VALLEY—SCM, W. Conley Smith, K6DYX—The recently-organized Sequoia High School Amateur Radio Club in Redwood City reports its officers are WA6QDP, pres.; WA6QYJ, vice-pres.; WV6RCJ, secy.; WA6OWG, treas. The club claims two new Novices, WV6UWZ and WV6VCZ; also WA6RLA and WA6RUH just got their General Class tickets. Officers of the San Mateo RC are K6PJW, pres.; WA6CXJ, vice-pres.; W6UQ, treas.; and WA6PBN, secy. Officers of the SCCARA are W6DJP, pres.; WA6KCY, vice-pres.; K6DEZ, secy.; and K6YKG, treas. Incidentally it's W6AUC (not WA6AUC) who is prexy of the SCARS, as recently reported. 'Scuse it, Russ. The most engrossing activity in the section during December was of course that associated with Oscar. WA6HRS and other OBSs dutifully transmitted tracking data. K6GZ and his crew, WA6OLQ, W6YBV, K6KCB, K6GID, K6DMW, K6DYX W6WX, W6ZRJ, W6AIT and W6HC, expedited Oscar radiograms coming through NTS to Hq. in Sunnyvale. Innumerable 2-meter men in the section submitted observation reports of Oscar passes. Notable among these was that rather elaborate and well-organized observing station of the W6ASH MARS group. The first month of operation of the Santa Clara Valley Section Net was auspiciously successful with 120 messages handled in 19 sessions. Under the managership of WA6EIC, PAM, the net meets Mon. through Fri. at 0400Z on 146.7 Mc. and through the NTS, relays traffic to all points. Traffic: (Dec.) K6KCB 679, K6GZ 424, K6DYX 370, WA6OLQ 258, WA6EIC 134, W6FON 90, W6HC 73, K6BBF 66, W6AUC 51, W6OII 36, W6YBV 18, K6VQK 16, W6RFF 15, K6SMH 13, WA6BZE 8, WA6HRS 8, K6EQE 6. (Nov.) W6ZRJ 54, W6FON 26, W6YHM 5.

EAST BAY—SCM, B. W. Southwell, W6OJW—K6ZYZ made the BPL. K6GK is remodeling his hamshack. K6ZYZ is asst. mgr. of RN6. The CCRC held its December meeting in San Mateo. WA6FKN joined the CHC and is No. 372. K6HYY and WA6HYU, newlyweds, have moved to Sacramento and started Calamar Electronics Co. WA6KLL finally worked a Utah contact after two years of trying. WA6IOU, WA6RMS and W6TXY have returned from service in the Army. W6GSR, W6TYM, W6TXY, W6NTU, K6EKD and WA6KLL are mobiles in Livermore Valley. W6UZM ex-KL7DKV, transferred from FCC Alaska, is a new member of the LARK. W6LZL is going to W5-Land and W6KZN is the new activities chairman of the LARK. K6IXH has his 75-meter mobile perking. WA6LVX is resigning as manager of NCN because of the pressure of school work. New officers of the HARC for 1962 are WA6JCS, pres.; W6NYK, vice-pres.; WA6HKD, secy.; W6UGO, treas.; K6YBS, sgt. at arms. K6HGO is a new member of the HARC. The NCN had a good turnout at its tenth NCN Dinner. New officers of the ORC for 1962 are K6DOQ, pres.; K6LWA, vice-pres.; WA6PTU, secy.; WA6KUK, treas.; WA6OLF and K6OXK, sgt. at arms. W6JOH is chief operator of the ORC station. W6OT, K6OXK was QRL flu-bug" during Christmas. WA6OLF is sweating out his General Class ticket from the FCC. K6CCQ, the son of K6KQD, is soil chemist for the Bureau of Reclamation at Fresno. The BAYLARC officers for 1962 are WA6AIK, pres.; WA6GQC, vice-pres.; WA6LIZ, secy.; WA6JGR, treas. The BAYLARC certificate custodian is K6SZT. The Bay Cities Six Meter Net meets on 51.15 Mc. at 8 P.M. Wed. and Sat. nights. Traffic: (Dec.) K6ZYZ 510. (Nov.) K6GK 130, K6ZYZ 114.

SAN FRANCISCO—SCM, Wilbur Bachman, W6RIP – W6BAA entertained the S.F. Club members at the Annual Christmas Dinner and brought along his jr. operator, who is running a close second to dad on the ventriloquism act. W6OLO, Lockheed Missiles and Space Division, spoke to the S.F. Club at its January meeting. Nick is technical advisor on Project Oscar. WA6DTQ spent a few days in the hospital. The CCRC meeting for January was held under the sponsorship of the BAYLARC group. Estelle, WA6ALK, new president of the local YL Club and her OM W6UDL, president of

(Continued on page 116)

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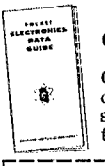

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QT-3

the S.F. Club, took in this meeting and remarked on how much is accomplished at these group meetings and how they both enjoyed greeting the representatives in person. New president Elza Petts plans to have presidents' night in the CCRC soon so the various club presidents can have a better understanding of what takes place at the monthly council meetings. W6QMO is once again net manager of NCN. She also accepted assignment as Route Manager for this section. Congratulations to W6KSF and his XYL on the birth of their first grandchild, John David Mangianti. W6BYS received recognition for his assistance in handling traffic for the SS *Hope* Project. Bill put in many hours on this and should be congratulated by all the amateurs for his good work. W6FDU has taken over the job as editor of *S.F. News*. Because of long business hours W6NCK had to give up the job. The Marin group lost a good friend and worker when W6WJF became a Silent Key just prior to Christmas. He and his XYL, W6FEA, were well known in both the Southern and Pacific Areas. W6BIP enjoyed his trip to ARRL Headquarters and had the opportunity to meet the gang and see some real snowstorms. W6MLK, HAMS Club, invites all amateurs visiting the area to drop in on its monthly meeting the 4th Fri. of each month at the Red Cross Bldg., 1525 Van Ness Ave., S.F. W6KZF reports that tests on 29 Mc. have proved this frequency inadequate for general Bay Area coverage by the AREC Net on Sun. at 10:30 A.M. so drill and discussions will continue on 3900 kc. in spite of the heavy QRM. There is a possibility of some tests on 160 meters. Local groups in Santa Rosa, Eureka and other cities of the section are urged to have a station from their nets check in to AREC. KZF has been in touch with the Marin Club and the Mill Valley Police regarding methods of alerting for using the mobile net for emergency or disaster operations. In order to keep the mobiles covered by state compensation insurance alerting must be done through the San Rafael Red Cross. Congratulations to K6ONJ 1 measurement, average error in parts per million 1.4; W6GQA 4 measurements; average error in parts per million 1.8; and K6LCF, 1 measurement, average error in parts per million 1.7 in the ARRL FMT. K6QJB is working on a homebrew receiver and says conditions are poor for traffic because of skip. K6ONJ hopes to jump in on the DX Tests A1 and A3 s.s.b. during '62. Traffic: K6JFY 168, W6QMO 155, K6SAA 80, K6QJB 51, W6GGC 22.

SAN JOAQUIN VALLEY—SCM, Ralph Saroyan, W6JPU—K6ODA has been appointed SEC for San Joaquin Valley and all ECs are requested to send reports to him. W6SRU has moved back to Fresno. WA6UOD is a new call. WA6BSL and K6MIO are experimenting with 420-Mc. TV and report good results. W6BJI and K6OGX report hearing Oscar loud and clear. WA6RDX has an MBF on 6 meters. W6PPO is reported to be heard on 6 meters. W6JPS is rebuilding Command receivers. W6FXV has a 20A on all bands. W6KTW is s.s.b. on all bands with a Heath exciter and Valiant amplifier. W6DBG is heard on a.m. in Fresno. The SJVN reports 507 check-ins, 36 contacts, 4 QSTs, 12 bulletins and traffic of 1, with 26 sessions. K6LKJ is operating portable at Bass Lake with a KWM-2. W6ONK has sold his equipment. W6UBK has an HT-37 on 20-meter s.s.b. with a rhombic. W7JSG was a recent visitor in Fresno. W6PXP is mobile on 40-meter s.s.b. with a Swan transceiver. W6OWL is heard mobile on 40-meters s.s.b. K6ZCD is heard on 6 meters. W6FEE has an HT-37 on 75-meter s.s.b. W6OUX is thinking about an s.s.b. transceiver. I would appreciate news from any of you fellows on the outskirts of Fresno.

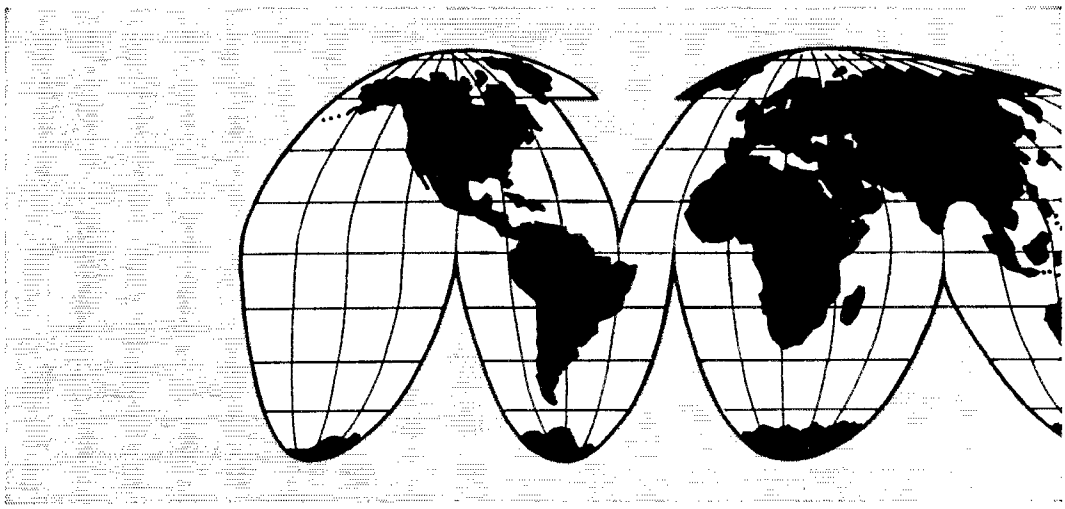
ROANOKE DIVISION

NORTH CAROLINA—SCM, B. Riley Fowler, W4RRH—PAM: W4DRC. V.H.F. PAM: W4ACY. RM: K4CPX. Congratulations to the amateurs in Eastern North Carolina, some twenty-two of them, who combined their resources and bought a Viking Ranger for one of the gentleman amateurs in the area, W4BAW. Al lost his Driver when the e.d. equipment was transferred to the Washington Area. W4MFK, EC for the area around Hillsboro, visited the SCM recently. Jim has a van equipped with some four transmitters and associated receiving equipment, a p.a. system, flood lights, a cot for sleeping, a hot plate, an electric heater and a generator to operate all the associated equipment. Aside from his activity as EC, Jim is a member of the CAP and Air Force MARS. Anyone interested should contact Jim. He has one of the neatest installations that I have ever seen, all in a small panel truck. Any of the units can be operated remotely and a plug is provided for commercial current. Many amateurs ask me *when* to get their activity reports to me. I would like to have them by the first of the month. I usually make this report on about the fifth of the month; any reports that reach me after that time are simply filed. These reports appear

(Continued on page 118)

AN IMPORTANT MESSAGE ABOUT **HARVEY'S** NEW GLOBAL ORDER SERVICE...

A special handling service has been set up by Harvey Radio to handle world-wide orders promptly and reliably – to assure the equipments safe arrival in perfect operating condition in the quickest possible time. Here's how it works:



- All orders for ham equipment are personally supervised and handled in all phases by hams. W2DIO and his ham associates understand your needs and Harvey has the immediate answer in its large up-to-date inventory.
- Upon your instructions, Harvey opens the original factory sealed cartons and gives the equipment a complete inspection and checkout. You can be sure it works when it leaves Harvey.
- Each product is carefully packaged to exacting overseas requirements. Proper protective shipping methods assure you that your equipment will arrive in perfect condition.

Hams around the world have always known Harvey to be a reliable source of supply. Now Harvey's Global Order Service adds blue-ribbon expediting to Harvey's well-established reliability. This combination assures you—more than ever before—of complete satisfaction.

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Harvey Radio carries a complete stock of RCA tubes for every power tube requirement.

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See us at the Single Sideband Amateur Radio Assocation Hamfest and Dinner. Statler-Hilton Hotel, N. Y. C. March 27th from 10 A.M.

two months after being written, so you can see how much news an activity three-months old would be.

SOUTH CAROLINA—SCM, Dr. J. O. Dunlap, W4GQV—The S. C. Fone Net is now on 3928 kc. instead of 3930 after agreement with the Wolverine SSB Net. K4JQY is a new OES. W4TLC monitored 23 passes of Oscar I as it circumnavigated the globe. The SCN welcomes several new stations, among them K4OPX, W4OFB, K4ZDK, K4LYY, K4VVV and WA4DGH. New officers of the Augusta-Belvedere Club are W4NMJ, pres.; K4FWB, secy.-treas. In the Tornado Alert Jan. 6, called by the SEC at the request of the Weather Bureau in Charleston, the phone net on 3930 kc. stayed in operation through the day with 130 stations checking in from the state and standing by. Liaison was established with the Weather Bureau, c.d. and the Air Force Installations. The SCEN members are to be commended for their interest, efficiency and readiness to render public service. Big John, W4FFH, is back on the air after recent hospitalization and surgery. Traffic: K4ZHV 168, W4AKC 97, K4WJR 75, K4OCU 41, K4WOI 20, K4KCO 17, W4PED 16, W4CHD 16, W4NDH 4, K4PJW 4, K4YFK 3, W4YPD 2.

VIRGINIA—SCM, Robert L. Follmar, W4QDY—Asst. SCM: H. J. Hopkins, W4SHJ. SEC: W4VMA. RMs: W4LK, K4MXF, K4KNP, W4SHJ, W4QDY. PAMs: W4BGP, K4JQO, K4PQV. Your SCM has returned from 6 months in Cuba. W4SHJ carried the ball during that time. K4EZL is in French Morocco; W4CGE in VP5-Land. W4DLA received EAN and A1 Operator Club certificates. K4QIX is turning in traffic totals despite working extra. W4OWV, the ole workhorse OBS, makes his regular reports of skeds. W4PRO and K4QIY are back to school after the holidays and working the net. W4WDZ is a newcomer and K4ORQ a new old-timer! OO K9VRV/4 has resigned as the Air Force ties up his time. Those making the BPL are W4PFC, W4SHJ, W4FOR, K4YZT, K4FSS, W4LRN and K4EVY, who made it the hard way —by mobile! Ole W4ZM got himself a passel of traffic when he "volunteered" for 4RN. Tech. Class licensee K4NNP reports 92 handled on 50.4 Mc. Our net managers report that long skip has affected 80-meter operation. K4TSJ is sporting a new Drake receiver besides a keyer. K4IIP is working on his c.w. Nice club reports were received from Roanoke, Richmond, Lynchburg and Arlington. EC W4FOR views increased activity in 1962 in Princess Anne Co. A new OES is W4FJ with very FB Oscar reporting. The SCM and Asst. SCM visited the Hampton 6-Meter Club at Deepcreek, Va., to spark 6-Meter traffic net establishment in the Tidewater Area. Traffic: (Dec.) W4PFC 1122, W4SHJ 683, W4FOR 652, K4YZT 237, K4EVY 213, K4FSS 211, W4DLA 206, K4TSJ 194, W4LRN 176, W4LK 157, W4WDZ 149, K4MXF 131, W4PRO 129, W4ZM 118, K4NNP 92, W4OOL 92, W4RHA 91, W4CGE 83, K4QIX 64, W4NVX 56, K4PRQ 34, W4CWT 33, K4MLD 28, W4IA 26, K4AL 22, K4JQO 15, K4IIP 14, W4BZE 12, K4DCN 11, K4SGQ 11, K4UVT 6, W4KX 5, K4QIY 5, W4OWV 4, W4TE 1. (Nov.) K4PRQ 34, W4OOL 30, W4BZE 15. (Oct.) K4TFL 17, W4JUJ 14, K4PRQ 4. (Sept.) K4TFL 4.

WEST VIRGINIA—SCM, Donald B. Morris, W8JM—K8LOU reports that WVN held 21 sessions in December with 105 stations handling 82 messages. W8HZA is active with the 6-meter net in the Kanawha Valley holding traffic training sessions. K8JSX has a new three-element beam and checks into the Huntington Weather Net. K8BLR has a new 60-watt 6-meter mobile with a Halo. K8CSG, having been called back to the Army, operates portable from Glen Burnie, Md., on 3890 kc. W8ESH reported to the SCM every month in 1961. W8VMP, W8MIS, W8TVO, W8OIV, K8JLF and W8GBF are active in frequency measuring work. K8MYU has received Worked Conn. and Worked Mass. Awards and made WAS from his new QTH in six months. K8RPB reports that from Chester to Wheeling there are 47 2-meter stations and he has worked 187 from his new hilltop QTH. K8AXU and K8KXD are active on 2 meters. W8JM attended the Mountain State Transmitters Radio Club meeting at Elkins. W8GIU continues to prove that you can work the world on low power. W8JFP is building a high-power amplifier. Traffic: K8MYU 255, K8CNB 88, K8LOU 63, W8HZA 51, W8NYH 43, K8CSG 12, K8RPB 8, K8JSX 6, W8JM 4.

ROCKY MOUNTAIN DIVISION

COLORADO—SCM, Donald S. Middleton, WØNIT—SEC: WØSIN. PAMs: WØCXW, WØLJR and WØGNK. RM: WØFEO. OBSs: KØDCC and KØEPD. WØMOX reports the 1296-Mc. converter and parametric amplifier ready for use and the 432-Mc. converter nearly finished. WØENA, at Pueblo College, and WØYQ at Colorado U. are experimenting on 440 Mc. in an effort to establish a TV contact. WØWJR gave a talk on auto-call systems

(Continued on page 120)

Leo I. Meyerson
WØGFQ

LEO SAYS:

The CM-1 Offers Fine Receiver Performance — ECONOMICALLY

NO MONEY DOWN WITH WRL'S CHARG-A-PLAN SYSTEM

Features: DOUBLE CONVERSION with crystal HF osc. DIODE and PRODUCT detectors; FULL coverage of all ham bands 80-10 meters; accurate calibration in 5Kc steps; "S" meter functions all modes of reception; 12-tube performance; selectivity 2.5Kc at 6DB; less than 500 cycle drift after 10 minutes. Sensitivity ½ UV for 10 DB S/N ratio on 10 meters; image and IF rejection 35 DB or better . . . 115VAC internal supply.

MOSLEY CM-1 RECEIVER $169.95

- **Clean, functional layout.**
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BOTH CM-1 RECEIVER & SPEAKER JUST $9.00 per mo. NO DOWN PAYMENT

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TOP TRADE-IN ON YOUR PRESENT EQUIPMENT — ASK US!

Send for our Giant, 3-Color USA Call Zone Map, 50c prepaid.

LATEST RECONDITIONED EQUIPMENT

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SEND FOR DESCRIPTIVE BROCHURE ON COMPLETE LINE OF COMET KITS!

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LEO: I want the CM-1 and speaker, payment enclosed ☐. I prefer to use the Charg-A-Plan with no money down. Rush information ☐. Quote Trade-In Value of my_____

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and vibrasponders at the December Western Slope Club meeting. High winds took their toll of antennas in December. WØETT lost his 60-meter antenna just prior to the Christmas rush. KØWGC is the new Asst. EC for Delta County. K8NXX will be stationed at Lowry AFB for six months. Look for him on 6 meters. Congratulations to WØFEO for an impressive first edition of the CCW Bulletin, to KØDCW for his new RO appointment in the state RACES program and to WØIA for his fine amateur radio service record in 1961. Gene is a nominee for the Edison Award. Oscar was first heard and reported in the state by WØIC, a former director. It has managed to elude most of our Colorado hams. BPL awards go to KØRTI, KØWWD and WØBES. Traffic: WØBES 812, KØWWD 507, RTI 290, WØETT 140, KØDCW 102, WØBWJ 83, KØWGC 49, KØEYG 37, WØCWD 25, KØZSQ 23, WØMYB 21, KØLCZ 12, KØCDA 4.

UTAH—SCM, Thomas H. Miller, W7QWH—SCM: John H. Sampson, 70CX, SEC: K7BLR. Officers of the UARC (Salt Lake) are JHM, pres.; APY, vice-pres.; MWR, exec. vice-pres.; EHX, secy.-treas. Kearns amateurs are considering the organization of a club, as is a group in Bountiful. A group at Hercules Powder Co. has been organized. Officers of the Ogden ARC are K7OIP, pres.; NHQ, vice-pres.; K7DOT, secy.-treas. OCX made the BPL. OCX, QWH, TFD, VTD and K7BGU earned BRAT Awards on BUN. TFD is mobile on all bands and has 300 watts on 80, 40 and 20 meters from the home rig. K7NWP is in the building process on a kw. final for c.w. K7HFV, QDJ and K7HVE turned in several reports on Oscar. BUN statistics were up in December because of the usual holiday traffic plus reports on the satellite. Traffic: W7OCX 399, K7NWP 117, W7QWH 35, TFD 8.

NEW MEXICO—SCM, Newell F. Greene, K5IQI—Asst. SCM: Carl W. Franz, W5ZHN. SEC: W5BQC. PAM: W5ZU. V.H.F. PAM: W5FPB. RM: W5ZHN. The Breakfast Club meets Mon. through Sat. at 0700 MST on 3838 kc. NMIEPN meets Sun. at 0730 and Tue. and Thurs. at 1800 on the same frequency. TWN meets daily at 2000 MST on 3570 kc. The holiday season brought the usual number of backhome trips and mobile operation. W5ANB and W5KDB went to Oklahoma; W5GRI was in Phoenix. RTTY and v.h.f. seem to be making strides. A Roswell group has applied for a mountain-top repeater in the 2-meter band; and a White Sands, Alamogordo, group has one projected for Sac Peak. These and a few others contemplated should make it possible to work the entire state on low power. Traffic: W5ZHN 260, W5UBW 52, W5MYQ 36, K5ONE 23, W5GB 23, W5GD 12, K5HTS 2, W5EZQ 1.

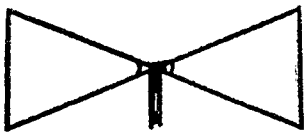
WYOMING—SCM, L. D. Branson, W7AMU—The Pony Express Net meets Sun. at 0830 MST on 3920 kc. The YO Net is a c.w. net on Mon., Wed. and Fri. at 1800 MST on 3160 kc. New hams: K7NZP, K7EAF, K7SAR. The High Plains Radio Society elected K7HAW, pres.; KN7POX, vice-pres.; K7QGW, secy.-treas. K7EMO, at K7HHB's Lander, held a 2-meter meet with UFB and the Casper gang successfully. K7KMR has a new radio shack—special by his dad. K7KMT is having trouble with the antenna tuner. W7BXS is hatching while his wife is at her Dad's bedside in Kansas. PYN is snowed in for the winter. HH assumed the RACES Radio Officer job with HDS as a new assistant. CQL is the new RACES manager for all nets. Traffic: (Dec.) W7BHH 71, K7KLE 31, ONK 16, W7AMU 12, CQL 5, AEC 4, K7AHO 4, HAW 4, IBU 2. (Oct.) W7BHH 21.

SOUTHEASTERN DIVISION

ALABAMA—SCM, Harvell V. Tilley, K4PHH—SEC: W4FQQ. RM: K4YUD. PAMs: K4BTO, K4PFM, K4KJD. New appointment: Harry L. Tooker, W4FQQ, P. O. Box 1962, Decatur, Ala., as SEC. The new AENP, Novice Net, meets on 3725 kc. at 1600 CST daily except Sun., 10 w.p.m. maximum speed. Net manager is WA4BDW. New NCSs for the AENP are WA4BDW, K4ZTT, K4ROR, W4OXU, K4UMD, W4FOE and W4HYI. The following received AEN certificates and manuals: AENT: K4FZQ, K4WWP; AENM: K4JSL, K4WQO. Thanks to K4AOZ and K4APF for their excellent SCM work the past two years. Traffic: (Dec.) W4FQQ 159, K4YUD 148, W4HYI 101, K4ROR 94, K4AOZ 90, W4OKQ 48, K4PHH 40, W4RLG 40, K4WHW 37, K4WOP 35, K4DJR 29, K4LNA 28, W4WHW 26, W4MI 22, K4WWP 18, WA4BDW 17, K4BTO 16, K4UMD 15, K4JDA 14, K4RIL 14, K4GXS 11, W4CIU 10, K4PBY 10, K4DSO 9, K4KJD 8, K4ZNI 8, W4YRO 7, W4DS 5, K4TDJ 5, K4WIF 5, K4LET 4, W4TOI 3, W4DFE 1, K4FTC 1, K4WSS 1. (Nov.) K4TRJ 18, W4OKQ 16, W4DS 4.

EASTERN FLORIDA—SCM, Albert L. Hamel,
(Continued on page 122)

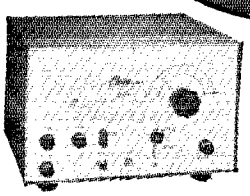
BULLSEYE BUYS at ARROW!



"Wonder Bar" 10 Meter Antenna

As featured in Nov. 1956 QST. Complete with B & W 3013 Miniductor. Only 8 ft. long for 10 meters. Wt. 5 lbs.

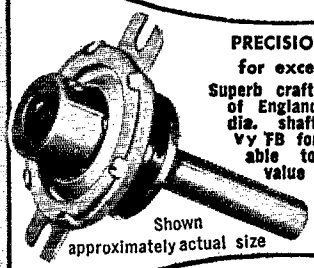
Amateur Net $7.85



99'er 6 Meter TRANSCEIVER

A true ham station, ideal for both fixed station and mobile operation.
Double conversion superhet gives you extreme selectivity and freedom from images and cross modulation.
Transmitter section has an ultra-stable crystal oscillator which also may be controlled by external VFO.
Efficient, fully modulated 8 watt final works into flexible Pi network tank circuit. Large S meter serves for transmitter tune-up procedure.

Amateur net price $139.95



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for exceptionally fine tuning

Superb craftsmanship by Jackson Bros. of England. Ball bearing drive, ¼" dia. shaft, 1⅛" long, 6:1 ratio, vy FB for fine tuning. Easily adaptable to any shaft. Comparable value — $5.95.

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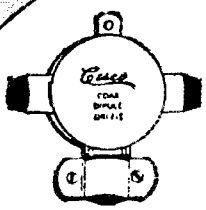
10 for $13.50

Shown approximately actual size

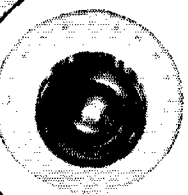


COAX DIPOLE DRI-FIT CONNECTOR

Ideal connector for dipole antennas. Completely moisture-proof, one-piece aluminum alloy construction. Handles power to maximum legal limits. Can be installed easily in a few minutes. For use with coaxial cables RG-8, RG-58, RG-11 or RG-59, or with 300-ohm twin lead. Has eye pull up for inverted V's. Weight, 2 oz.

Net Each $2.95

PRECISION BALL DRIVE DIAL



Another superb product of Jackson Bros. of England. 4" dia. dial with 6:1 ball drive ratio. Fits standard ¼" shaft. For that velvet touch...

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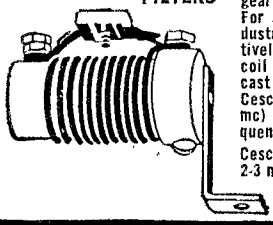

Tunable filter for 6, 12 or 24 volt generators; stops noise in mobile gear caused by generator brushes. For aircraft, amateur, C-B and industrial mobile uses. Conservatively rated at 30 amps. Phenolic coil form, brass hardware and die cast mtg. bracket easily installed.
Cesco Model 3-30 (Standard, 3-30 mc) or 30-60 (High Frequency, 30-60 mc) Net Each $2.95
Cesco Model 2-3 (Marine, 2-3 mc) Net Each $5.95

Versatile Miniature Transformer

Same as used in W2EWL SSB Rig — March 1956 QST. Three sets of CT windings for a combination of impedances: 600 ohms, 5200 ohms, 22000 ohms. (By using center-taps the impedances are quartered.) The ideal transformer for a SSB transmitter. Other uses: interstage, transistor, high impedance choke, line to grid or plate, etc. Size only 2" h. x ¾" w. x ¾" d. New and fully shielded.

Amateur Net $1.39
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SSARA HAMFEST & DINNER
Statler Hilton Hotel, N.Y.C. — March 27th

K4SJH—SEC: W4IYT. RM: K4KDN. RM RTTY: W4EHU. PAMs: 40 W4SDR, 75 K4LCF,V.H.F,W4RMU, S.S.B. W4CNZ. K4LVE needs news of YLs for *YLRL Harmonics* magazine. W4BKC reports the Orlando C.D. truck was robbed of all its radio equipment. W4WHK is gomg great guns on traffic. WA4BMC and OM WA4AZZ got their Tech. Class licenses recently. K4BY was ill over the holidays but is back again. K4LCF, the voice of FPTN, is back on the job after a nice vacation in the hospital. W4TRS is having rig trouble occasionally. K4MTP is selling his Morrow gear. W4LDM is a regular customer on GN now. Traffic: (Dec.) W4TUB 1328, K4SJH 1310, W4WHK 762, K4EHY 526, WA4BMC 521, K4FMA 514, K4BY 367, K4GBS 353, W4SDR 238, W4AKB 237, K4KGB 225, K4COO 223, K4AHU 221, K4LCF 217, W4HFD 177, W4TRS 155, K4OZS 153, K4ILB 148, W4DVR 140, K4DBT 135, K4KDN 129, W4EHW 114, W4UBS 102, WN4AKU 92, K4ENW 92, K4RNG 90, W4CNZ 87, K4RDX 81, W4LDM 79, W4ZAK 73, W4YPX 69, W4VCX 63, W4HTH 61, W4TRU 55, K4DAX 50, K4LVE 50, K4JWM 49, W4BKC 48, W4FFF 43, K4AX 42, W4UHB 37, K4BOO 32, W4KLP/4 30, K4AKQ 29,W4LMT 29, W4CWD 27, W4IYT 24, K4PPX 24, K4YOQ 23, WN4AME 21, W4HRC 17, W4HFR 16, K4VNA 16, K4ZIF 16, K4MTP 15, WN4COR 14, K4QQE 14, K8SXX/4 14, K4NVD 13, W4DQS 12, W4LSA 12, WA4AII 11, K4MNH 11, K4ZRP 11, W4TAS 10, W4SMK 9, K4YPN 8, WN4AZZ 7, WA4EDM 7, K4YBL 7, W4AYD 7, K4VGD 5, K4RHL 4, W4ARV 4, K4DAD/4 4, W4YOJ 4, W8LDU/4 4, K4MZR 4, W4OHA 3, K4LVL 2, K4TBG 1. (Nov.) K4DBT 317, W4SDR 305, K4LLI 30, K4JZU 29, K4NVD 19, W4BWR 10, K4OTJ 9, K4JZX 8, K4RNS 6, WA4BGL 3, WA4AII 3.

WESTERN FLORIDA—SCM, Frank M. Butler, jr., W4RKH—SEC: W4MLE. PAM: W4WEB. RM: K4UBR. The tornado which struck Crestview in December provided a realistic test of our AREC nets. Four 10-meter mobiles from Ft. Walton and a portable fixed station were on the scene reporting damage and handling welfare traffic. Later the c.d. communications van from Gulf County, with 75-meter gear was moved in. State Nets B and D and local 10- and 2-meter nets handled over 100 messages. Fort Walton: WN4DYN and W4TJO have "Twoers." W4ZGS will be /mm this summer in the new boat. K5RXT/4 made several 2-meter mobile contacts while in town recently. W4MLE arranged for new official Florida road maps to publicize the 29,560-kc. statewide mobile frequency. Traffic: (Dec.) K4UBR 499, W4BYE 375, W4MLE 100, K4VND 50, K4SWQ 48, K4LOL 42, W4CMG 10. (Nov.) K4CNY 226, W4MLE 83, WA4AGL 30, K4LOL 17.

GEORGIA—SCM, William F. Kennedy, W4CFJ—SEC: W4PMJ. PAM: W4LXE. RM: W4DDY. GCEN meets on 3995 kc. at 1830 EST Tue. and Thurs., 0800 Sun. GSN meets Mon. through Sun. on 3595 kc. at 1900 EST and 2200 EST. The 75-Meter Mobile Net meets each Sun. on 3995 kc. at 1700, W4LG as NC. The GPYL Net meets each Thurs. on 7260 kc. at 0900, K4KIH as NC. The Atlanta Ten-Meter Phone Net meets on 29.6 Mc. at 2200 EST each Sun., W4BGE as net mgr. The Ga. S.S.B. Net meets Mon. through Sun. on 3975 kc. at 2000 EST, W4RZL as net mgr. One of Georgia's long-loved amateurs passed away during the month of December. W4DOC, of Atlanta, died of a heart attack on the way home from an office Christmas Dinner Dec. 21, 1961. Bill had been an amateur for over 25 years. None of us can truly know the deep sorrow of his XYL. K4DNL. W4PIM made BPL for the third straight month. W4LME has been appointed ORS. W4HYW has a Hy-Gain HT-18 installed for 80/40 meters. K4PKK is enjoying his new SX-101A receiver. A certificate for 100 per cent ARRL membership was received by the Columbus Amateur Radio Club in December. W4AHA was selected chairman for the next Columbus Hamfest. Traffic: W4PIM 200, K4ZYI 89, K4BVD 63, W4LME 53, K4QPL 46, W4HYW 34, K4TEA 13, W4RTY 10, K4RHU 3, K4ADI 2, K4BAI 1.

WEST INDIES—SCM, William Werner, KP4DJ—CD Radio Officer: MC. QSL Mgr. YT. BDS represents P.R. on 4RN. 4RN traffic frequencies are 3547 kc. at 0045 and 0230 GMT daily and 7125 kc. at 1500 GMT daily. CH operates as a member of OCD Region 1 RACES network in Puerto Rico, and handles c.d. traffic to KIIZU at regional headquarters Harvard, Mass., on 14,082 kc. at 1230 GMT, Wed. 21.3 Mc is used for local ragchews after 2400 GMT by CH, DJ, SV, RM, ACF, APY, ASK, AQK and BCA. WP4AYP gets up at 0900 GMT to work European DX on the 21-Mc. Novice frequencies. ASK now owns AYZ's Viking I. DJ kept skeds with CH and ASK while operating portable in N.Y.C. on 21 Mc. New stations on the 40-meter C.D. Net are ATM, BAE, BAH, BBI and BBN. BDQ is a new station on 50 Mc. KV4CI joins the 40-meter roundtable with KP4s. K9ZSS. K9VAH and KØTTQ, on a Navy ship in San Juan, worked 50 Mc. for the WPR Award.

(Continued on page 124)

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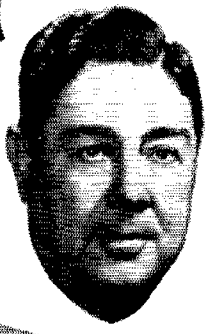

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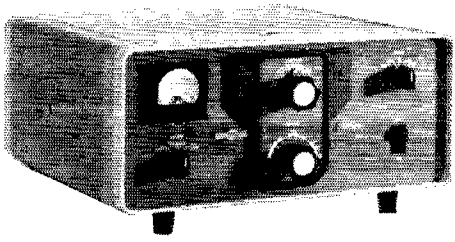

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W5WPM/MM worked KP4s on 40 meters while on a ship at Ponce. AXS and AXT are now WOFBW and WOFBX at Rapid City, So. Dak. API is home from Princeton and is building a mobile rig using a transistor modulator and power supply. PJ2AF, YV2BA, and UC2AA earned PRARC WPR25 Award certificates. YV5AUY and his XYL YV5BEG now live in P.R. AWH made WAC, needs only Utah for WAS and his DXCC is 105-75. BCL is on 40 meters from a Los Angeles development using a 500-watt linear and a Drake 2A receiver. Traffic: (Dec.) KP4WT 153, CH 6. AWH 5. (Nov.) KP4AWH 4.

CANAL ZONE—SCM, Thomas B. DeMeis, KZ5TD —The Canal Zone Amateur Radio Assn. elected KR, pres.; SH, vice-pres.; PR, treas.; GS, secy.; JT, act. mgr. SH was partially inactive working to get his antenna higher but is now back on. LE is on the air with his new KWM-2. CG and SW put up new tribander antennas. The Crossroads Amateur Radio Club elected CD, pres.; LW, vice-pres.; OB, secy.; BK, act. mgr. A new ham is KZ5MGN, the father of KZ5GM. SS put up a new tribander and is using a Valiant. LW put up a quad. HF was hospitalized with a back injury. MS is on the air again with an Apache and an SB-10. MS and DI have been experimenting on 6 meters with low-powered gear and are planning on improving their antennas. KR is in Oklahoma City attending the FAA School up there for two months. Traffic: KZ5JW 62, OA 50, OB 43, JT 36, AD 34, TD 16, HO 12, CD 9, FG 3.

SOUTHWESTERN DIVISION

LOS ANGELES—SCM, Albert F. Hill, jr., W6JQB—SEC: K6YCX. RMs: W6BHG, WA6ROF, K6LVR. PAMs: W6ORS, K6PZM. The following stations earned BPL for December traffic. W6GYH, K6EPT, WA6ROF and W6BHG. Congrats, fellows! Many stations have reported hearing Oscar during its trip around the world. WA6ROF has taken himself an XYL and made the A-1 Operator Club. Congrats, Jerry! W6UGA was doing fine in the SS until his final blew up! W6QAE is a new member of the OTC. WA6DWP took a trip to San Diego and Mexico. WA6MFH is putting up a new 80-ft. tower. WA6KVS attended the NCN dinner "up north" and operated a.m. on the way up. K6TCX and W6EBK spent the holidays at the Salton Sea. New officers of the Inglewood Amateur Radio Club are K6HCY, pres.; W6AQB, vice-pres.; WA6POC, rec. secy.; W6PFE, corr. secy.; W6NNT, treas.; K6JBV, sgt. at arms. The shack of W6NKR was broken into and 2-meter gear was stolen! W6SRE received a 24-hour clock from Santa. New officers of the 50 Club of California are W6ZPM, chairman; W6SBC, secy.; W6AGK, treas.; W6FMO, sgt. at arms; W6RAY and W6TDW, directors. W6VOZ has a new 40-ft. 3-band vertical up. W6ORS and W6BHG are building new shacks. New officers of the San Fernando Valley Radio Club are W6UEJ, pres.; WA6ASA, vice-pres.; WA6JZO secy.; WA6AYM, treas. The clubs noted many fine Christmas dinners and parties. Support your section nets: On c.w., the Southern California Net meeting at 0300 GMT on 3600 kc. daily; on phone, the SoCal Six Net meeting at 0300 GMT on 50.4 Mc. Traffic: (Dec.) W6GYH 1118, K6EPT 790, WA6ROF 635, K6OZJ 490, W6BHG 242, K6IWV 192, W6USY 156, WA6GRG 146, WA6KAW 138, W6QAE 132, W6WPF 126, K6SIX 123, WA6JOC 100, WA6CKR 57, K6HOV 44, WA6JDB 42, WA6MFH 42, WA6DWP 10, WA6KVA 10, WA6KVS 9, W6CG 8, W6NKR 8, W6CK 7, W6SRE 6, WV6SLF 4, W6UGA 2. (Nov.) W6GYH 675, W6SYQ 473, K6OZJ 306, WA6JOC 103, W6NKR 6, W6SRE 2.

ARIZONA—SCM, Kenneth P. Cole, W7QZH—Asst. SCM/SEC, George Mezey, K7NIY. PAM: OIF. RM: LND. The Copper State Net meets at 1930 MST Mon. through Fri.; the Grand Canyon Net Sun. at 0800 on 7210 kc.; the Tucson AREC Net Wed. at 1900 on 3880 kc. Tucson amateur radio operators assisted in the United Community Campaign by dispatching mobiles to pick up contributions. Those participating were SQX, DRC, IWJ, BZV, EVE, CUR, K7JTX, K7EVZ and KN7QAU. If you have a valid FCC amateur license (excluding Novice) bearing a 7th district call and are the registered owner of an automobile you are eligible for call letter license plates. Apply to the Division of Motor Vehicles, Arizona Highway Department, 1739 West Jackson Street, Phoenix, Ariz. The Catalina Radio Club is establishing a club library. Anyone desiring to put technical books to good use, please contact Phyllis Douglas, 6334 Calle Pegaso, Tucson, Ariz. In the contest held by Motorola Amateur Radio Clubs 7YWF won first prize, FKK has a 60-w.p.m. Certificate of Achievement issued by the Connecticut Wireless Assn. To any who wish to write Bruce Green, K7MEV, our exchange high school student, his address is 53 Chen Boulevard, Tel Aviv, Israel. The special Arizona Semi-Centennial certificate is now being issued. See Jan. *QST* Station Activities for rules and qualifications. W7GAQ received his WAS certificate. Traffic: WOWHE/7 338, W7LND 228, FKK 32, YWF 29.

(Continued on page 126)

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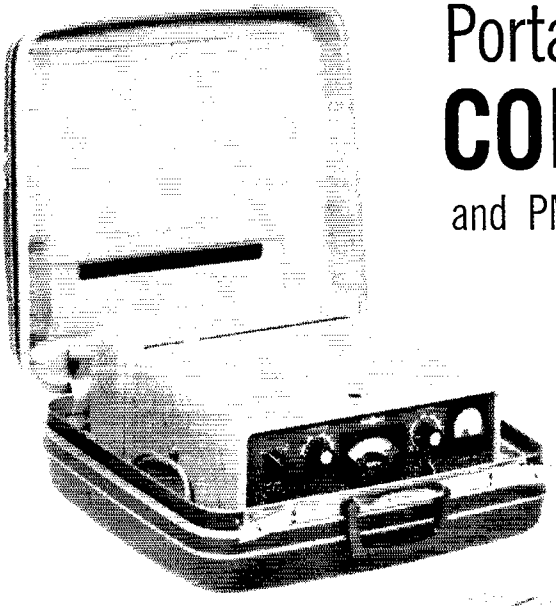

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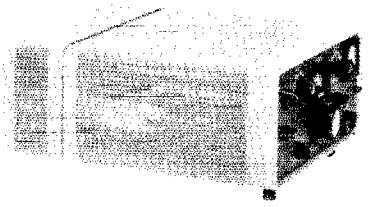

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SAN DIEGO—SCM, Don Stansifer, W6LRU—K6TFT reports six ex-police rigs now are converted for c.d. use in the South Bay. New officers of the American Radio Club in El Cajon are WA6IVC, pres.; WA6DZE, treas.; and jr. division officers of WA6BJM, pres.; WA6DNT, secy. K6LKD, in Escondido, reports problems with long skip on SCN during December. 3.5 Mc. is becoming a good DX band. A number of locals reported hearing Oscar during December. WA6JOF, of Alpine, was awarded the Florida Skip Outstanding Award in December by Division Director W6MLZ at the San Diego Council meeting. WA6JOF, ex-HC6JQ, helped twin bedridden boys get their tickets, with Collins furnishing a KWM-2 and the Coronado Club doing the antenna and installation work. Their calls are WA6QMX and WA6QMY. Also attending the December Council meeting was W6QJW, Division Vice-Director and his XYL, and the president of the Los Angeles Council plus an XE2. W6BZE and his XYL vacationed in South America in January. Dean Freudenberger, Methodist Missionary to the Congo, spoke to the Orange County Club in December, and told of the part amateur radio played in saving him and his family. New officers of the San Diego DX Club are K6BHM, pres.; K6ENX, vice-pres.; W6CAE, secy.-treas. The January meeting was held at the home of W6RCD. Both W6FAY and WA6PAH now work at Scripps in La Jolla. W6KEY, who helped your SCM get on the air from Santa Barbara in 1934, is now in San Diego with the Telephone Company. Welcome, Wayne. K6BPI, OBS, OPS and ORS, was nominated for the Edison Award. Traffic: K6BPI 2814, W6YDK 2453, WA6CDD 800, W6EOT 740, K6LKD 279, K6TFT 52.

WEST GULF DIVISION

NORTHERN TEXAS—SCM, L. L. Harbin, W5BNG—Asst. SCM: E. C. Pool, W5NFO. SEC: K5AEX. PAM: W5AYX. RM: W5LR. My congratulations to K5HTM for his FB article in December *QST*. Now would be a good time to take inventory to see it you are a Mc Snood or if you are trying to live up to the Amateur's Code. All of us have been wondering why K5ENL was so sleepy two mornings after Christmas. It seems that Ed got a 24-hour clock from Santa and he stayed up two nights to see if it would really keep time through the 24 hours. Ed is the unofficial Net Control for a group get-together on 3930 kc. each morning. I have heard very little comment on Oscar I guess everyone has been busy trying to get all the Christmas presents up and working. I hope that is the reason why I failed to get any news for this month. Traffic: K5LBG 593, W5BKH 168, W5GY 134, K5HTM 112, K5QWR 74, W5LR 72, K5SXK 58, W5CUI 41, K5VWJ 32, K5IBB 25, K5BAJ 14, K5PXV 10, W5EUV 8.

OKLAHOMA—SCM, Adrian V. Rea, W5DRZ—The Annual Christmas Dinner sponsored by the Enid Amateur Radio Club was well attended and everyone had a good time. A new OBS is K5FKV; a new OPS is W5JMQ. The new voice from Delaware county is W5KEH. K5MBK is the new manager for the Oklahoma Phone Emergency Net. W5CRY, a prominent amateur and state director of Army MARS, retired after 49 years in the newspaper and printing business. Has K5KHA finally got a 2-meter rig that suits him? W5IWL had quite a ball while in Chicago and New York recently. Andy says if he missed any amateur supply houses it was unintentional. Two Oklahoma XYLs have just completed terms of office with the YLRL group, K5BNQ as president and W5JCY as NCS. Two Silent Keys within days of each other in Oklahoma City are K5BEY and W5HXJ. Amateurs in Lake Texoma Area are busy making plans for the State ARRL Convention to be held this summer. The Bartlesville Club, through the Explorer Scouts which it sponsors, has set up a really mobile communications van. Vinita amateurs also have purchased a communications van. Traffic: W5DRZ 169, K5MBK/5 137, K5IBZ 101, K5AUX 82, K5JGZ 79, K5OCX 73, W5FKL 45, W5FWW 40, K5ZFF 37, K5JOA 35, W5JMQ 34, W5ICQ 24, K5GPU 22, W5ADC 16, K5DMS 16, W5CCK 15, W5MFX 15, K5VNJ 15, K5ZCJ 14, W5WDD 13, K5FKV 11, K5OOV 10, W5PNG 10, K5RWL 9, K5BNQ 8, W5EHC 8, W5JCY 8, K5EZM 7, K5CBG 4, W5UYQ 4, W5CCV 2.

SOUTHERN TEXAS—SCM, Roy K. Eggleston, W5QEM—SEC: W5AIR. RM: K5BSZ. Several of the Southern Texas hams received Oscar on its passes over this part of the world. W5FMG and W5VY, both of San Antonio, reported a very good signal from it but with an occasional missing of dots. W5FMG heard it for as long as 12 minutes. Congratulations to K5TYK, WA5ALH and W5OMR on their emergency work in locating serum for a leukemia victim in Uruguay and getting it shipped via Pan American Airways. This is one of the rewards of amateur radio, knowing that you have lent a helping hand to someone in need. W5QEM has a new HT-37. He lost his voice just about the time he got it and it

(Continued on page 128)

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sat on the operating table for 12 days before he could hook it up. Conditions have certainly been poor in this part of the country. 20, 10 and 15 meters have been practically non-existent. 40 and 75 meters have been plagued with long skip and were no good for local work after about 2300 GMT. W5EJT worked over a dozen countries and all continents but Europe on 3.5 Mc. during the month of December. W5LGG worked 78 Countries, 35 zones and made 212 DX QSOs during the week end of Nov. 26. W5AQK and family visited in Kentucky during the holidays. New calls at Edna, Tex. are KN5MTO and WN5AMW. Traffic: (Dec.) W5AC 256, K5JFP 57, W5AIR 24, K5FPJ 6, K5BDY 3. (Nov.) K5MXO 123, W5AIR 33.

CANADIAN DIVISION

MARITIME—SCM, D. E. Weeks, VE1WB—Asst. SCMs: A. E. W. Street, VE1EK, and H. C. Hillyard, VO1CZ. VO1CZ reports on amateur participation in the Sixtieth Anniversary celebrations commemorating Marconi's history-making reception at Signal Hill of the first Trans-Atlantic wireless message. Harry states that some 470 contacts were made. Those deserving special mention include VO1FP, VO1FC, VO1BD and SWL Al McBride. K1NPS/VO1 and K8EFK/VO1 both qualify for Brass Pounders League certificates two months in a row (Nov. and Dec.). Reception of signals from Project Oscar have been reported by LT and KX. Deepest sympathy is extended to the family of DS, who has joined the ranks of Silent Keys. ADH reports the formation of the Seaboard Code Net, 3550 kc., 1930 AST Mon.-Sat., incl. AGT is spending the winter on course in Savannah, Ga. ST has a new tower and quad in operation. Your attention is called to the WANSC (Worked All Nova Scotia Counties) Award which is sponsored by the NSARA. Full details may be obtained from: NSARA, P.O. Box 663, Halifax, N.S. Traffic: K1NPS/VO1 740, K8EFK/VO1 732, VE1ADH 67, AAX 22, OM 11, AEB 4.

ONTARIO—SCM, Richard W. Roberts, VE3NG—The Scarboro ARC elected CLT, pres.; EPM, vice-pres.; EGN, secy.; DFA, treas. CIL is editor of the club bulletin. CFR now has an Invader. At this writing AX is seriously ill in the hospital. EMF is now in New Zealand and will be off to Australia soon. EQM now has an Advanced Class ticket in Chatham. CRG informs AX's XYL as to his condition on daily skeds. 2AGM is the new mgr. of OQN Net. CNV is mgr. of the Laurentian Phone Net. Sudbury elected AKL, pres.; BLZ, vice-pres.; CUO, secy.-treas. The Nortown ARC of Toronto now meets at 555 Wilson Ave. the 1st and 3rd Wed. CUG is on the Dew Line. CZG, ABE, APD, DSZ and HK held an SET at Elliott Lake. EXK was in Trinidad for Christmas. Third-party traffic may now be made with hams in Venezuela the D.O.T. has advised. DQC was presented with a membership to ARRL for a good job of teaching advanced courses in Cornwall. BFC was a visitor to G-Land recently. BDS is racking up the DX on 20 meters with his 35 watts. JU is on s.s.b., AUU, BFC, BDS and NN will go s.s.b. soon. XQ is now in Hamilton. AUU is the first winner of the "Bill" Thompson Memorial Trophy. Toronto has the green light to run an ARRL Ontario Convention next October. The use of our emergency frequency should be remembered, 3765 kc. is monitored, also 3770 kc. Traffic: VE3CYR 243, DPO 175, BAQ 136, BZB 107, NG 104, FAS 85, GI 82, CFR 76, EHL 76, AML 72, EAM 36, DRF 35, CKG 25, BSY 24, DH 24, NO 23, DWN 21, LK 21, PR 10, RN 9, CE 8, AMT 6, OT 5.

QUEBEC—SCM, C. W. Skarstedt, VE2DR—AGM is new net mgr. of OQN, taking over from WT. This net meets on 3535 kc. at 0001Z daily. The Que. Fone Net meets on 3780 kc. at 2345Z week days. UQ gets our Oscar for fine work during the tracking of Oscar. NT is a new OES. OJ and WA are interested in ORS appointments. We still are looking for OOs. Ex-VE4LJ now signs BIT and is a welcome addition to the Lake Shore gang. ALZ is having some trouble with the big final. EC reports the passing of AEM, whom he used to sked regularly. SF does a good job NCing those unwieldy 75-meter round tables. The St. Maurice Assn. has 75 members. ANK enjoys f.m. on 2 meters. Correction from last month: AGN should have read AGD. The 75-meter s.s.b. boys report good DX during the early morning hours. To emphasize the popularity of the 2-meter band we have a listing of 75 VE2s active on this band. After a few years in the U.S.A., ex-ANZ is back, now signing YX. PX uses an Eico transmitter on 75 meters. APU is building and BEZ VO1 enjoys SWL DX at Torbay. SC's hoist of a 90-ft. mast was quite an engineering feat. BFB is active as N.C. on the MECC 20- and 75-meter nets. *MARCOGRAM* (the MARC bulletin) now is in 3-color print. BDV, as editor, deserves much credit. Traffic: VE2DR 200, AGM 168, AUU 63, CP 60, BG 29, EC 28, BFB 7, AGQ 5, BDV 5, BAC 1, BEO 1.

(Continued on page 130)

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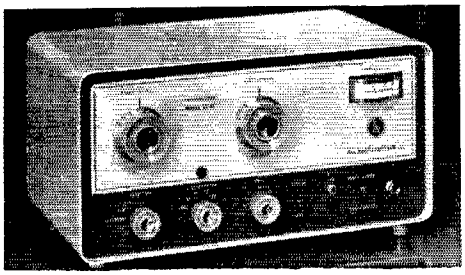

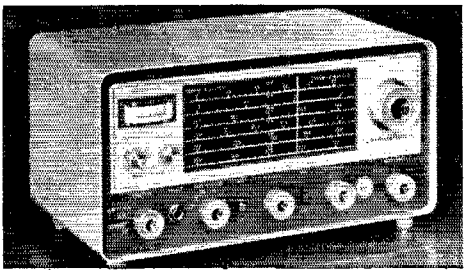

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ALBERTA—SCM, Harry Harrold, VE6TG—SEC: FS, PAM: ZPV, RM: AEN, ECs IU, SS, OO and OBS: HM, OPS: CA, ORS: WG, OES: DB. Fellows, AEN is looking for more check-ins to P.T.N. on Tue., Thurs. and Sat. at 2130 hours on 3600 kc. How about helping out? TW is confined to a wheelchair and would appreciate any calls his way. BJ is gathering junk all over his bench to rebuild and should be back on the air soon. HM has been nominated for the Edison Award. Nice going, Charlie. Some of the boys are working DX on 75 meters. PAM reports mostly blackouts on net nights. The SEC reports that ECs are moving along slowly. AFJ is heard burning the midnight oil on c.w. EO, QSL manager, asks that you get those self-addressed envelopes in as he has hundreds of cards in his shack. CA is sporting a TH-37 so is now "Donald Ducking" and sounds good but BC, the XYL, will not use it. Traffic: VE6HM 357, TG 11, AEN 9, ABE 4, PS 3, ADZ 2, VE 2, ABS 1.

BRITISH COLUMBIA—SCM, H. E. Savage, VE7FB—Our RM, AAF, and BCEN manager, BAZ, have moved their shacks out to a small mountain away from TV and the noise of the city. BGE is on 160 meters and looking for more VE7s to come up there. AOY is becoming an active c.w. traffic man. The VSWC's new officers are QB, pres.; AER, vice-pres.; DY, secy. The BCARA's officers are ALE, pres.; DZ, vice-pres.; YG, secy. The BCARA Cup Award went to BQ for his work on TVI. It is with sorrow we report that one of our popular gals, JFB, passed away from a stroke in December. BCM is heard at noon but not often after dark. Why? The Vancouver ARC's Christmas Dinner was a great event and those who missed the magician from San Francisco really missed a show. BBB, Eva, almost made BPL. Who is going to make it first in 1962? Christmas traffic reports show that traffic was down also band conditions did not help the matter any. We still are looking for ECs in some districts, and there are big things coming for the signers of Form 7 in 1962. Traffic: VE7BBB 87, BGE 50, AMW 21, AOY 3, AC 2.

SASKATCHEWAN—SCM, Jack Robinson, VE5BL—Now that we are into the new year it won't be long until hamfest time, so let's give the boys at Saskatoon a helping hand by planning to be there the July 1st week end with all the bugs ironed out of that mobile gear. Ed, ex-CW, is now 8NP located at Chesterfield Inlet using an HT-37 and an SX-111. SY also is the proud owner of a new SX-111 and an HT-37. JU, JI and LD report activity on 160 meters. BA now is retired and building an s.s.b. rig. DY is back on the air after 6 months rest with a new antenna for 75 meters. The second class for beginners sponsored by the Regina Club got underway in January with 12 prospective hams enrolled. HP reports over 400 contacts since receiving his phone ticket recently and expects to be mobile soon.

Youth Conference

(*Continued from page 22*)

Brookhaven National Laboratory; Dr. Hans A. Bethe, Professor of Physics, Cornell University Nuclear Laboratory; Harold B. Finger, Manager, Joint AEC-NASA Space Nuclear Propulsion Office; Dr. Norman Hillberry, former Director, Argonne National Laboratory; and Dr. Glen T. Seaborg, Chairman of the Atomic Energy Commission. Delegates were also taken on guided tours through the Argonne National Laboratory at Lemont, Illinois, and the Nuclear Power Station at Dresden, Illinois. They attended a Science Open House on the campus of the University of Chicago.

The National Youth Conference on the Atom is sponsored jointly by the 58 publicly owned electric utility companies of the United States, the National Science Teachers Association, and the Future Scientists of America. Additional information on this annual conference may be obtained from the Public Relations Department of any local electric utility company.

(*Continued on page 132*)

Amateurs frequently make up a percentage of the winners in the national competitive contests and scholarship programs. This is not accidental. The boy or girl who is an amateur is a person unusually well qualified to participate in this or any type of contest, no matter how competitive. Amateur radio, by its very nature, forces the amateur to seize control of himself, to work toward a goal that is truly worthwhile, to fight his way through some real competition, and to develop a high degree of proficiency. The amateur also learns to express his ideas, technical and otherwise, in a clear, understandable fashion. He must adopt a code of good conduct on the air. Amateur radio challenges his scientific curiosity and, above all, it teaches the amateur to think. All of these abilities find constant expression in his daily life. The result is a student with high academic standards well equipped to meet national competition and win. QST

How's DX?

(Continued from page 65)

but I've been working over the pole into One and Two territory," says Larry . _ . _ . G3NAC writes, "I go back to Aden for a two-year tour in June and hope to put Kamaran island on the air again. Please point out that the G stations in our October Kamaran operation may have signed VS9A or VS9K suffix appendages; a lot of cards arrived with merely 'VS9' on them — we want to get *our* DXCC memberships, too, you know!" . _ . _ . More Asian anglings via FEARL, PBRC, VERON and WVDXC: K8RTW's SB-10 shipment to VS9MB puts Maldives on the s.s.b. list. . . . 3W8FM gets into Europe on 14,030 kc., 1300 GMT, but the ITU/FCC taboo list excludes W/Ks. . . . One DJ6TL/p is reported active in Ceylon, 20 c.w. around 1730 GMT. . . . KA2JL's statistics show 126 WFKAS, 39 WTFKAS, 14 WSKAD certifications, and dozens of endorsements issued by FEARL in 1961.

Africa — ET2US returned to the air to greet the new year in grand DX style. "Same license situation as before," states staffer K1KOM. "No individual call signs — just ET2US fixed and portable. We have over twenty licensed operators here now, so we should be passing out plenty of QSOs to old and new friends." . _ . _ . EL4A reports, "The Liberian government canceled all EL licenses December 31st, so all must reapply. The new system probably will be patterned on the U. S. setup, General, Technician and six-month Novice classifications. Until they qualify, perhaps two-thirds of all ELs will have to remain off the air." EL4s A and YL got rolling on s.s.b. in late December with an SB-10 and DX-40 for a quick 35 countries. Ken adds, "In a few weeks we may have to slow down ham activity because of an uncertain fuel-oil supply. Our power plant may be off from 2130 to 0630 GMT." . _ . _ . From W8QNW: "5R8AD (F2AD) often uses 21-Mc. c.w. on week ends. He also works 15 phone but his 30-watt a.m. rig usually is reserved for QSOs with France." . _ . _ . According to K2UYG, 5U7AC goes on French leave late next month but will be back at the dials of his new HQ-129X (thanks to W9RKP and friends) later in the year. Bill hears that VQ8APB (VQ8AP) accomplished only 27 QSOs during his recent St. Brandon stopover, using battery-powered QRP on 20 c.w. . _ . _ . When the pile-ups grow unwieldy, Ascension's ZD8JP shuttles between 14,022 and 14,063 kc. or shuts down. K2UYG observes that Thursday is ZD8JP's favorite DX day . _ . _ . "EL6E operates mostly in the Canadian phone subbands with a KWS-1 and 8-element Sterba," remarks VE4OX . _ . _ . K6EC learns that ex-FQ8HO of Tchad now awaits a 6W8 ticket in Dakar . _ . _ . 9G1s DE and DN checked out of Ghana, the former returning to G-land and the latter possibly to ZS3. 9G1DE needed only a half dozen states to complete WAS. Ghana miss those guys . _ . _ . Africa addenda via FDXC, PBRC, VERON and WGDXC: 5H3s GC and HZ, formerly VQ3s GC and HZ, enjoy lively response to their new prefix on sideband and c.w., respectively. . . . VQ8BC may sign VQ8BCR on Rodriguez in May, 14- and 21-Mc. c.w. . . . ZS2MI's current Marion programme features 14,060-kc. c.w. at 1400–1500 GMT. . . . FB8WW seems too QRL with official duties to do much DXing with his c.w. BC-610 setup on 14,020, 14,025 and 14,050 kc. from Crozet. . . . ZD7SA heads homeward but there's talk of a three-year ZD7SG development. . . . VQ1FU (VQ4FU) expects a year's Zanzibar availability. . . . TT8AG hopes to bolster

(Continued on page 134)

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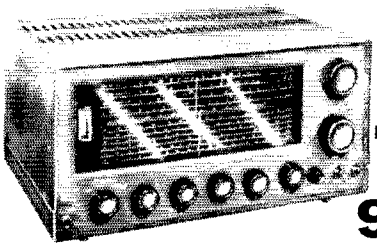

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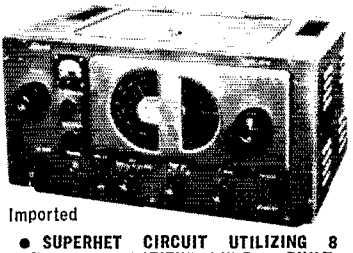

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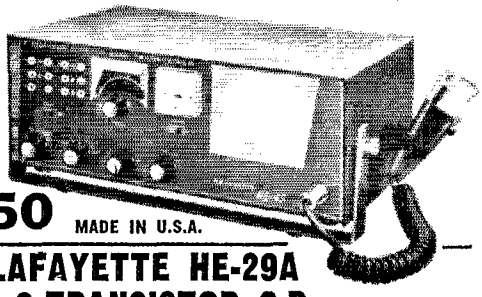

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his 1600-1830 GMT 20-meter output with more 15-meter phone transmissions this year. . . . ZS6PC may manage a ZS9 maneuver next month. . . . The WGDXC *DX Bulletin* poll of most-wanted countries is led by Gabon, Tromelin, Sikkim, Tibet, Willis, Timor, Heard, Yemen, Cambodia and a few others in the unavailable category.

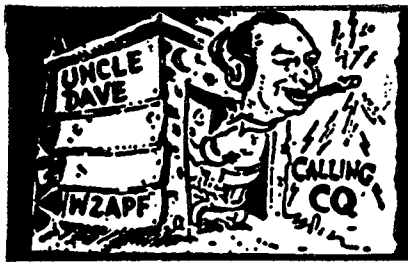
Oceania — Ten- and 15-meter phone favorite VR2BC now tours the world on leave, hoping to meet many of the chaps he's worked from Fiji. Greg set out in February for England via ZL VK 4S7 VS9 SU and ZB2. After a short U.K. sojourn VR2BC will visit VE3s CJ QU, the Caribbean, then home to Suva via the sea route from Curacao. New York will be included in the itinerary if possible. "Still a lot of VR2 activity; AP and BJ work s.s.b., DK is on c.w. and phone, DS fills departed DE's shoes; AC DC EB and EC are going strong, as is BZ. Our Sunday morning Mosquito Net on 40 usually is quite full. VR2BZ will be using my 20-meter beam while I'm away." Friend VR2DS drops us a line from sunny Lautoka, mentioning Nadi Airport sport on 20 and 15 sideband with a 32S-2 and 75S-2 layout. Moreover, according to W1HGT, G3JFF should be going strong as VR2EA right about now. Gee, Fiji has become a rather crowded ham's paradise . . . . K6QBJ/KG6 doesn't expect to see California again till next year, says W6OJW . . . . YL VE7BBB hears that KH6DKA will be operating /KG6 on Guam from time to time to regale K6BX's CHC gang . . . . PBRC, VERON, WGDXC and WWDXA offer other Oceaniagrams: FK8AT likes 20 c.w.'s low edge at 0800 on week ends. . . . VR1G should be rejoining VR1s A B and J about now after U.K. leave. . . . ZL4JF of the Campbells readies an SB-10 for DX-hungry sidebanders — no Kermadecs candidates in sight.

South America — VP4NC reports installation of a triband beam at Naparima College, San Fernando, thanks to yeoman assistance by VP4s LP and LQ. The school is planning an exhibition to further impress the local populace with the wonders of amateur radio. South Trinidad ARC welcomed VP4PL back from England recently . . . . "Ex-VP3RW now signs GW3PNZ," apprises WA2FQG . . . . K3KHK remarks, "Heard 47 PYs on 40 in one night — that band is getting hot!" . . . . A five-day Bajo Nuevo HK0AA outburst is threatened by HKs 1QQ 3LX 3TZ 0AI, Ws 4CKB 4DQS 4QVJ 6HAW and 8FGX late next month using c.w., a.m., s.s.b. and what have you. Serrana Bank, too, perhaps.

VU2SO likes 15- and 20-meter c.w. with an 807 fifty-watter, SX-28 and dipoles. Ghose is 22, an electrical engineer with India's air force. (Photo via W8QNW)

Hereabouts — W7LLV reminds us, regarding November's dissertation on vocal obsolescence, that Esperanto long ago was endorsed by ARRL and IARU as a worldwide artificial language, also more recently by the U.N. . . . . W1RAN scheduled a six-band St. Pierre DX foray last month, and VE3CJ's current VP5BP Grand Cayman activation should continue till the 18th of March if all goes well. Noel has an HT-37 and 2B along . . . . W5KNE's friend W5HCZ will try some VO2ing this month . . . . K5JVF no longer can bear just listening to juicy items rolling through on 3.5 Mc., so he's preparing a potent 3.5-Mc. fishing pole . . . . K2BMI and WA2CBB are interested in Sable island, a tempting DX hideaway just off Nova Scotia . . . . K6QPG's OM completed a six-month Swan Island stint sans hamming authorization . . . . Prominent West Gulfer W5GNG is about to become Six-type . . . . Considerable restlessness on the DX hoggery front, men. VE3BWY, who holds DXCC membership No. 5 of the original batch issued in the '30s (earned as G6WY),

(*Continued on page 136*)



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Hand crank GN45C Generators, can be converted to 12 V.D.C. Drive	$ 5.95
24 VDC motor driven generator to 800 volts .19 amps NEW	19.95
Receiving type tubes "Reliable" brand. Types such as 6BE6, 6BJ6, 6AB4, 6AU4, 6AU5, 6S4, list types needed	.65
Israeli Hi-Fi tweeters	4.59 2 for 8.00
Demo. Cornell Dubilier HAM-M rotor (New warranty)	108.00
Millen 90831 Modulator (40 watts) rack mounted (one only).	45.00
Mobilcon H302 Power supplies (12 VDC to 350V–125 MA	19.95
Tecraft model CC5-50 wired 6 Mtr. converter (14–18 MC IF) also (6–10 MC)	29.95
Transcom—10 meter transmitter & converter (12V filaments) Reg. $99.50	49.95
Akkord 8 transistor AM-FM-SW portable (Reg. $129.50 list)	79.95
Tecraft C3/26 Citizens Band converter (Bdcst. Band IF)	24.95
Tecraft model P-1 Power supply for CC5 converters	12.95

BARKER & WILLIAMSON

5100 AM Trans.	$275.00
504C Freq. Mult.	37.50

NEW—demonstrators—display models—one of a kind—subject to prior sale—list second and third choice.

CENTRAL ELECTRONICS

"Q" Multiplier	$24.95
"A" Slicer	44.95
10A Exciter	74.50

USED TEST EQUIPMENT

Simpson 485 Crosshatch generator	$ 59.00
RCP 750 Do-ALL TV generator	39.00
Hickok 660 Color-Bar generator.	149.00
Hickok 450 V.D.M.	20.00
Precision CR30 C.R. tube checker.	28.00
Anko 72 tube tester	54.00
Sylvania 140 tube tester	58.00
B&K 500 tube tester	59.00
Precision 620 tube tester	34.00
ITT TV field strength meter with portable battery supply	62.00

TUBES—NEW—GUARANTEED

All individually boxed except where noted in bulk.

	REG.	EACH	DOZEN
6H6	$3.50	$1.05	$11.50
6SJ7	3.75	1.15	12.65
6J7	4.55	1.25	13.75
45 (Bulk pack)	2.05	.65	7.15
2A6 (Bulk pack)	3.65	1.10	12.10
6A8G	5.80	1.75	19.25
6AE6G	2.05	.65	7.15
6S8GT (Bulk pack)	2.75	.85	9.35
6C4 (Bulk pack)	1.50	.45	4.95
6J6 (Bulk pack)	2.35	.75	8.25

LAKESHORE

Bandhopper (VFO)	$119.50

BEAMS
NEW AND USED
(AS INDICATED)

Mosley V-27GP (CB) (New)	$ 29.95
Mosley VPA1520 (New)	109.50
Mosley VPA1020 (New)	99.50
Telrex 3 El. 20 Mtr. (Used)	49.50
Telrex 3 El. 10 Mtr. (Used)	39.50
Mosley V144GP (2 Mtrs.) (Used).	17.50
Mosley VPA20-2 (New)	39.50
5A-6M Taco (New)	9.95
10A-6M Taco (New)	17.50
BA6M (Baluns-for-Above)	3.95
Hy-Gain HH-6 (6-Mtr. Halo) (New)	9.95

We have more beams and verticals at very special prices—write us about your needs and we will quote.

Write Uncledave W2APF with your needs and problems.

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A SUBSIDIARY OF FORT ORANGE RADIO DISTRIBUTING CO.

feels that indiscriminate CQ-DXing is a stupid approach to DX for W/K/VEs in the cramped 3.5-Mc. c.w. slot. . . . K4ZRA is bugged by QRO lugs who barge into pile-ups just to tell rare ones GLAD CUAGN or TNX FB QSL. . . . W4MLE wants to move TESTers and tuners to frequencies where they'll do some good; SWBC or commercial spots on 40 and 80, for example. . . . W9IHN finds liddishness on the increase in all departments lately, and feels that the ghost of T.O.M. and his Wouff Hong may yet be called upon to spray a trail of porcine gore from coast to coast.

Ten Years Ago in "How's DX?" — It's only the halfway point in the 1952 ARRL DX Contest but poor Jeeves already is fried to a frazzle _ . . . _ Nice stuff reported on 20 phone: CS3AC, FQ8AI, HE9LAA, HI8WF, MD2JB, MF2AA, MI3s BH DW LK LV NJ ZX ZZ, MT2KH, OQ5BG, SU1AS, TA3AA, TDRK of Guatemala, VK1s AWL BS NL SW, VS7FG, YI3BZR, ZCs 3AF 6JM, ZD4AX, ZK2AA and Marion Island's ZS2MI _ . . . _ C.w. 14-Mc. nifties are AG2AG, CR5AD, EK1AR, ET3R, Corsican F9s JD JW QV, FD8AB, FKS8AA, FL8s AE BC, FN8AD, I1NU/-Trieste, JY1AY, KM6AW/KS6, KT1LM, MDs 2DW/MD5 5JS, MI3AB, OQ5s GV RA, YI3s BZL ECU, ZD4BH, ZS9N, 4UA of Pakistan, 4UAJ in Kashmir, 9S4s AD and AX _ . . . _ Ten-phone diggers find HC8GI, HI6EC, MD2AM, OQ5s BQ BW GA, ZD4BF and 3V8AX, while 28-Mc. c.w. hounds hound FF8s AC AG and KW6AR _ . . . _ Australian s.w.l. Eric Trebilcock hears good long-path 7-Mc. signals from our east coast. KH6AD/KW6, KH6QY/KC6, KS4AQ and TA2EFA also are on 40 _ . . . _ Eighty is alive with CT2BO, FA8s BG RJ, FF8GP, HP1AW, OX3EL, OY2Z, VK9XK, VS7NG and ZK1AC, while 75-phone fun is supplied by HH2X, HR1BG, TG9AD, VPs 5FR 7NW, YN4CB, ZL3s FM PS and ZS6DW _ . . . _ A flock of Gs, GW3s FSP ZV and KV4AA keep the DX ball rolling across the water on 160 meters. QST

YL News and Views

(*Continued from page 67*)

Esther Stuewe, W8ATB, Chairman. Fri. May 18 — registration, luncheon, buffet supper and party at Howard Johnson Motor Lodge, G-3129 Miller Rd., Flint, Luncheon and banquet Sat. May 19. Registration $2.00 in advance to W8ATB, G-4098 E. Atherton Rd., Flint, Michigan.

ARRL Southwestern Division Convention — June 1-3 at Disneyland, Anaheim, California. Mildred Maxson, W6PJU, is in charge of the YL-XYL program.

16th Annual AWTAR — The 1962 All Woman Transcontinental Air Race will start at Long Beach, California on July 7 and will end July 11 at Wilmington, Delaware. Carolyn Currens, W3GTC, will again serve as chairman for the amateur radio net.

ARRL National Convention — Aug. 31-Sept. 3 at Portland, Oregon. YL-XYL activities will be conducted by the Portland Roses.

CLUBS and NETS

YLRL — Dues for 1962 are due March 1, 1962. Those who fail to submit $2.00 to Treasurer Jean Kincheloe, K6OQD, 6625 N. Brightview Drive, Glendora, Calif., by April 1, 1962, go on the delinquency list.

ALAMO YLs — New officers are Pres. K5YCE; V.P. K5TSZ; Sec.-Treas. K5UTO. The Alamo YL Certificate can be obtained by working 3 members. Texas stations must work 4 members. Log information and 25 cents to Inez Cole, W5WXT, 320 Meadowbrook, San Antonio, Texas.

WHOOT Club — New officers of the Dallas, Texas club are Pres. W5RYX; V.P. W5SPV; Secy. K5MTF; Treas. K5PLC. K5BNH is custodian of the WHOOT certificate. The club meets the second Friday at the Sanger-Harris shopping center at 1000 CST. All YLs cordially invited.

SSB Net (Upper) — meets Wed. 1900 GMT on 14,280 kc., not on 14,260 kc. as previously given. K5BJU is NCS.

MISCELLANY

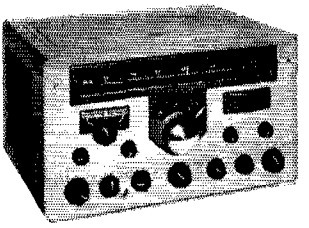
A new supplement to W5RZJ's book *CQ YL* is now available. It brings the book up-to-date with YLRL officers through 1962, club and certificate information. For the two page supplement send two 4 cent stamps to Louisa Sando' W5RZJ, 4417 Eleventh St., N.W., Albuquerque, New Mexico. . . . W7HHH, Bea Austin, wonders if all YLs who have ever exchanged QSLs with Bessie Jeans, W7DIC, might send Bessie a duplicate QSL. Recently Bessie had major cancer surgery and was undergoing intensive X-ray treatments when her new house burned to the ground and

(*Continued on page 138*)

BARRY ELECTRONICS CORP.

RME 6900—SSB/AM/CW

HAM-BAND RECEIVER



The RME 6900 offers optimum performance on SSB, AM, or CW with no compromises or apologies to competitive high-priced receivers. We have just received another brand-new lot of these fine receivers with matching RME 6901 Speakers. These units are, of course, in factory-sealed cartons, and are covered by full-factory warranty. Whether you operate SSB, CW, or AM, you have the almost uncanny feeling that the RME 6900 was designed solely for you.

CIRCUITS in the 6900 are designed to provide high selectivity; frequency stability, sensitivity and low internal noise. Finally, inclusion of ALL function controls necessary for a modern communications receiver . . . Vernier control knob with over-ride clutch for fast tuning; RF gain; AF gain; Antenna Trimmer; Band-Selector; Stand-By/Receive/Calibrate/Transmit; ANL Limiter; "T"- Notch Filter; Internal 100 Kc Hermetically-sealed crystal calibrator. Some additional important features of the RME 6900 are:

- **CONTROLS:** 11½" Single Slide Rule Tuning Dial: Logging Scale.
- **COVERAGE:** 80, 40, 20, 15 and 10 on 5 Bands, plus 10 to 11 Mc for WWV or WWVH.
- **PEAK** Selectivity plus tunable "T" Notch.
- 500 and 4 Ohm Outputs.
- **NOISE** Limiter for SSB and CW, AM.
- **SEPARATE** Detector for Single Sideband.
- **S METER** Calibrated in 6 db Steps above S9 for Better Reading.
- **IMPROVED** Fast Attack AVC Circuit.
- **SELECTABLE** Sideband. Upper or Lower.

ONE-HAND control knob of the Modemaster Switch gives five distinct functions . . . vitally required in the reception of AM, CW and SSB. The AM band width is 3.5 Kc with fast attack AVC System. In upper and lower side-band the AVC System is also switched to fast attack with the BFO automatically turned on and positioned for desired side-band reception. An advanced Product Detector switches in to replace the Diode Detector in all SSB and CW positions. When switched to the CW position, the band pass on the IF system is reduced to 500 CPS with the BFO Injection Control and Pitch, becoming operational. The AVC System is changed for optimum use when operating under CW conditions. It is our opinion that the RME 6900 is truly the paramount CW/SSB/AM Receiver. You are cordially invited to visit us and listen for yourself.

SUBSTANTIAL trade-ins on your present receiver will be given. Let us know of your interest and we will give you the *BEST POSSIBLE DEAL* available! We are sold on this Receiver and it should also be noted that the manufacturer stands behind us in the guarantee. The top DX'ers now using this receiver have attested to its capabilities PARTICULARLY when QRM conditions prevail or when the rare DX shows up.

PLATE TRANSFORMER: Pri: 115 V. @ 60 CPS. With Pri. taps to produce the following sec. voltage: 1600-1350-1100-0-1100-1350-1600 V.C.T. @ 350 Ma. 21 lbs net wt. 6" H x 4½" W x 6½" D. Order stk ET-18A. **$13.95.**

SWINGING CHOKE: 9 to 20 Hys. @ max. 525 Ma. Ceramic insulators 50 Ohm DC resistance. Approx. dimension: 6" x 9" x 7". 39 lbs. **$9.95.**

MALLORY INDUCTUNER: Tunes 55 thru 220 Mcs. Brand new. **$2.95.**

TELETYPE POLAR RELAY, MODEL 255A: $5.95.

831SP COAX CONNECTOR FOR RG-8/U, ETC., also designated as PL-259. **.25¢**

EIMAC SK-710 SOCKET FOR 4CX300A. Brand new, orig. box. **$14.95.**

TUBE SOCKET FOR 826, 829B, ETC. $1.00.

MOTOROLA 9.9 HYS @ 500 MA. CHOKE. 3 KV Insul. **$6.95.**

JENNINGS VACUUM VARIABLE CAPACITOR, MODEL U: 10 to 300 Mmf./10 KV. With shaft & instructions. Brand new. **$49.00.**

60' NYLON ANTENNA GUY ROPE. $2.50.

7½ V. EverReady Hot-Shot Battery w/strap. $3.95.

4" CERAMIC INSULATOR. 20¢.

RME 6900 ..... **$369.00** Amateur Net

RME 6901 Speaker ..... **19.50** Amateur Net

RME/PREPAID ANYWHERE: USA OR FOREIGN

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512 Broadway, New York 12, N.Y. Dept. Q-3

- ☐ Enc. is my order with money order or check.
- ☐ Send new 1962 Barry's Greensheet Catalog.
- ☐ Send information on RME 6900 Receiver.
- ☐ I have available for trade-in for the 6900 Receiver the following: .....

Name .....Title

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City .....State.....

all contents were destroyed. Any YL who has a W7DIC QSL is asked to kindly send a duplicate card to Bessie at 1188 Tyler St., Eugene, Oregon. . . . Marjorie Shiro, K2VXS, tells of her coming June wedding to Richard Abrahams, K2YRZ, and that "oddly enough, we didn't even meet through ham radio!" . . . Two teen-age Chicago YLs both received their general class licenses on their respective birthdays — K9TVN, Donita Price, on her 16th birthday and WA9ACO, Ethel Froikin, on her 19th anniversary. . . . Congratulations to Martha Shirley, WØZWL, who was re-elected ARRL Vice Director, Dakota Division. . . . PY7AHU, Neide, XYL of PY7AFP, is now on 20 meter s.s.b. often. Neide is the mother of six harmonics. . . . W1UZR, Rita, of Norfolk, Mass., was royally entertained by the Royal Society of Amateurs of Bermuda on a flying trip to VP9 land. . . . EA8CT, Christine, believes she is the first station in Spain to WAS on s.s.b. . . . SM5BMN is QRV daily 0700 to 0900 GMT and 1200 to 1400 GMT. Anna claims she is a "first-class ragchewer," and she can converse in English, French, and German. . . . Re the bit in the Dec. 1961 column on YL-XYL designations: Elaine, K6SZT, writes that she always refers to herself as an MYL, married young lady. She reserves the term YL for unmarried women hams only. OM W3BZW says that he thinks that he and OM K3DQL have come up with an acceptable solution to the whole situation. YL to designate a licensed young lady; XYL, an unlicensed wife; and a licensed married woman could be a ZYL "as justified by the vector relationship $\overline{X} \times \overline{Y} = \overline{Z}$ from elementary vector analysis!" QST

Correspondence

(*Continued from page 73*)

ORIGINAL CARTON

Have you noticed the phrase, IN ORIGINAL CARTON, cropping up regularly in the classified ad columns of *QST* lately? It seems that someone first used this term a few years ago in a For Sale ad, and now it has become almost mandatory in ham ads. Here's an example:

For Sale: Super Viking Globe, in original carton, $50 FOB Podunk USA. Joe Novice.

As a prospective buyer, I would read this ad and ponder. What does Joe mean? Did he ever have it out of the carton? Maybe he got some use out of it by cutting holes in the carton to get at the knobs.

If he took it out of the carton, why did he save the box? Did he think he wouldn't like it very well, and wanted to keep something handy to ship it back in? If he buys much equipment, where does he store the empty cartons?

All these questions flash through my mind. At first glance, I thought it looked like a real good buy, because, being IN ORIGINAL CARTON gave me the idea the equipment must be something like MINT CONDX. At least there would be hardly a scratch on it.

Then an ad like this pops up:

For Sale: Super Viking Globe, has worked 200 countries, in original carton, $50 FOB Podunk, USA. Joe Novice.

Now I know almost certainly that Joe had it out of the box and that it might even be 2 or 3 years old. Maybe it is even scratched a little and has some cigaret burns on top. But since it is IN ORIGINAL CARTON, it must be a good deal.

On the other hand, just exactly what is an "Original Carton?" After considerable thought, there is only one answer: It's an old cardboard box.

Now why is it that an old cardboard box immediately makes a piece of gear attractive and desirable? I have a friend with a Patterson PR-10. If he has by any chance saved the original carton for the past 25 years, I don't doubt that he can get rid of it at a good price.

What about the poor hams who throw the box away first thing? How do they ever sell anything? Saying "Worked 200 countries" makes it sound sort of worn out. About the only way left is to label it MINT CONDX.

It looks like a good business could be built up manufacturing and selling "original cartons." What with my XYL scrounging boxes to wrap Christmas gifts in and so on, I wouldn't be able to keep an original carton very long.

When I got ready to dump my very tired Super Viking Globe, I could drop a line to the Original Carton Co. for a box with a nice long serial number on it, tailored to fit, then I would be assured of a quick sale.

(*Continued on page 140*)

IRE SHOW

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"THE GOLDEN AGE OF ELECTRONICS"

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The New York Coliseum
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The Institute of Radio Engineers
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Members $1.00. Non-members $3.00. Age limit: over 18

But maybe by that time every piece of used gear offered would be IN ORIGINAL CARTON and my ad would look no different than any other.

Perhaps this would do the job: IN ORIGINAL SEALED CARTON! — *Harvel Baker, W7ALH, Naches, Washington*

NOT STUFFY

¶ We are two keen readers of *QST*. Though only SWLs we still find your magazine helpful, very interesting and think it tops. Our reasons for writing are to give our views on two opinions expressed by readers in the August *QST*.

First, K4HLP "Less Technical". We agree with K4HLP and would like to see more articles along the lines he mentioned.

Secondly, WA2LII said the mag was on the stuffy side. We couldn't disagree more. Compared with other short wave mags, yours is far from stuffy. As two small examples, the way "Strays" are set out and the use of the full stop and long break are certainly not our opinion of Stuffy. — *P. Lennard and M. Allin, Wartling, Sussex, England.*

"X" IN XYL

¶ The following may have been discussed pro and con many times prior to my admission to this wonderful group known as Amateur Radio Operators.

However, while listening on the various bands, I seem to discern a growing resentment to the use of XYL in reference to a married gal's status. Some are already using the prefix "M" instead of "X."

Looking in Webster's, I find X (ex) used in Roman numerals adds "ten" also, "the unknown quantity" and "ex" is defined as "out of; without"; "without the right to have" and "formerly, but not now."

So, if the above definitions are accepted literally, the "X" could be a misnomer. The ladies evidently do not take kindly to the implication that they are no longer YLs when the act of matrimony occurs and everyone knows that reference to a gal's age is usuallly a ticklish subject. Which also brings to mind that old adage "Never underestimate the power of a woman."

Be we men or mice, a lot of men are already referring to their wives as "MYLs" instead of "XYLs." — *Clyde H. Bidgood, WA9AJF, Elmhurst, Illinois.*

TRANSISTORS & PROGRESS

¶ Congratulations to William North, W4GEB *and* to *QST* for his article in December, *QST*, "Practical Ham-Shack Transistor Applications."

As far as I can learn there is only one leading manufacturer today who is offering an all-transistor communications receiver. In one of a series of articles by leading U.S. figures that appeared in the *S.E.P.*, a year or so ago, the statement was made that a backward nation emerging today could make incredibly fast progress in overtaking and passing us by jumping directly into solid-state physics, not being hampered as we are by the tremendous vested interest in obsolescent materials and methods. Is it later than we think?

I hope *QST* will find it possible to help us obey the Commandment, "The Amateur is Progressive", by publishing an increasing amount of material on semiconductors. — *W. F. Reeves, VE7CT, Chilliwack, B. C.*

SS TECHNIQUE

¶ While listening over the c.w. bands during the recent sweepstakes contest, one could pick out the newcomers to the SS battles.

For instance, the newcomer gave a long "CQ SS" and signed his call three times, in contrast to the veteran sweepstaker who sent a single "CQ SS de W1XXX," repeating the procedure after a reasonable listening period. The newcomer was wasting precious time and could have made a complete two-way contact in the time it took to send out his long "CQ".

However, that's the way to learn by participating in the contest. It serves a manifold purpose; by sharpening up operating procedure; by increasing code efficiency; by making a lot of otherwise rare contacts; and by renewing interest in ham radio. Next year the newcomer will be a veteran sweepstaker, ready to set an example for next year's newcomers. — *Myles W. Brennan, W1MOK, Willimansett, Massachusetts*

(Continued on page 142)

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GOV'T NETWORKS • OIL EXPLORATION • MINING • CIVIL DEFENSE

12 and 24 Volt Models Available
6 Crystal Controlled Channels
Sideband Output—125 W., P.E.P.
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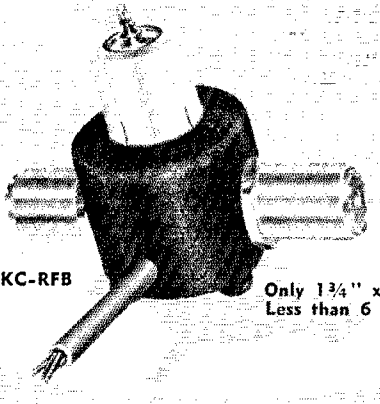

DKC-RFB

Only 1¾" x 2"
Less than 6 ozs.

DKC-RFB BROADBAND PRE-AMPLIFIER - - - $10.75

Not available with type "N" connectors

See any one of our 700 Dealers and Distributors in U. S. and Canada for catalog sheets or write:

GET SIGNALS YOU DIDN'T HEAR BEFORE!

The DKC-RFB is a highly useful, practical precision-made accessory for the amateur receiver, and an amazing booster for mobile equipment using convertors.

A brand new, fully tested and proven booster! It is essentially a 50 to 70 ohm impedance matching "Broadband Pre-amplifier" not a pre-selector. Designed specifically for medium-high to less sensitive receivers in use the world over by amateur operators. It is guaranteed to increase over-all gain by 1 to 6 "S" units of any receiver*, all bands, 1.5 to 30mc. A slight gain is noted through 60 mc, and the booster need not be removed when operating at this frequency. The DKC-RFB is the long-awaited accessory which will enable the amateur, using less costly equipment to improve the sensitivity potential, to work more DX, to bring up weak and unintelligible signals and to enhance the potential of the antenna. The amazing RFB is especially advantageous to mobile equipment where convertors are used.

A tuned antenna system, a coax connector at the receiver are necessary for the best results.

(*The RFB is not designed or intended to increase the receiving quality of expensive receivers; however, a gain of 2 or 3 "S" units is noted.)

★ **BROADBAND COAXIAL PRE-AMPLIFIER**
Designed specifically for less sensitive receivers, 1.5 to 30 mc. Receivers needing "front-end" drive.

★ **NO ADJUSTMENTS REQUIRED**
Antenna trimmer will aid in matching RFB to receiver on various bands.

★ **SIMPLE INSTALLATION**
Small, light-weight, compact, simple and easy to install, either fixed station or mobile.

★ **NOISELESS**
The RFB properly installed does not inject additional noise.

Manufactured by DOW-KEY COMPANY, Thief River Falls, Minnesota

EARLIER *QST*s

¶ I have just returned from an Aerospace Education Symposium in Ruston, Louisiana at Louisiana Polytechnic Institute. While there I had a chance to visit the library. Quite unexpectedly I discovered the library there possessed a complete run of *QST* from January, 1937, bound by year. I enjoyed browsing through the old copies of our magazine. Reading the various construction articles was especially enjoyable. The ARRL must be congratulated for its most patriotic efforts during the Second World War.

It would be most rewarding if all "young squirts" like me could be able to read some of the articles back then, and I highly recommend them. — *Bob Reynolds, K5VOL, Prescott, Arkansas*

World Above 50 Mc.

(Continued from page 72)

WA2DWL being first heard in Ames and lasted until 1559 CST when K4KZX faded out. We're also advised that KØJRM is now on sideband in Marshalltown, Iowa. Two more s.s.b. stations reported in Virginia: WA4BGG is in the process of building his linear and expects to have 1000 watts p.e.p. s.s.b. on the air soon, instead of his present 90 watts. WA4AYP has at present 600 watts p.e.p. s.s.b., and has worked K4UMK, W3JNE and W2GQK, all on sked and all two-way sideband. According to Bill (WA4AYP), s.s.b. activity is on the increase in his own area and in the D.C./Maryland area, with K3BRS, W3JNE, WA4BGG, W4ZBS and WA4AYP getting set to begin a daily s.s.b. net. More news received from Bill relates that WA4ALN has hung a linear (200 watts) on his Challenger along with an Eico modulator and has upped his signal enough to work into "Yankee Land". K4JOX is in the process of building a s.s.b. rig for 50 Mc. K4VHV, Elizabeth City, North Carolina is also going sideband in the very near future with 1000 watts p.e.p. Bill sez that the gang out that-a-way hopes to break out of the experimental stage of s.s.b. soon and have some real activity between Maryland, Pennsylvania, New Jersey, Delaware, Virginia and North Carolina. The opening of December 28 was good in Virginia with WA4AYP hearing Michigan, Illinois, Iowa, Wisconsin, Nebraska, West Virginia, and Ohio, all day long. WØPFP Ames, Iowa and WØWKB Ankeny, Iowa were worked by WA4AYP, 2-way s.s.b.

K8QPA in Blaine, Ohio reports the aurora of December 2 when he was hearing stations from the central east Atlantic coast to the North Atlantic coast. Dan reportedly is building gear for s.s.b. along with practically everyone else. New Jersey also reports the December 2 aurora; WA2BDP was hearing Vermont, Ohio, Michigan, and Illinois and sez that ground wave was good later in the evening. On December 11 Ken was copying KØKQI in Nebraska, and on December 16 heard Wisconsin, Illinois, Minnesota, and Michigan. December 17 Ken was hearing Missouri, Kentucky, Tennessee and Arkansas. Final aurora report received from Jerry, K9IHBT in Hudson, Wisconsin who sez that during the December 2 aurora he was hearing Illinois, Missouri, Nebraska, Iowa, Michigan and Indiana. Jerry reports that the sporadic *E* openings on December 16, 17, 28 and 29 were all to the east coast into New England and down to South Carolina. Activity is picking up in the Hudson, Wisconsin area with several new stations on the air in recent weeks, and increased interest in c.w. operation.

Two reports have been received concerning the opening of January 15 on 50 Mc. Dick Simpson, K1KRP in Laconia, New Hampshire, sent a very detailed report of what he heard during that opening between 0300 and 0350. Dick logged nineteen stations in four states (Minnesota, Iowa, Tennessee and Wisconsin) with most of the activity being between Minneapolis, Minnesota and New England. Dick sez: "All of the stations listed were copied on a bare-foot HBR-16 using a ninety-foot long wire about twenty feet up. Just finished making the six-meter coils so this was a great way to test them out. I don't have a six-meter transmitter yet so all of the stations were received only. I was quite amazed by the signals being put out with Communicators so I guess low power on six meters is just as effective as on the lower bands." A "Final, final" from George, K8NEY concerning the January 15 opening: "At 0450 GMT January 14 VE5LD started coming in. Steven was running a sixer and had a very good S9 plus signal; we worked him twice, at 0515 and 0540 GMT. Located at Porcupine Plain,

(Continued on page 144)

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Model 570—Single gang, single pole, 5 position switch, same as Model 550A except with N type connectors. Price: $13.35 each.

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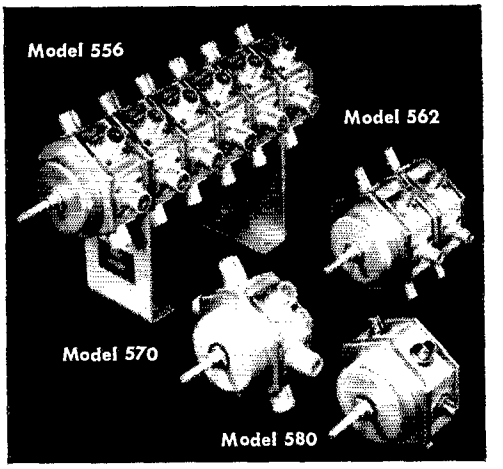

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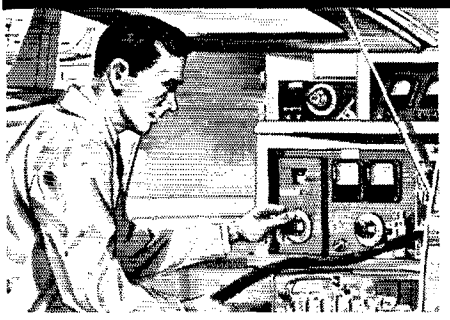

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Saskatchewan, VE5LD worked K8WKZ, W8BAN, K8QMX, W8APG, K8NEY, K8HNI, W8ESZ and W8BKT plus many others in the Michigan and Ohio area."

A late newsflash from Phil Spencer, W5LDH, New Orleans, Louisiana, who advises us that on October 28, 1961, he worked HK5GZ in Columbia, South America at 4:47 P.M. for his first DX to South America on 50 Mc. Phil uses a G-50 and has the QSL to show "proof of contact".

Art Goddard, K1AII, Plymouth, Massachusetts reports that during the opening of December 12 he worked W9OOO, K9WOK, K8WVF, KØCVK, K9AWN, K8GKX and W8IV all on c.w. No c.w. activity during the opening the following day into 4 and 9 lands. On December 21 Art worked W4KDH on meteor scatter and also worked K3MWV and WA2CHP on c.w. December 28 came through with another *E*$_s$ opening for Art into 9, 4, 9, 5, 6, and 7 lands; no c.w. heard but there was some double hop into 6 and 7 call areas. To finish off the old year, Art worked W4RMU on December 31 at 0710. Ted, W1LUN, worked Allan (W4RMU) at 0700 on schedule, then K1AII worked him and at 0730 WA2AXX also made the contact. Art sez that Allen was almost solid copy on forward scatter with many bursts bringing him over S9. Anyone is welcome to join the group at regular sked time — Sunday mornings at 0700. Frequency of W4RMU is 50.002, W1LUN is 50.010, K1AII is 50.005 and WA2AXX is 50.0035. Art makes the interesting comment that "cw activity continues at high level with thirty-five new stations worked since December 16. Most active on cw are the following locals: W2ITN, W3JLF, K2ITP, K2ITQ, WA2AXM, WA2AXX, K3MWV, K1RSS, K1LEV, WA2FRW, WA2FUL, W1VAH, K1QWJ, W1HGT, W1LUN, W1QIB, K2UVG, K1CRN and K2MUB." K3LLR, Oxen Hill, Maryland sez that he is trying to create interest in using m.c.w. on six meters but without success.

"No *E* skip, aurora, F_2, or other noticed by Casper VHF group", so sez Bob Lane, W7UFB in Wyoming. The Casper VHF group consists of K7GLL, Elmer; W7PSO, Jim; W7UFB, Bob; W7VDZ, Jim; W7VTB, Bob. W7UFB is now testing a new 7-element six-meter beam at 50 feet; K7GLL has a new 50-foot tower with six-meter beam on top; W7VDZ has a new 40-foot tower which will have new 7-element wide-spaced beam on top in a very short time. W7UFB and W7VTB will soon be starting 50 Mc. skeds with KØUDZ in Rapid City, South Dakota; KØATZ/mobile is living in Casper and while heard mobile most of the time will soon have the rig set up at a fixed location.

144 Mc. and Up

Word received recently from Marty, K3HDW, clears up the issue as to why we've heard nothing from him or about him in recent weeks. Seems that Marty has changed QTH, from Greenbelt to Bowie, Maryland, and has been off the air for a while. However, he's busy reassembling the rig and will soon be back on 144 Mc. with 829B (100 watts, phone and c.w.), 417A converter, BC-1284A pre-amp, and a twenty-element stacked yagi. He hopes to be very active once again and also continue meteor scatter skeds as he did at the old QTH. WØENC, South Dakota, active on both 144 and 50 Mc. has racked up state number 20 on two meters when he worked K9AQP during the Geminids meteor shower in December.

Ernie Brown, W5FYZ, Minden, Louisiana, sez that things get kind of discouragin' down his way as two-meter activity is once again at a minimum. However, Ernie has kept himself quite busy on the band with skeds, most noteworthy one recently with K9UIF on December 14 which paid off by making state number 30 for Ernie. He also kept skeds during the Geminids with W4VVH, North Carolina; K4EUS, Virginia; K8AXU, West Virginia; and WA6MLX in California. Pings and short bursts were heard from all stations except WA6MLX, but nothing complete enough for a QSO except the contact with K9UIF which lasted for one hour. Skeds were also kept by W5FYZ during the Quadrantids shower in January with W4VVH, K8AXU and K4EUS, but no good results, largely due to an extremely high line noise level at Ernie's location and bad weather conditions. However, he and W4VVH are continuing nightly skeds hoping that a coastal inversion might provide the wanted QSO. Wish we'd been able to listen in during the few days that Ernie spent in Dallas, Texas, when he had the opportunity to visit W5KFU and W5KXD. Needless to say that amongst these three avid (?) meteor scatter

(*Continued on page 146*)

operators "some tall tales were swapped."

K2PQY notes that on the evening of December 29 he heard W2CDO calling K4CMW on 144 Mc. On phoning W2CDO Augie learned that he had heard K4CMW tuning up and testing for several minutes on two meters but was unable to make a contact. We're also informed, via K2PQY, that K2KJH is building a two-meter linear using 4X250; WA2NUQ is looking for contacts on 432 Mc.; WA2SNR is working on a rig for 1296 Mc.; and K2PQY will soon be operating n.b.f.m. with 60 watts on 50 Mc.

From Detroit, Michigan, Craig Cameron, K8JEE sez that information is welcome on any results from 416B pre amp rigs used on 144 Mc.; that K8JEE now has 100 watts on 220 Mc. in Detroit, and that K8QON and K8WOR are both making plans for getting on 220 Mc; that Monday evenings are the ones that 432-Mc. activity is most likely to be found in the Detroit area. Another station building for three bands at once is Dick Fisher, K3LLR in Oxon Hill, Maryland. Dick sez he has most of the necessary parts to build such a rig, "It's just getting them together and then getting 'em to work that causes the delay." Has also constructed a seven-element beam for 144 Mc. using a bamboo pole as boom. K8PBA in Ypsilanti, Michigan tells us that there are many new two-meter stations in that area and that much courtesy was shown on 145 Mc. for Oscar.

WN4BMC and WA4BMC, Lake Worth, Florida, send their observations concerning weather conditions and 144 Mc.: "When a cold front moves into this area the copy from the north is exceptionally good. Heard several stations from Ormond Beach running very low power during one cold (?) spell. When the cold front moves on, and the weather starts getting warmer, the copy from the north is exceptionally bad." We also hear from the Eggerts that K4SJH, SCM for Eastern Florida has joined the Seven-Eleven Traffic Net operating on 144 Mc. every morning, and that he's a great addition to the two-meter band.

Marty, K3HDW sez that it's quite frustrating to see a beautiful aurora and have nothing but a mobile gooney-box and turn-stile antenna to work with. He's starting to correct this situation by erecting a 20-element beam for 144 Mc. and hopes that school work will soon (somehow or another) quit interfering with his ham operations. Seems to be a number of stations on two meters in New Mexico but we don't hear too much concerning this gang. W5FPB sends in a report of attendance at weekly net meetings on 146.802 Mc. every Tuesday, but no other information is received. We do know that W5FPB, W5GRI, W5KCW, W5VJN, K5HMN, W5MWY, W5CYZ, W5FAG, W5ZTN and K5YRQ all operate on 144 Mc. QST

VE/W Contest Results

(Continued from page 60)

Hawaii

KH6IJ	21,443
KW6DG	2022

Santa Clara Valley

W6ISQ	39,854
W6CLZ	23,393
K6BWX	18,772

East Bay

WA6ECF	35,956
W6IPH	23,068
WA6MUP	10,830

San Francisco

K6EIE	27,779

Sacramento Valley

WA6HRS	37,038
K6EIL	21,227

San Joaquin Valley

K6ROU	17,328

North Carolina

W8EXZ/4	29,313
K4YCL	7364

South Carolina

W4BWZ	40,721
K4ZHV	6498

Virginia

W4CKD	77,976
W4HTV	64,330
K4MXF	39,638
W4FZG	20,794
K4TFL	18,772

West Virginia

K8HID	13,645
K8JLF	1949

Colorado

WØEWH	44,620
KØVFN/Ø	2599

Utah

W7BAJ	16,750
W7POU	10,108

New Mexico

K5UYF	51,172

Wyoming

K7GMN/7	14,729

Alabama

W4SYY	27,292

Eastern Florida

W4FNQ	47,760
W4ORT	47,273
W6HWB/4	24,043
K4GBS	18,772
W4JTA	16,678
WA6OCH/4	15,306
K4LVP	14,404
K6SXX/4	5054

Georgia

W4SVJ	106,730
K4BVD	68,231
K4WWY	4224
K4BWQ	4061

West Indies

K7BWV/KP4	14,620
W1EXY/KP4	1877

Los Angeles

K6QPH	39,475
W6GQX	27,725
W6HAL	27,617
WA6LYX	27,292
W6NKR	26,317

(Continued on page 148)

W6OEO	14,296
WA6NHC	7310
W6ID	5487
San Diego	
WA6PDE	1472
WA6DNM	143
North Texas	
W5FTD	69,204
W5TPZ	41,587
K5ZOM	2816
Oklahoma	
K5OCX	58,969
K5LUR	25,667
W5EHY	9097
South Texas	
K5LGH	37,039
W5LJT	23,393
W5MPE	13,646

March, 1937

. . . Amateurs to the fore! Floods in the Ohio River Valley and the Mississippi had caused emergencies of vast proportions. Amateurs were busily providing communications, and *QST* promised *full* details next month. A preliminary report by Central Division Director R. H. G. Matthews, W9ZN, told how amateurs and the Naval Communications Reserve had provided vital communications. The complete story was yet to be told.

. . . For technical articles we had info on a 75-watt transmitter combining bandswitching and plug-in coils, electrostatic shielding for reduction of harmonic radiation, an amplifier using push-push or push-pull operation, how much *C* was optimum for transmitter tank circuits, some more of the W6CUH high-power finals, the directivity of horizontal antennas, a 5-meter crystal-controlled transmitter, plus the usual hints & kinks. . . . A popular Stray topic is that of how to keep a bug from sliding around on the operating table. This month W3BES suggested the application of a hot soldering iron to the bug's rubber feet.

. . . The Hq. publicized a perennial problem — that of unclaimed DX QSLs in the ARRL QSL Bureau. Hundreds of choice DX cards gathering dust — then and now.

. . . According to one of the ads, if you wanted ham parts in Springfield, Mass., you went over to the S.S Kresge Co. store. QST

Answer to puzzle appearing on page 57.

		K	E	Y		G	R	I	D			O	H	M		A	M	P
	W	I	R	E		A	U	D	I	O		H	A	H		C	O	L
T	A	L	E	S		I	N		T	M			M	O			D	A	H
V	F	O			I	N	T	R	O		S	O	S		C	R	E	T	E
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		C	A	P		F	R	O		I	D	E	S		L	A	O	S		
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	E	N	D		Y	L		D	E	A	D			H	U	R	R	Y		
		K	Y		L	E	S	S		R	U	L	I	N	G				C	Q
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O	H			O	L	D			S	E		A	T				Q	U	A	D
D	I	O	D	E		I	O	N	S			T	E	S	T	S		M	R	
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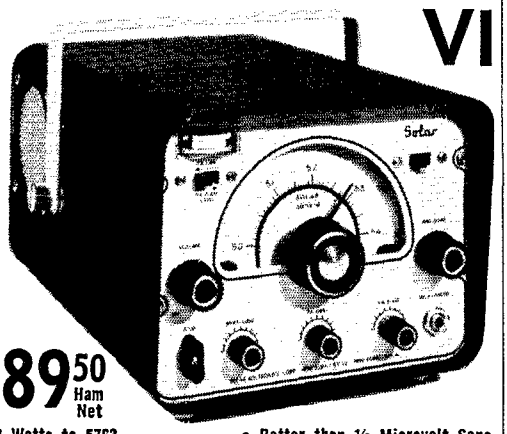

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W2, K2 — North Jersey DX Ass'n, P. O. Box 303, Bradley Beach, N. J.
W3, K3 — Jesse Bieberman, W3KT, P.O. Box 400, Bala-Cynwyd, Pa.
W4, K4 — Thomas M. Moss, W4HYW, Box 20644, Municipal Airport Branch, Atlanta 20, Ga.
W5, K5 — Brad A. Beard, W5ADZ, P.O. Box 25172, Houston 5, Texas.
W6, K6 — San Diego DX Club, Box 16006, San Diego 16, Calif.
W7, K7 — Salem Amateur Radio Club, P.O. Box 61, Salem, Oregon.
W8, K8 — Walter E. Musgrave, W8NGW, 1245 E. 187th St., Cleveland 10, Ohio.
W9, K9 — Ray P. Birren, W9MSG, 702 Spring Road, Elmhurst, Illinois.
WØ, KØ — Alva A. Smith, WØDMA, 238 East Main St., Caledonia, Minn.
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VE3 — Leslie A. Whetham, VE3QE, 32 Sylvia Crescent, Hamilton, Ont.
VE4 — Len Cuff, VE4LC, 286 Rutland St., St. James, Man.
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VE8 — Russ Allen, VE8BC, Aeradio Station, Snag, Yukon Terr.
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VO2 — Douglas B. Ritcey, Dept. of Transport, Goose Bay, Labrador.
KP4 — Joseph Gonzalez, KP4YT, Box 1061, San Juan, P.R.
KH6 — John H. Oka, KH6DQ, P.O. Box 101, Aiea, Oahu, Hawaii.
KL7 — Alaska QSL Bureau, Box 6226, Airport Annex, Anchorage, Alaska.
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(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 10¢ per word will apply to advertising which, in our judgment, is obviously noncommercial in nature.** Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, takes the 10¢ rate. Address and signatures are charged for. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising so classified takes the 35¢ 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 copy, signature and address be printed plainly on one side of paper only. 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 except those obviously commercial in character, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

MICHIGAN State Convention, Grand Rapids, 15th Annual April 14, 1962, Pantlind Hotel. Write Post Office Box 333.

WANTED: Early wireless gear, books, magazines, catalogs before 1922. Send description and prices. W6GH, 1010 Monte Dr., Santa Barbara, Calif.

MOTOROLA used FM communications equipment bought and sold. W5BCO, Ralph Hicks, Box 6097, Tulsa, Okla.

RECEIVERS: Repaired and aligned by competent engineers using factory standard instruments. Factory service at reasonable prices on Collins, Hallicrafters, Hammarlund, Gonset, National, Harvey-Wells. Our 25th year. 90 day guarantee. Douglas Instrument Laboratory, 176 Norfolk Ave., Boston 19, Mass.

DON'T Fail FCC tests! Check yourself with a time-tested "Sure-check Test". Novice, $1.50; General $1.75; Extra, $2.00. We pay the postage. Amateur Radio Specialties, 1013 Seventh Ave., Worthington, Minn.

TRIGGER. Cash paid for ham equipment. 7361 W. North Ave., River Forest, Ill. PR 1-8616, Chicago #TU 9-6429.

TOROIDS: Uncased 88 Mhy, like new. Dollar each. Five/$4.00 P.P. DaPaul, 309 So. Ashton, Millbrae, Calif.

SOUTHERN California: Transmitters and receivers repaired, aligned. Bandwidth, frequency, harmonics measured. Used ham gear bought, sold, traded. Robinson Electronics, 922 W. Chapman, Orange, Calif. Tel. KEllog 8-0500.

WANTED: All types of aircraft or ground radios, 17L, 618S, 388, 390, GRC, 51V, 51X2 units. Especially any item made by Collins Radio whatsoever. Also large type tubes and test equipments. For fast action write Ted Dames, W2KUW, 308 Hickory, Arlington, N.J.

SAN Francisco and vicinity: Receivers repaired and realigned. Factory methods. Special problems invited, any equipment. Associated Electronics, 58 South P Street, Livermore, Calif. Skipper, W6KF.

ATTENTION Mobileers! Leece-Neville 6 volt 100 amp. system, $50; 12 volt 50 amp system, $50; 12 volt 60 amp system, $60; 12 volt 100 amp syst, $100. Guaranteed no ex-police car units. Herbert A. Zimmermann, Jr. K2PAT, 1907 Coney Island Ave., Brooklyn 30, N.Y. Tel. DEwey 6-7388.

WANTED: Military or Industrial laboratory test equipment. Electronicraft, Box 399, Mt. Kisco, N.Y.

WANT 1925 and earlier ham and broadcast gear for personal collection. W4AA, Wayne Nelson, Concord, N.C.

MICHIGAN Hams! Amateur supplies, standard brands. Store hours 0830 to 1730 Monday through Saturday. Roy J. Purchase W8RP. Purchase Radio Supply, 327 E. Hoover St., Ann Arbor, Michigan. Tel. NOrmany 8-8262.

HAM TV Equipment bought, sold, traded. Al Denson, W1BYX, Rockville, Conn.

TELEPRINTER Converter CV89A/URA8A, audio input, 2" 'scope indicator, copies any shift from 10 to 1000 cycles, $245.00; Collins 51J2, 51J3, R-390A receivers, Hammarlund SP-600JX, Teletype and Kleinschmidt printers. Alltronics-Howard Co., Box 19, Boston 1, Mass. Tel. Richmond 2-0048.

WE Buy all types of tubes for cash, especially Eimac, subject to our test. Maritime International Co., 199 Front St., Hempstead, N.Y.

WANTED: KWM-2 Transceivers and any old issues of QST from inception through 1925. Al T. O'Neil, Camp Lakeview, Lake City, Minn.

QSLS? WPE? Finest and largest variety samples 20¢ (refunded). Callbooks: American, $5.00; Foreign, $3.00. Sakkers, W8DED, Box 218, Holland, Mich. (QSL samples with bible verses, 20¢).

C. FRITZ QSLs guarantee greater returns! Samples, 25¢ deductible. Box 1684, Scottsdale, Arizona (formerly Joliet, Ill.).

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.

QSL-SWL-WPE. Finest. Since 1946. Largest assortment. Priced right. Send 10¢ for samples to: Glenn Print, 1103 Pine Heights Ave., Baltimore 29, Md.

QSLS "Brownie." W3CJI, 3110 Lehigh, Allentown, Penna. Samples, 10¢; with catalog, 25¢.

QSLS-SWLS. Samples 10¢. Malgo Press, Box 375 M.O., Toledo, 1, Ohio.

DELUXE QSLS. Petty, W2HAZ, Box 27, Trenton, N. J. Samples, 10c

QSLS-SWLS, 100 2-color glossy, $3.00; QSO file cards, $1.00 per 100. Samples, 10¢. Rusprint, Box 7507, Kansas City 16, Mo.

QSLS: samples 25¢ (refundable). Schuch, W6CMN, Wildcat Press, 6707 Beck Ave., North Hollywood, Calif.

QSLS-SWLS Samples 25¢. David Spicer, 4615 Rosedale, Austin 5, Texas.

ORIGINAL Cartoon for your QSL pictorial, 10¢. Sirrah, W1SVH, P.O. Box 1461, Greenwich, Conn.

RUBBER Stamps for hams, sample impressions, Hamm, W9UNY, 542 North 93, Milwaukee, Wis.

QSLS, SWLS, WPE, Samples 5¢. Nicholas & Son Printery, P.O. Box 11184, Phoenix 17, Ariz.

QSLS. Priced right. Samples (stamp appreciated). K2ZMH Press, Box 55, Copake Falls, N.Y.

QSLS. Outstanding. Dime. Filmcrafters. Box 304, Martins Ferry, Ohio.

QSLS. Stamp and call brings samples. Eddie Scott, W3CSX, Fairplay, Md.

QSL's 100 glossy 4 color $3.70 Postpaid. Samples 10¢, or send 25¢ for large assortment and "Danger, High Voltage" sign. Dick, W8VXK, Rt. 1, Gladwin, Michigan.

QSLS. Samples, dime. Printer, Corwith, Iowa.

QSLS, SWLs. XYL-OMs (sample assortment approximately 934¢) covering designating, planning, printing, arranging, mailing; eye-catching, comic, sedate, fantabulous, DX-attracting, prototypal, snazzy, unparagoned cards (Wow!). Rogers, KØAAB, 961 Arcade St., St. Paul 6, Minn.

QSLS SWLS 3-colors, 100 $2.00 samples dime. Bob Garra, Lehighton, Penna.

CREATIVE QSL Cards. New catalogs and designs being completed. Free samples and catalog. Personal attention given. Wilkins Creative Printing, P.O. Box 1064-I, Atascadero, Calif.

QSLS. Fast service. Write for free samples. Satisfaction guaranteed. Blanton's, Box 7064, Akron 6, Ohio.

ATTRACTIVE QSLS: Large variety of styles, cartoons, multicolored same price. Personal ham stationery. Samples 25¢ (deductible). Paul Levin, K2MTT, 1460 Carroll St., Brooklyn 13, N.Y.

QUALITY QSLs. Attractive, different. Samples 10¢. K8IAI Press, 19470 Derby, Detroit, Mich.

QSLS. Large selection styles including photos. Lowest prices. Fast service. Samples dime. Ray, 679 Borah, Twin Falls, Idaho.

YLRL Specials, OM's, reasonable, nice designs, samples dime. W2DJH Press, Warrensburg, N.Y.

SPACE AGE 3-D QSL cards. Don't miss out! Free sample brochure. 3-D QSL, Dept. QM, 5 Wood End Road, Springfield, Mass.

SUPERIOR QSLS, samples 10¢. Ham Specialties, Box 823 Bellaire, Texas

QSLS, 3-color glossy, 100—$4.50. Rutgers VariTyping Service, 7 Fairfield Rd., Somerset, N.J.

PICTURE QSLs. Cards of your shack, home, etc., Made from your photograph. 1000, $13.00. Raum's, 4154 Fifth St., Philadelphia 40, Penna.

QSLS. 300 for $4.35, Samples 10¢. W9SKR. "George" Vesely, Rte. #1, 100 Wilson Road, Ingleside, Ill.

QSLS-SWLS. Samples free. W4BKT Press, 123 No. Main, McKenzie, Tenn.

QSLS. Samples free. Phillips, W7HRG, 1708 Bridge St., The Dalles, Oregon.

QSLS. Samples dime. Rubber stamps: name, call and address $1.35. Harry Sims, 3227 Missouri Ave., St. Louis 18, Mo.

QSLS, $2.50 and up. Samples 10¢. RBL Print M.R. 12, Phillipsburg, N.J.

QSLS. Free Samples. W7IIZ Press, Box 183, Springfield, Oregon.

QSLS. Kromkote-3 color. Order 200, get 25 each of 8 different styles—many styles. Samples 10¢. Progress Printing, Box 1154, Biloxi, Miss.

QSLS, SWL's that are different, colored, embossed card stock, and "Kromekote". Samples 10¢. Home Print, 2416 Elmo, Hamilton, Ohio.

RUBBER Stamps, $1.00. Call and Address. Clint's Radio, W2UDO, 32 Cumberland Ave., Verona, N. J.

EYEBALL QSO cards. Exquisitely distinctive. Samples, 10¢. 1.000 $5.00. Call Signs. Box 933, Aurora, Ill.

HUNDRED QSLS: 80¢. Samples, dime. Meininger, Jesup, Iowa.

CERTIFIED QSLS-SWLS, unique designs, speedy service. Catalog 25¢ (refundable) Certified Printing, Box 1023, Whittier, Calif.

QUALITY QSLS. New designs month, samples 10¢. Giant, 25¢. Savory, 172 Roosevelt, Weymouth, Mass.

QSL Cards printed. $1.00 per 100. Lewalski, 1367 Perkiomen, Reading, Penna.

DON'T Buy QSLS-SWLs until you see my free samples. Bolles, 7701 Tisdale, Austin, Texas.

QSLS. Kromekote 2 & 3 colors, attractive, distinctive, different. Free ball point pen with order. Samples 10¢. K2VOB Press, 62 Midland Blvd., Maplewood, N.J.

QSLS—$1.75 per 100 postpaid U.S. only. Glossy, red and green. All orders mailed within 10 days. Free sample. Hobby Print Shop, Umatilla, Fla.

CANADIANS! QSLS in fluorescent colors, by silk screen process. Free samples. Martin, 314 Delatre St., Woodstock, Ont.P., Canada.

CANADIANS: Sell or swap QSTs, 1924-1955 run. Want prior to 1924. VE4BU.

CANADIAN Used, surplus and new gear. Giant catalog, 25¢. Low prices, thousands of items. ETCO, Box 741, Montreal, P.Q., Canada.

FOR Sale: Johnson Rotomatic rotator complete with 150 ft. Johnson control cable: $195.00; Wincharger gasoline 6.5 Kw, 110-220 VAC generator 65 hours. Selling because new local zoning laws require Diesel unit. Cost new $1275.00. Selling like new, $975; Have pair of Millen 1" scopes complete, $75 for the pair. Walter George Bergman, W1WGM, P.O. Box 214, Wellesley Hills 81, Mass. Phone 617-235-3700. No trades, please.

WANTED: Information, schematic, Breting 40 rcvr. Will return material promptly. Steve Bemis, WN9AYN, 463 Evergreen St., Elmhurst, Ill.

SACRIFICE: Collins 75A4, B&W 5100B and matching SSB generator. Write. All letters answered. Might take smaller rig in trade. Gerald Skeen, Box 8, Ripley, W. Va.

KWM-1, DX Adaptor, AC supply, works perfectly, $550 or best offer. W2KOY, 1740 Front St., East Meadow, L.I., N.Y.

CHICAGOLAND Amateurs! Factory authorized service for Hallicrafters, Hammarlund, Globe, Gonset. Service all amateur equipment to factory standards. Heights Electronics, Inc., 1145 Halstead St., Chicago Heights, Ill. Tel. SKyline 5-4056.

KWS-1 $900. W2ADD.

SELL Or swap. Old radio equipment, magazines, tubes, surplus gear, etc. All inquiries answered. Laverty, 118 N. Wycombe, Lansdowne, Penna.

AMATEUR Radio and citizens radio equipment installed and serviced. Mystic Electronics, 119 New London Rd., Mystic, Conn.

CUP-Core inductances, excellent for sharp or band-pass 50 to 100 K.C. IF or BFO. Very high Q. Unused, cased, adjustable; solder terminals. Type 1, 2.9 Mh, type 17, 3.7 Mh. Dollar each postpaid U.S. Circuit suggestions included. Woods, 2346 Clover Lane, Northfield, Ill.

SELL: QSTs 1950 thru 1961. Top condition. $2.50 per year. Will not break this run. W. J. Tancig, K9MYZ, Beecher, Ill.

MUST Sell KWS-1. Best offer over $900. Also have KF93, $195.00, with A.C. power supply. Dave DeArmond, 226 Hobart, San Mateo, Calif. W6MSD.

WANTED: QSTs before 1923 and CQ May 1945. Have QST 1931 to 1956 and CQ 1946 to 1956 at 25¢ each. W2HO, Rte. 2, Box 156, Monroe, N.Y.

LOWEST Prices. Factory fresh sealed cartons, Central Electronics, CDR, Dow-Key, Drake, Electro-Voice, Gonset, Gotham, Hallicrafters, Hy-Gain, E. F. Johnson, Mosley, P & H Electronics, Telrex. Self-addressed stamped envelope for lowest quotation on your needs. Gonset G-33 brand new factory sealed cartons, $75.00. Brand new PL-172 and socket, $125.00. Used, perfect Ranger, $150.00; Valiant, $275.00; SX-110, $125.00; SX-100, $180.00; DX-40, $50.00; Sonar-120, $50.00; Adventurer, $35.00. H D H Sales Co., P. O. Box 73, Rowayton, Conn.

PROCEEDINGS Of the I.R.E. 1914 through 1933. Some volumes complete. Will sell any copy or copies. Excellent price on entire lot. (Mrs. Miriam Knapp, W1ZIM, 191 Beechwood Rd., West Hartford 7, Conn. Tel. JAckson, 3-7560.

CASH For your gear! We buy, trade and sell. We stock Hammarlund, Hallicrafters, National, Johnson, RME, Hy-Gain, Mosley and many other lines of ham gear. Ask for used equipment list. H & H Electronic Supply Inc., 506-510 Kishwaukee St., Rockford, Ill.

WANTED: QSTs for personal collection: January through August, 1916. ARRL Handbooks for personal collection: Editions 1, and 5. W1CUT, Box 1, West Hartford 7, Conn.

WANTED: Two or more 304TL tubes. Callanan, W9AU, P.O. Box 155, Barrington, Ill.

INVADER, Latest Johnson filter-type sideband, CW, AM transmitter. In mint condx. Original packing. $525. WA2OBZ. 3 Pryer Place, New Rochelle, N.Y. Tel. NE 2-7450

ELDICO SSB-1000F 1000 watt linear 4C x 300As factory rebuilt, exc. condx, small quantity $350.00. Buy SSB-100F with this amplifier bargain price $675 for the system. W2HKY, M. B. Kraus, Reeves Instrument Corporation, Lakewood Rd., Farmingdale, N.J.

VIKING Challenger, perfect shape, 6 meters to 80 meters. J. Christiano, W1EVX, 237 Water St., Quincy, Mass. GRanite 2-1397.

WANTED: Tech Manual for BC 224-B. Wagenblast, 5643 Northumberland, Pittsburgh 17, Penna.

IMMACULATE HQ-170C. $285. Bug, $7.75. K1IIK.

MOVING: Must sell Vesto 61 ft. tower, bearings, plus all fittings. $200 f.o.b. Telrex 10-meter #10M-3A beam, $35.00. 15 meter #153A, $50.00; 20-meter #503A, $65.00. All include 100 ft. or more RG8/U; Johnson #138-112-51 rotator with limit switches and over 100 ft. control cable, $200; PA400 SSB 400 watt linear, $75.00. W1RMS, 198 Euclid Ave., Waterbury, Conn.

RTTY For Sale: my Model 15 printer, $100 and 14 typing reperf $150; Syc motors. Looks and work like new. Four exc. 255 polar relays. $2.50 each. Want a 14 TD and AN/URA8 or single CV 89 freq. shift conv. Name your price. K9CNG, 839 N. 6th St. Vandalia, Ill.

COLLINS 51J3, AN/FGC/1 radio teletype terminal unit, double diversity 2125-2975 c.p.s. Cleaning out shack. Send 20¢ for complete list. Apt. #1, 424 W. Prairie, Decatur, Ill.

BIBLE Student, selling SX-100 rcvr with/S-47 spkr, $160.00; fw Viking Ranger, $150.00. All in vy gud condx. Write or call K2TXU, "Hank" Thompson, 133-40 Roosevelt Ave., Flushing 54, L.I., N.Y. Tel. HI 5-7809. Will ship C.o.d.

HAVE BC-221. Want tape recorder or turntable, etc. Thomas Yamamoto, Marshfield, Vt.

COLLINS 75A-2 receiver, good condition, with QST modification July 1955, $250.00; Hammarlund HC-10 factory reconditioned, clean, never used, $110.00; Pacemaker SSB transmitter, excellent performance, marred front panel, $235.00; 700-watt, home-brew linear with P/S, enclosed 5-ft. cabinet rack, band-switching, TVI suppressed, metered, performance good, appearance negligible, $80 local deal, $100.00 crated for shipment. W2BLL, 617 Beverly Road, Teaneck, N.J.

FOR Sale: Radiant Vibrator supply, 6V. inp., 300v. outp. 300 ma., $12; S40-B Hallicrafters rcvr., $52.00. W1PIO.

ELMAC PMR-7 and 6-12 volt DC pwr. supply with control relay for VOX mobile operation if desired for SSB reception. Exc. condx w/instruction manual. James Hartley, W1DIS, Raymond, Me.

HAVE 3 rechargeable batteries, each rated 2 volt, 24 amps, measuring 2½" x 2½" x 6½". Nice possibilities in portable equipment. $5.00 apiece. Jim Janossy, WV6UPQ, 2522 Compton, Gardena, Calif.

SELL: Heath HD-11 Q multiplier, $14.00. Bonadies, 95 Stillwold Drive, Wethersfield 9, Conn.

NOVICE Rig: NC-98 with crystal filter and matching speaker, $100. DX-20, $30. Both $125.00. W4GEK, 244 Iroquois Road, Oak Ridge, Tenn.

FOR Sale: 75S1, 32S1, 516F-2, 312B4, $1150.00; P&H 600A, $30; FCV2 6 meter, $18; Tecraft 1¼ meter trans., $45.00. K4GAX, Frank Wakefield, Franklin, Ky.

CHICAGO Area: Sell HQ-140-XA exc. cond. With XC-100 calibrator, speaker, manual, only $149.00. Hy-Gain 14AVS antenna with 14RMK mounting kit, instructions, only $15.00. Larry Guenther, W9ACS, 315 Dempster, Evanston, Ill. Phone UN 9-4421.

GLOBE CHIEF 90-A, $35, parts for 800/400V .2A power supply, $15; R/C tape pre-amp, $25; 813 $7. Mark Hubelbank, 152 Ranchwood Dr., West Haven, Conn.

2 Eimac 304TL, never used, $9.00 each; plate transformer 220V, pri. 2825-0-2825 at 1 amp, open type, $25, F.o.b. For that added punch in an SSB pwr. supply, 120 mfd., 3000V, pyranol cap., $25 ea., F.o.b. Eimac SK-400 air system socket and chimney, $7.00. K8PKS, Don Hoover, Columbiana, Ohio.

SELL: CB and 10M transceiver. Used twice, $40.00. Storli, 11634 Gorham, L.A. 49, California.

SALE: Best offer KWM-1, ac power supply, deluxe console. Elliott Adler, K2GLG, LY 9-1057.

HEATH Apache and SB10 combo in new condition. Best offer over $250.00. Will deliver 200 miles. W8JSF, 6434 McHugh Place, Cincinnati, Ohio.

KWM-1, AC power supply, mobile mount and cable, DC pwr. supply, just back from $130.00 reconditioning. Will send paid bill $895.00; 75S1 with 500 cycle mech. filter, BFO crystal, 32S1-$950; SX62A just out of carton, $275. Will take $875 plus brand new KWM-2 with portable power supply and case for the lot. W9IYG, Herb Rosenthal, 1353 Westmoor Trail, Winnetka, Ill.

FOR Sale: KWS-1, KW-1, 75A4, all in A-1 condition. May be heard on air any time. Joe Michaels, W2MNR, 80 Birch Lane, Woodmere, L.I., N.Y. CE 9-2342.

WANTED: DX100 and Dow relay. State condition and price. K1DVO, 81 Pine Hill Ave., Glenbrook, Conn.

WANTED: 1200 cycle filter for 75A4. W9BAG, 1023 N. Marion St., Oak Park, Ill.

HQ-140XA, speaker. Exc. condx. Sacrifice, $130 or best offer. Thomas Telford, 829 Pomona, El Cerrito, Calif.

SELL: Two HT33A linear amplifiers, $375 and $425.00. 600D dynamic mike, $12.00; JT30 mike, $5.00. W9MZP.

SELL: New Mosley CM-1 won at Hamfest. $125.00. WA2OHD, Marlton, N.J.

SWAP: Viking Mobile transmitter and VFO (FW) complete with 600v/225 Ma. pwr. supply. Want good ham receiver. No junk, please! S. Cokas, 16 Edgehill Rd., Swampscott, Mass.

HT37, $350.00; G77 complete, $175. John Evans, W2DMF, 65 W. Oak St., Ramsey, N.J.

STOP! NC-183, w/spkr. Dow-Key electronic relay wired in. $137.50 F.o.b. Denver. Write Bill Weir, 21 E. 5th, Bloomsburg, Penna.

FOR Sale: 75S1 with .5Kc filter and BFO xtal, in mint condx, orig. carton, $240.00. K2YEO, Smith, 57 Melbury Rd., Babylon, L.I., N.Y.

CRYSTALS. Various frequencies from 80-2 meters, 25¢ each. Send for list of frequencies. R. E. White, W6IMC, 210 Alden Road, Hayward, Calif.

SELL: Apache and Mohawk. Excellent condition, $400.00. K8DQC, 3713 Brooklyn Ave., Cleveland 9, Ohio.

SALE: Exceptionally fine 6146 60-watt Novice transmitter, $28.00; Viking 1, $115.00; SX-99, $90; Mohican GC-1A w/pwr. pack, $95; Heath Q multiplier, $8.50; exc. condx. Silvertone broadcast receiver, $9.50; 350 volt Mallory Vibrapack, $12. Dave Austin, Box 269, Hamilton, N.Y.

JOHNSON Courier, 500W linear, used only 3 months. Best offer over $175.00. W2DOR, 52 Houston St., Newark 5, N.J.

KWM-1, #1089. One of the last built, with Lock Key position and in exc. physical and electrical condition. Matching 516F-1 AC supply, 312B-1 speaker. Will ship in original packing cases with manual. All for $595 F.o.b. Maj. C. L. Stacey, W4DYH, 600 Selfridge Road, Goldsboro, N.C. Area Code 919, 735-0051.

FOR Sale: Collins 70E8A VFO without dial, $20.00; 4-1000A Eimac, $20. W8BBA, 502 Sixth St., Fairport Harbor, Ohio.

FOR Sale: Knight Span-Master rcvr, $12; new antenna relay, $10.00; soldering iron, $5.00. Robert Fisher, KN3QBX, Millville, Penna.

SSB Station: C.E. 10B exciter, factory-wired, with plug-in coils, VFO, anti-trip unit, $89.50: Collins 75A1 rcvr with spkr, $175.00, C.E. Model A Slicer, $35.00. All in exc. shape. Mike Brill, WA2WJS, 315 Bedford Circle, N. Syracuse, N.Y.

DRAKE 2B, new, $215.00. Johnson Valiant factory-wired, like new, late model, $310.00. Keller, 514 Stevens Road, Morrisville, Penna. CY 5-2564.

APACHE $200; SB-10 adaptor, $75; professionally wired and tested. In perfect condx. Both $250.00. Write for sked if you want to hear them. Forrest Sailors, 7509 E. 99th St., Kansas City, Mo.

FOR Sale: AF68. Like new, $140.00. John Maher, W1LIW, 153 Locust St., Holyoke, Mass.

SELL: 75A-3 with Collins speaker, $300. Very good condx. Peter Sypher, 738 Williams St., N.W., Atlanta 13, Ga. Tel. TR 5-6914.

SELL: Factory-wired 20-A and 458 VFO, $175; HT-31, $150; Hallicrafters SX-100, matching speaker, $175. Original owner. Local only. W2KOT, 200 East 205 St., Bronx, N.Y. Tel. SEdgewick 3-2709 evenings.

CENTRAL Electronics 20-A, QT-1 and Deluxe VFO. $200. LA-400 with 837s, $75. All factory-wired. Write Box 213, Blytheville, Arkansas.

COLLINS 516E-1, little used, $210. 399C-1 PTO unit, new, unused, $120. Will ship free. K8YEI.

COMPLETE Mobile unit on 2-meters. Twoer, power supplies, "hoop" antenna, bumper h'tch and all necessary wire and cables, $70. WØFSH, Box 122, Chipeta Hall, Gunnison, Colorado.

SELL: QST 1928 to 1959 (except 1934); CQ 1948 to 1959. Radio 1939 to 1941. Best offer all or part. W2EC.

JOHNSON KW with desk and Ranger driver. New condx. On air. Package deal only. No split. No trade. Pick up, sry. First $1000. W4SOX, J. B. Sample, 6525 Barmer Dr., Jacksonville, Fla.

SELL: DX-100 with cont. loading mod. and fil. power for SB-10, $165.00; SB-10 (Aug. 1961), $85. Both clean and in exc. condx. K8BBK, 14541 Oxford Drive, Plymouth, Michigan.

NEED: Field strength meter for 650 Kc. University of Maryland student radio station, WMUC, College Park, Md.

KW Amplifier, modulator, speech amplifier, and power supply for AM, CW, SSB assembled in Bud relay rack, never checked. Over $1200 in new parts including Johnson KW rotary inductor, Jennings vacuum variable, etc. Complete with tubes, $600. Write John Heath, 116 Blossom St., Lake Jackson, Texas.

KWM-2 accessories and 30 L-1. James E. Farner, 6541 Briley Dr., Ft. Worth 18, Texas.

DX-100B, tested and calibrated by Heath Company; clean, $169.00. K9VAU, Farmer City, Ill.

NEED Cash. Sell Hallicrafters SX-101A with LW Electronics 2-meter converter. Installed, $285.00; Eico 723 60-watt transmitter, $49.00; Heath AC-1 antenna coupler, $10. K1TUA, 54-B Forrestal Ave., Quonset Point, R.I.

TRAVEL Abroad costs less, and is lots more fun when arranged by The International Ham-Hop Club. Non-profit, non-political. Members in 50 countries. W6THN/1, Gunther, 165 Loyd, Providence 6, R.I.

4-1000A, brand new, original box, Eimac, first check $90. New Heathkit RF-1, $25.00. R. L. Nelson, 8260 Bancroft Hall, Annapolis, Md.

TUBES Wanted. All types, highest prices paid. Write or phone. Lou-Tronics, 131 Lawrence St., Brooklyn 1, N.Y. Tel. TR 5-1119.

SELSYNS 115 v. 60 cy., $10.00 pair ppd anywhere in U.S.A. Larson, W6HAB, P.O. Box 282, Hilmar, Calif.

FOR Sale: PRM6A converted to 6 or 12 volts, AF67, PE101C. $200. W1IOW.

IRE Proceedings, 1942 through 1961, $5.00 per year, F.o.b. John Palmquist, W2OSN, 10 Wagon Bridge, Moorestown, N.J.

SELL: 4-1000A, $20; 833A's, $10, 806's, $4.00; SB-10, $80; DX100, $160. K9III.

SALE: National HRO50T, Includes speaker and calibrator, $185.00. Ed Koppman, K5LTO, 3914 Spruce, Phila., 4, Penna.

HAMMARLUND HQ-140X, in exc. condx, $140; Central Electronics 10-B modified with 50 microampere tuning meter, $125.00. Connor, KØADL/4, 5607 Ash, Springfield, Va.

ANTENNA, $10; mobile or fixed, 32 ft. 5 in. high. See it on the cover of September 1961 CQ Journal. Wt. 11 lbs. W6WFR, 199 Random, Walnutcreek, Calif.

A-1 reconditioned equipment. On approval. Trades. Terms. Hallicrafters S-85 $79.00, SX-99 $99.00, SX-100 $199.00, SX-111 $199.00, SX-101A $299.00, HT-32, HT-37; Hammarlund HQ-100 $129.00, HQ-110 $179.00, HQ-160 $229.00, HQ-170 $289.00; National NC-183D $199.00, HRO-60 $345.00; Gonset G-50 $229.00; Central 20A $149.00, Viking II $159.00, Valiant $279.00; Collins 75S-1, 32S-1, 32V-1, 32V-3, 75A-4, KWM-2; Eimac, Globe, Gonset, Heath, Johnson, RME, other items. List free. Henry Radio Company, Butler, Mo.

BACK Issues of IRE. Solid run September 1942 through December 1960 (1947 through Dec. 1960 in binders) all perfect, $150.00. Also QSTs 1932 through 1935 and all of 1931 except Jan. and Aug., $10.00. E. M. Shook, 227 West Woodin Blvd., Dallas 24, Texas.

WANTED Hickok 292X sig gen and manual. State price and condx. B. Lamberti, WØWSJ, 3408 3rd St., Des Moines, Ia.

SALE: Johnson Valiant, $255; SX-71, $85; Heath distortion meter, $35.00; Heath AC VTVM, $15; Baldwin phones, $2.00. 200 watt Variac, $4.00. W6HHZ, 14543½ Dickens St., Sherman Oaks, Calif.

RME 6930, no modifications, in mint condx, $280 firm. Bill Peck, 1101 Larchmont Ave., Havertown, Penna.

VIKING Valiant, sold for best offer, in exc. condx. Bill Oringderff, 109 South Main, Elk City, Okla.

CLEANING House: NC-300 plus 6 & 2 meter converters, $250.00; 32V-1 $300 Seneca (perfect), $150.00; plate modulator, $50.00; Q multiplier $10.00; SB-10 (new), $95; RCA RBC-1 Precision rcvr and supplies, $200; modified tener, $40; 124 watt 829 6 meter xmtr, complete in metal cabinet, $100; Hy-Gain 8-el, 6-m. beam, $20.00; F.o.b. Carlisle, Penna. Will swap 99'er, Tribander beam, rotor or what have you. W3YXV, Bob Shaffner, 22 Baltimore St., Carlisle, Penna.

RTTY: Sell CV-31/TRA-7 dual diversity converters aligned to 455 Kc. Outputs: polar, neutral, and tone. $75.00. W1JBC/KIRUG, 281 Cross St., Winchester, Mass.

FOR Sale: HRO50T coils A, B, C, D, AA, AC, AD, xtal calib., spkr, Globe double sideband DSB100 xmtr. Make offer. Wells Chapin, 942 Arden Lane, Birmingham, Mich.

SWAP or sell mobile 27½ watt 10 meter xmtr, $25.00; Morrow 5BR-2 converter, $25.00; James pwr. supply, $25.00; new 4-400A, $14; transistor tape recorder $13. Want: Collins 75S-1 cabinet, and parts for Linear in June 1961 QST. KØVAB, 2819-15th Ave., So. Minneapolis, Minn.

SELL: SX-99, $90. Wanted: KWM-1 spkr, console, Triband beam. W2OBH, Epstein, 200-27 46th Ave., Bayside 61, N.Y.

SELL: Heathkit QF-1, $8.00; SG-8, $16; VF-1, $16; ppd. in U.S.A. In exc. condx. W7SVF, Box 252, Taft, Ore.

SWAP—Brand new, TS-175 C/U 85-1000 mc. freq. meter, original carton, for HRO rcvr or equal. Jerry Loecher, 16 Robert Drive, Huntington, N.Y. Tel. HAmilton 3-5757.

SELL: P & H LA-400 amplifier, $85. WØKLG, Box 425, Dassel, Minn.

SELL: Apache, $200; National NC-270, $200. Both are in perf. condx. Will deliver within 100 miles. WA6CIU, 1512 Crest Dr., Altadena, Calif.

QSTS from 1919 up. Send stamped envelope with want list. Mrs. Conrad Beardsley, 119 Wythburn Rd., South Portland 7, Maine.

SELL: Gonset Communicator IV, 2M, newest model, best offer. Alan Bergman, WA2PVW, 227 East 178th St., Bronx, N.Y.

HRO-60 with 5 coils; Viking II with grid block keying, PTT and additional meter for constant modulation reading. Best offer takes either or both. Ed Lasky, Philco Corp., Lansdale, Penna.

WANTED: Gonset GSB301 linear amp., $200.00; Heath Warrior linear amp., $150.00; must be in A-1 condx, complete and clean. J. A. Selvidge, WØOMG, 1103 Gardner St., Poplar Bluff, Mo.

SELLING Complete station, only $250.00. Sonar SRT-120 transmitter; Matchbox; Jones MicroMatch; Hammarlund 129X rcvr; 10 meter beam; microphone, etc. Forman, Woodbrook Drive, Springdale (Stamford), Conn.

SELL Or Trade complete station DX-100, SP600 tower, misc.; 188 countries confirmed. $350.00. Ringland, 1306 Sturkie, Columbus, Ga.

KILOWATT Linear; DX-35; Knight VFO, complete w/pwr. supply; less two 4X250Bs. In gud shape. Make an offer for any or all. W2THZ and WA2OOY, 786 East 19th St., Brooklyn, N.Y.

FOR Sale: HO-129X with Millen R-9er preamp, perfectly overhauled Nov. 1961, $115.00; Hallicrafters HT-18 VFO, 6L6 output, $25.00; B&W Tr switch, $9.00; power supply 1500V ct at 400 mills also 400V CT at 200 mills on same chassis, $35.00. All instruction sheets. Will deliver entire package on Long Island within 25 miles of QTH, otherwise F.o.b. W2FRZ at VA 5-5722.

MOBILEERS Attention! Get over the hump with the Humphrey Mobile Mount. Fits G-76, Communicator IV and similar units. Adjustable for height and angle. Available through your dealer, or direct from Humphrey, Inc. 9430 State Road, Philadelphia 14, Penna., authorized factory warranty station for leading amateur communications equipment.

TRADE Heath Q Multiplier for Heath reflected power meter. W2IZW.

SALE: DX-40, $48.00; SX-111, $207, in exc. condx. Lee Gaunt, 170 East Holly Ave., Pitman, N.J.

MINI-PRODUCTS, Model B-24 beam. Never installed. $40.00. See page 154 December QST. Washburn, 975 Elizabeth, San Francisco. VAlencia 6-3656.

SELL: One owner Viking I, Johnson VFO, new tubes, TVI suppressed, sequence keyer, PTT relay, ten crystals. Currently operating. Bargain for $125. W. H. Kibbe, W9OSQ, 2130 18th Ave., Monroe, Wis.

SELL: National HRO-50T1 with A, B, C, D coils. Good condition. Make offer. W8FEM, Dick Sowler, 111 Mansfield Ave., Mount Vernon, Ohio.

FACTORY-Wired Viking Challenger, P.T.T.; Viking VFO; first $115.00 takes both! KØPAN. 1601 W. 22, Sioux Falls, So. Dakota.

VALIANT, $225.00; Ranger, $150.00; HQ-129X, $100. W6GVP, 6225 Melvin Ave., Reseda, Calif. DI 3-2888.

EXCELLENT HO-100, matching spkr, $120.00; Tecraft 6M transmitter, $35; 6M converter, 14-18 IF $20; Hallicrafters 2M receiver, $20. Charles Prentice, WA2HGP, 289 Engle, Tenafly, N.J.

FOR Sale: Two-element Hy-Gain Tri-Band beam 10-15-20 with rotator, indicator, and 40 ft. crank-up tower, $70 takes it all. K2UUU 48 Morningside Rd., Colonia, N.J.

JOHNSON Adventurer, $40; Lafayette Sixer HE-35, $40 w/ xtals. Both in excellent condx. John Sawina, WA2PNF, 148-28 87 Ave., Jamaica, N.Y.

GONSET GSB-100 transmitter, in exc. condx, $300. WA2SLZ, 228 Roberts Ave., Yonkers, N.Y.

DX-35, VF-1, Johnson low-pass, Heath SWR-meter, Matchbox, TA-33, Jr., rotator, cables, Vibroplex, all for $200; Globe Champion 300A, $299; HQ-150, $225, TG-34A keyer, 15 tapes, $35.00. Delivered within 150 miles. *Butterworth, 2708 Gaither,* Washington 21, D.C.

NEW Collins, at distributor's cost! 75S1, $390.00; 312-B speaker, $24.00; 399 C console, $123.90; 516F2PS, $86.25; all new, original cartons. SX101A new, $320.00; used 75A-2 w/75A-4 PTO unit, $275.00; model A slicer, $39.95; Drake 2A receiver, $195.00. All A-1 condition. Radio-Electronic Equipment Co., Inc. 480 Skain Ave., Lexington, Kentucky.

ATTENTION Bargain Hunters! XYL says new Globe Scout deluxe must go to pay bills. $90 and will ship to any state. WØOIZ, 115 Cottage Lane, Canon City, Colorado.

ESTATE Sale: Equipment of late K2RGS. Mobile: A54H, Super Six, squelch dyno supply, mike and whip, $100; fixed: DX100, Super Pro Spkr and pwr. supply, Bandmaster Z-match, $300. Will include 10M beam, mikes, key, Oskey, Junkboy, coax, etc. All reasonable offers considered. Contact K2OCW, 55 Gaynor Place, Glen Rock, N.J.

FOR Sale: DX-100 in excellent condition, will include mahogany desk, $125.00; Gonset 3-30 and 10-meter converter, each $7.50; will trade for 2-meter Communicator. W. L. Wilson, K6UDB, 2553 Via Corona, Montebello, Calif. PA 1-9677.

FOR Sale: Eico tube tester, model 666 and multimeter model 556, $79. Robert E. Wittich, 617 Sycamore, Humboldt, Kansas.

BEGINNERS: Code bothering you? Now learned in one hour. New method. Quick approach towards ham ticket. Used in Armed Services. Ham Radio, Scouting. "Ketchum's Hour Code Course", $1.00 postpaid. Guaranteed. Oaks Ketchum, 10125 Flora Vista, Bellflower, Calif.

COLLINS 75S-1, very clean, 40 hours total time, $310. J. E. Triplett, 1616 Maxwell, Ames, Iowa.

FOR Sale: Unmodified prop pitch motor, exc. condition 24VDC, weighs 38 pounds, $24.00; Hy-Gain 10-15-20 Triband beam, converted from 152T-3 to TH-4 last February, like new, $65.00. U pay shipping charges. K4UJT, 301 Bayside Road, Palm Springs, Florida.

BARGAIN: DX-40, electronic TR, VF-1, $65; BC-342, tunable RME converter (hot combination, 160-10), $70. Buy as station; control center with Q multiplier, ANL, supplies, monitor, PTT, spotting, etc. Comes free! K4IUB, Rte. 1, Nox 628, Fairfax, Va.

FOR Sale: Complete SSB/AM station 80 to 6m, HT-37, CE600L linear, 600W, 6m converter xmtr, 175W P.E.P., SX-100 rcvr, with 6m xtal. converter (Nuvistor RF amp)—all cables and switches. Will not sell separate units. $995.00 complete. W2GOK, Florence Ave., Pitman, N.J.

SELL Heath Twoer, Mic., Ant. spec. M7-A ground plane, 15 ft. RG/8U coax, connectors, $45.00. Charles Shinn, 48 Midfield Lane, Levittown, N.J. Tel. TR 7-9622.

SSB Transceiver from the BC-453, 40 or 80 meters. 53 page step by step instructions, $3.00 ppd. WRA, 10517 Haverly St., El Monte, Calif.

NOVICES Note! $175.00 buys a complete station. Or separately, immaculate SX-99 with R-46B spkr, $110; Globe Chief 90 with modulator $65.00; Dow coax relay and ext. DPDT, $8.00, 2 crystals and key, $3.00. Rev. Bittner, WØAIH, Stewartville, Minn.

FOR Sale: AF-67, PMR-7, power supply M-1070, 80 mtr. Mobile whip, Heath CB-1, Gonset Triband conv., Telrex 20 meter beam. Write Lanny D. McCreary, 811 East 15th St., Bowling Green, Ky.

SELL DX100B and SB10, perfect condition both $225.00. Also SX140 factory-wired excellent condx, $75. Stu Personick, 3230 Cruger Ave., Bronx, OL 4-2381. Sorry, will not ship.

TOROIDS: 88 mhy with mounting hardware. Uncased; like new. Information sheet included, $1 ea. 5/$4.00 postpaid. KCM, Box 88, Milwaukee 13, Wisconsin.

COLLINS 75A-4 receiver, original owner selling with speaker, vernier tuning knob, 3.1 kc. filter. Serial No. 3653. In exclnt condx, $550.00 Kenneth H. Engstrom, W5CUM, 833 Oak Forest Dr., Dallas 32, Texas.

WANTED: Commercial or surplus aviation and ground transmitters, receivers, test sets, 18S, 17L, 51R, 618S, GRC, PRC, ARN14, MN8S, Bendix, Collins, others. RITCO, Box 1.5, Annandale, Va.

SELL Apache $200. Van Nostrand, 1808 Colton Drive, Orlando, Fla.

FW Viking Courier for sale or trade for Drake 1A, 600L or Collins gear. Want good bug. WØBNF, Box 105, Kearney, Nebr.

SELL BC610 xmtr matching speech amp. Like new, never used in services, coils 160-80-40-20 TVI suppressed, no low pass, new tubes, dolly for handling. Instruction book, schematics, $350.00; HRO 60 in mint condx, 10-15-20-40-80 coils. Wonderful rcvr, $375; Valiant 5 months use, factory wired, perfect, $350; SX101A little use bought new, $325.00; HQ110, mint condx, $165.00 All books and schematics. Will deliver equipment 100 miles out of Indiana. Want HT32B, Johnson KW, SX115 new or mint condx cash. K9UIV, Wilber L. Cox, 810 Pendleton Ave., Anderson, Indiana. Ph 642-2233 days.

HA-1 electronic keyer including key. Xmas present. First check for $40.00 takes it. W1ZHY, 19 Burgess St., Nashua, N.H.

DX-100B for sale. Excellent condx. Need money for college. Make offer. Robert Ball, W7GBF, 125 Edgemore Lane, Ithaca, N.Y.

HAMMARLUND HQ-110. With clock, no speaker, $165.00. F.o.b. Megaw, 5727 Antilles, Sarasota, Fla. W4ZBU.

TRADE: HO 5 engine train layout. Value $250. Want good receiver and transmitter outfit. Also have a garden tractor. Make me an offer! Paul Gerthe, Buffalo Center, Iowa.

KWM-1, operates on 10-15-20-75 M (See QST May 1959). Homebrew AC supply, $469. Mobile mounting tray, $20. 304TL, $7.00. David M. Dennis, K8ATS, R #1, Adrian, Mich.

WANTED: 1 KW (or larger) modulation xfrmr. Approx. 7500 ohms total pri. impedance to 7500 ohms sec. Must be compact high quality unit. Write or phone Ralph McIntyre, W8WOM, 3137 Mayfield Rd., Cuyahoga Falls, Ohio. OVerdale 8-5625.

COLLINS 32S-1, AC supply, $525.00; 75S-1, $375.00; Johnson Thunderbolt, $375.00; $1195.00 buys all. Will deliver 150 mile radius. W. L. Knowles 10 min. terr. Upper Montclair, N.J. PI 4-5994.

WANTED: Any information on the Edwin Guthman U-50 receiver or the Edwin L. Guthman Co.—David Shores, 7463 Stratford, St. Louis, Mo.

SELL: Globe Scout 680A. 65 watts c.w. 50 watts phone 80 thru 6 meters. $65.00 postpaid in U.S.A. David H. Wenner, K3KEL, RD #1, Montoursville, Pennsylvania.

INSTRUCTOGRAPH with osc. and 11 tapes, like new, 3 mo. old, $40. HT40, F/W like new, orig. carton, $75; NC183 D perf., no marks, no scratches, $200. K9DQO, Bill Dres, Box 273, Palos Heights, Ill.

30L-1, used a few weeks, made available by purchase of 30S-1. Mint condition. $445.00 F.o.b. F. Price, 4620 N. Magnolia, Chicago 40, Ill.

SELL: Factory wired Globe Chief excellent condition. $50.00, Hallicrafters S-85, good condition, $70.00. Paul S. Baillie, Box 4, Bourne, Mass.

SALE: Power supplies: 750v at 250 ma., $15; 1200v at 300 ma., $20; 3000v @ 350 ma. $35; all filtered, with variacs and tubes. Modulator, 300 w. audio, with pair 838s, $15; pair 4-125As, $5 each; 800w 75 meter final, with 4-400A, $25; cabinets, 19 ft. wide; 1 ea. 17½" 26" 37½" high, $5.00 each. Heath B1 balun coil, $5; Eico 706 code oscillator, $7. Cash and carry. W2HTD, 86 Brook Rd., Red Bank, N.J. OS 1-0131.

SELL: Mosley 20-40 meter shortbeam with new 40 meter coils. $39.95. Sell Mims rotator, control box and cable, $79.95. Want 500 cycle filter for 75A4, have spare 3.1 kc. filter for trade with cash. Gene Hubbell, W9ERU, Box 273, RR 4, Rockford, Ill.

SELL: 10B factory-wired, QT1, 458 VFO, like new, $109.00; 3" Triumph scope, $22; QSTs 1942-1960 inclusive, less 1955-56-57 and 5 Handbooks, $25.00. A. Margolis, W2UPN, 196-43 69th Ave., Flushing 65, L.I., N.Y.

HRO-7, fair condition, with original power supply and seven coils, $90. K5DZF, Box 1102, University, Miss.

APACHE and complete mobile, $200 each. Apache in exc. condx. Mobile best offer or will break up. Viking mobile xmtr and VFO Morrow MBR5, James C 1450 (110v. AC and 12 or 6v DC) plus cables, mike, Dow coax relay, mounts extra for package deal on mobile. Dave Clark, 3945 W. Willow, Lansing, Mich.

AF67 Wanted. Local purchase only. WA2DCA, 9 W. Cedar Ave., Merchantville, N.J.

THE Nikey: For your electronic keyer, $16.95. Lefor Industries, New Canaan, Conn.

FOR Sale: Gonset G-76 transceiver with AC supply, in vy good condx, $340.00. Will consider trade of any commercially made VHF gear and cash. K7GFX, 6402 Calle Pegaso, Tucson, Ariz.

WANTED: Good oscilloscope and Super Pro BC779. Best price, condition, and full particulars first letter please. W. Wesslund, WØDNW, 2801 Wright Ave., North Platte, Nebr.

FOR Sale: SX-111, HT-40, 6 meter nuvistor converter, many accessories, all perfect, best offer. S. Vernick, WA2QZV, 330 E. 46th St., N.Y.C. N.Y. OX 7-3157 evenings and week-ends.

SELL: Collins 75A4 with extra 500 cycle filter, serial 3685. Mint condition. $500.00. Also B&W 5100-B with 51SB-B sideband generator. Shipped in original cartons. $400. W4OD, 709 Knollwood St., Winston-Salem, N.C.

FOR Sale: Johnson Viking 500 transmitter, perf. condx $495. K6RTC. 470 Commercial Ave., South San Francisco, Calif.

GUD Buys: NC-300 calibrator, $230.00; Viking II, $145.00; tower, $35.00; Mosley 10-15 M beam, $25.00; cabinet speaker, $10.00; Vibroplex Bug, $15.00. All plus more for $425.00. Richard D. Lawrence, 160 Chestnut St., Abington, Mass.

SELLING B&W 75 ohm low pass filter, takes kilowatt, $12.00. Health Q-multplier with manual, $6.00. Novice xmtter, Heath AT-1, $20. Transcon VOx-Box, $15. W2ICW, Schickler, 16-18 163rd St., Whitestone 57, N.Y. FL 7-7146.

SELL: HQ160 factory checked, perfect, $295.00. W2CTO.

NATIONAL 300 receiver for sale. A-1 condition. Used very little. Will take best bid over $175.00. F.o.b. Bernard M. Criger, 97 Oakland Park, Columbus, Ohio.

SELL Or trade a Hammarlund HQ-100C shortwave receiver. Six months old $150.00. Moore, 5403 Ventnor Ave., Ventnor City, N.J.

USED Equipment Bargains! List 10¢. Brand's, Sycamore, Illinois. Equipment wanted!

SELL Johnson Thunderbolt. New final tubes, $379. K6GHU, 762 Juanita, Santa Barbara, Calif.

MOBILE Rig, Morrow MB565, Gonset Super 12, both $160.00, 7 months old. WA6OMA, 8737 Harrison Way, Buena Park, Calif.

FOR Sale: DX40, HQ110C, Heath AC VTVM, VF1, 1000 W. low pass filter; all equipment in excellent condx. Make reasonable offer. K3JUP, Dave Cropek, 3214 Old French Rd., Erie, Penna.

WANTED: ART-13 and ARC-5 rcvr and xmttr (80-40-2). Plse QSL WA5AAO, Box 57, La Grange, Texas.

LANSING, Michigan, Mint, HT-37, $340.00; HQ-170C, $265; 2GG813, neat brew, $100. K8VNE, 1620 E. Saginaw, Lansing, Mich.

HEATH Apache transmitter, clean, $180.00. Roy Norby, K2-COG, 2514 Crompond Road, Yorktown Heights, N.Y.

SELL. Best offer all or in part: Heath Seneca xmtr; Knight R-100 receiver, Tecraft CC-50 converter. K2KXL, Nelson, 24 Cedar Court, Plainfield, N.J.

WILL Trade new SX-115 receiver, B&W 5100B transmitter and companion; B&W 51SB-B sideband generator for North Carolina shore property. Furman James, W4YPZ, Cabarrus Bank Bldg., Concord, North Carolina.

CENTRAL Electronics 20A, factory-wired, QT-1, 458VFO, $150.00. W3APH, 104 Harbeth Drive, Pittsburgh 37, Penna.

RANGER Transmitter with P.T.T. and Mosley V-4-6 vertical, both in exc. condx, $200. Write WA6GWD, Box 1237, Quincy, Calif.

SELL: Heath Sixer, 8 mc. model with crystal, scarcely used, $33.00; International FCV-2 6 meter converter, BC band IF, in fancy case, factory aligned, never used; $10; new Triad R-58A *power transformer, 875 v. at 185 ma., $10; Motorola FMTRU-5V*, 12 volt, complete and operating on 147.3 mcs., $50 with accessories. George, K9AQM/6, 3752 Rollison Road, Redwood City, Calif.

SELL: HT-37 new condition. Used three hours, $350.00 f.o.b. W0FTS. Phil Hoover, 2726 Forest Road, Davenport, Iowa.

HEATH Mohawk in good condition, $250 f.o.b. Export, Penna. *W. Dunworth, RD No. 3, Box 137.*

SELL: Johnson Thunderbolt, $400; HT32, $400. Both in like-new condx. Used very few hours. Write for details. K2SJJ/8, 4058 Herman Ave., S.W., Grand Rapids 8, Mich.

SACRIFICE New Poly-Comm 62B with warranty. Outstanding 6 and 2 metel transceiver. $295.00 or trade fir SSB mobile. W3QKW.

FOR Sale: KWM1, serial No. 572, AC and mobile power supplies, mobile mount, $695.00. W3VDA, P.O. Box 1225, Harrisburg, Penna.

SELL: R-100 receiver with S-meter, speaker, calibrator, in exc. condx. $85.00. WA2WMP, 86-91 188 St., Hollis, N.Y.

BARGAINS: Used gear, all like new, Collins KWS-1, $900; Collins 30S-1, $850.00; Gonset GSB101, $225.00; Hallicratters HT33, $295.00; Johnson Navigator, $144.50, Genessee Radio, 2550 Delaware Ave., Buffalo 16, N.Y. Phone TR 3-9661.

COLLINS S Line bargains. 32S1, $500; 30L1, $450; 75S1, $380, with 500 cycle filter and BFO crystal, $240; 136A1 blanker for 75S1, $60; KWM2, $1000; 312B5, $275 and 351D2 mobile rack for KWM2, $90. All used but guaranteed perfect by Collins, authorized distributor. Many other new and used bargains. Write for list. Electronics, Box 3687, Corpus Christi, Texas.

ANALOG Computer for sale. Complete Heathkit electronic Analog Computer with two-function generators and supply of General Radio plugs and precision resistors. Reasonable. D. Carmody, W7ZCY, 3203 N.E. Klickitat St., Portland 12, Oregon. AT 7-7466.

TRADE Or sell: DX-60; ten novice crystals; Brush microphone, for new or likenew 32 S-1. WL7DWB, 625 Schoenbar Drive, Ketchikan, Alaska.

OSTs wanted, 1915 to 1922. Have many QSTs 1931 up at 25¢ each. W. Vollkommer, W2HD, Route 2, Box 156, Monroe, N.Y.

SELL: Excellent National NC-183-D rcvr. $195; DX-20, accessories, $25. Wiseman, 95 Linden Blvd., Brooklyn IN 2-0325.

CLEGG 99er. Cheap. K2JZH.

6M Lettine, factory wired transmitter, 50W. $60.00 F.o.b.; National 6 M conv., $15.00; Gonset Monitone, $15.00. W2OJS, Syracuse GL 8-2934 or Bach. Box 84, Verona Beach, N.Y.

SELL: Gonset Six meter Communicator III, complete with mike and canvas carrying case, exc. condx., $165.00. W2ADB, Teaneck, N.J. TE 7-2004.

FOR Sale: F.o.b. Sarasota, Fla. R-9A rcvr. Needs work, $50.00; S-38D. As is, $15; ARC-5 T-23, $10. K4DYB, 2239 Fiesta, Sarasota, Fla.

SB-10, $75; DX-100, $110 modified SSB Matchbox Coupler, $35. All in good condx. W3JGT, Carbondale, Penna.

BRAND New, in factory sealed cartons, Drake 2B and Johnson Viking Invader. Also practically new Johnson Thunderbolt and Hallicrafters SX-111. Will consider all reasonable offers on any item. W. E. Bauer, WA6PDU, 4255 Lido Dr., Riverside, Calif.

HT-32 A-1 condition, $350.00; Drake 2-B like new, $225. KØ-PPT, 1548 Wellston Place, St. Louis 33, Mo.

WIRING Difficulties? Let us wire your kit. Jennett, K1HRM, 274 Highland, Weston, Mass.

NOVICE Code practice material. Any 3/4 IPS tape recorder. 28 minutes, $2.50 PPD. Don Vaughan, W4MTY, 4607 Briarcliff Rd., Atlanta 6, Ga.

CLEARING Out shack. Send card for list of commercial manufactured gear and parts. QST complete from January 1937 to December 1961 except for four issues. Make offer. W2OM.

ELMAC AF-67 w/mike in gud condx. $85; PMR-6A w/12 volt pwr. supp., $50.00. Also SB-10 in exc. condx w/pwr. supply, $70. Will sell all or part or trade for CE20A and 458 VFO. Rich Haworth, 620 W. Campus Dr., Ripon, Wisconsin.

CRYSTALS Airmailed: SSB, MARS, Net, Novice, CD, etc. Custom finished FT-243 .01% any kilocycle 3500 to 8600 $1.49. (10 or more same frequency, FT-243, 99¢) 1707 to 20.000 $1.95. 20.001 to 30.000 $2.25. Overtones above 10 Mc. Fundamentals 10 to 13 Mc. $2.95. Add 50¢ each for .005%. Add 65¢ each for HC-6/u hermetics. QST projects—FT-243 crystals: "SSB Package" five mixer $9.95, Seven matched filter $9.95; October 1961 "Sectionalized Receiver" including 390 Kc. $9.95.—also other project crystals and sets. Be specific, write. Airmailing 9¢/crystal, surface 5¢. Crystals since 1933. C-W Crystals, Box 2065-Q. El Monte, California.

SELL: Heath DX-40, $50; Hy-Gain 6-40 meter doublet, $10; S-108 with Heath Q multiplier, $135. John Morgan, WA6LIP, 815 South G St., Madera, Calif.

TRADE Or sell: DX-60, new spare 6146; ten novice xtals; Brush microphone, for new or like-new 32S-1; 516F2. WL7-DWB, 625 Schoenbar Drive, Ketchikan, Alaska.

COLLINS 75A1, in exc. condx. matching speaker, $200; Apache, only year old, perfect, $200. Ron Adams, K8QEJ, 215 Franklin Ave., Cuyahoga Falls, Ohio.

PREMIUM Quality used equipment, over 1,000 units. Reconditioned with trial plan and full 90-day guarantee. Terms available. Write for free lists and top trade-in offer on your present equipment. World Radio Laboratories, Box 919, Council Bluffs, Iowa.

COLLINS 30S-1, one kilowatt linear amplifier, like new. $995. W8OLJ, Franklin, Michigan.

FOR Sale: GSB-100, unused. Highest over $400. Call after 3 PM 'til midnight. Waterbury 753-3871. W1TZO.

ANTENNA Farm 20 acres. Tall sky hooks. Trout brook, 7 miles to capitol. $2000. W1THM

SWAP: HQ100C for mobile receiver and supply. All offers answered. Bob, K5DZE, 316 South 11th St., Columbus, Miss.

SELL SX101A, cost $445, sell for $365, 3 weeks old. Eico 720 factory-wired, used 3 hrs $100. Emergency has come. D. Simo, *168-T* St. Charles, Ill.

SELL: 20A, QT-1, VFO, factory wired, Drake 1A, all perfect, $325.00 or your best offer. K2HWP/2, 125 Amherst Ave., Syracuse 5, N.Y.

SELL: Hallicrafters SX-99 receiver with Q Multiplier, $100. Bob Miller, RD No. 5, Lisbon, Ohio.

GONSET Communicator III, 6 mtr., in exc. condx, $165.00. Richard Mead, K2UNY, RD No. 1, Owego, N.Y.

COMMUNICATOR III, two meters, $150.00; BC348R, $35, Scharneck, 315 Willowbrook Rd., Staten Island 14, N.Y.

VALIANT, W/T, $329.00. Mel, K2JWD, 62-60 99th St., Rego Park 74, N.Y. Tel. IL 9-3813.

SELL: Gonset G76 with both AC and DC power supplies, antenna and mike, $500.00. W9SRH, Peoria, Ill.

NATIONAL HRO 60R receiver, as new, A.B.C.D coils, $300; Tapetone XC50C4 converter, 6 meters, 28-30 Mc output with 2 xtals on switch, $30; General Radio 605B signal generator 9.5 Kc to 50 Mc, $125.00; Weston 982 VTVM, $40; HP-400 AC VTVM, $40; coax ratio meter (equiv. MicroMatch), $20; Heathkit AA80 amplifier, transistorized, $25; BC221AA with book and regulated power supply, $75; Simpson 276 oscilloscope calibrator, $15. W2ACH, 41 Peters Ave., Hempstead, N.Y.

CE20A, 458 VFO, No QT1, exc. condx, no modifications, $160.00. K4EBI/5, 1809 Cranford, Garland, Texas.

FOR Sale: 75A4, perf. condx, serial No. 5099, highest bid above $575; 32S1, AC supp. w/spkr, perf., $850; MT-1, MR-1, AC/DC supplies, all new, $250.00; Legee-Neville, 12v. 50A system, $45.00; 2 el. Hy-Gain Triband $25; 304 TL linear, 75-40-20 Variac bias DC supply 42" cabinet on casters, $69.60; TS-175U freq. meter, 80-1000 mc, $105; BL-221, $49; LM-13, new calib. w/Eput meter, $55.00. Factory cartons, orig. manuals with all. Trade any above on late KWM-2 and/or 50 to 100 ft. H.D. tower. Send SASE for list. 1000 other things! All F.o.b. my QTH. Don Johnson, K6MIM, P.O. Box 1, Somis, Calif. Tel. HUnter 2-4291.

FOR Sale: Elmac PMR7 and AF67, complete with power supplies, relay, cables. Exc. condx, best offer over $280. Mel Alme, KØIMP, Drake, N.Dak.

SX28 Receiver, excellent, sensitive, precisely calibrated 80-10 meters. $95. K8HHK.

SALE: KWM-2, all modifications, new condition with 516-F1 AC power supply and 312B spkr. console 1000 dollars. K5YLU.

NEED Cash! Collins 32V1, $150; Pacemaker, $175. HQ180 (new), $325.00; Ranger PTT (new) $195.00. WA2QER.

FOR Sale: Excellent Apache, $220; SB10, $80. W2DID, 451 Smith St., Central Islip, N.Y. Tel. CE 4-8544.

FOR Sale: Communicator IV (2M), $270. less mike $265.00; NC-109 and calibrator, $116. KØFMF, Pulaski, Iowa.

SELL: Aerovox Model 97 L.C. checker, TG-34-A keyer, and Precision model 110 V.O.M. Kenneth Gould, 509 Vine St., Liverpool, N.Y.

"HORSE-TRADER" Ed Moory says, Our Motto: Pay Cash and save Money. Used Equipment Guaranteed—HT-37, $389.00; Viking Invader, $489.00; 75A-4, Perfect—$489.00; SX-115, $479.00; 75A-3, $349.00; 32V3, $269.00; 20-A, $145.00; Drake 2-B, $229.00; HT-32-B, Demonstrator $519.00; 30L-1, $399.00; 75S-1, $369.00; 32S-1, $489.00; GSB-101, $229.00; Heath Warrior Wired, $209.00; 200-V, $749.00; Globe Champion, $99.00; *Thunderbird Linear, $359.00; Special Order New, 200-V's* $895.00. Write for Special Quotations on Orders above $500.00. Terms: Cash; No trades: "Ed" Moory—Wholesale Radio, Box 506, DeWitt, Arkansas. Phone—Whitney—6-2820.

OFFERS Close to suggested prices considered for 6V Carter Genemotor, 500V output, $10; 60 watt modulator, 807s, with multimatch transformer, $20; BC696A, 80M transmitter, $10; BC-458-A, 20 CW, $5.00. C. Beasley, 1110 Harrison, Madison, Wis.

MAKE An offer on complete SR-500 station with HT-30, HT-31, SX-100 in metal console. Perfect shape. Plug in and operate SSB, AM, CW, 400 watts. Hildyard, KØTKG, Box 545, Independence, Kans.

SALE Bargain. HB VFO, good drive on 80-40, fair on 20, vernier drive. Stable enough for linear 40 operation; HB 100 watt (1625) multimatch modulator. Will sell to best offer of cash or money order. Will ship. Bill Fry, 1202 S. 18th. Artesia, N.M.

WANTED: Mechanical filters *F455C-08, F455C-31.* Jeff Tripp, 96 Fairview Ave., Belmont 78, Mass.

FOR Sale: Collins KWS-1, Serial 1563, $1000; KWM-2, Serials 1004 and 1210, each $825; 312B-5, Serials 196 and 265, each $225; 30S-1, Serial 74, $900; 516F-2 power supply, $85. Excellent condition. F.o.b. R. Littler, 640 Snowhill Blvd., Springfield, Ohio. Tel. 322-8722.

WANTED: Panadapter PCA2 type T-200. Operative or inoperative. Needed for spare parts, particularly transformer T1-5114. Advise condition and price. W3DX, H. Crossland, 4616 Rockville-Norbeck Road, Rockville, Md.

PARABOLIC Andrews antenna for sale, 1 six ft. spun aluminum, 1 ten foot, in exc. condition, best offer takes. *Also PP 813* amplifier, less tubes $30.00. Eico 221 VTVM, new condition, $30. W7GPP, 1308 F, The Dalles, Ore.

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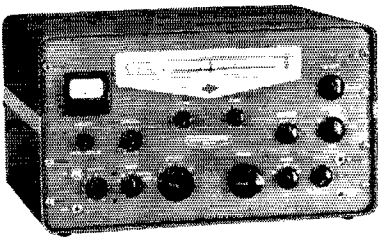

Gonset GSB-100 SSB Transmitter/Exciter

FB rig for SSB/CW/PM/AM linear on 80-10 meters. 100 watts PEP input. Built-in power supply; pi-net output; adjustable VOX and anti-trip, etc. Wt., 120 lbs. Subject to prior sale.

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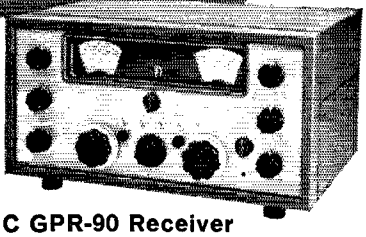

Popular TMC GPR-90 Receiver

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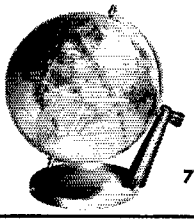
94 SZ 895. *Save $266.00!* Sale price only **$499.00**



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77 SX 325. Sale Price only **$7.99**

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Johnson Viking 240-1000 Kilowatt Amplifier. You save $299 on this kw amp for SSB/AM/CW! Has 4-400 A's in final, two 810 modulators. Mounted in pedestal. A terrific piece of gear. Wt., 500 lbs. **99 SZ 035.** Reg. $1595.00. Sale price only **$1296.00**

Collins 136B-1 Noise Blanker. For KWM-1. Holds down ignition, motor, appliance noises. 1 lb. **77 S 830.** Reg. $120.00. Sale price only.....**$99.00**

Central Electronics DQ Q-Multiplier. For receivers with 450-500 IF's. Also provides added selectivity and BFO in mobile SSB and CW reception. Wired. 4 lbs. **83 S 818.** Reg. $29.50. Sale price only.....**$24.95**

Johnson Mobile VFO Kit. For use with Viking "Mobile" Kit. **98 SX 056.** Reg. $33.95. Sale price only.....**$29.95**

Dow-Key DKC-TR2A TR Switch. For mobile/fixed station use on 144-148 mc., 6 or 12-v. operation. **77 S 749.** Reg. $12.50. Sale price only.....**$7.99**

Master Mobile Type 140X Heavy-Duty Bumper Mount. **97 S 160.** Reg. $7.79. Sale price only.....**$5.95**

807 Beam Power Tetrode. Special Allied purchase. **39 A 343.** While they last, each.....**79c**

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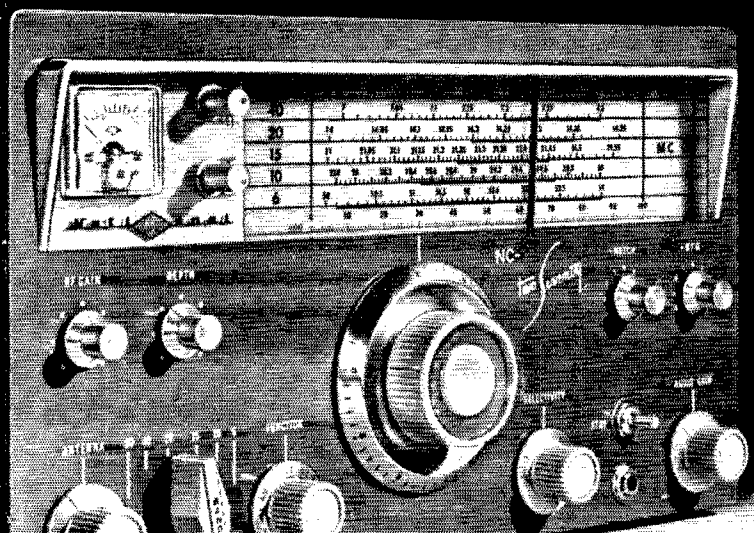
FROM QST — JANUARY 1961

"Stability, both mechanical and electrical, is exceptional . . . The NC-270 works well enough on 50 Mc. to encourage a v.h.f. enthusiast to design his converters . . . so that they will work into the 6-meter range rather than into the lower bands. This would give him full coverage of the 144-Mc. band and a four-megacycle spread in any of the bands from 220 Mc. up . . . and he can skip the construction of a 50-Mc. job. The NC-270 should do all he'll need in that range."

FROM CQ — MAY 1961

" . . . retains all the "feel" of the more expensive receivers for which this company is known . . . It is unusual to see a front panel NOTCH DEPTH control in this price class . . . The a.n.l. circuit in the NC-270 is exceptionally good . . . Mechanical stability is impressive. It is possible to tune a s.s.b. signal on one of the high frequency bands, lift the front of the receiver up several inches and let go. Unless the main tuning knob moves, the signal will still be there . . . (The National NC-270) is an extremely stable and sensitive receiver . . . "



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"I would like to congratulate you on one of the finest communications receivers on the market; the NC-270. (At RACES center during hurricane Carla) communications were maintained with schools and hospitals . . . Your receivers performed for over 60 hours. The thing that impressed me most was its extreme stability under the most adverse conditions. Emergency power and, at best, poor antennas did not help our situation, nor the 70 mph winds which blow at the airport where we were set up. The selectivity of the NC-270 helped to maintain contact with other stations with low power and bad antennas. On 6 meters, we rarely needed a relay and when this did happen it was due to their receiving conditions, not ours . . . performed like a high priced receiver . . ."

If you want a proven medium priced receiver, we strongly suggest that you hear the NC-270 at your dealer's. Write today for technical information.

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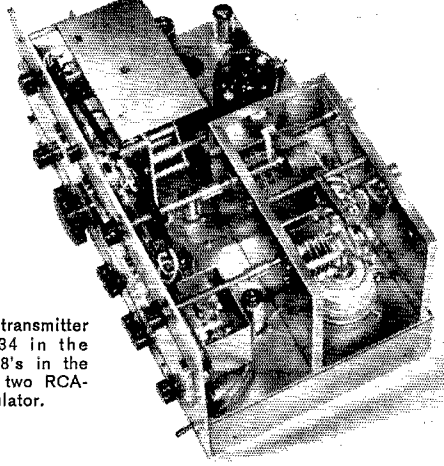
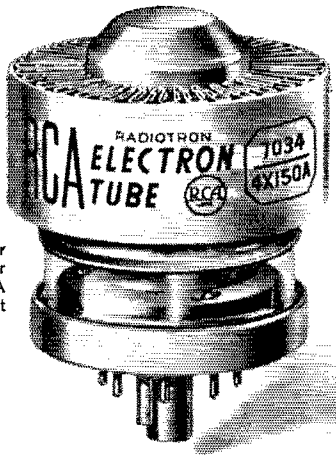
Q-03



Clegg's new Zeus transmitter uses an RCA-7034 in the "final", 2 RCA-7558's in the driver stages, and two RCA-811A's in the modulator.

The Clegg Zeus Does It with an RCA-7034/4X150A "Final"



RCA-7034—operates with higher margin of safety and longer life, directly replaces 4X150A in present transmitters without circuit changes.

Capable of up to 185 watts input AM or CW on 6 and 2 meters, this new transmitter by Clegg Laboratories, Inc., uses one of the most outstanding beam power tubes in amateur radio—RCA-7034.

Designed with a high-efficiency radiator to handle higher power, RCA-7034 operates with input ratings up to 500 watts on CW and SSB at frequencies up to 150 Mc—operates at reduced power up to 500 Mc! And note this: the RCA-7034 is not much bigger than a golf ball.

The RCA-7034 is available at your RCA Industrial Tube Distributor. For a technical bulletin, write Section C-37-M, Commercial Engineering, RCA Electron Tube Division, Harrison, N.J.

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