

December 1962

50 Cents

55c in Canada

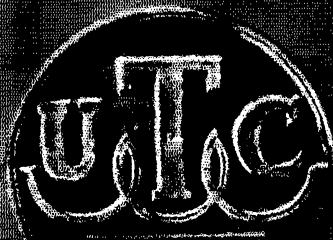
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REPLACEMENT TYPE TRANSFORMERS & REACTORS

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 $\frac{1}{2}$ "	1 $\frac{1}{2}$ "	1 $\frac{1}{8}$ "	2 $\frac{3}{8}$ "	$\frac{3}{4}$ "
FT-2	6.3 VCT-1.2A	2 $\frac{1}{2}$ "	1 $\frac{1}{2}$ "	1 $\frac{1}{8}$ "	2 $\frac{3}{8}$ "	$\frac{3}{4}$ "
FT-3	2.5 VCT-6A	3 $\frac{3}{8}$ "	1 $\frac{1}{2}$ "	2	2 $\frac{1}{8}$ "	1
FT-4	6.3 VCT-3A	3 $\frac{3}{8}$ "	1 $\frac{1}{2}$ "	2	2 $\frac{3}{8}$ "	1
FT-5	2.5 VCT-10A	3 $\frac{3}{8}$ "	2 $\frac{1}{8}$ "	2 $\frac{1}{8}$ "	3 $\frac{3}{8}$ "	1 $\frac{1}{2}$ "
FT-6	5 VCT-3A	3 $\frac{3}{8}$ "	2 $\frac{1}{8}$ "	2 $\frac{1}{8}$ "	3 $\frac{3}{8}$ "	1 $\frac{1}{2}$ "
FT-7	7.5 VCT-3A	3 $\frac{3}{8}$ "	2 $\frac{1}{8}$ "	2 $\frac{1}{8}$ "	3 $\frac{3}{8}$ "	1 $\frac{1}{2}$ "
FT-8	6.3 VCT-8A	4	2 $\frac{1}{2}$ "	2 $\frac{1}{8}$ "	3 $\frac{3}{8}$ "	2 $\frac{1}{2}$ "
FT-10	24 VCT-2A or 12V-4A	4	2 $\frac{3}{8}$ "	2 $\frac{1}{8}$ "	3 $\frac{3}{8}$ "	2 $\frac{1}{2}$ "
FT-11	24 VCT-1A or 12V-2A	3 $\frac{3}{8}$ "	2 $\frac{1}{8}$ "	2 $\frac{1}{8}$ "	3 $\frac{3}{8}$ "	1 $\frac{1}{2}$ "
FT-12	36 VCT-1.3A or 18V-2.6A	4	2 $\frac{3}{8}$ "	2 $\frac{1}{8}$ "	3 $\frac{3}{8}$ "	2 $\frac{1}{2}$ "

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

FT-13	26 VCT-.04A	2 $\frac{1}{2}$ "	1 $\frac{1}{8}$ "	1 $\frac{1}{8}$ "	1 $\frac{3}{8}$ "	$\frac{3}{4}$ "
FT-14	26 VCT-.25A	2 $\frac{1}{2}$ "	1 $\frac{1}{8}$ "	1 $\frac{1}{8}$ "	2 $\frac{3}{8}$ "	$\frac{3}{4}$ "

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 $\frac{1}{2}$ "	3	2 $\frac{1}{2}$ "	2	2 $\frac{1}{2}$ "
R-102	350-0-350	70	3A	3A	3	2 $\frac{1}{2}$ "	3 $\frac{3}{8}$ "	2 $\frac{1}{2}$ "	2	3 $\frac{1}{2}$ "
R-103	350-0-350	90	3A	3.5A	3 $\frac{3}{8}$ "	2 $\frac{1}{2}$ "	3 $\frac{3}{8}$ "	2 $\frac{1}{8}$ "	2 $\frac{1}{4}$ "	4 $\frac{1}{2}$ "
R-104	350-0-350	120	3A	5A	3 $\frac{3}{8}$ "	3 $\frac{3}{8}$ "	3 $\frac{3}{8}$ "	3 $\frac{1}{8}$ "	2 $\frac{1}{2}$ "	5 $\frac{1}{2}$ "
R-105	385-0-385	160	3A	5A	3 $\frac{3}{8}$ "	3 $\frac{3}{8}$ "	4 $\frac{1}{8}$ "	3 $\frac{1}{8}$ "	2 $\frac{1}{2}$ "	7

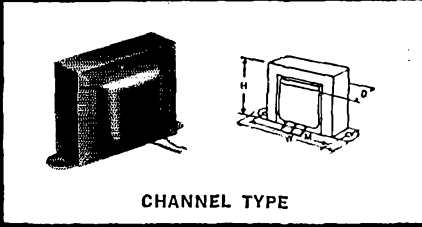
VERTICAL SHELL POWER TRANSFORMERS

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 $\frac{1}{2}$ "	2 $\frac{1}{8}$ "	3 $\frac{1}{2}$ "	2	1 $\frac{1}{2}$ "	2 $\frac{1}{2}$ "
R-111	350-0-350	70	3A	3A	2 $\frac{1}{2}$ "	3 $\frac{1}{8}$ "	3 $\frac{1}{2}$ "	2	2 $\frac{1}{2}$ "	3 $\frac{1}{2}$ "
R-112	350-0-350	120	3A	5A	3 $\frac{1}{8}$ "	3 $\frac{1}{8}$ "	4	2 $\frac{1}{2}$ "	2 $\frac{3}{8}$ "	5 $\frac{1}{2}$ "
R-113	400-0-400	200	3A	6A	3 $\frac{1}{8}$ "	4 $\frac{1}{8}$ "	4 $\frac{1}{2}$ "	3	3 $\frac{1}{2}$ "	8

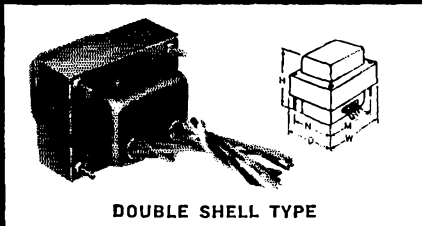
CHANNEL FRAME FILTER REACTORS

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

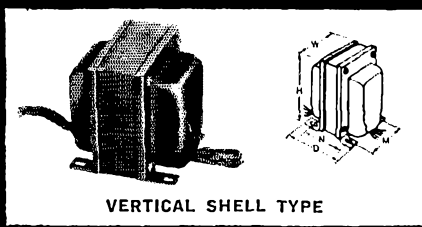
Type No.	Induct. Hys.	Current	Resistance Ohms	W	Dimensions, in.			M	Wt. Lbs.
					D	H			
R-55	6	40ma	300	2 $\frac{1}{8}$ "	1 $\frac{1}{8}$ "	1 $\frac{1}{8}$ "	2	$\frac{1}{2}$ "	
R-14	8	40ma	250	2 $\frac{1}{8}$ "	1 $\frac{1}{2}$ "	1 $\frac{1}{8}$ "	2 $\frac{1}{2}$ "	$\frac{3}{4}$ "	
R-15	12	30ma	450	2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



CHANNEL TYPE

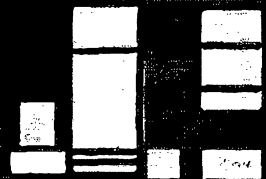


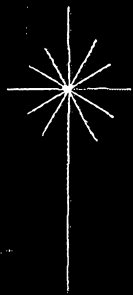
DOUBLE SHELL TYPE



VERTICAL SHELL TYPE

UNITED TRANSFORMER CORP.

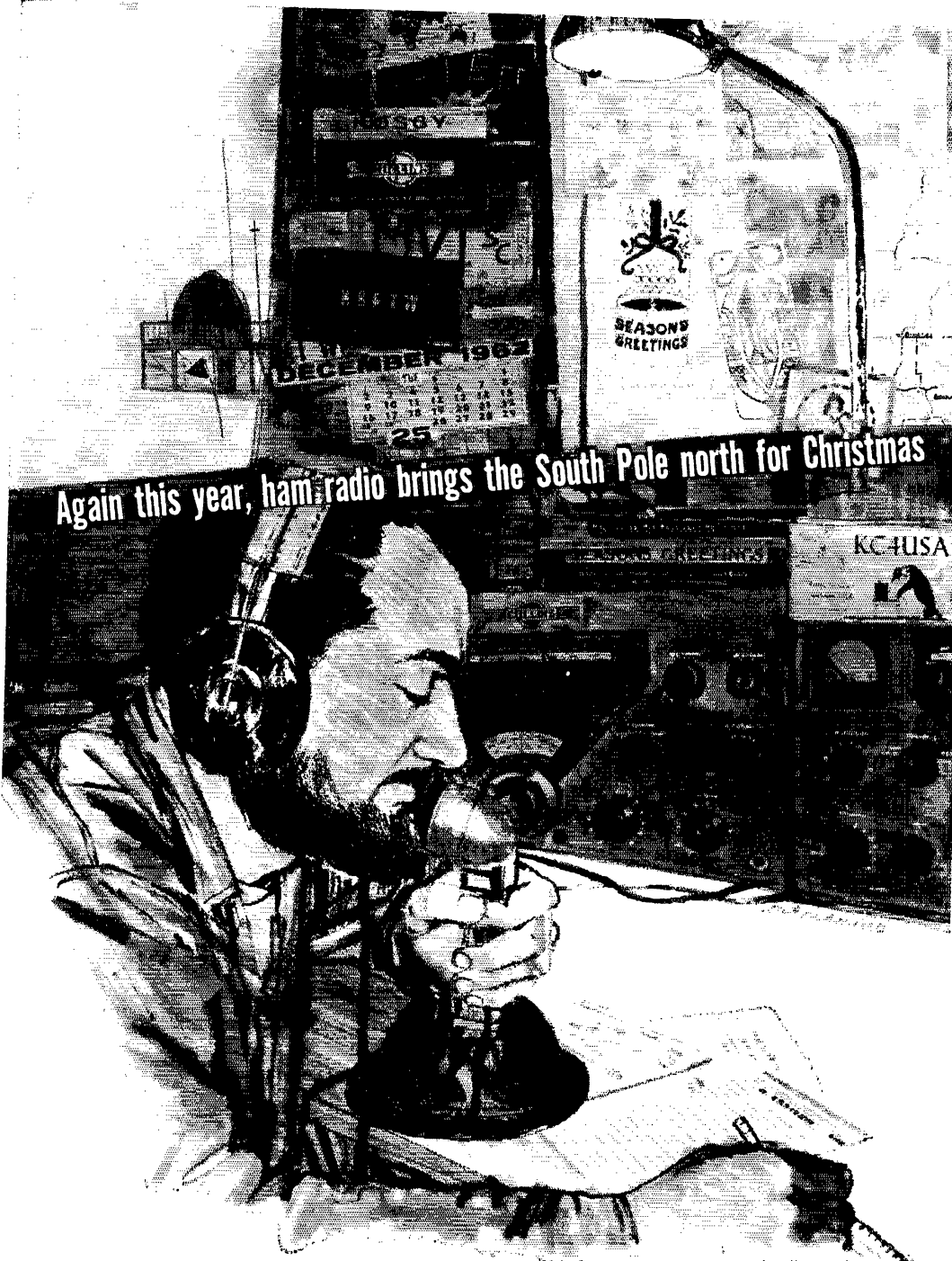




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can be rendered to mankind
than communication of
the greatest of all ideas
...the hopeful message
of Christmas*



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OFFICES

38 La Salle Road
West Hartford 7, Connecticut
TEL: 336-2535
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3-400Z	B	3000	.100	—	0	32	—	.12	655	5.0
	SSB		.333 ⁽³⁾							14.5
3-1000Z	B	3000	.240	—	0	65	—	.30	1360	7.5
	SSB		.670 ⁽³⁾							21.3
4CX250B ⁽¹⁾	AB1/SSB	2000	.1/.25 ⁽³⁾	350	-55 ⁽⁵⁾	0	0/.005 ⁽³⁾	0	300	6.0 2.5
	C/CW	2000	.25	250	-90	2.9	.019	.026	390	
	C/AM	1500	.20	250	-100	1.7	.02	.014	235	
4CX300A	AB1/SSB	2500 ⁽⁴⁾	.1/.25 ⁽³⁾	350	-55 ⁽⁵⁾	0	0/.004	0	400	6.0 2.5
	C/CW	2500 ⁽⁴⁾	.25	250	-90	2.8	.016	.025	500	
	C/AM	1500	.20	250	-100	1.7	.02	.014	235	
4CX1000A	AB1/SSB	3000	.25/.90 ⁽³⁾	325	-60 ⁽⁵⁾	0	.002/.035	0	1680	6.0 10.5
4-65A	AB1/SSB	3000	.015/.065 ⁽³⁾	360	-85 ⁽⁵⁾	0	0/.006	0	130	6.0 3.5
	C/CW	3000	.112	250	-105	1.6	.022	.009	270	
	C/AM	2500	.102	250	-150	3.1	.026	.013	210	
4-125A	AB1/SSB	3000	.03/.105 ⁽³⁾	510	-95 ⁽⁵⁾	0	0/.006	0	200	5.0 6.5
	B/SSB ⁽⁴⁾	3000	.02/.115 ⁽³⁾	0	0	16	0/.03	0/.055	240	
	C/CW	3000	.167	350	-150	2.5	.03	.009	375	
	C/AM	2500	.152	350	-210	3.3	.03	.009	300	
4-250A	AB1/SSB	3000	.055/.21	600	-110 ⁽⁵⁾	0	0/.012	0	400	5.0 14.5
	C/CW	3000	.345	500	-180	2.6	.06	.01	800	
	C/AM	3000	.225	400	-310	3.2	.03	.009	510	
4-400A	AB1/SSB	3000	.09/.30 ⁽³⁾	810	-140 ⁽⁵⁾	0	0/.018	0	500	5.0 14.5
	B/SSB ⁽²⁾⁽⁴⁾	3000	.07/.30 ⁽³⁾	0	0	40	0/.055	0/.10	520	
	C/CW	3000	.35	500	-220	6.1	.046	.019	800	
	C/AM	3000	.275	500	-220	3.5	.026	.012	630	
4-1000A	AB1/SSB	4000	.17/.48 ⁽³⁾	1000	-130 ⁽⁵⁾	0	0/.04	0	1130	7.5 21.0
	B/SSB ⁽⁴⁾	4000	.12/.67 ⁽³⁾	0	0	105	0/.08	0/.15	1870	
	C/CW	4000	.70	500	-150	12	.137	.039	2100	
	C/AM	4000	.60	500	-200	11	.132	.033	1910	
3CX100A5	C/CW ⁽⁷⁾	800	.08	—	-20	6	—	.03	27	6.3
2C39A	C/AM ⁽⁷⁾	600	.065	—	-16	5	—	.035	16	1.0

(1) Ratings also apply to 4X250B.

(2) Ratings apply to 4-250A within plate dissipation limitation.

(3) Zero signal and maximum signal dc current.

(4) Grid and screen grounded, cathode driven.

(5) Adjust to give stated zero-signal plate current.

(6) For operation below 250 Mc only.

(7) At 500 Mc.

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Reports Invited. All amateurs, especially League members, are invited to report station activities on the first of each month (for preceding month) direct to the SCM, the administrative ARRL official elected by members in each Section. Radio club reports are also desired by SCMs for inclusion in QST. **ARRL Field Organization station appointments** are available in areas shown to qualified League members holding Canadian or FCC amateur license, General or Conditional Class or above. These include ORS, OES, OPS, OO and OBS. SCMs desire applications for SEC, EC, RM and PAM where vacancies exist. OES, v.h.f. bands appointment, is available to Technicians and Novice, as well as to full-privilege amateur licensees.

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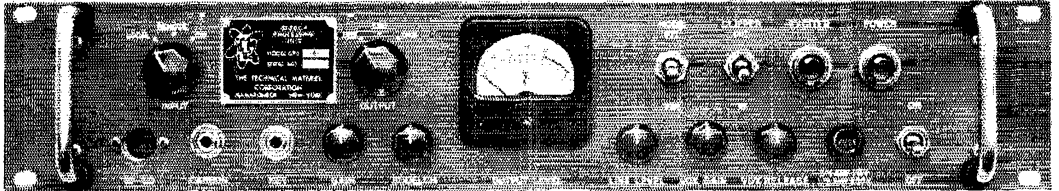
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is a noncommercial association of radio amateurs, bonded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio art and of the public welfare, for the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

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

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

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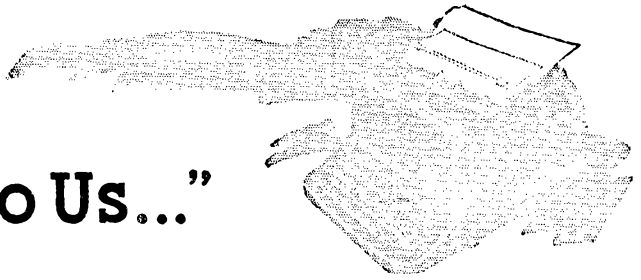
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"It Seems to Us..."



HONESTY IN REPORTS

As we've said several times recently on this and other pages of *QST*, a major problem facing the amateur service today is congestion in our bands. While the amateur body continues its steady growth, band limits remain finite. Individual station bandwidths, at least in proper operation, have been whittled down pretty much to the minimum the state of the art permits. The real solution, we believe, is sincere amateur attention to the League's program to alleviate congestion through a more intelligent use of our frequency privileges — proper choice of bands for the distance covered, use of minimum power, and a better understanding of the technical capabilities and limitations of equipment.¹

Our operating techniques can stand some close scrutiny, as well. And one key to improvement of our situation is the giving of honest reports.

Here's what too often happens: WA1ABC gets on the air with a new sideband rig, a manufactured job. He's so eager to get it going he hasn't read the instruction manual except cursorily. After all, he's held an FCC license a couple of years and ought to know how to run the thing. From what he's heard about linears, he expects the input meter needle to react substantially when he speaks, and he adjusts the mike gain accordingly. Of course, he "flat-tops." He makes a contact — and here is where our system falls down: the guy at the other end says, "you sound swell, OM, 5 by 9 plus 30 db., excellent quality." He works a couple more with the same results. Suddenly a more conscientious or better-equipped station reports his splatter. ABC naturally concludes the guy is a jerk, or a trouble-maker, since everyone else has rated the signal as tops. So he goes merrily on his way, continuing to produce a considerable amount of splatter and resultant interference to others on adjacent frequencies.

The offender is no more to blame than the contacts who give him erroneous reports of excellence. The inaccurate report may be due to sheer ignorance of what the signal *should* sound like, or a failure to check for spurious away from the "carrier." It may be the report-

ing operator hears the garbage but, since the transmitter has been identified as the latest manufactured unit, it is obviously a fault in his receiver. And although we hate to admit it, it may be because of a milquetoast attitude, a fear to start any argument with a fellow ham you want to call your friend.

We need more "arguments" about our signals these days — we mean, of course, gentlemanly discussions and a searching analysis of emission quality. Each signal, especially from a new or modified rig, should undergo careful examination of its characteristics. Even a two-letter call with a rig in use for some months is not exempt from possible misadjustment. The transmitting operator should receive honest views of how the signal sounds — better yet, how it looks on the scope. If it leaves something to be desired, tell him so. We can't afford space today for energy which isn't doing a communications job.

We've picked s.s.b. for the initial point of discussion, and indeed improperly operated sideband signals are major offenders in our crowded voice bands. But the principle applies to a.m. as well, and to c.w. "Ur 579 hr in . . ." is too often a standard habit, regardless of actual readability, strength or tone. If he has clicks, chirp, contact bounce, or whatever, tell him so!

We can live in our congested bands, but only with full cooperation of all active amateurs in a better understanding of the technical limitations of our equipment. And 100% honest reports are an absolute necessity, so that discrepancies may be cleared up immediately rather than permitted to take up priceless band space we need for communication.

A SALUTE TO I.R.E.

IN mid-1912 a group of professional wireless engineers met in New York City to form, as an outgrowth of the Society of Wireless Telegraph Engineers and The Wireless Institute, a new organization which they named the Institute of Radio Engineers. The first roster contained names synonymous with the early development of wireless, both professional and amateur: deForest, Hogan, Pickard, Collison, Farnsworth, Goldsmith, Hebert, Vanderpoel, Clark, Kolster, Hammond, Pacent, Sarnoff,

¹ E.g., see page 11, November *QST*; page 52, this issue.

(Continued on next page)

Eastham, Spangenberg, Alexanderson, Apgar, to mention a few.

IRE commenced operation with 46 members; today it has grown to 100,000. Initially, all organizational work was on a volunteer basis; today a staff of more than 200 services the Institute's needs. Part of this growth, assuredly, has come from the vast expansion of the electronics industry. But much of it has come about because the organization has had a real purpose, and its guiding directorships and operating staff have carried the Institute steadily forward toward such objectives.

A hearty salute, then, to our "big sister" society on its Golden Anniversary! **QST**

Hamfest Calendar

New York — The Westchester Amateur Radio Association will hold its Christmas dinner at 8:00 p.m., Dec. 20, at the Cabin Restaurant, 1172 Knollwood Road, White Plains, N. Y. The guest speaker will be Morton B. Kahn, W2KR, Hudson Division Director. Tickets are \$5.00 per person, and may be obtained at the door or in advance from Stan Rothman, WA2NRV, 247 No. Regent St., Port Chester, N. Y.

FEEDBACK

We have just learned that W6TKA was the photographer who took the picture of the W6ULS transmitter used on the November cover. Our apologies to W6TKA, because taking a photo of such an intricate set-up is no easy matter!

OUR COVER

For aesthetic purposes we've permitted considerable artistic license on this month's cover. Chubby Mr. C. has quite a load on his sleigh this year, and his schedule shows a special stop on the W1AW property in Newington, Connecticut. But Santa is really the League membership whose continuing contributions to the Building Fund are in process of providing the finest gift ARRL could ever receive. The package is certainly attractive, but — more important — is useful and functional. It is a gift which, when completed next Spring, will keep on giving long after next Christmas and dozens more to come. It is a present we members are really giving to ourselves.

Many thanks, OM and YL Santas — and a Merry Christmas and Happy New Year to you, too!

COMING A.R.R.L. CONVENTIONS

January 19-20, 1963 — Southeastern Division, Miami, Florida.

March 15-17, 1963 — Michigan State, Saginaw, Michigan.

April 26-28, 1963 — New England Division, Swampscott, Mass.

July 5-7, 1963 — Rocky Mountain Division, Albuquerque, N. Mex.

October 4-6, 1963 — ARRL National, Cleveland, Ohio

October 11-13, 1963 — Southwestern Division, San Diego, Calif.

Strays

W3HHC thinks he has the shack with the lowest ceiling — 4-ft. 8-inch headroom.



Some Heathkit Model HX-10 Marauder s.s.b. transmitters have exhibited a spurious signal at 13,900 kc. when operating c.w. at the very low end of the 20-meter band. A modification kit to attenuate this spurious signal is available free upon request from the Heath Co., Benton Harbor, Mich.

WV2WOA Dean A. Rook, 326 State St., Elmer, N. J.) is interested in auditory system response to radio frequency signals, and would like to hear from others who have info or interest.

LX1JW and W3GG/HB9IA were among the engineers and administrators attending the general assembly of the *Fédération des Ingénieurs des Télécommunications de la Communauté Européenne (FITCE)* held in the City of Luxembourg September 3-9, 1962. W3GG is Secretary-General of the International Telecommunications Union; LX1JW is president of FITCE and Chief Engineer of the Grand Duchy of Luxembourg.

This is the first of a series of articles describing the various sections of a transistor communications receiver. The construction is broken down into several discrete physical units which may be used either individually, or finally combined in a framework chassis to form the complete receiver, as the reader chooses. The sections include a tunable i.f. in the 2- to 4-Mc. range (described in this article), a series of crystal-controlled converters for the higher frequencies, a selective 455-kc. i.f. strip, a detector/a.g.c./noise-limiter unit, including both diode and product detectors, and an audio section with squelch control. A suitable a.c. power supply and control system complete the receiver.

A Tunable I.F. Amplifier Using Transistors

2- to 4-Mc. Unit with 455-Kc. Output

BY B. E. HARRIS,* W6ANU/4

FOREWORD

As many other writers have said, the current advances in the solid-state or semiconductor electronics field are destined to revolutionize communications. Although it is more than a full-time job to stay abreast of all developments in this field, it nevertheless behooves the technically inclined amateur to maintain some contact, or he will find himself left at the post in future years. The current wide availability of a large variety of semiconductor devices at constantly decreasing prices makes it possible for the amateur to maintain contact and, at the same time, build equipment which will perform most of the old tasks at least as well as vacuum-tube equipment and, in several cases (notably in portable equipment), do them better.

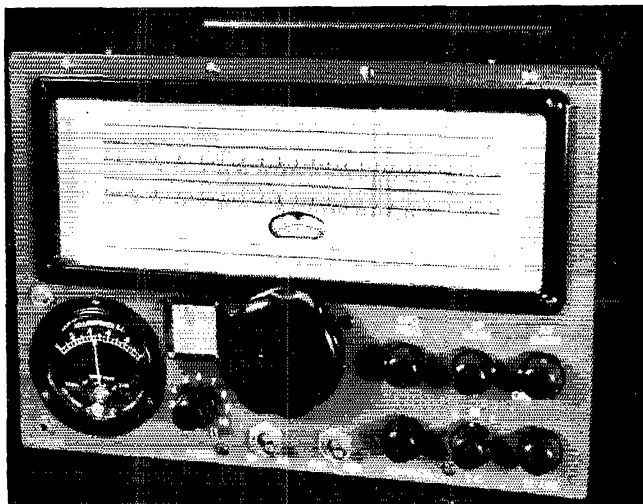
It was primarily with the idea of maintaining

*Chief Engineer, Polaris Project Office, Patrick AFB, Fla.

contact with the field that the writer began the experimental work which resulted in, among other devices, the various units to be described which are eventually combined to form a complete communications receiver. Most of the work is not new. There is, however, no stimulus to study and thought quite like the desire to complete a functioning and useful piece of equipment.

The word "transistor" has come to imply "miniature." While it is true that transistors permit considerable reduction in the size and weight of a complete receiver, as compared to an equivalent employing tubes, other components (principally the tuning dial) are limiting factors. The cabinet size of 8 by 8 by 10 inches, which houses the complete receiver shown in the photo, is small, but it can hardly be classed as "miniature." However, it is in the area of power consumption that a transistorized receiver is really differ-

Here is the complete receiver for which the tunable i.f. described in this article was designed. It takes up only 640 cubic inches of space and weighs 15 lbs. complete with long-life battery supply for portable operation.



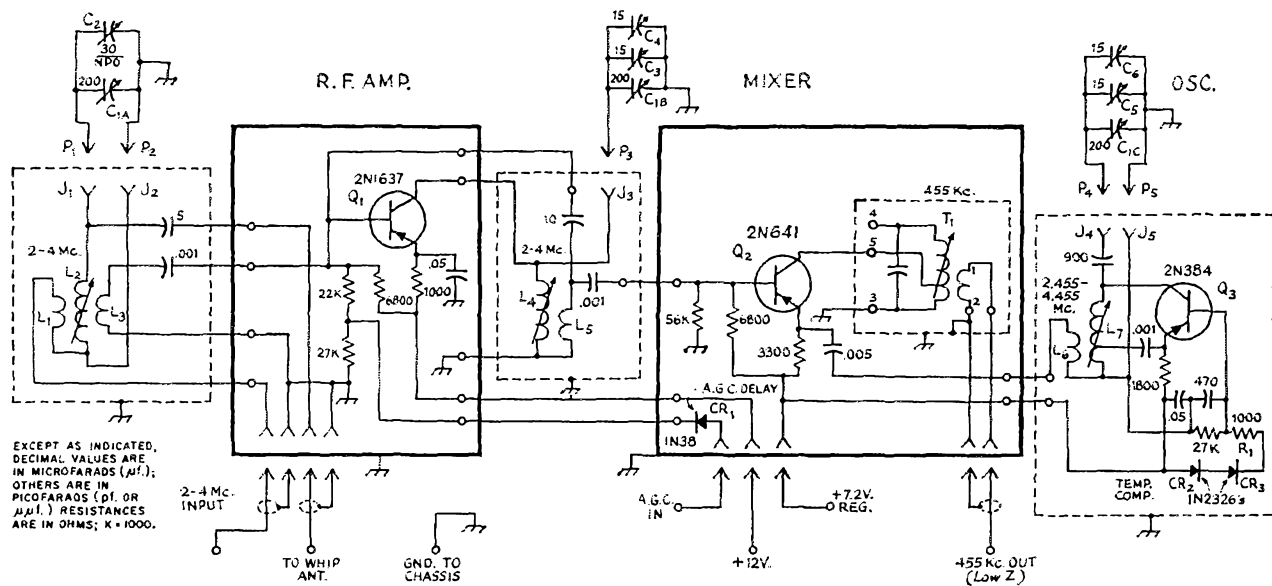


Fig. 1—Tuner circuit. Heavy lines outline subassemblies mounted on copper-coated phenolic boards. Resistors are $\frac{1}{4}$ watt. Fixed capacitors of decimal value are disk ceramic or mylar; others are silver mica or NPO ceramic. All unidentified plugs and jacks indicated are single-circuit miniature (CTC 2379-1 and 2378-2). Other components not listed below are identified for text-reference purposes.

C_1 —Triple-gang variable, approx. 200 pf. per section (see text).

C_2 —4-30-pf. NPO ceramic trimmer.

C_3, C_4, C_5, C_6 —Air trimmer (see text).

J_1 - J_5 , inc.—Banana jack (see text).

L_1 —4 turns over ground end of L_2 .

L_2 —70 turns.

L_3 —8 turns at ground end of L_2 .

L_4 —Same as L_2 .

L_5 —5 turns wound over ground end of L_4 .

L_6 —1.5 turns at low-potential end of L_7 .

L_7 —58 turns, tapped at 3 turns from low-potential end.

Above coils are close-wound with No. 32 enameled wire on $\frac{3}{8}$ -inch ceramic iron-slug forms (CTC PLS5-2C4L/B).

P_1 - P_5 , inc.—Banana plug (see text).

T_1 —Miniature transistor 455-kc. interstage i.f. transformer (Lafayette MS268A).

ent. The complete* receiver requires less than one-half watt at 12 volts with the dial lights turned off. (The two 6.3-volt lamps consume about five times as much power as the rest of the receiver!) This is more than two orders of magnitude less than the power required by the average communications receiver using tubes. The reduction is most evident in the absence of heating. Compact vacuum-tube devices are usually "hot boxes" indeed. The low-power requirement allows truly portable operation. There is space inside the cabinet for 8 penlight cells which will power the receiver for many hours. A 12-volt lantern battery (the recommended battery sup-

ply) will give practically shelf life under average use.

The mechanical design of the receiver is somewhat unusual in that, with the exception of the i.f. tuner described in this article, all units are assembled on bases of $\frac{1}{16}$ -inch copper-coated phenolic sheet of uniform dimensions ($4\frac{1}{4}$ by $1\frac{7}{16}$ inches). This makes it possible to interchange the positions of units in a framework chassis which has corresponding uniform mounting openings. The interchange of units is facilitated by a system of miniature plugs and jacks for connections, which is simplified by the fact that no heater wiring is needed.

The 2- to 4-Mc. Tuner

The tunable circuits are really the heart of any communications receiver, especially of one with sufficient stability for single-sideband use. It is here that good components and careful design, both electrical and mechanical, are most needed. The problem is much simpler if the tuning range can be made small compared to the frequency of operation. This tuner was initially built with the idea of receiving ship-to-shore s.s.b. communications associated with the guided-missile project on which the author is employed. The 2-Mc. tuning range is a compromise between a sufficiently slow tuning rate and a desire for maximum frequency coverage. The Eddystone dial mechanism selected for the job is smooth enough so that the tuning of s.s.b. signals is not difficult with the 2-Mc. tuning range. However, for a strictly amateur-band receiver, a range of one megacycle would probably be more desirable from a tuning-rate viewpoint. This would, of course, require two steps in covering the 10-meter band and several steps for higher-frequency bands. On the other hand, it would ease the problem of achieving a flat passband characteristic in lower-frequency converter sections preceding the tuner. A reasonably flat 2-Mc. low-noise passband is not difficult to obtain at 20 Mc. and above, but it is a little tricky at the lower frequencies.

The circuit of the tuner is shown in Fig. 1. The unit is designed to feed a 455-ke. i.f. amplifier having low-impedance input. Covering the range of 2 to 4 Mc. requires the use of a tuning capacitor with a fairly high ratio of minimum to maximum capacitance. A three-gang capacitor originally used in the 3- to 6-Mc. ARC-5 Command receiver was finally selected from the junk box because nothing better was readily available. This capacitor has three identical sections of about 200 pf. each. The front section (C_{1C}) is used for the oscillator, the center section (C_{1B}) for the mixer, and the rear section (C_{1A}) for the r.f. stage. Four air trimmers of about 15 pf. each (C_3 through C_6) are built into the frame of the tuning capacitor and connected, two in parallel, across the oscillator and mixer sections. A 4-30-pf. NPO ceramic trimmer (C_2) is mounted on the frame with 2-56 machine screws and connected in

parallel with C_{1A} to provide a means of trimming the r.f. stage.

The r.f. stage is neutralized because there was a slight tendency for it to oscillate when shock-excited by a strong static burst at the high end of the tuning range. The reversed-phase voltage is available from L_{55} , and neutralization is readily accomplished by adding a 10-pf. capacitor from this coil back to the base of Q_1 . The capacitive input-coupling connection was provided in the event that it is desired to receive in the 2- to 4-Mc. range with a whip antenna.

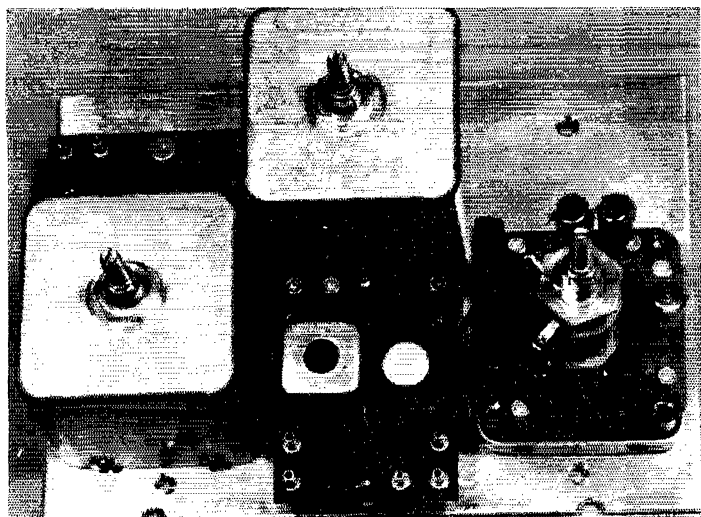
A g.c. voltage to the r.f. stage is delayed by diode CR_1 and the 27K and 22K resistors in the bias network. CR_1 is back-biased and does not conduct until the a.g.c. voltage exceeds the voltage at the junction of the two resistors. A germanium diode, rather than a silicon unit, is used because the forward drop across a germanium diode at low current levels is less than the relatively fixed drop across a silicon diode. More a.g.c. voltage is therefore available under saturated conditions.¹

Regulation of the mixer supply voltage is essential, not because of the effect on the mixer itself, but because of the pulling effect which the mixer has on the oscillator when the supply voltage is varied.

Temperature Compensation

Frequency stability in the tunable oscillator is, of course, a first requirement in a communications receiver and an absolute necessity in a single-sideband receiver. Unfortunately, the interelement capacitances of transistors are not as stable as they are in vacuum tubes, and good frequency stability is therefore more difficult to achieve. Transistor interelement capacitances are primarily functions of the area and width of the

¹ The term "saturated," as applied to transistors, refers to the condition where both the emitter-base and collector-base junctions are forward-biased. It occurs when sufficient current is fed to the base to drop the collector voltage to a value less than the emitter-base voltage. Since the base is normally forward-biased, and the collector normally reverse-biased, this condition results in a forward bias on both junctions. All but one or two hundred millivolts of the collector supply voltage appears across the circuit impedances external to the transistor. — Author.



The 2- to 4-Mc. tuning unit. The shielded r.f. coil is to the left, with the Q_1 subassembly behind it. The shielded mixer coil is at the center, behind a subassembly including Q_2 and i.f. transformer T_1 . The oscillator coil assembly (with shielding can removed) is to the right. In this assembly, Q is to the right and CR_2 and CR_3 behind the coil.

p-n junctions within the transistors and these, in turn, are affected directly by temperature and, more importantly, by voltage and current values. Although the applied voltage can be regulated by zener diodes, the portion of the applied voltage appearing across the various elements is a function of the bias condition and this again is a function of temperature. In the usual transistor-oscillator design, the largest contributor to frequency shift with temperature is the variation in junction width and, consequently, the variation in interelement capacitance.

The interelement capacitance most often specified in transistor characteristic sheets is that between the collector and base. In r.f. transistors of the type used in this tuner, this capacitance has a typical value of from 1.5 to 6 pf. The capacitance which is in shunt with the oscillator tuning inductance, however, is that existing between the collector and emitter, and this has a value several times the collector-base capacitance. The base-emitter capacitance is larger still, but this is in shunt with a low impedance and has a smaller effect. Oscillator designs which cause the collector-emitter capacitance to be in shunt with a much larger fixed capacitance (notably the Clapp circuit) minimize the effect of variations in the interelement capacitance. Unfortunately, these designs are not adaptable to tuning ranges which are significant fractions of the nominal frequency of operation. For this reason they could not be used in this tuner, and compensation for frequency shift with temperature was necessary.

Fortunately, the same effect which causes the trouble in the first place — the variation in junction width with current and voltage — offers means of temperature compensation. If the bias voltage is varied with temperature in a manner which is the inverse of the variation which would cause the transistor oscillator to exhibit the temperature/frequency characteristic which it does, then compensation is achieved. Voltage variation required to accomplish this is not a linear function

of temperature, but linear compensation will usually suffice over a reasonable temperature range.

In this receiver the temperature-sensitive bias network consists of two 1N2326 diodes (CR_2 and CR_3) in series. These diodes have a forward-voltage-drop vs. temperature characteristic such that for two in series there is a decrease of about four millivolts for each degree C. increase in temperature. This results in the necessary positive-going base bias voltage. After proper adjustment (discussed later) and an initial warm-up period of about fifteen minutes, during which a differential temperature between the transistor and diodes is established, the frequency shift is less than 100 cycles for ambient temperature variations of fifteen degrees Centigrade.

Construction

Throughout this series of articles, reference will be made to copper-coated phenolic board (printed-circuit board) which is used as a mounting base for subassemblies. It is easily cut and worked with a fine-tooth saw and files. The copper coating in this instance is not used for the actual wiring as would be the case in printed-circuit construction. Instead, all ground connections are made by soldering to the copper coating. The copper coating is cut away in the areas around ungrounded tie-point terminals or jacks.

Although the construction is not truly miniaturized by modern standards, the components are quite close together, and detailed drawings or sketches made in advance are advisable to be sure that all of the parts will fit. The use of "transistor-type" miniature capacitors and $\frac{1}{4}$ -watt resistors is essential. The layout of the bases is best accomplished by marking the required holes and cutout areas with light scribe lines on the copper coating. A jeweler's loupe (magnifying eyepiece) is helpful here and is probably a necessity for those over forty. Tolerances to better than $\frac{1}{64}$ -inch should be maintained.

Most of the wiring can be done using the leads of the components alone. For the small amount of additional wiring required in the subassemblies, No. 21 solid-conductor bare or plastic-covered wire was used.

As used in the receiver, the tuning capacitor is mounted on a plate of $\frac{1}{16}$ -inch aluminum which has a cutout for the dial flywheel. The dial drives the capacitor shaft directly. The original worm-drive mechanism was removed, and the dial coupled to the shaft with a flexible coupling. It is important to select a coupling which has high torsional stiffness. The one used by the author is a surplus item that looks as though it might have been made by Hammarlund.

With the worm drive removed, the capacitor increases capacitance with clockwise rotation of the shaft. Since the dial mechanism does not reverse the rotational direction, frequency decreases with clockwise rotation rather than increasing in the conventional manner. This takes a little getting used to. However, the oscillators in both the tuner and the converters used with it for the higher frequencies are on the high-frequency side of the signal. This causes a reversal of tuning direction so that the tuning direction is conventional on all higher-frequency bands. The dial is provided with two scales which are identical except that the 2- to 4-Mc. calibrations run in opposite directions. A small chart mounted on the panel shows the integral number of megacycles to be added to the dial reading when the converters are in use.

The capacitor plate shape is such that the tuning approaches straight-line-frequency when the oscillator padder is added. The scales are slightly compressed at the center and spread out at the ends of the range. The tuning rate is about 4.5 kc. per vernier division at the center and 3.5 kc. at the ends.

The coils are mounted in the shield cans which originally housed the r.f. mixer and oscillator coils of the ARC-5 receiver. The thin aluminum channel which originally held the three shields together is removed, and the shields are secured at the plug-in end to a dural plate (as shown in the detail photo) which is fastened by machine screws and spacers to the underside of the plate on which the tuning capacitor gang is mounted. Small banana plugs (removed from the original chassis-mounted coil connectors) are soldered to the leads from the tuning-capacitor sections and these are plugged into the appropriate coil connector through holes in the plate on which the capacitor is mounted.

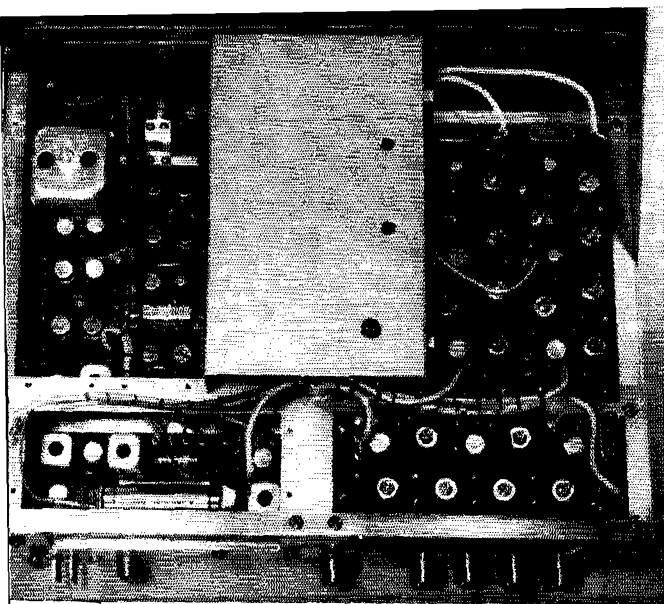
The r.f. amplifier and mixer transistors and the resistors, capacitors and output transformer associated with them are mounted on two small bases made of $\frac{1}{16}$ -inch copper-coated phenolic printed-circuit board. These bases are mounted with 2-56 machine screws on spacer bushings (CTC No. 2188-B- $\frac{3}{8}$ "') which are riveted to the plate on which the coil shields are mounted. A.g.c., power, and input and output connections are made to these subchassis with miniature plugs and jacks. This, together with the banana-plug connections

from the tuning capacitor, allows the plate carrying the r.f., mixer and oscillator coils, transistors and other components to be removed from the receiver as a subassembly.

As can be seen in the photo of this unit, the oscillator construction is somewhat unconventional in that the transistor, temperature-compensating diodes and other components are mounted inside the shield containing the oscillator coil. A small square of $\frac{1}{16}$ -inch perforated insulating board is cut so it will just fit inside the coil shield. The center of this piece of board is cut out to clear the coil, and the various oscillator components are mounted on CTC No. 1558-BB turret lugs riveted to the remaining piece of board. The transistor socket is mounted in a hole cut in the board. The board is fastened to four small spacer bushings with 2-56 screws. The screws which secure the coil shield to the dural plate come up through the shield base and enter the ends of these bushings. The coil is initially supported by the leads to it. When the shield cover is in place, the coil is secured to it with a nut. There is a flat on the threaded area of the CTC coil forms used and a D-shaped hole in the shield cover prevents the coil form from tuning when the nut is tightened.

Adjusting Temperature Compensation

The amount of compensation required can best be determined experimentally. The oscillator should be built in essentially the finished form and the bias and emitter-resistor values adjusted for best operation. The inductance values and the trimmer and padder capacitances should be adjusted to give approximately the desired frequency coverage. A thermometer is then clamped to the oscillator coil shield and the temperature varied while recording the frequency shift. Temperature can be varied over a fair range by the simple expedient of aiming an incandescent desk lamp at the oscillator at close range. Frequency shift can be determined conveniently by using a stable fixed-frequency oscillator (100-ke. calibrator or similar) and measuring the beat note with another receiver, an audio oscillator and an oscilloscope. A calibrated trimmer capacitor could also be used to return the beat note to zero after each increment of temperature change. The important thing is to obtain the relationship between temperature and frequency (or tuning capacitance). This relationship should turn out to be reasonably linear over a range of 15 to 20 degrees C. The bias-feed resistor (R_1) is then disconnected from the regulated supply and a smaller value substituted. A source of voltage which is variable over a range of 200 or 300 millivolts is connected between the bias feed and the positive supply. The nominal value of this voltage should be adjusted so that the base bias voltage is the same as it was with the original value of bias-feed resistance. Under these conditions the oscillator frequency should be the same as in the earlier step. With the temperature reasonably constant, the base-bias voltage is then adjusted in small increments (5 mv.



Top inside view of the complete receiver. Three h.f. converters are shown mounted in place in the right-hand portion of the skeleton chassis. Three additional converters may be mounted below the three shown. To the left, near the panel, are detector/a.g.c. (left) and audio units, with the i.f. strip at the rear. These three units are mounted on the lower level of the chassis, leaving room for two additional h.f. converters over the audio and i.f. sections. The large shield covers the first i.f. tuning capacitor, below which is mounted the tuner described in this article.

or so) to swing the frequency through the same range as was obtained in the temperature run. It will be found that, for this oscillator configuration, a positive shift with respect to ground in base-bias voltage causes an increase in frequency. An increase in temperature causes a decrease in frequency. With the information obtained from the above tests, a temperature-sensitive bias network can be designed which will compensate for oscillator-frequency shifts as a result of temperature. Because of variations in load impedance and feedback level with frequency, the above tests should be run at two or three points through the tuning range. Although the change in frequency will be different at different places within the tuning range because of the difference in tuning capacitance shunting the transistor the effective change in transistor interelement capacitance should be somewhere near the same. If it is not, a compromise point must be selected for design of the temperature-sensitive bias network or the oscillator component values must be adjusted until the change is relatively uniform across the tuning range.

The above sounds like a fairly complex operation and, if exact compensation is desired, it can be very complex indeed. However, if a transistor is used which has fairly low interelement capacitances to start with, adequate compensation can be achieved with a simple voltage-divider-type bias network, one element of which is temperature sensitive. The tests themselves can be simplified if it is not desired to separate out nonlinearities. This can be done by combining the two tests and using the variable bias-voltage source to return the oscillator frequency to the nominal value after an incremental change in temperature.

Tuner Alignment

The oscillator is first set for the proper frequency coverage (2.455 to 4.455 Mc.). The low-frequency point is set by setting the tuning ca-

pacitor to maximum and adjusting L_7 for the low-frequency end of the range. The high-frequency end is set by turning the tuning capacitor to minimum capacitance and adjusting the oscillator trimmer capacitance (C_5 and C_6). Some juggling of these settings will be required, of course, to achieve the correct range.

With the tuner feeding an i.f. amplifier and detector system equipped with an S meter, a signal source, variable from 2 to 4 Mc., is fed in at the antenna connector while the r.f. and mixer circuits are aligned. The procedure for adjusting coil inductances and trimmer capacitances is similar to that described for the oscillator. The S meter can be used as an indicator for alignment purposes. A frequency meter is desirable for setting the oscillator and calibrating the dial, but a 100-ke. crystal calibrator can also be used. Tracking can be checked by tuning accurately on a steady signal from a signal generator at various points within the tuning range. The r.f. and mixer trimmers are rocked back and forth at each point and, if the tracking is satisfactory, they should peak at the same place for all points. The Q of these circuits is high enough to show a reasonable peak throughout the band. It should be possible to get the circuits to track within a few kilocycles at all points within the tuning range.

Mixer Adjustment

The most critical point in the mixer adjustment is the coupling to the oscillator. Coupling too tightly will result in oscillator pulling, and too much oscillator injection will cause excessive mixer noise. The correct level is in the vicinity of 100 to 150 mv., as measured at the mixer emitter.

Image rejection has not been measured quantitatively, but no image signals have been heard in many hours of listening on the 2- to 4-Mc. range. A signal from a test oscillator which is more than sufficient to saturate the a.g.c. gives no noticeable response when tuned to the image frequency. QST

Superstitions still persist about lightning — Don't play the piano because sound "draws" lightning; never stand in an open door or near an open window because lightning follows a draft; lightning won't go around corners; lightning always follows the shortest path; lightning never strikes twice in the same place; and so on. This article gives some of the known facts about lightning and how to protect against it.

How To Protect Your Station From Lightning

Answering A Frequently Asked Question

BY LEWIS G. McCOY,* WIICP

OF ALL the various questions asked of the League's technical staff, the one that far exceeds all others is "How can I protect my equipment and property from lightning?" This article will discuss the lightning problem and describe how to provide the maximum protection for you and your equipment.

Before discussing protection, let's take a look at the problems involved and how lightning is generated. Lightning is simply a gigantic spark that occurs between an electrically charged cloud and earth or between two clouds. These electrically charged clouds commonly are found in two types of thunderstorms, local "convictional" thunderstorms or "frontal" storms. A convictional storm results from heated surface air in the summer rising into the colder air above, while a frontal storm comes from a mass of cold air riding in over warm, moist air. In either case an unstable condition is set up, with the warm air rising

rapidly into the colder air, causing condensation of moisture and the formation of a thundercloud. While it is not clearly understood exactly how it happens, both negative and positive charges of electrical energy accumulate. Usually the negative charge collects along the bottom of a thundercloud and the positive charge along the upper portions, resulting in a tremendous difference of electrical potential between the two portions of the cloud and between the cloud and earth.¹

When the charge in the cloud builds to sufficient intensity, a "pilot leader stroke" leaves the cloud toward the earth, traveling at about 100

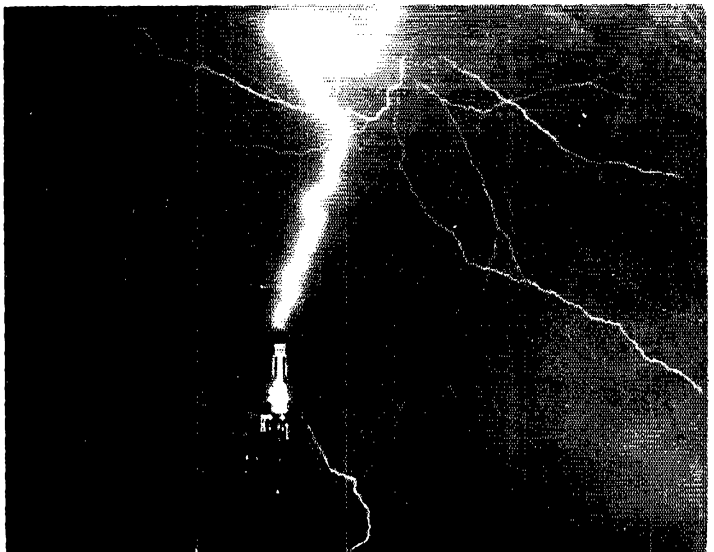
¹ Harold M. Towne, *Lightning, Its Behavior and What To Do About It*, published by National Lightning Protection Assn., Inc., 1728 Walnut St., Harrisburg, Pa.

Code for Protection Against Lightning, Handbook 46, U. S. Government Printing Office, Washington 25, D. C.

The Lightning Protection Institute, 53 West Jackson Blvd., Chicago 4, Illinois, has available a free booklet entitled *Lightning Facts and Figures*, which has additional information on the subject. Single copies can be obtained by writing to the above address.

* Technical Assistant, QST.

The Empire State Building in New York City has been hit as many as 48 times in one year, and during one lightning storm the building was hit eight times! This photograph shows the awesomeness of one of the strokes. (Photos courtesy of the Lightning Protection Institute.)



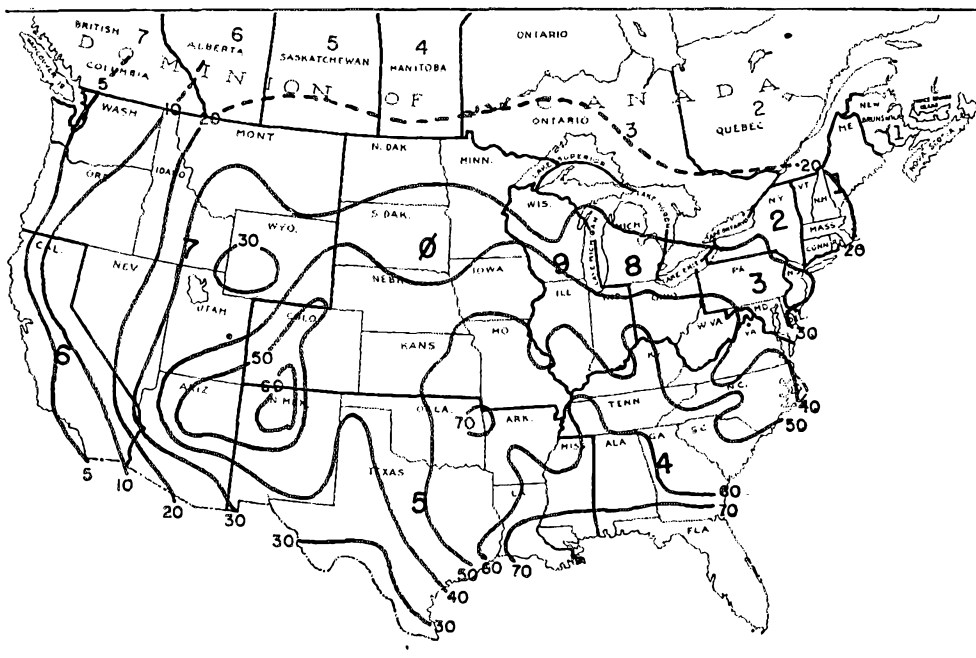


Fig. 1—This map of the United States has zone lines showing the approximate number of thunderstorms per year. For example, if you live in Kansas City, Mo., you can expect 55 thunderstorms per year.

miles per second. This leader stroke only carries a few amperes but it is quickly followed by "stepped leaders" of increasing intensity. Many of us think of a lightning stroke being a single unit, but actually it consists of many strokes all following the same path. As soon as these leader strokes reach the earth the current at the ground end of the path increases enormously and the main stroke then propagates upward into the cloud along the path set up by the leaders. This main stroke can develop a current as high as 200,000 amperes! The main stroke is many times followed by a "dart stroke" which is presumed to drain additional charges from the cloud. In many cases as many as 40 strokes make up what appears to be a single stroke. However, most flashes have only three or four strokes.

How Often — And where — Does Lightning Strike?

The map of the United States shown in Fig. 1 shows the approximate number of thunderstorms per year for any given area in the country. For example, if you live in Northern Illinois you can expect about 45 storms per year. The highest number for this country is in the Tampa, Florida, region with about 90 storms per year. It becomes apparent from looking at the map that the place to live is on the Pacific Coast, which shows an almost complete lack of thunderstorm activity. (However, they tell us that earthquakes are a problem there.)

The map doesn't tell the whole story. It has been estimated that 44,000 lightning storms

occur every day over the world with about 9,000,000 lightning strokes per day over land and sea. In the United States as a whole, the average is 40 storms per year for any given locality. What is important is the likelihood of lightning striking any particular area. In general, the number of strokes per square mile per year can be expected to average 1 to 2 times the number of thunderstorm days per year. Some areas, probably due to terrain and soil conductivity, have more strokes than others. In Pittsfield, Mass., where the General Electric Company has made many tests, it has been observed that there is an average of 45 strokes per square mile per year with the number per year as low as 19 and as high as 65.

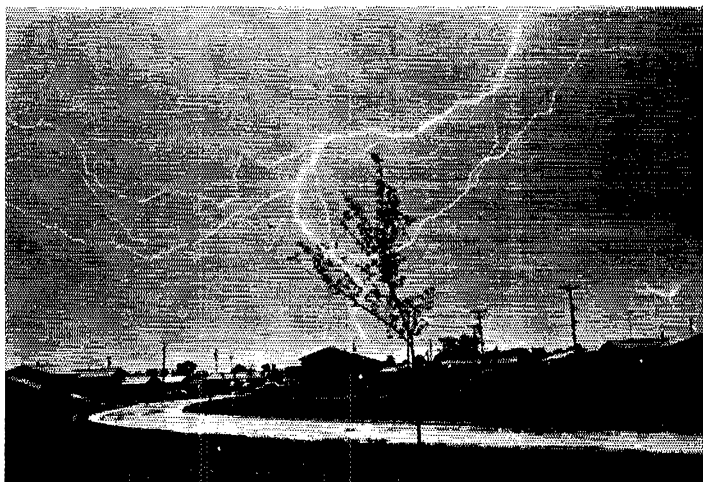
The higher an object is above the surrounding terrain, the greater the attraction of lightning to that object. For example, on a flat terrain having an average of 30 storms per year, a 50-foot metal tower can expect to be hit once in four years and a 100-foot tower every two and a half years. These figures are of particular interest to the ham who wants to put his beam up on a tower. However, don't be alarmed, because actually the tower can serve as a measure of protection. More about that later.

The Paths of Lightning Strokes

What is of primary concern to an amateur is the path of a lightning stroke. Whether or not his antenna system presents an attraction to lightning is the main question. And if it does, how does one protect against it?

As the tip of the pilot streamer approaches the

This exposure shows the multiplicity of strokes around a typical suburban community. Note the number striking the earth.



earth, streamers of opposite polarity develop in the earth and approach the pilot. These develop from projecting metal points such as metal church steeples, lightning rods, and, of course, antenna towers (metal). Such streamers grow in strength until they meet the pilot streamer which initiates the main lightning stroke. This, in turn, fixes the location of the later strokes, if there are more than two. Because of the large voltages involved it is impossible to insulate an object from the paths of the strokes. The term "lightning arrester" doesn't actually describe a preventive, because such a device doesn't actually "arrest" the lightning; it merely provides a favorable path for the lightning to follow.

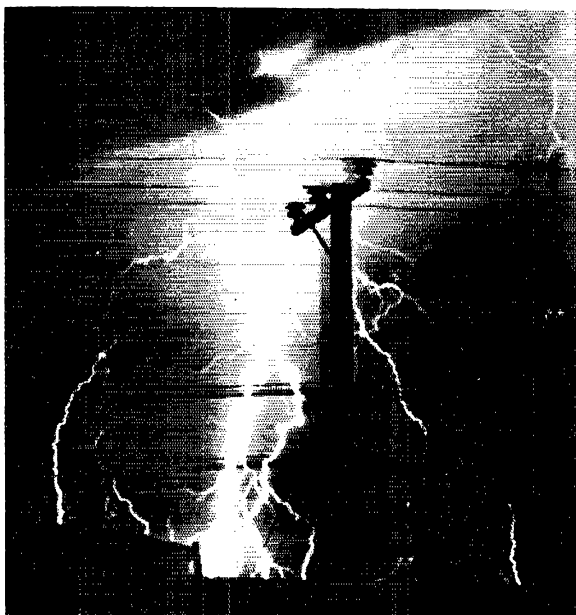
Until quite recently it was believed that installing lightning rods actually prevented lightning from striking an object that was rodded. The theory was that the rodded object kept a

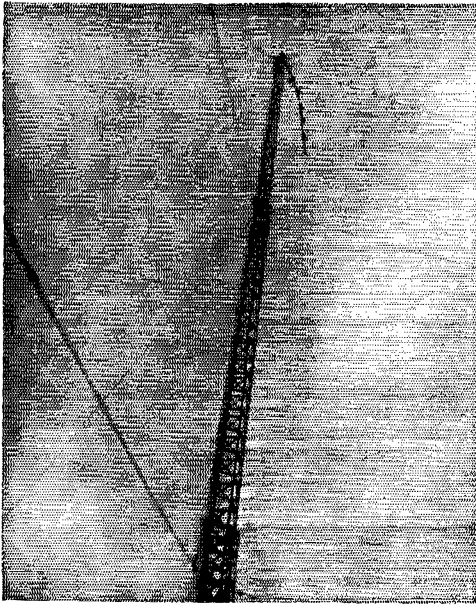
strong electrical field from building up by continually draining off the charge. Numerous tests and experiments have proven that this is not the case. Lightning will strike the rodded object, but because of the lightning protection the bolt is harmlessly drained off to ground. (We hope!)

Induced Effects

The radio amateur usually thinks in terms of direct hits by lightning, but there is another factor of considerable importance. Whenever there is a storm in your general area it has several effects that are of concern to an amateur radio operator. First, and of course the most obvious, is ordinary QRN. Even when a storm is as much as 50 miles away, the static can be quite bad. When the storm moves closer, more serious things can happen. The electrical field surrounding a storm can be quite strong and can create real hazards,

Here is a particularly impressive photo of a lightning stroke near the power lines of the Iowa Light, Heat and Power Co. Credit for this photo goes to C. H. Utter, who was awarded first prize at a Chicago Art Institute exhibit.





Here is what happened to an antenna on top of a 91-foot tower in Lewiston, Idaho. The tower itself is apparently undamaged but the antenna, which was used for cabled television service, was completely demolished. The newspaper account had some rather humorous quotes: "One office worker cried, 'We're hit,' and ducked under his desk." Another employee was quoted, "Never in all my years in electronics—and I've been in it all my life—have I ever heard of lightning striking a two-way radio tower." (Maybe it only is supposed to hit one-way jobs!)

even though there are no direct hits from lightning.

Measurements made in the vicinity of storms have produced some startling figures. For example, a wire clothesline, mounted six feet high on wooden posts, has been known to have an induced charge of 4600 volts per foot of wire when the lightning bolts were striking three miles away! The energy stored in such a charge may not be enough to be lethal, but it certainly could sear you.

Any antennas or feed lines that are ungrounded or don't have a means of draining off this "static" can have some fairly high charges built up. These could cause damage to equipment, let alone the shock possibilities.

How To Protect Against Lightning

The average ham is of course concerned about protecting his equipment first (!) and house last. His wife feels just the opposite. At any rate, all joking aside, it is a problem because any type of metal, be it antenna, feed line or tower, does present an attraction to lightning.

Let's discuss towers first. As stated earlier, a tower will provide a certain measure of protection to nearby objects. A well-grounded tower installation provides what is known as a "zone of protection," particularly if the tower is the highest object in the area. Numerous tests and ex-

periments have shown that lightning would strike a tower first, rather than nearby objects, if the tower is higher than the other objects. These tests have shown that anything within a distance of twice the tower height would be fairly safe from any hits. In other words, if you had a tower 60 feet high, then anything within a 120-foot radius would be safe. Actually, the tests have shown that the safe range is more often than not even greater than twice the tower height. If you have had a hard time selling the XYL on the esthetic value of an antenna tower, you might point this out to her.

The best time to put in a ground system is when the tower is installed. The National Electrical Code² provides that the grounding electrode can be a noncorrosive metal plate at least two feet square, or if rod electrodes are used they should be at least 1/2-inch in diameter and a minimum of eight feet long. Electrodes, wherever practicable, should be imbedded below the permanent moisture level. Grounding conductors should be at least a No. 6 wire or equivalent. Flexible copper tubing, 1/2 inch in diameter, would also make a suitable grounding conductor.

When the tower base excavation is made, the metal plate or an automobile wheel (which also has sufficient area) can be placed in the bottom of the hole. The grounding lead can be attached to the plate and brought up the hole to be attached to the tower. All connections should be solid and it would be a good idea to coat the connections with creosote or some similar material where the connections are below ground. The concrete for the tower base can then be poured.

If your tower is already installed and doesn't have a good grounding system, one should be installed. In this case a good grounding system would be to install two or more 8- to 10-foot-long ground rods around the base of the tower. The Electrical Code calls for the rods to be spaced no closer than 6 feet from each other. Grounding leads of the recommended size should be used to connect the electrodes to the tower base.

Beam antennas fall into two categories, the "Plumber's Delight" variety with all elements grounded to the boom, and the type using insulated elements. As far as performance goes, there is no evidence that one type is better than the other. As far as lightning protection is concerned, the grounded-element type would be preferred. This type of installation would put the antenna at ground as far as lightning is concerned. However, this doesn't mean that you are not able to provide adequate lightning protection for a beam with insulated elements. How you provide protection depends on the type of feed line used. Let's discuss coax line first, as it is probably the most popular.

For coaxial feed no arrestor is required for the outer conductor. If the coax is fed down inside the tower, adequate protection would probably result. However, to be safe, it would be a simple

² National Electrical Code, National Fire Protection Association International, 60 Batterymarch St., Boston, Mass.

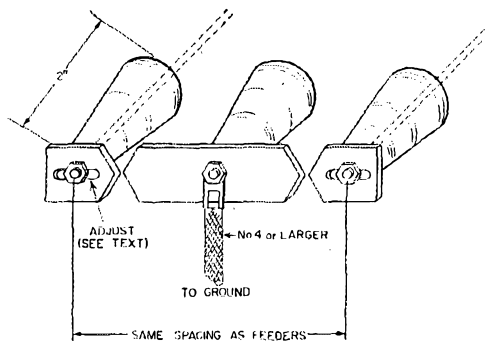


Fig. 2—Constructional details for a homemade lightning arrester. As mentioned in the text, the gaps between the center plate and outer plates should be $\frac{3}{16}$ -inch.

matter to remove a portion of the outer insulating material from the coax to expose the outer conductor braid. The braid can then be taped or clamped directly to the metal tower, preferably at the point where the coax line leaves the tower toward the shack. The connection should be weatherproofed to prevent moisture from getting inside the coax. The Electrical Code specifies that burying coaxial cable provides adequate protection, but it would seem safer actually to bond the cable to the tower to insure only one ground path.

This, of course, takes care of the outer conductor, but we are just as concerned about the inner conductor. The problem is to protect the station receiver and transmitter from the induced charges which can build up on the inner conductor when a storm is nearby. This can be taken care of quite simply by installing a "needle gap" across the chassis coax connector on the receiver and transmitter. Mount a ground lug under one of the screws that holds the chassis connector. Next, solder a short length, about one inch, of No. 14 or 16 solid wire to the ground lug. The free end of the wire can then be positioned so that it is about $\frac{1}{32}$ of an inch from the inner conductor terminal on the chassis connector. Do this on both the transmitter and receiver and, of course, make sure that both units are grounded to a good ground connection. If you find that on transmitting the needle gap arcs over, increase the spacing of the needle gap to the point where the rig doesn't arc. There are also commercially made lightning arresters for coax, one of which is called a "Blitz Bug," listed in nearly all parts distributors' catalogues.

A look through any distributor catalogue will show that there are several different types of arresters available for different types of lines. If Twin-Lead is used to feed a beam, an arrester should be installed, mounting it on the tower where the line leaves. Also, there are commercially produced arresters for the four-conductor cable used on beam indicators. These can be installed on the tower the same as other types of arresters. All lines leaving the tower for the

shack should have lightning arresters installed at the tower in order to prevent any charges from being carried into the house.

Arresters for open-wire feeders can easily be built (we don't know of any commercially made units). Fig. 2 shows the construction details for an arrester for open-wire lines. The arrester consists of three pieces of $\frac{1}{8} \times \frac{1}{2}$ -inch flat brass plate, the pieces being mounted on stand-off insulators. The center plate should be connected to the tower with a length of No. 4 wire. The gaps between the plates should be no more than $\frac{3}{16}$ -inch apart. An induced charge or bolt should jump the gap and be drained off to ground.

Wire antennas strung between masts or trees will, of course, be as subject to lightning hits as any other objects, and even more so if the antenna is the highest thing in the vicinity. If the supporting masts are made from metal, they should be adequately grounded by means of ground rods. The antenna can be taken care of by using lightning arresters on the feeders where they enter the building or shack. A ground lead made from No. 6 wire should be run from the arrester to a grounded water pipe or a ground rod. Some amateurs use a large knife switch to connect the feeders directly to ground when the station is not in use. Large knife switches are occasionally advertised by surplus houses.

In apartment buildings it may be impossible to install a grounding system, but with steel construction the building itself is adequately grounded. An amateur residing in such a building should use lightning arresters on his equipment to prevent damage, using the nearest ground connection, which may be a water pipe or radiator. Incidentally, the Electrical Code states that a ground connection either outside or inside a building is suitable as long as the ground is a good one, such as a water pipe.

In conclusion, lightning storms can be very frightening and the lightning itself can cause tremendous damage. And it should be emphasized that there is no positive method of predicting exactly what a lightning stroke will do, even with adequate grounds. Lightning is erratic in its behavior, and won't always follow the path you might expect it to take. But while we don't want to leave you with the impression that any method is guaranteed to provide 100 per cent protection, you can be *reasonably* sure that your radio equipment won't suffer damage from lightning strokes if the steps outlined in this article are followed.

Q57

**SWITCH
TO SAFETY!**





1962 Field Day Results

Record 15,000 Report Activity

BY ELLEN WHITE,* WIYYM

THIRTY years ago *QST* announced and reported a brand new kind of operating activity called the Field Day. Since its inception, this annual trek to the field has grown fantastically from a 1933 report (based on 50 logs) to this year, when over 3464 transmitters were reported used, indicating participation by a record 1450 logs! Over all, in 1962, 1018 separate entries were received from Class A stations with groups 3A, 2A and 1A (in that order) proving most popular. If the number of individuals participating is any gauge of the willingness and ability of amateur

radio to serve in an emergency, then amateurs in the League's field organization are doing one whale of a job!

Weatherwise, it drizzled, it rained, it poured (and then some)! In fact, if it didn't rain where you were, where were you? When the mop-up brigades finished their work what did we have? We had the best Field Day ever! Hams turned out to climb mountains, cut brush, tote gear, raise antennas, kill rattlers and make enormous numbers of contacts to prove again and again that there's absolutely nothing to compare with the ARRL Field Day.

How your group and others fared is best summarized and accounted for in the following tabulations, photos and club comments. To all who helped their clubs, to the fine tallies submitted by club secretaries and activity managers, to the XYLs, to the cooks and bottle washers, to the patient families, to one and all — *bravo!*

* Ass't. Communications Manager, Phone, ARRL.



PUBLIC RELATIONS received a double boost thanks to the efforts of K5SFU/5, the AR Caravan Club and AREC/RACES Groups of New Mexico. The OM of K5WZA took this photo showing the set up of the display at the Winrock Shopping Center. Public response was reported excellent.

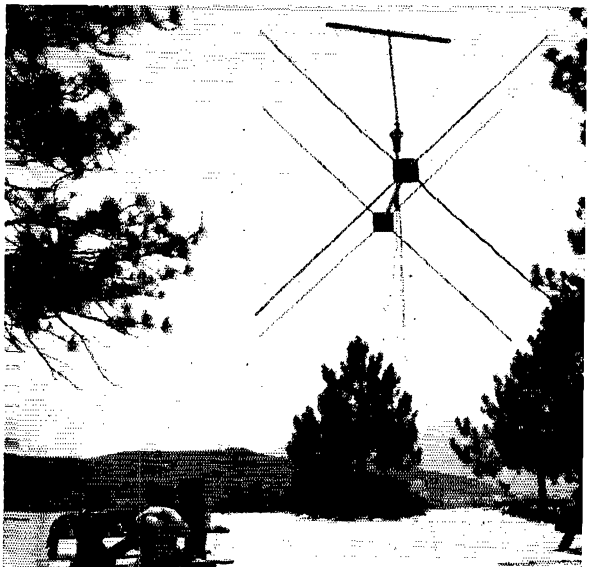
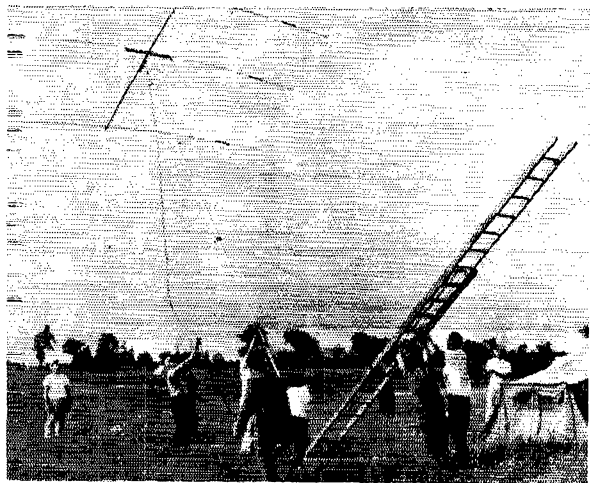
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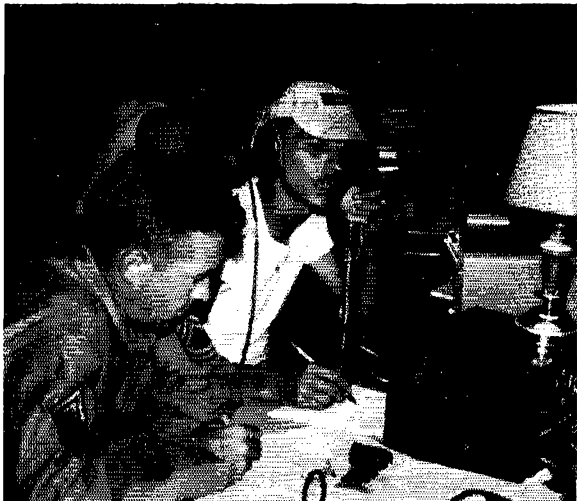
ANTENNA aspects include (reading down) getting that line up over the tree, à la David and Goliath, done in a forthright fashion by the boys at the Miami Valley AR Contest Society, W8CEA/8 (2A); raising the beam with cooperation from all hands at the 2nd high Canadian entry VE3WE/3 (the Scarborough ARC) and the Alexander Hamilton H. S. AR Alumni Association (2A) K6BEP/6 demonstrating a novel arrangement of a quad suspended upside down, rotor and all.

SOAPBOX

Class A

"We checked out everything ahead of time except the site. Next year we'll check out the site first and make sure it's not in a hole." — W9BLQ/9. . . . "A new temperature gauge next year for our overheating generator whose downtime cost us the 11-K mark." — *Livmore AR Klub*, W6GDP/6. . . . "Custom FD rigs for the 30-watt class plus a 1200' rhombic aimed east helped us to bring our points up this year." — *Tualatin Valley ARC*, W7OTV/7. . . . "Despite mosquitos, sunburn and a few wild moments when W0YCR dropped cigarette ashes on the logs, W0RA/0 recorded a new high score. Our success, still surprising to the battle-tested veterans who braved fire, fumes, carnivorous insects and near electrocution proves the old axiom that more operating and less goofing brings results." — W0RA/0. . . . "Our field day site was right on the beach of the blue Pacific and all 12 club members were workers, no loafers! One of our best outings demonstrating teamwork and fellowship." — *Honolulu Mobile ARC*, K116DQ/KH6. . . . "We had little trouble pitching our vertical, we just used a nearby snow bank." — K7UXB/7. . . . "Field Day was a blast! After cranking the generator all night both we and 80 were dead by morning, but we'll be grinding away next year." — K5PUU/5. . . . "The storage room atop the stadium where we were began to fill with water when the storm came up. Things were frantic for a while until someone plugged the proper drainpipes and allowed the water to flow over the sides of the roof. Even so, we had 1/2" of water until the broom brigade finished sweeping it out." — *ARC of Ohio State University*, W8LTI/8. . . . "The 1200' Ves did a job. After a slow start we bettered any previous year by 50%." — *Royal Order of Lightning Dodgers*, W2TIO/2. . . . "We heard 42 states on 6 meters using an 8' antenna wire strung around the tent, this on Mt. Somerset, Washington." — *Lake Washington ARC*, W7BB/7. . . . "Need any hot dogs or hamburgers? We have about 5 lbs. left of each. Oh yes, the mosquitos made more contacts than we did in spite of bug dope." — *Ogdensburg ARC*, W42FJN/2. . . . "A local thunderstorm almost tore down our 70' crankup tower. Another ham and I were the only ones present at the time and we stood in the rain for close to a half hour holding up the tower by pulling on the guys." — *Van Wert ARC*, W8FY/8. . . . "It was hot and the bugs almost carried us away." — *Jackson ARC*, W5PFC/5. . . . "In spite of all elaborate preparations for a winning score this year we fell on our faces by not checking out the new beam before FD. The darn thing got assembled wrong and as a result our score on 15 and 20 suffered greatly." — *SWANI RC, No. Group*, W9CCN/9. . . . "For the first time we set up in a shopping center parking lot to advertise amateur radio to the public, attracting approximately 100 visitors." — *Delta RC*, W4HYU/4. . . . "A '34' rattler crawled through a hole in the floor and we shot his head off with a pistol; 10 rattles. The guy sleeping by him wasn't sleepy anymore. P. S., we lost 20 minutes of operating." — *Klamath Basin AR Assn.*, K7CBP/7. . . . "We have four field days a year, January-April-June and October, during S&T exercise." — *Miami Valley AREC*, W8ILC/8. . . . "There was one period during the night when QSOs were so hard to come by that everytime someone made a contact it was announced over a p. a. system, much to the dismay of some fellows trying to get some shut eye." — *Milledgeville ARC*, W4PCF/4. . . . "In our gasoline generator we used 15 gallons of oil and 5 gallons of gas!" — *Warrnatus West H. S. RC*, K9KGA/9. . . . "We suggest that Field Day be held on the first sunny day in June!" — *Wantagh RC*, W2AZV/2. . . . "Our first job was to get a





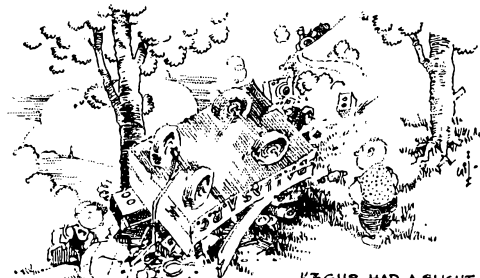
OPERATORS, top to bottom, include KP4ASL operating 20 s.s.b. with KP4BDO for the El Morro ARC (KP4ASK/KP4-4A); center the boys at K5BHF/5, the Electronic Technician and Amateur Club (2A) and bottom WN5AQV logging for K5ABV for the Lost Pines ARC (W5KPI/5), the top 1A score for 1962.

16-element 2-meter collinear up 83' and believe me that's a chore. It was done under the masterful direction of W2ER and a cheer went out when the last guy was fastened in place." — *Amateur VHF Institute of N. Y., W2WCR/2* . . . "Electrical storms ruined 80, couldn't load transmitter on 40, no antenna for 20, generator noise on 15, no antenna for 10 — *cheer!*" — *K3MNT/3*. . . "Congratulations for the superlative effort put forth by the fine men at W0RA/0. They are, by far, the best operators to be found in Minnesota." — *Winona ARC, W0LTX/0*. . . "We had Murphy whipped, but oh those Sunday afternoon conditions." — *RA of Erie County, K2SIL/2*. . . "Hula hoop up 75' worked 1B for 200 contacts on 6." — *Burlington AR Assn, W1CB/1*. . . "A tree-trimming company let us use two snorkels which raised our 80-meter center-fed Hertz to 43' in minutes. We had a 6-meter beam on top of one of the snorkels but the tri-bander we were going to use on the other snorkel didn't arrive till the Monday after Field Day." — *Soc. of R Operators, W9NGI/9*. . . "Field Day was a signal success for our group. Despite nearly 2 hours of lost time due to a thunderstorm, we showed a 41% increase in number of contacts over last year." — *O.B.P. #1, W0MCC/0*. . . "We feel many points were lost by assuming ten to be dead or by not listening on the band." — *Raytheon ARC, K6EGQ/6*. . . "Did you say unusual experiences? We started up Kocher Mt. with \$1000 worth of equipment but never reached the top. A quarter of the way up the wagon on which the equipment had been packed got loose from our tractor and started rumbling down. Fortunately (?) it turned sideways and tipped over. Four very depressed hams played pick-up-sticks for 4 hours with the gear." — *Dallas ARC, K3GHS/3*. . . "Four sides of the barn as well as the roof leaked. Over 2" of rain in about one hour." — *Levittown ARC, K2YBN/2*. . . "We used the observation tower at the Floricon Marsh headquarters to support our antennas. It is 75' high and its base is about 100' above the surrounding area. Signal reports received were tremendous." — *Rock River RC, W9TCH/9*. . . "Static level just before the exercise was terrific but let up as time went on. We have now gone 3 years with all gear working perfectly. All in all, a wonderful weekend of many experiences for all concerned." — *Tioga AR Assn., W2MTA/2*. . . "We wonder if having W4BAI/4 also active from Alabama cost us any QSOs?" — *K4BAI/4*. . . "The first 2 hours the 50-Mc. rig handled traffic for 4 volunteer fire departments working to save a large dairy barn. We handled traffic regarding a doctor for 2 heat victims, need for more water, etc. The fire departments were very appreciative of the assistance rendered by amateur radio." — *Miami County RC, K9ZEV/9*. . . "We operated 3 stations and

CLASS A LEADERS

1A W5KPI/5	Lost Pines ARC	7272
2A W2SSC/2	Niagara Frontier DX Assn.	11,331
3A W6JBT/6	Citrus Belt ARC	11,052
4A W20YH/2	Morris RC	16,254
5A W7HZ/7	Valley RC	25,515
6A K9AVE/9	Illinois Valley R Assn.	10,101
7A K2AA/2	South Jersey R Assn.	16,317
8A W3ZP0/3	Montgomery County AREC	13,353
9A W6PMO/6	Associated RA of Long Beach	14,364
10A W7NCW/7	Lower Columbia AR Assn.	10,614
11A W2LI/2	Tri-County R Assn.	23,337
12A W7DK/7	RC of Tacoma	25,137
13A W46ODP/6	Livermore AR Klub	9849
15A W6FA/6	The Corona Gang	9618

had 2 generators furnishing power. A public information booth was manned with civil defense material and a plotted orbit of Oscar 2 with a tape of HI's taken by K7KSE and W7JVF." — *Richland ARC, W7YPA/7*. . . . "Located on a high hill with dirt road access. Then it rained 1 3/4" in one hour. Anybody for 4-wheeled toboggans?" — *Washington University RC, W0QEV/8*. . . . "We were pleased this year to join forces with the National Bureau of Standards Radio Club, KØIUK, and we used one of the NBS field sites as our location, complete with 160' tower and many telephone



KØGHS HAD A SLIGHT MISHAP ON THE WAY UP KOCHER MOUNTAIN

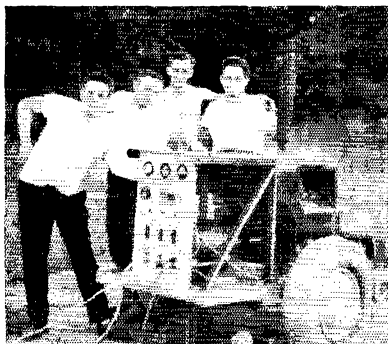
poles. Our 20-meter c.w. beam was on top of this tower and it helped immensely. During the past year we initiated a traveling trophy to go to the Colorado station with the highest score. We hope we win it back from the Montrose-Delta ARC." — *Boulder and National Bureau of Standards RC, W0DK/0*. . . . "We tried a new (for us) wrinkle, having 4 teams working 5 bands competing with each other. We believe this competition kept the transmitters going steadily better than any other method." — *Roanoke Valley ARC, W4CA/4*. . . . "Real fine Field Day. The quad worked like a bomb and everyone had fun. Fine weather (1) and a good location helped." — *K17SC/8*. . . . "Our second try with 100% homebrew, transmitter and receiver. Next year we hope to have a homebrew generator too. If next year is anything like this one though it'll need a snorkel." — *W3NN/3*. . . . "Everyone had a fine time and next year we expect to sleep a lot before FD and really rack up a score." — *ARC-5 RC of Ripley, Miss., KØYPV/5*. . . . "We encountered extremely bad conditions during the first portion of the test. However, everyone had a good time and it did give us a good test of the portable generator loaned through C. D." — *Pine Ridge ARC, KØLDH/0*. . . . "Our setup this year consisted of 4 separate operating positions, each with its own antenna system, thereby allowing instantaneous band changing. Each position included an operating indicator, consisting of 4 panel lights, one representing each post. This enabled each operator to know which transmitters were on the air and when he could transmit. Each transmitter's control circuit was tied into a central control box

POWER considerations, left to right, finds K4YYN cranking up W4TWW/4 for 1A operation at the Pine Haven Shopping Center in Charleston, S. C.; center the boys at K9HLV/9, 3A, in front of their home-brew generator. The neat job was constructed from a burned out 2-horse motor with an engine from an air compressor, trailer a reworked Plymouth frame. The unit is equipped with an electrical starter, automatic voltage and frequency regulation and completely interlocked to provide fool-proof operation. Right, sprucing up come Sunday morning is KØCKP, one of 7 fastidious operators at WØFTB/Ø, the Emporia ARC, class 2A.

CANADIAN HIGH SCORES 1962 FIELD DAY

Class	Call	Name	Score
1A	VE1JV/1	Pictou County ARC	276- A-10- 2709
2A	VE3RM/3	(nonclub group)	626-AB- 4- 3954
3A	VE7ARV/7	Vancouver ARC	326- A-14- 7666
4A	VE2ADX/2	South Shore ARC	343-AB-15- 5352
5A	VE6NQ/6	Calgary AR Assn.	1070-AB-23- 6813
6A	VE3VM/3	Niagara Peninsula ARC	913-AB-18- 7200
7A	VE3ZM/3	Guelph ARC	700-AB-25- 6243
8A	VE3KCD/3	Kitchener Waterloo ARC	900-AB-25- 6102
9A	VE3OW/3	Windsor ARC	1384-AB-69-10,590
12A	VE3NAR/3	Nortown ARC	1604-AB-60-12,738

which allows operation of only 2 transmitters simultaneously by shutting down all transmitters if a third is turned on. The 10 participating operators represent a total of over 2000 confirmed DXCC countries and this in itself indicates the caliber of operation involved and the ability to use the equipment to its utmost capability." — *Niagara Frontier DX Assn., W2SSC/2*. . . . "Although our transmitters were only 10' apart, the antennas were coax fed at right angles to each other. We were able to work 3.5 c. w. and 3.9 s.s.b. without the slightest interference between the two." — *W8AMR/8*. . . . "This year we decided to hold our field day at one of the local city parks and invite the public. We attempted diversified operations including emergency-powered teletype and a complete 2- & 6-meter station. While we were not too pleased with our total score, we feel that much was accomplished in the field of public relations." — *Midland ARC, W8AEA/8*. . . . "Our site was on top of Bowmans hill tower which stands on the top of a 300' hill. The "shack" was an enclosed area just below the observation platform. Lugging all that gear up 122 steps was a bit tiring but well worth the effort. The only trouble we almost had occurred when we learned that another group was going to operate near the tower with a kw. on all bands. Saturday morning looked like the Oklahoma land rush! The other group joined us under our call and we shared equipment. This is what I would call the true spirit of Field Day." — *K3JKJ/3*. . . . "Once again we chose a site adjacent to the rifle range in St. Bruno, P. Q., through the kind permission of the Canadian Army Command. Our emergency power was a 2.5 kva gasoline-driven generator courtesy of the RCAF which gave uninterrupted power. Messing was taken care of by a local group of Rover Scouts . . . an admirable job." — *South Shore ARC, VE2ADX/2*. . . . "Our mountain top location did not pay off because of inability to get low-band antennas in the clear. We plan to use a more open location next year, perhaps at the sacrifice

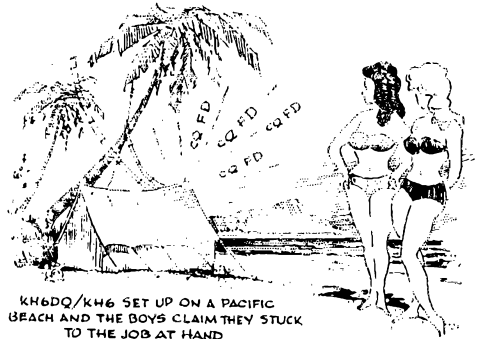


CLUB AGGREGATE MOBILE SCORES

Radio Amateur Mobile Society (Calif.)	87,706
Phil-Mont Mobile Radio Club (Pa.)	51,422
South East Amateur Radio Club (Ohio)	7,017
U. S. Naval Schools Command (Calif.)	3,267
Mobile Amateur Radio Club of South Bend	2,643
Hayward Radio Club (Calif.)	2,128
Parma Radio Club (Ohio)	1,784
Argonne Radio Club (Ill.)	1,527
Southern Wisconsin & Northern Illinois Radio Club	1,269
Hartford Amateur Radio Emergency Society	648
Chiburban Mobiles (Ill.)	635
Canonsburg Amateur Radio Society (Pa.)	176
Hi Line Radio Club (Mont.)	122

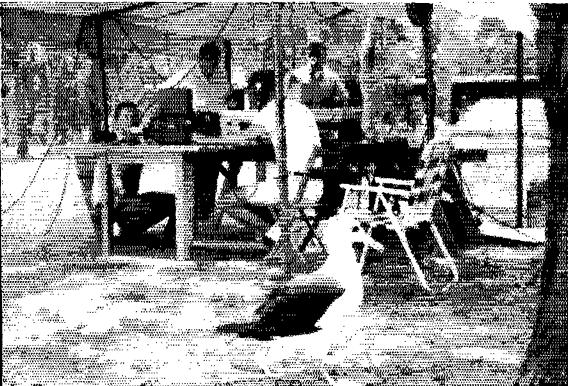
of v.h.f. operation." — *Piedmont ARC, K4MHS/4*. . . . "We had our own contest between the phone and c. w. ops same as last year and for the first time the phone ops won." — *Winslow AR Society, W9CZL/9*. . . . "Poor preparation and the 2nd heaviest rainfall in the history of the Philadelphia area curtailed operations somewhat, but everyone present enjoyed the entire affair." — *South Jersey R. Assn., K2AA/2*. . . . "Since our gang is small we've never managed to take a first place in FD. This year, being our 10th FD anniversary, we decided to go all out and win (we hope) by placing ourselves in the exclusive 15-transmitter group. The problems involved were many: (1) transportation of equipment and operators up a steep narrow fire road for 12 miles to the site (2) hauling a 3500 lb. generator up the same road, with a jeep about half the size of said generator (3) the inconceivable amount of intra-station interference with all rigs on simultaneously (4) the embarrassment when we discovered that our site was in a different county and ARRL section than we had been announcing for the prior 9 years!" — *The Corona Gang, W6FA/6*. . . . "Our location was at an elevation of 5000' in the Los Padres National Forest, south of Carmel Valley. Being in an area of extreme fire hazard we had extinguishers all over the place. For good fellowship within a small group you just can't beat the 1A Class." — *Monterey Bay Band Jammers, K6DYX/6*. . . . "Our second year out and the QRN was very bad, no breakdowns though and thank goodness for the tents." — *Bear Creek Wireless Assn., K81MN/8*. . . . "Except for our Apache, SX101A and HQ180 going on the blink (75% of our two rigs), FD was great from our 10,000' Colorado QTH." — *W0FEO/0*. . . . "Shortly after the contest began a tornado passed within about 3 blocks of our site. Interestingly enough, last year our mast was struck by lightning (same location). No telling what will happen next year!" — *K9RAS/9*. . . . "Inverted vees were held

up by the 50' boom of a Bay City crane with pulleys attached to the boom for easy lowering to change bands." — *Sawaga ARC, K4MCL/4*. . . . "Very few portables were heard identifying properly on phone. No other than identification of geographic location will satisfy FCC. FD is fine but it shouldn't be an occasion for such widespread violation of the regulations." — *Electronic Technician and Amateur Club, K5BIF/3*. . . . "Everyone at camp kept wide awake by a pack of dogs feared to be wild. We contacted the state police and were told to shoot if necessary. In addition, the mosquitos here carry wing tanks for extra capacity!" — *6 Up ARC of Burlington, W42TPV/2*. . . . "The San Diego Council of Amateur Radio Clubs has offered a F. D. trophy as an incentive to local activity." — *North Shore ARC, K6HAI/6*. . . . "Effective line filters and antenna pre-selection plus lotsa' pre plans made things run smoothly even when we had to fire up the standby generator." — *Schroetady AR Assn., K2AE/2*. . . . "Expanding suburban developments forced the club to a new site this year after many years at the old location." — *Watchung Valley RC, W2WV/2*. . . . "Approximately half of our operators/loggers were on their first FD so although they learned much for next year, it reflected in a lower score this year." — *Scarborough ARC, VE3WE/8*.



... "We experimented with a rhombic for low frequencies, making it 2 wavelengths on a leg on 20. It worked out quite well." — *Metuchen YMCA and Edison H. S. RC, K2YNT/2*. . . . "A dead skunk got into our water supply." — *Indiana County ARC, W3BMD/3*. . . . "We were able to arrange with a local commercial (WVOX) for a week long build up using taped 1- or 2-minute interviews, plus a studio taped and remoted half-hour show aired on Sunday at 1230. Program featured on-the-spot interviews, a plug for ARFC and RACES, actual FD contacts, etc." — *Communications Club of New Rochelle, K2YCY/2*. . . . "Once again we have proven that (on Field Day), Murphy rains supreme." — *South Amboy AR Assn., K2BEV/2*.

DX left, is KM6BJ/KM6, Midway Island, class 2A. Note in the foreground a good shot of an honest to goodness "Gooney Bird." Right, Class B entry KS6AM/KS6, American Samoa, with Operators KS6AM/W1BYH and K5KOR. A number of FD portables were pleasantly surprised to raise DX stations like these.



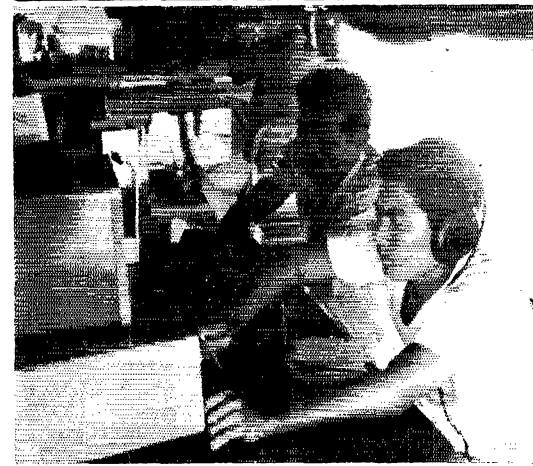
"Our location was nearly perfect, overlooking the great south bay and Atlantic waters. This year's effort was the result of many months of pro and con discussion and planning." — W2PVX/2. . . . "Our Heath inverter proved to be the perfect answer to Class B battery-powered operation. It supplied our entire station with power to spare, with a fully charged 12 volt battery lasting about 3 hours before change over. However, F. D. is never without problems. We had 2 antennas on 40, a vertical and a dipole, both loaded beautifully and exhibited an SWR below 1.5:1, but making QSOs on either of them was like pulling teeth." — W4UWA/3. . . . "Our location was Capitan Summit, Lincoln County, New Mexico." — W5YFN/5. . . . "We used a Winco 1.5 KW generator that performed like nothing I've ever used before and have operated in the field as W7PLT, W3WPY and now as W9CUH — never have seen a generator like this!" — W9CUH/0. . . . "Never have slept so little, laughed so much, got so hoarse, ate quite so sketchily or wasted so many cigarettes." — W67NY/6. . . . "We had a great time operating from Sheffield Island, about a mile off the Connecticut coast at Norwalk. During Saturday night we were forced to QRT for several hours because of troubles resulting from high winds and driving rain. Our return by sailboat was delayed also because of rough seas and poor weather." — K1SDX/1. . . . "We had a beautiful setup, the best in Texas I think. But troubles! Our rigs wouldn't load, our chief opr. was caught in bed with a tarantula and the generator wouldn't put out." — W5TWW/5. . . . "I forgot it was F. D. until the night before about 3 A.M." — W42RUE/2. . . . "I hereby wish to claim the high score for the under 1/2 watt division." — W6RHM/6. . . . "Next year we will (1) arrive at the site earlier than 1230 Saturday A.M. (2) prepare antennas in advance (3) learn how to operate the two meter rig before F. D. starts (4) provide separate antennas for the phone and c. w. rigs, separating the stations a bit (5) bring along a couple of spare operators, plus extra receiver and transmitter (6) get further away from people (7) be out for blood in 2A." — K6EVR/6. . . . "Perched precariously on 3000' Mt. Walker with a tremendous view of Puget Sound and the Seattle World's Fair which was exceeded only by the size and friendliness of the wood ants which periodically dropped down the neck of assistant W7IINV. But, to compensate, the astounding 50-Mc. opening Sunday morning bolstered our 6-meter score something fierce." — W7RGL/7. . . . "We were 100' downwind of a local radio, better advance planning would have helped!" — W5MZE/5. . . . "Even ZL1AH called us to say hello! Best F'D yet." — K2EKS/2

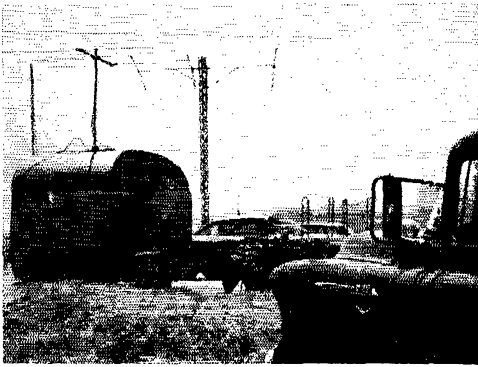
SCORES

Class A stations are clubs and groups in the field. Scores are tabulated according to the number of transmitters operated simultaneously at each station. The figures and letters following each call indicate the number of valid contacts, the power inputs used, the number of participants at each station and the final score. The "power classification" used in computing the score is indicated by the letters A, B or C after the number of QSOs shown. A indicates power up to and including 30 watts (multiplier of 3); B indicates power over 30, up to and including 150 watts (multiplier of 2); C indicates over 150 watts (multiplier of 1).

One Transmitter					
W5KPI/5	Lost Pines ARC	783-	A- 5-	7272	
W9RA/9	(nonclub group)	741-	A- 6-	6894	
W6LUX/9	Winona ARC	709-	A- 4-	6579	
W5DPL/5	Lafayette ARC	638-	A- 6-	5967	
W9CCN/9	SAVANI RC (No. group)	626-	A- 7-	5859	
W6TJ/6	Riverside County AR Assn.	596-	AB-17-	4956	
W9BZO/9	Chilurban R. Builders.	589-	A- 4-	4806	
W70TV/7	Tualatin Valley ARC	546-	AB-81-	4581	
K2SHL/2	R. of Erie County	479-	A- 5-	4538	
W9HRM/9	Milwaukee RAC	465-	A- 6-	4410	
K3MLJW/3	Skyview R. Soc. and Allegheny-Kiski AR Assn.	625-	AB-20-	3927	
W5CK/5	Order of Hotted Owls of New Mexico	408-	A- 4-	3897	
WAZMNQ/2	Brookside Off-beat Oscillators	432-	A-12-	3888	
W6ZRJ/6	Santa Clara County RACBS Group	422-	A- 4-	3798	
W88JC/8	(nonclub group)	572-	B- 4-	3432	
K4CMC/0	Mac West RC	537-	B- 5-	3372	
W9SO/9	Milwaukee RAC (No. Side)	444-	AB-14-	3270	
W1CB/1	Burlington AR Assn.	329-	A-28-	3186	
K0ZXE/0	(nonclub group)	327-	A- 4-	3168	
W9NGL/9	Soc. of R. Operators	502-	B-18-	3162	
W3EAN/3	Main Line Dandies	489-	AB- 5-	3156	

OPERATORS—you bet! The top photo finds K5TFB operating 20 c.w. for W5CAY/5 (3A); center shows the oldest club member of the Canton ARC, W8AL, on s.s.b. with K8ACZ logging during the 4A operations of W8RTR/8; bottom illustrates the winning teamwork between KH6DSW (rear) and KH6DRB on 15 c.w. for KH6CHL/KH6, the Koolau ARC (4A).





Looking south from the San Francisco Peninsula MARS Group site, W6WX/6, we note the 6-meter trailer and a tri-band atop a 30-ft. tower. The boys tallied up the 3rd highest score in the 7-transmitter class.

CLASS C

WA6GJT/6	328-A	5751	K3DJE/3	34-A	797
W8BJQ/82	340-A	4982	W3CDV/3	29-A	756
K3KDP/3	218-A	3474	W3WXC/3	29-A	729
W6QH/6	149-A	3548	K6CWE/6	29-A	728
K5NCC/3	303-A	3267	W3ADY/3	27-A	716
K2GK/6	139-A	3240	WA6GUM/6	50-A	675
WA6BRZ/6	132-A	3146	W6IIF/6	75-B	675
W3DSG/3	172-A	3092	K8VYK/88	49-A	662
K6UYE/6	129-A	3079	WB2HCX/2,3,8,23	4-A	648
WA6GEZ/6	123-A	3024	W3FPZ/3	19-A	594
W6GTC/62	124-A	3011	W3VNC/3	19-A	594
WA6DGH/64	123-A	2997	K9TBJ/3	44-A	594
K3GNJ/3	155-A	2970	W3UMK/3	15-A	540
WA6PH/6	119-A	2943	K9LJC/9	60-A	540
W6OOH/6	117-A	2916	W3DJV/3	14-A	527
K6SBA/6	135-A	2867	W9LJ/9	38-A	513
W3HFX/3	184-A	2849	W9AYU/9	35-A	473
K6SBL/6	109-A	2808	K6RIJ/6	9-A	459
W6KTB/6	100-A	2687	W3VAT/6	50-B	450
W3EQV/3	126-A	2552	W3LPM/3	8-A	446
W3AWH/3	152-A	2525	W9NIO/9	47-A	423
W4BWS/6	88-A	2525	K8TBJ/3	30-A	405
K6ZFI/62	83-A	2457	K3LJH/7	64-B	384
K3GNM/3	98-A	2403	K3EJZ/3	17-B	378
W3YHV/3	84-A	2390	K8HPN/8	3-A	378
W6OPY/6	78-A	2390	K8HIO/80	27-A	365
W3SRU/3	89-A	2295	K9SFG/9	27-A	365
WA6JID/6	68-A	2256	W8AWX/8	1-A	351
WA6JTO/6	66-A	2232	W8AWH/8	1-A	351
WA6NDL/6	66-A	2228	K8AXC/8	1-A	351
WA6LFS/6	53-A	2214	W8CTZ/8	1-A	351
K6BJU/6	60-A	2147	W8APDC/8	1-A	351
W9TOH/1	156-AH	2057	K8HJ/8	1-A	351
W4GDX/6	61-A	2025	K8HLJ/8	1-A	351
K6LUC/6	47-A	1944	K8LDT/8	1-A	351
K6YJL/6	44-A	1931	K8JFL/8	1-A	351
W3RQZ/3	134-A	1917	K8LMP/8	1-A	351
K5LAZ/62	172-A	1890	K8OLP/8	1-A	351
K6LPO/6	43-A	1877	K8OLP/8	1-A	351
W3DJV/3	64-A	1796	K8SNV/8	1-A	351
W3JYA/3	99-A	1782	K8TSL/8	1-A	351
WA6VLI/6	33-A	1782	K8UGK/8	1-A	351
W6CXD/6	104-A	1742	K8UNT/8	1-A	351
W3WVO/3	84-A	1715	K8VFT/8	1-A	351
K6NIV/6	22-A	1688	K8ZFJ/8	1-A	351
K6UMI/6	26-A	1688	K8ZND/8	1-A	351
K63UI/6	22-A	1634	K6ODJ/6	24-A	324
WA6AXZ/6	22-A	1634	W98ZR/9	24-A	324
K3HWX/3	90-A	1553	W9GZY/9	23-A	311
WA6MBZ/6	12-A	1499	K3JGZ/3	33-B	297
WA6RQ/6	68-A	1485	K9JTC/9	33-A	297
K6ZIQ/6	11-A	1485	K1JSH/1	48-B	288
K6VYV/6	65-B	1467	K8CVZ/87	20-A	270
W3MHR/3	71-A	1364	W9AVE/9	19-A	257
W3PWG/3	66-A	1364	K6OOL/62	28-B	252
W3WPD/3	68-A	1310	K6LW/6	28-B	234
W3AJQ/3	57-A	1269	K1RVF/1	16-A	216
W9TPA/91	69-A	1269	K8QZV/8	10-A	216
WA6IQK/6	68-A	1256	K6TWH/6	23-B	207
W3YJM/3	53-A	1180	W3ECO/3	15-A	203
K3EID/3	59-A	1134	K8BVM/89	13-A	176
K3EII/2	58-A	1121	K8BVM/89	13-A	176
K3GBA/3	56-A	1094	K6CQY/9	17-A	153
VE3BLT/3	56-A	1094	WA68ZY/6	11-A	149
W3FWI/3	50-A	1067	WA2MGX/2	16-B	144
W3DGG/3	42-A	1026	W9GQZ/9	10-A	135
W3GOV/3	51-A	1026	W7LW/7	17-A	132
W3CW/3	42-A	932	W9HV/9	9-A	122
W3NIP/3	44-A	932	K9TAW/9	8-A	108
W3TRQ/3	87-A	927	K68JP/6	7-A	95
W2LID/2	102-B	918	K1NII/1	14-B	84
W6NPL/6	41-A	891	K9GZB/3	5-A	68
K28VU/2	81-A	878	K8UCO/8	4-A	54
W3QZQ/3	40-A	878	W8CUM/8	3-A	41
W3LNU/3	68-B	855	K9NIP/9	3-A	41
W4CVO/4	70-B	855	WA2TJH/2	1-A	27
W3VVS/3	36-A	824	K6QLF/6	3-B	27

1963 FIELD DAY

JUNE 22-23

CLASS D

W4FYU 336, W9VMW 10 171, K8LUC 11 132, W5LJY 12 127, W9DTE 13 93, K1PQ1 14 90, WA2QBR 70, W5JUR 15 58, K5YFU 45, W7PWB 27, W4JZZ 22, W1BNB 18.

CLASS E

K9IUF 473, W8FAV 463, W6KG 351, K5LVL 311, K8OCO 261, K7INE 15 248, WINJI 229, K9VYS 229, WA2TX 194, K9ARW 17 191, W1AW 18 154, W9FPI 180, K0SCM 10 178, W5LJT 176, WA2DHF 170, WA2R1H 162, K7CHD 151, K5CWS 140, K0EKR 134, W2IYW 133, W3RPPZ 126, WA6MPE 12 126, WA6KHK 116, K7KBN 116, WA6MIG/6 115, WA6PFY 106, K5HFI 100, K9J8V 100, W1PFS 97, K1TUS 97, K0LIR 11 97, K3J9X 95, K5AMU 94, WA6OLD 92, K7GIP 92, WA8AJZ 89, K7JRE 84, K8TFY 85, K7KTQ/7 80, W8VA 79, K0BXP 76, W1BH 71 75, WA4RPE 73, W1CQO 70, K8SSY 70, W8AZA 64, K3GKH 61, WA6GLD 61, K208A 60, WA9AUM 12 60, W1VHL 59, WA2EXI 58, WA2ZHS 57, K9GLP 56, K1IIE 55, WA6PA/6 55, K1M0Z 54, K1LXS 53, K1QNL 53, W8ZAHB 52, W5DEC 51, WA2LUQ 50, K7RQP 50, WA2AV 48, K8RFY 47, WA2TX 45, W8FWQ 42, WA6ZU 41, K3GOF 40, WA5AID 40, K5HIM 40, K6KDE 40, WA6SZY 39, W9NDM 39, K9WAL 39, W8MNO 39, WA6LZG 36, W9YHN 36, W6OJW 35, WA2BWS 35, W2DHN 32, K9UCP 32, W9YAC 32, W1RFY 31, K9PCL 31, K9NBH 27 31, VE3AM 31, WA6HNC 30, WA6QKM 30, W9CHK 29, K4UFO 28, K8WOU 28, W9YRN 28, K3NID 28 27, W4HAN 27, VE3AYR/3 27, K5MFA 26, W2DLT 24, K3KJ 24, W4GFY 23, K1RKH 21, K3QPG 21, WA4DZY 21, WA6AAM 21, W9VSO 19, W46NDZ 18, WA6GD 18, K7L8H 18, K8DDC 18, WA2HXO 17, W5QPS 17, WA4AA 15, W8UVP 15, K9IOA 15, K5JAJ 15 14, W9TAL 14, W9ZBT 12, K8LGB 12, W9HHX 20 12, W9QGA 12, VO2XX 11, W9CHD 9, WA5DHC 6, W2EYW 5, K2VNL 5, WV2ZAC 12 5, WA9CZS 5, K9DVK 4, W0KIT 3, W1IIE 2, WA2PXL 2, W9YBY 2, WA2CCF 1.

K9S: DWK 12K, ops. 2, 2 ops. 8 K1s JHZ JQG, ops. 4 K9H8L W9TFA, ops. 6 K9YV, W9NEKR, ops. 6 K88 11U QCO, ops. 7 K8CVZ, W9NEKC, ops. 8 W3PWG, ops. 8 K88 BVM QCO, ops. 10 4 ops. 11 10 ops. 12 3 ops. 13 5 ops. 14 K1s MAW PQT, ops. 15 8 ops. 16 K7s IND INE, ops. 17 K9ARW, W9HUF, ops. 18 W1WFR, ops. 19 K8SCM, W9N8E, ops. 20 K7s JRE LXC, ops. 21 W1s BH MNG OBG, ops. 22 K88 HTM OEX, ops. 23 K3NID, K93TJA, ops. 24 K9GDF, ops.

ARRL thanks the following amateurs for submitting their logs for checking purposes: W1OPB, W2DFO, WA4RFB, W6AMI, K7EZL, W78 CQK HDC NPV7, W88 DM FX WEG, W98 RON RTY, VE78 BBB BT.



The first phase of "Murphy's Law" is dealt with by W6s VZT and ZRJ keeping W6ZRI/6 on the air for the Santa Clara County RACES group, well up in the 1A's.

It is unlikely that you will find a 416B or equivalent¹ for sale in your corner radio store, but because these hot tubes are widely used in commercial u.h.f. applications (where they are replaced regularly as a routine maintenance matter) they are readily available to most amateurs. Even though used for their normal life expectancy, they are likely to be better for u.h.f. amplifier service than miniature triodes of conventional design. A grounded-grid amplifier of the type described here will provide lower noise figure than anything but a parametric amplifier. Used ahead of an average good 432-Mc. converter, it will make a marked improvement in weak-signal reception.

A Low-Noise Preamplifier for 432 Mc.

Improving U.H.F. Reception with the 416B

BY LEO H. SCHMALENBACH,* W4TVP

ON one of my luckier days I was handed a couple of 416B tubes and asked if I could use them. Although not experienced with this tube, I was well aware of its capabilities as a low-noise v.h.f. and u.h.f. amplifier, so I eagerly accepted. It was decided that the best use I could make of the 416B would be as a preamplifier ahead of existing 432-Mc. converters at this station. Results with the amplifier to be described have been very gratifying, and very much worth the effort of building it.

Circuit Description

The amplifier uses a grounded-grid configuration, with a quarter-wave coaxial plate circuit.

* Rock Spring Estates, R.F.D. 1, Warrenton, Virginia.
 A new tube having u.h.f. amplifier capabilities equal to or better than the 416B was recently introduced by GE. Though not mechanically identical to the 416B, it is readily adaptable to u.h.f. amplifier applications. Called the 7768, it is described in the "New Apparatus" section of July QST, page 74.

The grid is grounded directly, and bias is obtained through a cathode resistor. Only a small amount of bias is needed, as the tube operates at 25 ma., with a supply voltage of 250. The cathode input circuit is also a quarter wavelength, and it provides a good impedance match to 50- or 75-ohm antenna systems.

The coaxial plate circuit has an outer-to-inner conductor ratio of 8 to 1, providing an impedance of 135 ohms. The output coupling loop is suitable for coupling into converters with low-impedance coaxial input circuitry. The amplifier is very stable, and has a gain of approximately 10 db. The plate circuit covers a frequency range of 400 to 500 Mc. The cathode circuit is broadly resonant at approximately 432 Mc. Best noise figure was obtained by capacitively tapping the antenna directly to the cathode shell of the tube. The 416B must be forced-air cooled, so as not to exceed the manufacturer's temperature rating on the glass-to-metal seals.

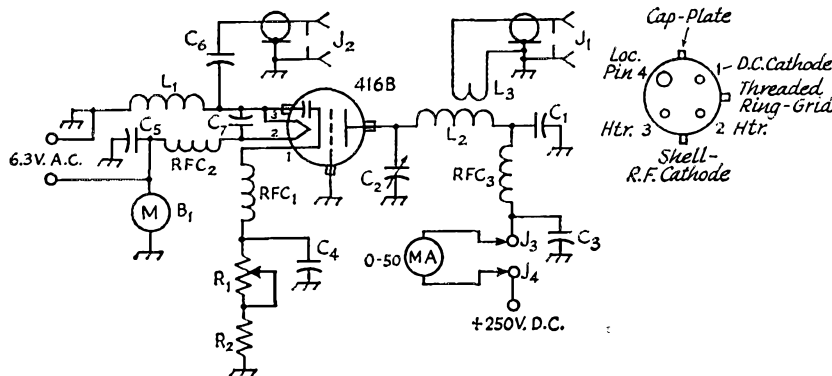


Fig. 1—Schematic diagram and parts information for the 416B preamplifier. Note that the capacitor between the d.c. and r.f. cathode connections is built into the tube.

B₁—Small surplus blower, with 6- or 12-volt motor.

C₁—Power lead bypass; see text.

C₂—5- μ mf. miniature variable made from Johnson 20M11 (160-110) cut down to three rotor and two stator plates. Leave stator bars intact; see text and photograph.

C₃, C₄, C₅—1000- μ mf. button mica.

C₆—50- μ mf. silver mica.

C₇—100- μ mf. ceramic.

J₁, J₂—BNC chassis receptacle.

J₃, J₄—Insulated tip jack.

L₁—Copper strap cathode inductance; see Fig. 2 and text.

L₂—Inner conductor, plate circuit; see Fig. 3 and text.

L₃—No. 16 wire formed into 1/2-inch loop, spaced 1/8 inch from L₂.

RFC₁-RFC₄ inc.—6 1/2 inches No. 20 enam., close-wound 1/8-inch diameter.

R₁—100-ohm potentiometer.

R₂—12-ohm 1/2-watt resistor.

Construction

All metal work was done with hand tools normally found in the well-equipped ham shack. Details are given in Figs. 2 and 3. The amplifier itself is built on a $\frac{1}{16}$ -inch brass plate, drilled as shown in Fig. 2. The amplifier assembly is mounted on a 5×7 -inch aluminum plate, containing the blower, variable cathode resistor, power receptacle and current-metering jacks. This plate then covers a $5 \times 7 \times 2$ -inch chassis, so that air from the blower will be forced up through holes around the tube, and out through holes in the top of the coaxial plate-circuit assembly.

The plate-circuit outer conductor is made from 2-inch copper tubing, obtainable from plumbing contractors. Principal dimensions and assembly details are given in Fig. 3. The first step in making the "hat" is to solder the top in place. This is done by first marking a $2\frac{1}{8}$ -inch circle on a sheet of copper a little larger than the tubing. The center of the circle should be center-punched for future drilling. The $2\frac{5}{8}$ -inch length of copper tubing is then centered in this circle and soldered in place, using plenty of heat and soldering paste. A propane torch was used, but a heavy soldering iron may also suffice.

The excess copper sheet is then trimmed off with tin snips, and finally dressed smooth with a file. Next, the center hole should be drilled, along with the air exhaust holes around the edge of the top plate. The bottom flange (the brim of the hat) should then be soldered in place, being careful not to overheat the top of the cavity. A damp cloth placed on the top, while soldering the flange, will help in this. Next, the holes for the output connector and the tuning capacitor may be drilled, and finally, the assembly should be given a good cleaning with alcohol or soap and water, to remove the soldering paste, etc. A coat of paint may be applied to the outside of the hat, to prevent tarnishing of the copper and to add to the appearance of the assembly. Alternatively, the copper surfaces can be polished with steel wool, and then sprayed with clear lacquer. Silver plating, inside and out, would be the best possible treatment, but this was not done here.

The inner conductor is made from $\frac{1}{4}$ -inch copper tubing, $2\frac{1}{2}$ inches long, slotted at one end to accept the 416B plate connection. Four slots are sawed to a depth of about $\frac{1}{4}$ inch, and the end formed on a suitably sized drill shank. The other end must be made to accept a 6-32 screw. This may be done by first inserting about $\frac{1}{4}$ inch of a brass 10-32 screw, or a piece of brass rod that will make a tight fit, and soldering either in place. The excess length is then cut off and trimmed smooth with a file. The end is center-punched and drilled and tapped for 6-32 thread.

The 416B preamplifier described by W4TVP is shown here connected to his 432-Mc. converter. The ventilated tank-circuit assembly is at the lower left, with the blower in the upper right corner of the base plate. Metering jacks and the cathode potentiometer are at the lower right.

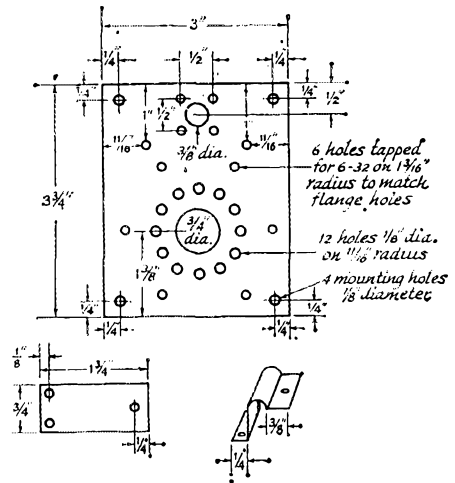
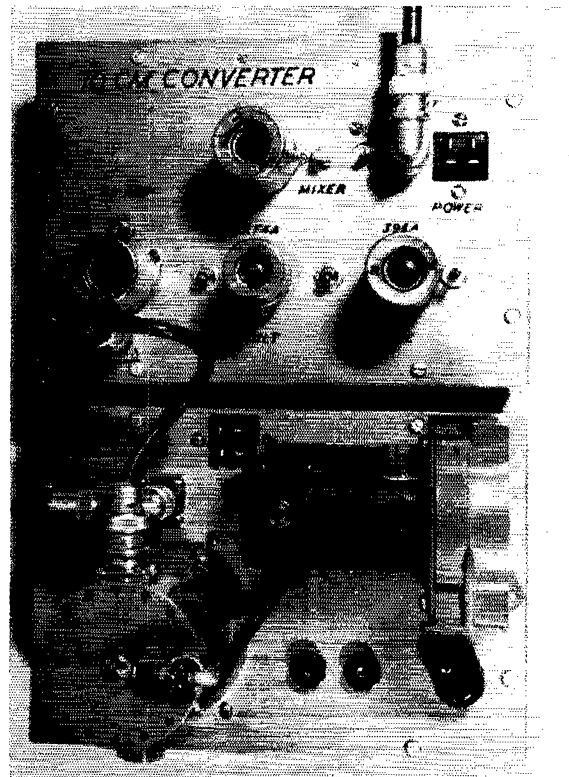
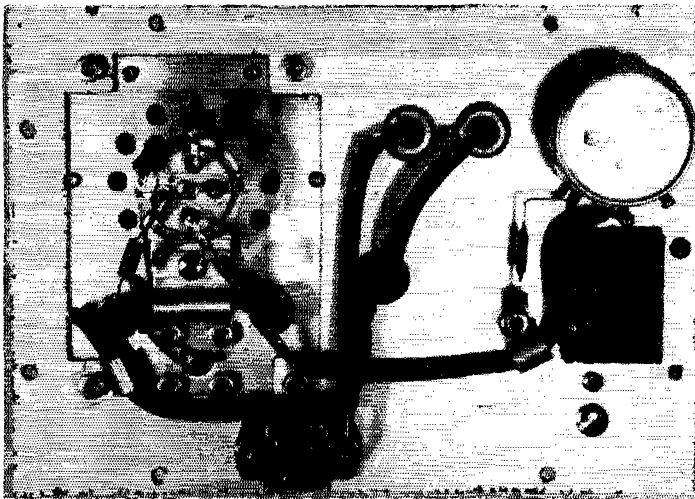


Fig. 2—The tube and tank circuits for the 432-Mc. amplifier are mounted on a $\frac{1}{16}$ -inch-thick brass plate, drilled as shown in the upper portion of the drawing. The cathode input circuit is a strip of thin copper or brass, before bending, at the lower left, and in the form in which it is used, at the right.

The disk that forms the hot side of the bypass capacitor C_1 is soldered to the end of the inner conductor next. Hold it in place temporarily with an iron screw, and solder, being careful not to solder the screw in also, as it should be removed after the soldering operation is completed.





Bottom view of the amplifier. Air from the blower opening, right, flows through the holes surrounding the 416B tube, when the plate on which the amplifier is built is mounted on a chassis.

The disk is made of flashing copper, $1\frac{5}{8}$ inch in diameter. The insulation between it and the cavity top may be any low-loss material capable of withstanding 250 volts, and it should be 0.005 to 0.01 inch thick. Since heat is not a problem here, plastic material taken from a small radio-parts bag should be suitable. The insulating disk should be only slightly larger than the capacitor plate, so that it will not block the flow of air through the holes in the top of the hat.

The inner conductor with its capacitor plate and insulating wafer may now be fastened in place by a 6-32 screw inserted from the outside. A soldering lug and an insulating washer are placed under the screw head. A washer with a $\frac{1}{4}$ -inch diameter shoulder is desirable here, but it is not absolutely necessary if care is used in lining up the screw in the center of the $\frac{1}{4}$ -inch hole. The plate-decoupling button-mica capacitor

is installed on the top of the assembly.

Now put in the coaxial receptacle and its output coupling loop. For a really neat job, the mounting flange of the coaxial connector should be bent slightly to match the curvature of the outer conductor. Finally, to complete construction of the cavity assembly, the tuning capacitor C_2 is installed. A Johnson miniature 5M11 may be used, or a 20M11 may be cut down to three rotor and two stator plates, leaving the stator bars full length. This was done here, as may be seen from Fig. 3 and the third photograph. The stator bars of the 20M11 fit nicely either side of the inner conductor, and may be soldered in place easily.

The 416B chassis plate is shown in Fig. 2. The tube is held in place by a $\frac{3}{4}$ -40 nut, no more than $\frac{1}{8}$ inch thick.² The nut should be soldered to the brass plate after positioning the tube properly. It may be well to stress here that the plate assembly should be removed or loosened before screwing the 416B in or out of the nut. The author had the sad experience of breaking a tube when neglecting this precautionary measure!

The cathode inductance is shown in its flat form, at the left, and after bending, at the right. It is made of flashing copper, so experimentation with its length, to resonate the input circuit at the desired center frequency, is not difficult. The end with the two holes is fastened to the antenna receptacle, and the other to a $\frac{1}{2}$ -inch standoff insulator next to the 416B. From this insulator to the shell of the 416B is a piece of finger stock $\frac{3}{4}$ inch wide, bent so as to provide spring contact to the r.f. cathode. The author was lucky enough to find some finger stock made for the 416B tube, but the above method should prove satisfactory. The input capacitor, C_6 , is soldered to this spring contact. Remaining construction details should be self-explanatory from examination of the drawings and photographs.

² A nut sometimes pressed into service for use with the grid thread on the 416B is the type used in BX cable and box work by electricians.

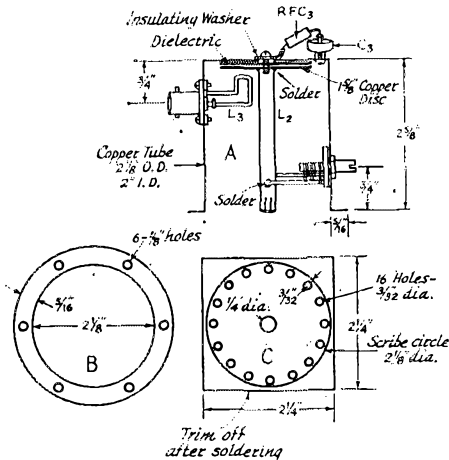
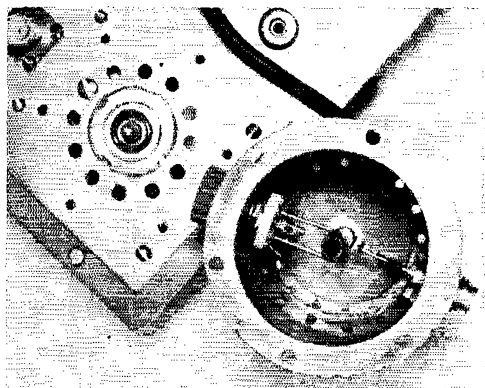


Fig. 3—The amplifier plate tank circuit is shown in cut-away form, A. The flange, B, is soldered to the open end of the assembly. The top, C, is made by soldering a slightly over-sized copper plate in place, and then trimming off the excess material.

Testing and Use

Putting the amplifier into operation is very simple, and few adjustments are necessary. The blower motor should be wired to come on with the heater voltage, and plate voltage application should be delayed approximately one minute thereafter. Plate current should be monitored, and adjusted to 25 ma. by means of the variable cathode resistor. With the amplifier connected to the 432-Mc. converter through a short piece of 50- or 75-ohm coax, an increase in noise should be noticed as the plate tuning capacitor is adjusted for resonance. Plate current should remain steady after it is adjusted to the proper value.

A diode noise generator with either a 52- or 75-ohm terminating resistor should now be connected to the antenna input and the input capacitor tap moved along the cathode inductance for optimum noise figure. If 75-ohm termination is used, the tap should be very close to the r.f. cathode shell of the tube as this is near the input impedance of the amplifier. If 52-ohm termination is used, the tap may be lower on the cathode inductance. Once the optimum position is found, the antenna may be connected and the preamplifier put to work. It is possible that stations never before heard may be encountered, if the converter normally used for this band is of average quality. The author's converter following this preamplifier has a 417A grounded-grid stage ahead of a 417A grounded-grid mixer. An improvement of approximately 4 db. in noise figure was obtained



Close-up view of the amplifier base plate and the interior of the plate tank-circuit assembly.

when the preamp was added.

The output coupling loop may be adjusted for maximum gain, but this was not too critical in the author's model. The loop should be run parallel with the inner conductor as shown, and spaced about $\frac{1}{8}$ inch from it. It may be well to recheck the noise figure and cathode inductance tap if this coupling loop is adjusted.

The author wishes to thank T. H. Strothman, W4UBY, for his encouragement and suggestions in making this article possible and also for on-the-air checks in testing and evaluating the preamplifier. QST



December 1937

... Much space was devoted to amateur television and the modern methods of cathode-ray reception. Technical Director Lamb announced a planned program of technical cooperation, and Marshall Wilder, W2KJL, discussed technical aspects.

... James McLaughlin and Karl Miles, both of the Hallicrafters Co., described an improved dual-diversity receiver for high-quality phone reception.

... Other technical articles included dope on applying inverse feedback to a universal speech amplifier, a rotary spider-web loop antenna with reflector, the design of the first stage of a speech amplifier, a cathode-coupled driver for Class-B modulators, a complete oscilloscope with i.f. input amplifier, a compact oscilloscope with i.f. input amplifier, a compact 56-Mc. portable-mobile transmitter-receiver, and the usual collection of hints and kinks.

... Gerry Sayre, W2QY, described conditions at the wintering-in site of the MacGregor expedition.

... W1JPE, regular "How's DX?" columnist, was off on a junket to western ham clubs, and so W1TS took over the DX news chores for the month. The news was that 28 Mc. was hot.

... We announced a new booklet, *Building an Amateur Radiotelephone Transmitter*.

... Montgomery Ward was a QST advertiser this month, selling a 60-watt ham transmitter built by Hallicrafters. QST

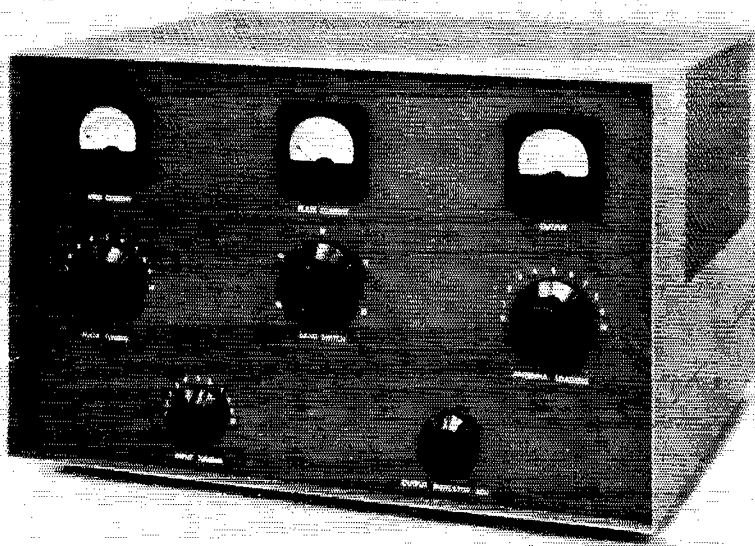
Strays

Despite the immensity of the monitoring task FCC is still keeping a watchful eye on the Citizens Radio Service. In one day's mail recently, Hq. received information copies of five license revocation orders. Violations were non-substantive communications (i.e., ragchewing), transmitting in excess of five minutes without observing the two-minute silence, failure to identify the station, transmissions not directed to a specific station, excessive deviation from frequency, allowing others to use the station, transferring the station to a location not specified in the license without notifying the Commission, failure to respond to notices of violation, and failure to keep the Commission informed as to correct mail address.

The Arctic ARC will hold its annual Winter Field Day on Dec. 29 and 30 in Fairbanks, Alaska. Club members will work all bands on c.w. a.m., and sideband. QSLs for all QSOs. For further info, contact Herb Loree, KL7EEH, Secretary, AARC, Box 389, College, Alaska.

FEEDBACK

In Hints & Kinks, page 58, November QST, WSBE's miniature 6-meter transmitter should have a ground at pin 1 of L_1 .



One kilowatt d.c., two kilowatts p.e.p., is the input this receiver-size amplifier will handle. The "no-screws" front panel is the result of laminated construction. Wrap-around cabinet is homemade.

A Two-Kilowatt P.E.P. Amplifier Using the 3-1000Z

BY
ROBERT I. SUTHERLAND, W6UOV*
AND
HAROLD C. BARBER, W6GQK**

UNTIL very recently, the amateur wishing to run high power on s.s.b. utilizing a zero-bias triode grounded-grid amplifier had to resort to the scheme of using many small tubes in parallel. This approach, while not too difficult at the 1-kilowatt p.e.p. input level, becomes extremely cumbersome at the 2-kilowatt p.e.p. level.¹ During 1961, the problem was simplified by the announcement of a new family of zero-bias triodes. Two members of this family are of immediate interest to the amateur who enjoys building his own equipment. These tubes are the 3-400Z and the 3-1000Z. A linear amplifier using the 3-400Z was described in the September, 1961, issue of *QST*. In addition, at least one piece of commercial gear available to the amateur has been put on the market using the 3-400Z.²

For maximum power input, the 3-1000Z tube may be used in similar circuits. This article is

intended to present a design approach for the 3-1000Z which others may wish to duplicate or to modify to fit their individual design specifications.

The 3-1000Z Zero-Bias Triode

The new Eimac 3-1000Z tube is a high- μ zero-bias triode having a plate dissipation rating of 1000 watts. It is rated to 2 kilowatts peak-envelope power input for single-sideband linear-amplifier service, as shown in the table of typical operating conditions. The 3-1000Z has no need for a bias supply for plate voltages up to 3500 volts. Used in a well-constructed, grounded-grid circuit, no neutralization is required.

The seated height of the 3-1000Z is only $6\frac{13}{16}$ inches from the base to the top of the plate cap, making it possible to build a complete amplifier behind a standard $10\frac{1}{2}$ -inch high relay-rack cabinet or within a desk-top cabinet of the same height. Forced air cooling is required for controlling temperature of the stem and plate seals. The air requirements are modest, and when the 3-1000Z is used with the SK-510 socket and SK-

* c/o Eitel-McCullough, Inc., San Carlos, California.

** 280 Justin Avenue, San Francisco 12, California.

¹ Based upon a 2:1 ratio between peak and d.c. input.

² Recent Equipment, "The Loudenboomer," *QST*, June, 1962.

Capable of a full kilowatt d.c. input on s.s.b. or c.w., this amplifier takes no more room on the operating table than an ordinary receiver. Grounded-grid zero-bias operation simplifies the circuit and takes a minimum of power accessories.

General Characteristics, 3-1000Z

Filament: 7.5 volts at 21.3 amperes

Interelectrode capacitances:

Grid-Filament	17.0 $\mu\text{mf.}$
Grid-Plate	6.9 $\mu\text{mf.}$
Plate-Filament	0.12 $\mu\text{mf.}$

	TYPICAL OPERATING CONDITIONS GROUNDED-GRID AMPLIFIER			
	2500 v., s.s.b.	3000 v., s.s.b.	2500 v., c.w.	3000 v., c.w.
Zero-signal plate current	162 ma.	240 ma.	162 ma.	240 ma.
Single-tone d.c. plate current	800 ma.	670 ma.	400 ma.	333 ma.
Single-tone d.c. grid current	254 ma.	205 ma.	127 ma.	94 ma.
Two-tone d.c. plate current	550 ma.	480 ma.	-----	-----
Two-tone d.c. grid current	147 ma.	122 ma.	-----	-----
P.e.p. input	2000 watts	2000 watts	1000 watts	1000 watts
P.e.p. output	1050 watts	1360 watts	610 watts	700 watts
Resonant load impedance	1700 ohms	2650 ohms	3280 ohms	4800 ohms
Driving power (approx.)	92 watts	65 watts	30 watts	24 watts

516 chimney the back pressure is quite low, allowing the use of a small inexpensive blower.

The 3-1000Z is designed to present a load of approximately 50 ohms to the driver, and has a drive power requirement compatible with the power output from a modern exciter using a pair of 6146s or similar type tubes.

The Amplifier Circuit

The 3-1000Z grounded-grid amplifier shown in the photographs is designed for 2 kilowatts p.e.p. input for single-sideband service on amateur bands between 3.5 and 29.7 Mc. The plate circuit is a pi-L tank presenting a tube load impedance of 2650 ohms, at a plate potential of 3000 volts, and capable of matching an antenna load impedance of 50-75 ohms. The pi part of the network has a Q of 20 and the L section has a Q of 10. With 2500 volts and a plate current of 800 milliamperes, the plate load impedance is 1700 ohms. The pi part of the tank circuit will then have a Q of about 12. When the amplifier is tuned for the maximum legal conditions for 1 kilowatt c.w. the network Q is somewhat higher, but this presents no problems.

A plate potential of about 2500 volts will provide a signal with somewhat less intermodulation distortion than is generated at 3000 volts, but any voltage from 2500 to 3000 will provide efficient operation.

The pi-L³ design was chosen for use in this amplifier because of two inherent advantages. First, the pi-L network provides an improvement in harmonic suppression of about 15 decibels over the simple pi configuration. Second, the loading capacitance can be chosen to allow the use of inexpensive variable air capacitors, without the usual selector switch for adding fixed capacitors in parallel for operation at the lower frequencies. In this amplifier it was decided that loading capacitor C_5 (see Fig. 1) would be a single 2000-

volt, 1000- $\mu\text{mf.}$ variable unit, or two 500- $\mu\text{mf.}$ units in parallel. In the design, the r.f. voltage across capacitor C_5 was arbitrarily limited to 1000 volts. The calculations indicated that a loading capacitance of 891 $\mu\text{mf.}$ would be required for 3.5 megacycles. Two E. F. Johnson 500- $\mu\text{mf.}$, 2000-volt air capacitors were then chosen to be driven in parallel by a set of 2 $\frac{5}{8}$ -inch diameter surplus gears.

A simple semiconductor voltmeter is incorporated in the output portion of the tank circuit to indicate relative power output. The sensitivity is adjusted by means of a rheostat.

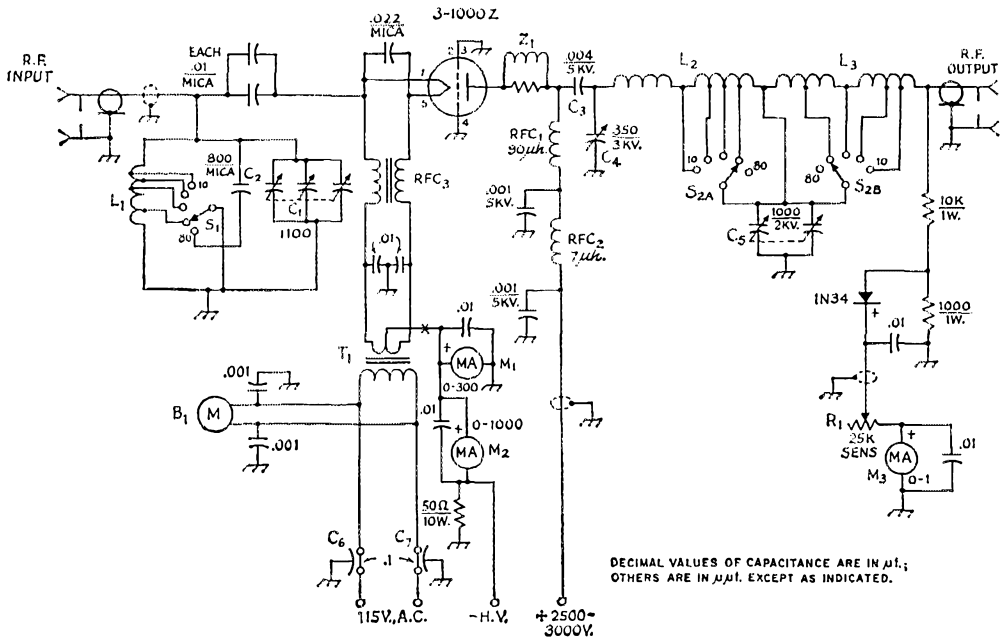
The only disadvantage of the pi-L network (if it can be considered a disadvantage) is the requirement for two sets of coils and two band-change switch decks for the plate tank. In addition, the operator may be surprised at the fast change in loading when the loading capacitor is placed across a relatively high-impedance part of the circuit. This effect could be eliminated by using a reduction gear arrangement between the loading capacitor and the dial.

The tuned input circuit is a conventional high- Q tank, with a Q of about 2, shunted across the filament circuit. The filament is above r.f. ground by virtue of a homemade bifilar choke wound on a ferrite core. The tuned cathode⁴ circuit aids in matching the exciter to the final and reduces the magnitude of the intermodulation distortion products. As the input impedance of the 3-1000Z is close to 50 ohms, it is not necessary to provide driving-point taps on the input coil for each band. The input tuned circuit is switched simultaneously with the plate tank by ganging the plate and input band switches with a sprocket and chain-drive scheme.

Meters are provided for measuring plate and grid currents. These currents are independently monitored by inserting the meters in the grid and plate return leads to the filament center tap. This

³ Rinaudo, "The Pi-L Plate Circuit in Kilowatt Amplifiers," *QST*, July, 1962, page 17.

⁴ Orr, Rinaudo, Sutherland, "The Grounded-Grid Linear Amplifier," *QST*, 1961, page 16.



DECIMAL VALUES OF CAPACITANCE ARE IN $\mu\mu\text{f}$;
OTHERS ARE IN μf , EXCEPT AS INDICATED.

Fig. 1—The amplifier circuit diagram. Capacitors are 600-volt disk ceramic except as indicated. Resistances are in ohms. S_1 and S_2 are ganged as described in text.

- B_1 —Blower, 20 cu. ft./min. at socket (Dayton IC-180).
- C_1 —3-section variable, 365 μf . per section, broadcast-replacement type (Miller 2113).
- C_2 —800 μf . mica (500 μf . and 300 μf . in parallel); (C-D type 4 or 9, 1200 volts d.c. test).
- C_3 —0.004- μf . ceramic (four 0.001- μf . in parallel); (Centralab 858-S).
- C_4 —350- μf . 3000-volt variable (Johnson 350E30, catalog No. 154-10).
- C_5 —0.001- μf . variable, 2000 volts (two Johnson 500E20, catalog No. 154-3, in parallel).
- C_6, C_7 —0.1- μf . feed-through (Sprague Hypass 80P3).
- L_1 —9 turns No. 10 enam., diameter 1 inch, length 1½ inches. Tapped as follows, measured from "hot" end: 7 Mc.: 4½ turns; 14 Mc.: 2½ turns; 21 Mc. 1¾ turns; 28 Mc.: ½ turn plus 2-inch lead.
- L_2, L_3 —See Fig. 2.
- M_1 —0-300 d.c. milliammeter.
- M_2 —0-1000 d.c. milliammeter.

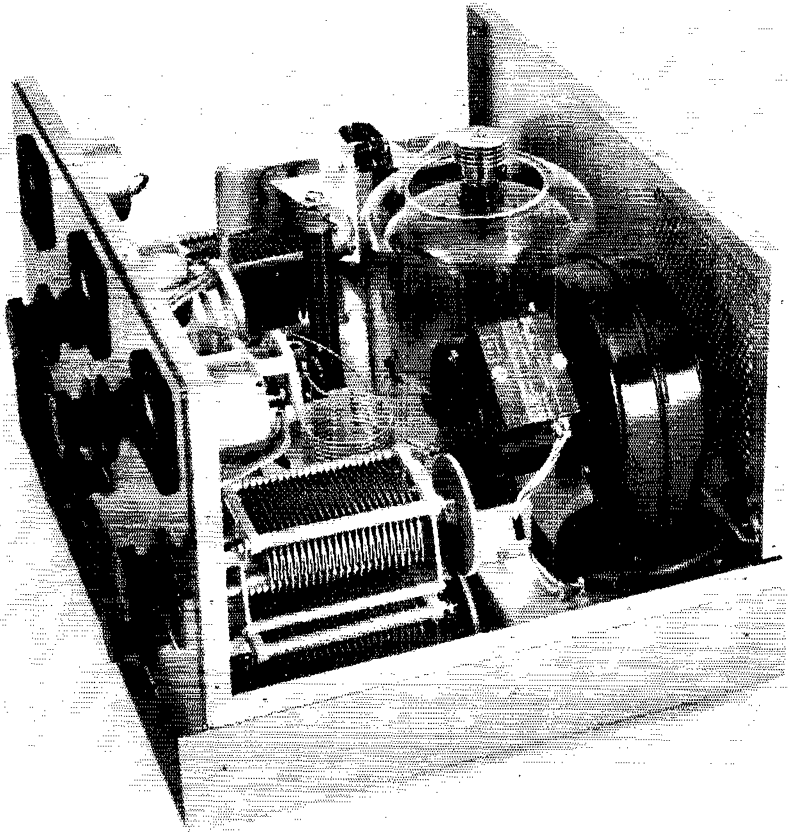
- M_3 —0-1 d.c. milliammeter.
- R_1 —25,000-ohm control, linear taper.
- RFC_1 —90 μh ., 500 ma. (B & W 800).
- RFC_2 —7 μh ., 1000 ma. (Ohmite Z-50).
- RFC_3 —Four windings, 50 turns each, No. 10 enam., on ½-inch diameter ferrite rod (Lafayette MS-333), winding length 4 inches. Bifilar wound in two layers, with two windings paralleled in each leg. (B & W type FC-30 may be substituted.)
- S_1 —1-section, 1-pole, 5-position ceramic rotary (Centralab 2501).
- S_2 —2-section, 2-pole, 5-position ceramic rotary (Radio Switch Corp. Model 86; two type H wafers, 60-degree detent).
- T_1 —Filament transformer, 7.5 volts, 21 amp. (Stancor P-6457).
- Z_1 —½-inch copper strip formed into U, 2 inches long, 1 inch wide, paralleled by three 100-ohm, 2-watt composition resistors.

method allows the three control-grid terminals of the socket to be directly strapped to the chassis. There are slots in the SK-510 socket especially provided to allow low inductance ground terminations to be made to each of the three grid terminals. This strapping technique is far superior to the use of grid bypass capacitors, and the low inductance of the straps contributes significantly to the stability of the amplifier. Each meter responds to one current; i.e., no subtraction of the meter readings is necessary. A 50-ohm, 10-watt resistor is placed between the "floating" negative side of the power supply and ground. This is to protect the operator in case the meters should become open-circuited. Without this resistor, an open circuit could cause the negative side of the power supply to rise dangerously above ground potential.

Shielded Enclosure and Chassis

This compact table-top amplifier is packaged in a homemade aluminum cabinet measuring 10½ inches high, 17 inches wide, and 14 inches deep. The small chassis at the back of the cabinet was fabricated after a layout satisfying the electrical requirements was determined. This chassis measures 2½ inches high, 17 inches wide, and 6½ inches deep, and is made of 0.063-inch sheet aluminum. It shields the input circuit and provides the mounting deck for the filament transformer, blower and tube socket.

The front panel is made of two pieces of aluminum sandwiched against one another. The "rear" panel, of 0.063-inch aluminum, is used for mounting all of the parts attached to the front panel as seen in the photographs. Flat-head machine screws in countersunk holes support the various



Looking in from the right-hand side. Both loading capacitors are visible in this view. The small aluminum box immediately below the blower motor houses the r.f. voltmeter circuit. Note perforations in the cabinet behind the blower to admit cooling air.

components and provide a smooth surface for the "outer" front panel to seat against. The "outer" front panel is made of $\frac{1}{8}$ -inch Dural and is painted and labeled to provide a neat looking appearance with no screw heads visible. The cabinet enclosing the amplifier is formed from two pieces of 0.063-inch aluminum sheet. The bottom is formed in the shape of a U from a solid piece of aluminum. The top piece was perforated (this work was done by the California Perforating Screen Company, 345 Folsom Street, San Francisco) to aid in cooling the tube and components. An edge of solid aluminum was left around the top piece for *esthetic reasons*. Both the top and bottom covers extend $\frac{1}{2}$ inch beyond the edge of the front panel.

All three meters are isolated from the r.f. field by the use of aluminum meter shields. The meter leads are brought through the shields in small ceramic feed-through capacitors. Panel bearings and shaft assemblies are used for front panel controls and on shafts from the input compartment to the plate compartment. The "C" retaining washers on both sides of the bearing serve as good wiping contacts to ground and prevent the shaft

from acting as an "antenna", coupling power from one compartment to the other, as can happen with simple panel bushings. A control shaft "hot" with r.f. can lead to circuit instability or TVI problems.

Component Layout and Assembly

General component placement may be seen in the photographs. The three meters are arranged across the front panel with the grid meter at the far left, the plate meter in the center and the r.f. voltmeter at the far right.

The plate tank and cathode tuned circuit band switches are ganged together by means of a chain and sprocket drive system. Both band switches have 60-degree indexing so the sprockets can be of equal size. A brass sprocket with 10 teeth⁵ was used on both band switches. The drive chain is Boston⁶ No. 1 brass chain. It is imperative that brass chain be used as the chain is in a fairly strong r.f. field. Iron has such high r.f. resistance

⁵ Perfection Gear Co. (American Stock Gear Division), 152nd Street and Vincennes Avenue, Harvey, Ill.; Sprocket #C-10, 1.125 inch diameter.

⁶ Boston Gear Works, Quincy 71, Mass.

that serious heating of the chain will prohibit its use even if the chain is copper plated.

The plate band switch must be insulated from the front panel by ceramic or bakelite mounting spacers and a ceramic shaft coupler. If this precaution is not followed, there will be serious closed-loop loading on the 80- and 40-meter bands because of the loop formed by the panel, chassis, switch and chain coupled to the plate tank coil.

A standard heat-radiator cap (Eimac HR-8) was modified to provide sufficient clearance between the radiator and the cabinet. The two top radiating fins were removed: this can be done in a lathe or by hacksaw and file. Ordinarily this is not a recommended procedure. However, after the modifications were made, the plate seal temperature was measured by a thermocouple and was found to be well within the manufacturer's ratings. The chimney and modified heat-radiator cap were in place and cooling air was supplied by the fan described in the parts list.

The SK-510 socket was modified to allow a shallower chassis to be used. The SK-510 has a short plastic cylindrical protrusion on the bottom to couple to an air hose for cooling purposes. This

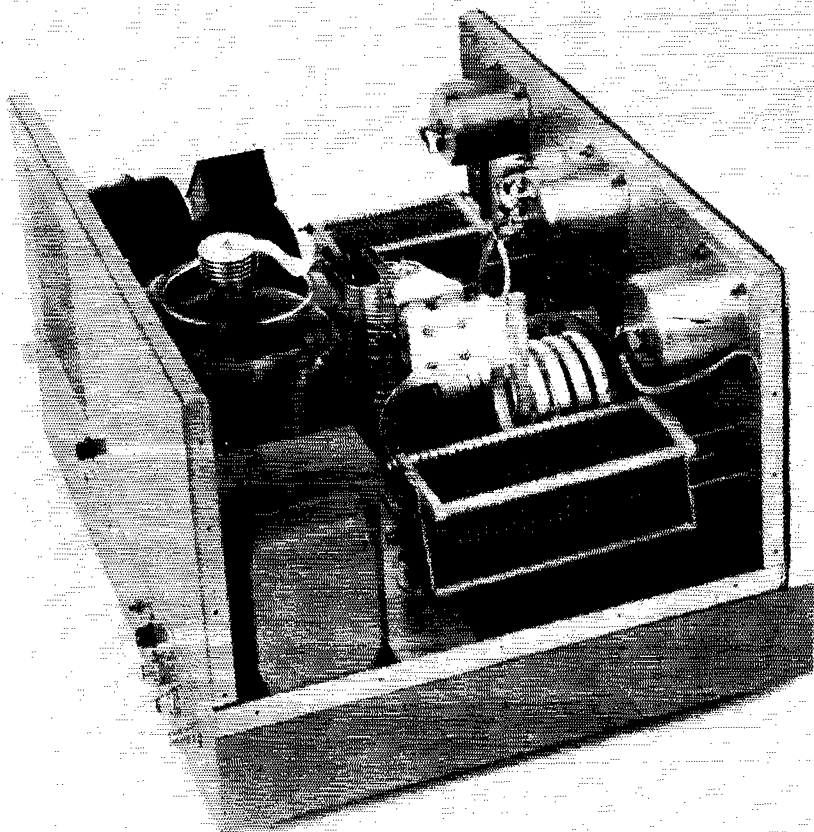
cylinder is not used when the chassis is pressurized as in this amplifier. The plastic cylinder can be cut off with a hacksaw and file after the contact pins have been removed. The pins are snapped back into the socket after the modification.

The semiconductor r.f. voltmeter is mounted in a small aluminum box bolted to the chassis just below the blower motor. A length of hook-up wire is attached between the voltmeter and the pi-L output to sample the r.f. voltage. The sensitivity control is mounted on the front panel and is connected to the voltmeter by means of a shielded wire. The indicating milliammeter is attached to the detector unit by means of a shielded wire.

Amplifier Wiring

Shielded wire is used on all low-voltage leads in the plate compartment except the blower power leads and r.f. sampling wire. Small ceramic feed-through capacitors pass all leads from one compartment to another. Coaxial capacitors are employed as 115-volt a.c. terminals on the rear apron of the chassis.

Silver-plated $\frac{1}{8}$ -inch copper strap is used for all



View from the left-hand side, showing the filament transformer, plate tank capacitor, and mounting for the plate blocking capacitor.

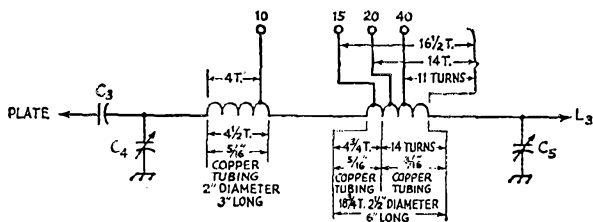
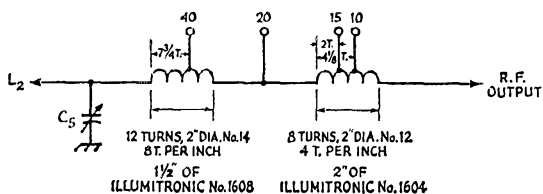


Fig. 2—Winding details of the pi-L tank coil, L_2 ; L_3 below.



taps on the pi section of the plate tank and for the plate leads connecting the tuned circuit to the 3-1000Z plate cap. No. 14 tinned copper wire is used to connect the taps on the L part of the plate tank to the band switch.

Large transmitting-type mica capacitors must be used as the coupling capacitors in the cathode tuned circuit, as all the drive power flows through these capacitors. The capacitor shunting the input circuit on 80 meters will carry part of the circulating current in this tuned circuit and therefore must be a good transmitting type. All of the

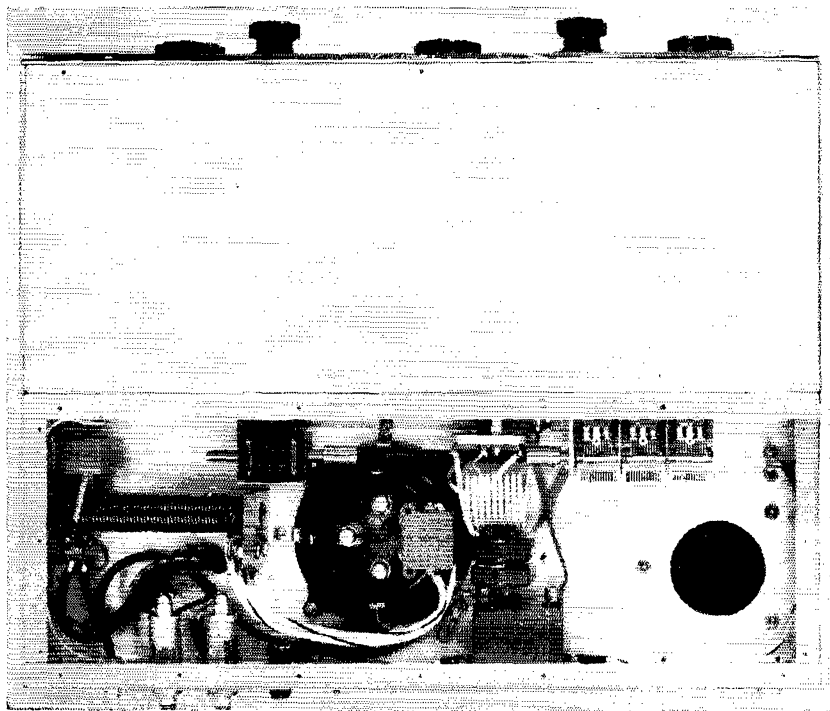
mica capacitors used for the cathode tuned circuit are widely available on the surplus market.

Testing and Tuning the Amplifier

The amplifier is entirely free of regeneration or parasitics. The amplifier will operate with no plate load connected, a full 3000 volts applied to the plate, no grid drive applied, and with the band switch and tuning capacitors in any position — with no sign of oscillation.

Preliminary tuning adjustments should be

(Continued on page 180)



This is the input compartment as seen from the bottom. The homemade filament choke is at the left, supported on small phenolic blocks. The input tank circuit is to the right of the tube, with the capacitor turned through a right-angle drive. Grid terminals on the tube socket are grounded directly to the chassis with copper strap.

The best way to find out something about a phone signal is not to listen to it. Not listen to it, that is, as a *phone* transmission. Treat it as a collection of c.w. signals and you begin to hear some things that aren't always evident in "normal" reception.

Looking at Phone Signals

The Receiver as an Analyzer

BY GEORGE GRAMMER,* WIDF

ANY receiver that will bring in c.w. signals satisfactorily can be used for checking phone signals. Although the check is purely qualitative, more than that isn't to be expected from a receiver. Quantitative measurements, whether on incoming signals or your own, take a great deal of auxiliary apparatus. However, a qualitative check will go a long way toward the goal of keeping signals clean.

Furthermore, you don't have to know much about your receiver's technical characteristics in order to make a fair assessment of the quality of a phone signal. It's largely a matter of knowing how to set the controls and knowing what to look for. The "how" is easy; the "what" takes some practice — critical observation and comparison of the various kinds of signals you run across on the air. While there isn't anything complicated about it, the technique differs from that used in ordinary reception.

First, about the receiver's controls. Turn off the a.g.c. This is vital. Any variation in receiver gain while you're examining a signal makes it practically impossible to interpret what you hear. Set the audio gain well up and turn the r.f. gain down to the point where the average signal is of moderate strength. Turn on the b.f.o.

Beware of Overloading

Before doing any phone checking you have to find out something about the receiver's ability to handle signals. An easy way is to tune across a c.w. band. When you come to a strong signal, vary the r.f. gain control. If the audio output keeps coming up as you increase the gain, the control is operating in the right region. If the output starts to level off at some point on the gain control, the receiver is beginning to overload. There is a change in the character of the beat note at that point; the tone begins to sound a bit thin or mushy. Also, signals and noise in the background will "bounce" in intensity with the keying of the signal. These effects will readily be recognized after you've heard them a few times. Pick out the strongest signal and set the r.f. gain well below the point where overloading starts. You should still be able to get all the output you need by increasing the audio gain.

Unless the controls are set in this way the

receiver can't handle the stronger incoming signals without overloading. Overloading has to be avoided at all costs if your observations are to be useful.

Adjusting the B.F.O.

Next, set the receiver's selectivity to maximum and turn off the b.f.o.¹ Tune in a c.w. signal by adjusting the tuning control so the response to the background noise is maximum when the sender's key is down. An unmodulated steady carrier can also be used, if such a signal happens to be available.

When the gain controls are adjusted as described, the background noise *increases* when a signal is present, just as it does when the b.f.o. is turned on. This is opposite to what happens when the a.g.c. is used and the manual r.f. gain is at maximum; in that case the background noise *decreases* when a signal is tuned in.

Finally, turn on the b.f.o. and adjust it to give a beat tone of about 500 cycles on the signal so tuned in. Either side of zero beat can be used.

Checking a Phone Signal

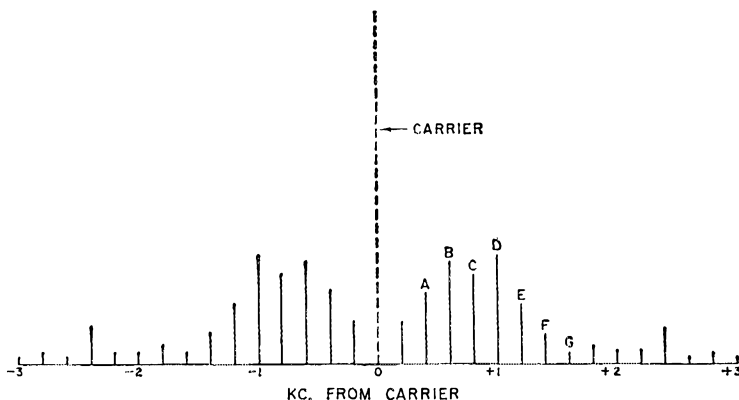
At this point you're ready to take a look at a phone signal. The a.m. broadcast band is a good place to start, if your receiver happens to be one that covers it. Broadcast modulation is likely to be held under proper control, and your object is to find out what the sidebands of a *properly* modulated signal are like.

First, tune in a carrier, adjusting the tuning for the selected beat tone. For the moment, ignore the modulation, which will sound like a miscellaneous collection of beat tones. Concentrate on the carrier beat. Two characteristics will stand out: (1) the pitch of the tone is constant; that is, the frequency of the carrier is not in the least affected by the presence or absence of modulation, and (2) the carrier amplitude also is constant. There will be no changes in carrier amplitude that occur simultaneously with modulation.

¹ — It may not always be easy to do this, since the b.f.o. and a.g.c. cannot be controlled independently in some receivers (although it is usually practical to pull out the b.f.o. tube temporarily). Also, receivers with product detectors do not lend themselves to this method of setting the b.f.o. frequency since the detector does not (or should not) function when the b.f.o. is not operating. In such cases the b.f.o. has to be set to give approximately the desired tone on background noise. This is good enough if the selectivity is high.

*Technical Editor, QST.

Fig. 1—A properly modulated a.m. signal may have, instantaneously, side frequencies, distributed something like the pattern in this drawing. The frequency pattern from instant to instant with voice modulation.



If you are tuned to a distant station and there is fading, the fading will cause variations in carrier strength, but careful listening will show that these variations are quite independent of the actual modulation.

Now tune off about a kilocycle to the side which makes the carrier beat tone rise in frequency. You'll now be in one of the two sidebands, and if the receiver selectivity is high the carrier beat either will be much weaker or will have practically disappeared. Listen carefully to the beat tones that rise and fall with the modulation. Unless the station is in the middle of a commercial (when the rules are sometimes conveniently overlooked) the sideband beat tones will have a clean, smooth sound—a little hard to describe accurately but easily recognizable after a short listening session. Continue moving the tuning away from the carrier frequency and there will be no change in the character of these beats, except that as the tuning is moved farther from the carrier their intensity usually will decrease. These smooth-sounding beats are "legitimate" sidebands.

Bandwidth

If the receiver tuning dial is calibrated closely enough it is possible to get a fairly accurate idea of the transmitted bandwidth by this beat method. Concentrate on those beats which have the same tone for which you set the b.f.o. at the start. Find the frequency setting, farthest from the carrier, at which you get that tone from a sideband component. Then the difference between that dial reading and the dial reading for the carrier is equal to half the signal bandwidth—half, rather than total, because you've looked at only one of the two sidebands.

Estimating bandwidth by this method requires the ability to concentrate on the right beat tone. Obviously, it is easier to recognize the beats when the receiver has high selectivity, because then the strongest beats will always be around the right tone regardless of the tuning-dial setting.

One other thing will have been noticeable about the properly modulated signal you've been examining: the sideband components are always relatively weak-sounding compared with the carrier. This has to be so, because with voice or program modulation the average power in one

sideband is only about one-eighth the carrier power. Furthermore, this power is divided up among the various component frequencies of the sideband, so any *single* component will have even less power. Occasionally, if you happen to be listening to music, a single tone will stand out, but even in this case its amplitude usually will be 6 db. or more below the carrier amplitude.

Analyzing the Process

If you aren't wholly familiar with receiver operation a diagram of this process may help. Fig. 1 is typical of the frequency-vs.-amplitude distribution that might exist in a good a.m. phone signal at some instant. Each sideband consists of a series of frequency components associated with a voice sound. These components usually have harmonic relationship, to a close degree, for any given sound; in Fig. 1, all the side frequencies shown are produced by audio tones that are harmonics of 200 cycles. More important, however, is the fact that each sideband consists of a group of *distinct* frequencies. It is not just a continuous mess. Each separate frequency gives a separate, and reasonably stable, beat tone with the receiver's b.f.o.

If the receiver can handle a group of these frequencies without doing injustice to any of them—i.e., without overloading—the individual beat components will stand out just as any one of a similar group of closely spaced c.w. signals will retain its individuality. Sideband components of this sort are generated in a properly modulated transmitter, and sound "clean" with the receiver's b.f.o. on.

By using as much selectivity as the receiver offers, the number of sideband components heard at any one time is narrowed down. In Fig. 2 a curve typical of "500-cycle" selectivity is shown superimposed on the lettered group of sideband components from Fig. 1. The response range shown is 60 db. If the receiver is tuned to the frequency of side component *D*, the response to that component will be as shown by the vertical line. This response is relative to the carrier-only response; the scale here differs from that of Fig. 1 because the former was plotted to an intensity (voltage or current) scale while Fig. 2 is in decibels. The sideband components labeled *B*, *C*, *E* and *F* would have the decibel response shown,

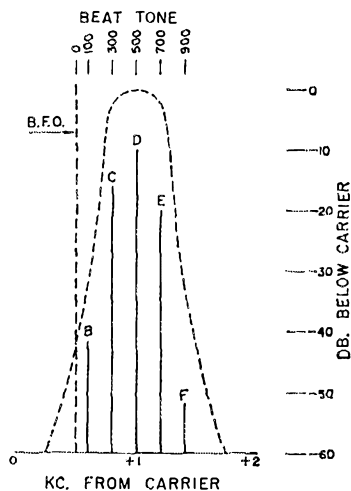


Fig. 2—With high selectivity, only those sideband frequency components to which the receiver is actually tuned will give appreciable response. This drawing shows the relative response a selective receiver would give on the lettered components in Fig. 1. The scale at the top shows the beat tone each component would produce when the b.f.o. is offset 500 cycles from the peak of the selectivity curve. In this case only C, D and E would result in appreciable audio output.

as a result of the effect of the selectivity on their original amplitudes. Note that A and G are so far down (more than -60 db.) that they do not even show on the graph. This is also true of all components higher in frequency than G and lower in frequency than A, including the carrier.

If the receiver's b.f.o. is offset from the selectivity curve by 500 cycles as shown (this was the object of the method of setting the b.f.o. frequency detailed earlier) each sideband component will give a beat tone as shown in the upper scale. The selectivity restricts these tones to a relatively narrow range centering around 500 cycles. This also will be true when the receiver is tuned to other parts of the signal. When this point is appreciated the beat-tone method of checking bandwidth becomes clear.

Practically speaking, any sharply peaked selectivity curve -- such as the kind a *Q* multiplier or the old-type crystal filter gives -- is best for this type of checking. While your mind can be trained to exclude those tones which differ appreciably from the one for which you originally set the b.f.o., it is easier with a highly peaked selectivity curve because then only a frequency component right on the peak -- that is, one that gives the selected beat tone -- really stands out.

Splatter

Splatter frequencies arising from overmodulation tend to have a different character than legitimate sidebands. There is a harshness associated with them that again is hard to describe but not hard to recognize. Listen for this sort of thing during commercials, particularly, and with the

tuning set toward the edge of the band you found to be occupied during normal program transmissions.

The harshness associated with splatter is the result of a different type of sideband-frequency distribution. The onset of splatter is usually abrupt, giving an effect something like key clicks. Also, the side frequencies it generates are often much more closely spaced than the sideband components of proper voice modulation, so that distinct tones are less easily recognizable.

Checking Amateur Signals

An hour or so spent in listening this way will give a much better idea of what a phone transmitter is really doing than months of listening to what actually is being said. Furthermore, what is learned is as useful in appraising an s.s.b. signal as it is for judging a.m.

Really horrible examples of overmodulation may have been missing in this preliminary training of listening to a well-modulated broadcast station. They are much less rare in the communication services -- including, sad to say, amateur. However, it is well to start off by learning what a *good* signal is like. If yours is a ham-bands-only receiver, you will have to identify the right kind through pre-knowledge of how it should sound. The difference between good and bad is clear enough, after you've heard both kinds.

With this background in checking modulation you're in a position to take a look at amateur signals and find out a few things about them. However, before condemning any signal you hear as not being up to par, ask yourself two questions: First, is there any possibility that the receiver is being overloaded, either by the signal in question or by one that may be far enough removed in frequency so that you aren't aware of its presence? That r.f. gain control setting is important. Second, if there are harsh "burps" indicating splatter from overmodulation or s.s.b. flattening, do they belong to the signal you're blaming? In a crowded band identification of bits and pieces of splatter is sometimes pretty difficult.

In other words, make sure that the signal being checked is the one you're actually hearing, and that no spurious receiver effects are being introduced. An overloaded receiver is worthless as a checking device. Most receivers have so much gain that even a weak signal can be amplified up to the overload point unless care is used in holding down the amplification. The lower you can run your r.f.-i.f. gain, the better.

A.M. Phone

With these precautions well in mind, you'll have no difficulty in spotting overmodulation on a.m. signals. "Overmodulation" here means any nonlinearity that results in splatter outside the proper channel. Very often it isn't overmodulation in the commonly accepted sense of the word, but is "spurious" generated by attempting to make a modulator do more than it is capable of doing. The actual modulation percentage may be

well below 100. The effect is much the same in either case.

You can find out still more by this method. Tune in the carrier and listen to the beat carefully while the transmitter is being modulated. A good many v.f.o.s can't "take it" when a succeeding stage is modulated. A change in the carrier beat frequency during modulation shows this up; it is most easily detected if the beat tone is made as low as possible. The change is often at a syllabic rate, giving an effect something like frequency-shift keying; the principal cause of this is a change in power-supply voltage when the modulation throws on an extra load.

If the v.f.o. frequency is modulated at an *audio* rate, the carrier will take on a mushy character during modulation. Audio f.m. leads to some undesirable effects; the combination of f.m. and a.m. causes distortion, increases bandwidth, and makes the sidebands unsymmetrical. If you run across such a signal, change to normal phone bandwidth, and with the gain controls still the same and the b.f.o. still on, try to tune the receiver to zero beat with the carrier. If there is appreciable audio f.m. it won't be possible to make the voice sound right. The same test on a stable signal will give no special difficulty, although it may not be possible to hold the exact zero-beat adjustment for any length of time because of minute frequency drifts in the transmitter's or receiver's oscillators.

The beat-note checking method also will show up changes in the carrier amplitude. As there are many controlled-carrier a.m. phone signals, an increase in carrier amplitude while modulating is often to be expected. However, if the carrier amplitude *decreases*, something is wrong with that signal. It may be poor power-supply regulation, but is just as likely to be something that results in the generation of spurious modulation components. A check of the sidebands will show which.

S.S.B.

Examined in this way, s.s.b. signals differ from a.m. only in the absence of the carrier and one sideband. Properly generated and amplified, the sideband components will have the same clean sound to them that properly modulated a.m. sidebands do. Overdriving a linear amplifier will result in "burps," especially noticeable outside the desired-sideband channel and particularly in the undesired-sideband region, just as a.m. overmodulation does.

Since there is supposed to be no carrier with s.s.b., the receiver's b.f.o. must be set up on a c.w. signal or unmodulated carrier as described earlier. This is obviously not the same setting that would be optimum for s.s.b. reception; the b.f.o. frequency is offset by 500 cycles or so from the s.s.b. setting. With this offset, you can easily determine whether any carrier is being transmitted; a continuous carrier will give a steady tone, usually weak compared with the sideband, but nevertheless present. You can also detect a carrier that rises with modulation. It is "keyed"

along with the voice, sounding something like slow c.w. with a very soft make and break. This is caused by incomplete carrier balance, which may be a dynamic effect—that is, the carrier may be quite well balanced out when there is no modulation, but becomes unbalanced when it is being driven by audio.

With high selectivity it is possible to check the bandwidth of an s.s.b. signal by the beat method, and particularly to see whether there is appreciable output in the undesired sideband region. As shown by Fig. 2, the beat tone that your b.f.o. is adjusted for will predominate only when a sideband component is on the frequency to which the receiver is set. If your mind is trained to exclude any other tones you may hear, you may be sure that you aren't being deceived by instrument errors. The selectivity has to be high enough so that the audio image of the b.f.o. tone is negligible; in other words, you have to have true single-signal c.w. reception.

Transmitter Checking

Of course, all this is only preliminary to the real object—checking your own transmitter. Practice on incoming signals of all types will give you the insight needed for analyzing your own signal. Having found out how to spot defects in others, you're well prepared to find out what, if anything, is wrong with your own.

Some suggested setups for checking your own transmitter will be discussed in a subsequent article. In the meantime, give a try at being your own sideband analyst. The only equipment you need is a receiver.

QST

Strays

Any blind would-be amateurs who would like some study material on tape are urged to contact last year's Edison award winner, Bill Welsh, WA6VTL, 2300 West Clark Avenue, Burbank, Calif. No charge except for postage.

At midnight Saturday (0000 EST, Sunday) WNCN (104.3 Mc., f.m., NYC) broadcasts an hour-long program called Hi-Fi Workbench, and devotes part of the hour to ham radio news. K2IBY and K2YQH do the show. Hams in the metropolitan New York city area and suburbs should take a listen.

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 VB5AA DXpedition

BY JOHN G. TROSTER* W6ISQ

ALL ready go now, B'wana."
"Good work, Number One. Now call the porters. I want to say a few words. You translate."

The leader climbed a sand dune and faced his punting porters. "Now, boys, we are about to start our DXpedition into this unknown ARRL-forsaken island. Just think, never before has anyone set foot upon this dot of land! The jungles are thick, the slopes steep. But, my friends, the rewards are great. You are standing in a new country! A radio society in Connecticut, U. S. A., said so. And we've come here to set up the first radio station. Can you poor fellows grasp the tremendous significance of that? Can you understand . . . can you appreciate . . . oh, well. All of you who survive will be awarded a medal."

"Haablub, haablub."

"What do they say, Numer One?"

"They say, 'peachy, peachy'."

"Boys, this award is a pin. And you can pin it proudly to your . . . alhh, you can pin . . . err, wear . . . make a string and wear it around your neck."

"(Ollong goo?"

"What do they say, Number One?"

"They say, 'what kind of medal?'"

"In American this medal is called a Booster Pin. And you will receive this citation for duty above and beyond the call of DX. Now, my brave fellows, let us point our beams toward the mountain. We are going to slash our way through this jungle and drag ourselves to that unsealed peak. Then we'll send messages all over the world."

"Pfund gruz --- blah gefoocy."

"Blast it, Number One, what do they say?"

"B'wana, they say, 'we do same with bongos, but no have to climb to mountain'."

"B'wana, porters say wish B'wana not put big long whirly-gig aluminiumium on piecy before walkum through jungles."

"I suppose you're right, Number One. I should have waited to assemble that dratted thing until we got to the top. But tell the machette-boys to

*45 Laurel Street, Atherton, California

cut a little wider. Two medals to those stout fellows!"

"Haablub, haablub."

"No sleep tonite, boys, we must be ready to call our first CQ by dawn. It's onward — onward and upward into the swirling mountain mists."

At last the steep slopes give way to level ground. "We're here, boys. Now quickly each to his own task. Hurry now, only an hour till dawn. Drat this fog."

Tent-boys heave canvas, fix tables, chairs and lanterns. Beam-boys straighten aluminum elements and swing the pieces aloft with a hearty dar-di-dar-dit-dar-dar-di-dar. The generator-lads gas up and spin old faithful. Radio-boys unbox and carry radios into the tent. All is ready with minutes to spare.

The leader steps from the tent into the heavy mists. "Number One boy," he shouted, "fetch our official flag. You know, the sheet with the numbers on it. Ah, there it is — now nail it to that spare mast and we'll hoist it over our camp. On your feet, boys. Right haaand, salute!"

"See that, Number One? That's the radio call of this new country we just climbed. V-B-5-A-A. Yes, Number One, the Governor personally filled out the proper papers and gave me that call. Then he presented me with this magnificent radio call flag. 'Good luck,' says he, 'you'll make radio history in that new country.' And so we shall, Number One. Just a few more minutes and we'll . . ."

"B'wana, B'wana. Fizt zwink coco hongo."

"Blast it, Number One, what's he so excited about?"

"Boy say, 'sounds like some fella knock cocanuts together out in middle of clouds.' Listen."

"He's right, Number One. There is something over there. Get me that flag pole — we'll advance our standard and investigate. Careful now, Number One, there may be some unfriendly natives on this island we don't know about."

"I can hear the voices now, B'wana."

"What do they say?"

"Don't know, B'wana, but I see sompin white. Think maybe tent."

"Let's move up behind that rock. Now — what do you see?"

"I see fella come out of tent. Maybe he make bed. He wave big sheet in air. No — he nail sheet to stiek. Up she go. See picture on sheet."

"Blast it, Number One, what's the picture? What's the picture?"

"Very hard see through mists, B'wana. Go closer."

"All right, Number One. The Governor himself told me . . . well anyway, here's the license in my pocket and the flag from the Gov . . ."

(Continued on page 184)



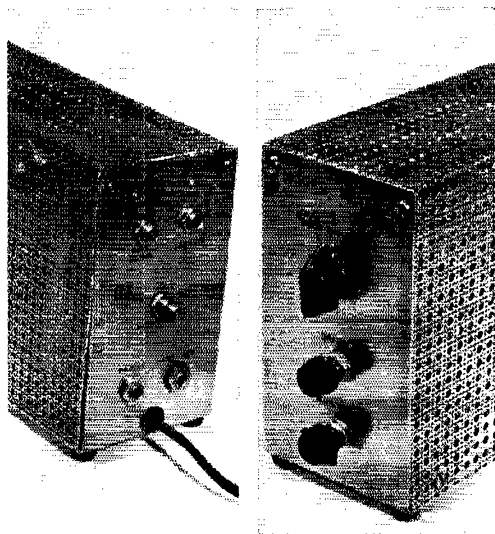
.. FELLA NAIL SHEET TO STICK

A Monitored Electronic Key and Keyer

Transistor Circuit for Both Cathode and Blocked-Grid Systems

BY JAMES C. MacFARLANE,* W3OPO

The solid-aluminum U-shaped chassis is approximately 11 inches long with ends measuring approximately 2½ by 5 inches. The perforated cover is cut to fit. Rear panel (left) has the two keyer jacks at the top, mark/space control at the center, lever and straight-key jacks and power cord at the bottom. Front panel (right) carries the three-position switch S_1 at the top, speed control at the center, and monitor volume control at the bottom.



While Harry Beecher, W2ILE, described his original electronic key in a *QST* article (April, 1940), it seems improbable indeed that he could have anticipated how thought-provoking the basic idea was destined to be. Over the ensuing 22 years and more, an almost steady stream of designs has appeared, some simple, some highly complicated, but each representing the designer's choice after weighing features, complexity, reliability and cost. All have had their followings of advocates. Is this the one for you?

In these days, as s.s.b. becomes more and more popular, it is sometimes felt that c.w. is a forgotten art. But recently there have been several articles published on electronic keyers.¹ Some of these units have been simple to build, but critical as to components or adjustments, and some have been complex and therefore unappealing. The keyer I'm about to describe is somewhere between these two extremes. I hope that this article continues to stir up interest in c.w., one of the finest modes of communication.

Here are a few of the features of this keyer:

1) Reliability through the use of positive and negative voltages and emitter followers to control the multivibrators in an "off" and "on" condition, which precludes unscheduled oscillations

which, in turn, would key the transmitter.

2) No regulated voltages are required. Although the unit has been worked at from 14 to 24 volts, it is recommended that the voltages be between 18 and 22. Two 22½-volt batteries, or one 45-volt battery with a 22½-volt tap, may be used in place of the simple a.c. supply described, if desired.

3) Constant mark-to-space ratio (once set) from the fastest to the slowest speed. There is no interaction with the speed control. The speed for this unit is approximately 15 to well over 70 w.p.m. This speed range may be changed by using different timing capacitors in the free-running multivibrator.

4) No relays are used to key the transmitter, yet cathode and/or grid-block keying outputs are available.

5) The layout is not critical. Indeed, the first breadboard unit was spread out over three or four feet and worked just as well as the finished "eyelet" model. The most expensive items in the unit are the transistors themselves. CK722s are available for considerably less than a dollar. This unit is particularly adaptable to printed-circuit-board construction.

6) Included are the usual provisions for speaker monitor output, optional hand key and/or bug. There are also provisions in the unit for holding a steady dash while tuning the transmitter.

Circuit

Referring to Fig. 1, the basic timing circuit is a free-running multivibrator including transistors

* 4917 Harvest Road, S.E., Washington 22, D. C.

¹ With particular reference to Old, "Transistorized Electronic Key and Monitor," *QST*, May, 1959.

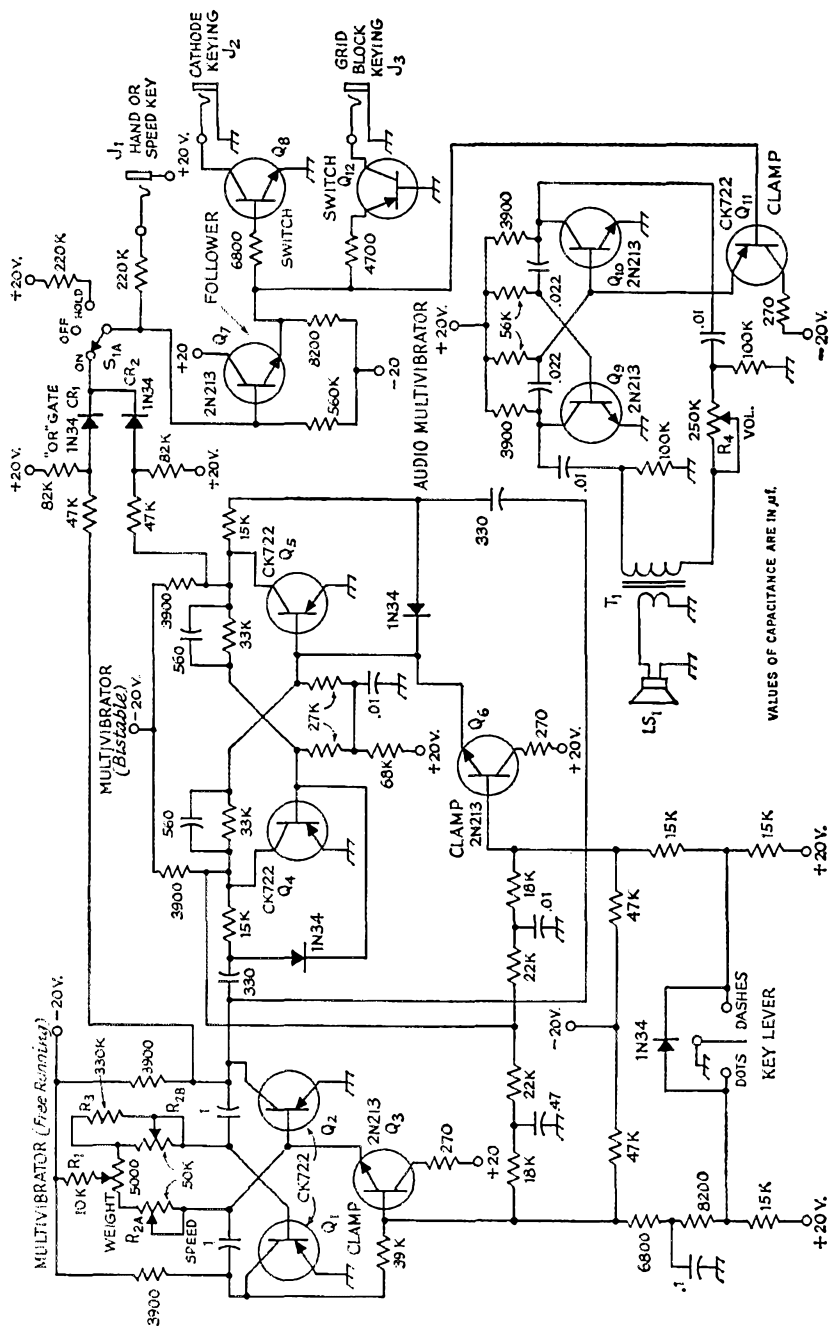


Fig. 1—Circuit of the monitored electronic keyer. Resistances are in ohms and resistors are $\frac{1}{2}$ watt. Capacitors of less than $0.001 \mu\text{f}$ should be mica or stable ceramic; $1\text{-}\mu\text{f}$ capacitors should be good-quality paper; other fixed capacitors may be disk ceramic or paper.

J_1, J_2, J_3 —Open-circuit jack (J_1 must be insulated from chassis).

LS_1 —3-inch speaker.

Q_9, Q_{12} —See text.

R_1 —Linear control.

R_2 —Dual 50,000-ohm linear control.

R_3 —See text.

R_4 —Audio-taper control.

S_1 —Double-pole three-position rotary switch (see Fig. 4 for S_1).

T_1 —14,000 ohms or more to voice coil.

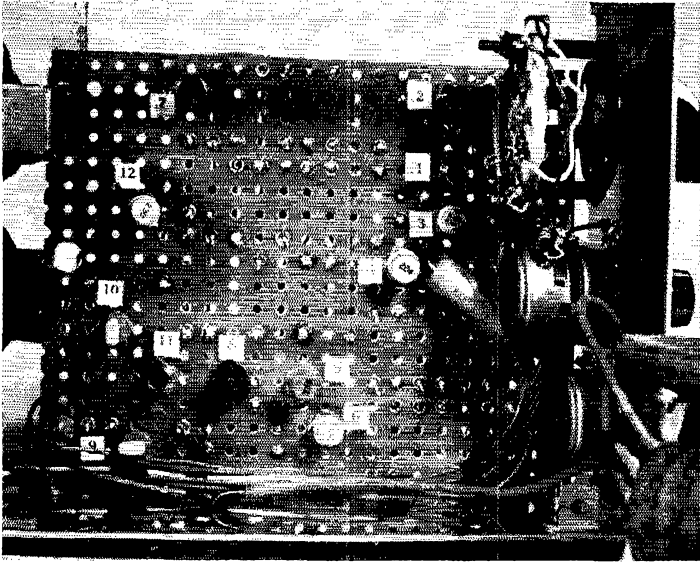
VALUES OF CAPACITANCE ARE IN μf .

Q_1 and Q_2 . This multivibrator provides the timing for the dot and space. Transistors Q_4 and Q_5 form a bistable multivibrator, and this circuit is used in forming the dash. The outputs of the two multivibrators are combined in an OR gate. Transistor Q_7 is a current amplifier (emitter follower) which drives the keying transistors Q_8 and Q_{12} and the clamping transistor Q_{11} . Q_3 and Q_{10} are in another free-running multivibrator

which produces a tone of approximately 500 e.p.s. for local speaker monitoring. Q_3 , Q_6 , and Q_{11} are emitter-follower clamps which control their respective multivibrators in an on or off condition.

When the paddle is in the center position the following conditions exist:

Q_3 and Q_6 (n-p-n) emitter followers, by virtue of the positive voltage on their bases, are clamp-



All transistors (identified by number according to the circuit diagram) appear on one side of the perforated phenolic component board.

ing Q_2 and Q_5 , respectively, in the off state.

To produce a series of dots, the paddle is pushed to the left. The base of Q_3 goes negative (off), which removes the positive clamping voltage from the base of Q_2 , and the multivibrator starts to free-run. Since Q_6 is still clamping Q_5 off, the bistable multivibrator is not operating and the output of the free-running multivibrator (Q_1 , Q_2) appears at the OR gate (CR_1 , CR_2 and associated resistors). The output of the OR gate drives the current amplifier (emitter follower) Q_7 which, in turn, drives the keying transistors Q_8 and Q_{12} and turns off Q_{11} , permitting the audio multivibrator Q_9 and Q_{10} to oscillate. Referring to the waveform diagram (Fig. 2) you will note that the collector of Q_2 has a sharp rise and a slow fall time. The lengths of the dots and spaces are measured at the zero-voltage, or crossover point at the OR gate output. Adjustment of the mark-space ratio will be described later.

To produce a series of dashes, the paddle is pushed to the right. The bases of Q_3 and Q_6 go negative, starting both multivibrators. Referring to the waveform patterns of Fig. 2B, it is noted that every time there is a positive-going pulse from the collector of Q_2 , it triggers the bistable multivibrator (unless the bistable is clamped off, as it is during a series of dots). The first trigger pulse causes the collector of Q_5 to go positive (on) for the first two thirds of the dash. The next positive pulse from the collector of Q_2 causes the collector of Q_5 to go negative (off) for the last third of the dash plus a space interval. The next dash is started on the next trigger pulse. The resultant waveform at the output of the OR gate shows the dash to be three times the length of a dot. The balance of the dash sequence continues as for the dots described above.

The resistors in the base circuits of Q_3 and Q_6 (to the collectors of Q_1 and Q_4) provide for biasing them negative until the timing interval (dot or dash) is completed. The capacitors in these feedback circuits provide the proper filtering and time constants.

Adjustments

There are no adjustments to be made if you are an operator who likes to work the weight or mark-space control to suit the situation. Many DX men like to make their dots a trifle heavy and slow down in speed when digging for the rare ones. However, if you are one who wants

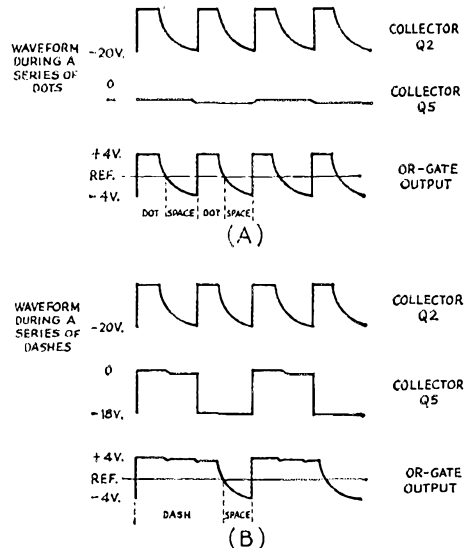
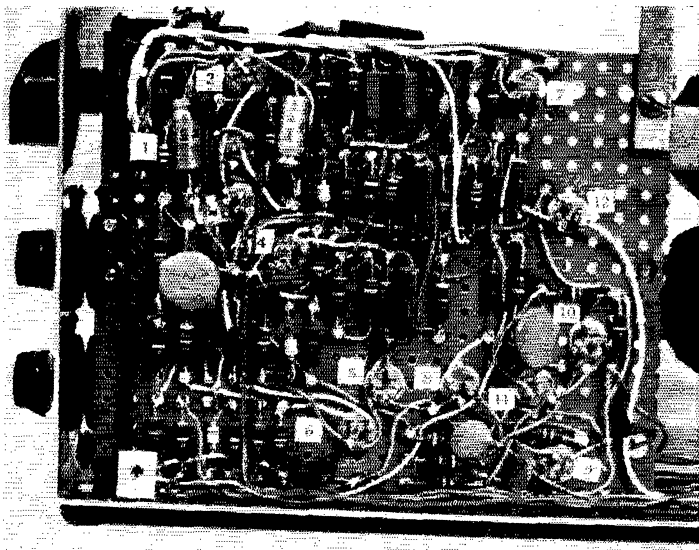


Fig. 2—Waveforms at the collectors of Q_2 and Q_5 and at the output of the OR gate with (A) dots and (B) dashes.



Reverse side of component board. Here again, the transistor sockets are identified by number.

essentially constant mark-to-space ratio, regardless of the setting of the speed control, here are some ways to do it.

If you have an oscilloscope which can duplicate the waveforms in Fig. 2, then it is a simple matter (after advancing the speed control to top speed) to adjust the weight control so that the dot and space are of equal length. Then return the speed control to the slowest speed. If the mark-space ratio varies by only a few per cent (undetectable to the human ear), you have now completed the adjustment. If it is off appreciably, that is, if the mark period is longer or shorter than the space interval, R_3 must be moved to the other potentiometer, R_{2A} . This resistor is required because the timing capacitors have a tolerance of plus or minus 10 to 20 per cent. If one capacitor had a minus value and the other a plus value, the timing intervals would be different for each half of the multivibrator, thereby destroying any chance of getting proper adjustment. If switching the resistor does not improve the adjustment, it would be advisable to find two capacitors whose actual values are more closely matched.

In lieu of a good oscilloscope, put a voltmeter across the output of the OR gate. Reset the voltmeter needle up scale away from zero, mechanically by the zero adjustment. Hold the key to the dot side. Adjust the mark-space control while swinging the speed control from the

fastest to the slowest speed. When you have reduced the voltmeter swing to a minimum, your adjustments are completed. On my unit the swing was less than plus and minus 0.1 volt.

The Keying Transistors

It is not necessary to provide both Q_8 and Q_{12} , of course, unless you want to make provision for both cathode and grid-block keying. If only one system is needed, the keying transistor and accompanying base resistor of the other system may be omitted.

In selecting a suitable transistor for either Q_8 or Q_{12} , it is important to determine the voltage that prevails across the transmitter key jack when the key is open, and the current that flows in the key circuit when the key is closed. Both voltage and current must be within the rating of the transistor used as the keyer. Consideration must also be given to the dissipation rating, although it can be stretched a bit because of the low c.w. duty cycle.

Readings made by the ordinary voltmeter and milliammeter will be satisfactory, provided that no high-voltage transient takes place. However, in keying the cathode circuit of the Pierce crystal oscillator in my Viking I transmitter, a check made with an oscilloscope showed an instantaneous voltage spike running as high as 60 volts coincident with opening of the circuit. The steady-state voltage as read on a voltmeter across the open key jack, was only about 15 volts. It is obvious that the most reliable check requires the use of a scope.

If transient spikes are detected, their cause should be investigated and corrective measures taken if possible. Otherwise, the voltage rating of the keying transistor will have to be sufficient to accommodate the peak value of the spike. It might be of interest to remark that the spike mentioned above occurred only when the keyed

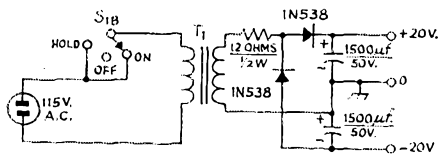
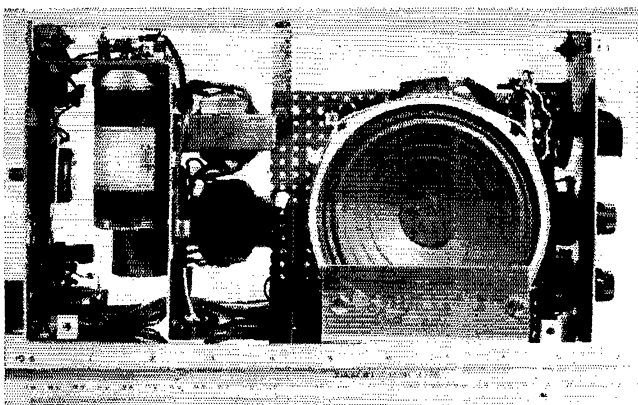


Fig. 3—Circuit of a simple power supply for the monitored electronic keyer. Capacitors are electrolytic. S_{1B} and S_{1A} (Fig. 1) comprise a single unit. T_1 is a 12.6-volt 1-amp. filament transformer.

The monitor speaker is mounted on the chassis by means of a bracket. It is on the transistor side of the component board. Power-supply components occupy the rear portion of the chassis.



stage was being operated as a crystal oscillator. When the stage was operated as a keyed buffer driven by a continuously-running external v.f.o., the spikes did not occur, and the open-circuit voltage was about 30.

In cathode-keyed systems, both the open-key voltage and the closed-key current will usually vary as the transmitter is shifted from band to band. Measurements should be made on all bands covered by the transmitter, and a transistor should be selected that will handle the highest values measured.

Most cathode-keyed transmitters these days are keyed in low-power stages where the voltages and currents are within the ratings of many of the low-cost (\$1 to \$3) n-p-n transistors. Where higher voltages are encountered, there are the 2N1310 (90 volts) and the 2N1311 (75 volts) at less than \$5.

Among transmitters using blocked-grid keying, you may find a few, but not many, using blocking voltages of less than 50 volts. On the other hand, you will find several whose blocking voltages run up to 250 volts or more. The most suitable low-priced p-n-p transistor seems to be the 2N398A rated at 105 volts. For blocking voltages exceeding 100 volts, two or more of these units can be

operated in series, as described by K5UIJ in an earlier *QST* article.²

Operation

Now that you have made your mark-space adjustments, have the proper transistor for keying your transmitter, and your transmitter is warmed up, turn on your keyer and get the feel of the key. If you have been disappointed with other keyers in recent years, I think you'll be happy with this one. If you've never used an electronic keyer before, it should not take you long to master it. As far as I'm concerned, the old saying, "You can't teach an old dog new tricks," does not hold true in this case. I used a semiautomatic key for over 20 years and I would never go back to it after the pleasurable hours I have had with this keyer.

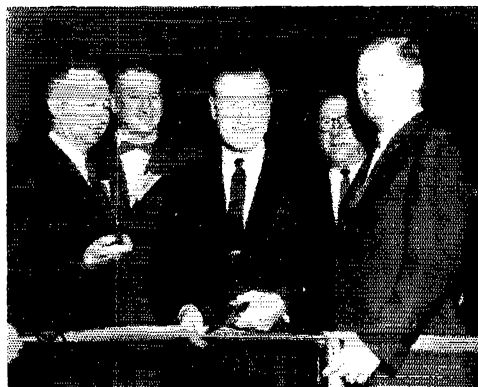
If it were not for my friend, Mr. Thomas P. Sifferlen, who designed the basic circuit, this article would never have been written. My thanks also to Mr. Chesley H. Looney for encouraging me to write the article and for checking it for technical correctness and to Ron Woodman for the photographs.

QST

²Lyon, "An All-Transistor Keyer and C.W. Control Unit," *QST*, July, 1962.

Strays

Governor Nelson A. Rockefeller of New York lent a note of official recognition to the ARRL Hudson Division Convention by cutting the ribbon at the start of the meeting, held in the Statler Hilton Hotel, New York City, on October 13. With the Governor are: K2SJM, convention vicechairman; K2SJO, convention chairman; W2KR, Hudson Division Director; and W2TUK, Hudson Division Vice Director and president of the Hudson Amateur Radio Council, Inc. The Governor also proclaimed October 13 as Amateur Radio Day in New York.



16th V.H.F. Sweepstakes, Jan. 5-6

ATENTION v.h.f. operators! Here is the dope on the 1963 VHF Sweepstakes, which will be bigger and better than ever. It will start at 1400 your local standard time on Saturday, January 5, 1963, and end at midnight local time on Sunday, January 6. Remember, contacts count only when the contest is in progress at both ends of a QSO.

This year there is one rule change, the section status of Delaware. As usual, VESs will count as a separate multiplier. This will make possible a total multiplier of 74.

So join in the fun this year. Just call CQ Sweepstakes or answer such a call.

Remember that, unlike the V.H.F. QSO parties, in the SS sections count only once no matter what band they are worked on, although you may work the same station on a different band again for additional contact points. Example: W1HDQ works W1FZJ on 50 and 144 Mc. for complete exchanges of 2 points on each band; 2 + 2 gives 4 points but only *one* section multiplier. So bandhopping will increase your score.

In scoring, the multiplier is the number of sections worked *plus ten*. Each complete exchange counts two points. Here is a scoring sample. Suppose W3HYJ made 100 contacts in 17 different sections:

100 QSOs
 $\times 2$ (if all SS data exchanged in both directions)
 200 (QSO points)
 $\times 27$ (17 sections plus 10)
 5400 (claimed score)

You can get log forms as shown in December, 1961, *QST*, by writing to ARRL, 38 LaSalle Road, West Hartford 7, Conn. Let us know how many you need. Logs must be post marked by February 2 to be eligible for score listing and awards.

Rules

1) *Eligibility*: Amateur operators in any ARRL section (see page 6) operating at home, or mobile or portable *under one call* on or above 50 Mc. are invited to take part. Yukon-N.W.T. (VES) counts as a separate multiplier.

2) *Object*: Participants will attempt to contact as many other stations in as many ARRL sections as possible.

3) *Contest Periods*: The contest starts at 2:00 P.M. your local time, Saturday, Jan. 5, 1963, and ends at midnight, Sunday, Jan. 6, 1963. Contacts between stations in different time zones can be counted only when the contest period

is in progress in both of the zones concerned.

4) *Exchanges*: Contest exchanges, including all data shown in the sample, must be transmitted and received for as a basis for each scored point.

5) *Scoring*: (a) Contacts count *one point* when the required exchange information has been received and acknowledged, a *second point* when exchange has been completed in both directions.

(b) Foreign entries: All contacts with foreign countries (such as Mexico and Cuba) count for score. All foreign countries are grouped together as one, and a section multiplier of *no more than one* (per band) may be claimed for contacts with all foreign stations contacted. Foreign stations may only work stations in ARRL sections for contest credit. Foreign stations will give their country name in the exchange.

(c) Final score is obtained by multiplying total contact points by the sum of different ARRL sections worked (the number in each of which at least one SS point has been credited) plus 10.

6) *Conditions for Valid Contact Credit*: (a) Repeat contacts on other bands confirmed by completed exchanges of *up to two points per band* may be counted for *each different station* worked. (Example: W1HDQ works W1FZJ on 50 and 144 Mc. for complete exchanges of 2 points on each band; 2 + 2 gives 4 points but only *one* section multiplier.)

(b) Cross-band work shall not count.

(c) Portable or mobile station operation under one call, from one location only, is permitted.

(d) A transmitter used to contact one or more stations may not be used subsequently under more than one other call during the contest period.

(e) Contacts with aircraft mobiles cannot be counted for section multipliers.

7) *Awards*: Entries will be classified as single- or multi-operator, a single-operator station being defined as one manned by an amateur who neither receives nor gives assistance to any person during the contest period. Certificates will be awarded in each ARRL section to the top-scoring amateur in the single-operator classification. In addition, a certificate will be awarded to the top Novice in each ARRL section where *at least three* such licensees submit valid contest logs. Multioperator work will be grouped separately in the official report of results in *QST*.

When three or more individual club members compete and submit logs naming the club with which they are identified, an ARRL certificate will be issued to the leading club member. When less than three individual logs are received there will be no club award or club mention.

A gavel with an engraved sterling-silver band will be offered the club whose secretary submits the greatest aggregate score, provided such scores are confirmed by receipt at ARRL of the *individual contest logs* from such members. Only the score of a bona fide club member, operating a station in local club territory, may be included in club entries. Claims from federations, radio club councils, or other combinations of radio clubs, will not be accepted, nor can special memberships granted for contest purposes be recognized.

8) *Conditions of Entry*: Each entrant agrees to be bound by the provisions of this announcement, the regulations of his licensing authority, and the decisions of the ARRL Award Committee.

9) *Reporting*: Reports must be postmarked no later than Feb. 2, 1963, to be considered for awards. QST

EXPLANATION OF V.H.F. SS CONTEST EXCHANGES

Send Like a Standard Msg. Preamble, the NR		Call	CK	Place	Time	Date
Exchanges	Contest numbers 1, 2, 3, etc., a new NR for each station worked	Send your own call	CK (Readability and strength or RST of station worked)	Your ARRL section	Send time of transmitting this NR	Send date of QSO
Sample	NR 1	W1AW	59	CONN	1402	JAN 5

It isn't often that you see a home-built 100-watt 6-meter transmitter inside a 3 × 5 × 12-inch box, but K2IUW has done it here without undue crowding of components.



A Compact Six-Meter Transmitter

100 Watt Input at Moderate Cost

BY SAMUEL M. BASES,* K2IUW

BACK in '57 and '58 when the sunspots favored 6-meter men, five watts would get you across the continent without much trouble. About the time the F_2 openings started to become rare and these conditions faded away, several ideas began to congeal into a plan for more power in a compact six-meter rig. The outcome of these ideas is the 100-watt transmitter shown here. It has performed reliably for over two years.

My basic requirements included provision for either crystal or v.f.o. input, high suppression of unwanted crystal harmonics, easy and complete neutralization, and reasonable power output with inexpensive tubes. Consideration was given for making the rig small enough to squeeze in between the present equipment on the operating table. The transmitter was designed to permit the use of junk TV types of power supplies.

Circuit

A 5763 Tri-tet oscillator-tripler takes 8-Mc. crystals or the unbalanced output from a v.f.o., the shield of the coax from the v.f.o. connecting to the ground side of the crystal socket. The oscillator plate circuit is tuned from the front panel, and is inductively coupled to the fixed-tuned grid circuit of the doubler.

Some considerable thought about doublers resulted in the choice of the Amperex 6360, a dual tetrode which lends itself to the push-push configuration. Its convenient pin arrangement also provides good input and output separation. The push-push doubler attenuates the third harmonic of the driving signal and is inductively coupled to

the final with a double-tuned circuit, to provide high attenuation of unwanted frequencies.

The final uses a pulsed-power version of the old workhorse 829B, the 3E29. This tube apparently has been overlooked by hams to some extent, for its published ratings apply to pulse operation and are generally misinterpreted. Either the 3E29 or the 829B may be used, but the former is less expensive on the surplus market.

Metering only the final grid and plate currents proved sufficient and permits simple switching and a reduction in the number of leads from the tightly wired oscillator-multiplier assembly. The meter leads are bypassed and filtered and the meter is shielded to reduce harmonic radiation.

Cathode keying of the amplifier is employed, and the modulation transformer secondary is automatically shorted in c.w. work. The modulator should be turned off or the gain reduced when operating on c.w. to prevent sounds in the shack from overloading the modulator tubes and transformer. The modulator must be capable of delivering at least 50 watts of power for proper phone work.

A "hi-low" switch, S_2 , inserts additional resistance in the final screen circuit to prevent excessive screen dissipation during tuning adjustments, or when the loading is lightened for low-power operation.

Construction

Construction should start with the oscillator-multiplier subassembly for this may be tested as a complete working unit and is more easily worked on before mounting in the chassis. Incidentally,

* 19 Standish Ave., Yonkers, New York.

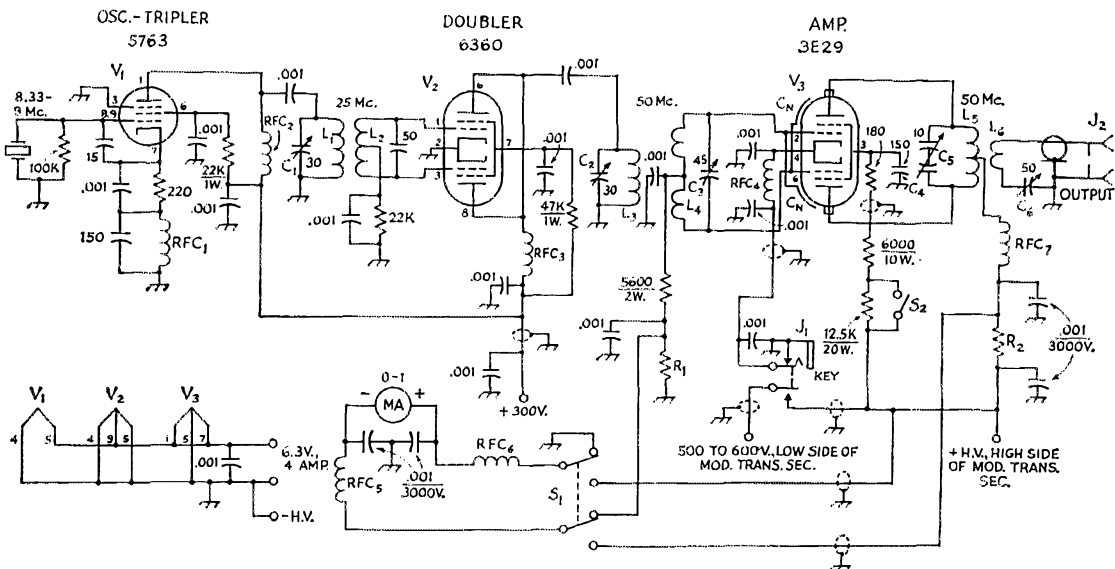


Fig. 1—Schematic diagram and parts information for the 50-Mc. transmitter. Resistors are $\frac{1}{2}$ watt unless specified. Capacitors are ceramic unless specified; decimal values of capacitance in μf .; others in μm f.

- C_1, C_2 —30- μm f. miniature variable (Johnson 160-130 or 30M8).
- C_3 —7-45- μm f. ceramic trimmer.
- C_4 —150- μm f. screw-mount button mica.
- C_5 —10- μm f.-per-section butterfly (Johnson 167-21 or 10LB15, or Hammarlund BFC-12).
- C_6 —50- μm f. variable (Johnson 148-4 or 50S8).
- C_N —Neutralizing wires; see text.
- J_1 —Keying jack with additional leaves (Mallory 705).
- J_2 —Coaxial fitting, SO-239.
- L_1 —14 turns No. 20, $\frac{1}{2}$ -inch diam., 16 t.p.i. (B & W 3003, Air-Dux 416).
- L_2 —9 turns No. 20, $\frac{1}{2}$ -inch diam., 16 t.p.i.
- L_3 —5 turns No. 20, $\frac{3}{8}$ -inch diam., 16 t.p.i. (B & W 3007 or

- Air-Dux 516).
- L_4 —3 $\frac{1}{2}$ turns each side of center tap, $\frac{3}{8}$ -inch diam., 16 t.p.i.; halves spaced to allow L_2 between them.
- L_5 —9 turns No. 10 enam., c.t., $\frac{3}{8}$ -inch diam., each half $\frac{3}{16}$ inch long.
- L_6 —1 $\frac{1}{2}$ turns insulated, $\frac{3}{8}$ -inch diam.
- RFC $_1$ —2.5-mh. r.f. choke (National R-50).
- RFC $_2$ —1-mh. r.f. choke (National R-50).
- RFC $_3$ —RFC $_7$, incl.—7- μh . r.f. choke (Ohmite Z-50).
- R_1 —Meter shunt, to give 0 to 15-ma. range. Wind R_1 and R_2 to suit meter used.
- R_2 —Meter shunt, to give 0 to 250-ma. range.
- S_1 —D.p.d.t. toggle switch.
- S_2 —S.p.s.t. toggle switch.

the subassembly might be used as a small two-tube transmitter if a suitable output link is added to the 6360 plate coil, L_3 .

The chassis for this assembly is made from 14- or 16-gauge aluminum. Care taken in bending the plate and in drilling the two variable-capacitor holes will minimize shaft-alignment problems when the assembly is mounted. A simple method to insure proper alignment of the shaft holes is to first drill the holes in the 3 by 5 by 13-inch main chassis. Then hold the subchassis up against it, and mark the hole locations on the subchassis, using the main chassis as a template. Small flexible shaft couplers may be required, though solid ones are employed here.

Note the positions of coils L_1 and L_2 in the photograph and mount them close together with L_2 alongside L_1 , using plastic tape between the coils for insulation.

Ventilation is provided by holes drilled in the top, bottom plate, and sides of the chassis, adjacent to the tube locations, or by perforated aluminum stock placed over slots cut in these surfaces.

If a painted chassis is desired for a more professional appearance, first etch the drilled chassis

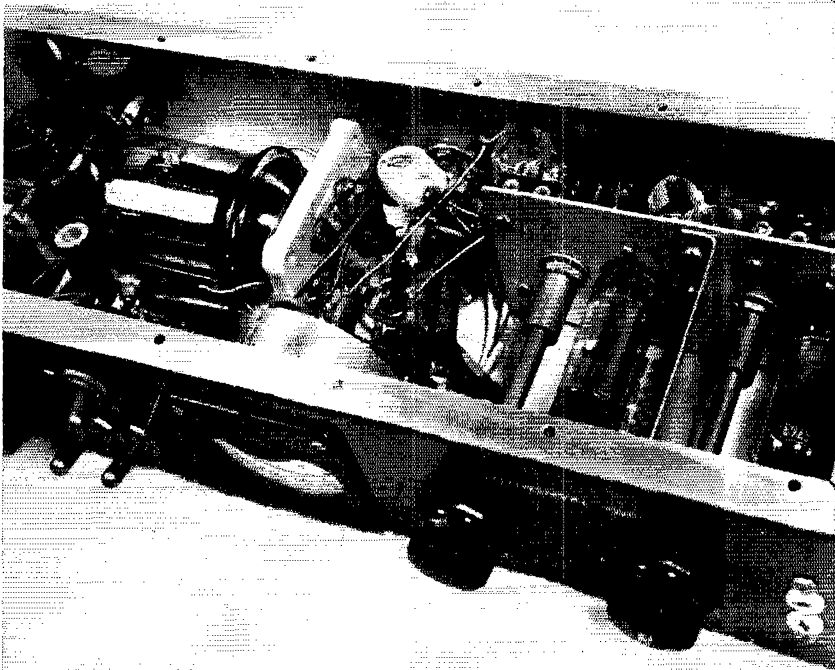
in a mixture of several tablespoons of lye (sodium hydroxide) per quart of cold water until the surface has a matte finish, and then rinse in cold water or vinegar. The etched chassis will take primer and paint well, and will be free of oil and fingerprints. Never let lye or lye solution contact the skin or eyes, and always dissolve the lye in cold water.

Electrical

Testing the oscillator-multiplier subchassis as a separate unit permits access and inspection, which would be difficult in the compact transmitter after assembly. For initial testing make a load for the 6360, using one or two turns of insulated wire, $\frac{1}{2}$ to $\frac{3}{4}$ inch in diameter, with a No 44 or 47 bulb connected to the ends of the coil. The completed load is temporarily taped to the grounded end of the 6360 plate tank.

If a grid-dip meter is handy, adjust the oscillator plate circuit, L_1C_1 , to resonate at three times the crystal frequency. If no grid-dip meter is available, the following tuneup steps should be carried out, with power on, doing this quickly to minimize the time off resonance.

Insert the crystal or connect the v.f.o. to the



Looking into the bottom of the compact 50-Mc. rig we see the oscillator-multiplier subassembly at the right, and the final amplifier at the left. Note that the meter is shielded to prevent harmonic radiation.

crystal socket, and connect the heater and d.c. leads to their respective supplies. Tune the oscillator capacitor, C_1 , and the doubler capacitor, C_2 , for maximum glow in the bulb load. An absorption wavemeter or g.d.o. in the indicating position held near the coils is helpful in tuning up. Output indications should appear smoothly with capacitor rotations and there should be no output when the crystal or v.f.o. is temporarily removed. Any spurious or erratic outputs indicate instability. An inoperative 5763 stage when v.f.o. is used may be corrected by changing the value of the grid-cathode capacitor slightly to compensate for the length of grid lead and coax used. The lengths used here were $3\frac{3}{4}$ inches of RG-58A/U from the tube socket to the crystal socket, and 10 inches from the v.f.o. to the crystal socket.

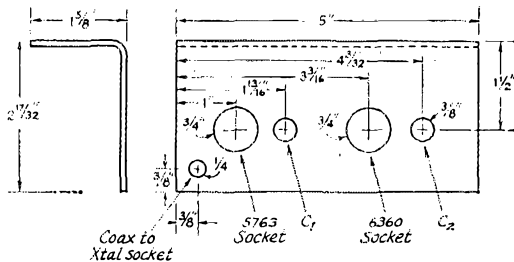
Final Assembly

The final socket is mounted with two I brackets so that pins 6 and 3 are towards the front and rear of the chassis, respectively. The screen bypass capacitor, C_4 , a screw-mounted button mica, must be mounted as close as possible to the screen pin and connected to it with a short length of heavy bare wire.

The final grid coil, L_4 , is made up of two individual B&W coils or a similar hand-wound coil, arranged so that the winding direction is the same for both halves. Ceramic trimmer C_3 is soldered directly across the heavy bare wires running from the final grid leads to the terminal strip which holds L_4 , although mounting this capacitor on small ceramic standoffs would result in a neater and more solid installation.

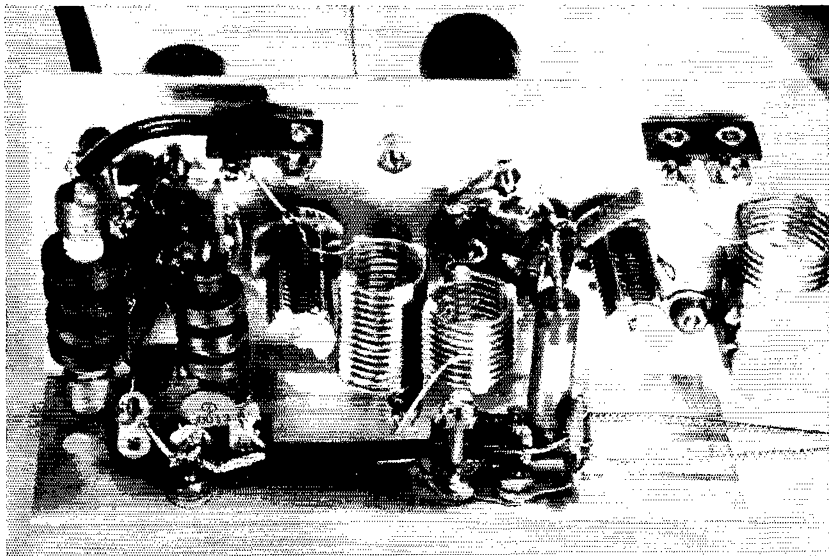
An 8-pin plug on the rear of the chassis connects with a cable-mounted socket to bring in the power leads. All the leads to the plug are bypassed with .001-mf. capacitors with the exception of the ground lead. Although this bypassing reduces power lead radiation, a more effective arrangement would consist of a small box mounted onto the outside of the chassis at the connector location and enclosing line filters. The connector would then mount on the rear of this box.

All the power, filament and metering leads should be dressed down against the chassis away from the coils and components, and all bypass capacitors must be connected with the shortest possible leads. Note that the final tuning capacitor, C_5 , requires an insulated flexible ceramic shaft coupler. A non-metallic shaft and regular coupler may also be used. The final tank circuit r.f. choke and capacitor are mounted on a tie lug



DETAIL OF SUBASSEMBLY CHASSIS

Fig. 2—Detail drawing of the plate used for the oscillator-multiplier subassembly.



Bottom rear of the oscillator-multiplier sub-assembly. The two coils at the center are L_1 and L_2 in the oscillator plate and doubler grid circuits. At the right is the plate circuit of the 6360 push-push doubler.

near the tank coil and coax socket, while a six-lug strip having two grounded lugs anchors the grid, screen and other circuit leads alongside the final tube socket.

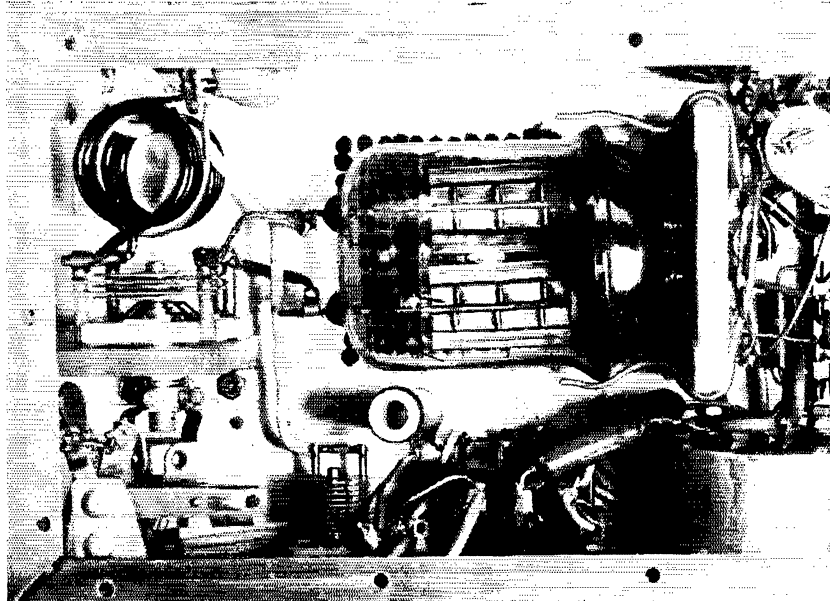
Neutralization and Alignment

After the oscillator-multiplier assembly has been tested and installed and the final grid circuit, L_4 , has been mounted, temporarily disconnect one end of L_3 or C_2 and set C_3 so that the grid circuit "dips" at 58 Mc. This is about $\frac{2}{3}$ open for C_3 . This adjustment is made with heaters off. With power applied the final input capacitance brings the resonant point within the band. Now reconnect the doubler tank circuit.

The neutralization leads are made from two

lengths of no. 14 solid wire which are covered with plastic spaghetti. Each capacitor wire connects to one grid pin, crosses the socket near the other grid pin and then is run along the side of the tube near the plate of the other tetrode section. Start with the wires extending about $2\frac{1}{4}$ inches above the tube socket and following the tube envelope contours. With the oscillator-multiplier operating and applying drive to the final and the final tube heater on, but the plate and screen supply removed, tune the oscillator and doubler for maximum grid current as indicated on the meter. Place a grid-dip meter, in the diode position, near the final tank coil and pick up the six-meter output. Without disturbing the

(Continued on page 180)



Close-up view of the 50-Mc. final amplifier. Note that the plate-circuit tuning capacitor is mounted on a polystyrene plate, insulating the rotor from ground.

Summary of Rules—1963 ARRL DX Contest

AMATEURS throughout the world are invited to participate in the 29th ARRL International DX Competition. A certificate will be issued to the top phone and c.w. scorer in each country. For those DX stations that do not receive complete DX Contest rules (next month in *QST*) in time for the contest, here is a summary of the rules for the 1963 ARRL DX Contest— they are unchanged from 1962.

1. DATES:

This 1963 DX Contest will be held two week ends each for c.w. and phone:

PHONE: February 9–11 and March 9–11

C.W.: February 23–25 and March 23–25

S.s.b. as well as a.m. stations are invited to participate in the phone contest. Phone and c.w. are separate contests.

2. TIMES:

The starting time in each instance is 2400 GMT Friday and ends 2400 GMT Sunday.

3. OBJECT:

DX stations try to QSO as many W-K-VE-VO-KH6-KL7 stations as possible during the contest in as many different call areas possible *per band*.

4. EXCHANGES:

DX stations send RS or RST report followed by a three-digit number representing power input. For example, on c.w. you might send 579050, which means RST 579 and power input 50 watts. U. S. A.-Canada stations will send a number consisting of RS or RST report followed by the name of their state or province, whose abbreviations follow:

W1, K1 — CONN MAINE MASS NH RI VT

W2, K2, W42 — NJ NY

W3, K3 — DEL MD PA DC

W4, K4, W44 — ALA FLA GA KY NC SC TENN VA

W5, K5, W45 — ARK LA MISS NMEX OKLA

TEXAS

W6, K6, W46 — CAL

K116 — HAWAII

W7, K7 — ARIZ IDAHO MONT NEV ORE UTAH

WASH WYO

KL7 — ALASKA

W8, K8, W48 — MICH OHIO WVA

W9, K9, W49 — ILL IND WIS

W0, K0, W40 — COLO IOWA KANS MINN MO

NEBR NDAK SDAK

VE1 — NB NS PEI

VE2 — QUE

VE3 — ONT

VE4 — MAN

VE5 — SASK

VE6 — ALTA

VE7 — BC

VE8 — NWT YUKON

VO — NFLD LAB

5. SCORING:

Repeat QSOs on additional bands are permitted. Your multiplier is the total call areas (not states) QSOed on each band (maximum of 21 *per band*). The 21 call areas are listed above. Each completed QSO counts three (3) points. For DX stations incomplete contacts count two (2) points. FINAL SCORE is the number of QSO-points times the multiplier.

6. ENTRY:

Free log forms are available on request from ARRL. You don't have to use these forms. Logs should contain calls, dates, times, bands, exchanges, and points. Sign your name to the statement: "I have observed all competition rules and regulations for my country." Send your log with summary data to:

AMERICAN RADIO RELAY LEAGUE

38 LA SALLE ROAD

WEST HARTFORD 7, CONN., U. S. A.

Your entry must be postmarked by May 3, 1963, to be eligible.

Strays

In case we forgot to tell you, our favorite author, Walker A. Tompkins, K6ATX, has written another thriller— *Dx Brings Danger* (Macrae Smith Company, Philadelphia 2, Pa.; \$2.95; 207 pages; cloth board covers, etc.). If you have a favorite nephew you've been trying to infect with the radio bug, this book, based on the adventures of an 18-year-old ham, just might turn

the trick. And, we might point out, that nephew's favorite ham uncle also may find it a pleasant way to spend a couple of hours one of these winter nights when the band is dead. Oh, yes — there are two earlier adventure books built around ham radio by K6ATX: *SOS at Midnight* and *CQ Ghost Ship* (same publisher).



Hints and Kinks

For the Experimenter



TRANSISTOR MODULATOR CONTROL CIRCUIT

WHEN using a transistor modulator with a vacuum-tube mobile transmitter the modulator should be turned on after the high voltage has been applied to the Class C load. If this sequence is not followed, and the modulator is turned on slightly before there is a proper load, the modulator transistors will most likely be destroyed. The circuit shown in Fig. 1 is one I use to protect the modulator transistors. The modulator relay, K_1 ,

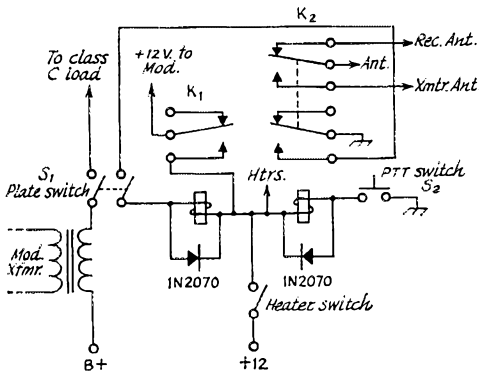


Fig. 1—Transistor modulator control circuit.

K_1, K_2 —12-volt relays.

S_1 —D.t.s.t. toggle switch.

S_2 —S.p.s.t. push-to-talk switch.

controls the 12 volts to the modulator and cannot be energized until the plate switch S_1 is closed, and the antenna relay K_2 is closed. The sequence is started when the push-to-talk switch, S_2 , on the microphone is closed. This energizes K_2 , which transfers the antenna and closes K_1 , which turns on the modulator. The IN2070 diodes across the relay coils prevent damage to the transistors as a result of the inductive "kick" from the relay coils.

— Bob Karl, W8QFH

RECTIFIER CHECKER

THE rectifier tester shown in Fig. 2 will check practically any type of semiconductor rectifier. The method consists of applying an a.c. voltage to the rectifier under test and reading the forward and reverse voltage drops on an oscilloscope. The oscilloscope presents a visual picture of the front-to-back resistance ratio of the diode, thus giving a relative indication of the merit of the rectifier.

The rectifier under test is connected as shown to terminals E_1 and E_2 . When point A in the circuit is negative with respect to point B, the

electron flow is through the resistor R_1 and the rectifier. Since the forward resistance of a "good" rectifier is much lower than that of the 1000-ohm resistor, most of the voltage drop occurs across the resistor (and the X input to the scope). The result, as indicated on the scope, is a horizontal line along the X axis. During the next half cycle, when point A is positive with respect to point B, the electron flow is reduced by the back resistance of the rectifier. If the rectifier is good, the back resistance is high, and the majority of the voltage drop is across the rectifier (and the Y input to the scope). This will give a vertical line along the Y axis of the scope. The time integrated pattern for a good diode will then be an "L," as shown at the bottom of Fig. 2.

If the rectifier is open, no current will flow through the rectifier at any time. The total voltage will be across the rectifier during all of the cycle, and only a line along the Y axis will be seen. If the rectifier is shorted, the total voltage will always be across the resistor, resulting in an X axis line only. A rectifier which does not possess perfect characteristics will present a distorted "L" shape, something like the one at the bottom right in Fig. 2. The extent of the distortion is an indication of the poor rectification properties of the rectifier.

Before using the tester, it is necessary to calibrate the scope. A resistor with the same value as R_1 is connected across E_1, E_2 and the amplifiers in the scope are set so that a 45-degree angle line of any convenient length is produced. Remove the calibrated resistor and insert the rectifier to be tested. If a 2.5-volt secondary transformer is not available, a 6.3-volt unit will work just as well. Resistor R_1 and the calibrated resistor must be changed to 3000 ohms, however.

— Jim Watt, W8GHZ

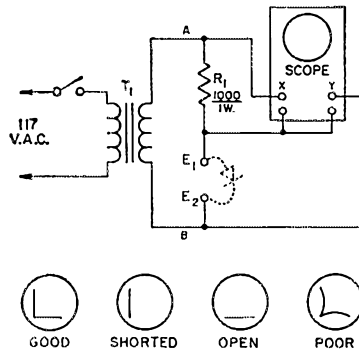
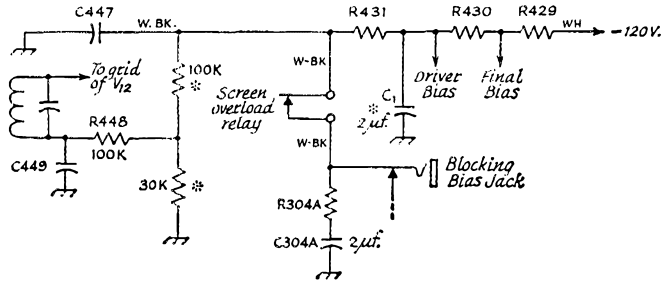


Fig. 2—W8GHZ's rectifier checker. The sketches below the diagram show some typical scope patterns.

T_1 —2.5-volt filament transformer.

Fig. 3—Components marked with a star, when added to the 100V, will reduce keying transients.



KEYING MODIFICATION FOR THE 100V

THE Hint & Kink in *QST*, June, 1962, concerning a keying modification to the 200V, triggered off a number of inquiries about modification of the 100V to reduce its switching transients and key clicks. The circuit shown in Fig. 3 shows the additions and changes to the original 100V circuit. Components marked with a star indicate that they are to be added. The 2- μ f. capacitor, shown in Fig. 3 as C_{304A} , is a replacement for the original 1- μ f. unit. Both 2- μ f. capacitors added in this modification should be mylar or paper types, not electrolytics. Keying characteristics of the 100V can be adjusted somewhat by changing the values of C_1 and C_{304A} in Fig. 3. For softer "make" increase the value of C_1 ; for a softer "break," increase the value of C_{304A} .

—O. M. Carter, W9ADN

SPRINGS FROM OLD PRESSURE CANS

SPRINGS from the cans of "Reddi-Whip" whipped cream are useful for battery retainers in portable equipment, and can also be used to replace corroded springs in commercial portable receivers and equipment. Be sure that the can is empty and not pressurized. Break off the plastic tip with a pair of pliers and the spring will slip off easily.

—R. W. Johnson, W6MUR

DIODE-SWITCHING MOBILE BATTERIES

THE battery system shown in Fig. 4 is useful in mobile work when it is desired to keep the car's electrical system isolated from the mobile equipment. In this plan, an extra battery is installed to power the mobile equipment. Although the car's charging system keeps the necessary

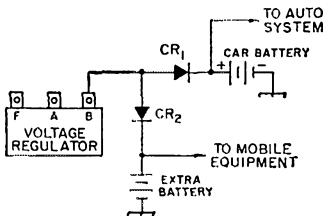


Fig. 4—Diodes are used to isolate the extra battery and mobile equipment from the automobile's electrical system, although both batteries are charged by the car generator. CR_1 , CR_2 —70-amp. 50-p.i.v. silicon diodes.

battery up to par, the mobile equipment draws only from the spare battery, leaving the car battery to perform its regular duties. All of this is done without any mechanical switching.

The system shown in Fig. 4 requires two silicon diodes, CR_1 , CR_2 , and the extra 6- or 12-volt battery. The two diodes are connected so that the car generator will supply both batteries with charging current (through the voltage regulator), but neither battery can feed current back to the voltage regulator or to the other battery. The forward voltage drop across the diodes is somewhere around 0.7 volt, so it may be necessary to advance the voltage regulator for an additional 1 volt. The diodes I used were not expensive: a 70-amp., 50-p.i.v. unit was obtained for about \$3.50. Most diodes will operate at temperatures up to 150 degrees C., so they can be mounted right up in the engine compartment. Of course, they must be isolated from ground and mounted on an insulated heat sink. I used a $\frac{1}{4} \times 4 \times 4$ -inch aluminum sink for each diode.

—Robert V. Grater, K6SUB/4

SIMPLE AUDIO OSCILLATOR

THE circuit in Fig. 5 is a transistorized audio oscillator that can be used for code practice, as a test oscillator for linearity checks in s.s.b.

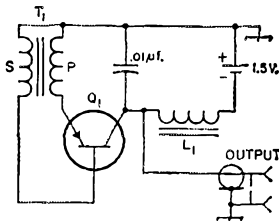


Fig. 5—W9CZ's audio generator. Transistor Q_1 is a 2N255 or equivalent.

amplifiers, etc. Most of the components can probably be found in the shack junk box. Transformer T_1 is an audio interstage transformer with a high turns ratio. L_1 is a choke, 20 henrys or more, and isn't particularly critical in value. My unit oscillates around 1000 c.p.s. and has surprisingly good wave-form. The total current drain is only about 500 μ a.

—Merlin W. Richardson, W9CZ

Happenings of the Month

RULES VIOLATIONS

The amateur radio service has a generally excellent record of self-policing, obviating the need for extensive official monitoring attention. Our performance is far from perfect, however, and during the months of July, August and September one in every thousand amateurs received an FCC citation. The Field Engineering and Monitoring Bureau has furnished the following statistics, showing the number of violations, definition and section of the rules which was violated:

125	Frequencies and types of emission	12.111
34	Purity and stability of emissions	12.133
33	Sidebands confined within band	12.113
22	Transmission of call signs	12.82
15	Classes and privileges of license	12.23
9	Notice of portable/mobile operation	12.91
6	Power supply to transmitter	12.132
2	No remuneration for use of station	12.102
1	Special requirements for nonportable stations	12.93
1	One-way communications	12.106

248 Total violations noted by FCC

Minutes of Executive Committee Meeting No. 289 September 29, 1962

Pursuant to due notice, the Executive Committee of The American Radio Relay League, Inc., met at the Headquarters office of the League in West Hartford, Connecticut, at 9:48 A.M. September 29, 1962. Present: President Herbert



Our congratulations to Domingo Arbo, of Buenos Aires Argentina, who recently observed a double anniversary — fifty years as publisher of *Revista Telegraphica Electronica* and twenty-five years as publisher of *The Radio Amateur's Handbook en Castellano*, the only authorized translation of a League publication. The monthly radio magazine, which started life as *Revista Telegraphica* in September, 1912 (*Electronica* was added in 1947 to keep it up-to-date), carries electronics articles of a general nature by top Argentine writers and translations from other magazines, including *QST*. In the early days it sponsored amateur pioneering efforts, for example cooperating with ARRL and the Radio Club Argentino in the 1923 DX tests, and still devotes considerable space to amateur affairs.

Hoover, jr., in the chair; First Vice President W. M. Groves; Directors Robert W. Denniston, John G. Doyle and Morton B. Kahn; General Manager John Huntoon; Vice President F. E. Handy; Treasurer David H. Houghton. Also present were General Counsel R. M. Booth, jr., Assistant Secretary Perry F. Williams, and Director Milton E. Chaffee.

On motion of Mr. Groves, unanimously VOTED that the minutes of the September 1 meeting are approved.

The Committee proceeded to examine nominations in the director elections, with careful attention to the application of the eligibility rules concerning membership, license status and freedom from commercial radio connections. The Committee made findings and ordered actions as detailed below, all by unanimous action.

CENTRAL DIVISION

For Director:

John G. Doyle, W9GPI and Kermit A. Slobb, W9YMZ, were found lawfully nominated and eligible and their names ordered listed on ballots to be sent to Full members of the division.

For Vice Director:

Philip F. Haller, W9HPG, was found lawfully nominated and eligible. Being the only eligible nominee, he was thereupon declared, pursuant to the By-Laws, to be duly re-elected as Vice Director of the Central Division for the 1963-1964 term without membership balloting.

HUDSON DIVISION

For Director:

Morton B. Kahn, W2KR, was found lawfully nominated and eligible. Being the only eligible nominee, he was thereupon declared, pursuant to the By-Laws, to be duly re-elected as Director of the Hudson Division for the 1963-1964 term without membership balloting.

For Vice Director:

Harry J. Dannals, W2TUK, was found lawfully nominated and eligible. Being the only eligible nominee, he was thereupon declared, pursuant to the By-Laws, to be duly re-elected as Vice Director of the Hudson Division for the 1963-1964 term without membership balloting.

NEW ENGLAND DIVISION

For Director:

Milton E. Chaffee, W1EFW, and Robert York Chapman, W1QV, were found lawfully nominated and eligible and their names ordered listed on ballots to be sent to Full members of the division.

For Vice Director:

Bigelow Green, W1EAE, was found lawfully nominated and eligible. Being the only eligible nominee, he was thereupon declared, pursuant to the By-Laws, to be duly re-elected as Vice Director of the New England Division for the 1963-1964 term without membership balloting.

NORTHWESTERN DIVISION

For Director:

Harold Walter Johnston, W7PN; R. Rex Roberts, W7CPY, and Robert Blaine Thurston, W7PGY, were found lawfully nominated and eligible and their names ordered listed on ballots to be sent to Full members of the division.

For Vice Director:

William H. Bennett, W7PIIO, and Stanley Loye, K7BIII, were found lawfully nominated but ineligible due to lack of the required membership continuity. Richard W. Rose, W7GMC, was found lawfully nominated but ineligible under Article 12 of the Articles of Association, being commercially engaged in the sale of communications apparatus. The Committee therefore declared no election for Vice Director in the Northwestern Division, and noted that under the provision of By-Law 6 the incumbent continues in office.

ROANOKE DIVISION

For Director:

P. Lanier Anderson, jr., W4MIWH, was found lawfully

nominated and eligible. Being the only eligible nominee, he was thereupon declared, pursuant to the By-Laws, to be duly re-elected as Director of the Roanoke Division for the 1963-1964 term without membership balloting.

For Vice Director:

Joseph F. Abernethy, W1AKC, was found lawfully nominated and eligible. Being the only eligible nominee, he was thereupon declared, pursuant to the By-Laws, to be duly re-elected as Vice Director of the Roanoke Division for the 1963-1964 term without membership balloting.

ROCKY MOUNTAIN DIVISION

For Director:

Robert B. Miller, W7QPP, and Carl L. Smith, W0BWJ, were found lawfully nominated and eligible and their names ordered listed on ballots to be sent to Full members of the division.

For Vice Director:

John H. Sampson, jr., W7OCX, was found lawfully nominated and eligible. Being the only eligible nominee, he was thereupon declared, pursuant to the By-Laws, to be duly re-elected as Vice Director of the Rocky Mountain Division for the 1963-1964 term without membership balloting.

SOUTHWESTERN DIVISION

For Director:

Raymond E. Meyers, W6MLZ, and Howard F. Shepherd, jr., W6QJW, were found lawfully nominated and eligible and their names ordered listed on ballots to be sent to Full members of the division.

For Vice Director:

A petition was found for Howard F. Shepherd, jr., W6QJW, but declared invalid under the provisions of By-Law 17, because of precedence of his nomination for director. Amadeus V. Bible, W6BDDW, was found lawfully nominated but ineligible due to lack of the required membership continuity. Lyle G. Farrell, W6KGC, and Virgil Talbott, W6GTE, were found lawfully nominated and eligible and their names ordered listed on ballots to be sent to Full members of the division.

WEST GULF DIVISION

For Director:

Roemer O. Best, W5QKF, was found lawfully nominated and eligible. Being the only eligible nominee, he was thereupon declared, pursuant to the By-Laws, to be duly re-elected as Director of the West Gulf Division for the 1963-1964 term without membership balloting.

For Vice Director:

Ray K. Bryan, W5UYQ, was found lawfully nominated and eligible. Being the only eligible nominee, he was thereupon declared, pursuant to the By-Laws, to be duly re-elected as Vice Director of the West Gulf Division for the 1963-1964 term without membership balloting.

On motion of Mr. Doyle, unanimously VOTED that Messrs. Groves, Denniston and Kahn, with Messrs. Handy and Houghton as alternates, are appointed to serve as a Committee of Tellers to count the ballots in the current director elections, under the terms of the By-Laws.

At this point the General Manager reported briefly on the status of League business matters, and the General Counsel on the status of League petitions before the Federal Communications Commission.

Mr. Kahn, as Chairman, reported for the Building Fund Committee. On his motion, unanimously VOTED that the President is requested to write each director informing him of the progress of his division toward its quota and asking special effort so that the goal may be met. The Committee also indicated approval of direct solicitation plans as proposed by Mr. Kahn.

President Hoover reported on administrative problems encountered by the Project Oscar Association and outlined a tentative plan to relieve the workload of dissemination of information to participants and correlation of intercept reports on future Oscar flights.

The Committee examined and informally indicated approval of a Headquarters outline of a specific program to implement the Committee's directive concerning improvement in amateur technical and operating capabilities and understanding.

The Committee was recessed for luncheon at 12:30 P.M.,



Howard Maguire, W2AAO, a tireless worker for call-letter license plates in New York, happily reaps the benefits of the more-than-ten-year campaign in the Empire State. The plate was personally handed to Howy by Governor Rockefeller at the Hudson Division Convention on October 13, 1962. Only Kentucky, Massachusetts and New Jersey are holding out on CLLPs now.

reconvening at 1:45 P.M. with all present except President Hoover and Mr. Williams. First Vice President Groves assumed the chair.

On motion of Mr. Huntoon, unanimously VOTED that approval is granted for the holding of a New England Division Convention at Swampscott, Mass., April 26-28, 1963, and a Southwestern Division Convention at San Diego, California on October 11-13, 1963.

On motion of Mr. Denniston, affiliation was unanimously GRANTED to the following societies:

- Anacostia High School Amateur Radio Club
Washington, D.C.
- Bogan High School Radio Club.....Chicago, Ill.
- Clearfield County Amateur Radio Association Clearfield, Pa.
- Estero Radio Club.....San Luis Obispo, Calif.
- Lee's Summit Radio Club, Inc.....Lee's Summit, Mo.
- Northern Connecticut Amateur Radio Club
Hazardville, Conn.
- Galva Amateur Radio Club.....Galva, Iowa.
- The Rockaway Amateur Radio Club
Rockaway Beach 93, N.Y.
- Zero-Beaters Amateur Radio Club., Washington, Missouri.

Mr. Hoover re-entered the meeting at 1:55 P.M. and resumed as chairman.

After examination of a proposal by Mr. Doyle, as Chairman of the Public Relations Committee, for an informational booklet on amateur radio to be distributed at fairs, hobby shows, etc., the Headquarters was directed to furnish copies of the draft to directors and vice directors for their comments.

At this point, 2:48 P.M., Mr. Chaffee excused himself from the meeting.

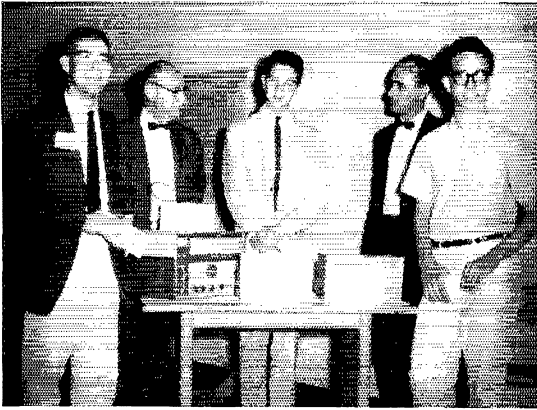
Concerning an informal inquiry as to whether the League would act as coordinator of a scholarship for young amateurs, with funds to be provided in an individual's will, on motion of Mr. Denniston, unanimously VOTED that the League is interested in such a project and the General Counsel is requested to explore the matter.

The Committee briefly discussed the possibility of regular WIAW bulletins with RTTY emission and requested a later report from Mr. Handy on its feasibility.

The Committee noted, with appreciation, receipt of an extensive analysis of amateur band occupancy habits prepared by Dana Griffin, W2AOE, and indicated a desire for more time to study the material and its conclusions.

There being no further business, the Committee adjourned at 3:45 P.M.

JOHN HUNTOON
Secretary



Each year the Rock Creek ARA, in Maryland, conducts a Beginners Home Built Equipment Contest, with savings bonds to the winners. Above, l. to r., we have first-place winner KN3RAZ, club proxy W3RE, third-place winner KN3TIV, contest chairman W3PIH, and second-place winner KN3STB. KN3RAZ's project was a 2-meter converter, while KN3STB built a ham-band transmitter.



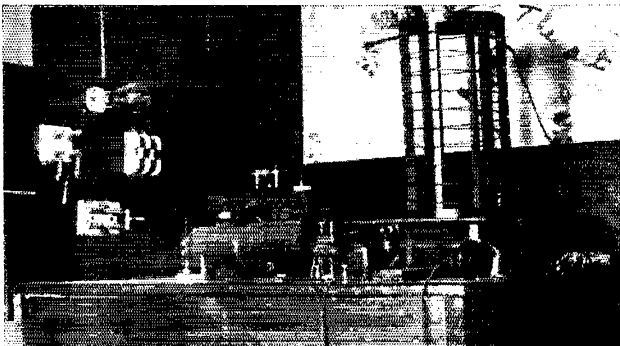
Above, Canadian Division Director VE3CJ (r.) presents a QST cover plaque award to VE3ABU, whose article was judged by ARRL's directors to be the best in the September issue.



The Delaware Council of Amateur Radio Operators operated K3UN in Gimbels downtown Philadelphia store from October 22 through the 27th, in observance of United Nations week. Among those operating the station were W3SLF, K3CEE, W3WMO, W3DZI, and K3HIJ.
(Photo via K3JMV)



During the National Electronics Conference in Chicago the Chicago Area Radio Club Council set an exhibit inside and a ham station on board a Navy sub chaser that was tied up outside the hall. Operating W9FCA (Ladies Amateur Radio Klub station) aboard the Navy ship were the following YLs: K9EMS, K9TRP, K9IVG, K9BJW, K9IWR, W9EXM, and K9DOT. The photo above shows the inside exhibit, with Harry Houck, president of Measurements, Inc., and CARCC chairman W9QKE.



Here is 6DQ as he was set up in 1913. The QTH at that time was California, but now OM Holmes is VE1AJ. As you can see, there have been a few changes in the way gear is put together in the past 50 years!

Military Affiliate Radio System, Navy Style

BY LCDR C. R. WINNETTE,* USNR

DURING the past few years there has been a growing group which has advocated a Navy MARS as a tangible program for the large group of Navy trained communications personnel and Navy orientated hams. There was a need for a Navy-sponsored program by which the Regular and Retired personnel, as well as young amateurs, could maintain a close relationship with Naval Communications through their amateur licenses. The possibility for an auxiliary network that could provide an unparalleled capability for the survivability of a Naval Communication System during periods of local, national, or international emergencies, plus the chance to create a potential input of personnel into the Naval Communication System while providing a means for the hams with salt water in their system to maintain their Navy proficiencies, led the DNC, CNO, and SECNAV to the conclusion that the time was ripe for a Navy MARS. Therefore, on 17 August 1962 the Secretary of the Navy approved a CNO request for authority to establish a Navy MARS. This decision was announced by Rear Admiral Bernard F. Roeder, the Director, Naval Communications, during his speech before the Twelfth Annual National ARRL Convention in Portland, Oregon, on 3 September 1962.

The target date for the implementation of the MARS program is 1 January 1963. At that time the MARS headquarters station NAV/K4NAA will commence operating from the old NAA site.

The Navy MARS will be an adjunct to the established Naval and Naval Reserve Communications Systems. Its operations and administration will be conducted on a parallel but separate basis from the existing Navy systems. No reduction in the present operational training of the Naval Reserve is anticipated. These two programs should augment each other and result in mutual benefits to each.

Participants in a Navy MARS will be amateurs first and may or may not choose to affiliate with one of the Naval Reserve programs. Membership in the Navy MARS program will be open to any amateur operator, club station, or military recreation station that holds a valid amateur radio license issued by an authorized agency of the United States Government and that can qualify under the eligibility rules as established by the Director of Naval Communications. Those ships operating as maritime mobile stations under specific authority issued by the Chief of Naval Operations may also apply for membership.

The eligibility rules are as follows:

a. Possess a technical and operating knowledge sufficient to warrant receiving the Navy's permission to operate one of its authorized circuits. The possession of a valid amateur radio license issued by an authorized agency of the U.S.

* Chief, Navy MARS

Government has been established as the sole criterion for fulfilling this requirement.

b. Be 16 years of age or older.

c. Possess a radio station, in being, which is capable of operating on, or which can be modified to operate on two or more of the Navy MARS frequencies.

d. Demonstrate a vital interest in the objectives of the Navy MARS and agree to conform to the directives which control the management and operation of the Navy MARS.

e. Not be a member of another Military Affiliate Radio System as of 1 January 1963.

Application for Navy MARS membership may be submitted on the standard DD 630 form. Simply write Navy MARS in the appropriate block of the form. Applications and/or requests for additional information should be mailed to the Chief, Navy MARS, Room 5D564, Office of Naval Communications (Op-945N), the Pentagon, Washington 25 D.C.

There will be local, state, interstate, Naval District, National and international networks organized for all the modes of operation. These networks will be administered by volunteer Net Control Stations and their appointments will be made by the Chief, Navy MARS, on the recommendations of the area Directors.

The times and frequencies for the various networks will be determined as soon as possible. Every effort will be made to establish circuits that will accommodate the preference of the majority of the members.

Navy MARS call signs will be assigned from a special block of calls from NØRAA through NØZZZ.

The Navy MARS manual is approaching its completion, and an attempt has been made to provide every echelon of MARS participation with the procedures and answers which will permit an active program in each of the networks. The procedures in this manual are identical with procedures employed by the Regular Navy Communications and the use of these procedures will be mandatory. No lapses into other procedures or the use of local procedure will be permitted. This will be a training program and the initial lack of knowledge of Navy procedures should not deter anyone, but since member stations may be called upon to communicate with other Navy Communications activities, each MARS station must adhere to the standards.

We invite any licensed amateur to participate in a MARS program, any MARS, but if by reason of prior service, family influence, or personal preference you are orientated toward the Navy then we welcome your membership. The Navy MARS will work very closely with the Army and Air Force MARS, and MARS participation can be an effective demonstration of the use of your amateur license in the public interest.

QST

Fifty Years of Amateur Radio

An Address by ARRL President Herbert Hoover, jr., W6ZH

My Fellow Radio Amateurs and Our Honored Guests:

It is indeed a great privilege to be here this evening and to join in honoring these Old Timers as they celebrate the 50-year Golden Anniversary of Amateur Radio. Their licenses and call signs, issued to them in 1912 by the Department of Commerce, mark the official birth date of an activity that has had a proud history for more than half a century.

It is most interesting that all of the pioneers who are here this evening are still active amateurs. As many of us have long suspected, the "Wireless Bug" that bit them 50 years ago, and is still in their blood stream today, is one of the world's most persistent microbes.

If my mail and telephone calls are any indication, I am sure there are thousands of additional amateurs who have counted back carefully through the years to see if they could be admitted to this elite group. I conclude there are probably more candidates to sympathize with, than to congratulate. But unfortunately for one reason or another, the also-rans did not appear in the 1913 Call Book and there was nothing your Committee could do for them at this late date. I am sure, however, they will be among the first to pay tribute to the pioneers we honor tonight, and their exchange of reminiscences will bring back many memories of the good old days to all of them.

I did a little counting back myself, but not too hopefully because I did not get started until several years after the magic date. Nevertheless I saw enough of the "old days" to come down with a bad case of nostalgia this evening.

The youngsters of today may get just as big a thrill out of their first contact on the air as we did years ago, but I doubt if it is now done under such dramatic circumstances. The painstaking process of manipulating a wire cat-whisker toward the most sensitive spot of a galena detector demanded absolute silence throughout the house. If a door slammed the whole process had to be repeated. Everyone whispered and walked on tip-toe as the budding genius strained to pick up a weak signal. Changing over to the "sender" involved throwing several big knife-switches — the larger the better. The key was also a massive affair, and when pressed the spark crashed forth, the neighbor's lights blinked,

The 50-year mark in amateur licensing was commemorated at a Golden Anniversary Banquet in New York City on October 13, as a climax to the Hudson Division ARRL Convention. Of the 72 hams who had been able to produce documentary evidence of 1912 license-holding, thirty-six were present to receive a standing ovation, an individual commemorative plaque, and high tribute for their pioneering contributions to the development of the amateur radio service.

the silence was shattered, and the nearby inhabitants jumped a foot.

In those days, on two or three hundred meters, distant stations did not come in well until long after midnight. How our families managed to survive these ordeals, I cannot guess. But all seemed forgiven the next morning as we related our exploits, and everyone rolled their eyes at the wonders of Modern Science. To exchange messages through the "ether" with someone 50 miles away, was almost beyond comprehension.

In looking back over those years, one of the truly great institutions were the old-time radio inspectors of the Department of Commerce. I know I speak for all of the early amateurs here this evening in paying tribute to this dedicated group of men in Government service. Many of them were enthusiastic amateurs in their own right and they have exerted a fine influence over the amateur fraternity right down to the present day.

Countless thousands of small boys have stood at the doors of inspectors' offices while they screwed up their courage to go in and ask to try out for a ham license. The encouragement and understanding they received usually pulled them through, and their interest and imagination was fired higher than ever.

Many of the today's leaders in electronics got their first friendly push forward by a reassuring smile and a pat on the back by an old-time radio inspector. I know, because I was scared to death as I



AMATEURS QUALIFIED FOR 50TH ANNIVERSARY AWARD

(with current and 1912 calls)

HARRY M. ASH	K2BA	2BA	EDWARD E. HAYWARD	W1PH	1JE	CLARENCE H. PFEIFER	W2FG	2FA
LEON W. ASHTON	W3HO	3CN	JOHN N. HERLAND	W2MDB	1JY	FEARING PRATT	W1JV	1JG
RALPH G. BARBER	W2AM	2FP	EARL HERMANDE	W2BM	2KM	HOWARD S. PYLE	W7OE	7FP
SAMUEL L. BARRIETTE	W2PC	2PC	W. HOLLIS HOFFMAN	W2WJ	3BT	HENRY R. REUPHER	W1GCK	1JV
LAURENCE S. BENNETT	W1TH	1HY	J. J. HOLMES	VE1AJ	6NQ	CHARLES E. RICHARDSON	K6BT	6EB
OLIN C. BROWN	W1AT	1AI	STANLEY E. HYDE	W8IAH	6RW	HAROLD B. RICHMOND	W1CL	1IA
ALAN W. BURKE	W1RM	1HI	B. B. JACKSON	W6FE	2GX	TOWNSEND J. PIGRY	W7COH	6OP
ALFRED J. CARVER	W1ED	8ED	RUSSELL L. JENKINS	W9CC	3CC	PHILIP F. ROBINSON	W1CK	7PR
PERCE B. COLLISON	K2DZ	2KN	GEORGE H. JETTE	W1FE	1UE	HAROLD S. SACHS	W6PO	2OM
CHARLES W. COOTE	W2OHF	2HF	GALE H. JOHNSON	W6AG	7GJ	RICHARD SCHELL, JR.	KP4ZK	2BF
ALFRED E. CRESSE	W2YGI	3BU	HENRY L. JONES	W7JH	7HJ	HOWARD SEEMER	W6EA	6EA
IRVING E. CUTTING	W1LY	9AI	KARL G. KROCH	W3BS	2RR	LATREL J. SMELSER	K6LS	6LS
ERNEST A. CYRIAX	W2DI	2DI	ELMER H. KUMPF	WA2PZR	8KK	ALBERT E. SNOW	W1HZ	1JF
ALFREDO S. DEWALD	W6KHR	6DW	FREDERIC A. LANE	W2GD	1GD	ALBERT E. SONN	W2GC	2CC
HAROLD B. DOTEN	W4KJ	1KH	WALLACE H. LELAND	W2WL	6WL	GEORGE E. STERLING	W1AE	1AE
GEORGE T. DROSTE	W8IN	2SO	JULIAN LOVEJOY	W1RT	8BN	SAMUEL J. THACKERAY	W3IT	3CH
EDWARD W. DUGAN	W2TY	2IV	S. FRANKLIN MACK	W2WE	6SF	FERDINAND C. W. THIEDE	W2EC	2EC
LAWRENCE J. DUNN	W2LP	2LM	DONALD L. MAXSON	W3DP	3DD	JOHN VAN DYKE	W2DNW	2CV
RICHARD S. EGOLF	W2WX	2LE	PAUEL C. MCCOY	W8DG	2HA	JOSEPH C. VAN HORN	W3PW	3PM
PAUL C. ELLIOTT	K2HB	2IQ	MAYBERT A. MCINTYRE	W2BO	2DF	NORMAN P. WHITE	W2DJ	3DG
ROBERT S. FENMORE	W4TY	3JH	CLARK B. MERRILL	W1IV	1HO	JOHN E. WILKINSON	W1KX	1KN
ANTON C. FREY	W2JF	2JF	KNOX W. NICHOLSON	K6DG	6KN	EARL C. WILLIAMS	W2BG	2BA
SEBASTIAN GAHM	W1DIU	1JL	STACY W. NORMAN	W4BN	78N	GEORGE D. WILSON	W7HP	7GW
AMBROSE H. HARDWICK	W2YQ	2FQ	FRANK M. O'NEILL	K6GE	6RZ	RICHARD D. ZUCKER	K2UR	2OR

hesitated in front of Ben Linden's door in the old San Francisco Customs House more than forty years ago. I will always owe him a great debt of gratitude for helping to get me started.

As the years rolled by after World War I, audions replaced the galena detector, tube transmitters displaced the spark, and cross-country contacts became a frequent reality. While signals were heard across the Atlantic on 200 meters in the tests of 1921 and 1922, it was not until the epoch making contacts in 1923 on 100 meters between Reinartz and Schnell in the United States, and Deloy in France, that international communication by amateurs came into its own.

In the year that followed contact was established with other amateurs on a world-wide basis as the wavelength was progressively reduced to 80, then 40, and finally 20 meters. By choosing the right frequency it was possible to talk to almost any point on earth with relatively low power, day or night, summer or winter.

These events proved to be a major scientific breakthrough, and Reinartz's articles in *QST* and elsewhere are still the foundation of short wave communication. Considering the later impact of shortwave broadcasting and commercial service on world affairs, I have never felt that John received the recognition he properly deserved.

In the best amateur tradition, Reinartz formulated a logical hypothesis of what might occur in this unknown part of the spectrum, built the equipment out of the meager materials then available, and enlisted the help of others who were also willing to give it a try. The scramble for high frequencies that has gone on ever since is a matter of history.

The desire to find out why things did or did not work, to improve on existing techniques, and to explore the unknown has been one of the great traditions of Amateur Radio. It is a far cry from the early work of 50 or more years ago, to the age of satellites and space in which we now live. Yet amateur radio has played a far larger part in this electronic age than many people might suspect.

In the United States and Canada, it is estimated that more than a million individuals, directly or

indirectly, have entered the amateur fraternity during the last 50 years. Many of them were youngsters of school or college age. Amateur Radio aroused their scientific curiosities for the first time, and the preponderance of them went on into careers in electronics, communications, or other branches of engineering and science. Their desire "to find out why, to improve and explore" is just as strong today as it was a half century ago.

If one could make a survey of the electronics and space industries, there is little doubt a substantial part of its brains and leadership came up through the amateur ranks. The amateur privilege has created a priceless asset that few other nations possess. And much of the credit goes to the foundations that were begun by these pioneers so many years ago.

One of those foundations was our national society, the American Radio Relay League, which will mark its own 50th anniversary just two years from now. In 1914 a few pioneering amateurs led by the late Hiram Percy Maxim banded themselves together to form the organization and locate its headquarters in Hartford. They soon realized that if Amateur Radio

(Continued on page 182)



Harry M. Ash, K2BA, receives his commemorative plaque from President Hoover.

September V.H.F. Party Summary

No Records, but Country-Wide Fun

WHERE you sit has a lot to do with how you view a v.h.f. contest, ordinarily, but with few exceptions the opinion stands that the September V.h.f. Party of 1962 was one of the worst on record, as far as propagation goes. Still, it brought in more than 450 logs, which would have been a record a few years back. As may be seen from the comments quoted below, there was no lack of enthusiasm, but a thorough search of the logs and letters fails to reveal a single record high of any kind.

This was a contest that paid off on operating skill, persistence, equipment quality and locations, more than most. This is perhaps the fairest kind, and over the weekend of Sept. 15 and 16 the element of luck had as little to do with the results as in any contest we've seen. Still, we find mostly familiar calls in the upper-bracket scores. Those who have the combination of know-how and facilities win, come what may in the way of natural aid or obstacles.

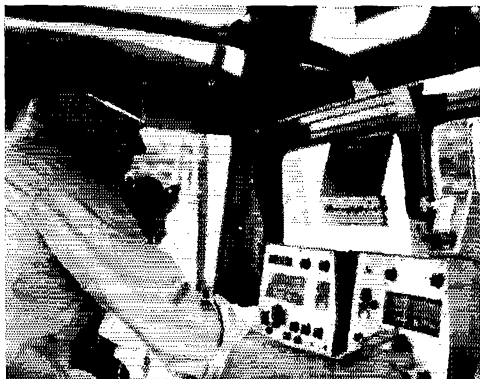
K3IPM, Philadelphia, worked the most stations and posted the highest score of any single-operator station, in winning the Eastern Pennsylvania Section award, as he has done on several previous occasions. Only K2LNS and W1RJA, award winners in Northern New Jersey and Connecticut, respectively, were also able to run up more than 300 contacts. Section totals of 29 were amassed by K3IPM, W1RJA and K1DIR, setting the pace in this department for the country.

Among the staff-operated stations there are also few Johnny-come-lately winners. The 6220 Club of Northern New Jersey, operating W2PEZ/2, ran up the country's highest total, 748-42-31,458, using 50 through 1215 Mc. A certain well-known call is missing from this category, the operators devoting their efforts to

one binge a year these days, but they had better look to their laurels, judging from the intensive efforts of several club groups in the September affair. Witness W1GB/1, with 570-42-25,116, tops in New England, and already working on next June. Or W1BU, with 554-43-23,822. W1OOP thinks that if Sam would get that 1296-Mc. dish to aim at earthly targets, as well as the moon, the RSVHFS gang would "have it made." Not to be counted out is the Cleveland 50-Mc. DX Club, W8HBI/8, with 600 contacts and a score of 18,051. Our records indicate that the region centered on Ohio is a "sleeper," just waiting for the right combination to put over a score that will leave the rest of the country gasping.

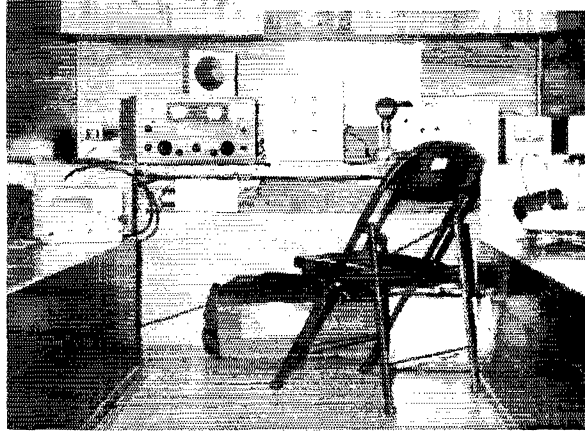
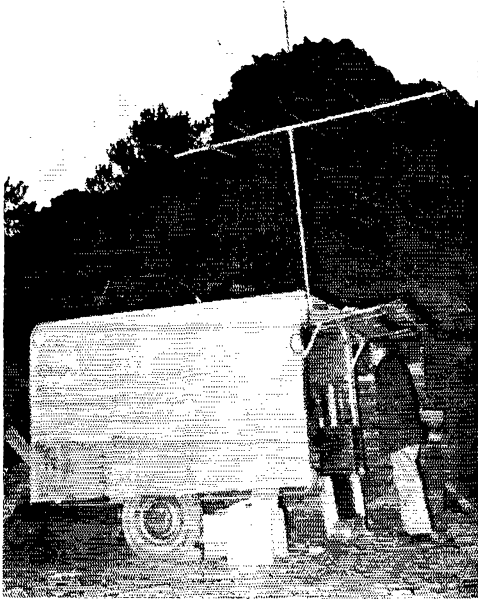
There were some surprises, mostly in the large numbers of stations worked without benefit of any favorable propagation, in areas where dead-band conditions used to rule out interesting work in a v.h.f. party. We find W0FPP/0, K0RRC/0 and W0DK/0, operating from high points in Colorado's Front Range, all making more than 100 contacts, and the Boulder Radio Club, W0DK/0, working three Wyoming stations on 432 Mc. WA4BVW, licensed for and operating from Clingman's Peak, Mt. Mitchell, N. C., made 120 contacts on 50, 144 and 220, for 2000 points. WA4AAJ won the Kentucky Section award on 50 Mc., with 161 contacts, on a "dead" band. K4BEI/4 found 85 stations to work from Alabama on 6. WA5CDG won in North Texas with 111 essentially local 50-Mc. contacts. W0EKM won in Missouri with 105. W0EAO/5, operating from a 200-foot gravel pile in North-eastern Oklahoma, found 110 stations to work on 6, despite poor conditions. K8KIX worked 245 stations on 6 from Michigan.

The mostly dead conditions boosted the worth



The Western Pennsylvania Section has always been tough for stations along the Eastern Seaboard, but this was remedied in the September Party by W3SDZ/3, atop Rauchtown Mtn. The most easterly high point in the section saw two towers, 60 and 70 feet high, erected for the occasion by K3SBQ, K3SHY and W3SDZ. A 7.5-kw. generator supplied power, and gear was housed in a converted school bus and a commercial radio mobile news cruiser. K3SHY at the mike.

More will be heard from this station in future contests.



V.h.f. trailer of KØRRC/Ø used atop Squaw Peak, 11,500-foot elevation west of Denver, Colo.

of the 144-Mc. band, and some real digging produced fine scores for operators who work that band only. WA2MOY/2 ran up the country's highest one-band score, 250-18-4500, on 144 Mc., the first time in the memory of the oldest inhabitant of the v.h.f. bands that this trick has been turned by a 2-meter operator. WA2LRO won the NYC-LI award with 220 contacts in 12 sections on 50 Mc., for the best total on that band. Favorable tropospheric propagation (more help on 2 than on 6) was a factor in the ability of several 2-meter men to work more sections this time than the best 6-meter operators. Note that W1PKQ/1 was able to collect 15 sections from Connecticut on 144 Mc. The predominance of 2-meter activity is reflected in several California totals, and in the record of VE3BGB and VE3E2C, with 169 and 164 stations, respectively, on 144 Mc. And note that one of the better Novice scores was that of WN9EYJ, who worked an even 100 2-meter stations.

The real flavor of the party comes through best from sampling the comments appended to logs. Here are a few:

K3IUU — Wish more would use c.w. under weak-signal conditions. Sure makes a big difference. Increased activity noted on 220 and 420 this time.

K3HNP — Conditions like the worst of January. C.w. activity picking up, but slow operators should practice contest exchanges — and stick to the basic information.

W3ZSR — Conditions crummy, but never had so much fun!

W3HB — Really had to scratch for 61 contacts on 2!

K9EEC — Activity very good for September. Most stations ever worked in September or January contest.

K9YNF — Not much like June, when I heard the whole country at once on 6!

W9CSF/9 — Transmitters, converters and antennas all home-built. Michigan City ARC is real building club.

W4ZZ/4 — Conditions very poor. First contest in which no Ohio or W. Va. stations have been worked

from this high mountain location. (LeConte Lodge, Gatlinburg, Tenn.)

W8WZJ — Smart operating pays off. Noticed that operators who give their location, beam heading and tuning patterns frequently make the contacts fastest.

K8BHH — Well, now, *that* was a contest!

WN2AKA — My first; low score, but good experience!

WA2RJJ — Never heard so much 2-meter activity!

WA2EMA (94-13-1222, on 144 Mc.) — Most contacts made on c.w. VE3's came through beautifully Saturday night in N. N.J.

WA2FVL — Lots of people could do with more selective receivers, even when using low-power.

WØROY/Ø — Antenna 12-section super-turnstile, 570 feet above ground, courtesy of KOAM-TV, Pittsburgh, Kan.

W1PKQ/1 — Can't stress enough the value of c.w. in digging up section multipliers!



Once again, K3IPM, Philadelphia, won the E. Pa. Section award in the September V.h.f., and this time also posted the country's highest single-operator score.



Inside the 2-meter tent of W2PEZ/2 we see WA2NAT logging, K2QKR receiving and K2URC operating. Such platooning helped the 6220 Club to post the top score by any group-operated station.

K1TKZ — This was a contest for high power and mountain tops, but high local activity kept things interesting for everyone.

W1GWB/1 — Better gear this time enabled us to beat our June score by 5000 points, despite poor conditions. Not many groups can say this. Wait! til next June! 220 paid off with 24 contacts in 11 sections.

K1DIR — More people should try scatter skeds!
W1OOP — Worked Maine on 1296 Mc., but couldn't get my own section!

W1HDQ/1 — Worked from long-time favorite portable site, Sweetman Mtn., Granville, Mass., first used by the writer on 5 meters nearly 30 years ago. Some different now!

K1GYT — Very quiet in Vermont his time, with few mountain-toppers.

K3JRJ/1, Vt. — Used 2-meter beam made of coathangers — but it worked!



Up they go! The 6- and 2-meter beams of WA2IOG/2 are hoisted to their position on a building of the Rutgers Experimental Farm.

W7GUIH, Portland, Ore. — Best contest yet. Tropo excellent to Seattle, nearly 200 miles.

W7RT, Seattle — Scatter skeds paid off on 50 Mc. Got SJV and LA Sections in California, workable no other way this time.

WA6GYD — Real lack of activity in Bay Area.

WA6BQO — Best activity on 432 in a long time.

WV6YQS — Your V.h.f. QSO Parties are wonderful; just wish more v.h.f. men would make an effort to participate in them.

W4GNF, Greensboro Radio Club — Over 4 inches of rain on Saurtown Mtn. over the weekend!

W4TLC — Lost 2 power transformers Saturday!

W4TBQ — We need more listening for c.w.!

KØRRC/Ø — Highest station? Squaw Mtn., 11,500 feet.

WØPPP/Ø — Would be glad to hear from other groups crazy enough to work mountain-portable in winter, to swap ideas on logistics.

VE2APN — Most v.h.f. activity ever seen here!

VE3EZC — Many stations could have picked up another section by turning their beams our way. Conditions excellent entire weekend. Best contest ever!

SCORES

In the following tabulation, scores are listed by ARRL Divisions and Sections. Unless otherwise noted, the top scorer in each section receives a certificate award. Columns indicate the final score, the number of contacts, the section multiplier, and the bands used. A represents 50 Mc.; B, 144 Mc.; C, 220 Mc.; D, 420 Mc.; and E, 1215 Mc. or higher. Multiple-operator stations are shown at the end of each section tabulation.

ATLANTIC DIVISION

<i>Eastern Pennsylvania</i>	
K3IPM 11,165-356-29-ABC	W3FDH/3
5221-217-23-ABC	4386-100-34-ABCD
4104-214-19-ABC	K3CQR/3
3402-189-18-AB	K3HNP 2736-228-12-A
K3JRO 1560-120-13-AB	W3NOK 1104-92-12-B
1092-84-13-AB	K3AIR 931-133-7-AB
K3THX 912-114-8-A	K3JGU 856-107-8-A
K3QMK 512-64-8-AB	W3ZRJ 455-59-7-AC
K3MBQ 416-52-8-AB	K3PYK 344-64-6-AB
K3ODS 306-51-6-A	K3TEV 140-35-4-A
W3ZRQ 110-22-5-A	K3THQ 70-14-5-A
W3BJC 30-15-2-A	W3WJC/3 (8 oprs.)
21,600-501-40-ABCDE	W3KX/3 (16 oprs.)
13,195-352-35-ABCD	W3HZU (K3S AAX DJC, W3HZU)
10,819-318-31-ABCDE	W3KWH (11 oprs.)
8316-375-22-ABC	W3AD/3 (9 oprs.)
6888-287-24-AB	K3UNZ/3 (7 oprs.)
5267-229-23-AB	K3MTX/3 (13 oprs.)
4480-320-14-A	W3EDU/3 (4 oprs.)
3135-185-19-AB	K2VEB/3 (9 oprs.)
2700-150-18-AB	
<i>Mid-Del-D.C.</i>	
W3CGV 3360-112-24-ABCD	K3AZH 3280-162-20-ABD
K3IQQ 3060-180-17-AB	W3LCC 3055-99-18-ABCD
K3MWQ 780-75-6-AB	W3TFA 553-77-7-ABCD
W3ZSR 456-57-8-AB	K3OBU 396-45-8-ABD
W3HJ 366-61-6-AB	W3QJA 352-32-11-AB
K3AUN/3 305-61-5-A	K3UAL 183-61-3-A
K3ALZ 150-50-3-A	W3NQC 140-35-4-B
K3QMH 100-25-4-B	W3JZY/3 (K3S AAK HFF,

W3JZY 8242-317-26-A14
K3MOY (K3's KST MOY)
402-67-6-A

Southern New Jersey

WA2EMB
W2NSF 4862-175-26-ABD
W2REB 3530-198-16-AB
W230B 3230-170-19-AB
WA2KOK1580-156-10-B
W2ESX 1365-105-13-B
WA2GSO 1005-67-15-AB
W2HXF 610-61-10-AB
W2VCG 330-13-5-11
K2BWR (K2B BWR ZIKJ)
1443-111-13-A

Western New York

K2YCO 1880-188-10-AB
K2GUG 1860-120-15-ABC
K2JWR/2 1860-124-15-AB
K2ERO/1 1610-161-10-AB
WA2VCM/2 1332-148-9-AB
K2DUR 1168-106-11-AB
W2ZKF 1022-73-14-B
W2MPK 840-05-8-AB
W2ROA 777-111-7-B
WA2KND 500-112-5-AB
K2LFB 504-56-9-AB
WA2THS 308-76-5-AB
K2ODL 278-46-6-AB
WA2TGC/2 210-30-7-AB
WA2MLV 153-51-3-AB
WA2ZNN/2 116-29-4-A
W2UKA 105-35-3-A
WA2YRH 64-32-2-AB
WV2VCL 46-23-2-B
W2VOK 38-19-2-A
W2RLJ 7-7-1-B
K2RRM (7 oprs.)
10,696-380-28-ABC
K2JLR/2 (K2J JRR SDP
WA2OXF)
7364-263-28-AB
K2LOK/2 (W2A8 GHN ILH
ISB) 6545-385-17-AB
K2KTK/2 (6 oprs.)
1974-141-14-AB
K2KKA/2 (8 oprs.)
1771-160-11-ABD
WA2CJL/2 (W2A2 CLK
UJN) 1506-114-14-AB
W2ALL/2 (4 oprs.)
1417-109-13-ABC
WA2KLF (6 oprs.)
609-115-6-AB
WA2CTH/2 (5 oprs.)
180-39-6-AB

W2EJZ/2 (K2ZBU, W2EJZ
oprs.) 99-33-3-AB
Western Pennsylvania
W3BWI 2654-159-17-ABCD
W3CSA 761-87-6-AB
W3SYU 650-65-10-AB
W3DTW 204-31-6-AB
K3PSN 180-45-4-B
W3DJM 132-33-4-A
K3CPA 32-16-2-B
W3SDZ/3 (6 oprs.)
14,587-503-29-AB
K3HKK/3 (K38 AKR AHCY
HKK) 6768-279-24-ABC

CENTRAL DIVISION

Illinois
K9DWR 1776-140-12-ABC
K9ZWI 1509-111-11-ABC
K9PWF 1071-119-9-AB
W9DJ 748-68-11-ABC
K9ZVV 682-56-11-ABC
K9DMW 610-122-5-B
W9AA 9 555-111-5-B
W9NFYJ 300-100-4-B
W9AMHU 370-74-5-B
W9AFGW 324-81-4-B
W9CRN 265-53-5-B
W9BPH 252-63-4-B
W9BOD 234-69-7-B
K9CJD 207-69-3-B
W9FLT 140-35-4-A
W9BGU 115-23-5-A
W9AD 88-22-4-B
K9YF 66-34-2-A
K9PGV 24-8-3-A
W9BMG/9 6-1-B
K9ZWJ (K9ZJW-W9MEM)
2106-234-9-AB
K9PAF/9 (8 oprs.)
169-22-9-AB
K9EMT/9 (K9S EMT QNO,
K1PLX/9)
1040-130-8-AB
K9BZZ (K9S HZZ CBA)
1008-126-8-AB

Indiana

K9QCB 2964-247-12-AB
W9BF 2112-192-11-AB
K9YD 1143-127-9-AB
K9MZY 1080-103-10-AB
W9MHP 545-40-10-AB
K9ZUH 348-58-6-AB
K9CLF 312-52-12-A
W9NDRR 129-43-3-B
W9YDF 120-24-5-A
W9CFY/9 (Multi-op)
4662-250-18-AB

Wisconsin

W9JOT 329-47-7-AB
W9DHF 252-63-4-B
W9TQ 189-27-7-AB
K9VPH 162-12-1-B
K9VNM (WA9CNP K9VNM)
912-114-8-AB

DAKOTA DIVISION

South Dakota
K0SCL 50-10-5-AB
Minnesota
K0DTA 174-58-3-AB
W0DAK 8-6-1-B

DELTA DIVISION

Louisiana
WA5AVQ 300-60-5-AB
W5GPK 265-53-5-AB
W5JFB 8-8-1-A
Tennessee
K4CRX 308-44-7-AB
W4ZZ/3 228-38-6-A
K4JWZ 128-62-4-A
W4FHY 54-18-3-A
K4KTC 44-10-3-A
K4CVA/4 (K4REV, W4RJC,
W4EDZ)
2888-207-14-AB
K4FKO/4 (5 oprs.)
1752-146-12-AB
W4FHW (K4S EPM YNT,
W4FHW)
868-124-7-AB
W4TGM (3 oprs.)
675-75-9-AB
W4GON (K4S EJC, TTY,
W4GON)
115-23-5-AB

GREAT LAKES DIVISION

Kentucky
K4RZK 1413-157-9-AB
W4AAJ 1286-161-8-A
W4AXM 390-58-5-A
W4CQG 224-56-4-A
W4CFL 111-37-3-A
W4AXN (K4VEZ, W4-
AXN) 384-64-6-AB

Michigan

K8KIX 2205-245-9-A
W8P 1222-80-13-BCD
W8YLO 1088-136-8-H
W8ZSN 910-84-10-AB
K8LXU 840-120-7-AB
W8JXU/8 670-134-5-AB
W8VRI 155-91-5-B
K8ZGF 408-68-6-AB
W8VQ/8 396-84-4-AB
K8LWP 320-64-5-B
W8UCDF 308-77-4-A
K8WUZ 183-93-2-A
W8VKQ 111-37-3-AB
K8VZJ 68-34-2-B
K8V 24-8-3-B
W8ZF 31-7-3-B
W8BKW (K8SMC, W8BKW,
W8BBS)
172-43-4-AB

Ohio

K8JDO 2314-178-13-AB
K8RAM 1500-150-10-AB
K8ZLS 1188-99-12-AB
W8DHS 864-108-8-AB
W8JEN 608-101-6-AB
K8S8K 530-106-5-AB
K8CRO/8 490-70-7-B
K8YVF 485-97-5-B
W8NCAE 420-70-6-B
K8BHE 408-68-6-A
W8ABEY 400-100-4-AB
K8ZVN 284-44-5-A
K8ZTV 188-47-4-AB
W8LXU 156-39-4-AB
K8ALO 132-33-4-B
K8YXV 90-30-3-A
W8NCFJ 81-27-3-B
W8ZU 29-2-2-B
K8OGB 20-10-2-A
K8RXD 16-8-2-B
W8HBI (Multi-op)
18,051-600-29-AB
W8RTX/8 (7 oprs.)
7413-329-21-AB
W8CCI (Multi-op)
5640-376-15-AB
K8YJY (5 oprs.)
440-88-5-A
W8ACKS (W8AS APD CKS)
96-32-3-AB

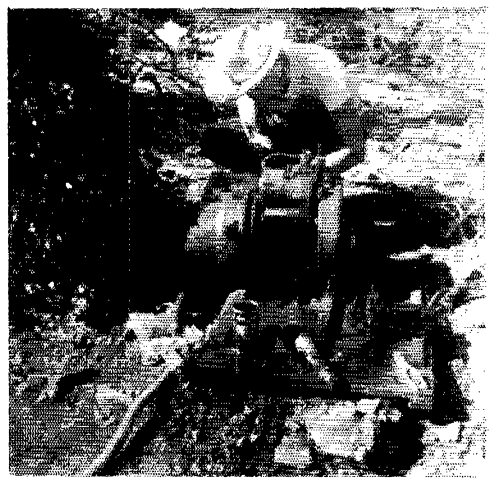
HUDSON DIVISION

Eastern New York

W8DPI 5400-200-17-AB
W8DQ 792-72-11-AB
W8ROJ/2 408-51-8-AB
WA2RLEO 350-50-7-AB
K2JHR/2 329-47-7-B
W2LVJ 287-41-7-B
W2HIO 276-46-6-B
W2HAQ 240-30-8-AB
WA2YAJ 232-58-4-B
WVZOT 170-34-5-B
W2IP 162-27-6-B
W2NAKA 130-26-5-B
W2NEH 130-30-3-B
W2NCD 63-21-3-B
W2WGE 30-10-3-B
K2CVG/2 (9 oprs.)
14,944-467-32-ABCD
W2HZZ/2 (8 oprs.)
31,458-711-42-AB
K2CBA (4 oprs.)
9196-242-38-ABCD
WA2MOY/2 (5 oprs.)
4500-250-18-B
WA2RXO/2 (3 oprs.)
32-8-4-B

N. Y. C. and Long Island

WA2LRO 2640-220-12-A
WA2YX 1390-139-10-B
WA2GPP 1330-84-14-
AB
K2YGM 690-138-5-A
W2OQA 672-112-6-B
W2KNG 575-115-5-B
W2BON 534-89-6-B
W2NDNZ 444-74-6-B
W2DRK 455-45-6-B
W2VYN 390-65-6-B
W2JZX 336-56-6-B
W2DGG 312-52-6-A
WA2YHR 280-70-4-B
WA2NFQ/2 270-45-8-B
WA2VQT 260-52-5-B
K2IDDK 243-27-9-B
WA2GKY 208-24-8-AB
WA2JUG 200-40-5-AB
W2NBQJ 152-38-4-B
WA2ICP 120-24-5-B
W2UAF 72-18-4-B
W2NAXG 72-24-3-B
W2BOV 66-22-3-B
WA2OUM 51-17-3-B
W2RJJ 48-12-4-B
W2ZKS 14-2-3-B
W2EFC/2 (K2S RGV, GYT,
W2EFC)
7656-348-22-AB
WA2JSG (4 oprs.)
2760-184-15-AB



K6EWO makes "minor adjustments" to the generator intended for use by W6HBW/6 in the September V.h.f. Party. Regulator trouble forced use of a smaller standby power unit throughout the contest

K2RTH (Multi-op)
2715-181-15-AB
WA2VDC (WA2S VDO UMP,
W2VPR)
1404-156-9-B

Northern New Jersey

K2LNS 8175-327-25-AB
WA2NON 4911-283-17-AB
W2N2N 2783-253-11-B
WA2DDP 1834-131-14-AB
W2DZA 1496-60-17-
AB
WA2PTS 1314-146-9-B
WA2ENTA 1222-94-13-B
K2RGF 1056-64-16-AB
WA2JJI 819-117-7-B
W2GKR 630-63-10-AB
WA2WII 468-78-6-B
K2KJQ 462-66-7-B
WA2EDE 432-72-6-B
WA2FVL 432-72-6-B
W2NDQS 336-56-6-B
K2VHI 248-62-4-B
K2DMI 150-30-5-B
K2DIG 144-18-4-C
WA2PMT 96-21-4-B
WA2MXZ 60-15-4-B
WA2CCF 24-12-2-B
W2PEZ/2 (10 oprs.)
31,458-711-42-AB
K2BJP/2 (14 oprs.)
13,804-435-20-AB
WA2VLR 4 (4 oprs.)
5388-336-18-AB
W2JUJ/2 (4 oprs.)
3900-200-15-AB
W2MINK (K2RZP, W2MINK,
WA2NIP)
1760-110-16-AB
WA2AEF (5 oprs.)
1608-134-12-AB
WA2IOG/2 (4 oprs.)
351-39-9-AB

MIDWEST DIVISION

Iowa
W0PEP 280-35-8-AB
Kansas
W0WPO 240-47-5-ABD
W0ROY/9 236-59-4-AB
K0VHI 200-40-5-AB
W0VRL 60-30-2-B
W0HNG 36-12-3-B
Missouri
K0EKI 420-105-4-A
K0CWP 222-74-3-A
K0ZKC/0 (K0ZKC WA0-
DPL)
720-144-5-A
Nebraska
K0ETA 27-9-3-A
K0SBV 18-9-2-A
W0WRT 15-15-1-B

NEW ENGLAND DIVISION

Connecticut

W1RJA 9280-320-29-AB

K1PKQ/1 2220-148-15-B
W1YDS 1539-73-19-ABCD
K1PLR 1364-124-11-B
K1PLR 129-129-10-AB
W1HKL 1152-128-9-B
K1ROK 730-73-10-AB
W4SHI/1 553-79-7-AB
W1AW 477-53-9-AB
W1MEH 370-37-10-AB
W1WHR 364-52-7-B
K1UIU 315-63-5-B
K1RIS 280-56-5-B
K1TKZ 266-38-7-B
K1WTF 204-48-5-B
K1WVE 208-52-4-B
K1OAV 340-34-6-AB
W1MFT 184-15-8-BCD
K1VQZ/1 168-42-4-B
K1SXP 148-37-4-B
K1VMI 144-36-4-B
W1HAX 130-26-5-B
K1TEY 54-27-2-B
K1WNS 30-15-2-B
W1GB/1 (14 oprs.)
25,116-570-42-ABCD
W1VLR/1 (5 oprs.)
3344-147-22-ABC
K1REL (10 oprs.)
2624-164-16-AB
K1PUG/1 (K1S PUG TKJ)
1404-108-3-B
K1RGO (Multi-op)
1012-92-11-B

Maine

K1NTC 456-76-6-A
K1NLL 252-28-9-AB
K1KKK 64-32-2-AB
K1VFE 7-7-1-B
K1NAX/1 (4 oprs.)
3000-200-15-AB
W1EHF/1 (K1VIC, W1EHF)
2160-187-20-BCDE
W1KRI/1 (4 oprs.)
1125-75-15-AB
W1ZEN/1 (Multi-op)
550-55-10-AB

Eastern Massachusetts

K1DIR 7076-229-29-ABC
W1SBC 348-138-25-ABC
K1SRZ 2975-175-17-AB
K1JCC/1 2774-139-19-ABC
K1KKS 1364-124-11-AB
W1OOP 1292-47-19-BCDE
K1IHI 958-67-14-A
K1WTK 560-110-5-A
K1QVU 504-56-9-AB
K1OYU 390-65-6-A
K1PCB 162-27-6-A
K1MNO 100-25-4-B
K1NWS 99-33-3-B
W1DND 36-6-3-C
W1RU (6 oprs.)
23,822-532-43-ABCD
K1VGC (3 oprs.)
2025-135-15-AB

Western Massachusetts

W1HDC 2688-124-21-ABC
W1UCB 108-18-6-AB
K1IYL 30-10-3-B

W1BRF/1 (8 oprs.)
2010-134-15-AB
K1ICM/1 (5 oprs.)
1692-112-AB
W1LWZ/1 (Multi-op)
368-46-8-B
New Hampshire
W1FZ/1 3388-147-2-ABCD
K1UEV/1
2832-177-16-AB
K1OJA 2219-163-13-AB
W1UBN 1596-114-14-AB
W2NSD/1

K1260 84-15-AB
K1SHR 476-68-7-AB
W1ULU 252-36-7-AB
K1TEL 224-32-7-B
W1ALE (W18 TNO YQH)
3078-162-19-11B
K1OKX (K1OKX, W1FZS)
1417-109-13-AB
K1LZF/1 (K1N1s YCC YCD)
648-72-9-A

Rhode Island
K1CRN 2280-102-20-ABC
W1AJR 1120-50-20-ABCD
K1JSG 480-60-8-B
W1VXL/1 (8 oprs.)
1920-128-15-AB

Vermont
K1GYT 375-75-5-AB
K13JK/1 330-30-11-AB
K1NSO 84-28-3-B
K1HJ 81-7-3-B
W1IJP/1 (9 oprs.)
7392-216-32-ABCD
K1KAN/1 (K1CEY, KAN,
W1JVL) 70-7-7-ABC

NORTHWESTERN DIVISION
Oregon
W7GUH 618-100-6-ABC
Washington
K7BBO 2000-249-8-ABD
W7RT 1710-189-9-ABC
K7IQJ 1071-151-7-ABCD
K7DBR 308-100-8-A
K7QFW 188-94-2-A
K7QLC 165-55-3-A
W7ANI 100-50-2-A
K7JZP 72-36-2-B
W7EMJ (K7GPI, W7HJ)
264-66-4-AB

PACIFIC DIVISION
Nevada
K7ICW 36-9-4-AB
K61LF/7 (K61LF, W6DPG)
264-33-8-AB

Santa Clara Valley
W6GGYD1157-82-13-ABC
K6KOP/6
1152-96-12-AB
W6RRH 625-125-5-B
W6BQO 308-28-9-ABD
K6TJ/6 (K68 DTR TJJ,
W6ORR)
3402-185-18-ABC
W6HBW/6 (4 oprs.)
1056-96-11-AB
W6AQQI (W6G8 QQH QQI)
315-63-5-B

Post Bay
K6KLY 1199-101-11-ABD
K6LRN/6 720-120-6-B
W6GNE 546-91-6-AB

San Francisco
W6AJF 949-60-13-ABCD
W6BYM 104-26-4-B
W6BNDZ 72-24-3-A

Sacramento Valley
W6GER 950-95-10-AB
K6OHS/6 612-102-6-B
W6MLN 600-58-10-ABCD
K6CFP 250-50-5-B
W6GDO 140-20-7-B
K6JDD/6 42-21-2-B
W6VYQS 9-9-1-B
San Joaquin Valley
W6MQZ/6 (K6QMJ, W6-
QWJ, W6M32)
1305-87-15-AB
W6PMW (4 oprs.)
190-38-5-A

ROANOKE DIVISION
North Carolina
W4BVW 2000-120-16-ABC
K4WVP/4 780-130-6-AB
W4HJZ 420-70-6-AB
K4YYJ 372-62-6-AB
W4AJT 200-55-4-AB
W4VHH 190-60-BC
K4GPL 142-71-2-B
K4QIF 96-48-2-B
W4RRK 90-45-2-B

W4UA 44-44-1-B
K4HJE 35-35-1-B
W4N4JW 20-20-1B
W4G8NF/4 (Multi-op)
1332-147-9-ABC
W48MWD OAB VHH
W4UR8/4 632-79-8-AB
K4RKG/4 (K48 HGK HSK
K48VN) 325-65-5-A
W4WAU/4 (4 oprs.)
58-58-1-B

South Carolina
K4JQY 360-45-8-AB
W4TLC 351-35-9-ABC
K4UNA 21-21-4-A
W4YRV 68-17-4-A
W4DEN/4 (W48 DEN VIV)
252-42-6-AB

Virginia
W4VCC 1872-111-16-ABC
W4LTU 1776-108-16-BD
W4VHW 1752-146-12-A
K4TBQ 1390-130-10-A
W4CIV 320-80-4-A
K4AWQ 48-16-3-A

West Virginia
W4LSV/8 891-99-9-A
K3WVP 627-57-11-AB
K3RBP 516-44-6-AB
K3AOM 180-30-5-AC
K3DRK 132-33-4-A
K4RMG/8 (5 oprs.)
980-98-10-A
K8KVX/8 (K8KVX, W8-
EEL) 124-31-4-A

ROCKY MOUNTAIN DIVISION
Colorado
W6AQX 102-51-2-A
K6M1Q 30-30-2-AB
W6WZ 28-28-1-B
W68AV 3-3-1-B
W6DK/0 (7 oprs.)
1080-108-10-ABD
W6FP/0 (5 oprs.)
355-11-5-AB
K6RR/0 (6 oprs.)
488-122-4-AB

New Mexico
K5UYF 4-4-1-A
SOUTHEASTERN DIVISION
Alabama
K4BEI/4 415-83-5-A
K4HPR 144-36-4-AB

Georgia
W4BLM 111-37-3-A
W4G18 36-12-3-B
K4YZE 28-14-2-B

SOUTH WESTERN DIVISION
Los Angeles
W6DJTB 780-130-6-AB
W6S1F 540-68-5-AB
W6RR/1 (W68 RRT TJJ)
665-12-5-AB
W6ZIP (Multi-op)
525-75-7-AB

Arizona
W7LXY (4 oprs.)
24-24-1-A
San Diego
K6RCK 756-126-6-AB
W68NCV 234-39-6-AB

Santa Barbara
W6LKE/6 (Multi-op)
100-25-4-B

WEST GULF DIVISION
Northern Texas
W45CDG 444-111-4-A
K5MLD/5 324-108-3-A
K5ARA 249-83-3-A
K5KSN 212-53-4-A
W45DQ8 177-1-A
W5HXW 22-22-1-A
K5SHOW 12-12-1-A
Oklahoma
W5LOW 120-24-5-AB
W5WAX 72-19-4-AB
W5FMX 21-12-2-AB
W9AJO/5 (W48 FMS KMV)
330-110-3-A

CANADIAN DIVISION
Maritime
VE1OD 4-4-1-A
Ontario
VE3DR 1989-117-17-AB

VE3BGB 845-169-5-B
VE3EJC 820-164-5-B
VE3APF 755-161-5-B
VE3DFH/3 340-68-5-B
VE3EZF/VE3 325-65-5-B
VE3AR 198-66-3-B
VE3NN 153-51-3-B
VE3FX 128-64-3-B
VE3RRI 112-28-4-B
VE3AAH 106-53-2-B
VE3DFA 82-41-2-B
VE3IU 71-27-3-B
VE3FCE 66-33-2-B

W2A20IR, opr. 2 K9JPH, opr. 3 K2QYC, opr. 4 W45AWF
opr. 5 K1BZB, opr. 6 W1WPR, opr. 7 Hq. Staff, not eligible
for award.

Quebec
VE2SH 876-73-12-AB
VE2ZX/VE2 210-35-6-ABD
VE2AXO 120-30-4-AB
VE2APN 25-25-1-B
VE2BKE/2 VE2S AWR BKE
280-56-2-
Foreign
NF1OE 108-18-8-A
NE1DD 1-1-1-A
NE1PE 1-1-1-A

Silent Keys

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

K1DLF, Charles C. Pyne, Marblehead, Mass.
W1HCY, Alfred D. Bartell, Randolph, Mass.
W1OM, Eldon E. Stark, Andover, Mass.
K1ONV, Robert C. Dole, Chelmsford, Mass.
W1YUH, Wayne B. Palioea, Newton, Mass.
WA2CED, Carl T. Herman, Hamilton, N. Y.
K2DLM, John D. Blanchard, Saratoga Springs, N. Y.
W2OB, William P. Johnson, Franklin Square, N. Y.
W2SYW, Elmer R. Campbell, West Babylon, N. Y.
K3DJX, Carl H. Brown, Bethesda, Md.
W3KAK, Francis B. Widdoss, Mount Pocono, Pa.
W4HRJ, William F. Ebert, St. Petersburg, Fla.
W4NTZ, Milton A. Chambers, Alexandria, Va.
W4US, Charles A. Koethlinger, sr., Wilmington, N. C.
W4VMT, William L. Dempster, Miami Springs, Fla.
W5EHT, Olive Hawes, Norman, Okla.
W5KCW, Verl A. Coleman, Albuquerque, N. Mex.
W5PAB, J. T. Cooper, Wright City, Tex.
W5UNW, Renvil J. Walker, Graham, Tex.
W5WFR, Emile F. Meyer, jr., Bethesda, Md.
W6AB, John C. Lewis, Santa Barbara, Calif.
W6AFP, Lester W. Squires, El Segundo, Calif.
W6AON, Gordon Evans, San Francisco, Calif.
W6COF, Harold J. Steck, Van Nuys, Calif.
W6FFA, Ivan H. Foster, San Lorenzo, Calif.
W6IIO8, Thomas H. Lucking, Santa Barbara, Calif.
W6IWH, Earl Adams, Santa Rosa, Calif.
W6RSV, Alvar E. Rohland, Long Beach, Calif.
W6T1J, Theodore C. Marilli, Larkspur, Calif.
W6GUDU, Delmah F. Ore, Anaheim, Calif.
ex-6WE, ex-9PS, Donald C. Goshay, Thousand Oaks, Calif.
W6WN, Robert B. Woolverton, San Francisco, Calif.
W6ZNN, Arthur H. Hart, Plaster City, Calif.
W7AFP, Donald L. McPherson, Portland, Oreg.
W7RWG, Robert R. Travis, Walla Walla, Wash.
W7VQC, Edward G. Griffin, Moscow, Idaho
W8FGL, Kenneth W. Weekley, Parkersburg, W. Va.
K8JHZ, Arthur L. Cavar, Bay Village, Ohio
K8JPR, Ashton T. Ogle, sr., Caledonia, Ohio
W8LCM, James R. Leonard, Cincinnati, Ohio
W8N1U, Clarence H. Hoffman, Wickliffe, Ohio
K9LAQ, Edward W. Blank, sr., Brownsburg, Ind.
K9MBF, Marvin A. Knoller, Milwaukee, Wis.
K9RZR, Raymond E. Fleisener, Techny, Ill.
W9WK, Carroll W. Thomas, Elm Grove, Wis.
W9WNF, Myron J. Earl, Chicago, Ill.
W0EDD, A. Milton Anderson, Stromsburg, Nebr.
W0FIR, John S. Baker, St. Louis, Mo.
K0JLY, Harold C. Henning, Emporia, Kans.
K8OKK, Floyd M. Pollock, St. Joseph, Mo.
W0YEB, Milo A. Adamson, Englewood, Colo.
VE5DW, J. McTaggart, Unity, Sask., Canada
VE5MY, C. T. Mulholland, Tisdale, Sask., Canada
VE5WB, W. M. Brown, Naicam, Sask., Canada
VE7ACW, C. N. Ramsey, Burnaby, B. C., Canada
VE7ARP, J. Cant, North Vancouver, B. C., Canada
VE7ATL, Anson J. Beam, Ft. St. John, B. C., Canada



CONDUCTED BY SAM HARRIS,* W1FZJ

OSCAR

THE Oscar Association has in the past demonstrated its ability to design and construct a transmitter capable of orbiting the earth and performing in a predicted manner. The two successful Oscar transmitters were heard by amateurs the world over. You will be interested to know that the Oscar III repeater in breadboard form is now in operation. This transponder, or translator, is located on a 30-ft. tower at the shack of W6VMH. In its present form it listens to a 50-kc. slice at the low end of 144 Mc. and retransmits whatever it hears at about the center of the 144-Mc. band. The exact frequencies employed as well as the method of operation are still under consideration and I cannot at this time predict what the end result of the development program will be. The point is that the Oscar Association is continuing to work on their planned program and those interested should be preparing their equipment in order to take advantage of the Oscar III potentialities. As in the past, *QST* will carry complete details on the new venture as the information becomes available. Tentative plans are for a spring firing date.

Receivers — Parametric Amplifiers — Projects

In our efforts to spur the v.h.f. fraternity on to greater accomplishments, we quite often make reference to various projects which are undertaken at the Rhododendron Swamp VHF Society. Naturally, if we make an essentially overload-proof receiver we are interested in letting you know that it can be done. A result of this disclosure is, of course, a deluge of mail asking "How can it be done?" Unfortunately, while it is easy to point out that we solved the problem in our particular case, it is very difficult to solve someone else's specific problem.

The solution of our problem was not easy. It required months of experimentation with various converters and receivers, and combinations of filters and tubes in order to result in a system which could have low noise capabilities as well as high overload capability. The solution does not lie only in a converter. Nor does it rest in the choice of an i.f. receiver. Rather it is a result of carefully designing your over-all system, to provide the proper signal level translation from the antenna to the loudspeaker. Most of our efforts are directed towards improving our equipment and while the programs are in progress there is little or no time to document the results. The subject of receiver overload would require a several-part article, the writing of which would be a considerable undertaking. So also is the design and construction of a parametric amplifier or the design and installation of a moonbounce station.

We have, for instance, spent a considerable amount of time over the past two years in an attempt to document our moonbounce efforts. We still have some months to go before the first draft of the complete installation is ready for distribution. The same applies to our efforts at building parametric amplifiers for use in the v.h.f. range. The bare recording of how to build a device leaves much to be desired when its operation requires information which is not readily available.

Some months ago we suggested that if enough people were interested in a 132-Mc. parametric amplifier we would attempt to prepare an article on the construction of one. I am happy to point out that there was certainly sufficient interest in such an article. In fact, we are still getting inquiries, some of them irate, as to when if ever we are going to prepare such an article. To be perfectly frank I would almost rather build you one than try to write an article telling you how to build it. The difficulty lies not in making one which works satisfactorily but in determining how to tell you how to make one which performs satisfactorily.

It isn't enough to tell you that the parametric amplifier will give you considerable improvement in noise figure. We must also delve into the method used to determine when you do get an improvement in noise figure. While it is obvious to me and most other older hams who listen to weak signals that if an improvement in noise figure is obtained there will also be an improvement in signal-to-noise ratio, it is not easy to explain this to someone who believes that an S meter that reads S9 is better than an S meter that reads S3 when no signals are present.

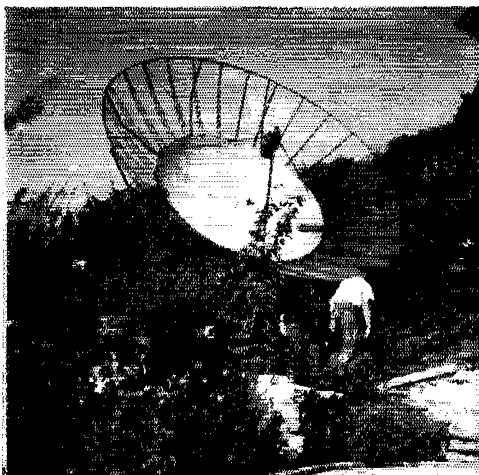
How do you explain that it is not the actual reading of the meter but the difference between what it reads with no signal and what it reads with some signal which counts. I have received letters from all over the world concerning the operation of parametric amplifiers and with some exceptions they are almost all saying that they are not obtaining any improvement although the amplifiers are working. This, of course, is ridiculous. If the parametric amplifier is working there will be an improvement in signal-to-noise ratio. Unfortunately, a parametric amplifier can in fact show evidence of gain and not be working properly. It is obvious therefore that an article on the construction of a parametric amplifier must also include a sub-article on instrumentation or measurements.

It is easy to go into a well-equipped laboratory and tune up the parametric amplifier using several thousand dollars worth of test equipment. With information gained from this type of preliminary work it is then relatively easy to remove the same parametric amplifier to a operating installation and make an improvement in signal to noise in on-the-air tests. However, if one must start blind and have only a normal amateur receiving set-up as test equipment, the problem becomes considerably more difficult. And so it is with problems of receiver overload, or problems encountered in a moonbounce installation, or a satellite-bounce installation.



"Die Unzertrennlichen," Swiss Style, moonbouncers. Right to left: Dr. Hans Lauber, HB9RG; Kurt Eckert, DJ3LN; Hans Raetz, HB9RF; Edy Krahe, DL9GU; and Teigwarenfabrikant Juergen Wasmus, DJ4U. This group heard their own 1296-Mc. signals between Switzerland and Germany via the Moon on April 23 of this year.

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



Parabolic dish in use by the Swiss moonbounce group. Diameter has been increased to 18 feet since their first experiments.

144 Mc. and Up

Two meters is still being good to those working the band, but it's beginning to look as though those boys are getting a bit spoiled too. Out in Sparta, Illinois, Joe, K9SGD sez: "The two-meter band has not been good but not bad either during the month of September. On 9/7 I worked W5RCI in Marks, Mississippi; 9/11-W5PZ and W5LNY in Ponca City, Oklahoma; 9/12-W5HCX at Oklahoma City and W9DIQ at Lake Mills, Wisconsin; 9/21-W5ML, Vivian, Louisiana; W5BEP and W5DKX in Longview, Texas, and best one of all, a new state on 144 Mc., WA4BVW, Spruce Pine, North Carolina; 9/22-W5TIE and W5PTD in Arkansas." Now if that isn't pretty good for two meters, maybe the rest of us had better change locations. Joe goes on to say that a.s.b. activity is picking up and is noticeable particularly during the openings when more and more is being heard. He will have his own sideband rig on the air by this time.

In Salisbury, North Carolina, K1YYJ reports no unusual conditions yet this season. A small opening was observed there on September 10 into Ohio and during the September contest Virginia, South Carolina, Georgia and Tennessee were worked. Jim has nightly skeds with W8GZW, Milford, Ohio, and to date has been able to complete two out of ten skeds. He sez that they have been able to hear something, either one way or the other, on each sked. K1YYJ operates on 144.040 and W8GZW is on 144.260 Mc. K4IAF sez that on September 12 144 Mc. was open from North Carolina north to Maine from 2000 EST to midnight. Roger worked K3FEW, W1GJ, K2ANR, W1HJR, K1AI and W1JSM during the opening.

W1JSM in Waltham, Massachusetts brings us up to date with his activities by telling us that on August 15 144 Mc. opened in the late evening to 8- and 9-lands when he worked K9UIP in Indiana, W8SFG, K8ERV, W8YIO, W8PIH in Ohio and Michigan. On the 31st (of August) he worked VE1TV, VE1QT, VE1OL, VE1MX, VE1KX and VE1QG. Don's new 200 rig is now complete and he's using a 10-element beam with it. Next on his list is a rig for 432 Mc. We hear from Doc, VE3BQN, that he has upped his "states worked" total to 20 when he worked Delaware during the June Contest. You might look for Doc nightly at 144.051 Mc., when he is calling "CQ S.E.", at 10:15 p.m. local time.

Ted, W3RUE, brings us to task for scrambling his listing in the 220 and 432 Mc. listings. Think we have it correct now, Ted, and while we're about it, we'll ask the rest of you to check your listings and if we're incorrect or have left you out, please advise. Depending on the call area in which you are located is the reason that some who have sent in listings have not been entered in the two-meter box. For instance, if you live in 1 or 2 lands you'll not be listed unless you have worked 15 or more states; but if you live in 6 land or some of the states in 5 and 7 and 9 lands you might get listed with as

few as three or four States Worked. (Now see what you brought on, Ted!).

On August 30 W3RUE worked K8AXU for the first Pennsylvania to West Virginia contact on 432 Mc., and on September 10 W3RUE worked W8LFX for the first Pittsburgh, Pennsylvania, to Cincinnati, Ohio, contact on 432 Mc.

Two meters is represented by 15 or more stations in Winnipeg, Manitoba, with more joining the ranks every week. Recently VE4TL worked the first "ground-wave DX" from Winnipeg on 144 Mc., when he kept successful skeds with W0PIID in Warren, Minnesota; with W0EUQ in Grand Forks, North Dakota, and with W0YSJ in Fargo, South Dakota. W5FPB, Albuquerque, New Mexico reports good attendance at net sessions during September with ten to twelve stations reporting in each week. Net is held on 146.802 Mc. each Tuesday night at 2300. K1QVU sez that it must have been good groundwave on September 3 'cause he worked Maine, New Hampshire, Cape Cod and Rhode Island on two meters with his halo.

In Memphis, Tennessee, W4ZNV is looking for two-meter skeds with anyone looking for Tennessee, cw or am on 145.047. Jack sez that to date his best DX is W4TKH in Lexington, Kentucky, whom he worked on September 11. He also heard Ohio signals that same date but had no luck in snagging a contact. On September 22 Jack had a good opening into Illinois, Texas and North Carolina, when he heard lots of activity but was only able to work W9RNM, K9ZID and K9EID, all in Illinois. On Labor Day Jack put up a 17-element yagi at the 60-ft. level and has worked 7 states so far. He sez it's doing a fine job but doesn't compare with the 48-element colinear at 63-ft. that he used in Ohio (K8JLA) in 1960-61.

Out St. Louis, Missouri, way W0DQY would like to let the gang know that it is possible to work above 145 Mc., get contacts and even DX. Glenn has worked twenty states so far running 150 watts into a 15 over 15 up 80-feet. He finds he can work about a 250-Mile radius under normal conditions and can talk to K9ZZG in Lebanon, Indiana and W0FAJ in Kansas City, Missouri regularly. Glenn operates at 145.05 almost every evening from 2300 to 0100 CDT, so a few of you might start a-lookin'.

W5SWV sez: "Had good tropo opening on October 8 and 9 on both 144 and 432 Mc. Got Oklahoma and Tennessee for another two on a.s.b. on 144 Mc. which makes a total of 13 states two way a.s.b. on that band. (Daily has twenty states on 144 Mc. non-a.s.b.) Worked W4HHK on 432 Mc. for 1st Texas/Tennessee on 432 Mc., Q5-86/7". A lively tropo opening was noted by K1AI on September 13 when stations as far south as North Carolina were worked on phone with 5-5 reports. Strongest signals were K2JWT, W2GUX, W4LTU and W3LML. K3MZO reports good ground wave on September 3 when K3OLM in Hanover, Pennsylvania was running only 8 watts but had an 89 signal; K2TYW in Gibbsboro, New Jersey was hitting 89; and K3MWQ in Ellicott City, Maryland was 88. On October 10, W5WAX worked W4HHK on 144 Mc. for state #8, and W5JSB worked W4HHK (Tenn.), W4LOJ (Tenn.) and W5RCI (Miss.) the same night. Also heard or worked during this opening were W5JSB, W5HKT, W5HCX, W5SWV, W5NU, W5UGO and W5HTZ.

Up in Appleton, Wisconsin, W9FBC had a good month on two meters with openings on September 3, 7, 9, 12, 16, 21, 24 and 30; most of these to the south but a couple into northern Illinois and the upper peninsula in Michigan. Maury tells us that W9BCH now has stacked 10-element beams, that W9DKY has stacked 5-element beams, that K9WNZ has stacked five-element beams and that W9IEP is a new v.l.f. man in town. Walt, W4FWH in Doraville, Georgia, noted no DX openings but sez that tropo openings to Alabama and North Carolina were good all during the month. Best period was from 9:8 to 9:15. A rig for 432 Mc. is now under construction at Walt's QTII, so there's another one to be watching for.

Virginia didn't do so well during September according to Sam, K4EUS. He comments: "144 Mc. I No Aurora - No tropo - No nothing - Maybe my converter is dead!" Hope not Sam, but if it was I'm sure you've found it out by this time. K9FNB is putting up a tower and will have a 12 over 12 J beam on two meters when the structure is erected. "Ozzie" had one good opening on two meters on September 21, when he worked WA4BVW in North Carolina. Good conditions were observed by K8BLH on 9:2 when he worked WA2LSF/VE3 and WN8DMM in Michigan.

W9WDD writes that he's been active on 144 Mc. for two years and has decided it's time to be listed in the two-meter standings; to date Charles has worked 16 states and is going strong. His station consists of a Johnson 6 & 2 Thunderbolt driven by a Communicator III. Antennas and tower are new and have been up about two months. Two 15-element beams stacked, with top one being 100 feet up, are being used. Charles has had consistent phone contacts with stations at 250 to 300 miles and is looking for skeds; he usually operates between 144 and 145 Mc.

From VE3 land we received word from Bert, VE3EUU about his aeronautical-mobile jaunt with VE3AUT on September 1 and 3 on 144 Mc. "To say the least we were gratified by the results — 17 contacts in $\frac{3}{4}$ of an hour on 9/1 and 19 on September 3. Immediately after our first QSO we stood by for calls and found one giant heterodyne across the band. Our route took us from Buttonville Airport west and south to Hamilton, and then east to Oshawa at a height of about 5000 feet. Plans are presently under way to mount a two-meter halo permanently on the plane. We originally used a crystal mike and one set of head phones, but now have a system where two sets of head-phones are operating simultaneously and two carbon mikes, which can be switched from one operator to the other." Must be great fun and we wish you more good luck during the winter for your future trips.

In Thomaston, Connecticut, K1PKQ sez that 144 Mc. wasn't any good at all during September, but that October 2, 3, and 4 were very good with VE3BPR, VE3RQN and K3KEO all coming in with very good signals. K3ADS has been experimenting with receiving conditions on 220 Mc. and finds that "local" coverage is as good as two meters if not a little better, and that some stations at greater distances are even more consistent. Larry is presently working on a final amplifier for 220 Mc. and a nuvistor converter for 432 Mc., hopes to be on the air soon with both.

From South Carolina and W4TIC we learn that W4CPX is now on 144 Mc. s.s.b. Charlie, W4TLC, reports that the path to K4KLD in Georgia has been fair on Sunday mornings with good copy possibly 80% of the time (220 Mc.). There is usually rapid fading on the signals though. No other 220 Mc. stations have been worked from that QTH except K4ULZ in North Carolina who consistently has a good signal.

From ole Paul, W4HHK, we hear that: "Had a terrific tropo opening between Tennessee, Oklahoma and Texas on the night of October 8 when I worked W5SWV on 432 Mc. e.w. for the first Texas, Tennessee 432 contact and state #8. While trying to start 432 Mc. QSO with W5SWV, W5LITZ in Oklahoma called me on 432 Mc. so of course we had a contact there. Using only the recently completed 144 Mc. s.s.b. gear, I worked as far west as W5YYO near Amarillo, Texas, and also worked W5PTD, W5HCX, W5KHT, W5ISB, W5UGO and W5WAX. Several of the two-meter contacts were on s.s.b. both ways. The two-meter s.s.b. setup consists of phasing type 14-Mc. exciter and transmitting converter with 6360 linear output stage driving the Kmac 4CX300A's, all 'home built.'" Congratulations, Paul, on another new state on 432.

More good news, this time from Rex, W5RCI in Marks, Mississippi, who sez: "Though I'd better get my late news up to date. On September 6 we had a little opening to the northeast and I worked 8KAXU at his new QTH on 2, 220 and 432 Mc., making state #12 on 432 Mc., distance about 660 miles. On October 9 had another opening, this time to the west, and worked the fellows around Oklahoma City, W5HHT, W5HCX, etc. on two meters." More congratulations extended!

W6GGYD would like to let it be known that he will be on 224.5 nightly (except Mondays and Wednesdays) between 2030 and 2110 local time. He will call "CQ" to the north between 2030/2040; to the east between 2045/2055; to the south between 2100/2110; and will tune the entire band after each CQ. Anyone calling him should give at least a three-minute call. Out in Boulder, Colorado, probably the first 1225 Mc. contact from strictly home locations was made on Labor Day between W0MOX and W0EYE. Both of the boys were using converter APX-6's and the signals were loud and clear; plans are being made to extend the range considerably with the same rigs.

Clubs and Nets

The Confederate States Rebel Net, which operates under the auspices of the Confederate States Amateur Radio Club,



Custom-made sweaters identify Canadian delegates at Syracuse VHF Round-Up. Nonchalant wearers can supply information on how hard it is to get these beautiful works of art.

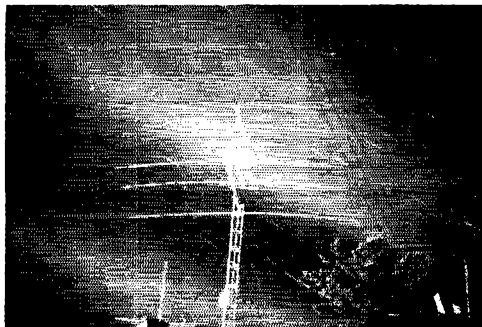
opened the fall season at 2100 EDST on September 7 on 50.4 Mc. 24 stations reported into the net with Pennsylvania, Maryland, District of Columbia, Virginia and West Virginia being represented. On September 27, 27 stations reported in to the net, 14 new Rebels were certified during the month of September, thus swelling the ranks to 283 certified members.

The latest project of the Midwest VHF Club, Inc., was the installation of a v.h.f. station at a Veterans Hospital, the Hines Memorial Hospital near Chicago. Next project of the club, which has over 50 members, is a mobile emergency net including another well-known club, the Six Meter Club of Chicago, which has over 250 members.

Recently in this portion of the column we mentioned the newly formed "Burlington Amateur Radio Klub and Net" and gave its location as Burlington, Wisconsin. Our apologies to the Klub — location is Burlington, WASHINGTON. Anyone wishing to join this group can contact K7PIG, Larry, on 50.4 Mc. at 8:00 p.m. nightly, or drop him a note at his home QTH, 420 North Pine Street, Burlington, Washington.

50 Mc. — Argentina

Haven't heard very much from Mike, LU3DCA recently, but did receive a letter today and think you'll all be interested in what he has to say. "I am busy building a sideband exciter and heterodyne units for output on 6 and 2, completely transistorized, which should feed a high power final with 7034's. On 6 we have the usual spring TE season. On the evening of October 18 I heard YV5AHS and YV5AHO talking about a contact with Australia; I am not sure who made it as I could not raise either of the boys to ask about the contact." Mike goes on to say that he will be visiting in this country in January and would like to meet as many of the v.h.f. gang as possible. As plans stand at this writing he will be visiting in Puerto Rico, Miami, San Francisco, Los Angeles, Houston, Dallas and Mexico City; then back to Buenos Aires. Watch for him! He'd like to meet you!



Aurora lights the sky over VE8BY's antenna farm.

2-METER STANDINGS

W1RFPZ	32	8	1300	W6NLZL	12	5	2540
W1AZK	28	8	1205	W6DNG	9	5	1040
W1KCS	24	7	1150	W6AJF	6	3	800
W1RFU	24	1120		W6ZL	5	3	1400
W1AJR	23	7	1150	K6HMS	4	3	850
W1NIN	22	8	1200	K6TTP	4	2	900
W1HDQ	22	6	1020	W6AMLU	3	2	950
W1ZY	20	7	1180				
K1CRQ	19	6	800	W7JRG	15	6	1280
W1AFO	18	6	920	K7HKD	14	5	1150
K1AFR	17	5	450	W7LHL	6	3	1050
				W7GJM	5	2	670
				W7HP	4	2	900
				W7JU	4	2	235
W2NLY	37	8	1300	W8P1	39	9	1260
W2CKY	37	8	1360	W8KAY	38	8	1245
W2ORI	37	8	1320	W8SDJ	37	8	1220
W2HLV	36	8	1020	W8LFX	35	8	980
K2ZQL	35	8	1365	W8SFG	34	8	1040
K2LMG	34	8	1290	W8LOF	33	8	1080
W2AZL	29	8	1050	W8GGH	32	8	1180
K2HFJ	27	8	1060	W8BAN	32	8	960
K2CEH	25	8	1200	W8AMH	32	8	910
W2AMJ	25	6	960	W8NOH	31	8	1050
W2ALR	24	1100		W8SVL	30	8	1080
W2RXG	24	1000		W8HWW	30	8	860
W28ML	23	1000		K8AXU	29	8	1050
K2HOD	23	7	950	W8LPD	29	8	850
W2DWJ	23	6	860	W8VRN	28	8	680
W2PAU	23	6	753	W8DX	26	8	720
W2LW1	21	6	753	W8LTC	25	8	800
K2KIB	21	5	700	W8JWV	25	8	940
W28XU	21	5	750	W8WNA	25	8	900
W2UTH	21	7	880	W8GFN	23	8	540
W2WZR	19	7	1040	K1CRQ	22	8	690
W2RGV	19	8	720	W8LGY	21	7	610
W2RLG	17	6	980	W8GTR	17	7	550
K2JWT	16	6	550	W8NRM	17	7	550
W3RUE	33	8	1100	W9KLR	41	9	1160
W3EPH	32	8	1000	W9WOK	40	9	1170
W3GKP	31	7	1180	W9GAB	34	9	1075
W3SGA	31	8	1070	W9AAG	30	9	1050
W3TDF	30	8	1125	K9AAJ	31	8	1070
W3KCA	28	8	1110	W9REM	31	8	850
W3BYF	28	8	1070	W9ZTH	30	8	830
W3LNA	21	7	720	K9UIF	28	8	970
W3IST	21	6	800	W9HFB	28	8	820
W3NKM	20	7	730	W9LVC	27	8	950
W3ZD	20	7	650	W9OJJ	27	8	910
K3HDW	12	6	1015	K9SGD	26	8	1100
				W9ZHL	25	8	700
W4HJO	38	8	1150	W9HPV	25	7	1040
W4HHK	37	9	1280	K9AQF	24	7	900
W4LTU	34	8	1160	W9LFE	23	7	825
W4ZCL	34	8	954	W9KPS	22	7	690
W4MKJ	33	8	1149	W9CUX	21	7	800
W4AO	30	8	1120	W9ALU	18	7	800
W4WNH	30	8	1050	W9WDD	16	5	500
W4LVA	26	8	1000				
K4EUB	26	7	1130	W0HFB	37	9	1350
W4BQM	25	7	1040	W0IHD	31	8	1040
W4AIB	25	8	900	W0SMJ	29	9	1075
W4TLV	23	7	1000	W0LFE	28	7	1050
W4JJC	23	6	725	W0GDH	27	9	1300
W4VVE	23	6	724	W0RUF	27	9	900
W4RMD	21	7	1080	W0GFC	26	7	1360
W4KZ	20	6	720	W0MOK	26	6	1150
W4OLK	20	6	720	K0ITP	21	6	940
W4LNG	19	7	1080	W0INI	21	6	830
W4RFR	19	9	820	W0TGC	21	7	870
K4YUX	18	8	830	W0BYG	20	8	925
W4CPZ	18	6	650	W0DQY	20	7	700
K4VWH	18	6	590	W0BNC	20	6	1100
W4MIDA	17	6	757	W0AZT	18	7	1100
				W0JAS	18	6	1130
W5RCL	38	9	1280	K0AQJ	16	6	1120
W5FYZ	33	9	1275	W0IF8	16	6	1100
W5AJG	32	9	1360				
W5JWL	29	7	1150	V1ECL	8	4	800
W5DFU	28	9	1300	V1EDR	35	8	1330
W5PZ	27	8	1300	V1EAB	28	8	1340
W5LPG	25	7	1000	V1EAG	24	7	950
W5KTD	23	8	1200	V1EBQ	20	7	790
W5SWV	18	6	960	V1EAGG	18	8	1300
W5KPU	13	4	1300	V1EDR	17	8	1340
W5FSC	12	5	1390	V1EHW	17	7	1350
W5HZZ	11	5	1250	V1EABF	10	4	580
W5CVW	11	5	1180	V1EHO	1	1	915
W5NDE	11	6	1200	V1E7F	2	1	365
W5VY	10	1200					
W5VAX	5	5	735	KH6UK	2	2	2540
W5EDZ	5	5					
W5YD	7	4	1330				
W5UNH	6	3	1200				
W5WSQ	15	5	1390				

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

50 Mc.

We hear from Bill, VE1TL, that there are quite a number of "locals" in his area on six meters; in fact, there are between 50 to 55 stations on 50 Mc. in the Manitoba area, mostly in the city of Winnipeg.

Anyone on 6 interested in experiments with tilted beams? K3AQH would like to hear from you. He wants to run tilting tests at medium distances, under various conditions. Candi-

220- and 420-Mc. STANDINGS

220 Mc.							
W1AJR	11	4	480	K0GDU	5	3	425
W1AZK	9	3	412	K0ITP	6	3	515
W1HDQ	11	3	450	KH6UK	1	1	2540
K1JJK	10	3	450	VE3AIB	7	4	450
W1OOP	12	4	400	VE3BPR	3	3	300
W1RFU	15	5	480				
W1UHE	11	4	385				
				420 Mc.			
W2AOC	13	5	450	W1AJR	11	4	410
K2AXQ	9	3	240	W1HDQ	8	3	310
W2BAH	4	2	167	W1MFT	8	3	370
K2CHA	13	6	650	W1OOP	11	3	190
K2DIG	4	3	140	W1QWJ	9	2	—
W2DWJ	15	6	740	W1RFU	7	4	410
W2DZA	12	5	410	W1UHE	6	4	430
K2ITP	11	5	265				
K2LTO	11	5	265	W2AOD	6	4	290
K2JWT	6	3	244	W2BLV	12	5	360
K2KIB	12	4	300	K2CBA	6	3	225
W2LRL	10	4	250	W2DFZ	6	3	200
W2LW1	10	4	400	W2DWJ	10	4	196
W2NTY	12	5	300	W2DZA	5	3	130
K2PPZ	11	4	490	W2HQE	8	4	280
K2QJO	13	5	540	K2KIB	4	2	100
W28HU	9	3	225	W2NTY	3	2	100
K2UTR	4	3	105	W2OTA	10	4	300
				K2UTR	9	3	280
W3AHQ	4	3	180	W2VCG	9	4	280
W3FEY	11	5	350				
K3LUV	5	3	310	K3CLK	9	4	300
W3YYL	8	4	295	K3EUF	6	3	250
W3LCC	8	3	450	W3FEY	8	4	296
W3KKN	10	4	255	K3LUV	7	3	310
W3LCC	9	5	300	W3LCC	2	2	200
W3LZD	15	5	425	W3RTG	3	2	370
W3RUE	10	5	480	W3UJG	6	4	350
W3UJG	13	5	400				
W3ZRP	5	4	112	W4HHK	8	4	550
				W4VVE	7	4	430
K4TFU	8	4	400	W4TLV	3	2	225
W4TLC	5	1	315				
W4UYB	7	5	320	W5AYG	5	1	425
				W5HTY	5	3	440
W5AJG	3	2	1050	W5RCL	12	3	660
W5RCL	8	5	700	W58WV	7	3	525
				W6GTG	1	1	180
K6GTG	2	1	240				
W6MMU	2	2	225	W7LEL	2	1	180
W6NLZ	3	2	2540				
K7ICW	1	1	250				
				W8HCC	3	2	355
KSAXU	10	5	1050	W8HRG	3	2	250
W8LJG	9	5	475	W8LJQ	4	2	275
W8LPD	6	4	480	W8NEM	3	2	200
W8NEM	8	4	390	W8P1	6	3	310
V8PT	10	5	660	W8ROL	4	2	270
W8SVL	6	4	520	W8TYJ	9	5	580
				W8UST	3	2	225
W9AAG	9	4	660				
W9GOC	11	5	740	W9AG	8	4	525
W9JCS	6	2	340	K9AAJ	7	3	425
W9JEP	9	4	540	W9GAB	9	4	608
W9OVL	6	3	475	W9OJL	6	3	330
W9UEB	4	4	605	K9UIF	6	3	240
W9ZTH	10	5	500	K0ITP	3	2	185

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

dates write Robert D. Bailey, 326 Hoffnagle St., Phila. 11, Pa.

A very interesting letter has been received here from Alice, KH6ECA, now 54 in Jacksonville, Florida; she drops KH6 calls around just as though they were common calls to hear on 50 Mc. "We certainly had some good openings over in Hawaii and am looking forward to some good DX here. I'm anxious to look up the 3 contacts I made in November, 1960, when California and Florida were in at the same time. Miss our friends in Hawaii and wonder if KH6DBY and KH6BKB (only mobile KH6 to work Japan) are having any openings; if KH6DFF has his beam up yet; if KH6BTV has had time to work Oahu from Kauai; and how the stations which were new on 50 Mc. when we left are doing. In 1959 and 1960 it was almost a nightly routine to work VK9XK and VKZBE and VK4ZBM during February to August. During the same period in the afternoons, LU4's were in and we worked PY5 once, and Spanish speaking stations were heard (Mexico, I think) but not contacted. Then come the astonishment of W6 land — working about 150 of them in a morning, and the fun (?) of QSLing them. Also heard W7 land and one VE7. We had an extra bonus in having ZLs come through, only one night in three years, and JA's one afternoon. Lucky me (K6HGR, KH6 at the time) was home at the right time but the OM, Walt, (K6HGP, KH6 at the time) had to work. In 1961 there were no openings to W6 land but a few to VK4 and VK9."

Randy, K9HBT, reports that during a weak aurora on

August 18 KL7FLC was heard. Randy was in QSO with VE8BY at the time when KL7FLC was heard breaking in. The time was approximately 2:18 CST, signal peaked a 2-1-9 with a beam heading of 330. Signals of both VE8BY and KL7FLC faded out a short time later.

The opening of September 17 held some interesting moments according to Jeff, WA2GFP, when a 4 in Miami "told off" practically everybody on the band; and a 2 in New York tuned up on the "skip" stations frequency and proceeded to tell off the locals who could not copy the 4's through him. (Too bad — but these occasional free-for-alls on any band do help) to perk up the conversation for a few days thereafter.) The evening of the 17th started off with good groundwave to 1 and 3 lands (for Jeff) and while tuning carefully for a possible Virginia contact he heard WA4GDC in Sebring, Florida. Only four skip stations were heard; WA4GDC, W4VDF, WA4BAO and WA4IYL, and these started fading after about thirty-five minutes.

Laconia, New Hampshire and K1KRP report a half-hour opening into Indiana on September 7 with signals being fair to good. Dick now has up a three-element beam, is running 15 watts c.w. and 10 watts a.m., using an HBR-16 for receiving, and wishes that more people would turn their beams toward New Hampshire. K4LLI reports that on September 6 he heard KP4PCS and on September 22 Texas was coming through into Florida for about three and a half hours. K3RYR mentions an opening into Leesport, Pennsylvania on the 10th when 4's and 5's were being heard. On September 13, Milt, WA6YIT, observed the only opening of the month (for him) when he copied two Texas stations for approximately 15 minutes. No contacts. From Cincinnati, Ohio, and K8NQN we hear of a good opening into Texas on September 5 followed by a brief opening to the north when WA8FAE heard a VE3. The 17th was marked by an opening into Florida and the south.

Only three reports have mentioned openings during the September VHF Contest; K9CGD says that the band opened to Wisconsin during the contest and also to Indiana. W4RIX reports Mississippi being heard on the 15th and Florida on the 16th. W8MBH heard stations in 1, 2 and 3 call areas on the 14th, 15th and 16th but were weak and no contacts made. Emmett, W4RIX, also observed openings on September 6 (Illinois, Michigan), 7th (Illinois, Texas and Arkansas), 17th (Florida), and the 19th into Texas.

Steve, WA2WII, at Bayside, New York sez that on September 2 several stations in Illinois were heard with good signals; and that ground wave was very good in the early mornings on September 3, 4, 5, 6, and 7. One opening only was heard by K3KPA in Philadelphia, but the one he heard was to the south on the 22nd of the month; John also mentions that ground wave was very good during September with New York and Maryland stations putting in very fine signals. Six and two meter beams at K3KPA have just been raised to 50' and John sez it was worth the effort. He is hearing and working farther and getting better reports.

Also from Pennsylvania, K3ARR and K3ADS come through with ground wave reports; Bill, K3ARR, noted good conditions on September 9, 10, 11, 14 and 15 when stations were heard in the 1, 2, 3 and 4 call areas. Larry, K3ADS comments that ground wave was good to excellent on most days during the month. He also has a suggestion for those who have built the 6 meter converter (nuvistor) as in the '62 Handbook. "Install a 100- or 120-ohm resistor in the cathode of the 1st r.f. amp and bypass the cathode with a .001 μ f. disk ceramic. This increases the bias in the first stage to allow it to handle signals that would normally completely overload it."

Others who mentioned good conditions for ground wave are K4YYJ, K6VXI, K8JEE, W8MOW, K0PFC, and W0CMI. Dan W0CMI, sez that he finally has his 40-ft. tower up and a six-element beam. Result — much better signal reports than ever before. Dan sez that six-meter activity is really at a peak in St. Louis. On September 21 a roundtable was started at 1800 CDST and four and a half hours later there were twelve stations participating. On the 25th Dan worked WA0CKS in Burlington, Iowa on cw for a new state. He then broke into a roundtable already in progress in the Peoria, Illinois area. On September 30 K4OCK was worked in Miami, Florida.

Ted Fabian, W3RUE in Pittsburg, Pennsylvania, writes that on July 26 of this year he worked PJ2AA. Aruba, on 50 Mc. for country #19. K3HNP mentions a slight aurora on September 4, but nothing worked; while Jerry, K9HBT noted aurora activity on September 1, 2, 9, 19 and 25 with 8's, 9's and 0's being heard and worked. W0EUQ was worked

on the 2nd of the month by Jerry for state #45 on 50 Mc. In Philadelphia K3MLI reports that "1 kw. p.e.p. amplifier is now completed, one 4CX250B running 4X150B's 450 p.e.p., d.s.b. SB 10 now complete and checked out, now building mixer to use it on six meters." WA6NDZ sez that although contacts were few during the September VHF QSO Party, two of the contacts were with s.s.b. stations, W6BUR and K6BBJ; also that there is an up-swing of s.s.b. stations in the Bay area, some of which are K6HCP, W6BUR, W6JKN, K6BBJ and several others.

Out in Jackson, Michigan, W8BAN is building a new linear for higher power on s.s.b. for 50 Mc. Augie, K2PQY in Massapequa, New York, would like to hear from stations throughout the country who are using n.f.m., n.p.m. and f.m. He is interested in hearing of their experiences, records of QSOs during the past summer; and is anxious to obtain a roll call of all stations operating n.f.m.-u.p.m. K5AKB reports that he is now transmitting and receiving on both six and two meters RTTY; while W8MBH in Detroit comes through with the information that five more stations in that area now have RTTY which brings the total to 34 on RTTY in his area. A net is being planned (in Detroit) for RTTY on 50.4 Mc. W8RLT has come up with a smaller TV transmitter and has been putting on demonstrations.

From the state which 99% of the six-meter boys need, Idaho, comes a letter from Roger, K7AAV. "The first opening during 1962 was observed on May 12 and since then I have worked over 120 stations of which 99% needed Idaho. Operating time here is limited to after 1730 (when I get home from work) and week ends. The rig here is a home-brew 807 running 25 watts to a 4-element beam; the receiver is a double conversion which is also home-brew. Operating frequency is 50.2 and 50.5 Mc. I have 17 states confirmed and two v.h.f. certificates since May. There isn't too much local activity on six at the present, but things are improving. K7OIE, K7CRS, K7QKV, K7KBY and W7DMP all have six-meter rigs and are on occasionally." Looks like we might have more activity out of Idaho.

K8VQN writes that he recently operated from Camp Maplehurst in Northern Michigan; call used was WA8EPA. While there Andy used a Clegg 99er to a halo up about 50 feet and had very good luck, working distances of 125 to 150 miles on ground wave and into Canada, New England and the South on skip. He also wishes to assure any and all that activity is increasing yearly in the Traverse City area and that no one need worry about contacts if he's thinking of taking a 50-Mc. rig into that area. Another tower recently erected was that of K9YKL in Wisconsin; a 52 ft. tower now supporting six elements for 50 Mc. and 18 elements for 144 Mc.

Out in Petaluma, California, John, WA6ROJ sez that he recently heard K7AAD on scatter sending dots and call sign, but other than that has had little luck with his 50 Mc. scatter work. 5 element yagi will soon come down and stacked 10-element yagis for 144 Mc. will go back up for a few months. We finally received a c.w. activity report. K1AIJ sez: "Lively c.w. activity during weekend of September VHF QSO Party. Strongest signals were W2EIC #2, K3IPM and K3GQJ. W3JZY #3 and K4VWH were both worked." Art also comments that "it was a shame (but not unusual) to hear W2NSF, W3JZY #3 and K4VWH calling CQ fruitlessly on c.w. during the contest, WA6NDZ is looking for skeds weekdays between 0700 and 0730 local time, on 50.3 Mc. QST"

CANADA/CHILE THIRD PARTY

Just at press time we learn that the governments of Canada and Chile have entered into an agreement permitting the amateurs of the two countries to exchange messages on behalf of third parties, subject to the usual conditions that no pecuniary interest is involved and that the messages handled are not important enough to justify use of commercial circuits. Canada has previously signed similar agreements with Costa Rica, Honduras, Mexico, the United States and Venezuela.

HERBERT HOOVER, JR., W2JH, PRESIDENT
W. M. GROVES, W3NM, FIRST VICE PRESIDENT
ALEX. REID, VE2BE, VICE PRESIDENT

JOHN HUNTOON, N0LQ
SECRETARY & GENERAL MANAGER

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DAVID H. HOUGHTON, TREASURER



THE AMERICAN RADIO RELAY LEAGUE

ADMINISTRATIVE HEADQUARTERS

OFFICIAL ORGAN: QST

WEST HARTFORD 7, CONNECTICUT, U.S.A.

Dear Fellow Members:

As you know, the League has a new administrative office building under construction. Our present staff quarters have been occupied for 30 years, during which time ARRL membership -- and the resultant workload -- have increased severalfold. Now our League is to have long-needed facilities from which to work more completely and efficiently for you and every other amateur in the country.

In accordance with the desires of our membership, a Building Fund drive was initiated to help finance the new structure. I am fully confident of the eventual achievement of our goal, but currently the fund has lagged somewhat behind costs incurred in construction. In talking with amateurs at conventions and club meetings I find many who plan to participate but have been "putting it off." For that reason I am writing this reminder to all League members hoping that (if you have not already done so) you will see fit to add your name now to the list of supporters of the ARRL Building Fund.

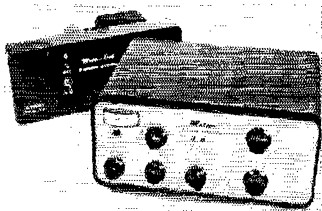
Some amateurs have been able to give substantial amounts. Many have contributed an extra year's dues. Many others have sent \$1 or more for each year of holding an amateur license. The average contribution so far is \$12.

Whatever yardstick you use to measure your own participation, make your contribution payable to the ARRL Building Fund, and please mail it now.

Sincerely -- and 73,

Herbert Hoover Jr
President W6ZHH

• Recent Equipment —



WRL SB-175 "Meteor" Transmitter

THE SB-175 is a suppressed-carrier double-sideband band-switching transmitter that will operate on the 80- through 10-meter bands. Either crystal or external v.f.o. can be used for frequency control. The power supply isn't furnished although one is available as an accessory from the manufacturer. Power input to the transmitter is rated at 175 watts c.w., 140 watts p.e.p. d.s.b., and 100 watts on a.m.

This transmitter could also be called a "power balanced-modulator," since the r.f. amplifiers, two 6DQ6B TV sweep tubes, are connected in a balanced modulator circuit for d.s.b. operation. The remainder of the r.f. circuit, an oscillator/buffer, and a driver/multiplier, are more or less conventional. A block diagram of the transmitter is shown in Fig. 1. The equipment is not limited to double sideband, but can also be operated on c.w. and a.m.

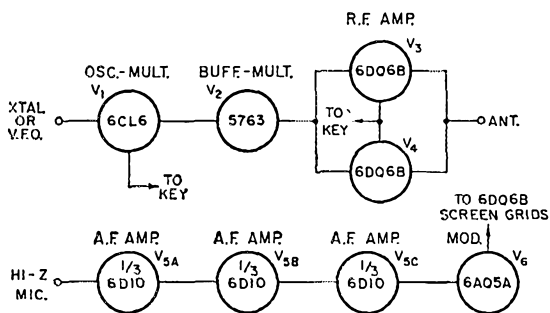


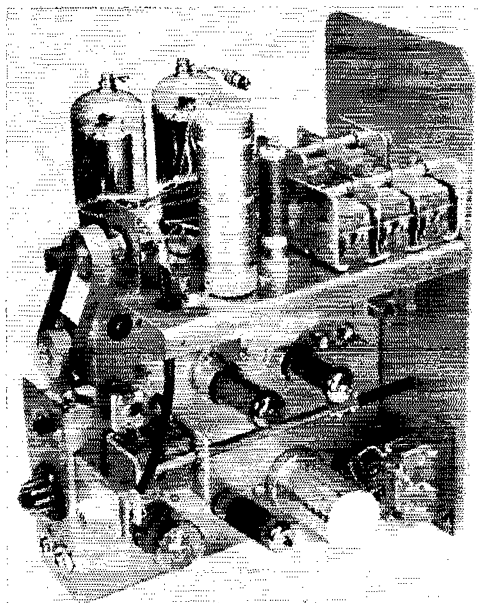
Fig. 1—Block diagram of the SB-175 transmitter.

A switch at the rear of the chassis changes a 6CL6 pentode, V_1 , from an oscillator/multiplier (with crystal control) to a buffer/multiplier with v.f.o. control. Crystals plug into a socket on the front panel; the v.f.o. must be connected to pins in an 11-pin accessory plug at the rear of the chassis. The v.f.o. output must be on 160 or 80 meters for 80-meter operation, on 80 or 40 for 40-meter operation, and on 40 meters for 20-, 15- or 10-meter output. With crystal control, 40-meter crystals are used on all bands except 80 where, of course, 80-meter crystals are used.

There are tuned circuits in the plate of the 6CL6 on 10, 15, and 20 meters. The proper one is selected by the panel BAND switch. On 40 and 80 meters, the plate load is resistive.

A 5763 driver/multiplier, V_2 , following the 6CL6 operates as a straight-through amplifier on 80 and 40, as a doubler on 20 and 10, and as a tripler on 15. The plate circuit uses an r.f. choke as a load. There is no r.f. switching in this stage when changing from band to band, but the screen voltage changes with the band-switch setting. To keep the drive more or less constant on all bands, the screen-dropping resistor is lowered in value as the frequency of operation is increased.

The unusual features of the amplifier circuit in the SB-175 are shown in Fig. 2. For d.s.b., the circuit operates as a balanced modulator, with the amplifier grids fed in push-pull and the plates connected in parallel. For c.w. and a.m., the amplifier grids are connected in parallel. When the FUNCTION switch, S_1 , is in the d.s.b. position, S_{1B} connects the grid of V_4 to one side of the circuit while V_3 is left on the other side. Switch section S_{1A} is open in the d.s.b. position. Since the 6DQ6B plates are in parallel and the



The cabinet has been removed and the chassis tipped over in this view of the SB-175. The final-amplifier tubes, shown at the top of the photograph, are mounted parallel to the chassis. The belt and pulley system adjacent to the final-amplifier section is part of the band-switch mechanism. Rear-apron components and connectors at the bottom left are mike and key jacks, crystal/v.f.o. switch, and power-supply connector.

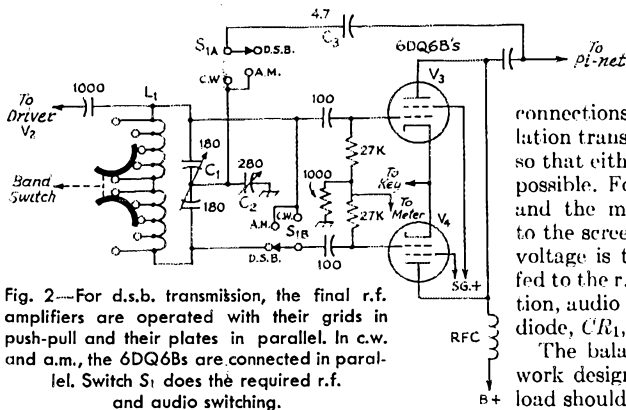
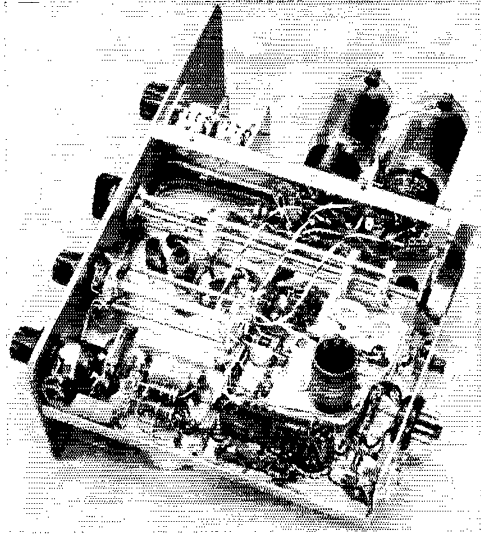


Fig. 2—For d.s.b. transmission, the final r.f. amplifiers are operated with their grids in push-pull and their plates in parallel. In c.w. and a.m., the 6DQ6Bs are connected in parallel. Switch S_1 does the required r.f. and audio switching.

grids are in push-pull, the r.f. carrier is balanced out. However, audio is applied to the screen grids of these tubes in push-pull, generating the sum and difference frequencies, or sidebands, which appear in the output. WRL rates the carrier suppression of the SB-175 at 40 db., and the model we had here showed a carrier suppression of at least this order. There are no provisions for balancing the grid-plate capacitances or adjusting the bias on each tube, but this really isn't necessary because there won't be any output anyway without screen voltage, which isn't present during "no-talk" periods.

With S_1 in either the c.w. or a.m. position, the control grid of V_4 is connected in parallel with the control grid of V_3 . Switch S_{1A} connects capacitor C_3 so that C_3 , along with C_2 , forms a capacitive bridge-neutralizing circuit. C_3 is out of the circuit in d.s.b. operation since the balanced modulator configuration is self neutralizing.



Bottom view of the SB-175 transmitter. The three printed circuits in the bottom right-hand corner are used in the modulator speech-amplifier section. The two coils end-to-end to the left of the rear-apron slide switch are the 10-meter coils in the final-amplifier grid circuit.

Audio is fed to the 6DQ6B screen grids in parallel for a.m. Fig. 3 shows how the function switch, S_1 , changes the screen connections for d.s.b., c.w. and a.m. The modulation transformer has a center-tapped secondary so that either push-pull or single-ended output is possible. For d.s.b. the center tap is grounded and the modulator output is fed in push-pull to the screen grids. On c.w. the modulator high voltage is turned off, and d.c. screen voltage is fed to the r.f. amplifiers in parallel. In a.m. operation, audio is fed through a negative-peak clipper diode, CR_1 , to the DQ6B screens in parallel.

The balanced modulator feeds into a pi-network designed for loads of 50 to 75 ohms! The load should have an s.w.r. of less than 1.5 to 1.

The speech amplifier has only one tube envelope, a Compactron, containing three triodes. This

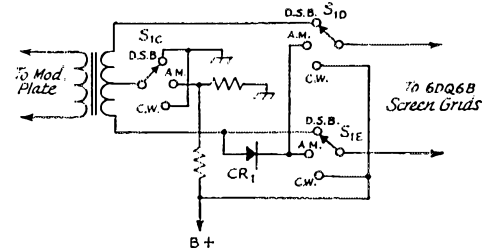


Fig. 3— S_1 switches the screen modulator for push-pull output on d.s.b. and parallel operation for a.m. The diode CR_1 is a negative-peak clipper-diode.

tube, along with several printed circuits, reduces the chassis area required for the speech stages. The speech amplifier is designed for use with high-impedance crystal or ceramic microphones. A three-way microphone jack is used in case push-to-talk operation is desired; the control circuit goes to an accessory socket at the chassis rear. A microphone gain control is located on the front panel.

Power for the SB-175 must be supplied from an external source. A power supply that will furnish all the necessary operating voltages is available from WRL as an accessory. An 11-pin connector at the rear of the chassis is used for power pickup.

For c.w., cathode keying is used with both the oscillator and the 6DQ6 cathodes keyed. The key jack is at the rear of the cabinet.

The SB-175 is housed in a gold and brown

WRL SB-175 Transmitter

- Height: 5 1/8 inches.
- Width: 11 1/2 inches.
- Depth: 8 1/2 inches.
- Weight: 10 pounds.
- Power Requirements: 6.3 volts a.c., 1.8 amp., or 12.6 volts a.c., 2.1 amp.; 300 volts d.c., 125 ma.; 600 volts d.c., 300 ma.
- Price Class: \$100.00.
- Manufacturer: World Radio Laboratories, 3415 W. Broadway, Council Bluffs, Iowa.

perforated cabinet. The front panel has seven operating controls: the FUNCTION and BAND switch, plate TUNE and PLATE LOAD, GRID, MIC gain, and METER switch. The meter switch allows reading either plate current (actually cathode

current) or grid current. The meter is calibrated with a relative scale which includes limit marks as aids in tuning up in the various modes. The crystal jack is also located on the front panel.

— E. L. C.

Trans-Pro C.W. Monitor

THE term "Monitor" really doesn't do justice to the Trans-Pro TN-1. This device not only furnishes a side tone when the station transmitter is keyed, but also squelches the receiver output during key-down periods. The action is similar to that described by Warner¹ in his transistorized "Little Oskey."

The TM-1 is completely transistorized and contains its own battery power supply. When using the monitor, headphones and key are plugged into the unit and connections are made from the monitor to the transmitter's key terminals and the receiver's audio output. With the key up, whatever comes out of the receiver will be heard in the headphones. When the key is closed, the receiver output is automatically disconnected from the headphones, and a side tone, generated in the monitor, will be heard instead. The volume and pitch of the side tone is adjustable (pitch: 700-1200 c.p.s.). A function switch permits bypassing the unit so that the key can

¹ Warner, "A 'Solid' Look at 'Little Oskey,'" *QST*, August, 1962.

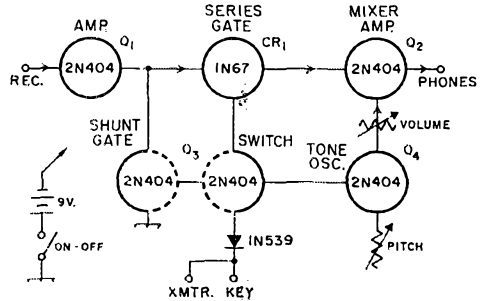


Fig. 1—Block diagram of the Trans-Pro C.W. Monitor

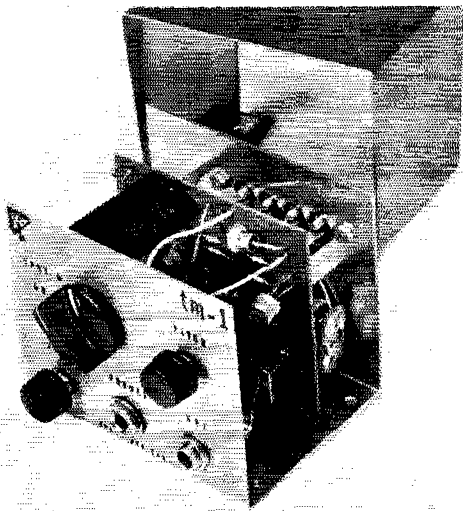
be closed for "spotting" purposes without the receiver output being squelched or a side tone being generated. Of course, the monitor can be used as a code-practice oscillator simply by turning off the transmitter or by removing the transmitter key leads.

A block diagram of the Trans-Pro monitor is shown in Fig. 1. With the battery switch on and the key open, audio signals from the receiver are amplified in transistor Q_1 , pass through the normally-closed series-gate diode switch, CR_1 , through the transistor mixer, Q_2 , and on to the headphones. When the key is closed, transistor Q_2 opens the diode switch, CR_1 , and also shorts the output of Q_1 to ground through the shunt gate. Switch Q_3 also turns on the transistor tone oscillator, Q_4 . Oscillator output goes through the mixer to the earphones.

The 1N539 diode is connected between the monitor and the transmitter to provide isolation. Without it, the transmitter could "key" through the monitor. The diode shown in Fig. 1 is connected for cathode-keyed transmitters, and will work in transmitters with up to 300 volts across the open key.

Models are available for either cathode-keyed (TM-1) or grid-block-keyed (TM-1G) transmitters.

— E. L. C.



Most of the components are mounted on an etched circuit board which sits vertically in the center of the chassis. The board is supported by three metal posts attached to the rear wall of the chassis. The self-contained power supply is a 9-volt battery. Battery terminals are just visible behind the component board at the bottom right of the photograph. Front-panel controls and connectors are from left to right: VOLUME, function (SPOT, ON, OFF), PHONES, PITCH, and KEY. A rear apron terminal strip, just visible in the photograph, connects to the transmitter key jack and receiver audio output.

Trans-Pro C.W. Monitor

Height: 4½ inches.

Width: 1⅞ inches.

Depth: 3½ inches.

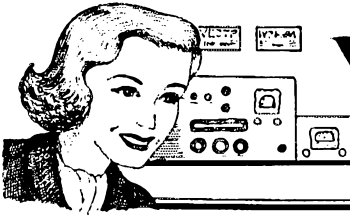
Power Requirements: Self-contained

9-volt battery.

Price Class: \$17.00.

Manufacturer: Trans-Pro Labs. 263

Bouchard Ave., Dracut, Mass.



YL NEWS AND VIEWS

CONDUCTED BY ELEANOR WILSON,* W1QON

Between Us Girls

THEY bend with Jack La Lanne, stretch with Debbie Drake, have their wigs set weekly, clamor for creams "guaranteed" to erase wrinkles, then sprinkle gold dust on their eyes. We could go on, but, girls, you know what we mean. In these days of going modern" we're in the midst of it all. (We're not summarily saying it's all bad either.) But, licensed YLs, we've got something that doesn't come in a jar, but something exclusively ours that we can turn to with the twist of a knob that can light up our faces better than any foundation, that can stimulate us more deeply than any vibrating brush, that can truly give us that magical "inner glow."

It comes not quite for free — but for the price of a ham ticket, plus a rig to operate. You say you realize this? Sure you do, but occasionally it is good to pause long enough to reflect on what we have at our fingertips. Of course, we don't get on the air deliberately to scintillate, to put a sparkle in our eyes. We didn't seek our licenses for that purpose. But the stimulation, the "I feel good all over feeling" comes anyway!

Girls, we're sitting pretty! We already have what countless women are looking for, or if we may say so, *should* be looking for. We have the opportunity to be part of something bigger in this life than our own little world within the confines of our own home. We have a unique opportunity to serve others, and if helping others is a large

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



W7HHH reads the inscription on the award she accepted in posthumous honor for her OM, W7GNJ.

part of what life should be all about, we have an opportunity for service that is unique.

Milady ham, you have a few extra blessings to count!

Oregon Hams Honor W7GNJ Posthumously

Honorary chairmanship of the Oregon Amateur Radio Association was conferred posthumously upon Carl H. Austin, W7GNJ, at ceremonies during the ARRL National Convention in Portland, Labor Day weekend. Mr. Austin's widow, Bea, W7HHH, of Bend, Oregon, accepted a cup in recognition of her late husband's outstanding career as an amateur radio operator.

Selection of W7GNJ for the honor was made unanimously by the OARA nominating committee and confirmed by the Affiliated Council of Amateur Radio Clubs, Inc. of Portland, in recognition "of the respect and high esteem in which W7GNJ was held by his fellow amateurs." W7GNJ was the 25th amateur to have his name engraved on the OARA pin. The award was instituted in 1932.

Mrs. Bea Austin, W7HHH, who served as president of the YLRL in 1962, will hold the honorary chairmanship until the next OARA convention, to be held in Eugene in April 1963.

YL Club Field Day Scores

Last month we reported all of the scores and participation in the 1962 Field Day that we had received. Our thanks to Ellen White, W1YYM, of ARRL headquarters, for the following information on YL clubs that participated.

(Scores show QSO total, power class, nr. operators and final score)

2-Transmitter Class:

- W3AAU/3 Penn-Jersey YL RC
365-AB-7-2682 (scores sent by W3AAU)
- K7UER/7 Portland Roses
200-AB-6-1194 (scores sent by W7ZMN)

3-Transmitter Class:

- K5SKF/5 Gulf Area YL AR Klub (GAYLARK)
581-B-20-3636 (scores sent by K5BJU)

Fourth International Convention of the YLRL

It's not until June 19-21, 1964, but the Fourth International Convention of the YLRL is already looming large in the thoughts of YLRLers everywhere. 1964 marks the 25th anniversary of the Young Ladies Radio League too, so the convention should be the highlight of the year's celebration. And when a group of YLs like the Huckleys Belles, sponsors of the convention, start working hard on plans two years in advance, it can be expected that the event will be top-notch.

The convention site is Lincoln Lodge, two miles west of Columbus, Ohio. Shirley Rex, K8MZZ (new YLRL Treasurer) is Chairman, with Ruth Rickett, W8LGY, Co-Chairman. Alice Geib, W8OTK, is Business Manager. Marie Helminski, W8MBI, is Publicity Chairman. Toni Chapman, K8PXX and Joy Cornell, K8GWF, are in charge of prizes. Favors and Decorations will be handled by Marge Farinet, K8ITF.

Reserve the big dates now — June 19, 20, and 21, 1964!

An OM Suggests

Carl C. Drummeller, W5EHC, writes: "For some time there has been a need for a title to designate a mature



Bettie Mayer, K7BED; Ruth Donnelly, K7ADI; and Mary Govig, K7BIL (l. to r.) tend the Portland Roses booth at the National Convention. The hanging aprons were decorated by YL clubs around the country and were later awarded as prizes at the YLRL dinner. (Photo by W7HPT).

female amateur radio operator. 'YL' is okay, but sometimes it is a bit out of place when applied to a great-grandmother.

"The term assigned by international convention to the amateur radio service is AT. By logic, an amateur operator might be designated as an ATA. By further reasoning in the same channel, a lady amateur operator could be a LATA.

"Perhaps something of this nature might get away from the insulting term XYL (no longer young, no longer a lady)."

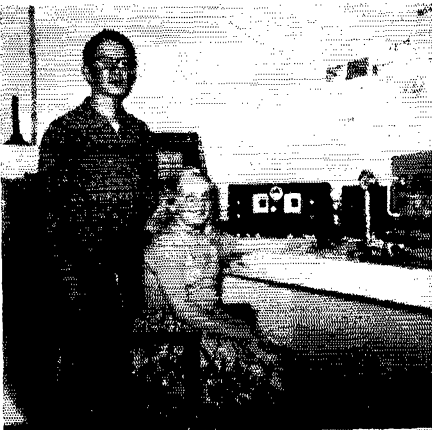
We're still open to all suggestions in the YL-XYL designations debate! — W1IQON

YL Doings at the National Convention

From Beverly Welker, W7HPT, has come the following report of the YL part of activities at the 1962 ARRL National Convention in Portland, Oregon, Labor Day weekend. W7HPT is publicity chairman of the Portland Roses Club, and we are grateful to her for giving those of us not lucky enough to have been there in person a glance at what went on.

"The 1962 ARRL National Convention in Portland, Oregon was a complete success, as far as the Portland Roses are concerned. We met many YLs, exchanged ideas, and had a great deal of fun being official hostesses.

"One of the meeting points for the YLs was the Portland



Ten-year-old Shirley Vainio, KN7TBM, and her 14-year-old brother Ed, K7MWL, would be glad to sked anyone who wants a Washington QSO on either 20 or 40 meters

Shirley and Ed live in the town of Edmonds in the Evergreen state.



ARRL President Herbert Hoover, jr., W6ZH, was one of the visitors who stopped by at the busy Portland Roses booth. Committee member Mary Govig, K7BIL, sports one of the distinctive Portland Roses bonnets. (Photo by W7HPT.)

Roses booth, located in the Exhibit Hall of the Memorial Coliseum. The most colorful part of the exhibit was furnished by the YLs in the form of brightly colored aprons decorated by YL clubs around the country. The aprons were later awarded as prizes at the YLRL dinner.

"The booth also featured posters of YLRL certificates, photos of the Roses, and certificates offered by the club. On display were the YLRL Scrapbook and the scrapbook of the Third International Convention of the YLRL. A feature of the booth that proved popular with all visitors was the Oregon agates and polished beach pebbles that were free for the taking.

"Among the visitors we were pleased to welcome to the booth were ARRL President Herbert Hoover, jr., W6ZH; Ethel Smith, K1LMB, founder of the YLRL; and Helen Mailet, W7GGV, ARRL SCM for Idaho. The YLs and XYLs we welcomed would be too lengthy to list, but we enjoyed every eyelash QSO.

"Two of the featured events for ladies were the Saturday fashion show and shopping tour at Lloyd Center, the world's largest shopping center of its kind and the Sunday



Last month OM WA6HUW "exposed" the art of feigning housework while hamming employed by his good wife Ruth, WA6RCR. Here is Ruthie and her mischievous grin. (We can only assume that she stole a few moments from her arduous housecleaning chores for a quick QSO on 40 c.w.) But it's all in good fun, WA6HUW says, and he's really well-adjusted about the whole thing.



The Swensons, Henry, W1QQO, and Grace, W1RLQ, of Morningdale, Mass., (left) were happy to share their microphone last summer with visiting guests, the Tendrons, Monique and Jean Pierre, FG7XL, (right) of Guadeloupe, French West Indies. Grace and Monique have chatted often on 15 and 20 meters. W1RLQ is a notable DXing YL, having worked 215 countries with 205 confirmed and a sticker for 75 DX YLs. Grace suggests a contact with Monique if you would like to QSO a charming YL. (Photo courtesy Telegram-Gazette.)



DJ4XL, Lisa Doell, was the DX "adoptee" of Grace Swenson, W1RLQ, in 1962. Lisa is one of West Germany's most active YLs on 15 meters. (Photo via W1RLQ.)

sightseeing tour in Portland's West Hills, that included such spots as the International Rose Test Gardens and Portland Zoo.

"The only event exclusively for licensed YLs was the dinner Saturday night. It was presided over by Helen Maillet, W7GGV, who also served as chairman of the YLRL Forum. Letters were read by Ethel, K4LMB; Marty, K0EPE; Fran, K7MRX; Irma, K6KCI; Helen, W7GGV; and Dot, K0GIC. These letters were from YLRL officers who could not attend. Letters were also read from W5RZJ, Louisa, YL Editor of *CQ* and from W1QON. Reports were given by Beth, W7NJS; Bettie, K7BED; Bertha, K7CHA; and Bea, W7H11H; on different phases of YL activity. Various YLRL projects were discussed. YLs were present from the 4th, 5th, 6th, 7th, 9th, 10th, and KL7 call areas, with a total of 47 in attendance.

"On Sunday 82 women attended an 'herb breakfast.'



The Hoosier Amateur Women's Klub (HAWK) celebrated its 5th anniversary in September with a party at the QTH of Mildred, K9ZLB, in Plymouth, Indiana. Shown operating at K9ZLB's rig are Adah, W9RTH, club director (seated); Fran, K9ILK, outgoing president (center); and Butch, K9IXD, director (right). HAWK members now number about one hundred.

Alena Jacobson gave an interesting talk on the uses of herbs in the diet.

"Sunday afternoon 104 YLs and XYLs attended a luncheon, at which George Crockett, W7GG, gave an illustrated talk on the wildflowers of the Northwest.

"The fun event for YLs and XYLs was the SWOOP (Suffering Wives of Operators Protectorate) breakfast, with 116 attending. Portland Roses dressed as impoverished ham widows. Tales were spun by XYLs of the miseries they had 'suffered' by being wives of hams. XYLs Mrs. Lois Richardson and Mrs. Harriette Maxes were selected as SWOOP sweethearts, following their heartsearing stories of broken teeth and electrical shocks!

"Many prizes and favors were given at all meals, and Margaret Stewart, W7FVF, won the afghan knitted by the Portland Roses especially for the event.

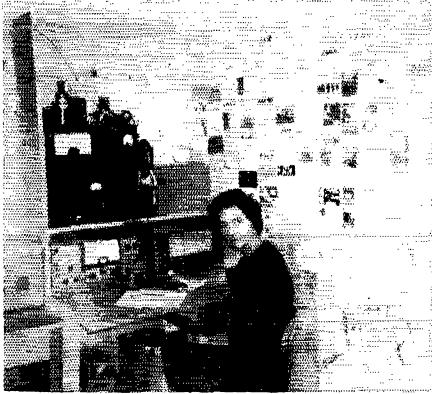
"The Portland Roses would like to thank all those who helped with the convention and everyone who attended for making it, they feel, one of the best conventions ever!"

Clubs & Nets

YL Welcome Net— All YLs are cordially welcomed to this net which meets Wed. at 1400 GMT on 3900 kc. W8ATB is NCS; K8LHF is alternate.



Three HAWKS from Texas drove all the way up to Indiana to enjoy the club's anniversary party. Estelle, K5ZBM; Mary, K5RWR; and Dell, WA5DHC (l. to r.) put their mobile rig to good use during the long drive.



In Norway applicants for amateur licenses must be at least 16 years old, according to LA6ZH, Ruth Tollefsen, who was licensed herself in April 1961. Ruth's eldest son, LA5CH, is presently in California. Ruth's DXing hours are mainly in the morning. (Photo by W1RLQ.)

Loaded Clothes Line Net — New officers are Pres. K5ECP; V.P. K0EPE; Secy. K0ZRI; Treas. K0GIC; Pub. K5OPS/0. The LCL Net meets Monday at 1600 GMT on 7235 kc. K0GAS is NCS.

Georgia Peaches — Winter frequency for the Georgia Peach Net which meets Thurs. at 1400 GMT is 7260 kc. K4ZNK is net manager. New officers are Pres. K4LIU/4; V.P. K4IFF; Secy. K4RIU; Treas. K4HSC.

LARK — New officers installed in Sept. were Pres. W9UON; V.P. K9IWR; Secy. K9BWJ; Treas. K9ZVW; Pub. W9GJB.

Pellicol Operators of Six — New officers are Pres. K3DIG; Secy. K3KYI; Treas. K3BAK; NCS K3COP. The POOS meet Thurs. at 0200 GMT on 50.5 Mc.

Portland Roses — New officers are Pres. W7ZMN; V.P. W7REU; Secy. K7ADI; Pub. W7NJS.

B'ROME — The club conducts three nets as follows: Yankee Lassies, Wed. at 1330 GMT, 3900 kc.; Six Meter Net, Wed. 1900 GMT, 50.65 Mc.; C.W. Net Fri. 1330 GMT on 3600 kc. Informal luncheons are held on the first Saturday



The result of a contact on six! All members of the Rhode Island State Phone Net and the Roger Williams VHF Society attended the wedding of Tony Cline, K1PNI, and Mary Jervis, W1CFT, in Coventry, R. I. recently. The Pawtucket ARC presented the happy couple with a plaque on which was mounted a gold microphone with the inscription: "To commemorate the merger of W1CFT and K1PNI, Sept. 1, 1962". K1PZY was master of ceremonies at the reception. (Photo by KN1UXS)

each month at the 1812 House, Rte. 9, Framingham, Mass. W4YLRG — New officers are Pres. K4EAM; V.P. W3RXJ; Secy. W4TVT; Treas. K3SQX.

Coming Events

YL-OM Contest — The fourteenth annual, conducted by the YLRL. Phone section March 2-3; C.W. section March 16-17. Rules later.

Ladies Day — The second Monday of each month is reserved for just plain YL ragchewing on all bands. Let the laundry go in favor of a fun day of YL QSOing.

Strays

Are you a Phi Lambda Epsilon? If so, get in touch with Danny O'Connell, K0UWZ, 625 Highlands Drive, Springfield, Missouri.

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The Wally Byam Caravan Club is a group of trailer fans who travel throughout the world and hold an international rally or convention once a year. On June 30 — July 5 of this year their rally was held at Auburn, Washington, and among the group were 18 hams. They have formed a club known as the Amateur Radio Club of the Wally Byam Caravan Club. Earl Johnston, W0ICV, was elected president, and Robert M. Smith, W0LD, was elected secretary. On-the-air meetings are held the first Monday of each month on 14.260 kc., at 0200 GMT. For further info write to W0ICV at 619 Buchanan St., Topeka, Kans.

- - - - -

W5DTL is Dr. John A. Hunter, president of Louisiana State University.

K6UMV was working on the electrical system of a Navy P2V antisubmarine plane which was being reconditioned and in the radio compartment came across a QSL from KG4AA to WA2MET. WA2MET is mighty lucky that a fellow ham found that scrap of paper, for otherwise it might have been given the heave-ho.

- - - - -

If you play the brass as well as pound it — that is, if you are a member of a drum or bugle corps — contact Joe Hoener, K0FYL, Great Bend, Kansas.

STOLEN HAM GEAR

A Gonset G-76 (serial no. B-1195) and its power supply (serial no. 1094), together with a Shure 10 4 microphone, were recently stolen from Lemond Meadows, K2HPW, 2645 Clydesdale Ct., Oceansville, N.Y. If you have any info on this gear, write, or phone collect Rockville Centre RO 4-0598.

I.A.R.U. News



INTERNATIONAL HAMFEST — BRAZIL

The Association of Brazilian Radio Amateurs, LABRE, through its Sao Paulo section, will sponsor an "International Meeting and Symposium of Radio Amateurs" April 7 to 11, 1963. This will be part of an International Aeronautics and Space Fair being held in Sao Paulo at that time. A symposium of radio amateurs will be held to enable amateurs to express ideas, discuss matters and introduce themes which might be included in future International Telecommunications Congresses. Subjects for this symposium will range from TVI problems to international legislation.

In addition to the many interesting discussion groups, there will be an exhibit of amateur equipment produced in various countries, special visits available to the electronic and radio industries of Sao Paulo, and a program of entertainment.

More details will appear in a later issue of *QST*.

QSL BUREAUS OF THE WORLD

For delivery of your QSLs to foreign amateurs, simply mail cards direct to the bureau of the proper country as listed below. Cards for territories and possessions not listed separately can be mailed to the bureau in the parent country; e.g., cards for VPSs go to RSGB in England. W, K, VE and VO stations only may send foreign cards for which no bureau is listed to ARRL.

For service on incoming foreign cards, see list of domestic bureaus in most *QST*'s under "ARRL QSL Bureau." **Bold face listings indicate corrections or additions.**

Algeria: G. Deville, FA9RW, Box 21, Maison-Carree, Alger
Angola: L.A.R.A., P.O. Box 484, Luanda
Argentina: R.C.A. Carlos Calvo 1424, Buenos Aires
Australia: **P.O. Box 41, Box Hill, E. 11, Victoria**
Austria: Oe. V.S.V. Vienna 1/9, Box 999
Azores: Via Portugal
Bahama Islands: (VP7) **D. R. Thompson, VP7NS, Box 48, Nassau**
Bahrain: (All MP4), **Ian Cable, MP4BBW, P.O. Box 425, Awali.**
Barbados: Arthur St.C. Farmer, Storms Gift, Brandons, Deacons Road, St. Michael
Belgium: U.B.A., Postbox 634, Brussels
Bermuda: R.S.B. P.O. Box 275, Hamilton
Bolivia: R.C.B., Casilla 2111, La Paz
Brazil: I.A.B.R.E., Caixa Postal 2353, Rio de Janeiro
British Guiana: D. E. Yong, VP3YG, Box 325, Georgetown
British Honduras: L. H. Alpuche, VP1HA, P.O. Box 1, El Cayo
Bulgaria: Box 830, Sofia
Burma: B.A.R.T.S., P.O. Box 800, Rangoon
Canton Island: **Phil Preece, Postmaster Canton Island,** USPO 06-5000, Canton Island, Phoenix Group, South Pacific Via **Honolulu, Hawaii**
Ceylon: P.O. Box 907, Colombo
Chile: Radio Club de Chile, **P.O. Box 13630, Santiago**
China: M. T. Young, P.O. Box 16, Taichung, Formosa
Columbia: L.C.R.A., P.O. Box 584, Bogota
Congo: (TN8) **Albert Noger, TN8BA, Box 2012, Brazzaville**

Congo: (9Q5) U.G.A.R. QSL Bureau, P.O. Box 3748, Elisabethville, Katanga

Cook Island: Bill Scarborough, % Radio Station Rarotonga

Costa Rica: Radio Club of Costa Rica, Box 2412, San Jose

Cuba: F.A.R.A.C. QSL Bureau, P.O. Box 6906, Habana

Cyprus: Mrs. E. Barrett, P.O. Box 219, Limassol

Czechoslovakia: C.A.V., Box 69, Prague 1

Denmark: E.D.R. QSL Bureau, Ingstrup

Dominica: VP2DA, Box 64 Roseau, Dominica, Windward Islands

Dominican Republic: RCD, P.O. Box 157, Ciudad Trujillo
East Africa: (VQ1, VQ3-5H3, VQ4, VQ5-5X5) **P.O. Box 3433, Kampala, Uganda**

Ecuador: Guayaquil Radio Club, P.O. Box 5757, Guayaquil

Ethiopia: Telecommunications Amateur Radio Club, P.O. Box 1047, Addis Ababa

Fiji: S. H. Mayne, VR2AS Victoria Parade, Suva

Finland: S.R.A.L., Box 306, Helsinki

Formosa: **Taiwan American Radio Club, Box 13, USARSCAT, APO 63, San Francisco, California**

France: R.E.F. BP 26, Versailles (S & O).

France: (F7 only): F7 QSL Bureau, MARS, Headquarters U. S. European Command, APO 128, New York, N. Y.

Germany (DL2 calls only): G. E. Verrill, G3IFC, 10 Seahorse St., Gosport, Hants, England

Germany (DL4 & DL5 calls only): DL4 & DL5 QSL Bureau, % DL4AVJ Base MARS Station, APO 130, New York, N. Y.

Germany (other than above): D.A.R.C., Box 99, Munich 27

Gibraltar: E. D. Wills, ZB21, 9 Naval Hospital Road

Ghana: 9GICW, Hans Suss, P.O. Box 1945, Kumasi

Great Britain (and British Empire): **R.S.G.B. QSL Bureau, G2MI, Bromley, Kent**

Greece: George Zarakis, P.O. Box 561, Athens

Greece (Unlisted SV8s only): **Signal Officer, Hqtrs. IJUSMAGG APO 223, New York, N. Y.**

Greenland (OXs only): Via Denmark

Greenland (KGIs only): **All KGIF's to MARS Director, 2004 Comm. Sqdn., APO 121, N. Y., N. Y. All other KGI's to MARS Director, 1983 Comm. Sqdn., APO 23, N. Y., N. Y.**

Grenada: VP2GE, St. Georges

Guam: M.A.R.C., Box 445, Agaña, Guam, Mariana Islands
Guantanamo Bay: Guantanamo Amateur Radio Club, Box 55, NAS, Navy 115, F.P.O., New York, N. Y.

Guatemala: C.R.A.G., P.O. Box 115, Guatemala City

Haiti: Radio Club d'Haiti, Box 913, Port-au-Prince

Honduras: O. A. Trochez, P.O. Box 244, Tegucigalpa, D. C.

Hong Kong: Hong Kong Amateur Radio Transmitting Society, P.O. Box 541, Hong Kong

Hungary: I.I.S.R.L., Postbox 185, Budapest 4

Iceland: Islenskir Radio Amatorar, Box 1058, Reykjavik

India: P.O. Box 531, Delhi 1

Iran: **Joseph L. Mattinly, EP2BN, American Embassy APO 205, New York, N. Y.**

Ireland: I.R.T.S. QSL Bureau, 24 Wicklow St., Dublin 2

Israel: I.A.R.C., P.O. Box 4099, Tel-Aviv

Italy: A.R.I. Viale Vittorio Veneto 12, Milano, Italy

Jamaica: Ruel Samuels, VP5RS, 34 Port Royal St., Kingston

Japan (JA): J.A.R.L., Box 377, Tokyo

Japan (KA): F.E.A.R.L. (in), APO 925, % Postmaster, San Francisco, Calif.

Kenya: **See East Africa**

Korea: Korea Amateur Radio League, Central Box 162, Seoul, Korea

Kuwait: William N. Burgess, 9K2AZ, % Kuwait Oil Co., 14 — 5th St. North, Kuwait, Persian Gulf

Lebanon: R.A.L., Ahmadi, B.P. 3245 Beirut

Liberia: Ken Hale, EL4A, Le-Tourneau of Liberia, Roberts Field.

Libya: 5A QSL Service, Box 372, Tripoli

(Continued on page 178)

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

When?

The subject of radar DX arose here last month during our continuing reflections on the remarkable Mr. Marconi. Lest you fall into the error of regarding Guglielmo as a mere tinkerer who happened to get lucky with a spark gap and coherer, here's an excerpt from his prophetic speech at an IRE shindig in New York City on June 20, 1922:

As was first shown by Hertz, electric waves can be completely reflected by conducting bodies. In some of my tests I have noticed the effects of reflections and deflections of these waves by metallic objects miles away.

It seems to me that it should be possible to design apparatus by means of which a ship could radiate or project a divergent beam of these rays in any desired direction, which rays, if coming across a metallic object, such as another steamer or ship, would be reflected back to a receiver screened from the local transmitter on the sending ship, and thereby immediately reveal the presence and bearing of the other ship in fog or thick weather.

DX men being what they are, it was only a matter of time before they looked beyond Mama Earth for something far enough away to make pulse techniques more interesting. Hence such propagational propositions as moon-bouncing and Project Winkle. But passive spatial reflection, already old hat in terms of the art, is a fringy variety of communication. One soon wearies of one's own echo in the valley and yearns for a live response from someone on the other side. RCA's M. Handelsman, at this year's Western Electronics Show and Convention, delivered a provocative paper on possible celestial two-ways, reported by L. Tolopko of *Electronics News*:

... He listed factors that enter into the calculation of the over-all probability of communicating with intelligence on another planetary system. Among them were the following: (1) Fraction of stars with planets. (2) Fraction of such stars with sufficiently long and stable existence for evolution of life on its planets. (3) Fraction of such planets with stable circular orbits. (4) Fraction of such planets with orbits within favorable zones for life. (5) Fraction of such planets with mass, atmosphere and biochemical environment favorable for life. (6) Fraction of such planets on which civilizations evolve technically capable of long-range communications. (7) Fraction of such civilizations with the requisite longevity or rebirth rate for coincidence of at least their signal's arrival with our listening period. (8) Fraction of such civilizations who can and want to establish communications with us.

Mr. Handelsman cautioned that there are undoubtedly many more factors, some known but overlooked, and others unknown at present. To receive a signal from at least one civilization within 1000 light years, an examination of some 2×10^5 likely stars in a field of about 10^7 stars is required, Mr. Handelsman estimated. This examination is based on optimistic assumptions—the civilizations have a longevity of 50,000 years, and no previous intercommunication. For much shorter longevities, an exchange of messages is not possible as the round-trip time exceeds the lifetime of the civilizations, Mr. Handelsman said.

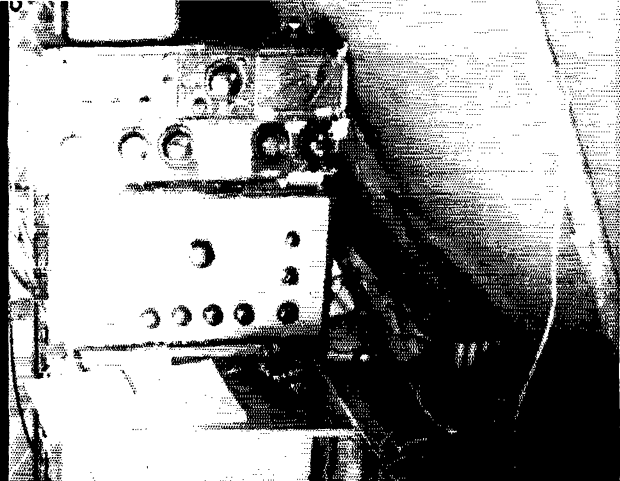
... He described a system to search 2×10^5 stars within a period of ten years, looking for a contact signal being broadcast from as far away as 1000 light years. It was assumed that one large antenna would be used twelve hours a day, and the search time would be ten minutes a star, allowing 3.3 minutes for slewing and positioning.

Mr. Handelsman assumed that a determined transmitting civilization is willing to expend a total of \$200 billion per year, which might represent a significantly less proportion of its resources than it would to us. It was also assumed that about 20 per cent of this goes to prime power generation and the remainder to conversion to microwaves so that the radiated power is about 10^{11} watts.

Okay, Mr. Handelsman, but we still want to see the color of those QSLs. Don't snicker, though, OMs. Why, even as you read this some three-headed four-armed five-eared radio amateur a few light years away may be puzzling over that strange noise-increase he observes on 14



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



UB5UG combined a recent mountain-climbing trip with western-style DXpeditionary work as UB5UG/UJ8. Yuri scored sideband QSOs from a glacier QTH at the 13,000-ft. level with a 75-100-watt rig, ground-plane and long-wire. Generator troubles, a shot 5Z3 rectifier and poor propagation conditions beset the endeavor. These photos come courtesy K8GHG, UB5UG/UJ8 QSL club.

Mc. every so often when an ARRL DX Contest comes along.

What:

Getting back to earth again, WIBB reminds us it's time for the Annual Transatlantic and World-wide 160-Meter DX Tests, a ham DX tradition of long standing. From 0500 to 0730 GMT on December 2nd and 16th, January 6th and 20th, February 3rd and 17th, there will be concentrated I.R.-A.C. intercontinental efforts. Stew suggests that, as in the past, W/K/Vs call *CQ DX TEST* the first five minutes of each hour, listen five minutes, call again for five minutes, etc., till the QSO ball is rolling. Non-W/K/Vs should call during even 5-minute periods, listening for our side during the odds. After two-ways start poppin', of course, it's each man for himself. . . . Led off by K3MBF, our east coast gang began working VK3s AKR and HG on 160 back in September, and W3GQF apparently scored the first transatlantic crossing of the new season with G6QB on September 16th. Westerners have already worked ZL3RB, and VP8GQ began working Statesiders in midsummer. JA6AK tells WA6IVM he hears our Sixes at good strength on topband. Check the most recent tabulation of "Bands Available" in *QST* or your *Handbook* to ascertain what 160-meter frequencies, if any, are available in your area. Hope you can join the fun!

Jeeves & Co. gratefully acknowledges activity reports from the following stations in these respective bands:

20 c.w.: Ws 1GDQ 2JBL 7DJU 7LZF 7YAQ 8YGR 9CED, Ks 1JFF 2UYG 3MINJ 6TZX 8BSH 9CZV 0GVA 0JPL 0VSH, WAs 2HLH 2MUA 2PJJ 2RQZ 2RUB 6HRS 6VAT 9AEA, DL9LI, 11ER and VE7BBB.

20 phone: W5DLN, Ks 1JFF 2TDI 2UYG 6TZX 9CZV 0GVA, WAs 2HLH 2MUA 2PJJ 2RQZ 2RUB 9AEA and XZ2DW.

15 c.w.: Ws 1GDQ 2JBL 7YAQ, Ks 3CUI 4SQS 9CZV 9TZK 0JPL, WAs 2JIS 2MUA 2PJJ 6HRS 9AEA 8ATT 0BHL, DL9LI and 11ER.

15 phone: W1BPM, K9s CZV TZK, WAs 2JIS 2MUA 2PJJ and 9AEA.

15 novice: KNs 1VWL 3SMR 3UOV, WVs 2ZVJ and 6YAT.

10 phone: W9CSC, WA2s PJJ and RUB.

40 c.w.: Ws 1GDQ 2JBL 6RCV 7DJU 7YAQ 0CED, Ks 8BSH 8DCP 0GVA 0JPL 0VSH, WAs 2HLH 2RUB and 0ATT.

40 phone: K1JFF.

80 c.w.: Ws 7DJU 7YAQ 8IBX, K8JPL, WAs 2RUB and 6IVM.

Next month we intend to present the usual cross-section of DX activity on all bands to get the new DX year off to a running start. Good fishin', gang!

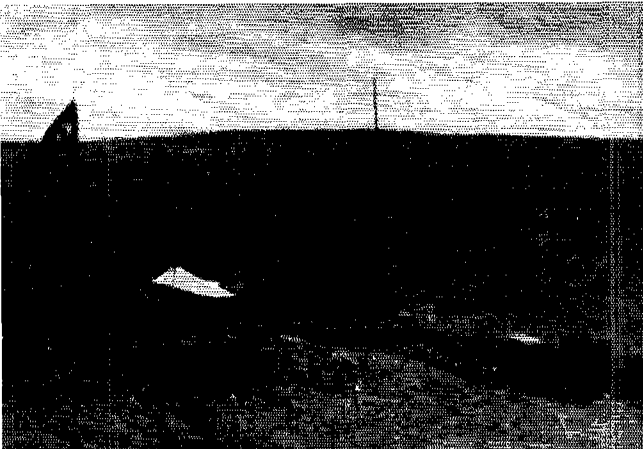
Where:

Asia — ARRL Assistant Secretary W1ECH has word from MP4BBW that Ian will handle all inbound Bahrain,

Das, Muscat, Oman, Qatar and Trucial Oman QSLs through his *Callbook* QTH. . . . W0ZY relays an apology from W2AYN (HL5X, ex-1P5X-EQ2AT-etc.) for tardy response to correspondence. Now working with the Ministry of Communications and National Police of South Korea, W2AYN is adding to the fifteen-year overseas tour that has taken him from Thule through Amazon jungles to both ends of Asia. . . . Regarding UB5UG/UJ8 confirmations, QSL aide K8GHG states that replies are sent direct to W/Ks who supply self-addressed stamped envelopes, otherwise via bureaus. . . . "Have closed operation at KA2AB," writes W1CJD/75. "I still have a good supply of cards if any replies have gone astray. My address (in the list to follow) will be good for the next nine months." . . . When VS9API and friends make it to the Kuria Marias G2BVN will handle QSL matters, according to VERON's *D Xpress*. . . . WGDXC's *D X Bulletin* indicates that G3JJH may be of assistance in confirming certain VS9MB Maldives QSOs. . . . The *D Xer* of NCDXC has it that 9K2AD invites inquiries on late cards.

Africa — Informative W1ECH advises that 6W8BF can handle QSLs bound for any Senegal amateur, as can REF of France. Furthermore, TN8BA writes Gary that he relays cards for TL8 TN8 TR8 and TT8 areas, while ZD6RM volunteers the same for all Nyasalanders. . . . XT2Z tells W1ECH his current *Callbook* address should be good till June of '63 whereafter he will return to Switzerland for keeps. Meanwhile, QSLs for Louis's October Upper Volta operation may go via HB9ZY. . . . W1WPO of the ARRL DXCC Desk and W1ECH call attention to prefix changes for Sierra Leone and Uganda. ZD1s become 9L1s, VQ5s 5X5s. . . . "It is my policy to QSL 100 per cent on receipt of QSLs from stations worked," assures ZD6GA, a new s.s.b. convert. . . . W8KX reports DXcellent results with W2SAW's mint foreign stamp enclosures when other means failed. Walt further advises that 9U5BB helps out with 9U5DS QSL chores when the latter is away in Belgium. "A few words in highschool French help considerably in obtaining cards from former French and Belgian colonies," hints W8KX. . . . K3MINJ can give prompt response to s.a.s.e.-bearing W/K requests for 5N2R8B QSLs but non-Yanks should apply to Jim's Nigeria address. . . . A self-styled 7-Mc. CT3AV complicated W3KVQ's QSL labors in behalf of that Madeira station, according to NCDXC. CT3AV rarely hits 10. The *D Xer* also suggests petition to CT1LL if you're still short CR5AR's pasteboard.

Oceania — KW6CJ writes W1ECH that he prefers incoming Wake cards be addressed to P.O. Box 445 rather than old Box 127. "The old one was my business address, and QSL activity has reached such a degree that it would be better to use my new personal box number." . . . NCDXC recommends KC6BK's current QSL as a collector's item for the truly discerning DXer. . . . "I've completed my tour at Wake Island and have been transferred, bag and baggage, to Hawaii where I expect to become a new KH6 shortly," writes W6VUN/KW6. "All QSLs will be answered as soon as possible. I'm running short of cards at the moment, so those who include s.a.s.e. will receive priority." Verne has a new batch en route from the printer, and his KH6 address appears in the list to follow. . . . WA6HRS and Kwajalein Amateur Radio Club proxy KX6AJ advise. . . . The membership of KARC recently voted to assume the duties of QSL bureau for incoming KX6 QSLs. It is felt that the activity level in the Marshall



Islands will be sufficient to justify having a local bureau for the next several years. The address of the club is KX4BU, Box 444, Navy 821, FPO, San Francisco, Calif. Realizing that it will take some time for this changeover to take place, the club will continue to handle cards which are received via the KG6 bureau for as long as they come through. QSLs for recently departed KX6s AB AH AI AN AP AQ AR AS AU DG DJ DK and NG will be forwarded by KARC. . . . W5HTM writes that as of September 11th, "I have QSLd every entry in my own VR3P logbook direct to those who sent cards to me, via bureau for others. S.w.l. reports also have been confirmed. W5BKT, still on his way home at this writing, will send out cards as soon as possible. All requests for VR3P QSLs should go to him or to me and we will see to it that they are forwarded to the operator involved. FCC authorized the use of "/>

Europe — "As for Spitzbergen QSLs from LAS 11H/P and 9RO/P, I have talked with LA5AD who plans to take care of this service," says LA6VC of Trondheim. . . . W8KX laments, "I mark F7 stations as the poorest QSLers. Not a single card from dozens worked in the last five years. Could it be the 'french food, wine, women and song?' Walt has named some strong QSL-chose distractions!"

South America — "Timely and topical observation by W8KX: "This is the time of year when surface mail destined for the Caribbean and South America regions will not reach journey's end until March. Christmas loads, you know, and six-week island hopping with inadequate shipping space will find many letters and packages held over for the next trip. Better send those QSLs airmail." . . . ARRL staffer W1ECH remarks, "Cards for Antarctica stations in the KC4USA-KC4USZ block go to K1NAP, Amateur Radio Station, USN C/B, Davisville, East Greenwich, R. I. WIWWN, the present OMI there, says, "One other point that might help the fellows sending QSLs to be forwarded to the "ice:" K1NAP only collects and forwards from Rhode Island. The individual stations make out their own cards so that they will have the Antarctica postmark." Also, WIWWN himself will be going to KC4USV shortly." Gary adds that cards for KC4USB QSOs from November, 1957, to November, '58, may go to K8YKJ who also has QSLs for KC4AAE operation. OMI Barnes expects the latter station to reactivate next month for a full year's DXing.

Hereabouts — Three cheers and a large tiger for our "QSLers of the Month": DJ1ZG/M1, F8BD, KA2MM, KC6BK, KG6s IJ, NAA, KJ6BW, KN6CE, KR6BK, TG9AD, VP8GB and ZK1AR, plus QSL managers W8 2CTN 5QK 8EWS, Ks 4LRA and 8BSII. These rapid-type QSO-confirmer are nominated by W8YGR, Ks 6TZX 0VSH, WAs 2RUB 6HRS and VE7BBB. Any candidates for commendation in your log? . . . WA2s KHW YQP, K8BSII, KN38ME and VE3EPM volunteer to serve as QSL handlers for overseas DX ops in bona-fide need of such Stateside representation. . . . QST Editor W1LVQ, a

low-number DX Century Club member from 'way back, directs our attention to the subject of poor taste in QSL-design motifs. The objective of most W/K QSLs is to gain QSLs in return. Cards with political or military overtones can scarcely accomplish this purpose if sent to the U.S.S.R. balliwiek (and vice versa). Voluptuous-girly QSLs go over like lead balloons in many parts of the world where customs differ conservatively. Perhaps, as in QSOs, we should let our QSLs stick to the subject — amateur radio. . . .

Research by W1ECH affirms that hard-working QSL helper W8KVV holds logs for the operation of CT3AV, F4AL, TF2WFF, TP8AG, TI2AL, VP2AR, VS9s AAC KAC ZD1s AW CM, 27WP and 9N1MM. . . . W4OPM is E1B's QSL chief as of August 1st on a world-wide basis. Joe also serves VP6WD (ex-ZL2S) in this capacity, and helps confirm the North and South American contacts of PA17WQ (88KS tackles the remainder). . . . K3GCS needs a hint on obtaining PR7ZB's QSL after direct and REP approaches failed. Similarly, K8CHG could use a boost toward confirmation of his HR0AA contact in Feb., and VQ6AB, Aug., both 1958. . . . W3MIEW disclaims connection with F8 QSL matters despite postal evidence to the contrary. . . . W1CLCN was amused to receive, via his mother, some QSLs destined for VP7NQ via K6BLT. W1CLCN's brother, you see, was listed in the *Call-book* as WN6BLT five years ago. Possible moral: All Novices do not become Generals or Techs, at least not right away. K4WIS advises that QSLs from HAMS *Bounty*, VE0MO, should arrive okay from VE7ALE without a.s.e. . . . W3ICQ carries through her QSL exchange with correspondence that has netted her some 100 close friendships throughout the world. A year ago Elsie received Christmas cards from 34 countries. . . . K2UYG confirms that log-keeping and QSL-filling-out habits among the DX gang are generally becoming more ragged as competitive pressures mount. QSOs improperly or insufficiently recorded, and inaccurate or incomplete QSLs are such a dreary waste. Let's be thorough — and double-check that GAIT. . . . Quite a few specific suggestions this month, so we had better get started:

- ex-AP2CR (to 9M2CR)
- CE3XA, NASA, c/o U. S. Embassy, Santiago, Chile
- CE9AV, c/o M. Valenzuela, Base Naval Arturo Prat, Correo Naval, Punta Arenas, Chile
- CE0ZI/mm, USS *Eltania*, c/o FPO, New York, N. Y.
- GO2BG, M. Ortiz, P. O. Box 6996, Havana, Cuba
- ex-CR5AR (to CT1LL)
- CX2AX, M. Bialade, Box 37, Montevideo, Uruguay
- DJ0HZ, A. Brogion (K3KMO), Fuerstenberger Str. 147, Frankfurt a/M, Germany
- ex-DL4HC/A, J. Hallowell, 5296F Missouri Av., Plattsburgh, New York
- DL4HU, J. Barrows, c/o Bitburg ARC, 36th Civ. Eng., APO 132, New York, N. Y.
- DL4KW (via K4GLA)
- EL2PN (via W4JZW)
- ex-FP5X-EQ2AT (to HL5X)
- ET3LM, c/o U. S. Embassy, Addis Ababa, Ethiopia
- FA2VW (via REP)
- FA2VX, W. Porter (K1YPE), c/o State Dept. Mail Rm., Washington, D. C.
- FS7GS (to K9KD1)
- HC8JU (to HC1JU)
- HC0NE, Box 2951, Quito, Ecuador
- HL5X, B. F. Horsody (W2AYN), USOM-TC/P.S., APO 301, San Francisco, Calif.
- HL9KG (via K4GA3)
- HL1LM (via W4SUS)
- HR1MD, P.O. Box 456, Tegucigalpa, Honduras
- HR3JW (via K3COW)
- ex-JZ0ML, M. Leahy, G3MJL, 5 Whitehall Rd., London W.7, England



1X1TJ is a delicious 14-Mc. single-side-band morsel also sometimes available on 10 and 15 meters. Jules sports 150 watts, a double-con superhet and a triband quad. (Photo via W3ICQ)

K0RAX/KL7, C. Helber, c/o RCA, Nikolski, Alaska
ex-KA2AB, V. J. Smith, W4CJD/5, 335 Baker St., Biloxi, Miss.

KC4s AAE USB (see preceding text)

KC4AF (via W8JIN)

KG4AN, Navy 115, Box 39, FPO, New York, N. Y.

KP4BCL (via W9AQW)

KP6AX (to K1AZA)

KW6DU, D. Lodwick, c/o PMRF, Box 188, Wake Island

LA5 IIIH/p 9RG/p (via LA5AD)

LX3JE (to DJ2JE)

MP4MAO, c/o Southeastern DX Club, Box 749, Atlanta 1, Ga.

OA9F (via RCP)

OA0HA, Las Palmas AFB, Lima, Peru

OH2BT/OH0 (to OH2BT)

OX3KC (via W2CTN)

PJ2CU, P.O. Box 383, Willemstad, Curacao, N.W.I.

PY1BCR (via LABRE, or to P.O. Box 58, Rio de Janeiro, Brazil)

PZ1CP, P.O. Box 221, Paramaribo, Surinam

SV0WZ (to W7FTU)

TF2WGE (to K1QIM)

TT8AM, T. Savelli, Moussoro, Tchad

UB5UG/UJ8 (W/Ks via K8GHG)

VE3FF/SU, WO/2 M. Tennant, 56th Canadian Sig. Sdn., CAPO 5049, Montreal, P. Q., Canada

VE0MO (via VE7ALE)

VK8NK, R. Knight, Box 31, Alice Springs, N.T., Australia

VK0VK (Heard Island via K5ADQ; Wilkes base via VK2VK)

VP2KZ, Z. Joseph, jr., Box 321, St. Kitts, B.W.I.

VP2ML (via K4LRA)

VP2SY (via K2MRB)

VP2VI, Box 45, Tortola, B.V.I., W.I.

VP4TM (via KV4AA)

VP5BG, Box 268, Kingston, Jamaica

VP6WD (via W1OPM)

VP8GB (via W5QK)

VP8GU (via RSGB)

VO1GDW (via RSGB)

VQ2EW (via W2CTN)

VQ2WM (via W2CTN)

VO5IV, Box 355, Kampala, Uganda

VR3L/VR1 (via W6MAZ)

W5ICZ/VO2 (via VO2UA)

W5YNI/KS6 (to W5YNI)

W6CBE/KG6 (via W6ZMW)

W6POP/KJ6 (via KH6EGO)

ex-W6VUN/KW6, V. Baughman, 309 Karsten Dr., Wahiuna, Hawaii

WA2VYG/VO2, C. Lange, 868th Med. Gp., Box 2008, APO 677, New York, N. Y.

XE1EW, H. Wallace, Box 31834, Mexico, D.F., Mexico

NW8AT, OICC, c/o U. S. Embassy, Vientiane, Laos

XZ2DW, U Toe Myint, 46 52nd St., Rangoon, Burma

ZB1A (via VE7ZM)

ZB1BX (via W2CTN)

ZC5FF (to G3KOJ)

ZD6GA, G. Armstrong, P.O. Box 41, Zomba, Nyasaland

ZK2AB (via W6ZEN)

ZL3JO, M. Johnstone, 107 Beverley Rd., Timaru, N. Z.

ZP5CN (via K4RSM)

ZS3T, J. Laufs, Box 267, Walvis Bay, Southwest Africa

ZS6BBB/ZS8/9, B. Avidon, P.O. Box 9299, Johannesburg, S. Afr.

ZS6PC/ZS8/9 (to ZS6PC)

ex-ZS7H, now ZS1BH, P.O. Box 1, Cape Town, S. Afr.

3V8CA (via W4YWX)

4S7BR, B. Rampala, Box 355, Colombo, Ceylon

5H3BJ (via W7HIO)

5N2RSB (via K3MNI)

5R8AG, Box 173, Diego Suarez, Madagascar

5T5AI, Box 208, Nouakchott, Mauritania

6O1WF, W. Franklin, U. S. Embassy, Box 6, Mogadiscio, Somalia

6O1WT, U. S. Embassy, Mogadiscio, Somalia

9G1EE, P.O. Box 233, Tema, Ghana

9L1HP, Box 7, Freetown, Sierra Leone

ex-9N1GW (to K3PQO)

9O5AAA (via W2HMJ)

9O5JR (via UBA)

9U5AS (via ON4HK)

9U5s BH ZZ (via W4ECD)



HL9KR (W4WNY) enjoys a visit by HM1AP between pile-up sessions at Seoul. This photo was snapped by HL9KN operator W3MYK who has since returned to our side. HM1AP is probably the most widely worked of Korea's nationals gang.

HC4CD and family enjoy wireless hobnobbing with the North American gang via this layout at Manta. Danny has favored 10 and 15 meters but changing conditions may force his Viking II and HQ-160 toward lower frequencies in the sunspot-deficient years ahead.



A sweeping bow to our QTH donors for the preceding, namely Ws 1B2CH 1GDQ 2JBL 6ZY 7LZF 7YAO 8KX 8YGR, Ks 1BVI 2TDI 2UYG 3CUI 3GCS 3MINJ 4WIS 6TZX 7CNO 9TZK 8AXU 8JPL, Was 2HLH 2MUA 2RUB 6HRS, DL9LI, KH6EVT and LA6VC, plus such live-wire DX clubs and groups as DARC DX-11B (DLs 3RK 9PF), Far East Auxiliary Radio League News (KA2EB), Florida DX Club DX Report (W4CKB), Japan DX Radio Club Bulletin (JA1DAI), Kanawha (W. Va.) Radio Club Splatter (K8BIT), Long Island DX Association DX Bulletin (W2MES), Newark News Radio Club Bulletin (L. Waite, 39 Hannum St., Ballston Spa, N. Y.), North Eastern DX Association DX Bulletin (W2DQW), Northern California DX Club DX'er (K6CQMD), VERON D Xpress (PAbs FX LOU VID WWP) and West Gulf DX Club DX Bulletin (K5ADQ). Fine work, team!

Whence:

Asia — More on UB5UG/UJ8's mountaineering s.s.b. 1) Xploits from K8GHG: "UB5UG flew from Kiev to Moscow, then to Tashkent, then to Osk. There everything was loaded aboard autos, including equipment shipped by rail to that point. For 50 km. (roughly 36 miles) they had to travel by foot, packing all gear on their backs through wild country. Camp was set up on Ohtibrsky glacier at 13,000 feet. The shack was built of wood and canvas which they carried with them. The gasoline generator would not work, so Yuri had to dismantle it, find the trouble, and put it together again. He erected a ground-plane, and later a north-south long-wire. The 5Z3 tube in his transmitter was n.g. because of portaging vibration, but he improvised a circuit with several germanium diodes, raised a VU2 on QRP c.w. and asked him to relay a request to Osk for a

new 5Z3. It arrived several days later by caravan. Propagation conditions were very bad, so only a handful of W/Ks were worked. UB5UG/UJ8 heard many loud stations who were deaf to his calls. In addition to his radio work, Yuri took part in several trips with loads to set up intermediate camps on the way to Lenin peak (7134 meters). His own top climb was 6100 meters." KØLWV writes from his new post in Korea. "I'm constructing a 35-watt transmitter from the ARRL Handbook. After finishing the rig I'll be signing an HL9 call on 40 c.w." According to W6ZY, HL5X (W2AYN) soon will have a KWM-2 on DX bands WA6PMK credits JA5FQ and VS1FJ with consistent Asian signals on 14 Mc. despite trying conditions. The latter is on almost daily. 1300-1600 GMT DL9LI finds Aden a cinch thanks to VS9ACH's potent 150 watts, RME inhaler and dipole on 14.035-kc. c.w. around 1600-1700 GMT Asia oddments via the clubs route: G3LWS brings a Vic-rov KW combo to Cyprus for 5B4CZ festivities. . . . Two Yanks man that TA4RZ BC-610 and 75A-4s. . . . BY1PK keeps popping up from Peking on 7 Mc., 2000 GMT or so. . . . VS1FJ intends to try his Christmas island (VK9) luck early in the new year.

Africa — ZD6GA, back in the slots after an eight-month pause, remarks, "As the only ZD6 single-sideband station I would have thought that W/K QSOs would be quite easy. However, they just don't seem to know I exist. There is a new s.s.b. country for anyone who cares to tune around on 20, 15 or 10, whichever band is open, between 1400 and 1800 GMT. I run 180 watts p.e.p. to a 3-element Mosley, and I trust these comments will get a few beams turning my way." "ZS6AJH tells me he is QRV with a full-size 80-meter ground-plane, 0300-0400 GMT, on 3510-3515-ke. c.w., or on sideband just below 3800 kc.



Radio Club of Cuba in Exile, P.O. Box 1688, Miami 1, Fla., includes among its 150 members, front (left to right), CO2s FK OA ZT UA HR; standing, CO2s DD UP ZQ AN, an s.w.l., CO2s RB HC GU and CO5TM. (Photo via CO2ZQ)



YV6AV/2 and XYL YV2DW punch quite a hole in the 10-, 15- and 20-meter phone ranges with their HK-500, Thunderbolt, HQ-170, cubical quad and TA-36 beam. Johnny and Pat also keep a multiband dipole handy for occasional DXcursions to 40 and 80 meters.

He looks for W/Ks just above 3800 kc., other North Americans on his own frequency." This from W8IBX who is working a goodly share of lower-frequency DX these days Sheepskin chasers world wide now can shout for Northern Rhodesia Amateur Radio Society's WANR certification. For W/K/Vs, confirmed QSOs with 10 VQ2s in five different towns since 1945 should do the trick. But check with NRARS awards manager VQ2AT for details Notes from Africa via the trusty club organs previously mentioned: Rwanda's actives include 9U5s (L, J, L, PC and PE, while 9U5s CB DM DS KU and XX hold forth from Burundi. W4BPD did well from both areas as 9U7s BH and BB, respectively. . . . The return leg of W4BPD's vast DXpeditionary swing may include 1963 stops at 5R8, PB8 islands, FR7, VQ8-land again, AC3 AC5 9N1 AP5, CR8 Timor, VK9 Cocos and Christmas, other rarish VK outposts and ZM16. . . . VQ9HB/mm shook us up in claiming Agalega island as QTH. . . . LA9ZH/o is said to be available on Bonvet isle, 14,180 kc. . . . UT3LM is a 14-Mc. sideband prize. . . . 4U4ITU/SU is the call of roving HB9ST on Gaza Strip, a.m. and sideband. . . . SM5CBC/9Q5 lurks with s.s.b. on 14,230 kc. about 1900 GMT. . . . HB9RS is back at UT3RS for a spell of s.s.b. and possibly c.w. . . . VQ3CF heads for retirement in New Zealand. . . . ZS6s BBB and PC may be active from ZS8 and/or ZS9 as you read this, strictly sideband on 7095, 14,345, 21,445 and 28,650 kc.



4X4DK, Asia's No. 1 DX man, entertained W5LDH on the latter's recent visit to Jerusalem. Phil was officially licensed as 4X4DK's second op during his stay. 4X4DK has a ZA receiver, a 250-watt homebrew linear, vertical and folded-dipole radiators.

Oceania — From K5KOR/KS6 via K6OZL: "I'm on daily, 0600-1000 GMT, usually working Pacific stations on s.s.b. but answering breakers. Also, depending on my work schedule, I look for Asians, Europeans and the U. S. east coast from 1100 to 1500. I use 14,230-14,310 kc. on single-sideband, 14,030-kc. c.w., and I'll have a new K86 call shortly." K6TZX adds that K5KOR/KS6 is very interested in ZM16 possibilities. . . . ZL1s LR and JP (OM and XYL) visited the west coast, VE7s BBB and ZK this fall. . . . WA6HRS, fresh from a look-see on Kwajalein, observes, "If you ever heard local QRM, that is the place! However, the fellows get along with each other nicely. So far nobody has shot down anybody's beam. KX6BU carries the main load of phone traffic on sideband, KX6s DB or 1DC running a close second. KX6AJ holds down the c.w. fort." . . . W6ZDF/KM6 recounts highlights of his ham career to W8KX. Jack became W6ZDF with the Navy in 1946, then signed JA2KW for a spell where he developed a strong yen for traffic work. Daily skeds with W6BAM went off like clockwork. He became W7UAMK in 1950, enjoying QTC doings in the ARRL nets, then did a nonhamming tour in the Philippines. Okinawa next, where he built a DX-100 for future use. Back to California, then a stint in Maryland with very little hamming, and finally assignment to Midway where W6ZDF/KM6 is extremely popular on 15 through 80 meters at this time. "I'm 34 and still single, so nobody interferes with my operating." That old ham spirit! . . . Pacific miscellany via the clubs: VK9LA's Cocos-Keeled status should be safe for another year with a new HT-37 on tap. VK9RW is there, too, but temporarily inactive. . . . VP2VB/mm, fresh from Manihiki triumphs, expects stops at Samoa, Niue and Tonga early in the year. Danny's c.w. hangouts are 7001, 14,065 and 21,065 kc., sideband stops 14,195 and 21,445 kc. . . . After his one-month Heard isle effort beginning in January, VK0VK will winter at Wilkes base. Steve will use a DX-40 with probable s.s.b. conversion, an NC-109 and multiband dipole for c.w. on multiples of 3503 kc., also a 14,120-ke. sideband spot. . . . Rare Novice entry W6GALS may show up on 21,202 kc. from Rota. . . . VK1s CB on phone. CU newly arrived on phone, and CV, mostly c.w., have things humming in the Solomons. VR1CW is away on leave and may not renew activity. VR4CV particularly enjoys c.w. sport on 3520 and 3550 kc. . . . W0JIF, VE7s ALE ZM1 and VK5AB are talking up a potential two-week Willis island venture as VK4WE come spring. VK5AB also has Timor and Cluistmas (VK9) credentials.

Europe — LA6VC's spare KWM-1 should make LAs 1H/p and 9RG/p DXremely available on Spitzbergen. Finn comments: "A wireless from the boys up there states the rig arrived safely and they will be on the air as soon as they have their antennas rigged. Activity will be s.s.b. and c.w., mainly in the 14,100-14,200- and 14,250-14,350-ke. ranges. The transmitter will stay there until June of next year, so everyone should have a fair chance of working Svalbard." . . . Don't forget that RSGB 21/28-Mc. Telephony Contest due on the 1st and 2nd of this month as detailed on page 160 of November QST. . . . K3KMO now is active as DJ9HIZ with a Navigator XB receiver and various antennae. Al is interested in possible DXpeditionary work at rare Continental points, so be alert. Neighbor K8GLG is about to fire up in Germany, too, preferring 10 or 20 phone with his T-150 and R-100A. . . . K9SPD, with the Army in England, hears fat 14-Mc. signals on c.w. from K1USA, W2s EAT NWV HAQ QJJ, WA2s IRII KHV MGB WCG, W3s EPV KDP RTB, W4YZC, K4s EVU GRN ZKI, W5s EXG KCP, W8s C1V LMF VLU WBV, W9HAQ, K9FOF, W0FRX, K0BLT and VE1EV. . . . Karel Bohounek, Tr. Csl, army 539, Chrudim 4, Czechoslovakia, an electrician by trade, is desirous of corresponding with a North American lad or two on the subject of amateur radio. . . . DL9LL broke an eight-month propagational abstinence with a new ground-plane and SX-101 on 15, 20 and 40 c.w. Horst rates Cuxhaven a superior radio location, and his results seem to bear him out. . . . A rarish Finland call area is available through OH4NG's 25-watter and U. S. A.-oriented quad on 14,080-ke. c.w. W5VSO also mentions the far-north activity of OH2AD/OH19 at Pyhantunturi. . . . Now European addenda via club sources: OY7ML has permission to run 10 watts of c.w. on 160 meters till April. . . . SV0WY joins SV0s WO and WT on Crete, 14,323-ke. sideband at 1600 GMT. . . . That roving single-sideband rig of UA3CR & Co. piled up 20,000 miles and 6500 contacts in 1961 while wandering in rarer U.S.S.R. regions.

South America — W9GMS qualified for the first 7HK7 certification awarded to a Yankee by Santander Radio Club. HK7ZT welcomes inquiries on this one, pointing out that plenty of HK7s are active on c.w. and phone nowadays. . . . "Very erratic and unfavorable," is HC4C's summation of 28- and 21-Mc. conditions in Ecuador lately. . . . PY4AP mentions the Worked Bole Horizoute diploma, wallpaper available to those W/K/VE/VOs who work five B.H. PY4s since 1958. Only three such QSOs are required of Asia and Oceania applicants. Check with PY4AA for details on WBH. . . . HC1JU intends to make use

(Continued on page 178)



Correspondence From Members-

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

NOVICE ACCENT

Recently I obtained my Novice ticket. I have found amateur radio to be a very interesting and educational hobby. But, I was shocked to see the way Novices are criticized. Sure, I'll admit I've heard some Novices who act like they got their licenses out of a cereal box, but I have heard just as many Generals and other upper licensees who make just as many mistakes. Some Generals think they can come busting in on any frequency, any time they want to, even if somebody is already engaging in a nice QSO. That isn't the same thing Novices are told when studying for their licenses! I'm sure many agree with me. — *Michael E. Sheehy, W1N0CWK, New Hampton, Iowa.*

Though I've been a Novice for only a few months, I wish to respectfully submit the following message for the "QRM of the Month Award." . . . QTH (13), is (6), BT (13), Austin (18), BT (13), Texas (16), BT (15), name (17), BT (14), adr (19), BT (10), 5499 (12), BT (2), Chesterfield (11), BT (2), so hw cpy? . . . de WN . . .

As you may have guessed, but find hard to believe, the numbers in the parentheses are the approximate number of times the word was repeated. So far as I could tell his handle is BT, since after sending "name" 17 times he forgot to send his name. I don't know what the unfortunate Novice on the other end answered, but had it been me . . . rrrr . . . (for ten minutes). — *Alfred L. Mowery, jr., W1N5BC7, Los Alamos, New Mexico.*

WHY NO V.L.F.?

The amateur radio spectrum extends from 1.8 Mc. to infinity. The FCC has always been pushing us up in frequency. Why not open a band well below those in use today? Who uses the frequencies below 20 kc.? I'm sure there is many a ham who would like to string up an antenna 2.3 miles long (a quarter-wave at 20 kc.) and have the benefits of continental ground wave. — *Dennis McCormack, K1PIX/9, Chicago 41, Ill.*

TNX

I would like to thank you for the excellent article on the HBR-16 by Ted Crosby and all the modification articles the past two years. I built the original in October 1959 QST and now have rebuilt it with the Eddystone dial and new 6BY6 product detector. Ted Crosby has been very helpful and prompt on all inquiries to him, and the same for Alex Stewart on the Eddystone dial. Believe me, these men are a real asset to the great fraternity which is amateur radio, of which I have been a member the past 30 years or so. — *Howard J. Klinger, W1SPZQ, Roseville, Michigan.*

The following Resolution was passed at the American Radio Relay League Convention in Corpus Christi, Texas, August 5, 1962.

We members of the West Gulf Division of the American Radio Relay League, in convention assem-

bled at Corpus Christi, Texas, 5 August 1962, do hereby commend the League Headquarters Staff, and the West Gulf Division Director, Dr. R. O. Best, for outstanding leadership in the promulgation and implementation of programs designed to enhance the status and prestige of amateur radio and the American Radio Relay League. — *Holland Henderson, W5GQK, General Chairman.*

Thank you for that plain and understandable article on a beginner's antenna (page 17, October QST). Most of the time the older hams don't want to fool around with the beginner. The dimensions for the elements and match were especially helpful. — *Steve Spetock, W8IEG, Kingsville, W. Virginia.*

I just thought I'd take this opportunity to tell you that I think QST is the best magazine of all those devoted to ham radio. Although I have been a ham, member of the ARRL, and a reader of QST for only four months, these things have given me a hundred-fold that figure in knowledge, enjoyment and hours of pleasure.

In reading QST I have particularly enjoyed your novice and v.h.f. columns. I hope you keep up the good work. — *Mike Kendall, W1N9CRA, Jasper, Indiana*

COMPLETE ADDRESS, PLEASE

I would like to back up WA2FQG's remarks in June QST. I also live in an apartment block, flats we call them in G-land. Very often W/K stations omit my flat number; hence, the postman has difficulty in finding me. Luckily this block is not very big and I am the only amateur in it. Usually the QSLs reach me without trouble, but they are often delayed.

Another pet peeve of mine is the stateside method of dating, i.e. 6.8.62, being the 8th of June, whereas we in Europe read it as 6th of August. Also, why use local time? It means nothing to the European station. Who wants EST, CST, MST, PST, etc? Why not GMT? It would make it so much easier to tie QSLs up to QSOs. — *Don Walmsby, G3HZL, Isleworth, Middlesex, England.*

WHAT BAND, HEY?

A ham antenna on a car immediately catches the attention of every amateur; and the question immediately pops into mind: "I wonder what band he works?" Why couldn't that ham antenna tell us what band it is tuned for all in the same glance? It would be a simple matter to fly a colored streamer from the end of the antenna, indicating the band being used. Suppose a color-scheme something like the following were published and adopted by hamdom:

- 4-Mc. phone — red
- 7-Mc. " — green
- 14-Mc. " — orange
- 21-Mc. " — yellow
- 28-Mc. " — blue
- 50-Mc. " — pink
- 144-Mc. " — white

To make the scheme complete, one could fly double streamers if working c.w.

I believe there would be far more car-to-car contacts on the highways if we could know at a glance what band is being worked. — *F. J. Mehrteus, W5QO, Schulenburg, Texas*

HELPING HAND?

☐ In defense of the amateurs who do not acknowledge SWL cards, may I suggest that SWL Edward O. Page (September Correspondence) consider that he is not the only SWL (or the only ham, either) who may listen to a given QSO, and that it is not only he who is asking for a QSL acknowledgement.

. . . From experience at my station, the number of SWL cards received varies directly with the amount of a.m. phone operation. Few such cards are received for s.s.b., and almost none for c.w. contacts. The conclusion is inescapable that very few SWLs are embryo hams. Their interest seems to extend only as far as turning on a switch, spinning a dial, and collecting cards. This may make an interesting pastime, but is not remotely a part of amateur radio, and its participants have no claim on legitimate amateurs. It is difficult to see how a meaningless card can help a beginner toward his license, or how the lack of it can be construed as refusal to extend a helping hand. . . . — *Willard Bridgham, W1WF, Pittsfield, Mass.*

BE A SPORT

☐ I have never heard such bedlam on the amateur bands till lately.

I have monitored the 75-meter phone band every day for the past eight months, and for the past few days on 40-meter phone. What discourtesy I have heard!

Although I know the regulations do not specify that c.w. cannot operate in our phone bands, it is becoming more commonplace to jeopardize good phone quality by incessant "chop-chop" and voice operators have to give up in disgust if they cannot QSY. I have observed this unsporting attitude among the newly licensed to c.w. on the phone bands mentioned above, thus making communications impossible.

The unwritten code used to be, each to his own section. Has that passed? If it has, then I propose an FCC Docket initiated by ARRL to make it mandatory for c.w. to stay out of our amateur phone bands. It is just as easy for a fixed station or mobile to work c.w. on the proper frequencies.

Everybody knows the rules, but not everybody knows the sport: let's make the sport the rule. — *Eugene Cope, W6DUW, Pasadena, California*

PRIVATE SHORT-CUTS?

☐ Being very active on the c.w. bands, I have noticed in the past few years a great number of amateurs who have made up their own private set of abbreviations for use by themselves. This has become somewhat of a trouble when trying to copy c.w. between 15 and 20 w.p.m. either in your head or with pen and paper. Using either method to copy, you do not have time to stop and wonder what the sender may have meant or whether you have copied what he sent correctly.

I do not profess to be either an expert or a high speed c.w. operator but it does seem to me that if every one used the standard international Morse code and abbreviations, maybe we could decrease the number of mistakes made in copying c.w. — *Paul H. Valentino, K3FPP, Mt. Pleasant, South Carolina*

OSCAR

☐ The Oscar III "breadboard" translator is on the air, operating into a single $\frac{1}{4}$ -wave whip used for simultaneous transmission and reception.

The translator picks up a 50-kilocycle band at 144.1 Mc. and rebroadcasts it at 145.9 Mc. with a peak transmitter power of about one watt.

On October 8, 1962, at 9:15 P.M. PDT W6DKH and W6HEK had a two-way QSO via the repeater, which was located at the QTH of W6VMH. Later, W6VMH joined for a 3-way QSO, also using the repeater. Distances involved were of the order of 5 miles, and all signals were a.m.

This is a historic "first" for amateur radio using a frequency translation system on 2 meters which can accommodate more than one QSO. Tests of the Oscar III repeater are now underway to determine its translation capability when a number of signals are within the passband of the equipment.

A "well done!" to W6VMH and W6VKP who built this miniature "Poor man's Telstar"! The first, important step towards a radio amateur translator satellite has been successfully taken! — *William I. Orr, W6SAI, Project Oscar, Inc., Sunnyvale, California.*

BPL REVISED

☐ Has ARRL ever considered reappraising and perhaps revising requirements for Brass Pounders League? I assume this award is intended to honor outstanding performances in handling reasonably significant messages contributing to the public good. However, it seems that in pursuit of BPL a few monopolists glut nets with trivia.

Batches of "nice working you X hope we do it again soon", dispatched two-towns-down, drive away many conscientious and capable operators who do not wish to be identified with a childish distortion of the public service that the FCC expects of us.

I realize that practice messages cannot always (perhaps for the beginner should not) be vitally important but I deplore the practice of "earning" a several-hundred-point BPL score with such items as: "sent you QSL today X looking for yours." That sort of thing weakens and cheapens amateur radio. — *Eleanor D. Hope, W4CIL, Lorahatchee, Florida.*

INFORMATION NEEDED

☐ As national historian for the Associated Public-Safety Communication Officers, Inc., it has been necessary for me to do considerable research into the early days of police mobile radio systems.

It was most interesting to discover that police radio and mobile radio, in general, owe so much to the amateurs for the valuable assistance given by many hams throughout the country in the pioneering days of public-safety mobile radio.

For the sake of amateur radio as well as police radio, a record of this early work prior to 1932 would make a valuable part of the mobile history.

I would appreciate it very much if any hams who have contributed in any way to this pioneer, public-safety radio work, or know of someone who did, will send the information along to me so that the amateurs can be given credit for their work in the development of mobile radio communications which have saved countless lives and made our country a safer place to live.

An informal note containing the facts and infor-

(Continued on page 184)



Operating News



F. E. HANDY, WIBDI, Communications Mgr.
GEORGE HART, WINJM, Natl. Emerg. Coordinator
ELLEN WHITE, W1YYM, Ass't. Comm. Mgr., Phone

ROBERT L. WHITE, W1WPO, DXCC Awards
LILLIAN M. SALTER, W1ZJE, Administrative Aide.
FRANK GILMORE, K6JPI/1, Ass't. Comm. Mgr., C.W.

K2YFM Wins at 60 w.p.m. Last month we gave you the results of the National Convention Code Contest. This month it is our pleasure to report on the Code Contest held at the Hudson Division Convention, Oct. 13th. This was ably conducted by W2CVW, assisted by K2IWC. There were successive elimination runs; clear text tapes were run at increasing speeds. Lots of interest! Edward J. Sheehy, K2YFM, Allendale, N. J. was announced as the code contest winner. He made accurate typewritten copy at 60 w.p.m. competing with a group of other operators. FY7YE was the runner-up.

Using Amateur Radio To Send Holiday Greetings. It's that time of year again, and no better time to demonstrate Amateur Radio. Your message handling capability can readily be used to exchange Christmas or New Year's greetings. Receiving a radiogram can be a pleasant surprise.

We suggest getting off your messages into appropriate networks early to allow time for their relaying to destination ahead of the peak traffic days. Make the addresses complete and correct to facilitate delivery.

To insure reasonable speed and accuracy put your message in the hands of amateurs who specialize in traffic handling. Such operators are best equipped in know-how and the techniques of seeing the message through. If you are not on the air, you still can file your amateur radiogram with any active local ORS or OPS who reports into h.f. nets, or with OPS supporting v.h.f. nets and having relay connections into the National Traffic System.

On Message Originations; International Limitations. There's personal pleasure and challenge in sending messages from your own amateur station. Consult the booklet *Operating an Amateur Radio Station* for message form and to find out all sorts of details about message handling, message count etc. For each message you get off by radio, starting this at your own station your own call can rightfully go in the station-of-origin part of the message. *International* communications for *third parties* are prohibited (see Chap. 8, International Regs, *License Manual*) with certain exceptions. Happenings, June '62 *QST*, lists the 16 countries having agreements with the U.S.A. permitting specified amateur work. Canada has similar special agreements with the U.S.A., Venezuela, Costa Rica, Mexico, Chile, and Honduras. But we amateurs within the U.S.A. can freely handle traffic with each other,

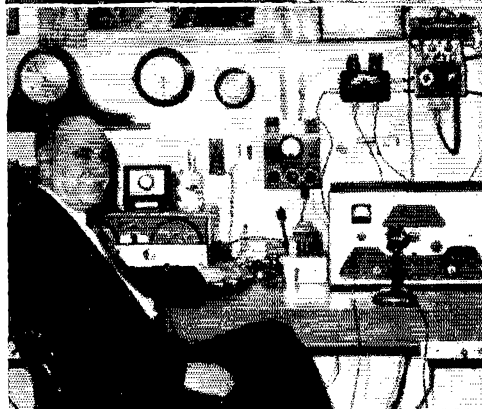
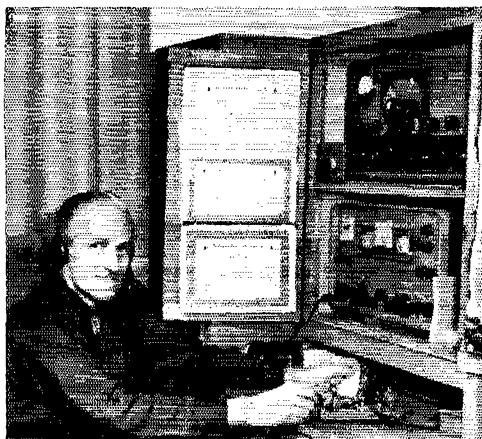
barring any compensation, direct or indirect. See FCC's Sec. 12.102 as pertinent.

If you enjoy casual operating and have lots of time you can make a project out of finding an amateur at or near the destination for your traffic, combing the bands for a dependable station to handle your message direct. But you are perhaps taking more of a gamble to locate such a station unless you can find in *Station Activities* that your man is engaged regularly in traffic handling. A "directional CQ" also can be used to try to find stations at the point where a message is directed. This is less practical than using the organized amateur nets or traffic facilities, especially when you have more than one message. Working with a net avoids the disappointment of running into an amateur who has his interests only in other directions. So we suggest using *organized* amateur radio means, the useful c.w. and voice networks.

Your Section Net, whose frequency and time of operation is given in the ARRL Net Directory (sent on request) or in *Station Activities*, can most often solve any problem of a reliable spot for placing your traffic. Some time before the hour for net operation you tune up quietly on the net frequency. At net time when the NCS calls for stations to report in you call in. You state to the NCS that you have traffic, indicating the number and destinations of messages. Name the city if this is in your own state; otherwise for distant points (beyond Section boundaries) merely say that you have "thru" traffic. The NCS will advise you to stand by or designate which station to give your traffic to. After you



On the right, West Virginia SEC W8SSA, General Chairman for the 1962 West Virginia State Convention, wishes luck to W8JIM, SCM of W. Va., the chairman-to-be for the '63 ARRL affair.



Section Communications Managers all, reading down: Carl W. Franz, W5ZHN, SCM for New Mexico, holds a Public Service Award plus many ARRL appointments. His gear includes a Valiant and HQ-170C. In the center is Georgia's SCM, J. W. Giglio, W4LG. Jim has been active with the local CAP in search and rescue. His XYL is active as W4VIM and the home rig is a DX-100B driving 2-811As in class C, modulating with a pair of 811As. A tri-bander and doublets round out the station. On the bottom, L. F. (Jack) Worthington, K4HDX, representing South Carolina. Jack is an active c.w. man and edits his local club bulletin. That fine looking station houses a homebrew sideband exciter and two 4CX250Bs in linear. An NC-183D and antennas galore complete the picture. When time permits, golfing is another hobby.

KC4's in Antarctica. We remind amateurs of the calls and locations of the stations presently assigned in Antarctica and also give their frequencies where known.

KC4USV, McMurdo Sound. 14,265 kc.,
14,250 kc. and
14,350 kc. for
Pac. and Eu.
work.

KC4USN, South Pole. 14,270 and
14,250 kc.

KC4USH, Cape Hallett. 14,250 and
14,300 kc.

KC4USR, USS *Arneb*. When south
of 60° south
latitude.

KC4USB, Byrd Station. 7 and 14 Mc.

Inactive: KC4USK at Eighties; KC4USM, auroral (near Byrd); KC4USX, AIRDEY-
RON near McMurdo; KC4USC, Field
Traverse party. Also: KC4USP USS *Dur-*
ant; KC4USE, USCGC *Fashwind*; KC4UST,
USS *Edisto*; KC4USG USS *Glacier*; KC4-
USS USS *Staten Id.*; KC4USD USS *Tom-*
bigbee; KC4AAA USNS *Ellanin*, National
Science Foundation.

clear with this station and it receipts for or QSLs a message, it is successfully on the way. Enter its call and handling data right on the ARRL message blank or other form for a record of the handling. In receipting for a message an operator accepts the moral responsibility to see it on its way to the best of his ability. (You can be part of this traffic group all year 'round just by brief participation in the net whenever you can report in. Otherwise work into the system and nets for starting your traffic on special holidays or as desired.)

ARRL-Texts. Individually worded radiograms are most popular ordinarily. For *emergencies* as well as holiday situations which develop traffic in volume, ARL-check numbered-text messages can be used to cut circuit time. This device helps the fraternity *do a bigger public service job*. Each ARRL Log Book has the list of such texts. A radiogram to ARRL will bring an extra copy of this list (CD Form 3) to any amateur. Precautions: When a text is represented by a number, ARL should be sent *both* in the check and in the text ahead of the *spelled out* number. If one gets an ARL-text for his city, it is his responsibility as receiving operator to expand this fully for delivery. (Numbers merely identify a particular text to amateurs and are meaningless to the addressee.)

General Holiday Communication. If you specialize in voice work the holiday season is a good time to invite persons besides licensed amateurs to talk to their friends and convey greetings back and forth across the U.S.A. Remember, of course, to log the names of "third parties" as required by FCC's 12.136 (b). Best luck with holiday traffic!

— F.E.H.

Traffic Topix



The fullest enjoyment of traffic handling can only be derived from the ultimate in both operating ability and station equipment. Now somebody is going to say that we said you can't enjoy traffic handling unless you're a hot shot operator and have a lot of power; but this isn't what the above statement says. Traffic can be a lot of fun regardless of your circumstances; but it is *more* fun the better your operating ability and the better your station equipment.

Perhaps *your* traffic work would be more enjoyable if you considered some of these aspects, instead of just struggling along in the same old rut, thinking of what a wonderful public service you are doing.

First, how about your operating ability? Do you handle all your traffic on phone? If so, you're missing something, brother. Is your procedure clean, snappy, business-like? If you're one of these casual traffic-handlers who thinks it doesn't really matter whether the filing time comes before the date or afterward, or whether recommended procedure is used as long as the message gets handled, you're cheating yourself out of one of the greatest satisfactions in amateur radio — that of doing a job properly and efficiently and thereby gaining the respect and admiration of your fellow workers.

How is your station set up? Can you work break-in c.w.? Fast push-to-talk on phone? Do you pack as good a signal as your power will allow? Is it a clean signal, devoid of key clicks or distorted modulation? Is your receiver good enough to separate signals for best possible reception?

All these things add up. The best operator with the best station makes the best traffic handling combination. Anything less than the best you can muster is an injustice to yourself. Yet, one hears all kinds of excuses for inferior performance. How often have we heard amateurs say that they "just can't seem to master the code." How many can't operate on 80 meters because they don't have enough room for an antenna? How many abhor the thought of "making a chore out of a hobby"? The list of excuses is endless, but they all add up to one thing: "I'm too lazy." We admire much more the amateur who frankly admits that he just goes on being a slob because he is too lazy to do otherwise, than the one who concocts all kinds of excuses, consciously or subconsciously, for his various shortcomings.

There is a difference between reasons and excuses. There is no excuse for being a low-grade traffic handler. If all you have are excuses, then let's get with it and start doing it right. It's a little harder, perhaps, but a great deal more fun! — WINJM.



At the Lake Huron Amateur Radio Club picnic in August, SEC W8LOX presented the club with its League-affiliation charter. The snapshot above shows K8EFG (l.) and K8GSW, secretary and president respectively, proudly displaying it.

Section NTS Nets are urged to report each month on form CD-125, either via your SCM or direct to headquarters, so your data can be included in the monthly summary. If you do not use the standard card report form, send us the information on a separate sheet so it will not be delayed in reaching us; many section net reports which are stuck on SCM monthly activity reports do not reach us until after our copy deadline. Be sure your report indicates the identity of the region net your net liaisons with, whether this is done direct or through another section net.

In a recent exchange of correspondence with old-timer W4BAZ, who was operating at high c.w. speeds about the time most people who now consider themselves old timers were in knee pants (or even three-cornered ones!), he asks "Isn't it possible to have run in QST some propaganda to the effect that c.w. is more difficult to master (and therefore a greater challenge), is more effective in handling formal messages, is faster and more accurate, will get the traffic through under rough conditions where voice fails, performs better under emergency conditions because it uses less power and simpler equipment and gives you infinitely more mileage per watt, and that it is an honor to be able to handle c.w. in an efficient manner and that such an operator is much more desirable than one who cannot do so?"

BRASS POUNDERS LEAGUE

Winners of BPL Certificate for September Traffic:

Call	Orig.	Recd.	Rel.	Del.	Total
W3CUL	250	1800	1396	462	3988
K6BPI	97	1910	1782	128	3917
W9JZO	12	832	844	3	1691
W0LGG	93	634	589	40	1356
W9SCA	46	648	646	2	1342
K7KBN	242	408	317	102	1169
W1PEX	42	449	425	22	938
WA4BMC	168	382	299	22	871
K4AKP	23	408	353	74	838
W7DZX	5	426	374	21	826
W8DHF	11	394	319	63	797
K6BPT	25	375	316	39	775
W7BA	9	366	331	30	734
W3EML	50	357	285	34	726
K6MDD	10	350	300	50	710
K4IWT	110	425	159	8	702
WA2FQT	88	393	300	3	694
K1RYT	9	351	308	22	688
K4SJT	76	453	123	6	658
W9F8P	34	312	271	28	645
WA6ZOW	227	141	193	41	642
W7FGY	11	293	276	15	595
W9AOW	11	281	239	42	573
W3WB	22	271	265	9	560
W9NZZ	108	219	0	216	543
W1TXL	96	217	190	27	530
W6WPF	24	251	225	26	526
WA2GPT	50	239	216	19	524
W9IDA	250	246	23	4	523
K7JHA	21	272	227	1	521
KP4CGB	25	245	5	245	520
W9DYG	42	257	207	11	517
K8LBU	23	239	231	8	501
Late Reports:					
W9SCA (Aug.)	11	979	989	4	1983
*K7JHA (July)	28	670	629	2	1329
W6EOT (Aug.)	0	346	336	10	692

More-Than-One-Operator Stations

Call	Orig.	Recd.	Rel.	Del.	Total
W6IAB	172	1446	1426	52	3096
K8BGF	43	303	142	145	1303
W4PEC	55	622	606	16	1299
WA6NCD/6	283	316	0	43	642
Late Reports:					
W1ZLH/1 (July)	1700	12	0	0	1712
K8BGF (Aug.)	601	126	28	98	853
W4PEC (Aug.)	33	292	274	18	617

BPL for 100 or more originations-plus-deliveries

K8VKT/8	301	W2EIV	119	WA2CCF	101
K9CQA	219	W0AYB	115	WA2RUE	101
K6GZ	199	W5AC	111	W4RHA	100
W4NTR	154	W7APS	108	Late Report:	
WA4LHH	135	W8DAE	107	WA6TYR (Aug.)	103
V87BDJ	125	KG1BM	107		

More-Than-One-Operator Stations

W8BIV	231	W8FY/8	158	Late Reports:	
K8BAH	212	K8B61	118	K8B6H (Aug.)	224
K8BCL	175	K8BMD	118	K8B6B (Aug.)	113

BPL medallions (see Aug. 1954 QST, p. 64) have been awarded to the following amateurs since last month's listing: K1MZM, WA2OPG, K7JHA, W8CHT.

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.

* Correction from October issue.

That's a long, drawn-out question, JB, but a good one. If these things are all true (and who can dispute them?), what reason (no excuses, now!) can any amateur have for handling traffic on phone?

Sept. Net Reports,
Net

	Sessions	Check-ins	Traffic
20 Mtr. L.S.B.	21	445	969
Northeast Area Barnyard	—	870	10
Fourth Region Day	30	218	115
All Service	5	31	27
Mike Farud E & T	50	319	406
7290	38	1676	878
Eastern Region	21	102	46

National Traffic System. Although so far the devastating long skip hasn't been as devastating as expected, we think it fitting to mention the device customarily used by Central Area Net to combat such conditions. CAN Manager W9DYG tries to line up another station at some distance from the NCS (often in another area) to QNB or QNG, depending on how long the skip actually is. When skip is only 300 miles or so, another station in the same area can often do the job; but when the skip extends to 800 or a thousand miles, it is good to have an alternate NCS in another area to QNG, for he can hear all net stations and is in a good position to control the net. In such cases, judicious use of QNQ and QNV is required, for very often net stations cannot hear each other and QNB becomes necessary. W9DYG is now busily engaged in lining up EAN stations to assist CAN operations at the same time he is offering CAN stations to assist in the operation of EAN. This is a type of inter-net cooperation not envisaged in the original CD-24, nor indeed in the present one, but it definitely has its place. It requires much net "savvy," close acquaintanceship with the QN signals, and ability to improvise; and it isn't always the solution to the problem, but it helps.

September reports:

Net	Sessions	Traffic	Rate	Average	Representation (%)
1RN	60	401	.351	6.7	71.7
2RN	60	415	.422	6.9	97.7
3RN	60	678	.393	11.3	99.4
4RN	58	408	.273	7.0	93.4
RN5	60	396	.226	6.6	71.6
RN7	60	500	.233	8.3	70.8
8RN	57	190	.160	3.3	92.5
9RN	60	543	.448	9.1	67.7
TEN	53	618	.523	11.6	54.7
ECN	20	67	.199	3.4	68.4 ¹
TWN	30	218	.418	7.2	68.6 ¹
EAN	30	1034	.731	34.5	98.3
CAN	30	1123	.740	37.4	98.9
PAN	29	974	.640	33.6	98.9
Sections ²	1162	7116		6.1	
TCC Eastern	120 ³	385			
TCC Central	90 ³	826			
TCC Pacific	117 ³	573			
Summary	1829	16465	CAN	8.0	3RN
Record	1769	21234	.942	15.4	100.0
Late Report:					
TEN (Aug.)	44	673	.609	15.3	50.8

¹ Region Net representation based on one session per day or less. Others are based on two sessions per day.

² Section nets reporting: AENO, AEND, AENB & AENM (Ala.); POI (Hawaii); QMN & Wolverine (Mich.); MDDS & MIDD (Md.-Del.-D.C.); WSN (Wash.); W, Fla. Phone; ILN (Ill.); NEB (Nebr.); BN (Ohio); QKS (Kans.); TSSN & TN (Tenn.); SCN (Calif.); WSB (Wis.); OQN (Ont.-Que.); CN & CPN (Conn.); VSN, VFN, VN & VSB (Va.); NJN (N.J.); MSPN Noon, MSPN Eve, MSN, MJN (Minn.); SCN (S.C.); GEM (Idaho); BUN (Utah); NCN & NCSN (N.C.); RISP (R.I.); Ohio SSB; GSPN (N.H.); EPA (Pa.).

³ TCC sessions reported, not counted as net sessions.

For the first time in several months we have surpassed a previous record, as the number of net sessions reported for September exceeds all previous Septembers. September was a good month. The feat was accomplished mainly, of course, by an increase in section net reports.

We noticed that quite a few section net reports are being received which do not appear to be NTS-affiliated nets. The above is a strictly NTS summary, and we're sorry we cannot include non-NTS nets; however, both NTS and other section nets can be listed in the section activities column, at the discretion of the SCM. Use form CD-125 for reporting NTS section nets to this headquarters. Be sure to show your NTS liaison, or you may find yourself omitted.

In this job, you get so you're pretty good at reducing three pages of gab to one short sentence, if necessary. We like to say just a few words about each region and area net in this space, but sometimes it's pretty hard to know just what and how much to say when a net manager fills up the whole reverse side of his CD-89 with single-space typing, hi. That's all right, fellas, keep it up. We'll answer you individually at some length.

W1BVR advises that 1RN has stayed on the early alternative for the winter season; sessions will be at 2315 and 0030 GMT. WA2GQZ, new 2RN Manager, advises that region net certificates have been issued to WA2a SRK, OVK and W2THE. APO-NY traffic may now be routed via 2RN and NLI. Tennessee has returned to the Fifth NTS Region, as of Nov. 1; this also involves a switch from the Eastern to the Central Area; there will be a small amount of confusion until we get used to the change. RN7 traffic was lower than last month, but showed an improvement over Sept. 1961. W8CHT submits his first report as 8RN manager, showing a big increase in West Virginia representation. W0DUA submits his last report as TEN manager before W0BYV takes over. ECN went back to a seven-day operating schedule on Oct. 1. TWN is having the same old representation problems; Arizona and New Mexico are the chief delinquents. W2EZB reports that 86 different stations handled representation or liaison on EAN during September. CAN is back to normal after what W9DYG calls "that August nightmare." PAN Manager WA6ROF is having his troubles keeping staffed, but no holes yet.

A.R.R.L. ACTIVITIES CALENDAR

(Dates shown are per GMT)

- Dec. 6: CP Qualifying Run — W6OWP
- Dec. 18: CP Qualifying Run — W1AW
- Jan. 4: CP Qualifying Run — W6OWP
- Jan. 5-6: V.H.F. Sweepstakes
- Jan. 12-14: CD Party (e.w.)
- Jan. 16: CP Qualifying Run — W1AW
- Jan. 19-21: CD Party (phone)
- Feb. 9-11: DX Competition (phone)
- Feb. 2-17: Novice Roundup
- Feb. 7: CP Qualifying Run — W6OWP
- Feb. 15 — Frequency Measuring Test
- Feb. 23-25: DX Competition (e.w.)
- Feb. 21: CP Qualifying Run — W1AW
- Mar. 9-11: DX Competition (phone)
- Mar. 23-25: DX Competition (e.w.)
- June 8-9: V.H.F. QSO Party
- June 22-23: Field Day

OTHER ACTIVITIES

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

- Dec. 1-2: 21/28 Mc. Telephony Contest, RSCB (p. 160, last month).
- Dec. 8-9: New England QSO Party, Conn. Wireless Assn. (p. 122, last month).
- Dec. 9: Wisconsin State QSO Party, Milwaukee Radio Amateurs Club (p. 131 this issue).
- Jan. 26-27: Fourth New Mexico QSO Party (next issue).

Transcontinental Corps. All TCC directors report the same trouble — getting enough stations with the needed combination of operating ability and power. As far as TCC is concerned, this is our greatest need at the moment. Prospects are for using 80 meters for most TCC schedules this winter. TCC-Central certificates have been awarded to W9JQZ, K2UGY and K0IVQ.

September reports:

Area	Functions	% Successful	Traffic	Out-of-Net Traffic
Eastern	120	73.3	1461	385
Central	90	84.4	1738	826
Pacific	120	85.0	1146	573
Summary	330	80.7	4345	1784

The TCC roster: Eastern Area (W1SMU, Dir.) — W1s EMG NJM SMU, W2EZB, WA2OPG, W3EML, W4DLA, W'ss CHT UPH, V'ss FAS FES. Central Area (K4AKP, Dir.) — K4AKP, W9s JOZ DYG VAY FSP ZYK, K9s DHN UGY, W0s SCA LGG. Pacific Area (W7DZX, Dir.) — W6s EOT HC, K6s KCB DYX GID, W7DZX, K7s NHV NWP, W0s WHE/7 KQD.



Nearly every subject has a history of past discussion, and the history of the National Calling and Emergency Frequencies is certainly no exception. Going back through past issues of *QST*, we find it cropping up again and again. It must have been a good idea to merit all that consideration, but so far no one has ever come up with a good, workable system that was acceptable to everyone.

The NCEFs were based on an original idea for a National Emergency Net promulgated by this headquarters in about 1948. Two contingents of amateurs were signed up, one for phone and one for c.w. Each such amateur or station was expected to appear on one of the NEN frequencies, ready for emergency action when alerted by headquarters. Being selected as one of the NEN stations carried with it a certain amount of prestige, but the idea didn't work because NEN stations were hard to alert and not particularly sensitive to emergencies not in their own areas. The plan was modified to give more action and less prestige and eventually withered as stations were dropped for inactivity until only the usual handful of stalwarts was left. The calling frequencies were adopted, however, and expanded to other bands under pretty much our present arrangement (see box, page 104).

Theoretically, there is nothing wrong with the present setup for National Calling and Emergency Frequencies. Practically, it doesn't work because we don't make it work. Nearly everybody thinks it is a good idea, but only a few ubiquitous reliables are willing or able to devote the time and effort required for implementation. Down through the years, our NCEFs have been subjected to periodic discussion involving criticism, alternatives, different frequencies and the usual denunciations of ARRL policy. Regarding the latter, the principal allegation has been that the League has not pushed and popularized them enough.

Well, maybe not. For many years we have carried the list of NCE frequencies in almost every issue of *QST*, along with information concerning their use, and occasionally have entered items to encourage greater utilization. Once in a while a campaign to popularize them has been conducted by interested amateurs and has been given encouragement and publicity in *QST* and in bulletins. Again, amateurs have come forward with well-thought-out proposals for changes. Even FCC has had a crack at instituting use of NCEFs on a regulatory basis, only to be booted down by the amateur fraternity in general — proving that amateurs are not interested enough in emergency work to set aside a part of our hands for that exclusive purpose.

And still the subject keeps coming up, sometimes from amateurs who seem not even aware that we already have calling frequencies. Quite often the appeal is for leadership and decision from headquarters, but usually this appeal is qualified by implied threats of non-observance if the decision doesn't favor their ideas.

Whatever plan is finally decided on as official, one thing is sure: observance will be voluntary. This means that if a majority don't favor it, there is no use setting it. How do you go about getting majority approval of a plan, when a dozen minorities will have pet ideas of their own?

We have, for some months, had in mind a set of rules for effective utilization of the NCEFs, but we are in no hurry to stick our necks out until or unless the demand for such rules and the willingness to abide by them is apparent from the attitude of the fraternity. — *W1NJM*.



Kansas SEC K0BXF sends along a report for the month of May, 1962, on the Kansas Storm Warning Net submitted by K0EMB that definitely merits summarizing. This is really a group of dedicated amateurs, active almost every night. The highlights of the month's activity are as follows:

May 1: Net operated by K0HGI handling emergency weather traffic from severe weather conditions in Missouri and Iowa.

May 2-16: Regular sessions, reports of hot, dry windy weather.

May 17: Severe weather alerts, tornado, high winds, rain and hail in the west. Twenty-five stations participated.

May 18: Tornadoes, 80-m.p.h. winds in central part of state. Thirty-nine stations took part.

May 20: Bad weather cells and both confirmed and unconfirmed tornadoes reported and watched, along with high surface winds and electrical disturbances. Twenty-nine stations.

May 21: Severe weather threatened but did not materialize. Thirty-one stations.

May 24: This was the date of the most severe storm for several years, and makes an emergency communications story in itself. The net was opened at 2200 GMT by K0PFU operating Newton Amateur Radio Club station W0BZN, to institute watch on six confirmed and numerous unconfirmed funnel clouds in the central part of the state. Information was also channeled into the net from a watch being maintained on 2 meters. Hutchinson was first hit by a tornado and hail up to 8 inches in diameter (aw, c'mon now!), then tornadoes made several passes at Newton and wrought great destruction, disrupting power and communications. K0EMB was forced to leave the air, and club station W0BZN went on emergency power. K0FIF also carried on during the height of the storm on 2 meters.

May 26: The net held its regular session, closed, then was reactivated for severe weather again. Five tornadoes were tracked throughout the state. Net control was shifted from W0EMB to K0LHF and K0HGI, with more than 30 stations participating before being secured.

May 27: Again extra hours were spent in sessions as tornadic activity continued. Seventeen stations took part in extremely heavy QRN.

May 28: Once again warnings were out. High winds, hail and one unconfirmed funnel were tracked. Net was closed when contact was lost with all stations at 0433 GMT.

May 31: The net opened at 0000 GMT with four areas of severe weather reported throughout the state. However, the buildup was unnecessary, as no damage was wrought despite the appearance of two full-fledged tornadoes. The net was closed at 0463 GMT after 41 stations had reported in with information.

This is the Kansas Weather Net on 3840 kc. — right on the job when needed.



At 1725 GMT on Sept. 15, VE7ARB, on the British Columbia AREC Net, reported a 7-year-old girl seriously ill at an Indian reservation on Vancouver Island. VE7BJV telephoned long distance to a doctor in Vancouver as well as consulting his own doctor, and both agreed on a diagnosis of pneumonia. VE7PO arranged for air evacuation of the child to a hospital. From start to finish, the operation lasted one hour, at the end of which time the child was safely hospitalized. — *VE7FB, SCM B.C.*



On Sept. 3, early in the evening, Bryan, Texas, EC K5JOT received a call asking for assistance in the search for a little girl missing from her home. K5KAZ was set up as base station while mobiles K5s JOT ZXL KNE EPI WIC and DNB joined the searchers. Other amateurs assisting were K5s MLT WJJ GIC and W5JBU. Shortly after 2330 local, K5GIC found the little girl unharmed in a ravine near her home.

During the SET week end (Oct. 6 & 7), Maine was being lashed by several storms. K1DYG, EC for Hancock County, decided to forego the planned SET drill in the prospect of a real emergency, and concentrated on monitoring on 75 and 2 meters, with occasional net meetings to swap weather information and other news. Contact was also maintained with other states. Approximately fifty amateurs were involved in this alert. — *K1DYG, EC Hancock County, Maine.*

An explosion and fire at a paint factory in San Leandro, Calif., on Sept. 12 gave the Southern Alameda County Emergency Net their baptism of fire under actual disaster conditions. Operating on six meters, mobiles W46s RAX and KOS were at the scene of disaster in constant contact with base control station W46BZA, later W46GRO. K6DOQ relayed traffic from the American Red Cross chapter house to the disaster chairman at the scene. Some of the communications problems encountered included getting evacuees together with people offering their homes for shelter, procurement of lumber to board up blown out windows, escorts for supply vehicles of various kinds, procurement of coffee, fresh water and other necessities. Other amateurs who assisted included K6s KQD RMD, W46s AWI NEL EJA YLR. — *W46BZA.*

On Aug. 22 a gasoline truck crashed into a telephone pole and burned, cutting off telephone communication between Oak Ridge and Knoxville, Tenn. K4OUK, who first heard about the trouble, alerted Anderson County EC K4VOP. From 1900 until shortly after midnight channels were maintained among Oak Ridge, Norris, Rockwood, Ozone and Knoxville on 50.7 Mc., even though most telephone communication was restored late in the evening. Communication was conducted on behalf of hospitals, three UCNC plants and the Red Cross. Stations participating included K4s LQO VOP GNU WOE WKB PUM VZI YVE EAK IUF KYL, W4s SGI NGY YYN HPN DNF NCV GMA, W4As EPZ GDY COT ADM AUX K4VOP, EC Anderson County, Tenn.

The Sarasota-St. Petersburg area experienced heavy flooding during Sept. 20-21, necessitating action by the AREC of both Florida sections. Shortly after QFN had completed its regular session, WA4IJJH broke in to report that Sarasota had lost electricity and telephones. This was relayed to the press in Tallahassee by W4MLE. Via W4IYT, the Miami Weather Bureau requested weather observations from Sarasota. Contact was established between WA4IJJH and K4QXF in Sarasota, and K4UBR, Western Fla. RM, joined the net. For some time thereafter informal traffic flowed over this route, eventually culminating in Sarasota being declared a disaster area. W4MLE contacted the state c.d. director in Jacksonville and arranged for him to keep contact with Sarasota via QFN on 3650. Later, at the urging of state c.d. Communications Officer W4UHY, several of the stations were moved to 3940 kc. sideband. QFN continued operation informally as a net, and handled formal traffic for Eglin Air Force Base regarding USAF installations in the Sarasota area. Approximate operating time was from 0418 to 0926 GMT. Three traffic operators who stayed right with the job to the end were K4UBR, W4SEA and, especially, WA4IJJH. The entire operation was a great credit to the AREC. — *W4MLE, SEC Western Florida.*

When fire razed the telephone exchange room of the Pacific Power & Light Building in Whitesett, Mont., the evening of Aug. 25th, the town was left with a shortage of communication. The Flathead Valley 6 Meter Net was activated and remained on standby until two days later when normal service was resumed. — *W7KUH, SEC Mont.*

August reports were received from thirty-four SECs representing 15,473 AREC members. This is five more reports than ever received for August before, and represents almost 3,000 more AREC members than the previous August record. What's more, the number of AREC members shown is the second-highest on record for any month previously. But if you think this is good, wait'll you see the Sept. report!

Sections reported: Conn., W. Fla., Ont., Alberta, E. Mass., N. Dak., Ore., N.Y.C.-L.I., Los A., Ind., N. Mex., E. Nev., Nevada, Wash., E. Fla., Ohio, Mich., Maine, S. Texas, Tenn., Wyo., Utah, N.N.J., W. Mass., Colo., S. Dak., Kans., Iowa, E. Pa., Sac. Valley, Okla., N. Texas, S.C.V., Hawaii.

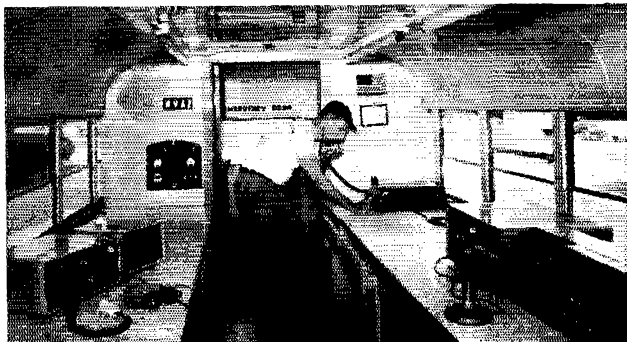
RACES News

RACES amateurs in Texas' District 31 were activated on Sept. 4 to assist in the search for a missing child at Garner State Park in Uvalde County, Texas. The account received is not too clear, but here it is just the way we received it. K5IUS called W5BRC on 7230 kc. at 2046 GMT saying he needed some information from San Antonio on the lost child, which he had to report to c.d. headquarters at the airport in Uvalde. Their c.d. frequency was crystal controlled at 3995 kc. At 2133 GMT, K5VFC in San Antonio broke in on 7230 kc., and



with wonderful cooperation from him, W5BRC talked to W5DRO on combined radio and landline link. The latter agreed to go to 3995 kc. At 2202 GMT, W5BRC joined K5IUS, K5IQJ, and K5TSZ on 3995 kc. At 2217 they were joined by W5DRO, and W5BRC acted as relay between K5IUS and W5DRO. Due to conditions and the emergency situation W5DRO then called the District 31 RACES Net into emergency session at 2255 GMT on 3995 kc. The following day the net again met on 3995 kc., with W5BRC doing the net controlling. Those commended, in addition to the above, were W8TSP/mobile for supplying a much needed San Antonio contact until W5DRO was available; K5MQK, who took his mobile to the park; W5VB, who supplied liaison between the 80 and 40 meter nets; W5VPQ, who remained on frequency the second day to provide continuing contact with San Antonio; W5BDR, who established another San Antonio contact on 75 meters; W5IHT, who gave unselfishly of his time and effort and acted as relay and liaison on 75 meters; and W5HZR, who effected close cooperation between c.d. units in Bexar and Uvalde Counties and helped organize ground-air communication.

The story has a sad ending; the girl was found drowned. But without the aid of the RACES net, the search would have been much more poorly organized.



This interior shot shows how members of the Kankakee Area Radio Society outfitted a bus as a c.d. communications control center. That's W9VQC, c.d. communications director, demonstrating one of the units. Note the control panel for the 3-kw. gasoline-driven generator at the left rear. Besides being equipped to operate all amateur bands, the unit is air conditioned and contains a galley. KARS members and local business establishments of Kankakee, Ill., donated labor and materials.

A.R.R.L. AFFILIATED CLUB

HONOR ROLL

This Honor Roll is presented to extend special recognition to all those affiliated clubs whose *entire membership* consists of members of the League . . . but which clubs have not been so commended earlier this year. June '62 QST, page 93, carried the earlier section of our '62 Honor Roll including all then-known affiliates having recorded for '62 their 100 per cent ARRL membership. Each year our listings are completed from data given us in the current Club Annual Report (CD-18) forms. In February 1963 we plan again to forward to every active ARRL-affiliated radio club the form for new '63 annual filings. This will be examined in connection with the Board's 51 per cent requirements for continuing affiliation and also for further QST 100%-listings. The following-listed Honor Roll clubs are scheduled to receive our "100% ARRL club" certificates shortly after the distribution of this issue of QST:

- Bays Mountain Radio Club, Kingsport, Tenn.
 Beacon Radio Amateurs, Havertown, Pa.
 The Birmingham Amateur Radio Club, Inc. Birmingham-Ala.
 Butler County V.H.F. Assn., Hamilton, Ohio
 Chisholm Trail Amateur Radio Club, Inc., Duncan, Okla.
 Columbus Amateur Radio Club, Inc., Columbus, Ga.
 Fort Hamilton Amateur Radio Association, Hamilton, Ohio
 Helix Amateur Radio Club, San Diego, Calif.
 Levittown Amateur Radio Club, Levittown, N.Y.
 Lower Columbia Amateur Radio Assn., Inc., Longview, Wash.
 Martin Van Buren High School Amateur Radio Club, Queens Village, N.Y.
 Mason County Radio Club, Inc., Ludington, Mich.
 Massillon Amateur Radio Club, Massillon, Ohio
 Northern New Jersey Radio Association, Englewood, N.J.
 Northwest St. Louis Amateur Radio Club, Inc., Florissant, Mo.
 Nortown Old Timers' Radio Association, Toronto, Ont., Canada
 The Order of Boiled Owls, Sea Cliff, L.I., N.Y.
 Order of Boiled Owls of New Mexico, Albuquerque, N. Mex.
 Potomac Valley Radio Club, E. Riverdale, Md
 Richland Amateur Radio Club, Inc., Richland, Wash.
 Rome Radio Club, Inc., Rome, N.Y.
 Santa Fe Radio Club, Inc., Santa Fe, N. Mex.
 Volunteer Emergency Signal Service—"Signaleers," Tinley Park, Ill.
 South St. Louis Amateur Radio Club, St. Louis, Mo.
 State Line Radio Club of New York and New Jersey, Upper Saddle River, N.J.
 Two Meters & Down Club, Inc., Los Angeles, Calif.
 Virginia Century Club, Norfolk, Va.
 West Valley Radio Club, Sepulveda, Calif.
 York Road Radio Club, Inc., Elkins Park, Pa.

ELECTION RESULTS

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

- Delaware** M. F. Nelson, K3GKF Dec. 10, 1962
 In the Northern Texas Section of the West Gulf Division, Mr. L. L. Harbin, W5BNG, Mr. Luther E. Harrison, W5LR, Mr. James G. Brown, W5BOO, and Dr. Harry W. McLeckie, W5GY, were nominated. Mr. Harbin received 271 votes, Mr. Harrison received 254 votes, Mr. Brown received 158 votes and Dr. McLeckie received 66 votes. Mr. Harbin's term of office began Sept. 13, 1962.
 In the Mississippi Section of the Delta Division, Mr. S. H. Hairston, W5EMM, and Mr. Daniel R. Patterson, W5EWE, were nominated. Mr. Hairston received 135 votes and Mr. Patterson received 63 votes. Mr. Hairston's term of office began Sept. 27, 1962.
 In the Nevada Section of the Pacific Division, Mr. Leonard M. Norman, W7PBV, and Mr. Charles A. Rhines, W7VIU, were nominated. Mr. Norman received 52 votes and Mr. Rhines received 51 votes. Mr. Norman's term of office began Oct. 10, 1962.
 In the Kansas Section of the Midwest Division, Mr. C. Leland Cheney, W8ALA, and Mr. Robert M. Summers, K8BXF, were nominated. Mr. Cheney received 252 votes and Mr. Summers received 232 votes. Mr. Cheney's term of office began Oct. 20, 1962.

ELECTION NOTICE

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

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

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

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

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

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

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

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

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

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

— F. E. Handy, Communications Manager

Section	Closing Date	SCM	Present Term Ends
Vermont	Dec. 10, 1962	Miss Harriet Proctor	Aug. 10, 1962
North Dakota	Dec. 10, 1962	Harold A. Wengel	Aug. 19, 1962
Canal Zone	Dec. 10, 1962	Thomas B. DeMeis	Oct. 1, 1962
Connecticut	Dec. 10, 1962	Henry B. Sprague, jr.	Dec. 9, 1962
Colorado	Dec. 10, 1962	Donald S. Middleton	Feb. 14, 1963
Minnesota	Dec. 10, 1962	Mrs. Lydia S. Johnson	Feb. 23, 1963
Sacramento Valley	Dec. 10, 1962	George R. Hudson	Feb. 25, 1963
Maine	Dec. 10, 1962	Albert C. Hodson	Resigned
Michigan	Feb. 11, 1963	Ralph P. Thetreau	Apr. 10, 1963
British Columbia	Feb. 11, 1963	H. E. Savage	Apr. 10, 1963
Idaho	Feb. 11, 1963	Mrs. Helen M. Maillet	Apr. 10, 1963
Alberta	Feb. 11, 1963	Harry Harrold	Apr. 10, 1963
Los Angeles	Feb. 11, 1963	Albert F. Hill, jr.	Apr. 18, 1963

CLUB COUNCILS AND FEDERATIONS

- British Columbia Amateur Radio Association, Dave Gilmour, VE7ARA, 1150 Comox St., Vancouver 25, B.C., Canada.
 Cleveland Area Council Amateur Radio Clubs, Gertrude E. Maxim, W8OIS, Secy., 23644 Woodhill Drive, Brook Park 42, Ohio.
 Indiana Radio Club Council, Inc., Adah Elliott, W9RTH, Secy., 721 Centennial St., Seymour, Ind.
 Michigan Council of Clubs, Wendell R. Mellberg, W8QPO, Secy., 1885 N. Westwood Dr., Saginaw, Mich.
 The Ohio Council of Amateur Radio Clubs, Ernest E. D'Angelo, K8DJM, 3134 Ontario St., Columbus 24, Ohio.

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.

WIAW 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. 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 list, try to send in step with WIAW.

Date	Subject of Practice Text from Oct. QST
Dec. 3:	<i>It Seems To Us . . .</i> , p. 9
Dec. 6:	<i>The Ultimate Exciter . . .</i> , p. 11
Dec. 12:	<i>Announcing 1962 ARRO SET . . .</i> , p. 15
Dec. 15:	<i>Some Thoughts on Power Supplies . . .</i> , p. 28
Dec. 17:	<i>The Towering Problem . . .</i> , p. 33
Dec. 18:	<i>Phasing/Filter S.S.B. Generator . . .</i> , p. 38
Dec. 21:	<i>2-Meter Moonbounce . . .</i> , p. 52

WIAW SCHEDULES

(December 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. The station will be closed Dec. 25, Christmas Day, and Jan. 1, 1963, New Year's Day.

Operating Frequencies

C.w.: 1805, 3555, 7080, 14,100, 21,075, 28,080, 50,700, 145,800
Voice: 1820, 3945, 7255, 14,280 (s.s.b.), 21,330, 29,000, 50,700, 145,800

Frequencies may vary slightly from round figures given; they are to assist in finding the WIAW 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.

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 WIAW will be made Dec. 18 at 0230 GMT. Identical tests will be sent simultaneously by transmitters on 1805, 3555, 7080, 14,100, 21,075, 28,080, 50,900 and 145,800 kc. The next qualifying run from W6OWP only will be transmitted Dec. 6 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 Dec. 18 becomes 2130 EST Dec. 17.

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.

WIAW CONTACT SCHEDULE

Would you like to work WIAW? WIAW 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 WIAW 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.

* Operation may be on s.s.b. as announced at the beginning of the period.

DX Century Club

The following list contains the call letters and country totals of holders of the DX Century Club Award who have submitted confirmations to ARRL for the period from October 1, 1960 thru September 30, 1962. New members in DXCC for the period from September 1 thru September 30, 1962, also appear in this list. DXCC members qualifying for the Honor Roll appear in the Honor Roll list below. Since the necessary space to run the complete DXCC Roster is not available, the total number of DXCC certificates issued as of September 30, 1962, being 8755, this list contains only the calls and totals of those who have shown an active interest in their DXCC rating over the indicated 24-month period.

Honor Roll

The DXCC Honor Roll consist of the top ten numerical totals in the DXCC. Position in the Honor Roll is determined by the first number shown. The first number represents the participant's total countries less any credits given for deleted countries. The second number shown represents the total DXCC credits given, including deleted countries. Positions in cases of ties are determined by date of receipt. All totals shown represent submissions received from September 1 thru September 30, 1962.

W6GUO... 308/322	W8DMD... 305/317	W5ASG... 304/317	W7PHO... 302/313	W3LMA... 301/313
W2AGW... 308/321	W6AM... 305/319	W6VZ... 304/315	W7ZM... 302/314	W9NDA... 300/313
W3GHD... 308/321	W8BKP... 305/317	W8UJZ... 304/316	W6GPB... 302/314	W1LYH... 300/313
W1GKK... 308/322	W3KT... 305/318	W6EBG... 304/318	W1BIH... 302/315	W2LPE... 300/313
W2ZCK... 308/321	CE3AG... 305/318	LU6DJX... 304/317	W7GBW... 302/315	W8LKH... 300/312
W8BRA... 307/320	W9YFV... 305/318	4X4DK... 304/315	W9HUZ... 302/314	W4TM... 300/313
KV4AA... 307/321	G4CP... 305/318	G2PL... 304/316	W8DU... 302/314	W8DAW... 300/313
W2HUO... 307/320	W3JNN... 304/317	G3AAM... 303/316	CX2CO... 302/315	W2WZ... 299/312
W4DOH... 307/320	W1ME... 304/317	W2HMJ... 303/315	H19J... 302/316	W4OCW... 299/310
W9RBI... 306/320	W8BF... 304/316	W1CLX... 303/315	K2GFO... 302/315	W8EL... 299/311
W8KIA... 306/319	W7GUV... 304/317	W2BXA... 303/316	W8KML... 301/313	W8JBI... 299/312
W8JIN... 306/320	W5ADZ... 304/316	W5MMK... 302/314	W9LNM... 301/315	W2JT... 299/311
				W8AIW... 299/311

Radiotelephone

W3RIS... 309/323	W8GZ... 305/317	CX2CO... 302/315	W4DOH... 300/311	W8KML... 299/311
WY2CK... 308/321	W8BF... 305/315	W8PQQ... 301/312	W7PHO... 300/311	W6YY... 297/310
W9RBI... 306/318	VQ4ERR... 302/315	4X4DK... 301/312		W3JNN... 297/309

311 W6YY	W9AMU DL3LL	298 W2BOK W2UVE W9FKC W9WHM	W6CAE W6FOZ W6KSM W8NGO W9GIL	286 W3OP W5BGP W8TXL W9NLY H9TTL	W2PCJ W2RDD W2SSC K2UVU W3PGB K4IAM W4DKP W4CFD W4HFR W5BVR W5HDS W5PSB K6CQM W8KEV W6NJU W6GHA W6UOU W8GLK W8UBA W9APN K9EAB W9IU W9KXX G6XL ZP5CF	275 W1TW W5FFF W6GMF	W3OCU W4CXA W4GRP W5BRR W5BZT W6ANN W6BD K6KII W2DGW W3ALB K6ASD W6WU W6WV W9MQL W9RKP W8AJU W1FPQ W3RE W3DHM W3GUY W5DA W5HJA W6EPZ W4VYP W6EYF W6SIA W6YK K6HJ W8SA W9GDI W9QNO OY7ML W9YNB DL3RK PY1HX	264 W1ICP F3YR KP4KD	263 W1EOB W1ILB W5WZQ W6RLP W6SOP W8KBT W8WLT W8UDR W9QYI W9BCI K13NPP LA3DB PAB7AU K47BQ D3JKR W6YK W8SA W9GDI OY7ML W9YNB DL3RK PY1HX	K2CPR W2FXA W2GVZ W3DKT W4CKB K4ICX W4YWX W5WZQ W6RLP W6SOP W8KBT W8WLT W8UDR W9QYI W9BCI K13NPP LA3DB PAB7AU K47BQ D3JKR W6YK W8SA W9GDI OY7ML W9YNB DL3RK PY1HX	W9QYW W9WYB	254 W1NLM W2CIVK W3MWC	W1LZE W1ORV W2EMW W2KJZ W2LXK W2LXK W3WU W4LRN W6BIL W6DBP K6EIV W6LN W7ZAS W7GHB W9YCR W9RQM W9WFS VE3J VE7MD LASHB PAB9LF SM5WJ	244 W1BOD W3NCF K4BVQ K4HXI W6GMC W6KUT G13JM W3KFS K6EIV W6LN W7ZAS W9YCR W9RQM W9WFS VE3J VE7MD LASHB PAB9LF SM5WJ	249 W1QJR W2PZI W3AYS W3KFP W3RBW W6PLK W8BPA Z4JW DL7BN EA1BC F8PI	252 W1QMM W2CKY W4SSU W6KG W7AUS K9ECO DJ3JZ KP4WD PY4OD	238 W2AYU W3SOF W8DUS DL7AH DL8NB	237 W1AJG W1BGY W2QKJ K4EHA W9HB W2ZKQ K6EDE W7DLR W9PIO TG9AD ZL3GU	236 W5VU KH6BLX G6VQ	235 W1OHA K2UJK W9HKL W9HIN K8LFY DL1KB KV4BB
310 W3JTC W4GD W5KC	302 K2BZT W2OKM W2ZGB W3GUA W7AMX W7ENW SM5LL	297 W1FZ W1MW W1ZKK W3CGS W4VPD W4IMI W6NGA W8SYK	291 W2AYJ W3R9Q W4AUA W4IMI W4LVV K6EC K6FVR G3AAE	285 W2AEB W2CNT K4PDV W5PUJ HB9MQ	284 W6GHA W6UOU W8GLK W8UBA W9APN K9EAB W9IU W9KXX G6XL ZP5CF	277 W1WA W3FBG K4GSU W4KFC W6OBH G5VT	272 W1BGA W4DZH W4EEE	268 W1BGA W4DZH W4EEE	267 W1TS W2CTN W3ADZ W4BJ W6ID W3ZAO W6LGF K4RPK W5QVZ W6ZVQ W1AEW W2TPE K4LPW W8LW PY1GJ	257 W8ONA W8VDJ CE3HL G6YQ K25WZ SM5CCE	256 W1AEW W2TPE K4LPW W8LW PY1GJ	255 W1JNV W5ARJ W5GJ W6BUI W7GWI	W1LZE W1ORV W2EMW W2KJZ W2LXK W2LXK W3WU W4LRN W6BIL W6DBP K6EIV W6LN W7ZAS W7GHB W9YCR W9RQM W9WFS VE3J VE7MD LASHB PAB9LF SM5WJ	249 SM5CO	248 W1QM W4NNH VE5RU W3VKD K4TML W6LTX W6UQU W7CMO W9DWQ W9LTR W9WIO K9RAL VE2YU W6A1H VE3 VE4XO G3AIZ W1JNV ZS1OU	247 W1TX WA2OJD K5KBH VE3DKY	246 W1BLO K2QHL W9UIG EA2CA VE3 W2SHC W4INT W8AQJ W8CJW PZ1AX ZP5ET	240 W1FPH W10OA W9UIG W4JII K6AYA W6BYB W8GB W8UMR W9HLY W9TKV W9UZS VE3PK	234 W2BHM W4LUL VE1WL	
309 W2ZX W5AFX W7GXA W8EWS W8TMA ZL1HY	W7AMX W7ENW SM5LL	297 W1FZ W1MW W1ZKK W3CGS W4VPD W4IMI W6NGA W8SYK	291 W2AYJ W3R9Q W4AUA W4IMI W4LVV K6EC K6FVR G3AAE	285 W2AEB W2CNT K4PDV W5PUJ HB9MQ	284 W6GHA W6UOU W8GLK W8UBA W9APN K9EAB W9IU W9KXX G6XL ZP5CF	277 W1WA W3FBG K4GSU W4KFC W6OBH G5VT	272 W1BGA W4DZH W4EEE	268 W1BGA W4DZH W4EEE	267 W1TS W2CTN W3ADZ W4BJ W6ID W3ZAO W6LGF K4RPK W5QVZ W6ZVQ W1AEW W2TPE K4LPW W8LW PY1GJ	257 W8ONA W8VDJ CE3HL G6YQ K25WZ SM5CCE	256 W1AEW W2TPE K4LPW W8LW PY1GJ	255 W1JNV W5ARJ W5GJ W6BUI W7GWI	W1LZE W1ORV W2EMW W2KJZ W2LXK W2LXK W3WU W4LRN W6BIL W6DBP K6EIV W6LN W7ZAS W7GHB W9YCR W9RQM W9WFS VE3J VE7MD LASHB PAB9LF SM5WJ	249 SM5CO	248 W1QM W4NNH VE5RU W3VKD K4TML W6LTX W6UQU W7CMO W9DWQ W9LTR W9WIO K9RAL VE2YU W6A1H VE3 VE4XO G3AIZ W1JNV ZS1OU	247 W1TX WA2OJD K5KBH VE3DKY	246 W1BLO K2QHL W9UIG EA2CA VE3 W2SHC W4INT W8AQJ W8CJW PZ1AX ZP5ET	240 W1FPH W10OA W9UIG W4JII K6AYA W6BYB W8GB W8UMR W9HLY W9TKV W9UZS VE3PK	234 W2BHM W4LUL VE1WL	
308 W2LV W4AIT	W5PQA W6LDD W7KTN W8KPL W9FID HB9EU	296 W1HZ W2LAX W8WZ ON4DM	290 W2UNT W4AZK W4BYP W6PME W7ADS W6BVM W6KZL W6QNA W6WVQ W7WVE W8IRN W8FBF LA7Y	283 W1ADM WA21ZS W9AUN K9EAB W9IU W9KXX G6XL ZP5CF	279 W1AXA W3FBG K4GSU W4KFC W6OBH G5VT	272 W1BGA W4DZH W4EEE	268 W1BGA W4DZH W4EEE	267 W1TS W2CTN W3ADZ W4BJ W6ID W3ZAO W6LGF K4RPK W5QVZ W6ZVQ W1AEW W2TPE K4LPW W8LW PY1GJ	257 W8ONA W8VDJ CE3HL G6YQ K25WZ SM5CCE	256 W1AEW W2TPE K4LPW W8LW PY1GJ	255 W1JNV W5ARJ W5GJ W6BUI W7GWI	W1LZE W1ORV W2EMW W2KJZ W2LXK W2LXK W3WU W4LRN W6BIL W6DBP K6EIV W6LN W7ZAS W7GHB W9YCR W9RQM W9WFS VE3J VE7MD LASHB PAB9LF SM5WJ	249 SM5CO	248 W1QM W4NNH VE5RU W3VKD K4TML W6LTX W6UQU W7CMO W9DWQ W9LTR W9WIO K9RAL VE2YU W6A1H VE3 VE4XO G3AIZ W1JNV ZS1OU	247 W1TX WA2OJD K5KBH VE3DKY	246 W1BLO K2QHL W9UIG EA2CA VE3 W2SHC W4INT W8AQJ W8CJW PZ1AX ZP5ET	240 W1FPH W10OA W9UIG W4JII K6AYA W6BYB W8GB W8UMR W9HLY W9TKV W9UZS VE3PK	234 W2BHM W4LUL VE1WL		
307 W1ZW W2TQC W3BES W6ENV W7AC DJ1BZ	W9FID HB9EU	296 W1HZ W2LAX W8WZ ON4DM	290 W2UNT W4AZK W4BYP W6PME W7ADS W6BVM W6KZL W6QNA W6WVQ W7WVE W8IRN W8FBF LA7Y	283 W1ADM WA21ZS W9AUN K9EAB W9IU W9KXX G6XL ZP5CF	279 W1AXA W3FBG K4GSU W4KFC W6OBH G5VT	272 W1BGA W4DZH W4EEE	268 W1BGA W4DZH W4EEE	267 W1TS W2CTN W3ADZ W4BJ W6ID W3ZAO W6LGF K4RPK W5QVZ W6ZVQ W1AEW W2TPE K4LPW W8LW PY1GJ	257 W8ONA W8VDJ CE3HL G6YQ K25WZ SM5CCE	256 W1AEW W2TPE K4LPW W8LW PY1GJ	255 W1JNV W5ARJ W5GJ W6BUI W7GWI	W1LZE W1ORV W2EMW W2KJZ W2LXK W2LXK W3WU W4LRN W6BIL W6DBP K6EIV W6LN W7ZAS W7GHB W9YCR W9RQM W9WFS VE3J VE7MD LASHB PAB9LF SM5WJ	249 SM5CO	248 W1QM W4NNH VE5RU W3VKD K4TML W6LTX W6UQU W7CMO W9DWQ W9LTR W9WIO K9RAL VE2YU W6A1H VE3 VE4XO G3AIZ W1JNV ZS1OU	247 W1TX WA2OJD K5KBH VE3DKY	246 W1BLO K2QHL W9UIG EA2CA VE3 W2SHC W4INT W8AQJ W8CJW PZ1AX ZP5ET	240 W1FPH W10OA W9UIG W4JII K6AYA W6BYB W8GB W8UMR W9HLY W9TKV W9UZS VE3PK	234 W2BHM W4LUL VE1WL		
306 W5ABY G6ZO OE1ER	W6CXY W3KBP K6ENX W8YXG W6TS W6VE W8PUD W9KOK W9YSX W9QDF VE2WV W4MR W5CKY W5EGK G3FRM	293 W1HX W2SAW W3WGH W8MX W6PGI DJ2BW G8KS ZS6BW	288 W2DOD W7HKT W6DAE W8MLY	281 W1HA K2LWR W4RCI W5AWT W5LGG VF2NJ KP4CC	277 W2FBS W4BQY W4WVI W5ACE W6LRU W7CNM W8TJ JA1DM YS1O	272 W1BGA W4DZH W4EEE	268 W1BGA W4DZH W4EEE	267 W1TS W2CTN W3ADZ W4BJ W6ID W3ZAO W6LGF K4RPK W5QVZ W6ZVQ W1AEW W2TPE K4LPW W8LW PY1GJ	257 W8ONA W8VDJ CE3HL G6YQ K25WZ SM5CCE	256 W1AEW W2TPE K4LPW W8LW PY1GJ	255 W1JNV W5ARJ W5GJ W6BUI W7GWI	W1LZE W1ORV W2EMW W2KJZ W2LXK W2LXK W3WU W4LRN W6BIL W6DBP K6EIV W6LN W7ZAS W7GHB W9YCR W9RQM W9WFS VE3J VE7MD LASHB PAB9LF SM5WJ	249 SM5CO	248 W1QM W4NNH VE5RU W3VKD K4TML W6LTX W6UQU W7CMO W9DWQ W9LTR W9WIO K9RAL VE2YU W6A1H VE3 VE4XO G3AIZ W1JNV ZS1OU	247 W1TX WA2OJD K5KBH VE3DKY	246 W1BLO K2QHL W9UIG EA2CA VE3 W2SHC W4INT W8AQJ W8CJW PZ1AX ZP5ET	240 W1FPH W10OA W9UIG W4JII K6AYA W6BYB W8GB W8UMR W9HLY W9TKV W9UZS VE3PK	234 W2BHM W4LUL VE1WL		
305 W4GXB W8MPW	W6TYS W8PUD W9KOK W9YSX W9QDF VE2WV W4MR W5CKY W5EGK G3FRM	293 W1HX W2SAW W3WGH W8MX W6PGI DJ2BW G8KS ZS6BW	288 W2DOD W7HKT W6DAE W8MLY	281 W1HA K2LWR W4RCI W5AWT W5LGG VF2NJ KP4CC	277 W2FBS W4BQY W4WVI W5ACE W6LRU W7CNM W8TJ JA1DM YS1O	272 W1BGA W4DZH W4EEE	268 W1BGA W4DZH W4EEE	267 W1TS W2CTN W3ADZ W4BJ W6ID W3ZAO W6LGF K4RPK W5QVZ W6ZVQ W1AEW W2TPE K4LPW W8LW PY1GJ	257 W8ONA W8VDJ CE3HL G6YQ K25WZ SM5CCE	256 W1AEW W2TPE K4LPW W8LW PY1GJ	255 W1JNV W5ARJ W5GJ W6BUI W7GWI	W1LZE W1ORV W2EMW W2KJZ W2LXK W2LXK W3WU W4LRN W6BIL W6DBP K6EIV W6LN W7ZAS W7GHB W9YCR W9RQM W9WFS VE3J VE7MD LASHB PAB9LF SM5WJ	249 SM5CO	248 W1QM W4NNH VE5RU W3VKD K4TML W6LTX W6UQU W7CMO W9DWQ W9LTR W9WIO K9RAL VE2YU W6A1H VE3 VE4XO G3AIZ W1JNV ZS1OU	247 W1TX WA2OJD K5KBH VE3DKY	246 W1BLO K2QHL W9UIG EA2CA VE3 W2SHC W4INT W8AQJ W8CJW PZ1AX ZP5ET	240 W1FPH W10OA W9UIG W4JII K6AYA W6BYB W8GB W8UMR W9HLY W9TKV W9UZS VE3PK	234 W2BHM W4LUL VE1WL		
304 W2QHH W3EHR W4MR W5CKY W5EGK G3FRM	W9YSX W9QDF VE2WV W4MR W5CKY W5EGK G3FRM	293 W1HX W2SAW W3WGH W8MX W6PGI DJ2BW G8KS ZS6BW	288 W2DOD W7HKT W6DAE W8MLY	281 W1HA K2LWR W4RCI W5AWT W5LGG VF2NJ KP4CC	277 W2FBS W4BQY W4WVI W5ACE W6LRU W7CNM W8TJ JA1DM YS1O	272 W1BGA W4DZH W4EEE	268 W1BGA W4DZH W4EEE	267 W1TS W2CTN W3ADZ W4BJ W6ID W3ZAO W6LGF K4RPK W5QVZ W6ZVQ W1AEW W2TPE K4LPW W8LW PY1GJ	257 W8ONA W8VDJ CE3HL G6YQ K25WZ SM5CCE	256 W1AEW W2TPE K4LPW W8LW PY1GJ	255 W1JNV W5ARJ W5GJ W6BUI W7GWI	W1LZE W1ORV W2EMW W2KJZ W2LXK W2LXK W3WU W4LRN W6BIL W6DBP K6EIV W6LN W7ZAS W7GHB W9YCR W9RQM W9WFS VE3J VE7MD LASHB PAB9LF SM5WJ	249 SM5CO	248 W1QM W4NNH VE5RU W3VKD K4TML W6LTX W6UQU W7CMO W9DWQ W9LTR W9WIO K9RAL VE2YU W6A1H VE3 VE4XO G3AIZ W1JNV ZS1OU	247 W1TX WA2OJD K5KBH VE3DKY	246 W1BLO K2QHL W9UIG EA2CA VE3 W2SHC W4INT W8AQJ W8CJW PZ1AX ZP5ET	240 W1FPH W10OA W9UIG W4JII K6AYA W6BYB W8GB W8UMR W9HLY W9TKV W9UZS VE3PK	234 W2BHM W4LUL VE1WL		
303 W2GUM W5OLG W6BZE W6PUY	W2TQR W3RUT W4BPD	292 W2ESO W2GT W3NKM W3RUT W5XU	287 W1RB W4OM W6TI KH6CD W9FJB	280 W1BIL W2BBS W2CYS DL13V W2JVV	277 W2FBS W4BQY W4WVI W5ACE W6LRU W7CNM W8TJ JA1DM YS1O	272 W1BGA W4DZH W4EEE	268 W1BGA W4DZH W4EEE	267 W1TS W2CTN W3ADZ W4BJ W6ID W3ZAO W6LGF K4RPK W5QVZ W6ZVQ W1AEW W2TPE K4LPW W8LW PY1GJ	257 W8ONA W8VDJ CE3HL G6YQ K25WZ SM5CCE	256 W1AEW W2TPE K4LPW W8LW PY1GJ	255 W1JNV W5ARJ W5GJ W6BUI W7GWI	W1LZE W1ORV W2EMW W2KJZ W2LXK W2LXK W3WU W4LRN W6BIL W6DBP K6EIV W6LN W7ZAS W7GHB W9YCR W9RQM W9WFS VE3J VE7MD LASHB PAB9LF SM5WJ	249 SM5CO	248 W1QM W4NNH VE5RU W3VKD K4TML W6LTX W6UQU W7CMO W9DWQ W9LTR W9WIO K9RAL VE2YU W6A1H VE3 VE4XO G3AIZ W1JNV ZS1OU	247 W1TX WA2OJD K5KBH VE3DKY	246 W1BLO K2QHL W9UIG EA2CA VE3 W2SHC W4INT W8AQJ W8CJW PZ1AX ZP5ET	240 W1FPH W10OA W9UIG W4JII K6AYA W6BYB W8GB W8UMR W9HLY W9TKV W9UZS VE3PK	234 W2BHM W4LUL VE1WL		

(Continued on page 122)

• 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 B. Breiner, W3ZRQ—SEC: W3DUI. PAM: K3BHU. RM: W3EML. V.H.F. PAM: W3SAO. New section appointments go to W3SDZ and W3BKF as OESs and W3MIZI as EC for Lancaster County. The 1000th AREC member recorded at the office of the SEC is K3CBE, of Berks County and he received a special membership card denoting it. The EPA C.W. Net reports 195 pieces of traffic passed in 30 sessions with 292 QNI. New Gear Dept.: To W3BNU a Hornet Tri-bander. W3AXA is sporting a new v.f.o. on the EPA Net. K3AIK has a complete new antenna farm, towers and all. W3NNL received his belated A-1 Operator Club certificate. QTH changes: W3PMY moved to Shippensburg. W3HNK moved to Norwood and W3UIU changed jobs and moved to Clearfield in the Western section. License changes go to K3UOW, now Technician; K3TVY, 12 years old, and K3RDM now General Class. K3MQE elevated himself to Extra Class. K3NDW is on 6 meters in the Hazleton Area. An additional 6 meter station in the Reading Area is K3JGJ. W3YPF lost a 40-meter antenna together with the roof that supported it during a wind storm. K3EAG has become quite active as a Hazleton traffic outlet via 6 meters. The North Penn ARC lost W3DIJ, who has moved to Colorado. The section surely will miss Jonyev. The new building project of the Lancaster Transmitting Society is novistor converters. The Lehigh Valley ARC has started code and theory classes. New officers of the Big "K" ARC are W3BEF, pres.; K3MBM, vice-pres.; W3JDB, secy.; K3EAG, treas. Delmont RC's officers are K3BHQ, pres.; K3EYD, vice-pres.; W3FOX, secy.; K3JJO, treas. K3IUE is on 6 and W3QDJ is active on 40 meters in the Cumberland County Area. This section showed an increased interest in the recent SET. K3MVO vacationed in Georgia and met an old Army buddy, K4AAW, who happened to be his neighbor. K3ARR is looking for activity on 50-Mc. c.w. Anyone interested in appointment as EC for Sullivan, Monroe, Northampton or Lebanon County? Traffic: W3CIB 3988, W3EML 726, W3WR 560, K3ISX 259, K3MQE 236, K3ATK 218, W3FAE 116, W3ZRQ 92, W3UIU 85, K3MNT 72, K3ONW 70, W3AXA 59, W3RV 51, W3JXY 44, K3BHU 32, K3MVO 32, K3OWE 31, K3ACH 30, W3NNL 19, K3LKQ 15, K3CAH 12, K3EMG 12, W3BPF 11, K3HTZ 11, W3ITL 11, W3HNK 10, W3GIA 9, W3BUR 9, W3OY 9, W4DUI 7, W3CHC 6, K3RPH 6, W3BNU 4, W3EEN 4, K3RDM 4, W3BKF 3, W3ADE 2, K3ARR 2, W3BNR 2, W3ID 2, W3ELI 1.

MARYLAND—DELAWARE, DISTRICT OF COLUMBIA—SCM, Andrew H. Abraham, W3JZY. Asst. SCM Del.: Skip Nelson, W3GKF. SEC: W3CVE. RM: K3JYZ for MDD Traffic Net, which meets on 3649 kc. at 0000Z daily. MDDS (slow) net meets on 3650 kc. daily at 0130Z. NIEPN meets on 3820 kc. M-W-F at 2300Z, on Sat. and Sun. at 1800Z. Del. EPA Net meets on 3905 kc. at 2230Z on Sat. Delaware: K3GKF has been busy making arrangements with the fire chiefs' association to use fire stations as a base of operations in case of emergency. The U. of Del. ARA is a newly organized radio club. The Amateur Radio Clubs in Delaware are planning next year's hamfest. K3LEC reports all nets are having good check-ins. W3EEB reports a fine trip to the World's Fair. K3AZH is working hard as EC for New Castle County getting new AREC members; he also is Radio Officer for c.d. in the county. W3JFR says that the Kent County ARC is giving Novice and General Class instructions. K3ORU is active on 6 and 2. K3SXA has a shack full of new gear. W3FKO is back in Wilmington. K3RRT has a new Ranger II. W3LML is using 8-d-over-8 on 2 meters. K3REW has a new halo on 8. Md.-D.C. W3AKB, W3BWT, K3GVE and K3NEX report little activity. W3AYD is looking for a Gating amplifier. W3CDQ will be active in contests. K3CYA is relaxing in Florida. K3DNO is attending the U. of Md. W3EOV helped in the Sports Car Rally. W4EXM/3 is

in Teheran, Iran, working with the Imperial Iranian Army. Art is trying to obtain a EP2 call. K3HPG is looking forward to the DX season on all bands. With winter coming W3HQE will have more time for radio activities. K3JYZ took his Tribander beau down, checked it out and put it back up. Andy reports much better signals going out. K3LFD, president of the Friendship Amateur Radio Club, is NCS on MDD. K3LLR will be active on all bands soon. W3MCG has been rebuilding and soon will have a 40-meter beam to work that hard-to-get DX. K3MQP is using an inverted "V" antenna and working out fine. K3NCM has been ill and is feeling much better. W3NO is remodeling his DX-100B by installing all modifications and also is converting ART-13 for the ham bands. K3NZV was the highest scoring W/K using less than 175 watts in the recent CQ S.S.B. Worldwide DX Contest. W3OHI has an ART-13 transmitter and wants to sell his Ranger so that he may buy a 100V. W3OYX reports the AREC members of the Antietam Radio Association assisted the Maryland State Police by furnishing communications to seven locations during the Centennial of the Battle of Antietam. K3QFG is top traffic man this month (Phil is only 13 years old). Phil worked with W3CVE operating the District Heights Radio Club Station, K3IIDO/3, during the Prince George County Fair at Upper Marlboro. K3PRN has been trying to work on 432 Mc. but is having TVI. W3ZAQ has made DXCC 111/100, and reports that the 15-meter band is opening up for DX. W3ZNV reports that the MDDS (slow) Net has moved to 28.1 Mc. Net time is 0130Z Tue., Thurs. and Sun. The 1962-1963 officers of the Potomac Valley Radio Club are W3MCG, pres.; W3GRF, vice-pres.; and act. mgr.: W3BKF, secy.; W4GF, treas. Traffic: (Sept.) K3QGP 297, W3TN 119, W3VGC 117, K3JYZ 110, K3WBJ 69, W3HQE 55, W3EFR 52, W3BKE 30, W3MCG 29, W3EOV 25, W3ZNV 20, W3NO 16, K3CYA 15, K3AZH 8, W3BWT 7, K3LLR 6, K3OSX 5, W3OHI 4, K3EWK 3, K3NCM. (Aug.) K3MQP 41.

SOUTHERN NEW JERSEY—SCM, Herbert C. Brooks, K2BG—SEC: K2ARY. PAM: W2ZL. RMs: W2HDW and W42VAT. New appointment: W42BLV. Somerdale, as ORS. Steve is active in NJN and 2RN. W2RG, Merchantville, enjoyed a visit with friends in Vermont. N.J. Phone and Traffic Net totals for Sept.: 30 sessions. QNI 502, traffic 85. W2RZJ, Pennington, vacationed in VEI-land. W2ZVW, Burlington County EC, is NCS Mon. nights on EAN. With regret we report the passing of W42FKM, Millville. W42ARJ and W42QHJ, in the Millville Area, have a class of 28 code and theory students. W42NXY, Gloucester, has applied for Army MARS license. K2SOX, Northfield, received the Amateur Extra Class license. W42QPK received a General Class license. The Southern Counties ARA boasts an AREC membership of 30. W42OZQ, Northfield, is the Atlantic County EC. SJRA's *Hamfest* was a big success with over 1500 attending. W42HSP received the Amateur Extra Class license. Six-meter s.s.b. activity is increasing with SJRA members W2ADA, K2EHG, K3EHI, K3EOF and W42ONB heard almost nightly. NJN Mgr. W2QNL reports the following Sept. totals: 30 sessions, traffic 279 for an average of 9.3. The net monthly paper is edited by W42QQZ. K2DEI, Maple Shade, replaces K2HJY as Radio Officer of Burlington County. County radio drills are held Wed. night on 51 Mc. W2BAY, Had-donfield, after some minor repairs, expects to be all set from 2 to 160 meters. K2JJC, Pitman, has returned to the active list. The McGuire Amateur Radio Club recently affiliated with the League. W42CSL/2 is the club's secretary. Traffic: W2IG 95, W42WLN 76, W42BLV 36, W2ZI 35, W2TLO 22, W2BZJ 18, W2ZVW 16, W42ARJ 14, K2JJC 10, W42HJD 6, W42NXY 3.

WESTERN NEW YORK—SCM, Charles T. Hansen, K2HUK—SEC: W2LXE. RMs: W2RUF, W2EZB and W2PEP. PAM: W2PVL. NYS C.W. meets on 3670 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. and 7102.5 kc. at 1930 Wed. TCPN 2nd call area on 3970 kc. at 1900. IPN on 3980 kc. at 1600. 2RN on 3690 kc. at 0045 and 2345 GMT. Endorsements: K2RTQ as OPS. W42BEC as OPS. K2PBU as OPS and OES. The Syracuse V.H.F. Club held its 8th Annual Roundup with 750 plus at the Banquet. KH6UK and W1BU (W1FZJ) highlighted the program with their own account of the record-breaking 1298-M contact via Moon-Bounce! W2RHQ, as program chairman, and the rest of the club deserve much credit for the success of the event. It gets bigger and better every year. W2EZB reports that 2RN meets at 1845 and 1945 local time in case the GMT is

(Continued on page 130)

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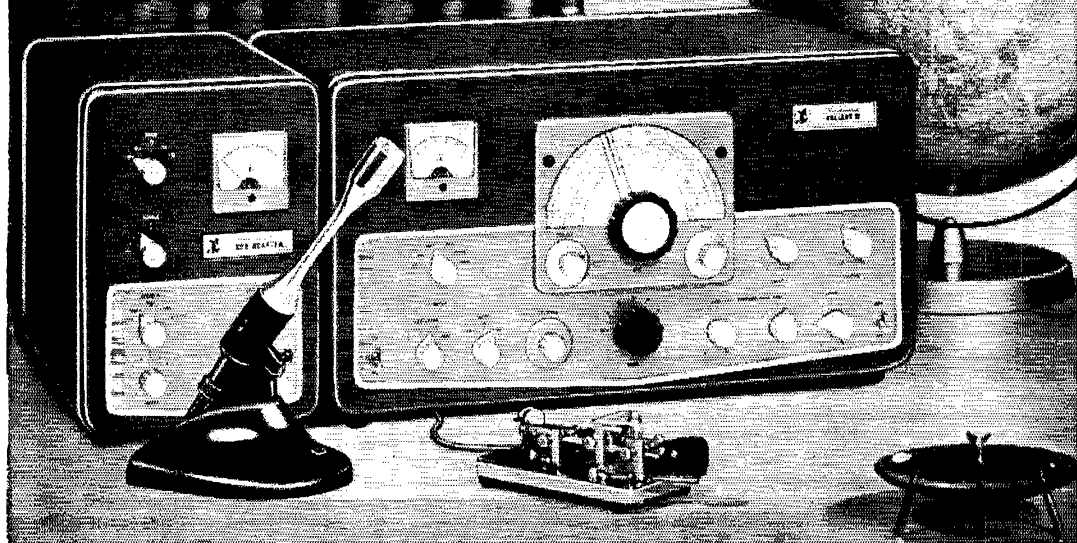


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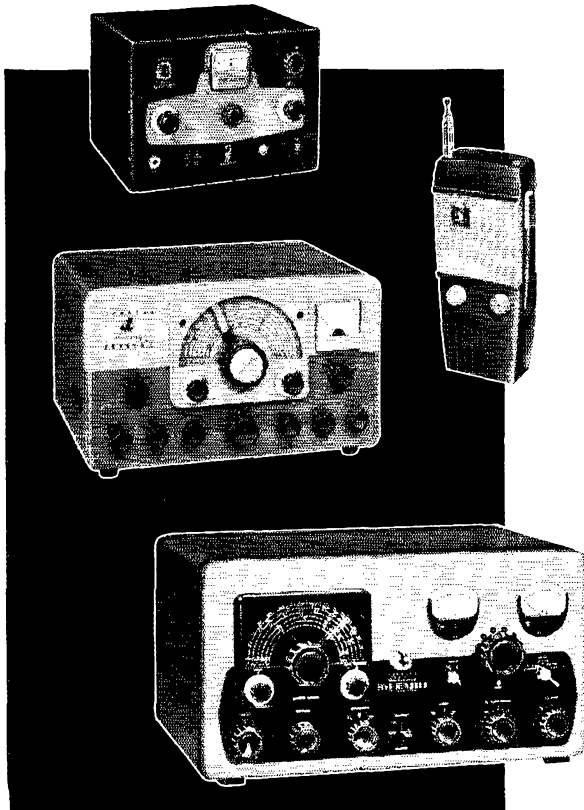
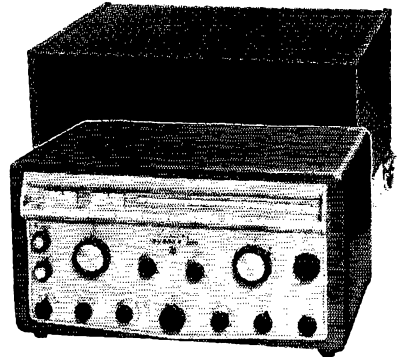
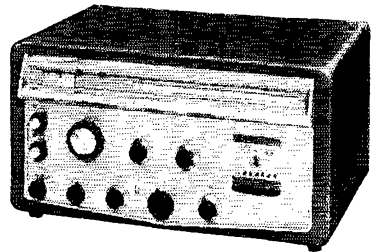
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"ADVENTURER"—Completely self contained single knob bandswitching 80 thru 10 meters . . . effective TVI suppressed . . . and puts 50 watts of power into a rugged 807 transmitting tube. Operates by crystal or external VFO control. Front panel meter switching permits monitoring of the final grid of plate currents . . . keying is clean and crisp. Wide range pi-network output with tubes, less crystals.

Cat. No. 240-181-1 Kit.....Amateur Net \$69.95

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, "Quiet" control silences receiver on standby. With battery compartment for penlight cells (less cells) Rechargeable cadmium battery and other accessories available.

Cat. No. 242-103 100 milliwatt.....Amateur Net \$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 keying, TVI suppressed. Pi-network load matching from 50 to 500 ohms. With tubes, less crystals.

Cat. No. 240-162-1 Kit.....Amateur Net \$249.50
240-162-2 Wired, tested.....\$359.50

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. 240-500-2 Wired, tested.....Amateur Net \$1050.00

The Christmas Ham ...



... With All the Trimmings

Wise Amateur Radio operators know that they can depend upon Heath for quality, dependability and performance at lowest cost! Savings realized through easy, do-it-yourself kit construction, make it possible for the radio amateur to equip his station with complete facilities at savings of up to 50%! You also enjoy latest engineering design and features for top performance and convenient operation. Whatever your need, whatever your interest . . . "Mobile", "Fixed", AM, CW or SSB . . . there's a Heathkit product to fill it! The handy accessories shown above are only a few of the many money-saving Heathkits available to make better contacts, more conveniently, and with added fun.

1. MONITOR SCOPE: Specially designed for Amateur use! Displays envelope, AF and RF trapezoid patterns. Ideal for checking "flat-topping" and non-linearity in SSB linear amplifiers, observing modulation characteristics of AM & SSB transmitters plus quality of received signals. Use on amateur bands 160 through 6 meters. Built-in two tone test generator. 10 lbs.
Kit HO-10 . . . no money down, \$6 mo. **\$59.95**

2. REFLECTED POWER METER: Checks efficiency of antenna system by measuring forward and reflected power or standing wave ratio. Handles a peak power of well over 1 kilowatt and may be left in the antenna system feed line at all times. Matches 50 or 75 ohm lines. Covers 160 through 6 meters. 2 lbs.

Kit HM-11 **\$15.95**

3. 100 KC CRYSTAL CALIBRATOR: Perfect for checking VFO's, receivers and other communications gear! Provides precise output every 100 kc from 100 kc to 54 mc. Circuit is transistorized and battery powered for complete portability. .005% crystal included. 1 lb.

Kit HD-20 **\$14.95**

4. RF POWER METER: Samples RF radiation near antenna to give continuous indication of relative power output of transmitter. Sensitive 200 ua meter. Requires no external source of power for operation. Covers 100 kc to 250 mc range. 2 lbs.

Kit PM-2 **\$12.95**



Easy to Build Heathkits

5. "CANTENNA" TRANSMITTER DUMMY LOAD: Permits testing or servicing transmitting equipment "off-the-air" . . . no TVI, QRM, or FCC violations to worry about! Handles up to 1 kilowatt I.C.A.S. with less than 1.5 V. S. W. R. up to 300 megacycles. Features oil-cooled resistor (oil not included). 2 lbs.

Kit HN-31 \$9.95

6. "TUNNEL DIPPER": Exclusive with Heath! . . . a solid-state grid dip oscillator. Covers 3 to 260 mc. Improved circuit extends ambient operating temperature (0° to 120°F). Color-matched coils and dial scales. Battery powered, use it anywhere! Complete with rugged, epoxy coated coils, protective cover. 3 lbs.

Kit HM-10A . . . no money down, \$5 mo. \$34.95

7. VARIABLE FREQUENCY OSCILLATOR: Provides complete coverage of amateur bands, 80 through 2 meters. Rugged, reliable and loaded with special features for top performance and stability. Use with most transmitters designed for grid-block or cathode keying. All connecting cables furnished. 12 lbs.

Kit HG-10 . . . no money down, \$5 mo. \$34.95

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SECOND ANNUAL

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Contest open to any Licensed Amateur*
on Planet Earth. • All entries must be post-
marked no later than 23:30 GMT, 31 De-
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NOTHING TO BUY...

Here's all you have to do—
Simply pick up an Official Skyhook II Entry
Blank from your favorite Hy-Gain distributor
and, in twenty-five words or less, complete the
following statement: "If I were the New Prod-
uct Manager of Hy-Gain, I'd ask my engi-
neering department to develop an antenna
design that would (25 words or less)." Send
your entry to Hy-Gain Antenna Products, NE
Highway 6 and Stevens Creek, Lincoln, Ne-
braska. All entries will be judged on the con-
tribution the suggestion offered will make
toward universally improving reception or
transmission and will remain the property of
Hy-Gain Antenna Products, Inc.

FIRST PRIZE... 3.5–500 MC including RBX-1
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cone with range of 50 thru 500 mc., TH-4
Tribander, 402-B 40 Meter Monobander,
2BDP Multiband Doublet and 56' Spaulding
Tower.

2nd PRIZE—DB-24 Duobander, 20-40 meters

3rd PRIZE—18HT All Band Vertical

4th PRIZE—TH-4 Thunderbird Tribander

5th PRIZE—TH-3 Thunderbird Tribander

*Sorry, we must exclude entries from
Cities, States or Countries where con-
tests are prohibited by law.

BE A WINNER! Pick up an Official Entry
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Huntsville—Curle Radio Supply, 106 Winston Ave.

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Phoenix—Southwest Electronics Devices,
129 East Jefferson, P. O. Box 3751
Tucson—Elliott Electronics, Inc., 418 No. Fourth Ave.

ARKANSAS

Dewitt—Horsestrader "Ed" Morry Wholesale Radio,
12th & Jefferson

CALIFORNIA

Anaheim—Henry Radio, 931 N. Euclid Ave.
Buena Park—S. J. Radio Electronics Co., 6306 Beach Blvd.
Burbank—Valley Electronics, 1302 W. Magnolia Blvd.
Burlingame—Amrad Supply, Inc., 999 Howard Ave.
Goleta—Dow Electronics of Goleta, 5857 Hollister Ave.
Hemet—Gil Severns Wholesale Electronics,
40400 East Florida
Inglewood—Acorn Radio, 4736 W. Century Blvd.
Long Beach—Scott Radio Supply, 266 Alamosos Ave.
West Los Angeles—California Electronics Supply, Inc.,
11201 West Pico Blvd.

LOS ANGELES—Federal Purchaser, Inc.,

11275 W. Olympic Blvd.
Henry Radio, 11240 West Olympic Blvd.
Radio Products Sales Co., 1501 South Hill
North Hollywood—Arrow Electronics,
7035 Laurel Canyon Road

Oakland—Elmar Electronics, Inc., 140 11th St.
Oxnard—Dow Electronics, 1505 South Oxnard Blvd.
Palo Alto—Zack Electronics, 654 High St.
Pasadena—Arrow Electronics, Inc., 2650 E. Colorado Blvd.
Dow Radio, 1759 E. Colorado Blvd.

Riverside—Mission Ham Supplies, 5474 Mission Blvd.
Sacramento—Selectronics, 4113 Franklin Blvd.
San Diego—Western Radio & TV Supply, 1415 India St.

San Francisco—Amrad Supply, Inc., 3425 Balboa St.
San Francisco Radio & Supply, 1284 Market St.
Zack Electronics, 1423 Market St.
San Jose—Quement Industrial Electronics,
161 West San Fernando Ave.

Santa Ana—Arrow Electronics, Inc., 2713 South Main St.
Santa Maria—Dow Electronics of Santa Maria,
222 West Main St.

Vallejo—Electronics' Best Buys, 1219 Monterey St.
Van Nuys—Valley Electronics, 17647 Sherman Way

COLORADO

Denver—Radio Products Sales Company, 1237 - 16th St.

CONNECTICUT

Hartford—Harty of Hartford, 100 High St.
West Hartford—Radio Shack Corporation,
39 South Main St.

New Haven—Radio Shack Corporation,
230-234 Crown St.

New London—Aikins Electronic Supplies, 531 Broad St.

Norwalk—Arrow Electronics
Stamford—Radio Shack Corporation

WASHINGTON D. C.

Electronic Wholesalers, Inc., 2345 Sherman Ave., N.W.

DELAWARE

Wilmington—Almo Radio Company, 1122 French St.

FLORIDA

Jacksonville—Kinkade Radio Supply, 1354 Laura St.
Melbourne—Electronic Wholesalers,
1301 Hibiscus Boulevard

Miami—Amateur Radio Center, Inc., 2805 N.E. Second Ave.

Electronic Wholesalers, 9390 N.W. 27th Ave.

Orlando—Amateur Electronics Supply,
23 Azalea Park Shopping Center

Tampa—Kinkade Radio Supply, 1719 Grand Central

GEORGIA

Dalton—Curle Radio Supply Company,
710 North Hamilton

HAWAII

Honolulu—Honolulu Electronics, 819 Keeaoumoku St.

ILLINOIS

Alton—Ebinger Radio, Inc., 1022 East Broadway

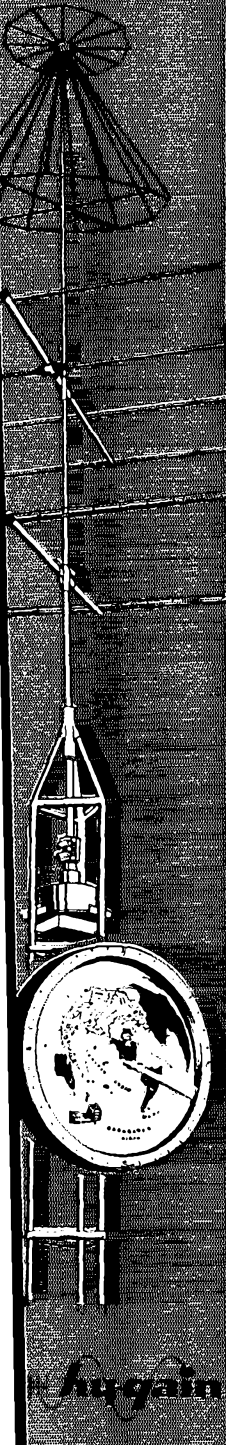
Benton—Lampley Radio Company, 452 E. Church St.

Chicago—Allied Radio Corp., 111 N. Campbell

Amateur Electronics Supply, 6450 Milwaukee Ave.

Newark Electronics, 223 W. Madison St.

Chicago Heights—Heights Electronics, Inc.,
1145 Halsted Street



Hy-Gain

Galesburg—Knox Electronic Supply, Inc., 67 North Cherry St.
Genoa—Crawford Electronics, 233 W. Main St.
La Salle—Klaus Radio & Electronics, 1055 First St.
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—Selectronics Supplies, Inc., 801-03 S. W. Adams St.
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Rockford—H & H Electronic Supply, Inc., 506-510 Kishwaukee St.
Springfield—Bruce Electronics, 1120 E. Capitol Ave.
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Evanston—Castrups, 1014 W. Franklin St.
Tri-State Amateur Supply, 8 East Iowa St.
Fort Wayne—F. Wayne Electronics Supply, Inc., 3606 E. Maumee Rd.
Warren Radio Company, 1716 S. Harrison St.
Indianapolis—Brown Distributing Co., 3746 College Ave.
Graham Electronics Supply, Inc., 122 S. Senate Ave.
Van Sickle Radio Supply Co., 4131 N. Keystone Ave.
Jeffersonville—Moakler Electronic Supplies, 500 E. Chestnut St.
Lafayette—Lafayette Radio Supply Co., Inc., 406-408 E. North St.
Muncie—Muncie Electronics Supply, Inc., 222 N. Madison Ave.
South Bend—Radio Distributing Co., 1212 High St.
Colfax Company, Inc., 747 South Michigan St.
Terre Haute—C. T. Evincer Company, 1216 Wabash Ave.
Terre Haute Radio Company, 501 Ohio St.

IOWA
Cedar Rapids—Iowa Radio Supply Co., Inc., 719 Center Point Rd., N. E.
Council Bluffs—World Radio Labs., 3415-27 W. Broadway.
Des Moines—Radio Trade Supply Co., 1224 Grand Ave.
Amateur Radio Center, 1214 Grand Ave.

KANSAS
Salina—Electronics, Inc., 227 North Santa Fe
Wichita—Amateur Radio Equipment Company, 1203 E. Douglas

KENTUCKY
Lexington—The Collins Company, 411 W. Hayman Ave.
Louisville—Arcyb Electronics, Inc., 540 East Gray St.
Universal Electronics Supply, Inc., 533 South 7th St.

LOUISIANA
Baton Rouge—Davis Electronics, 1735 North Acadian Way
Lake Charles—Wholesale Radio Equipment Co., Inc., 1722 Common St.
New Orleans—Crescent Electronic Supply, Inc., 537 S. Claiborne Avenue
Radio Parts, Inc., 1112 Magazine St.
Southern Radio Supply, 1909 Tulane Ave.

MARYLAND
Baltimore—Amateur Radio Center, TV Sound Communications, 2203 Fulton Ave.
Salisbury—Almo Radio, 317 Park Heights Ave.
Wheaton—Uncle Georges Radio Ham Shack, 11324 Fern Ave.

MASSACHUSETTS
Boston—Demambro Radio Supply Co., Inc., 1095 Commonwealth Ave.
Lafayette Radio, 110 Federal St.
Radio Shack Corporation, 730 Commonwealth Ave.
Braitree—Radio Shack Corporation
Hyannis—Demambro Radio Supply, 223 Barnstable Rd.
Lawrence—Alco Electronics, 3 Wolcott Ave.
Demambro Radio Supply, 473 Haverhill
Leominster—Demambro Radio Supply, 760 North Main St.
Medford—Demambro Radio Supply, 135 Mystic Ave.
Reading—Graham Radio, Inc., 505 Main St.
Salem—Demambro Radio Supply, 280 Highland Ave.
Saugus—Radio Shack Corporation
Saugus Shopping Center
Springfield—Demambro Radio Supply Co., Inc., 169 Spring St.
Worcester—Demambro Radio Supply Co., Inc., 222 Summer St.

MICHIGAN
Ann Arbor—Purchase Radio Supply, 327 East Hoover Ave.
Battle Creek—Warren Radio Company, 93 W. Bidwell
Detroit—Midway Electronic Supply, 17801 W. McNichols Rd.
M. N. Duffy & Co., Inc., 2040 Grand River Ave.
Northwest Electronics, 20926 Schoolcraft Ave.
Radio Electronic Supply Co., 14405 Wyoming Ave.
Radio Supply & Engineering Ham Shack, 90 Sheldon Ave.
Radio Supply & Engineering Co., 10605 Fenkell
Radio Supply & Engineering, 10001 Chalmers
Reno—Radio, 1314 Broadway
East Lansing—Iape Recording Industries, 1101 E. Grand River Ave.
Flint—Shand Radio Specialties, Inc., 2608 Leith St.
Kalamazoo—Warren Radio Company, 1710 S. Westnedge St.
Marquette—Northwest Radio, 1010 W. Washington St.
Monroe—Warren Radio Company, 112 Cass Street
Warren Radio Company, 1155 W. Front St.
Muskegon—Electronic Dist., Inc., 1960 Peck St.

MINNESOTA
Minneapolis—Electronic Center, Inc., 107 3rd Ave.
Harry Starks, Inc., 112 3rd Ave. North
Lew Bonn Co., 67 South 12th St.

MISSISSIPPI
Jackson—Swan Dist., Co., Inc., 342 N. Gallatin St.

MISSOURI
Butler—Henry Radio Co., 211 No. Main
Kansas City—Burstein-Applebee Co., 1012-1014 McGee St.
Burstein-Applebee Co., 305 E. 55th St.
Saint Louis—Walter Ashe Radio Co., 1125 Pine St.
NEBRASKA
Lincoln—Scott Electronics Supply Corporation, 2201 O' St.
Omaha—Ladd Electronics Co., 111 North 41st St.
NEVADA
Las Vegas—Metcalls, Inc., 25 East California St.
NEW HAMPSHIRE
Concord—Evans Radio, Inc., P. O. Box 312
Dover—Demambro Radio Supply Co., Inc., 286 Central Avenue
Keene—Demambro Radio Supply Co., Inc., 300 West St.
Manchester—Demambro Radio Supply Co., Inc., 1308 Elm St.

NEW JERSEY
Atlantic City—Almo Radio, 1800 Verona Ave.
Camden—Almo Radio, 1133 Haddon Ave.
Mountainside—Federated Purchaser, Inc., 1021 U. S. Route 22
Newark—Lafayette Radio, 24 Central Ave.
Paramus—Lafayette Radio, 182 Route 17
Plainfield—Lafayette Radio, 139 West 2nd St.
Shrewsbury—Federated Purchaser, Inc., 483 Broad St.
Trenton—Almo Radio, 201 Calhoun St.
Vineland—Almo Radio Co., 219 Landis Ave.

NEW MEXICO
Albuquerque—Radio Equipment Co., 523 East Central
Roswell—R & R Electronic Supply, 605 F. 2nd St.

NEW YORK
Albany—Fort Orange Radio Dist. Co., 904-916 Broadway
Amsterdam—Adirondack Radio Supply, Inc., 191 W. Main Street
Elmira—Chemung Electronics, Inc., 403 E. Third St.
Farmingdale—Gem Electronics, 34 Hempstead Turnpike
Jamaica—Harrison Radio, 144-24 Hillside Ave.
Lafayette Radio, 165-08 Liberty Ave.
Mineola—Arrow Electronics, 525 Jericho Turnpike
New York—Arrow Electronics, 65 Cortlandt St.
Harrison Radio, 225 Greenwich St.
Harvey Radio, 103 West 43rd St.
Lafayette Radio, 100 Sixth Ave.
Scarsdale—Lafayette Radio, 691 Central Park Ave.
Syosset—Lafayette Radio, 111 Jericho Turnpike
Syracuse—Harvey Electronics Syracuse, Inc., 1000
Richard Drive
Radio Shack Corporation
Vestal—Federal Electronics, Vestal Parkway

NORTH CAROLINA
Asheville—Freck Radio & Supply Co., 38 Biltmore Ave.
Burlington—Womack Electronic Supply Co., Inc., 623 South Worth Street
Womack Electronic Supply Co., Inc., 315 North Church
Durham—Womack Electronic Supply, 601 Ramseur St.
Goldsboro—Womack Electronics Corporation, 106 N. Carolina St.
Greenville—Womack Electronics Corporation, 311 Boyd St.
High Point—Womack Radio Supply Co., 130 S. Lindsay
Raleigh—Womack Supply Co., Inc., 421 S. Salisbury St.
Rocky Mount—Womack Electronic Supply Co., 105 Marigold St.
Winston Salem—Womack Electronics Corporation, 926 Brookstown Ave.

NORTH DAKOTA
Minot—John Iversen Co., 216-2nd St., S.W.

OHIO
Akron—Warren Radio Company, 71 S. Broadway
Canton—Walkerradio, 1546 Fulton Rd., N.W.
Cincinnati—Costin Electronic Distributors, 2345 Ferguson Rd.
Mytronic Co., 2145 Florence Ave.
Cleveland—Bernon-Ray Service, Inc., 2118 E. 21st St.
Jeff-Tronics Unlimited, 4719 Memphis Ave.
Phoenix Electronics Supply, 5403 Prospect Ave.
Dayton—Custom Electronics, Inc., 1918 South Brown St.
Srepro, Inc., 314 Leo St.
Elyria—E I A Company, 235 Lodi St.
Toledo—Warren Radio Company, 1002 Adams St.
Youngstown—Armies Electronics, 320 W. Federal St.

OREGON
Albany—Oregon Ham Sales, 409 First Ave.
Portland—Portland Radio Supply Co., 1234 S. W. Stark St.
United Radio Supply, Inc., 22 N. W. Ninth St.

PENNSYLVANIA
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Easton—Federated Purchaser, Inc., 925 Northampton St.
Erie—Warren Radio Company, 1313-15-17 Peach St.
Lancaster—George D. Barby Co., 622 Columbia Ave.
Norristown—Almo Radio Co., 550 Markley St.
Philadelphia—Almo Radio, 913 Arch St.
Almo Radio, 7450 Frankford Ave.
Almo Radio, 6205 Market St.
Almo Radio, 5801 Rising Sun Ave.
Radio Electric Service Co., 709 Arch St.
Pittsburgh—Hydings Co., 933 Liberty Ave.
Reading—George D. Barby Co., 333 North 4th St.
Wyncote—Ham Burger, Rices Mill Rd. at Glenside Ave.

RHODE ISLAND
Cranston—Radio Shack Corporation, 1301 Reservoir Ave.
Providence—Demambro Radio Supply Co., Inc., 1290 Westminster St.
W. H. Edwards, Inc., 116 Hartford Ave.

SOUTH DAKOTA
Rapid City—Burghardt Radio Supply, Jackson Blvd.
Sioux Falls—Burghardt Radio Supply, 208 N. Weber
Waterbury—Burghardt Radio Supply, Box 746

TENNESSEE
Chattanooga—Curle Radio Supply Co., 439 Broad St.
Dyersburg—Warren Radio Company, Hwy 51 North
Memphis—W & W Distributing Co., 644-46 Madison Ave.

TEXAS
Abilene—Howard Radio, 1425 Pine
Amarillo—R & R Electronic, 707 Adams
Corpus Christi—Electronic Equipment & Engineering Co., 805 S. Staples St.
Dallas—Amateur Electronics, Inc., 2802 Ross Ave.
Denison—Denison Radio Supply, 310 W. Woodward St.
El Paso—R & R Electronic, 2530 E. Yandell
Fort Worth—Amateur Electronics, Inc., 215 So. Jennings
Houston—Busacker Electronic Systems, Inc., 1216 West Clay
Lubbock—R & R Electronic Supply, 1607 Ave. G
Victoria—Electronic Equipment & Engineering Co., 1007 North William St.
Wichita Falls—R & R Electronic Supply, 1300 - 12th St.

UTAH
Salt Lake City—Manwill Supply Company, 2511 S. State St.
Standard Supply Company, 225 E. 6th St.

VIRGINIA
Arlington—Key Electronics, 100 South Wayne St.
Danville—Womack Radio Supply Co., 513 Wilson St.
Norfolk—Priest Electronic, Inc., 6431 Tidewater Drive

WASHINGTON
Aberdeen—C & G Electronics Co., 510 West Wishkah
Bremerton—C & G Electronics Co., 1301 Pacific Ave.
Centralia—C & G Electronics Co., 217 So. Lower
Olympia—C & G Electronics Co., 318 No. Capitol Way
Seattle—C & G Electronics Co., 2221 3rd Ave.
Seattle Radio Supply, Inc., 2117 2nd St.
Spokane—Northwest Electronics, Inc., East 730 First Ave.
HCl Electronics, E. 6904 Sprague
Tacoma—C & G Electronics Co., 2502 Jefferson Ave.

WEST VIRGINIA
Wheeling—Radio Parts Company, 1312 Main St.

WISCONSIN
Fond du Lac—Harris Radio Corporation, 289 North Main St.
La Crosse—Communications Equipment Co., 518 State St.
Madison—Satterfield Electronics, Inc., 1900 South Park St.
Milwaukee—Allied Radio of Wisconsin, 5314 N. Port Washington Rd.
Allied Radio of Wisconsin, Point Loomis Shopping Center, 3555 S. 27th St.
Amateur Radio Supply, 3832 W. Lisbon Ave.

ALASKA
Anchorage—Yukon Radio Supply, P. O. Box 406

CANADA
ALBERTA
Calgary—Smalley's Radio Limited, 1105 7th Ave. West
Edmonton—Sacker Electronics, 10235 - 103rd St.

BRITISH COLUMBIA
Prince George—Western Agencies, Limited, 409-3rd Ave.
Vancouver—Canadian Electronics Limited, 971 Richards St.
Pacific Electronics, 1641 West 2nd St.
Western Agencies Limited, 951 Seymour St.
Victoria—Western Agencies Limited, 2500 Douglas St.

MANITOBA
Winnipeg—Cam-Gard Electronic Distributor, 397 William Ave. at Ellen St.

NOVA SCOTIA
Amherst—Canadian Assemblies Limited, Station St.
Halifax—Consolidated Supply Limited, 86 Hollis St.

ONTARIO
Downsview—Alpha-Aracon Radio Co., Limited, 555 Wilson Ave.
Fort Williams—Inter-Comm Supply Co., 1315 Victoria Ave.
Hamilton—Crawford Radio, 119 John St., North
London—C. M. Peterson Co., Limited, 575 Dundas St.
Ottawa—Wackid Radio & TV Labs., 149 Gloucester St.
Toronto—Alpha Aracon Radio Co., 29 Adelaide St. West
Electro Sonic Supply Co., 543 Yonge St.
Wholesale Radio & Electric Limited, 66 Ortus Rd.

QUEBEC
Montreal—Etec Electronics, 464 McGill St.
Payette Radio Limited, 730 St. James St. West
Quebec City—Grobel Limited, 225 Rue Lee St.

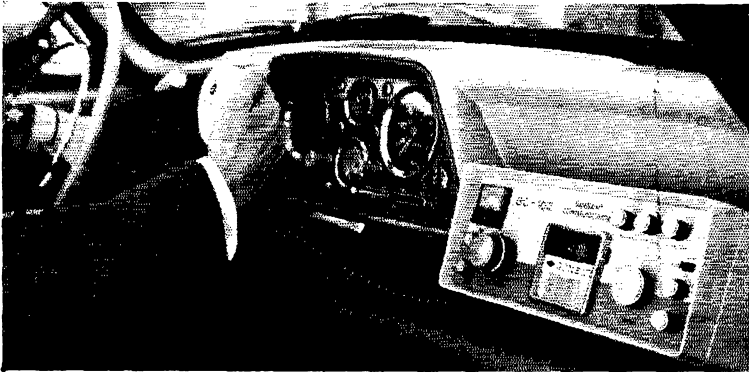
NEWFOUNDLAND
St. John's—Electronic Center, 90 Campbell St.

GERMANY
Bamberg—Ing Hannes Bauer, Hornthal Strasso 8
ITALY
Genoa—Standard Elettronica Italiana S.R.L.

Been "reading the mail" lately?

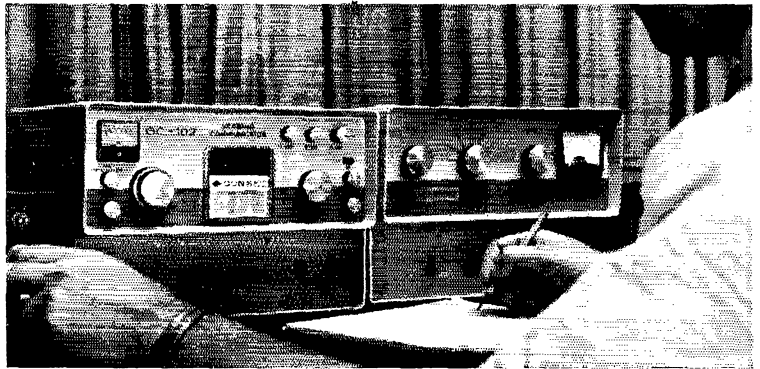
Good news travels fast. And if you've been listening to local or DX bands you know that Gonset has come out with a new single side band transceiver that's everything you've been waiting for!

Of course you want the facts on the new Gonset GC-102, so here's the scoop. Whether you want to operate it barefoot or with shoes, the GC-102 is the best SSB transceiver you can buy!



Because the Gonset GC-102 receiver uses transistors and "hybrid" tubes, it operates from 12 volt DC with a minimum power drain!

Coupled with the Gonset GSB-201 Linear Amplifier, the GC-102 gives 1500 watts P.E.P. input.



ONLY THE GONSET GC-102 SSB TRANSCEIVER GIVES YOU ALL THESE DELUXE FEATURES!

- Mechanical filter used to generate side band.
- All bands, 80 through 10 meters, in basic 500 KC segments.
- 2-speed concentric dial drive with "coarse" tuning ratio of 20:1 (50 KC/revolution) and "vernier" tuning ratio of 100:1 (10 KC/revolution).
- Power input to final: 180 watts P.E.P.
- Receiver features dual conversion.
- Semi-digital dial presentation with 10 KC major divisions, 2 KC minor divisions.
- Highly stabilized VFO.
- Designed for mobile and fixed station operation.
- Separate AC and 12 volt DC power supplies.
- AC P/S forms pedestal for transmitter to match appearance of GSB-201 Linear Amplifier.
- "Edge-lighted" dial and illuminated "S" meter.
- 100 KC Crystal calibrator built in.
- Transceiver tunes WWV (15 Mcs) for calibration purposes.
- High voltage power supply is used only in "transmit" mode.
- VOX and speech amplifier sections are completely transistorized.

For the Gonset distributor in your community consult list on the next page.

 **GONSET**
DIVISION OF YOUNG SPRING & WIRE CORPORATION
801 SOUTH MAIN STREET, BURBANK, CALIFORNIA

FOR FULL INFORMATION AND DEMONSTRATION OF GONSET QUALITY COMMUNICATIONS EQUIPMENT WRITE OR VISIT ANY OF THE FOLLOWING DISTRIBUTORS

EASTERN STATES

ALABAMA
BIRMINGHAM
James W. Clary Company
1713 2nd Ave., South

CONNECTICUT
HARTFORD
Dressler Electronics
325 Trumbull Street
Watly of Hartford, Inc.
100 High Street

NEW BRITAIN
Universal Radio
53 East Main Street

NEW HAVEN
Radio Shack
230 Crown Street

NEW LONDON
Aikens Electronics Supp., Inc.
531 Broad Street
DeMambo Radio
334 Broad Street

STAMFORD
Radio Shack
High Ridge Rd.

WATERBURY
Bond Radio
439 West Main Street

WEST HAVEN
Aikens Electronics Supply
670 Orange Street

WEST HARTFORD
Radio Shack
39 South Main Street

WESTPORT
Music Systems of Westport
Post Road

DISTRICT OF COLUMBIA
WASHINGTON
Electronic Wholesalers, Inc.
3345 Sherman Avenue, N.W.

FLORIDA
MIAMI
Electronic Wholesalers, Inc.
9340 N.W. 27th Avenue

ORLANDO
Amateur Electronic Supply
23 Azalea Park Shop, Ctr.

TAMPA
Kinkade Radio Supply, Inc.
1719 Grand Central Avenue

MAINE
AUBURN
Radio Supply Co.
28 Cross Street

BANGOR
Radio Service Lab.
33 Palm Street

PORTLAND
Radio Service Lab
1004 Congress Street

MARYLAND
BALTIMORE
Amateur Radio Center
2310 N. Fulton Avenue

SALISBURY
Standard Electronics Co., Inc.
301 Snow Hill Road

TOWSON
Raynesville Electronics
1761 E. Joppa Road

WHEATON
Electronic Distributors, Inc.
11324 Fern Avenue

MASSACHUSETTS
HOSTON
Cramer Electronics
811 Boylston Street
DeMambo Radio Supply Co.
1095 Commonwealth Avenue
Lafayette Radio
110 Federal Street
Radio Shack
730 Commonwealth Avenue

BRAINTREE
Radio Shack
Shopping Center

BROCKTON
DeMambo Radio
1839 Main Street

BUZZARDS BAY
Buzzards Bay Electronics
196 Main Street

FALL RIVER
Haddad Electronics
121 Pine Street

HANOVER
Valley Electronics
201 Winter Street

HYANNIS
DeMambo Radio
23 Barnstable Road

LAWRENCE
Alco Electronics
J Wolcott Street
DeMambo Radio
194 Broadway

LEOMINSTER
DeMambo Radio
760 South Main Street

NEW BEDFORD
E. A. Ross Co.
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DeMambo Radio
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N. WESTPORT
DeMambo Radio
95 GAR Hwy., State Road

READING
Graham Radio
505 Main Street

SALEM
DeMambo Radio
280 Highland Avenue

SAUGUS
Radio Shack
Shopping Plaza

SPRINGFIELD
DeMambo Radio
269 Spring Street

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Radio Maintenance
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DeMambo Radio
222 Summer Street

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CONCORD
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DeMambo Radio
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PORTSMOUTH
Rockingham Electric
377 Court Street

NEW JERSEY
CAMDEN
Radio Electric Service Co.
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Federated Purchases, Inc.
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PARAMUS
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182 Route 17

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National Electronics
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UNION CITY
Nidisco, Inc.
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ALBANY
Fort Orange Radio Dist. Co.
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Winchell Electronics
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27 Water Street

JAMAICA
Harrison Radio
144-24 Hillsde Avenue
Lafayette Radio
165-08 Liberty Avenue

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Arrow Electronics
525 Jericho Turnpike

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Arrow Electronics
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Harrison Radio
225 Greenwich Street
Harvey Radio Co., Inc.
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Rochester Radio Supply Co.
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Universal Service
114 North Third Street

DAYTON
Custom Electronics, Inc.
1918 South Brown Street

Spreco, Inc.
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DOVER
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P. Specialists Co.
203 N. Tuscarawas Avenue

FREMONT
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Pioneer Electronic Supply Co.
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Iydrics Company
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Moyer Electronics Supply Co.
330 East Norwegian Street

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Radio Shack
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PROVIDENCE
DeMambo Radio
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W. H. Edwards Co.
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NASHVILLE
Electra Distributing Company
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VERMONT
BURLINGTON
Radio Service Lab.
703 Pine Street

ST. JOHNSBURY
DeMambo Radio
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Industry Services, Inc.
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Priest Electronics, Inc.
6431 Tidewater Drive

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CHARLESTON
Chemcity Electronic Dist.
1637 Fourth Avenue

HUNTINGTON
Electronic Supply, Inc.
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TEXARKANA
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1237-16th Street

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566-510 Kishwaukee Street

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Northwest Distributing Co.
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Castrop's Radio Supplies
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THE ULTIMATE PROOF OF THE FINE PERFORMANCE OF THE
GOTHAM VERTICAL ANTENNAS IS IN THE ACTUAL FIELD
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PROVEN! PROVEN! BY THESE EXCERPTS FROM UNSOLICITED TESTIMONIALS:

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"I am very delighted with the first V80 and want another for a different location." A. C., California.

CASE HISTORY #159

"I ordered a Gotham V40 Vertical Antenna and found it so successful that several others are wanting them, too. Will you please send me four more." W. A., Alaska.

CASE HISTORY #248

"I just wanted to let you know how pleased I am with my Gotham V80 antenna. I have worked a W.A.S. of 46/43, a WAC of 3/3, and DXCC of 14/12 in about 12 months." G. W., Maryland.

CASE HISTORY #111

"The V160 did a beautiful job on a VE1 for me. Also, I forgot to take it down during the hurricane of last week. It is just as straight as it was when bought it." D. S., New Jersey.

CASE HISTORY #250

"I have one of your vertical antennas and have been having fine results on 10, 15, and 20 meters." N. S. P., Missouri.

CASE HISTORY #613

"I have never been happier with any antenna than I have been with the V80. I have worked all bands with it and have had tremendous success — i.e., DL4s, ZS3, etc., all solid copy." R. D. S., Penna.

CASE HISTORY #483

"My V80 is working wonders. I am able to maintain a 1:1 SWR all across the 40 meter band. After many years on 10, 15, and 20, the XYL and I are getting great kicks out of some of the lower bands." J. A., New Mexico.

CASE HISTORY #123

"I am full of praise for your vertical. In the recent field day, we went up to the mountains near here and QSO'd a KA2, KZ5, and an XE at 2100 PDST on 15 meters. We got a 59 plus from the KA and KZ and 58 from the XE." D. P., Nevada.

CASE HISTORY #398

"Some months ago I purchased one of your V80 vertical antennas. I have had wonderful results with this antenna, and I think it was of far greater value than the small amount I paid for it." R. C., Utah.

CASE HISTORY #766

"The Gotham vertical takes almost no room. I don't see how I could have used any other type very well. Sure do appreciate the fine record this antenna has made so far." H. C., Haiti.

CASE HISTORY #146

"I have had very good luck with mine (my V80) feeding it with a Johnson Adventurer; works fine on all bands." B. I., Nebraska.

CASE HISTORY #555

"Being an owner of your V80 vertical I would like to let you know of the excellent results I am getting with it, both working the DX and the local stations on the lower bands. It certainly is an excellent antenna system." F. H. Jr., New York.

CASE HISTORY #84

"A few months ago I purchased your V40 vertical and have achieved outstanding results on the air." K. G. B., North Carolina.

CASE HISTORY #407

"I recently purchased a Gotham V80 vertical antenna and I am very pleased with the results. Up until now my home brew antenna has had a very high SWR, but with the V80 the SWR is 1:1." J. D. R., Virginia.

CASE HISTORY #414

"Just a quick note to tell you how pleased I am with my 2 day old V80. My old SX-28 just seems to be re-born. An excellent receiving antenna as well as a fine transmitting antenna." D. J., Utah.

FREE

Catalog of all Gotham antennas,
including 47 different beams
covering 2 meters through 20
meters, free on postcard request.

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GOTHAM proudly announces our appointment
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We feature a unique plan that absolutely
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- Absolutely no guying needed.
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- 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.
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- No relays, traps, or gadgets used.
- Accepted design—in use for many years.
- Many thousands in use the world over.
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- Non-corrosive aluminum used exclusively.
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- 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.

73
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3. EVERY GOTHAM ANTENNA IS SOLD ON A TEN DAY TRIAL BASIS. IF YOU ARE NOT FULLY SATISFIED, YOU MAY RETURN THE ANTENNA PREPAID FOR FULL REFUND OF THE PURCHASE PRICE. THIS IS YOUR GUARANTEE OF FULL SATISFACTION.



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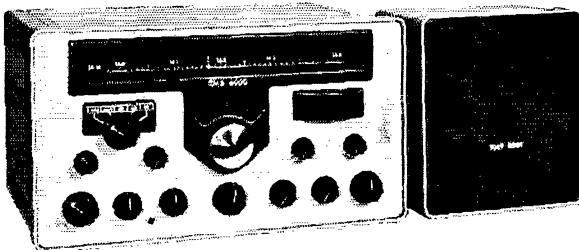
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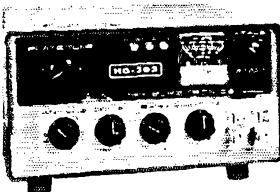
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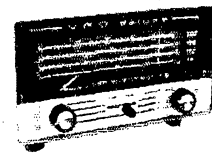


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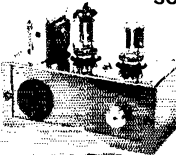


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For Globe Chief or similar CW transmitter Permits radio-telephone operation at unheard of low cost

HG 303 MODULATOR

Companion modulator for the HG303 or any 6146 rig



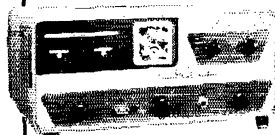
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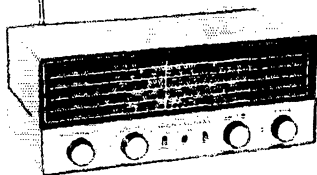
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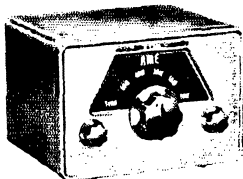


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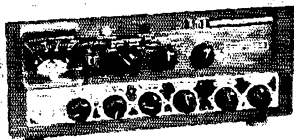


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Preselector gain plus automatic match between receiver and antenna for optimum performance. One setting continuous tuning not necessary Improves the performance of any receiver! 26 db gain.

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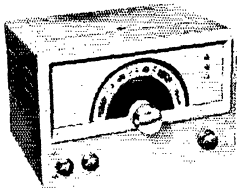


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Maryland, Baltimore
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Pennsylvania, Philadelphia
Rhode Island, Providence
South Dakota, Watertown
Tennessee, Memphis
Texas, Corpus Christi
Texas, Dallas
Texas, Dallas
Texas, Houston
Texas, San Antonio
Vermont, Rutland
Washington, Seattle
Wisconsin, Janesville
Wisconsin, Madison
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I am pleased to announce formation of SBE, Sideband Engineers, Inc., a new communications manufacturing company headed by myself and a fine group of former amateur radio associates. As many of you know, I retired from active electronic manufacturing several years ago and since then have been asked continually when I would return to the field. After careful study of potential new items that would meet my requirements of high value and performance, I have formed this group to bring you a new series of dynamic products. All will have outstanding "break-through" features.

Our first product is a new single-sideband transceiver which is described on the adjoining page. It is my personal feeling that this exceptional unit will soon lead the field. It is physically small, outstanding in circuitry, provides 4-band operation with selectable upper and lower sidebands, has built-in power supply. These are truly dynamic new features. There are several other new products in our laboratories that will soon go into production. These will be announced in the near future.

73

Faust Gonsett, W6VR, Pres.

Sideband Engineers, Inc. Rancho Sante Fe, California

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Entirely New! Outstanding! Dynamic!

SB-33 transceiver . . . dynamic product of solid-state electronics and advanced electro-mechanical design! Exceptionally small—less than one-half cubic foot including built-in AC supply and weighing only 15 pounds! Powerful . . . 135 watts P.E.P. input. Four-bands, 80-40-20-15 meters. Upper or lower sideband selectable by panel switch and without carrier or dial shift! Collins mechanical filter. Very low frequency drift. Check the specs . . . compare prices. This has to be one of the biggest values ever! Available at your SBE distributor during February 1963. Write today for complete specifications.

SIZE: 5½"H. 11¾"W. 10¼"D. Weight 15# (approx.)

FREQUENCY RANGE: Band 1: 3.8-4.0 mc,
Band 2: 7.15-7.35 mc. Band 3: 14.2-14.4 mc,
Band 4: 21.25-21.45 mc.

TRANSMITTER

POWER INPUT: 135 watts P.E.P. max. (Speech waveform.)

DISTORTION PRODUCTS: Down at least 25 db.

CARRIER SUPPRESSION: -50 db.

SIDE BAND SELECTION: Upper or lower sideband selectable by panel switch.

UNWANTED SIDE BAND: -40 db.

OUTPUT IMPEDANCE: 40-100 ohms unbalanced.

RECEIVER

SENSITIVITY: Better than 1 uV for 10 db signal/noise ratio.

SELECTIVITY: 2.1 kc @ 6 db. 5.3 kc @ 60 db.

SPURIOUS RESPONSE: Images and I-F response down at least 40 db.

STABILITY: Less than 100 cps drift in any 30 minute period in any normal ambient temp. condition.

AUDIO OUTPUT: 2.0 watts @ 10% distortion.

TUNING RATE: 30 kc per revolution.

POWER SUPPLY: 117VAC POWER SUPPLY IS BUILT IN.

POWER CONSUMPTION: AC operation. Receive 35 watts.

Transmit: 165 watts (single tone).

DC operation through vibrator or transistorized inverter.

TUBE AND SEMI-CONDUCTOR COMPLEMENT:

2—PL-500 beam power tetrodes, PA. 1—12DQ7 driver.

19—transistors, 13—diodes, 1—zener diode.

OPTIONS: Several options are separately available including VOX and Calibrator unit with provisions for mounting on rear of transceiver. Internal power supply provides operating power. Rear connections are brought out for linear amplifier

**389⁵⁰**

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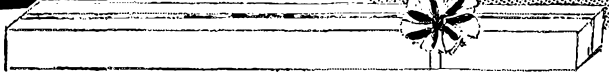
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AMATEUR NET, \$99.75 at your favorite amateur equipment dealer.

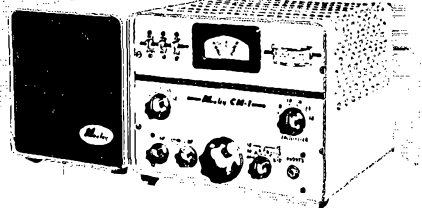
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- WEATHER RESISTANT WITH YOUR CHOICE OF EPOXY RESIN OR GALVANIZED FINISHES.
- ENGINEERING CALCULATIONS AVAILABLE FOR BUILDING AND ERECTION PERMITS WITH PURCHASE OF TOWERS.
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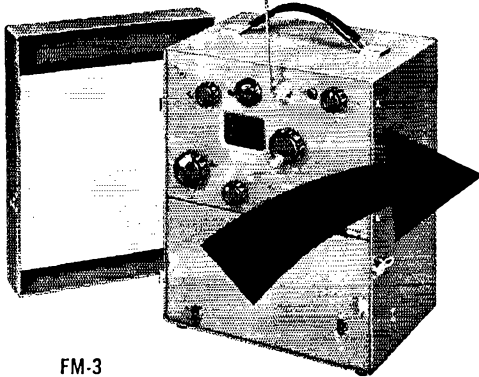


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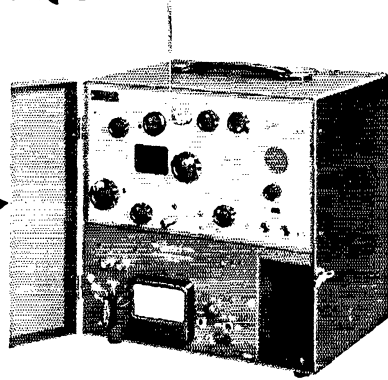
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— factory conversion provides direct reading
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All Gertsch Model FM-3 frequency meters can now be factory-converted to measure and generate *all* assigned channels in both 150-170 mc, and 450-510 mc bands.... with $\pm .00025\%$ (2.5ppm) accuracy. Instrument features a single 1-mc crystal which is easily standardized against WWV.

Converted units can also be operated as standard FM-3 instruments through 20 to 1,000 mc, at .001% accuracy.

Conversion includes: an all transistorized converter module, a new front panel and carrying case, and a built-in amplifier (with speaker). Also, a front-panel jack allows input of external audio signals, such as those from a Gertsch Model DM-3 deviation meter. Space for a DM-3 is provided in the case.

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MODEL 714SR Ceramic Mobile Microphone

All-new hand-held design. Unbreakable Cycloac® case withstands roughest handling—feels comfortable at any temperature. Ceramic element is unaffected by extremes of heat, humidity. Panel mounting bracket included. Hi-Z output -55 db. Shielded coiled cord. DPDT switch. Net price \$9.90.

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Improves base station performance at remarkably low cost. Cardioid pickup pattern cuts out room noise, improves VOX action, permits greater working distance from microphone. Ceramic element rugged enough for mobile use. Handsome case fits easily in hand, or slips quickly into desk stand or floor stand adapter provided. DPST switch. Hi-Z output -60 db. Net price \$15.90. Without switch (Model 729) \$14.70.

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an E-V communications loudspeaker adds useful volume and articulation to your fixed or mobile receiver. Carefully controlled band-pass of compression driver and horn improves efficiency, cuts distortion and overloading, eliminates unwanted noise.

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(Continued from page 106)

confusing. WA2DAC is looking for 1298-Mc. contacts. W2EUP and K2GUG are building a 2-meter repeater setup for Erie County. We will keep you informed as we get more information. This column would like to publish a list of all frequencies which are monitored on a regular basis by various groups in our section. Send information to K2HUK. See page 6 this issue for address. WA2WEE has a new Valiant and an HQ-180. The Rome Radio Club elected WA2NHQ, chairman of the board; WA2PLX, pres.; W2B2YE, vice-pres.; W2MSM, secy.; W2IXR, treas. WA2MZZL and WA2TRT are working actively on ham TV. W2ELF gave a talk and demonstration on ham TV to the RAWNY. WA2YOK has a Polycorn 62B and a DB 62 beam. K2IQH reports that he's back on the air now that he's got his release from the Navy, a college degree and a new wife. WA2LKW has a new NC-303. W2RUF, Clara, has another protégé. He's WN2DYQ. Clara worked with him while he was hospitalized for a serious operation until he got his license and then introduced him to the Lockport Club members, who will see that he gets to meetings. W2RUF and W2FEB are giving him further code instruction and rounding-up equipment. Traffic: W2OE 357. W2RUF 219. W2EZB 187. W2FEB 187. WA2KQG 84. WA2HSB 49. K2QFV 41. W2RQF 28. WA2ANE 22. K2IMJ 22. WA2DAC 13. WA2WEE 13. K2TDG 12. WA2GLA 10. W2PVI 7. K2HUK 3. K2OQO 3.

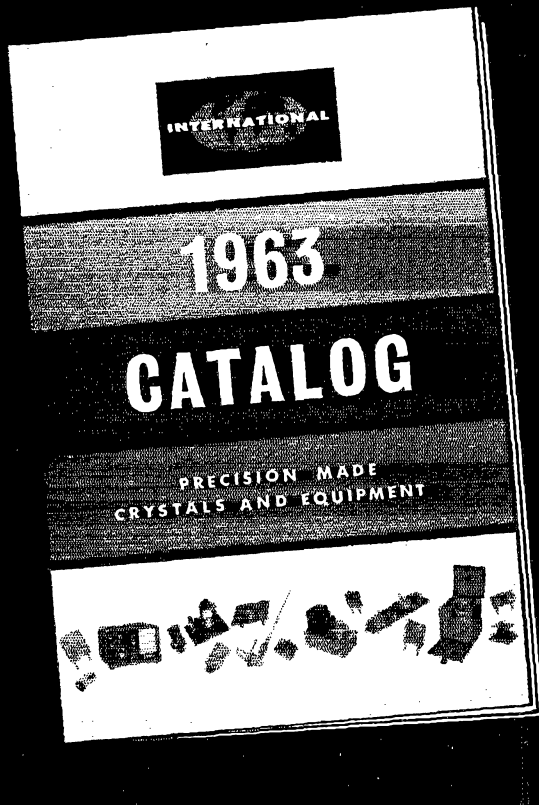
WESTERN PENNSYLVANIA—SCM, Anthony J. Mroczka. W2UHN—SEC. W3LIV, RAL; W3KUN and W3NUG. The WPA Traffic Net meets Mon. through Fri. at 2400 GMT on 3585 kc. The Keystone Slow Speed Net (KSSN) meets at 2330 GMT on 3585 kc. Mon. through Fri. We regret to record the death of W3UJP, of Pittsburgh. W3JHG is working toward his WAS. K3EDO has a new KW3-2. New officers of the POOS are: K3DIG, pres.; K3KYI, secy.; K3BAK, treas.; K3COP, net mgr. K3-AZY is moving to Arizona. Anyone wishing a list of TV manufacturers supplying filters can obtain same through the Greater Pittsburgh V.H.F. Society. K3QIO is attending St. Mary's Prep school in Michigan and operating on 6 meters. W3IYI is using an inverted "V." The Cumberland Valley ARC reports via *Valley QRM*. The club again will participate with the Cerebral Palsy Drive; Field Day was a huge success; W3JKZ, W3ESV, W3-ZQU, W3CUC, K3MUF and KN3SYK represented the club in the V.H.F. Contest. W3SMV is installing an 80-meter vertical. K3QBM moved to W6-Land. K3CTN is mobile on 10 meters. K3STG is on 2 meters from State College. The Steel City ARC reports through *Kilovatt Harmonix*: The club station, W3KWH, won the V.H.F. Contest for the section; W3ZDW loaned the club his kw. rig. K3DFD is attending school at Penn State. Indiana County ARC (W3BMD) reports that the code classes under the able supervision of W3IYI netted six new Novices—KN3s VDC, VDD, VDE, VDF, VDG and VCI. Up Erie way: W3KNQ is conducting code classes for the RAE; K3KJN has a new tower for 6 and 2 meters. W3NXK is home from the hospital. W3RKT is working mobile with a Tenner. K3GYC is now working s.s.b. K3KMO now is in Germany using the call DJ0-HZ. The Bedford County ARC had a QSL Display Project in Bedford and Everett bank windows. K3LQK has an HQ-140XA. The Etna RC reports via *Oscillator*: W3MUC is active on 160 meters; K377Q has a Marauder; K3MQX has a Warrior linear on his Apache; W3-TIE is busy working DX. Traffic: (Sept.) W3IFB 216. K3OOU 132. W3KUN 82. W3JGH 43. K3EDO 34. K3-DKE 29. W3UHN 27. W3IYI 25. K3HID 9. W3OEO 8. K3COT 4. W3KW 4. W3NUG 3. W3SMV 3. K3BWT 1. (Aug.) W3SMV 6.

CENTRAL DIVISION

ILLINOIS—SCM, Edmond A. Metzger, W9PRN—Asst. SCM: Grace V. Ryden, W9GME. SEC: W9RYU, RM: W9USR, P.AM: W9WJ, EC of Cook County: W9-HPG. Section net: ILN, 3515 kc. Mon. through Sat. at 1900 CST. This column's sympathy is extended to our Asst. SCM, W9GME, on the recent death of her husband, K9CUM; also to the family and friends of W9BHD, who W9MAK 10. W9PRN 10. K9VUL 9. W9NCLM 5. K9OCU also passed away suddenly. Joe will be greatly missed by the gang at the Allied Ham Shack where he was employed for several years. From reports at this early date, the SET was very successful and many Illinois amateurs were very active. W9CGT is a new call on 2 meters. K9KEJ is sporting a new s.s.b. transceiver. W9EPII is now mobile. W9IDA reports that some of the newer traffic men are confused in the counting of traffic. If those who are interested in the procedure and care to drop me a line, I'll forward complete details immediately. W9SKR has a new antenna tower. K9DCS also reports a new 50-ft tower. K9FSS is now in O-Land awaiting his new call. K9DCZ is on 8 meters with a new Lincoln transceiver. K9BCI has moved to Ohio. The McClean County RACES and c.d. program has 9 mobiles and 2-meter t.m. K9QMJ and K9VCZ are operating portable from St. Mary of the Lake Seminary at Niles. K9VKM has a new Clegg 90er for 6 meters and reports that it is getting out well. K9GSK and W9HC manned

(Continued on page 132)

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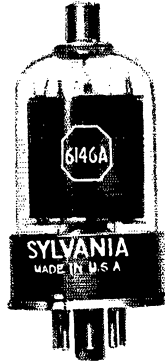
West Hartford 7, Connecticut

a Red Cross First Aid tent for the Signaleers at Tinley Park for the fall festival over the Labor Day week end. Officers of the Signaleers are K9GSK, W9HLC, W9CYE and K9IEL. K9RII is recuperating from a serious eye operation at the Menonite hospital in Bloomington. We have received many announcements of code and theory classes sponsored by the various Illinois clubs. Please notify prospective students to contact the nearest club for information on these classes. K9DDA has been spending the summer working for awards and has received a few of the rare ones. K9RHU is attending the U. of Michigan and is operating K9RHU/8 and K8GRE. WA2TKS is portable at Lake Forest College and soon will have a 9 call. The Crawford County Amateur Radio Club and the Skokie Six Meter Indians were approved for League affiliation at the Executive Committee's meeting. The Moultrie Amateur Radio Club elected W9PHD, K9JVI and K9HIR as the new officers for the coming year. K9COB and W9BZK have erected new 50-ft. towers and tri-band beams. League officials W9GPI, W9HPG and SCMI W9PRN attended an FB meeting of the DXCC at the Sheraton Chicago Hotel on Sept. 15. New appointments include W9AMH as EC of Ford County, K9CGD as OBS and W9OKI as OBS. The Joliet Amateur Radio Society has installed an 80- and 40-meter Mosley trap dipole on its recently erected tower. The Peoria Area Hamfest was one of the largest gatherings in this area. Many eyeball QSOs were held and old acquaintances renewed. The North Central Phone Net handled 198 messages and the ILN's traffic count was 245 during August. For September they were 108 and 131, respectively. W9IDA is the only recipient of a BPL certificate for Sept. traffic. Traffic: (Sept.) W9IDA 523, K9KZB 313, W9USR 262, WA9AJF 138, K9ZQT 101, W9JXV 58, W9AZ 52, K9UCG 51, K9DRS 50, K9UMH 44, K9OAD 34, K9CRT 33, WA9DEW 31, K9NBH 27, K9IAS 23, K9LXG 12, K9UMH 12, K9ISP 10, W9IAK 10, W9PRN 10, K9VUL 9, WN9CLM 5, K9COU 5, K9DDA 4, K9GN 4. (Aug.) W9USR 453, K9OAD 46.

INDIANA—SCM, Donald L. Holt, W9FWH—Asst. SCM; Clifford M. Singer, W9SWD, SEC; W9SNQ, PAMs; K9KTL, K9CRS, K9GLL, RMs; W9TT, K9SGZ, K9WET, Net skeds (all times in GMT); IFN, 1300 daily and 2300 M-F on 3910 kc. ISN (s.s.b.), 0030 daily on 3920 kc. QIN (training), 0000 M-W-F on 3745 kc. QIN daily at 0030 and RFN, 1300 Sun. on 3656 kc. New officers of the Tri State College ARC are K2QVZ, K3RQY, and W3JKE. With deep regret the following Silent Key is reported: Edward Blanck, sr., K9LAQ. ARRL has confirmed the fact that W9CC, Russ Jenkins, held the call 3CC in 1912. Russ believes there were only eight of these licenses issued before it was discontinued by the Secretary of Commerce. In 1915, Russ received his amateur 1st-class license with the number 7903. QIN honor roll: W9TT, K9UEF, W9VAY and K9SGZ. Those making BPL: W9JOZ, W9NZZ and K9SGZ. *Amateur radio exists as a hobby because of the service it renders.* Sept. net traffic reports: IFN 296, ISB 320, QIN 132. QIN (training) 2. Hoosier V.H.F. 37. W9ZYK reports 9RN traffic as 543 and for Aug. 9RN traffic as 1118. Indiana was represented 100 percent for both months. Traffic: (Sept.) W9IOZ 1691, W9NZZ 543, W9ZYK 394, W9RE 265, K9DHN 221, K9CQA 219, W9QYQ 190, K9BSL 124, K9SGZ 114, K9IVG 96, K9RWQ 84, K9KTL 73, W9SNQ 51, K9ARW 49, W9BUQ 47, W9FWH 43, K9ZLB 43, K9OET 41, K9GLL 36, K9CRS 34, W9EJW 31, W9RTH 31, K9ZLA 29, W9QLW 26, K9WET 26, W9DGA 25, W9ETM 17, W9AWH 15, W9HTZ 15, W9OG 15, W9DOK 14, K9KFM 13, K9WWJ 13, W9YYX 10, K9UEF 8, K9ILK 7, K9OFG 7, K9QVZ 6, W9IMU 4, W9AB 3, K9MAN 2. (Aug.) W9ZYK 282, K9UEF 72, W9AB 2, K9WWJ 2.

WISCONSIN—SCM, Kenneth A. Ebneter, K9GSC—SEC; W9BCC, PAMs; W9SSA, W9NRP, W9NGT, RMs; W9VHP, W9VIK, Nets; WIN, 3535 kc. at 0115 GMT daily; BEN, 3950 kc. at 2400 GMT daily; W9BN, 3985 kc. at 2315 GMT daily; W9SSN, 3535 kc. at 0030 GMT Tue.-Sat. New appointees: WA9DHL as EC for Dane County, K9MIF as EC for Portage County. Renewed appointments: W9EWC, W9VRL, K9KJT, W9SZL as ECs; W9SZR as ORS; K9GSC as OES. W9FSP took over as WIN RM while W9VHP and W9VIK vacationed in New Mexico. Wisconsin QSO Party winners for 1961 were: Combined class W9RQM; phone W9YT; c.w. W9DYG; Novice KN9GTH, mobile W4VRD/9. W9SZR has left W9YT and is back in Kiel. W9LMN and W9RBI talked on sun spots at the FLARC. K9BDA and K9ZMT had a 41-hour QSO. W9FSP is now a member of the TCC. He also has a 60-w.p.m. code certificate. W9OTL is now owner of a Globe Champ. K9ELT is trying to get a rig for his new Corvair. W9DYG has earned BPL cards for 41 consecutive months of over 500 traffic count. The Milwaukee AREC assisted in the Shrine Parades. W9RNZ was mobilizing coast to coast. W9HHC has rebuilt his beam. K9WGN has left Wisconsin for Iowa. W9VQD has donated a rig to his High School ARC. Racine Megacycle Club officers are W9HAG, pres.; W9KZZ, vice-pres.; W9GPT, secy.-treas. K9YKL has a new 52-ft tower. Traffic: (Sept.) W9FSP 645, W9AOW

(Continued on page 134)



So we asked Collins...

There is an old saying that curiosity killed the cat. But curiosity was instrumental in getting a signal to the moon and back, so this trait is not without benefit.

As a current example, take Collins and the Sylvania Type 6146A beam power pentode...

The story begins a while back when we began to wonder if there was a way to improve the type 6146 for mobile work. Trouble was that power output dropped off with a decrease in heater voltage. So, knowing of no way to maintain a constant car battery voltage, we went to work on the heater and cathode structures of the tube.

Much to our pleasure, we came up with designs that held power output within the limits of 20 per cent...which is another way of saying that, with the car battery down to 5 volts, loss in output is negligible.

So, you might say that the Sylvania Type 6146A is a souped-up 6146.

Subsequently, we were highly pleased to learn that Collins had become interested in testing our 6146A for both the KWM-2 Transceiver and the 32S-3 Exciter.

To us, this all sounded very logical for a mobile job...at least for the KWM-2 mobile job. But our curiosity got the better of us when we learned that Collins had standardized on our 6146A for the new 32S-3 fixed-station rig. So we asked the Collins boys why...and we're glad we did.

Since the 6146 and the 6146A are directly interchangeable in any final, and cost the same, it could have been a case of easy bookkeeping. But there was a more forceful reason. After extensive life tests at 110 nominal watts at 30mc, Collins engineers found the Sylvania 6146A maintained consistently high power output...well beyond their expectations.

If you use 6146's barefooted, to pump a linear, or in your commercial designs, you might give our 6146A's a try the next time around. The experience, we think, will duplicate that of Collins. Electronic Tube Division, Sylvania Electric Products Inc., 1100 Main St., Buffalo 9, N. Y.

73,

Bob Lynch

K2RMN

SYLVANIA

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Hy-gain VERTICALS

World Famous for
Quality and Performance

The All NEW Model 18V... for 10 to 80 Meters

Here's a low-cost, highly efficient, 18 ft. vertical that can be tuned to any band—10 thru 80 meters—by a simple adjustment of the feed point on the matching base inductor. Designed to be fed with 52 ohm coax, the 18V is amazingly efficient for DX or local contacts. Self-supporting, this radiator which will survive winds up to 50 MPH, may be quickly installed on a short 1½" mast driven in the ground. It is also adaptable to roof or tower mounting. Highly portable—knocks down to overall length of 5 ft. A tremendous buy in an antenna with multi-band capability. Priced at **\$16.95**

TRAP VERTICALS

- Automatic Band Switching
- Exclusive Hy-Gain Slim Traps

Model 14 AVS... for 40 thru 10 Meters

The world's most popular multi-band, omni-directional antenna. Self-supporting and completely factory pretuned to maintain an SWR of 2:1 or less across the entirety of each band. The 14 AVS features a low angle DX radiation pattern. Thoroughly weatherproof. May be roof top or ground mounted. Height: 21'. Wt.: 10 lbs.

Realistically Priced at **\$29.95**

Model 14RMK Roof

Mounting Kit **\$11.95**

Model LC80 Loading Coil

for 80 M use **\$ 7.95**

Model 12 AVS... for 20, 15 and 10 Meters

Companion to the Model 14 AVS... for 10-20 Meters. Completely self-supporting and factory pretuned with SWR 2:1 or less. Height: 13.5 ft. Wt.: 9 lbs.

Priced at **\$21.95**

Model 12RMK Roof Mounting Kit... **\$ 9.50**

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573, W9DYG 517, W9SAA 172, K9IMR 111, K9LGU 105, K9BLN 60, K9GSC 31, W9UEB 31, W9NRP 30, W9YT 30, W5LLA/9 22, K9GDF 18, K9DOL 16, W9IQW 15, W9-OTL 15, K9WTE 13, W9HPC 11, W9AOI 8, K9ZMU 6, W9CBE 3. (Aug.) K9WGN 39, W9CBE 10.

WISCONSIN QSO PARTY

December 9, 1962

All Wisconsin amateurs are invited to take part in a QSO party, sponsored by the Milwaukee Radio Amateurs' Club in order to promote friendship and operating ability within the section.

Rules: (1) The party will begin at 1600 GMT and end at 2259 GMT Sunday, December 9. To facilitate log checking, the use of GMT is requested of all contestants. (2) The general call will be "CQ WIS". (3) Exchange will consist of a QSO number (starting with number 1), RS or RST report, county and operators name. (4) Logs should show time of contact, station worked, signal reports, sent and received, band, type of emission, power input, QSO numbers sent and received, and name of operator and name of county worked. Sheets from the ARRL log book may be used with the additional information required being entered in the data column. (5) You may operate on either CW or Phone, but not both. CW to phone contacts will be permitted but cross-band contacts are not allowed. To encourage the use of bands other than 3.5 to 4 mcs. and to enable you to increase your score, you may work the same station once per band. (6) Scoring: Each message sent and acknowledged will count one point and each message received will count one point. For a maximum of two points per contact. Each Wisconsin county worked counts as a multiplier and to obtain your final score, multiply your total contact points by the total number of band counties worked. Only QSOs with other Wis. hams count, and the log entries must be complete. Any violation of the contest rules of F. C. C. regulations may result in disqualification. (7) Send logs, postmarked not later than January 7, 1963, to Russell Burss, W9RKP, 6285 S. Baas Dr. New Berlin, Wis. The decision of the Contest Committee will be final in judging of logs received. Suitable awards will be given to the 1st, 2nd, and 3rd place winners for CW only, mobile, and Novice entries. Mark your calendar now for December 9. Get on the air during the contest period and see how many Wisconsin stations you can work. Meet the gang and have fun with "CQ WIS"

DAKOTA DIVISION

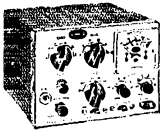
NORTH DAKOTA—SCM, Harold A. Wengel, WO-HVA—SEC: W0CAQ, PAM: K0TYY, RM: K0QWY. The North Dakota 75-Meter Phone Net reports: For Aug.—19 sessions, 292 check-ins, 26 pieces of formal traffic and 33 informal with 6 relays. For Sept.—19 sessions, 335 check-ins, 21 pieces of formal traffic handled and 42 informal with 7 relays. W0CAQ has a new HT-37 and an SX-101A on the air and got a new stick for his beam antenna. The Minot Amateur Radio Assn. has its own QSL cards. The first of a series of sessions to acquaint the would-be ham with radio was held in September by the M.A.R.A. Ten people registered for the course. K0RLF left Bismarck Sept. 17 to attend school in Seattle. WN0DAR has completed a 2-meter transceiver. K0JNB now makes his home in Pelican Rapids, Minn., and K0BOT has his job as act. mgr. with the local club. A new call in Bismarck is WN0DWA. Traffic: (Sept.) K0ITP 35, K0FRP 24, W0YCL 17, W0BFN 5, W0CAQ 4, W0HSC 2, K0MPH 2. (Aug.) K0FRP 41, K0ITP 34, W0AYL 14, K0JNB 14, K0QYD 14, W0YCL 8, W0IRN 6, W0MQA 3, W0PVH 1.

SOUTH DAKOTA—SCM, J. W. Sikorski, W0RRN—SEC: W0SCT, K0WEN, K0WEM and W0A6YF have received the first three South Dakota certificates, sponsored by the SFARC. W0SMV has installed a 60-ft tower at his new QTH. K0ALT has moved to a new home. W0UND and K0IAP are working for KNWC, Sioux Falls. K0YCD, Huron, is reported attending Harvard University. K0ESP moved from Aberdeen to Watertown. W0AYJ has been issued the call W0HAT for operation from Jamestown, N. Dak., where he is teaching. K0TVJ is operating portable from college at Springfield. K0BMQ renewed RM and FC appointments. Traffic: W0SCT 306, K0BMQ 113, W0DYB 73, K0-

(Continued on page 136)

AMECO**LEADER in COMPACT, QUALITY HAM GEAR****COMPACT 6 THRU 80 XMTR.**

Will handle 90 watts phone and CW on 6 thru 80 meters. Final 6146 operates straight-through on all bands. Size is only 5" x 7" x 7" —ideal for mobile or fixed use. Can take crystal or VFO.



Model TX-86

Model TX-86K—Kit \$9.95
 Model TX-86W—Wired \$19.95
 Model PS-3 power supply, wired \$4.95
 Model W612A mobile supply, wired \$4.95

NUVISTOR PREAMPLIFIER
 for 27, 28, 50, 144 or 220 MC.
 Lower noise figure
 Over 20 db gain.


Model PV—Uses 6CW4 Nuvistor. Improves gain and noise figure of present converter or receiver. Specify frequency.

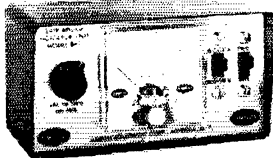
Model PV—Wired & tested \$13.95

Model PH—Uses 6CB6 tube—for any frequency or ham band, 2 to 27 MC. Wired & tested \$13.95

NEW SWR BRIDGE & INDICATOR**STANDING WAVE BRIDGE
MODEL SWB**

Model SWB accurately reads SWR from 1.8 to 225 Mc. and handles up to 1000 watts. It uses the superior type of inductive coupling and can be left in the line without insertion loss. Size 1 1/2" x 2 1/4" x 4 1/2".

Model SWB—wired and tested.....\$9.95

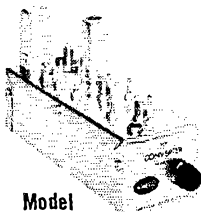
**BRIDGE INDICATOR UNIT
MODEL BIU**

Model BIU, when used with the AMECO SWB or other make of bridge will read SWR, % power and % voltage (three scales). It contains a 100 microamp D'Arsonval meter. A feature found only in this indicator is a switching circuit for reading either one of two bridges. Model BIU can be calibrated to read power up to 1 Kw.

Model BIU—wired and tested\$15.95

NEW AMECO CONVERTER SWITCH BOX...

Makes it possible to switch up to three converters or the low frequency antenna to the receiver. A single switch automatically switches rf and power. May be used with AMECO converters and power supply or any other makes. Model CSB—kit form only.....\$9.95

**NUVISTOR CONVERTERS**
For 50, 144 & 220 MC
High Gain, Low Noise


Model CN

\$49.95 wired **\$34.95** kit

Two Nuvistor RF stages, a Nuvistor mixer and a 6J6 osc. give lowest noise figures and high gain. Ameco converters do NOT become obsolete as their IF output is easily changed to match any receiver. All CN models (CN-50 for 6 meters, CN-144 for 2 meters and CN-220 for 1 1/4 meters) are available in ANY IF output. (Specify IF output in order.) Specs. Noise figure 2.5 db at 50 MC; 3.0 db at 144 MC; 4.0 db at 220 MC. Gain 45 db average, image and spurious rejection—better than—70 db. IF rejection—better than 100 db. Power required—100 to 150 V at 30 ma, 6.3 V at .84 A. See PS-1 Power supply.



CB-6

Tube-type low noise, high gain converters. IF easily changed. Specify IF.

CB-6K—6 meter kit, 6ES8-rf Amp., 6U8-mix./osc. only \$19.95

CB-6W—6 meter wired & tested\$27.50

CB-2K—2 meter kit, 6ES8 1st rf amp., 6U8—2nd rf amp./mix. 6J6 osc. only \$23.95

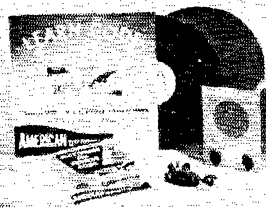
CB-2W—2 meters wired and tested. \$33.95

Model PS-1—Matching Power Supply—plugs directly into CB-6, CB-2 and all CN units. PS-1K—Kitonly \$10.50

PS-1W—Wired\$11.50

**EASY TO UNDERSTAND AMECO BOOKS**

Amateur Radio Theory Course\$3.95
 Amateur License Guide50
 Radio Operators' Lic. Guide, EL 1-2 .75
 Radio Operators' Lic. Guide, EL 3..... 1.75
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**CODE PRACTICE MATERIAL**

Ameco has the most complete line of code records, code practice oscillators and keys. Code courses range from start to 18 W.P.M. and are on 33, 45, or 78 r.p.m. records. Model CPS oscillator has a 4" speaker and can be converted to a CW monitor.

Code courses on recordsfrom \$ 4.95
 Model CPS-Code oscillator, Kit 13.75
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Write for complete details on code courses and other ham gear.

Ameco equipment is available at all leading ham distributors.

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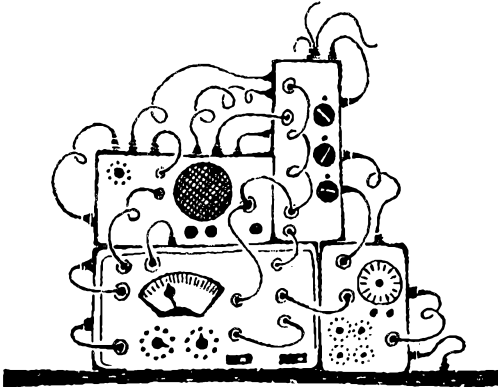
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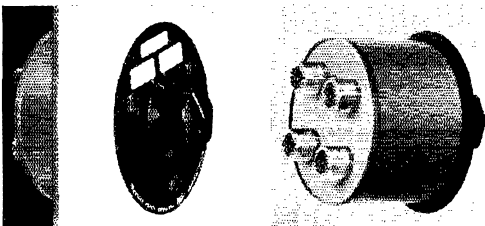
COAXIAL SWITCHES



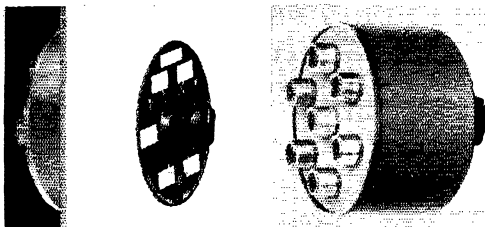
SWITCH IN, SWITCH OUT, OR DO THE 6-WAY SWITCH IF YOU'RE A HAM WHAT AM WITH A WATERS COAXIAL SWITCH. Designed for panel mounting, and featuring in-line orientation of the coaxial connectors, these compact units occupy a minimum amount of space with ready access for connecting and disconnecting. The Waters Coaxial Switches have a negligible insertion loss, low standing-wave ratios (less than 1.1 up to 150 mc.), and a power carrying capacity of 1 kw. They come in two models complete with mounting screws, knob, and escutcheon plate with provision for erasable markings.

COAXIAL TRANSFER SWITCH — MODEL 336. A double-pole, double-throw (internally strapped) unit for in-and-out switching of a Power Amplifier between an exciter and antenna. Connections are made to 4 standard SO-239 UHF connectors. Amateur Net: \$11.45

COAXIAL SELECTOR SWITCH — MODEL 335. A single-pole, 6-position switch used for selection of RF sources, antennas, etc. Connections are made to 7 standard SO-239 UHF connectors. Amateur Net: \$12.95 Available at leading distributors



COAXIAL TRANSFER SWITCH — MODEL 336



COAXIAL SELECTOR SWITCH — MODEL 335

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ZBJ 16, WORWM 14, KORPK 10, KOCXL 8, KOBSW 7, WOFJZ 7, WOGWW 7, WOYF 6, KOGSY 4, KOTVJ 4, KOAIR 3, WOIGG 3, WOYVF 3, WOCQN 2, KQJGM 2, KOKOY 2, KOAKT 1, KOHQD 1.

MINNESOTA—SCM, Mrs. Lydia S. Johnson, WOKJZ Asst. SCM; Charles Marsh, W0ALW. SEC: KOKKQ. PAMIS: KOEPT, WOGCR, WOHEN. RM: KOUNQ, WOKJZ (sub.) Nets: MSPN, noon 3820 kc. at 1805Z; MSPN Evening, 3820 kc. at 2100Z. The two phone nets combine and meet Sun. and holidays same frequency at 1500Z. MISSB Noon, meets on 3805 kc. at 1730Z, and Evening at 3812 kc. at 0045Z. C.w. nets: MSN on 3595 kc. at 0030Z and MJN (our slow-speed training net for beginners and Novices) on 3595 kc. at 0100Z. Novices, please take note and send your call, name, QTH and crystal frequency for 80 meters if you wish to be placed on the MJN Roll-Call to your SCM, WOKJZ (address page 6 Q87). Here are our present section appointees. If you are not among them, please check the appointment expiration date found on your certificate. A news item is accepted in lieu of a report. Failure to report can lead to cancellation. ORS: W0S DQL, KLG, KJZ, RQJ, ISJ, THY, RIQ, KOS, OTH, AKM, UKU, YTC, IZD, ORK, WPK, OPSS: W0S BUO, FGF, ALV, BVJ, WAA, OPH, UMX, HEN, LST, GCR; K0S, IWK, VPI, ANY, EPT, ZKK, ICC, SBB, OOS, W0S ISJ, WAA, KLG, KOORR, OES: W0HPS, K0S VLD, ARG, PSE, OBS, W0S, DOI, BUO, KOORR, ECs W0S, HEN, YAC, TCK, GGG, FIT, THY, PGP, MZR, UMX, K0S CNI, DEH, RDP, DZE, HFS, MEQ, EGE, IKU, ICG, MNY, WAOCAN, K0SBB and his XYL will be in Bombay, India, for two years as instructors with the Dunwoody Institute, with the U.S. Government program, Operators Herb, Carl and Bill, of W0BIV, are to be congratulated on the excellent traffic-handling they do for the V.A. Hospital patients during their lunch hour. A note of appreciation to all of the Minnesota operators, who so willingly accept the responsibility of delivering these messages. A happy Holiday Season to all of you! Traffic: (Sept.) WOKJZ 430, W0BIV 240, KOJFQ 180, W0ATO 95, W0QABU 78, W0HEN 60, K0UJX 55, K0HHD 51, K0LJU 46, K0GCG 43, W0WMA 43, W0BOYO 42, K0ZKK 31, W0ALW 28, W0KLG 28, K0VJP 24, K0WPK 24, K0MGT 22, W0THY 21, K0JFB 20, W0UMX 16, W0GCR 14, W0KYG 11, K0ZRD 11, K0FLT 10, K0PIZ 4, W0RIQ 4, K0CNI 3, W0QAIM 3. (Aug.) K0VTG 9, K0CNI 1.

DELTA DIVISION

LOUISIANA—SCM, Thomas J. Morgavi, W5FMO—Our newest OBS, W5CME, will be on 14,090/7140 kc. Mon., Wed. and Fri. at 0000-0015 GMT with RTTY, W5-AJY and W5HWB have been appointed Official Phone Stations, W5JRK has been appointed EC for the Alexandria-Pineville and surrounding area, K5HKG, who does lots of 6-meter work, applied for and received his OES appointment, W5CEZ had his RM and ORS appointments renewed and is back handling traffic after a trip to New York to see his harmonies. The Jefferson ARC members are hard at work on a new clubhouse and have put up antennas and installed some equipment. The club subscribed \$25 to the ARRL Building Fund. On a recent transmitter hunt, W5CKS almost wound up in the river. It was a night-time hunt; he thought the river was a road and it took two hours to get him back on the road. K5UYL received his 35-w.p.m. code certificate. Congrats to W5KC on his DX test triumph. K5-DGI received his E.E. at L.S.U. and is back home after a trip to Europe. He will be 7/8 at Michigan State after Christmas. K5KQG, who has been operating in Florida under the call W4CMG, is back in New Orleans with his old call. OES W5JGV has his teletype going using t.s.k. on all bands 80 through 6 meters. W5BUK, Westside ARC EC, had his appointment renewed. Your SEC, W5MXQ, and your SCM are looking forward to lots of activity and reports from ECs, holders of ARRL appointments and others interested in making the Louisiana section tops. Traffic: (Sept.) K5QXV 379, W5CEZ 166, W5MXQ 69, W5ZBC 66, W5EA 4, K5VJT 4. (Aug.) W5MXQ 47.

MISSISSIPPI—SCM, Floyd C. Teetson, W5MUG—SEC: K5SQS, W5N5CYR is now on from Dorsey, K5-YPV reports that W5SEMJ is now on in Ripley, K5-MDX reports that he has worked over 200 countries this year. I think this is quite a feat. It is with much regret we must report the passing of the XYL of W5JHS. She was nearly as much a ham as he. K5WSY reports that he plans to work his AREC program so as to help the Red Cross a bit. A new appointment is K5DPG as EC for Kresler Air Force Base. This is my last report as your SCM. The duties of Director require much time. Therefore, with regret I must resign as Mississippi SCM. W5EMM, of Meridian, has been elected as the new SCM. I join with W5RWE in extending congratulations to Jack. Let us each get in there and help Jack to make ARRL and amateur radio in Mississippi go. It has been a pleasure to work with you all. As your Director I hope to see each and every one of you from time to time. Traffic: K5WSY 16, K5MDX 3, K5YPV 2.

(Continued on page 138)

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BASE STATION
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Cash Price **\$112.50**
Only \$10.50 per month

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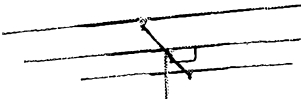
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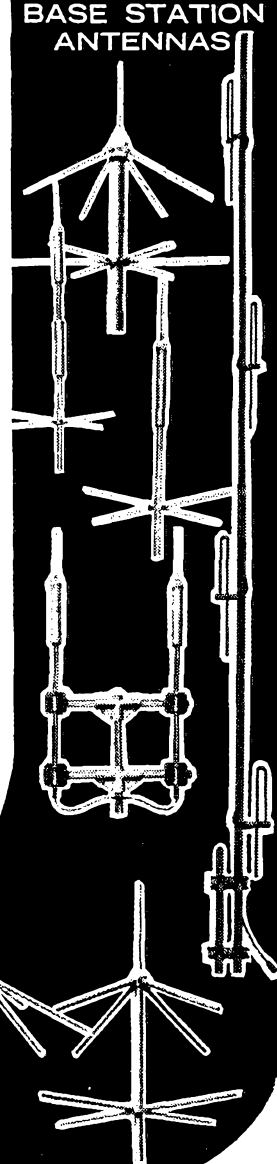
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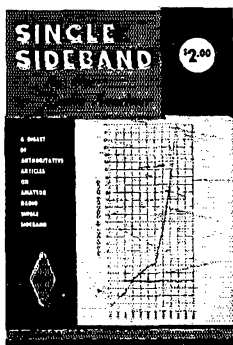
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TENNESSEE—SCM, David C. Goggio, W4OGG—SEC; W4WBK, PAMs: W4LLJ; K4WWQ, RM: W4OQC. Traffic: TN, 3635 kc, 72 QTC, ETPN 39, TSSN 40. New appointments: W4NGO as EC Henry County, K4YUJ as EC Bedford County, K4VOP Anderson County EC reports emergency operations Aug. 22 when telephone lines were out between Knoxville and Oak Ridge. K4SBO announces formation of the Manchester club. Congratulations to K4OUK on a fine job during 1961 as SEC. Tennessee placed first in the 3rd-class EC group. Tennessee is 19th nationwide in traffic. The MARA (Memphis) reports 12 new members from a radio school held last spring. Loudon County ARC is conducting code classes with W4FYQ in charge. Kingsport ARC reports a talk by W4SGI and W4VSN on 1215-Mc. transmissions which appeared in July *QST*. Your SCM, operating from his station with SEC assisting, received SET messages from ECs K4VOP, W4TZG, W4BQC, W4IGW, K4VIR, W4NGO, W4TZJ, W4VNU, K4PYH, W4TYV, W4FLW and W4PFP. Thanks for the fine cooperation and a successful SET. Cumberland ARC reports operating in the V.H.F. Party and will start code and theory classes. Weakley County EC W4FLW reports AREC operating on 145.5 Mc. W4UVU is constructing a 100-watt 2-meter rig. W4NGK, Montgomery County EC, enrolled a new Technician in the AREC. W44ZJ, OES W4ZNV/K8JLA is looking for skeds on 145,047 Mc. and has erected a 17-element yagi. A few appointments for Official Observer are available for experienced operators with frequency measuring knowledge. We wish every reader a very Merry Christmas and a Happy and Prosperous New Year. Traffic: (Sept.) K4AKP 838, W4PL 397, W4MXP 119, K4WWQ 104, W4OGG 93, W4OQC 86, W4PQP 78, W4PFP 29, W4GNK 27, K4OUK 20, W4TIO 18, W4LU 15, W4GGM 14, K4TAX 14, W4LLJ 13, K4WUH 13, W4RMJ 12, W4TZG 10, W4VNU 10, K4CPC 8, K4JXG 8, W4AIS 6, W44BNF 6, W4PJY 6, K4VOP 6, W4FLW 5, W4WST/4 5, W44CRH 4, W4CVG 4, W4HID 4, W4TYV 4, W4WBV 4, W4DRL 2, K4RQP 2, W4SGI 2, W4SZE 2, W4UVU 1, W4WBK 1. (Aug.) K4OUK 34, K4VOP 3.

GREAT LAKES DIVISION

KENTUCKY—SCM, Elmer G. Leachman, W4BEW—SEC: W4TFK, PAM (a.m.): W4S2B, PAM (v.h.f.): K4LOA, RM: W4CDA. A very successful State Convention was held in Lexington under the auspices of the Blue Grass Amateur Radio Club. If you didn't attend, come next year, Sept. 14, 1963. Welcome is extended to our new Section Emergency Coordinator, W4TFK of Frankfort, one of the best known and best liked hams in the business. Johnny succeeds W4BAZ, whose term has expired. Thanks, J.B., for the fine job. All ECs will be contacted and plans made for increased activity and readiness. Traffic is picking up again with renewed net contact. We need more c.w. operators in the KYN. Contact W4CDA for a net manual. Please report in at 5 p.m., 7 p.m. EST on 3600 kc. AIKPN had a big month with 31 sessions, 636 call-ins, 102 messages, 2 stations 100 percent, 16 stations 50 percent. W4AKB/4, aboard the c.d. bus stationed at the Kentucky State Fair, handled 84 messages. All districts were worked, including some DL3s and the Submarine *Cutlass* (submerged). Thanks are extended to the 31 operators who participated. The bus is equipped with two complete 8 Lines, K4HSB is running 813s in e.g. on all bands, a.m., c.w., s.s.b., and worked WAC in 4 hours. Boys, please remember to send news to *Kentucky Ether Clippings*. Traffic: K4FWQ 923, W4ABK/4 84, K4HOE 77, W4BAZ 40, W4IKP 30, W4CDA 28, W4USE 28, K4OZG 24, W4S2B 21, K4LOA 20, K4VDO 13, K4ZQR 11, W4BEV 10, W4YYI 10, K4TQZ 8, K4WJI 7, W4ACQ 5, W4JUI 4, K4HSB 3.

MICHIGAN—SCM, Ralph P. Thretreu, W8FX—SEC: W8LOX, RMs: W8EGL, W8XJ, W8FWQ, K8-KM, PAMs: W8LQA, W8CQU, PAM V.H.F.: W8PT. Appointments: W8FWQ as ORS; K8DNY and W8TOX as ECs; W8JUU as OES; W8TXJ as RM. We regret to hear that W8QIX's XYL died suddenly. New officers: Genesee County RC—K8BFP; pres.: W8JFK, vice-pres.: W88BAH, secy.: W8GJH, treas.: K8JEH, tech. dir.: W8RCG, program dir. Catalpa ARS—K8OIG, pres.: W8S2B, vice-pres.: K8VOQ, rec. secy.: K8CNS, treas.: W8TQN, corr. secy.: W8GJX and W8VHQ recently were married. The best to you two. W8HBB joined Silent Keys. The Suburban Teen AR Club has started up in Oak Park. K8PX and W8EYI made General. From Iosco County: W8AMS has a new 40-ft tower; W8DVD and W8DVE have a halo on a 30-ft pole; W8GZF has a halo and a Sixer in the VW; W8CNQ is in AF MARS, W8OPC and W8GZF are operators in Saginaw; W8DXL thinks of quitting. K8TXZ transferred to Wisconsin. W8LUP/VQ2, from Flint, now is in Goose Bay, Lab. and runs a KWS-1 on 14,270-kc. s.s.b. for AF men's contacts. Old Timers' Nite will be held Sat. May 4, 1963. The guest speaker will be Herart Hoover, jr., ARRL president. K8IWP now is Act. chief engineer at W8AM. W8OND moved to Arizona for his health. K8EGU and K8KBN made General. W8WVP moved to

(Continued on page 140)

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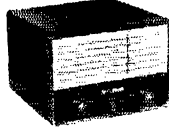


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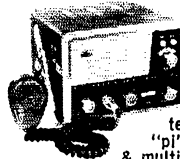


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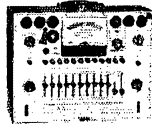


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Indiana, K8IRW and K8EGU work W8NOH/6 on 14,075 kc. W8NRX is president of the Bangor Six Meter Club. Ex-W8JKX is now W8BAKL in Santa Clara, Calif. Ex-W8OCU also is in California. W8CRM is slowly recovering from a bad heart attack. K8QKX left Michigan for Minnesota. New gear: K8LFI, Clegg 99; W8ONC, Heath Warrior; K8NTE, kWS-2; K8TDV, HT-40. The Michigan 6-Meter Club had a nice banquet and is working with the Wolverine RC on a S.E. Michigan Convention for 1963. W8MIG suggests that all clubs in the Detroit Metropolitan Area get together on one bulletin for the whole area. This could save a lot of duplication, but could the clubs cooperate? W8IXJ now runs 700 watts. K8PKU has a new SX-115. K8JPJ is coming along after a stroke. Traffic: (Sept.) K8KMQ 169, K8PKU 129, W8PBO 118, W8DSW 70, W8IXJ 65, W8RTN 64, K8HLR 57, K8GOU 55, W8REU 54, W8BEZ 53, K8XJW 40, K8PYW 38, W8FSZ 35, K8TIF 33, W8FGI 29, W8ZJE 29, W8DSE 28, W8FXN 23, W8TRP 23, W8AUD 20, W8FLW 20, W8HKT 20, VE3CYG/W8 18, W8FWQ 17, K8MKG 14, W8AHV 13, K8VDA 13, K8RNN 12, W8ILP 11, W8ZHB 10, K8IUZ 7, K8JED 7, K8GJD 6, K8WQV 6, K8LZF 4. (Aug.) K8WQV 16, K8IUZ 4.

OHIO—SCM, Wilson E. Weckel, W8AL—Asst. SCM: J. C. Erickson, W8DAE, SEC: W8HNP, RMs: W8BZX, W8DAE, W8VTP and K8ONQ, PAMs: W8VZ, K8KSN and K8UBK. Appointments made in September were K8RKY and W8AEY as GEsS, W8CVK and W8WPF joined the Silent Keys, W8DG vacationed in Michigan and visited W8AK and W8JUY, W8AQ vacationed in Maine, K8BXT sends in this news: W8PKC vacationed in VE-Land, Your SCM attended the Findlay Hamfest where 468 amateurs registered with between 1500 and 1700 attending including 43 licensed YLs, K8VPH won an NC-190 and Gerald Wimer, of Michigan won an NC-270. Canton ARC's *Freelance* contained 18 pictures taken at the club's picnic and the club elected K8MZS, pres.; K8LBZ, vice-pres.; K8RMY, secy.-treas.; W8OYV and K8KTM, directors. The ARC of the Ohio State University's *W8LT Log* tells of the club's efforts in trying to find housing for the club station (help and/or suggestions from the alumni would be most welcome) and the stork brought K8EAIN a baby boy. Toledo's *Ham Shack Gossip* names K8ZCZ as its Ham of the Month, W8SUT is in the hospital, Oregon RC elected K8LCW, pres.; K8KGL, treas.; K8CCP, secy., and the St. Lawrence Seaway (2) Meter Net held a picnic. The Columbus ARA's *Caracase* states that W8BAX and K8HRR worked each other 18 miles away on 1296 Mc. and W8IBX received YLCC-150, WNYC-LI, WAT and Port of Stockton Awards. Queen City Emergenc Net's *The Listening Post* showed pictures taken at a transmitter hunt. The South East ARC's *Ham-Eat* informs us that K8TTF vacationed in Oregon and W8ACEU is in Connecticut with the U.S. Coast Guard. Springfield ARC's *The Q-5* tells us that W4PFO discussed Development Trends in Electron Tubes, WOCHM and W4MJH visited in the city and the elected its 1963 officers. The Inter-City RC's *IRC News Bulletin* says that the club's 1963 officers are K8LRN, pres.; K8LEN, vice-pres.; K8QAX, treas.; Ralph Stahl, secy., W8REW is in the hospital following an operation, K8QVD is teaching radio and TV in the high school, K8LRN and W8QJF are on s.s.b., W8JYY and W8LRR have started their ham radio classes, Warren ARA's *Q-Match* tells us the club operated its hamfest in the black and K8ZNB received his General Class license, Dayton ARA's *R-F Carrier* informs us that W8HCE again portrayed Dr. Moskowitz and at its second meeting W8PTF spoke on Philosophy of Repair. Six-Meter Nomads' *The Amateur Extra* says the stork brought K8VJB a new baby girl. The Greater Cincinnati ARA's *The Mike and Key* stated the club held its election of 1963 officers and the rest of the bulletin was devoted to news on the club's hamfest, which your Great Lakes Director Dana Cartwright, WRUPB, and your SCM attended. There were 1875 amateurs in attendance, with ideal weather, two big meals, refreshments, model airplane flying show, etc. K8GJA took home a Clegg Zeus V.H.F. transmitter and W4AAJ a Drake 2-B receiver. W8HNP received Toledo Radio Club's second annual award for outstanding service to amateur radio, W8DAE, W8FY8, W8UPH and K8LBU made the BPL in September, W8CJN received his Amateur Extra Class license, DXCC, WAC phone and CHC Awards, W8RGJ is back at Case Inst. W8LUZ is back home after touring Europe. So far this year we've had five hamfests in Ohio that drew between 1500 and 2000 amateurs. Traffic: (Sept.) W8UPH 797, K8LBU 501, W8DAE 388, W8BZX 183, K8SQK 169, K8UBK 169, W8FY8 163, K8PCL 85, K8ONQ 62, K8VWN 31, K8YUZ 23, W8QCU 17, K8RND 16, W8AL 14, W8HZJ 13, K8TKG 12, W8IBX 8, W8AJD 7, K8LKA 6, K8PBE 6, K8KXS 5, K8RYU 5, W8IEP 4, K8DDG 3, W8WYS 2, W8EEQ 1. (Aug.) K8BXT 66, W8PMJ 60, K8PBE 2.

HUDSON DIVISION

EASTERN NEW YORK—SCM, George W. Tracy, W2EFT—SEC: W2KGC, RMs: W2PHX and K2QJL, PAM: W2JG. Section nets: NYS on 3870 kc. nightly at (Continued on page 142)

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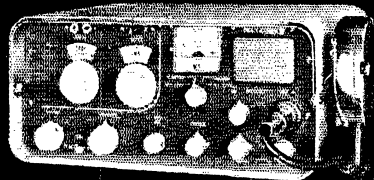
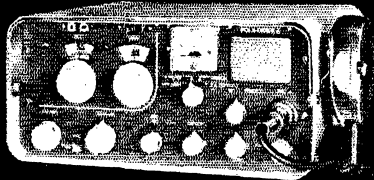
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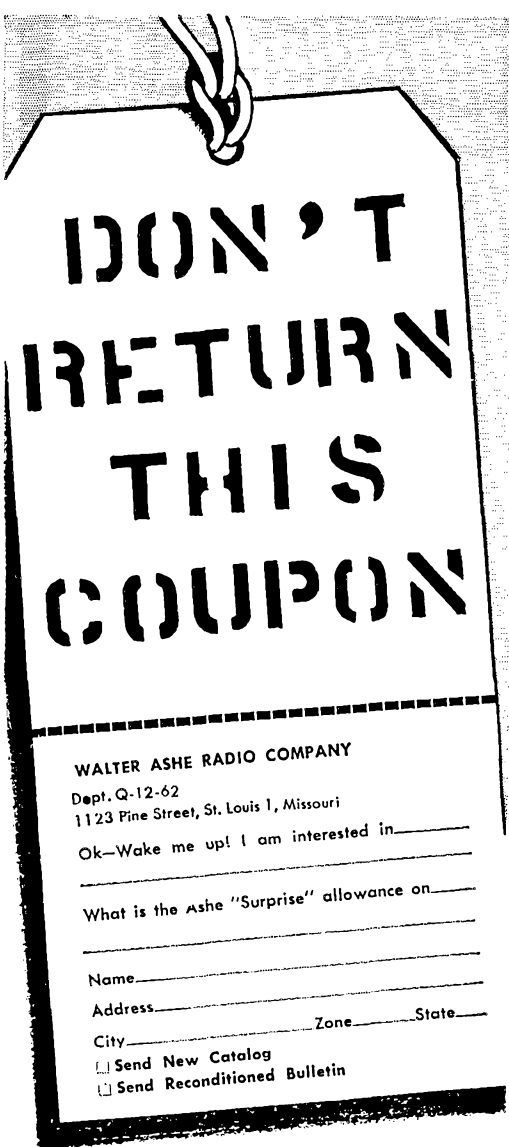
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0000 GMT; NYSPTEN on 3925 kc. nightly at 2300 GMT; ESS on 3590 kc. nightly at 2300 GMT; MHT (Novice) on 3716 kc. Sat. at 1800 GMT; Inter-club on 25,690 kc. Mon. at 0130 GMT. Appointments: W2VGT as OES. Endorsements: W2HIC as PAM; W2THE as ORS; K2S-JN as EC OES. W2BAH/2 is working 6 meters at Clarkson College of Technology. W2EYG, in Coxsackie, says he would like to play chess on 3.8 or 145 Mc. If others are interested, New S Lines invite the shacks of WA2OBZ and WA2IZE. Both WA2OBZ and WA2OCA are completing homemade kilowatt linears. K2IES and WA2VGT with new 2-meter converters, are members of the Knuckle-Busters Club in New Rochelle. WA2DST has a new Payne on 2 meters. EC- K2IES, WA2QEQ, K2S-JN and WA2QAO staged a get-together with the Red Cross and other public officials in Westchester to discuss AREC activity. We wonder how many other ECs do the same? The Schenectady Club held an "Old Timers Nite" and W2ICE presented his newest slide presentation, "120 Years of Brass-panning." K2BGU reports a 32-element colinear for 432 Mc. A staff of nine kept K2VYG/2 on the air from Mt. Beacon during the Sept. V.H.F. Party. K2ARO recently relocated in Fish-kill. K2LRR is 6-meter mobile at Tutts while K2ZDJ is s.s.b. at Nichols College in Massachusetts. WA2LZK is the proud mother of a new son and missed only about a week on NYSPTEN. Congrats. Our SEC, W2KGC, took over 30 messages at one sitting during the SET. Traffic: W2THE 180, W2EPU 128, WA2HGB 87, K2S-JN 57, W2PKY 49, K2TXP 16, K2HNW 13, WA2VYS 9, W2-URP 7, K2MPP 6, WA2BAH/2 2.

NEW YORK CITY AND LONG ISLAND—SM.

George V. Cooke, jr., W2OHU—SEC; K2OVN, RM; W2-WFL, PAM; K2HCU, V.H.F., PAM; W2EAW, Section nets: NLI 3630 kc. at 0015Z nightly; NYCLIPN, 3908 kc. at 2230Z nightly; V.H.F. Net, Tue.-Wed.-Thurs, 145.8 Mc. at 0100Z and Fri. through Mon. on 145.25 Mc. at 0000Z; Mike Farad, on 7238 kc. at 1700Z; All Service Net, 1800Z Sun. on 7270 kc.; Q5 Net, on 3935 kc. at 2100Z daily. RPL certificates for traffic handled during September go to WA2TQT, WA2GPT, WA2RUE and W2EW. The new net manager for the Q5 Net is WA2OBG. WA2RMP has been inducted into the ranks of A-1 Operator status having received the enviable certificate. W2GKZ had 126 confirmations accepted by the League for DXCC. The new quad sure must be working FB. WA2UQ earned certificates for WNYC-LI and HTII. WA2VLK put up a new Hornet TB750 and an AR22 rotor, and his younger brother became WN2DTH. Anyone in the section interested in 432-Mc. TV work should write WA2WIIH or WA2GFP. W2TKK now is using a Johnson 6N2 on the air. W4JQG is signing WB2DQB from Dix Hills. K4GG flew up from Bradenton for the Hudson Division Convention. WA2LJT, an OES, has been trying out underwater communications for scuba diving with some success and has applied knowledge in medical electronics in surgery and medicine. WA2GAB received a nice reply from JFK in answer to her amateur radiogram announcing the station set up in the Brooklyn VA Hospital. New officers of the Stuyvesant WS RC, W2CLE, WA2PIV, pres.; WA2ZIQ, treas.; WA2RZJ, secy. WA2VYG and W2CEW are new Generals in the Rockaway Area. WA2-RUE has been elected president of the Newfield HSR. WB2BLH has had a pair of 813s on the air. K2CMJ and K2DNY installed a Clegg Zeus and Interceptor in the shack. W2EAW, V.H.F., PAM, encourages 2-meter stations with good coverage to sign into the 2-meter net for traffic-handling and for tryouts as NC's K2PQY would like to hear from stations across the country using n.f.m., n.p.m. and Em., their experiences and records of QSOs. WA2LAN has been installed as president of the ARC of Cornell U. W2QPP and his new XVI, have located in Carl Place. W2IAG urges Queens amateurs to join the 10-meter AREC and RACES group on 29.5 Mc Mon. at 0030Z and requests cards to him for AREC applications. W2SEU's 220-Mc. standing has been upped to 3 call areas, 9 states and 225 miles. K2-YMY's new antenna mounted on a rotor and the APX-6 transmitter are ready for skeds with any takers. Code and theory classes are flourishing in many of the section clubs and information can be had for the asking via the SCM. W2WFL, RM for the NLI 80 C.W. Traffic Net is seeking additional stations in the section for better coverage of traffic distribution. With the holiday season fast approaching all of the section nets can use many operators. Why not assist where you can by reporting into the net of your choice? All of our appointees will be glad to help you in this effort and a League appointment awaits your results. PICON means public service, so let's help it along by joining in an organized activity. Seasons greetings to all and may your holidays be happy ones. Traffic: (Sept.) WA2TOT 694, WA2GPT 524, K2-URB 330, WA2RUE 312, W2EAW 250, WA2QJU 187, W2-WFL 174, WA2RMP 136, K2IAT 134, WA2NCE 113, WA2LJS 70, W2GKZ 55, WA2UQ 51, K2THY 39, K2-SPG 33, W2OME 30, W2JGY 27, W2DBQ 24, K2UFT 24, WA2IAH 16, K2KYS 15, WA2QHT 15, WA2VLK 15.

(Continued on page 143)

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U.S. PATENT NO. 3,031,668

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Cat. No. 200-509 Stationmaster Collinear Gain Antenna is designed to meet the ever increasing need for high antenna gain in minimum space and at lowest cost. This antenna, consisting of a number of collinear radiating elements fed inphase and encapsulated in a continuous weatherproof fiberglass housing, meets the above requirements. Low overall weight eliminates the need for extensive erection equipment required by previous antennas offering equal power gain. The input fitting on these antennas is a standard Type N male connector mounted at the end of an 18" flexible terminal extension. Designed for maximum strength with minimum cross-section, Cat. No. 200-509 is capable of withstanding winds in excess of 100 MPH.

*Exact frequency must be specified

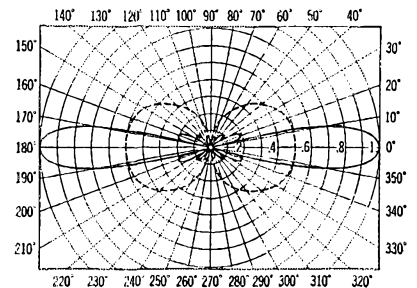
Vertical field strength pattern of Cat. No. 200-509 Stationmaster Antenna. A dipole pattern is shown for reference.

Electrical Specifications:

Nominal input impedance	..... 50 ohms
VSWR	..... 1.5:1
Bandwidth	..... $\pm 0.3\%$
Maximum power input	..... 500 watts
Internal feedline	..... RG-8A/U
Flexible terminal extension	..... 18" of RG-8A/U
Termination	..... Type N male with Neoprene housing
Omnidirectional gain	..... 144-174 Mc 5.8 db 130-144 Mc 5.5 db
Vertical beam width (1/2 power points)	..... 18°
Lightning protection	..... Direct ground

Mechanical Specifications:

Radiating element material	..... Copper
Element housing material	..... Fiberglass
Element housing tip diameter	..... 5/8"
Element housing butt diameter	..... 1 1/8"
Element housing length	..... 19"
Ground plane element length	..... 18"
Support pipe	..... 2 3/4" dia. hot-galvanized steel, 22" available for mounting
Rated wind velocity	..... 100 MPH
Lateral thrust at rated wind	..... 45 lbs.
Bending moment 6" below ground plane at rated wind 450 ft. lbs.
Weight 30 lbs.

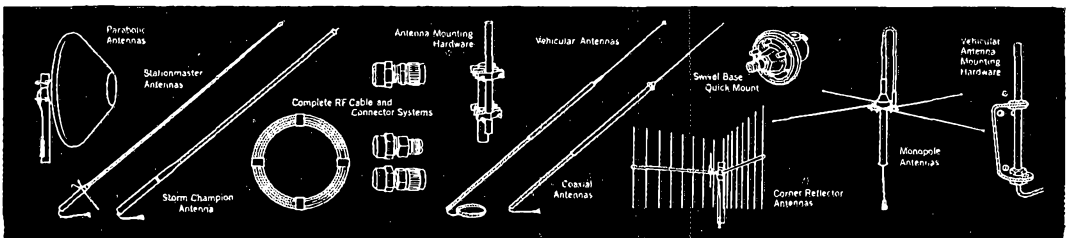


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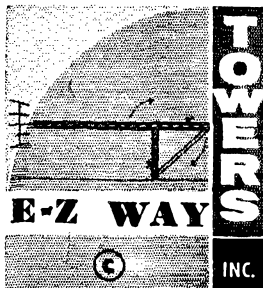
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WA2VVV 12, WA2PUE 8, K2AAS 7, W2LAG 7, WA2WEA 7, WA2WIH 7, WA2EFN 5, W2PF 5, WA2GFP 3, W2GP 3, WA2KSP 2, WA2MTB 1, W2TUK 1. (Aug.) WA2NCE 91, WA2FUL 4.

NORTHERN NEW JERSEY—SCM, Daniel H. Earley, WA2APY—SEC: K2ZFL RM: W2QNL, PAM: K2SLG, V.H.F. PAM: K2VNL. The names, times and frequencies of the NJ NTS nets: The NJN, 2300Z, 3695 kc. daily. The NJPN, 2200Z, 3900 kc. except Sun, at 1200Z. The NJ 6&2, 0300Z Thurs. and Sun. on 51.15 Mc., 2200Z Tue. and Sat. on 146.70 Mc. Net reports (sessions, attendance and traffic): NJN-30 (attendance not available), 279. NJPN-30-502-85. NJ 6&2-19-110-25. Four new appointments were made in September: WA2-WSB and WA2ZQH as ORSS, WA2EDE and K2KDJ as OESS. Renewals: WA2GQJ, WA2GQZ, W2BVE, K2VNL, W2EAWZ, K2AGJ and K2EQP as ORSS. Only one made BPL in September. It was WA2CCF again. The fellows were complaining about the lack of traffic but it didn't effect the OTs like K2VNL and K2UCY from turning in their tow hundred. K2AGJ says that W2CVW is a darn good radioman. Looks like W2BVE is working out of Philadelphia now. K2UKJ has been given a standing invitation for a five-hour cruise on the Coast Guard Cutter *East Wind* for her work handling traffic during Operation Deep Freeze. That's the kind of publicity we like. WA2KLY reports that WA2PWY is moving too Ogdensboro. Sorry to report that W2NIY's NYL still is in the hospital. The SCM's NYL was in the hospital too, that makes four girls and a boy. WA2CCF has three stations running simultaneously. Hope that W2CVW gets that rig of his fixed before he takes off for Salt Lake City. WA2PBN worked 34 states with twenty watts on 6 meters. WA2QVK has held up the traffic work despite school. WA2ZQH has gotten the 39th state confirmed. W2BSC (Steven's Institute) hoped to get on the air in the Oct. CD Party. K2UCY has been playing the piano at the Kiwanis Club. Already the new RM W2QNL is complaining about the book work. Can't say that I blame him. W2ABL says that although traffic is pretty skimpy the ratchewing is good. WA2FTZ is taking care of skeds for K2SBS while the latter is getting set up after moving. The Parsippany High School Radio Club elected WA2SKY, pres.; K2SBS, vice-pres.; WA2UQM has received his General Class ticket and is going after that DX. W2DFP, a new Novice, would like to know the whereabouts of a local club. His OTH is Orange, N.J., can anyone help him out? W2COT has been very busy running all over New England. I hope you all had a good time at the convention. Traffic: K2UCY 254, WA2CTF 191, K2VNL 158, WA2SRK 143, W2OVK 112, WA2JTZ 92, WA2WSB 81, W2QNL 56, W2CVW 38, WA2LUD 30, K2SBS 27, K2SLG 26, WA2APY 22, W2TFM 16, K2EQP 15, W2BVE 10, K2QGD 9, K2AGJ 8, W2OXL 5, WA2IGQ 4, W2EAWZ 3, WA2ZQH 3, W2ABL 2, WA2JCQ 2, W2NKD 2.

MIDWEST DIVISION

IOWA—SCM, Dennis Burke, WONTB—SEC: KOEXN, PAM: WOPZO, RMs: WODUA, WOLGG. The Tube and Shutter Club at Cresco reports its officers are WOHKS, pres.; KOCG, secy.; KNOKAA, treas. Good luck to you fine folks in Northeast Iowa. KOVKT reports another successful year at the Old Time Threshers Reunion at Mt. Pleasant, Iowa. KOVKT reports the same from North Iowa. The Clay County Fair at Spencer, with KOGVC/O, KOHGH and KOEXN hamming it up for the customers, was the usual success. KOHPG reports the annual V.H.F. and U.H.F. Picnic at Jester park was most enjoyable and featured a transmitter hunt on 8 meters. The Bedford Picnic had to be cancelled, to everybody's sorrow. KOPOI is a grandma now and
(Continued on page 146)

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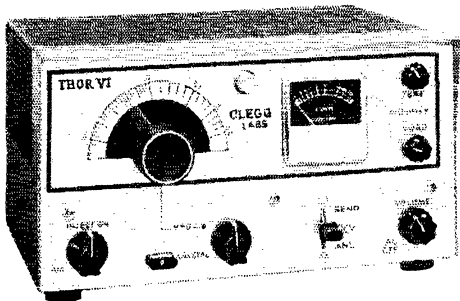
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And best of all, this rig is priced at a level that every ham can afford. Place your order with your distributor today. Deliveries start late in November.

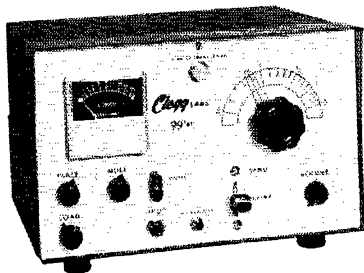
And here's one for you VHF sidebanders!

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celebrated by going high power. Congratulations. There is lots of activity on the West Coast of Iowa WOQVA is back in business. Our pleasure, OM. WOLGG has done a splendid job with the Tallcorn Net since she took it over. There are 26 names on the latest roll call and the list sounds like Who's Who in the Iowa section. My sincere thanks and congratulations, Bertha. We thank Uncle Vine Davis, Bob Evans and Jack Laudis for a splendid time at McRae Park. Traffic: (Sept.) WOLGG 1356, WOSCA 1342, KOVKT 301, WONTB 70, KOAFG 50, KOEXN 46, KOAAU 42, WOTTT 27, KOVVA 17, WÖBLH 16, KOQKD 12, WORTN 11, WÖFDM 10, WÖVWF 10, KOHBL 9, WOYD 9, WÖGQ 8, KOMYU 8, KÖKAQ 7, WÖCTJ 6, KÖARI 2, WÖFMZ 2. (Aug.) WOSCA 1983, WÖDUA 116.

KANSAS—Acting SCM and SEC, Robert M. Summers, KÖBXP—Asst. SEC, KÖFMR, RM: WÖSAF, PAM: KÖEFL, V.H.F. PAM: WÖHAJ, Sept. report. Nets: KPN, 3920 kc. Mon.-Wed., Fri. 1245Z, Sun 1400Z; 15 sessions reported QNS high 45, low 13, total 381, average 21.2; QTC high 17, low 1, total 79, average 5.2; NCS: WOORB, KÖQKS, KÖEFL, KÖGHI, WÖFHU, KÖVTA. Top QNR, for Sept., KÖVTA and KÖVQC, QKS, daily 3610 kc. 0030Z, 30 sessions; QNI 201, high 11, low 4, average 6.7 per cent; QTC 124 high 17, low 0, average 4.1 per cent; ACSs KÖBXP, KÖEFL, KÖIRL, WÖQGG, WÖSAF, KÖVTA, WÖBYV, KSRN 3920 kc. Sun 1330Z, KSWN, 3840 kc. Mon.-Sat. 0001Z 26 reg. stations 425 stations participating and one emergency sessions Sept. 18, 7 stations taking part. The Ham-Butchers Net is now back in full swing after a brief battle with QRM, QSB and QRN. Net Mgr. KÖHGI reports for Sept.: Stations 13, traffic 162, QNI 118, NCSs KÖYWT, KÖIVG, WÖAWE, WÖIPZ, KÖWNZ KÖHGI. HBN meets Mon. through Fri., 1805 Z 7280 kc., the new EC for Z one 9, including Chautauqua, Montgomery, Elk, Wilson and Greenwood Counties, is KÖGLW. The new EC Zone 16, Sedgewick County, WÖYZB. An NVARC Flint Hills certificate is available to all hams in Kansas certifying five Emporia contacts (send log data to WÖZGB 420 Neosho, Emporia, Kansas). All out-of-state hams need only three Emporia QSOs. We believe the record-holder for certificates is WÖAYL, or the way she has been going after them it won't be long. Contributions for the Memorial Fund of Silent Key, Raymond E. Baker, WÖFNS, should be sent to Bob Schill, WÖBSS, 724 North 8th, Neodesha, Kansas. EC appointments renewed by WÖFNS before his death: KÖCPD, Zone 1; WÖGJ, Zone 2; KÖLHF, Zone 3; WÖQJU, Zone 4; KÖVQC, Zone 11; KÖYBR, Zone 14, WÖBBO, Zone 15; WÖZXX, Zone 20; and KÖOUS, Zone 22. WÖHAJ reports 2 meters has been real good lately but Kansas sure would like to work a 5 from Arkansas. Traffic: KÖHGI 225, WÖSAF 142, WÖBYV 125, KÖVTA 93, KÖEFL 56, KÖJAF 44, KÖBXP 43, KÖPSD 41, WÖTOL 34, WÖABJ 30, KÖGHI 17, KÖLHF 16, KÖZHO 10, KÖEMB 8, WÖTSR 8, WÖIFR 7, KÖQKS 7, WÖWFD 3, WÖFDJ 1, KÖVQC 1.

MISSOURI—SCM, C. O. Gosh, WÖBUL—SEC: KÖWNZ, RMs: WÖOOD, KÖGNK, PAMs: WÖBYL, WÖTPK, WÖLFE (v.h.f.) Net reports: POY (Mo.) 3810 kc. 2100 GMT M-F 19 sessions; QNI 240; QTC 94; NCSs: WÖHJ 19, Mo. S.S.B.; 33963 kc. 2400 GMT, Tu-Th 8 sessions; QNI 135; QTC 54; NCSs: WÖPNE 2, WÖECA 2, WÖOMM 4, MEX (2885 kc. 2400 GMT M-F) 12 sessions; QNI 238; QTC 107; NCS: KÖGNK 4, KÖVPH 4, WÖTPI 4, MÖN (3550 kc. 0100 GMT, Tu-Su) 25 sessions; QNI 180; QTC 182; NCSs: WÖOOD 12, KÖFPC 5, WÖRIK 4, KÖVPH 4, KÖGEA 1, SMN; (3580 kc. 2200 GMT, Su) 5 sessions; QNI 26; QTC 35; NCSs: WÖOOD 3, KÖFPC 2. No report was received from MSN (3817 kc. 2200 GMT M-F. Appointment: WÖPME as OO (II, III, IV). Endorsements: WÖYHT as EC, KÖOLW as EC, WÖGJB as ORS. Reports of activity are gratefully acknowledged from OOs KÖPYB and WÖWVH and from OFEs KÖFPC, WÖRVA and WÖCMI. Because of a change in employment demanding that he be out of town and away from the home station extensively from now on, sufficient time is not available for the SCM to continue with a detailed column. A request has been made to be relieved of the SCM duties; we regret we have to present an abbreviated column. Traffic: WÖTPK 256, WÖAYB 228, KÖVPH 152, KÖFPC 119, WÖKIK 94, WÖOOD 93, KÖVBT 88, WÖOMM 38, WÖZLN 36, WÖBUL 31, KÖVNB 12, KÖWNZ 11, WÖBAZ 8, WÖBYL 6, WÖKCG 2, WÖOVV 1.

NEBRASKA—SCM, Charles E. McNeel, WÖEXP—SEC: KÖTSU. The recent Hamfest and Steak Fry at Milburn, sponsored by WÖERW and WÖIQE, was a great success with about 50 in attendance. Your SCM has left for a vacation in New York so KÖWFG has finished this report. KÖJXX reports 27 sessions, QNI 318, Nebraska Storm Net. The Western Nebraska Net NC reports QNI 619, QTC 74; 100 per cent checked WÖAES, KÖAIG, WÖDVE, WÖNIK, WÖDPP; WÖEGQ checked 52. The Nebraska Slow-Speed Net opened Sept. 3 Mon. through Fri. at 3700 kc. at 2300, QNI 94, (Continued on page 148)



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formal traffic 17, sessions 18, 4 Novice and 2 General class regulars, W00KO count 55. The C.W. Net: 30 sessions, QNI 129, traffic 33. The Nebraska 75-Meter Morning Net: QNI 605, QTC 90. The Nebraska Noon Phone Net: QNI 539, QTC 25. New net members are WA0BYC, WA0BYV, K0FSC, K0QFF, W0EYF had a wonderful time in New York City. Traffic: W0ZJF 26, W0N1K 47, K0DGW 39, W0LOD 33, W0PNH 30, W0EQJ 21, K0HLL 14, K0MSB 12, W0NOW 11, K0TWK 11, W0KDW 9, K0SBB 9, W0CTW 8, W0DEA 8, K0EZZ 7, W0GPF 7, K0KJP 6, W0BOQ 5, K0JUC 5, K0EYZ 4, K0ATZ 4, W0PQP 4, W0VZJ 4, W0YFR 4, W0LJO 3, W0WKF 3, W0F0J 2, W0FSX 2, W0RFY 2, K0UAB 2, W0ZOU 2, W0AIB 1, WA0BYK 1.

NEW ENGLAND DIVISION

CONNECTICUT—SCM, Henry B. Sprague jr., W1-CHR—SEC, EOR, RAM; KYQ, H.F. PAM; YBH, V.H.F. PAM; FHP. Traffic nets: CPN, Mon-Sat, 1800, Sun, 1000 on 3800 kc.; CN, daily 1845 on 3640 kc.; CVN, Tues., Thurs. and Sat, 2030 on 145.98 Mc.; CTN, 0900 on 3640 kc., all local times. W1OJR is sport parachuting and says waiting for the right wind conditions is like being in a DX pileup with 5 watts. W1WX is on 160. W1WKW is planning 144-Mc. activity after a long lapse. W1KKB is proud of 2nd place (Conn.) in the DX Contest. W1GEA, EC Norwich, reports his ARCC group is growing from a beginning of 8 members to 48. K1RTS worked his 7th state on 2 meters and says the Waterbury Wireless Assn. shortly will be on 2 with ARCC-4s. K1QPN blew his 4X150A final and still is working on his quad. K1PQM has a pair of 10 elements on 2. W1KYQ reports that the late CN sessions will be dropped if IRN's skulls remain at 1815 and 1930 local time. K1PKQ enjoyed the V.H.F. QSO Party as a portable and made 148 contacts in 15 sections. K1LZE will represent the Yankee Network at the Seattle World's Fair. The Manchester RC is sponsoring code classes conducted by W1SBB 1900 Tue. in the local Town Hall. Theory questions will be answered as time permits. K1PLR advises the Stamford United Fund drive used 4 mobile units to accompany runners reporting to the NCS at City Hall. Participating were W1s PCZ, TZX, K1s OAS, IKE, P1R and KN1VMT. The Northern Conn. ARC is now ARRL affiliated. W1EWF made the Charter presentation. Connecticut hams are urged to support *Nutmeg News Notes*, covering all ham doings in the state. This worthwhile monthly publication is only \$1.50 yearly. Write W1EWF, 28 Itzessner Rd., Southington. CPN held 20 sessions handling 207 messages with an average daily attendance of 26. Attendance leaders: W1s L.H. DAV, HKT, LWW, VQH, YBH, IHG, K1s DKG, BOP, OJZ, SRF, MBA, LFW. CN held 30 early sessions handling 227 messages and 5 late sessions handling 5 messages. High QNI were W1s KUO, RFJ and K1PQS. Traffic: (Sept.) W1KYQ 173, K1PQS 163, W1YBH 99, W1RFJ 95, K1QVX 94, K1QPN 91, W1EWF 88, W1AW 65, W1OBR 58, K1HVV 57, K1EIR 52, W1BDI 51, W1KUO 51, K1PFF 41, K1DGG 40, W1LUN 40, K1PUG 37, K1JAD 24, K1SRF 23, W1FXX 21, K1PFF/1 17, K1MBA 14, W1BNS 11, K1OJZ 6, K1PLR 4 (Aug.) W1KYQ 195, W1CUH 4, K1PLR 4.

MAINE—SCM, Albert C. Hodson, W1CBB—By the time this is printed you will all know the writer has submitted his resignation as SCM. It is with regret that this decision had to be made but it has been impossible to carry out the various duties as they should be done and still be away from home so much on business. I wish to again thank all those who have helped with the Seagull Net and Pine Tree Net and those who have contributed items of interest for this column. It takes a little effort on the part of all amateurs to keep our hobby up to the standards it has maintained over the years and there is a greater challenge ahead with the crowded frequencies and expanding modes of operation. Maine can be a leader by setting an example of correct and courteous operation. Several persons with appointments as OPS, ORS, OES, EC have not sent their certificates in for annual endorsement. This is a requirement for continued recognition as well as participation in CD activities on the ARRL calendar. Please check yours for date and send in to make it easier for the next SCM. Merry Christmas and Best Wishes for a successful 1963. Traffic: K1GUP 172, K1GSF 51, K1MDM 24, K1EFZ 18, W1ISO 14.

EASTERN MASSACHUSETTS—SCM, Frank L. Baker, jr., W1ALP—W1AOG is our SFC. ECs, how about sending a report to him? W1AAU, W1STX and K1OLN reported. Please note my new QTH on page 6. New appointments: K1HTK Framingham, K1STS Sudbury as ECs; K1s MCL and MEM as OOS; K1s QVJ and WTK as OES. W1OMI, K1ONV and W1HCY are Silent Keys. W1BGW has WAE and WPX awards. W1OKI is on 75 meters. KP4BEA, ex-1EXY is on s.s.b. W1BA has a new SX-101A. W1PQA plans a new shack. The Dim Light boys met at W1OHA's. W1GFO got a promotion. W1ACB made a 40/80 vertical antenna. W1MEG

(Continued on page 130)

NEW *Sonar* - MONO-BANDER



SSB transceiver for any one Amateur Band 80 to 10

- 180 watts P.E.P., 160 watts C.W.
- Collins 2.1 kc mechanical filter
- Driver stages employ electronic tuning
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- Receiver has 1 microvolt sensitivity for a 10 db s/n ratio
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SPG-10 SSB/CW, AM/MCW CONVERTER. Rack mtd (For SP-600 and other 450 to 500 Kcs I.F. Recvrs). Clean, lab tested OK. \$275.00.

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has a new tower and beam for 2 meters. WICRO is now a Chief in the Coast Guard. KN1VXB, Weymouth, is on 2. The T-9 Club met at W1KON's and MJE's QTH. The QRA has a new meeting place—Woodville School, Farm St., Wakefield. W1P1I spoke at the meeting. The Chelmsford ARA meets the 4th Thurs. of each month. All are welcome. W1DBY and K1MGP are getting beams up. W1OLP spoke at the Wellesley ARS on "Radio Controlled Model Airplanes." K1VBN has a five-element yagi 80 ft. up on a Tri-ex tower and is going on 220 Mc. KN1WYF/1 is at Tabor Academy in Marion. K1JUM is at Mass. Maritime Academy. W1LJO is the new Middlesex ARC president. His tower is 80 ft. now for a 6 meter antenna. W1LJK has been ill. W1QT retired after being with General Radio for 39 years. is on 2 and 75 meters. W1TSD and K1KRG set up rigs on 2 and 6 meters at the Prescott Grange Fair, Pepperell. Traffic from the fair was handled with K1s HNL and KBO at Ft. Devens. Officers of Honeywell EDP are K1OUY, pres.; W1QKJ, vice-pres.; K2KIR, secy.; K1TRL, treas. K1LCQ has a Gonset and an eight-element Telrex beam for 2 meters. W1PEX made the RPL. W1AUQ, W1ATX and K1PNB have been on 160. W1MX will be on RTTY soon, reports K1YVX. K1DRB is in college. K1VBN is moving to Framingham. KN1VWL is on 2. K1YNM is on 2 and 6. The Massachusetts ARA held an ARRL night with a nice banquet. W1EWF presented the club its charter of affiliation. W1ALP also was there. W1EAE moved to a new QTH. K1RLE has WAC and WAS. K1VSK is starting a ragchew net on 15 meters. K1VXS has his General Class license. K1AII was active on 6-meter and phone during the V.H.F. Party and worked into W3-4-Land. K1MVN is at Worcester Polytechnic Inst. The King Philip ARS won the certificate for W. Mass. in the June QSO Party. W1JSM has a rig on 220 mc. The Framingham Club is holding meetings again. K1PYI is going to Holy Cross College and is active at home on several bands. K1MEM has a Drake receiver. W1MD is a member of FOC TOPS and has gone s.s.b. with an Invader. The Hingham Club meets the 1st and 3rd Tue. of each month. W1DPO retired from the P.O. Dept. and now is selling real estate. EM2MN had 20 sessions, 245 stations, handled 138 pieces of traffic. W1DOM is doing a fine job as net mgr. K1GTX is home from the hospital. K1VZX, Salem, is in the 2-meter net. W1OMN is the editor and puts out by himself the V.H.F. Communicator for the Mass. V.H.F. Society. K1AAA is going after her General. W1ME had a meeting at his QTH. The Yankee Club had a Ham & Hobby auction. K1TWJ and W1EDO are new in Danvers. K1VOV is now General Class. The 6-Meter Cross Band Net had 23 sessions, 420 stations, 161 traffic. The Mass. Phone Net had 23 sessions, 479 stations, 309 traffic. W1KBN is back on this net again. W1AWA made the RPL Traffic (Sept.) W1PEX 938. K1TSD 244. W1OPK 251. W1ZSS 127. W1DOM 41. W1AUQ 29. W1LES 28. W1AOG 25. K1GKA 22. W1SIV 21. K1DGI 20. K1OCD 14. W1RKL 13. W1VYS 13. K1AII 10. K1QNZ 8. W1GEX 3. W1MX 3. (Aug.) K1TSD 282. K2KIR/1 31. K1DGI 29. K1LCQ 15. W1FJJ 14. K1OCD 9.

WESTERN MASSACHUSETTS—SCM, Percy C. Noble, W1BVR—SEC; W1BHY/K1APR. RM: K1IJV. PAM: K1RVT. The WMN Picnic, arranged by our RM K1IJV and held Sept. 9, was not largely attended, but was thoroughly enjoyed by those who did attend. The Hampden County Radio Association has given a substantial sum to the ARRL Building Fund. Thirteen new members were added to the rolls at the October meeting of the HCRA. PB! K1NIJ is attending Worcester Tech. (W1YK). K1IJU really is whacking out the DX with his new beam. W1VEL is planning a 500-watt s.s.b. final for 2 meters. Mt. Greylock looks like Field Day on week ends with so many hams there! W1MDM is working on his "final final," a 4-1000A with a 5-kv. ½-amp. supply. RM K1IJV reports 15 stations active on WMN during the months (we always have had our ups and downs—we are now apparently on the ups). Gardner High School has an HT-37 and an HQ-145X. Gardner AREC is getting real active, thanks to its new EC. K1LNC. W1ZPB is reactivating after about a year's layoff. K1SSH has a new Sixer. W1AZW and W1UUK attended the N.E. DX Assn. Dinner Meeting at Albany. The Nipmuc Emergency Radio Corps of Upton reports that its emergency truck even has a 40-ft. collapsible tower as part of its equipment. WMN was represented at 59 of the 60 sessions of the First Region Net during September. We don't always hit 100 per cent but we do come close! W1DWF has moved his rig to the basement and expects to be more active this season. Traffic: K1RVT 684. K1IJV 216. W1BVR 102. K1LNC 77. K1LBB 50. K1PES 36. K1SSH 11. W1MNG 6.

NEW HAMPSHIRE—SCM, Ellis F. Miller, W1HQ—SEC: K1GQK. PAM: K1XNV. RM: K1BCS. GSPN meets Mon. through Fri. at 2400 and Sun. at 1430 on 3842 kc. CNEN meets Mon. through Sat. at 1130 on 3842 kc. NHN (c.w.) meets Mon. through Sat. at 2330 on 3685 kc. Appointments: W1CBB as OBS and OO; K1AEG as OO and K1BCS as RM. Endorsements; (Continued on page 152)

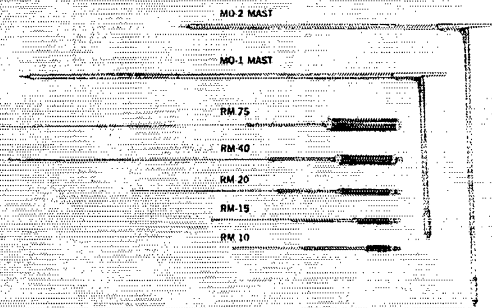
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The 54-inch fold-over, heat treated, 1/2-inch aluminum mast permits instantaneous interchange of resonators. Mast folds over for garage storage. When opened to full height, the two sections of the permanently hinged mast are held rigidly in position by a shake proof sleeve arrangement. Mast has 3/8-24 base stud to fit all standard mobile mounts. Power rating is 75 watts dc input A.M. — 250 watts PEP input for SSB.

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ANY MAST OR RESONATOR MAY BE PURCHASED SEPARATELY

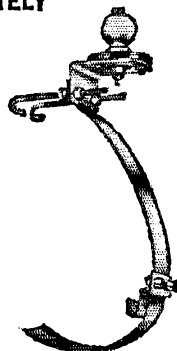
FITS MORE CARS THAN ANY OTHER BUMPER MOUNT!

MODEL BM-1 Flat alloy steel strap fits tightly against any shape bumper yet is inconspicuous. Length of strap permits its attachment to both large and small bumpers.

Assembly is held in place by two "J" bolts at the top of the bumper and strap clamp at the bottom. "J" bolts may be inserted between top of bumper and car body where clearance is as low as 1/4".

Whip receptacle assembly consists of a heavily chrome plated 1 1/2" die cast Zamak ball with 3/8-24 thread. Adjustable so as to maintain whip in true vertical position. Black phenolic base. All metal parts of the bumper mount are heavy cadmium plated.\$6.95

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Memo . . .

To: XYLs and YLs only
Subject: A "neat" Xmas Suggestion

Do you find his 1962 *QST*s scattered about the shack and other rooms of an otherwise neatly arranged home? There's a simple solution to this problem: have a bright, new *QST* binder under the tree for him on Christmas morning. He'll love you for it! And, he can file those valuable copies neatly for future reference. While you're at it, better get two Binders so he can start off the New Year right with a file for those interesting issues coming up in 1963.

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WIJJB as OO, K1BCS as OPS and ORS and W1YHI as ORS and OPS. We congratulate K1BCS on his appointment as RM. We feel sure that Press will inject some new life into N1N. The Flubadub gang, at the invitation of Doc. W1BST, held its Annual Fish Fry Sept. 9 with some 40 members and their XYLs in attendance. The ferry service to the island was excellent, being supplied by W1KKK and W1BST. The fish fry put on by K1NYS and W1HQ is reported to have been quite a success. W1KPD attended "in absentia" with much photography being practiced in his behalf. All who attended are looking forward to another get-together next year. We are sorry to lose K1GQK as SEC. Howard feels that business prevents his wholehearted participation. Thank you, Howard, for your help during the term. Traffic: W1TA 62, K1BCS 34, K1DQM 28, W1JNC 12, W1SWX 12.

RHODE ISLAND—SCM, John E. Johnson, K1AAV—SEC: W1YNE, PAM: W1TXL, RM: W1SAMU. New appointments: K1OZI, EC for West Warwick; K1OZM, EC for Coventry; K1DPR, EC for Lincoln; W1POP, EC for Johnston. Endorsements: W1JFF, EC for Newport; K1ARR, EC for Cranston. K1NEF as ORS. All the ECs have been working with the SEC to get their sections organized for the AREC Program. K1PZY, in the Smithfield section, and K1TPK, in the Portsmouth section, also are to be commended for their fine work. All amateurs interested in the AREC Program, contact your EC, SEC or SCM for applications. The results of our first month's AREC Program shows 34 members, 17 mobile units and 10 emergency units. R1SPN reports 30 sessions, 695 QNI, 110 traffic. K1NEF reports that the RN meets on 3540 kc, at 1900 EDST Mon., Wed., Fri., Sat. and Sun. He would like any to join even though they do not have traffic experience. The W1AQ Club of Rumford voted that \$25.00 be given to the ARRL Building Fund. K1QZX was elected into membership. In his first year of operation K1TPK completed 1074 QSOs with 1074 different stations on 6 meters. Traffic: W1TXL 530, K1WKW 152, W1SMU 77, K1DZX 37, W1YNE 37, K1TPK 29, K1PZY 27, K1NJT 20, K1OZI 11, K1GR 9, K1RCW 8, K1GRA 8, K1MNZ 1.

VERMONT—SCM, Miss Harriet Proctor, W1EIB—SEC: K1DQB, PAM: W1HRG, RM: W1KRY, K1YMY, of Rutland, ex-W1FSW, is again active. Welcome back, Dick. The CVARC has a new masthead on its *Newsletter* listing the club call, K1YMZ. W1NDL is trustee. W1LRU and his XYL visited hams in the Morrisville Area. K1UYG has tried out mobile operations on two mountains. W1LYD had an informal roundup of hams at his camp. W1ZJL has a teletype setup. The WIND Hams Club attendance is growing. The BARC's new officers include K1CEJ, pres.; W1WPY, secy.; W1HRG, treas. Other trustees are K1PPW, K1IRH and W1SLJ. K1OXG has worked all but three countries in South America. K1MPN is going s.s.b. mobile. W1VSA and K1HPM have new jr. operators. Traffic: (Sept.) W1KJG 28, K1YD 11, (July) W1ZLH/1 1712, K1BXV 150, K1DQB 150.

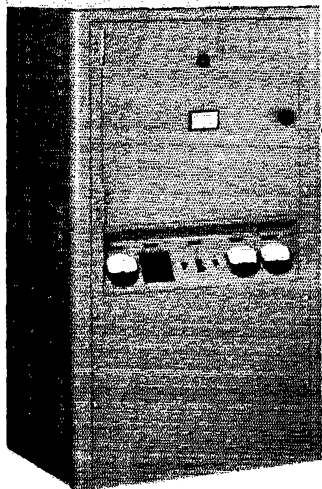
NORTHWESTERN DIVISION

ALASKA—SCM, Kenneth E. Koestler, KL7BZO—OO: KL7BJW, KL7AQU, KL7EIT, KL7DLA had a very bad fall and hurt her back but is recovering fine. W5GEG/KL7 has left Alaska to be with his ailing father. KL7BLL and KL7AUV are getting ready to hold open house in their new home. KL7EIT left Alaska Oct. 17 for a new assignment in Texas. KL7BJW is putting a new 4-1000A final on the air. KL7AQU is getting out of the army. He now has his beam on an 85-ft. telephone pole in the back yard with the help of KL7BZO. The 2- and 75-meter c.d. nets are doing very well. Anyone wishing information should contact KL7CUK. The Anchorage amateurs had a surprise visit when W3PS, General Counsel of the ARRL in Washington D.C., stopped in Anchorage on his way to the Convention in Portland. A meeting was held at KL7AGU's to discuss articles of interest that were pending with Mr. Booth, the SCM and many other fellow amateurs attending. The Salmon Derby at Seward was a great success and the amateurs who provided communications really did a terrific public service. KL7BZO is putting up a new Hy Gain high-tower multi-band vertical for 40-meter DX. W6EBG and his XYL spent 5 days in Anchorage.

IDAHO—SCM, Mrs. Helen M. Maillet, W7GGV—The FARM Net meets at 0200Z on 3935 kc. The Goni State Net meets at 0300Z on 3580 kc. The Intermountain Weather Net meets at 1345-1420Z on 3970 kc. The Third Emergency Net (MAGIC Valley Area) meets at 1600Z on 3910 kc. Sun, with 35 on roll. W7YQC, Moscow, became a Silent Key. K7SJM is the new EC for Custer County. A statewide CD Alert activated K7NDX and W7s AVY, DPD, DUP, GGV, OA and RKL on 80 meters. K7CLK has a new son, W7IST a new daughter. Those operating portable while attending college are K7CVB, Logan; K7GQE, Helena; and K5RUN, Pocatello. K7KRO was hospitalized for a pinched nerve. W7THD is becoming an expert hunter with the bow and

(Continued on page 154)

USE AEROCOM'S AMPLIFIER FOR MORE COMMUNICATION POWER!



AEROCOM'S Linear Amplifier used with conventional low power SSB transceivers for excitation, provides power output of 1000 watts PEP, continuous service. The SSB exciter should have at least an output of 65 watts PEP to obtain maximum output of the amplifier.

The Model 10LA amplifier is housed in a cabinet (22" Wx14 3/4" Dx36 3/4" H) which can serve as a base for conventional SSB exciter, or amplifier may be placed a short distance away from the associated exciter, if necessary for convenience.

Frequency range of 10LA is from 2 to 22mc, covered in 6 bands. Up to 4 independent non-simultaneous channels are provided. These four channels are selected externally by exciter channel control. One tuning unit is provided for each frequency specified up to maximum of four.

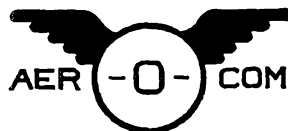
The 10LA amplifier is designed to work into a 50 ohm coaxial feed line. One output coaxial receptacle,

common to all four channels, or 4 output coaxial receptacles (one for each channel) are available; each channel normally requiring its own antenna. For multi-channel operation with 1 antenna it is recommended that Aerocom Model ATU-410 antenna coupler be used.

A built-in directional coupler provides monitoring of output power and SWR. Grid current, plate current, filament voltage and high voltage are metered.

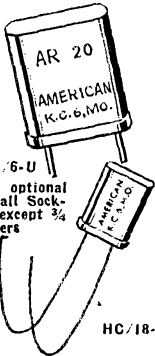
Harmonic output attenuation: second harmonic is at least 55 db down and higher harmonics are at least 70 db down. Noise level is 40 db below 1000 watts PEP output. Distortion products, in two-tone test, are at least 35 db down, depending on characteristics of exciter.

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arrow. New v.h.f. antennas were installed by K7QIE on 6 and W7UKH on 2 meters. The Pocestello group meets on 145.35 Mc. daily at 0130Z Gen State Net traffic: 54. Traffic: W7VQC 87, K7KBY 82, W7FBL 69, K7HLR 61, W7GGV 18, K7MIX 12, K7OAB 3.

MONTANA—SCM, Walter R. Marten, W7KUH—SEC. W7UPR; PAM, W7YHS; RM, K7AEZ. Montana nets are as follows: MPIL, M-W-F, 3910 kc, 1800M; MSN, T-T-S, 3550 kc, 1830M; TSN M through F, 7230 kc, 1200M; Flathead Valley 6-Meter Net, T-F, 50.135 kc.; Harlowton Emergency Net, 1st and 3rd S, 3885 kc.; Missoula Area Emergency Net, each Sun, 3890 kc, 0900M. Following are new appointments: W7UPR as SEC; K7PKN as EC Kalispell Area: K0OBF/7 as OO. Section Net certificates were issued to K7BKH, K7GHI, K7KJH, W7YQZ, K0ITP, K7DCH, K7IHA, K7LDZ, K7GWA, W7FL, K7NDV, W7TGM, W7HQT, W7IDK and W7NPV. W7JAU was home on 80 days leave. K7OGF is on a trip to Wisconsin. W7FL moved to Kalispell. W7VIR is back on the air with 300 watts. W7YB is the new club station call for the MSC. K7NKS is a new Conditional in Bozeman. New calls in Bozeman are W7BNG, K7IDG, K7SVQ and K7KOK. W7OOY and W7NPV moved to Bozeman. W7ELY visited in Great Falls. K7PKV has a new call in his shop, K7UUI. K7GZA:7 is operating with 12 watts from Dry Wolf. W7HDP has a new Panadapter. K7JWC is operating s.s.b. with a 4-1000, K7GVZ and K7GWA moved to Great Falls. K7DES is back at MSU. New net officers of the Montana Phone Net are K7NDV, K7DCH and W7IOJ, directors; K7DCI, net manager and recorder; K7KJH and K7DCH, area control stations. W7JGG is building a new 6-meter rig. W7CDG and W7EGH are on 75-meter mobile with new SWAN s.s.b. rigs. W7KUH and family made a vacation trip to W6-Land. A new call at Whitefish is KN7UUL. K7EZW is doing major remodeling on his home. K7NHV is building a new p.p. 813 c.w. rig. W7QYA is on a trip around the world visiting DX friends en route. W7IJM and W7JZ moved back to Higham from their farm. K7DES is back at MSU. The Yellowstone Radio Club and Electric City Radio Clubs had fine picnics. K7LGV is rebuilding a linear. K7BKH and K7AEZ visited with W7ZUJ and W7ZUK. G3NGH visited Billings area hams. W7JAU visited in Billings from Ft. Bragg. K7LDX was on furlough in Great Falls from the Air Force. K7BYC is heard on s.s.b. K7PKV is on the air with a Jefferson-Travis transceiver. W7ODK assisted K7GHC in putting up a new antenna. K7HDP now has a kw. rig on 6-meters s.b. K7KLE moved back to Sheridan from Miles City. Traffic: K7DCI 38, K7NHV 36, K7DCH 30, K7IHA 4.

OREGON—SCM, Everett H. France, W7AJN—SEC; W7WKP, RM; W7MTW. Appointments: W7BNS as EC for Columbia County; K7IGD as EC for Tillamook County. Endorsements: W7ZFH and W7MTW as ORSs; W7AJN as ORS/OBS. Nets and schedules (GMT): OSN, 3585 kc. 0230 Tue.-Sat. OAREC, 3585 kc. 0330 Wed.-Thurs.; AREC, 3875 kc. 0300 Tue.-Sat.; AREC V.H.F., 30.550 Mc. 0400 Fri.; OEN, 3840 kc. 0200-0300 daily. OSN: sessions 21, total attendance 188, traffic 85. BRAT awards went to W7AJN W7BVH, W7ZFH and K7IWD. OAREC: sessions 8, total attendance 44, traffic 5. AREC V.H.F.: sessions 4, total attendance 76. KN7UUB is a newly licensed ham in Grants Pass. K7NXX is on 80-meter c.w. with 50 milliwatts to a 2N94A transistor. An AREC meeting for Multnomah County was called by W7AJN and W7RVN. A planning committee was formed and the following Asst. ECs were appointed: K7PHP as general assistant, K7OWF for 75-meter phone fixed stations, K7PQF for 75-meter mobiles; W7ZFH for c.w.; K7ORB for 6 meters; W7GWT for 2 meters; W7JVH, of civil defense, as liaison. Monthly meetings will be held the 3rd Fri. of each month. All interested in AREC are invited to attend these meetings. The National ARRL Convention held in Portland was a success because of the excellent planning by the various committees and they should be commended for a job well done. Your SCM would like to hear from you as to your amateur activities, as it is all we have to go on for making these reports. Traffic: (Sept.) K7IWD 323, W7ZFH 75, W7AJN 35, W7DEM 20, W7RVN 20, W7MTW 13, K7CZV 12, W7KAB 5, W7MAO 4, W7BNS 3. (Aug.) W7RVN 46.

WASHINGTON—SCM, Robert B. Thurston, W7PGY—Asst. SCM/SEC; Everett E. Young, W7MHQ, RM; W7AIB, PAM; W7LFA. New officers of the Cascade Amateur Radio Club are W7UVI, pres.; K7ISL, vice-pres.; KN7THW, secy.; K7DKV, treas.; W7BLX, W7ROL, W7QME and W7PQS, trustees. K7CWO is in a new QTH and attending W.S.U. at Pullman. New appointees are K7IAE as ORS, W7CZY as OBS; K7MGB, K7CZT, K7HFN and K7HEF as OESs. W7IST is looking forward to a gallon on 220 Mc. W46PVV/7 soon will have a new seventh district call, W7QPZ and W7YXX toured the Olympic Peninsula. W7ORK made a trip to the mainland from sunny Whiy Island and was a visitor at K7AJT's QTH in Aberdeen. New officers of the Columbia Basin Net (CBN) are W7PJO, net mgr.;

(Continued on page 156)



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W7ZCE, secy-treas.; K7s LVT, MZN, RHY and W7s HRK and IJK, directors. Net time is 0330 GMT and frequency is 3960 kc. The WSN had 20 sessions, 239 QNIs and 99 QTCs during September. W7RGL fired off his new kw. WIHD has ordered a new s.s.b. station. The Kitsap County AREC meets at 1845 Tue, on 3980 kc. K7URA is a new call in the Walla Walla Area. The Richland Amateur Radio Club now has a station located in the Red Cross Building. W7OEB received his amateur Extra First ticket. A group of the YLRL members in the Tri-Cities are planning to establish a YL club. K7JRE is active on WSN and QNBs RN7. W7IFX was seen at the National Convention in Portland. W7-LWB vacationed in WO-Land. The SCM and SEC attended the Walla Walla Hamfest along with 235 others. There were 27 licensed YLs and XYLs. K7EVA and K7-JHA came out in a dead heat in the c.w. code contest. W7EQY and K7AJT received certificates in the Handicappers Net. W7CBE is installing a new vertical. W7IEU is running a new HX-50. The World's Fair station, K7USA, and KL7SOA/7 closed down a month early because of loss of donated space. W7QEU is building a new 20-meter beam. W7RA has 237 countries confirmed. W7JNC was a Seattle visitor from Portland. W7JEY is in a new QTH in Othello. W7HRC and his XYL went to Klamath Falls, Ore. and Vancouver, B.C., on their vacation. W7OE is being heard on WSN again after long absence. W7AMC is "passing" with a spare phone hook-up for the shack. K7JHA spent five days in traction in the hospital. W7NWK is awaiting a new all-band vertical. W7YXX has a new KM-2. RN7 is planning to go to 160 meters for the winter months on the second sessions. Ten AREC members answer ISC's call for club house work at VARC. W7HMQ and W7WHV attend the Richland and Grays Harbor meetings. W7UWT made his 29th consecutive report to the ISC. Traffic: W7DZX 826, W7BA 734, W7PGY 595, K7JHA 421, W7OEB 206, W7APS 179, W7GIP 136, W7-AMC 56, W7GYF 54, W7BTB 20, K7JRE 17, W7AIB 14, W7JIC 12, W7ZVY 10, W7IEU 9.

PACIFIC DIVISION

HAWAII—Acting SCM, Mike Fern, KH6ARL—SEC: KH6CQV, RM: KH6DVD, PAM: KH6EGL, KH6EGL and KH6ATS have launched the 50th State Net (3895 kc., 2000 HST, Mon, through Sat.) as a rallying point on 75. Please kobay. KH6DVD went to KC8 for his firm during October. KH6AGY helped set up special communication circuits for the Schirra pickup task force. KH6BQ lived up the Kauai C.D. Gonsets. KH6EOF is ready for 160 this winter. KH6BZF has a new QTH. W6ZDF/KM16 made ORS and worked JTIAG. KH6EOT applied for ORS appointment. WH6EXP and WH6EXX are on 40 from Maui, which has a bumper crop of YL Novices. KH6ELH brought KH6DYV's gear when Milton left for Oregon State. KH6KS, KH6AFC and KH6EU held down the Oahu end of K6CQV/KS6s phone operation for the South Pacific Conference. KH6ECT broke his leg, and came home with a custom-fitted ground bus in his hip. The Kauai C.D., V.H.F. Net meets on 146 Mc. at 2200 HST nightly. If you want to see your news here, send it in. Traffic: W6ZDF/KM16 117, KH6DVD 93, KH6EWD 72, KH6EGL 39, KH6EOF 20, KH6ARL 18, KH6EOT 6, KH6BZF 1.

NEVADA—SCM, C. A. Rhines, W7VIU—W7THH is moving to Reno. W7MAH and his XYL visited the Reno gang. Reno hams are expecting trouble with a proposed zoning ordinance. The NARA is enjoying good turnouts at its meetings, and is planning classes in code, theory and regulations. K7JUV passed his General Class exam. W7FJV is back in Reno. K7KBN made the BPL for the second straight month with loads of traffic from Antarctica. This will be my last time of reporting for the section as you fellows have elected W7PBV as your new SCM. It has been a real pleasure working with all of you and meeting some of you personally and representing you at the various meetings called by your Director. Give your support to W7PBV and I'll be looking for you on the air. 73 and DX. Traffic: K7KBN 1159.

SANTA CLARA VALLEY—SCM, W. Conley Smith, K6DYX—The SCCARA reports the Old Timers Spaghetti Dinner, Sept. 10 was a great success. Frank Quement and Dick Barrett showed pictures of by-gone days complete with spark, arc and tube. The oldest amateur present was Doug Perlman, "DP" before 1913. The club has started another code and theory class with WA6HYN in charge. WA6HRS, OBS, is back from Kwajalein where he enjoyed operating KN6BU and KN6DB. Hil is moving to a new house and negotiating with the XYL for antenna installations. It's good-bye to California for K6ZCR, at least for a while. As an AF nurse, Claire will be stationed at Lackland AFB initially. W6YHM made the Portland Convention on the way back from KL7-Land. Don is now busy with a 2-meter f.m. converter for the SARO. His other hobby is flying and he recently touched down at Monterey for a short chat with your SCM, K6GID, K6DNW, WAGGX and

(Continued on page 158)

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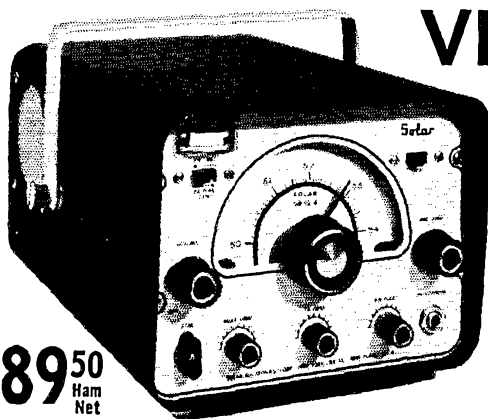
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W6THD supplied radio communications with walkie-talkies and WA6YVZ, the 2-meter repeater for the Palo Alto regatta. WA6UC maintains s.s.b. skeds nightly with Hawaii and Alaska. K6GZ is now equipped for high-speed c.w. reception, by tape apparently since he is already qualified at 45 w.p.m. on the mill! This is my last report after four years as your SCM. Thanks to everyone for your support. I have enjoyed making so many new friends. See you on the low end. 73. Traffic: (Sept.) W6RSY 450, K6GZ 250, W6AIT 113, W6YBV 102, WA6EIC 66, W6DEF 64, WA6TNY 48, W6YHM 48, W6OIF 37, WA6UC 27, K6BBF 27, K6DYX 19, K6GID 18, W6RFF 14, K6VQK 10, K6EQE 4, W6VWX 3, K6MTX 2. (Aug.) WA6OTQ 22.

EAST BAY—SCM, B. W. Southwell, W6OJW—Following is a list of appointments in the East Bay section. If your call is not listed, a note to the SCM will change the records: SEC: WA6MIE, ECs: W6NOP, WA6WRII, K6OSO, K6EDN, K6JFY, WA6RGD, K6HTJ, W6WAI, RMs: K6ZYX, W6NWX, PAMS: none, OESs: W6OWJ, WA6ICD, W6NDR, WA6PKN, WA6MXI, W6OIJ, K6TWT, K6KEY, K6QNY, W6NCD, OPs: WA6EWI, W6EY, W6AKB, WA6KFN, OBSs: WA6WLE, WA6VAT, K6IGN, K6GK, W6DUB, W6LW, OItS: W6T, W6EY, K6OSO, K6AHV, K6ZYX, W6NBX, WA6ECT, WA6RGD, WA6MIE, OOs: W6OJW, W6EY, WA6MIE, W6IDY, K6GK, W6BEZ, W6FZC, W6CBF, WA6PKN. Remember appointments are subject of cancellation for non-report of activity. WA6NCD 6, operated by members of the Rangers Radio Club, made BPL on AWTAR '62. W7QOH 6 was in there fighting during the WAVE test. The Walnut Creek gang under RACES handled all traffic for Ko-Polo on Sept. 23 with 47 mobiles in action. WA6LGH/WA6LGE have a new Heath Chevelle and Comanche with an inverted "V" antenna. W6OJW got his USA-CA Award and has three more about cornered. WA6WLE is QRL school. WA6MXI has two 35-ft. spiral rays for 6 meters and 2 for 2 meters up 120 feet. W6NBX is building a new final. WA6LGE got the QRP Award and is chasing WAS, but needs 6 more states. W6PFR got a letter from Washington, D.C. making her a full-fledged postmaster. W6LWV, WA6CNV, WA6CNY, WA6PWR, WA6ANE, WA6FBS, W6BXE, K6TIF, W6EFL and WA6QYN handled communications for the Walnut Festival Parade. The LARK held its annual picnic Sept. 15 with a good turnout. WA6KLL won a 24-hour clock, and WA6RMS and WA6IOU won timers. W6AUB, 11 years old, is the youngest YL to join the ORC in many years. W6URA has wode practice sessions on 6 and 2 meters at 9 P.M. Wed. and Sat. starting at 4 w.p.m. to 17 w.p.m. W1LVQ was guest speaker at the Sept. meeting of the HARC. WA6AHF is having trouble with his G-76 transfer relay. WA6RQS is recovering from surgery. WA6IMC, WA6QIU, WA6NXC and W6WXM are QRL school. W6ICR has a new 300-watt Final. WA6VWY, a new member of the HARC, has a DX-100. W6FYM is president of the NCARTS, N. Calif. RTTY Society. K6ESZ sends NCARTS RTTY bulletins on 3820 kc. and 146.475 Mc. at 7 P.M. the 1st and 3rd Thurs. of the month. East Bay section has too numerous to mention attended the Convention in Portland and a bang-up time was had by all. K6YSS is giving 144 Mc. a whirl. Traffic: WA6NCD 6 642, K6GK 110, WA6MIE 40, W7QOH/6 12, W6OJW 3.

SAN FRANCISCO—SCM, Wilbur E. Bachman, W6-BIP—*San Francisco Club*: New officers elected at the Oct. meeting are W6JXE, pres.; W6URA, vice-pres.; W6VYLX, secy.; W6FAX, treas. *Marin Radio Club*: W6TIJ, Teddy Marilli, one of club's most popular members now is a Silent Key. Code practice is conducted on 3590 kc. Mon. through Thurs. at 6:30 P.M. by K6USN, starting at 5 w.p.m. *H.A.I.S.*: Red Cross Clubs W6CXO and W6MLK were active in the alert drill of Oct. 6. They monitored 7250 and 3875 kc., also AF MARS channels. W6MISN is a new asst. EC. *Tamalpais Radio Club*: Member WA6IWH is now a Silent Key. K6BAQ is a new resident in Novato. K6JGX helped move people out of the area during a recent critical fire in Lake County. *Baylarc Club*: W6BDE has to take things easy now so she has discontinued editing *Splatter*. Dot, WA6LIZ, and Vera, WA6PKP, have taken over this task. The XYL of K6ANP and also the XYL of W6GGC met some of the "Portland Roses" at the Portland Convention. *Humboldt Radio Club*: Fortuna and Eureka amateurs changed their Oct. meeting night to hold a joint meeting in Fortuna. *CCRC*: The Oct. meeting was held at the QTH of W6CTH with good attendance. The First Greater Bay Area Hamfest held at Hilton Inn was a huge success. About two hundred and fifty attended and all reports are that congratulations should go to the committee in charge for a job "well done," as they decided, planned and held this big affair within three months. Clubs already have decided to hold a second hamfest next year with more clubs participating in plans. The San Mateo Radio Club, San Francisco Club, Northern Peninsula Electronics Club, Oakland Club and Hayward Club took charge of the first get-together. I wish

(Continued on page 160)

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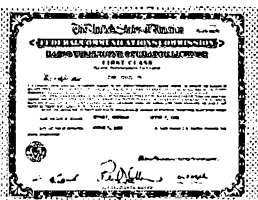
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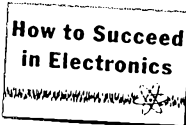
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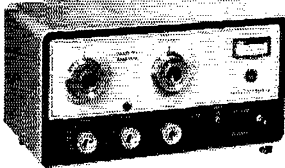
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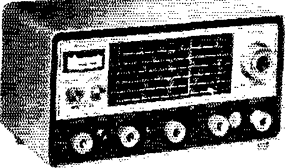
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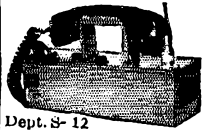
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to take this opportunity to thank all my appointees especially the OESs for their fine, faithful reports each month. Traffic: (Sept.) K6SAA 28, W6GGC 12, W6JWF 10, W6GHT 8, (Aug.) WA6MDL 234.

SAN JOAQUIN VALLEY—SCM, Ralph Saroyan, W6JPU—W6JUK and K6LKJ attended the S.S.B. Convention in Santa Barbara. K6EJT attended the National Convention in Portland. W6IUD is on 6 meters. W6BJI, W6TZJ, K6PBL, K6PBN and W6AREA are organizing a 6-meter RTTY MARS net. K6KEP is on 6 again. W6QJAI passed the General Class exam. W6WVYN has a new Drake 2A receiver. K6PBL is building an RTTY converter. The following stations checked in on 3854 kc. for traffic and reports during the recent earthquake near Ridgecrest: W6EFB, W6WRJ, W6MNXR, WA6UOK/6, WA6VBP, W7KYM, and W6ZSA. K6OZL has a DX-100. K6QOO lost a 2-kv. transformer. The SJVN had 804 check-ins, traffic 42, 70 contacts, 7 QST, 10 bulletins and 9 phone calls. K6DMIH is teaching radio at high school. WA6BTK is in the Army for two years. K6GVG got married and is located in Berkeley. The Annual Stockton to Colusa and Return Boat Races were held, and W6DKI, WA6SET, WA6OAP, W6LRS, W6GFT, W6UAX, K6RBB, K6SFF, K6UII and W6OVR helped with communications on 2 meters. The Fresno Radio Club is conducting code and theory classes at the Fresno Jr. College, Mon. at 8 P.M. W6FFJ is in charge. K6GTI is teaching TV at Fresno Jr. College. I'd like to take this opportunity to wish each and every one of you a very Merry Christmas and thank all of you who have sent me monthly reports. Traffic: (Sept.) W6ADB 188, W6EFR 14, (Aug.) W6ADB 213, W6JPS 78, K6OZL 67, K6QOO 2.

ROANOKE DIVISION

NORTH CAROLINA—SCM, N. J. Baruch, W4CH—RM: K4CPX, V.H.F. PAM: W4ACY, W4BAW, W4LCV, W4EYZ and others are doing a grand job with the Coastal Carolina Emergency Net on 3907 kc. The Carolina V.H.F. Society, with a membership of over 100, assembled at High Point for its annual meeting. K4YCL submitted a very comprehensive copy of QNS reports for NCN's monthly activity. It was a delight to listen to young Jimmie, WA4BHX, call the roll for the Hurricane Hunters S.S.B. NET. W4PNI has been transmitting synoptic encoded weather reports as drill messages on 3545.5 kc. from RACES headquarters. K4FMV, Raleigh Area EC, is busy working up an active AREC group. K4IEX passed the 200 DXCC mark with 203 confirmed. K4YYJ queries about a 2-meter emergency net with NCS on Mt. Mitchell and would like to hear from other stations further east. W4BZU has completed his kw. s.s.b. rig for 2 meters. OO reports came in from W4FJM and W4FUI. Excellent OES reports were received from K4YYJ, W4OAB, W4COJ and W4HJZ. W4ONZ resigned as RO for Buncombe County C.D. to take a job with VOA. We regret to announce the passing of W4GG, one of our real old-timers. Traffic: (Sept.) K4CPX 185, W4PKS 104, W4PCN 92, WA4FUJ 82, WA4APD 78, WA4ANH 75, K4TPE 51, W4BAW 48, K4YCL 46, K4QFV 21, W4FJP 19, K4MPE 18, W4EJQ 6, (Aug.) W4PKS 93, WA4ANH 82, K4IEX 52, K4NPE 19, WA4DAA 6.

SOUTH CAROLINA—SCM, Lee F. Worthington, K4HDX—SEC: W4BCZ, PAM: K4ECO, RM: W4PEL. Nets: c.w., 1900 and 2200 EST 3795 kc.; a.m., 1930 EST 3930 kc.; S.S.B., 2000 EST 3915 kc.; emergency s.s.b., 1900 EST 3985 kc. Wed. Under the guidance of the SEC, the state AREC successfully participated in the annual SET. Excellent cooperation was given by the c.w., a.m. and s.s.b. nets to the emergency s.s.b. net which was set up with the SEC and ECs. W4AKC, Vice-Director Roanoke Division and K4HDX/SCM, attended a special meeting of the Aiken ARC on Sept. 21. National and state-wide activities of ARRL were the principal subjects. Appointments and Endorsements: K4PJE, W4FFH, K4WJU, K4ZIV, W4BZC and K4JOQ as ECs; W4AKC and W4HMG as ORSs; W4VTW as OES; K4OCU as OPS; W4PED, W4IKU and W4AKC as ORSs; W4PED as RM; W4CSO and W4RFP received Section Net certificates. Six-meter activity is on the up-swing again in the Spartanburg Area. Contact WA4AEB for information on W.A.S. (Worked All Spartanburg) certificates. Seasons Greetings to all from your SCM, SEC, RM and PAM. Net traffic: c.w. net 83, a.m. net 45, s.s.b. net 40. Traffic: K4OCU 60, WA4DGH 36, W4AKC 32, K4WOI 28, K4LND 25, WA4CSO 16, K4YFK 16, W4NTO 15.

VIRGINIA—SCM, Robert L. Follmar, W4QDY—Asst. SCM: H. J. Hopkins, W4SHJ, SEC: W4VMA, RMs: W4LK, K4TIV, W4IA, W4SHJ, W4QDY, PAMs: W4BGP, W4UFX, K4JQO. All stations are urged to report to the SCM as soon as possible after the end of each month. K4SGQ had a visit from W4SHJ. W4TE was tied up with Hamfest Planning and Autocal. W4CYO's report was mailed from Alaska! The SET came off very nicely for many stations. K4QIX blew the transformer
(Continued on page 162)

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in his HT-37 but got a new one back in place. W4BGP again is back in the running, having changed his QTH. K4ORQ got the bug out of his new homebrew rig besides spending time in the hospital. W4WBC is struggling with a new Heath Marauder. PVRC's W4KFC is starting a project to rebuild the transmitter and operator position. K4AL says, "Having lots of fun with home-made quads. It's ugliest 3-bander in Richmond." W4JFY has bugs in the new 150-watt amplifier. W4NTR is putting up a new TA-3340 with a new CDR HAM-M. W4NYX misses them that 100-ft trees in Lynchburg! K4PIK is putting a new Gonset 201 Linear on the air. W4PTR reports the Penultimate receiver is in working order but needs finishing touches. K4TZF had a buzz on his signal until he found a bad bias cap. WAS and HTH 50 Awards were received by K4YDL. OO K4PNY is busy with overseas MAIs on naval ships. W4JUI is spending much time looking for new counties and 592 confirmed, including 42 in Virginia. Up Winchester way W4OOL reports the SVARC is helping the Lions Club with its Annual Broom Sale. W4ZM reports new officers of the PVRC are W3MCG, pres.; W3GRF, vice-pres.; W3BKE, secv.; W4GF, treas. W4FOR still is in thar fighting. W4DLA says 80 and 40 have been the best for several months. Traffic: (Sept.) W4PFC 1299, W4DLA 335, W4RHA 326, W4NTR 279, W4DVT 183, W4FOR 138, W4WDZ 137, W4SHJ 126, W4JFY 103, K4PNY 100, K4FSV 85, W4LK 84, K4ITV 64, W4IA 54, W4PTR 45, K4Y2T 43, K4VDU 35, W4WVO 21, W4JUI 21, W4BZF 17, K4MXP 17, K4ATF 16, K4TZF 16, W4LRN 12, W4OOL 12, W4NYX 11, W4TF 11, W4ADUW 9, K4DCN 8, K4-ITP 8, W4BGP 7, K4JYL 6, W4QDY 6, K4YDL 6, K4-BAV 5, K4IQO 5, K4LTK 5, K4SGO 5, W4QWV 3. (Aug.) W4PFC 617, W4OOL 20, K4JYL 13, K4TZF 8, W4RFC 7, K4JQO 5, K4UVT 1. (July) K4LTK 2.

WEST VIRGINIA—SCM, Donald B. Morris, W8JM—SEC: W8SSA, RM: K8HID, PAM: K8CFT, WVN C.W. meets on 3570 kc. at 0000 GMT, WVN Phone on 3890 kc. at 2330 GMT. We welcome Kay, W4BLR, and her OM, W4BVB, formerly from Richmond, Va. to West Va. PAM K8CFT reports 17 net sessions, 402 stations and 34 messages. K8CQY reports 17 sessions on c.w., 109 stations and 64 messages. New officers of the Blennerhassett Radio Club of Parkersburg are K8HYE, pres.; K8BOT, vice-pres.; K8PFC, secv.; K8DXT, act. mgr.; Bob McKinley, pub. W8AGD received his General and W8ANT and K8ZPP are new Techs. W8TAP and K8QAZ are conducting code and theory classes for the Veterans Administration ARC at Beckley. K8UXP has been named trustee for the Opeaon Radio Society station. K8MQB will be chairman of the YLRL activity for the 1965 West Virginia State Radio Convention. Are you ready for the Centennial Year with your new Centennial QSL card? Traffic: K8UQY 77, K8ZWN 23, W4BLR/8 21, K8ELH 12, K8CFT 7, W8JUE 4, K8LOU 1.

ROCKY MOUNTAIN DIVISION

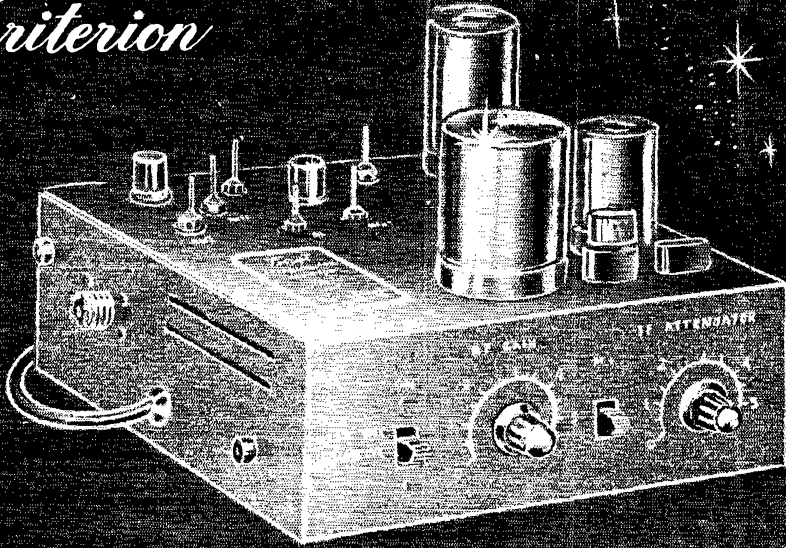
COLORADO—SCM, Donald S. Middleton, W0NIT—SEC: W0SIN, PAMS: W0CXV, W0JLR and W0GNK, RMS: W0FEO and K0DTK, OBS: K0DCO. W0MOX reports that the BARC made several 492-Mc. contacts with Wyoming during the Sept. V.H.F. 492 party. The state RACES Radio Officer K0DCV spoke to the PARA on RACES matters at the regular Sept. meeting. W0RX addressed the Annual Conference of Junior Colleges at its Sept. meeting. Two new QESs for Colorado are W0DRP and W0DKA. The HNN showed a QNT of 287 and a QTC of 93. Traffic: K0DCW 32, K0ZSQ 27, W0MYB 23, W0ENA 17.

UTAH—SCM, Thomas H. Miller, W7QWH—Asst. SCM: John H. Sampson, W7OCX, SEC: K7BLR. The UARC in Salt Lake had a good meeting recently. The main program was a contest for home-brew equipment. Contrary to popular belief, many hams still build their own equipment. The main prize was won by W7CYG with his kw. linear amplifier. Band conditions on TWN and BUN have been steadily improving. W7OCX, K7-MPQ, W7QWH and W7VW received BRAT awards on BUN. BUN activity control and alternate control stations. Station activity reports have reached a low. Director Smith of the Rocky Mountain Division has set a goal of doubling the membership in the division this year. *Every member get a member. Help The Building Fund.* Traffic: K7NWP 358, W7OCX 66, W7QWH 8.

NEW MEXICO—SCM, Carl W. Franz, W5ZHN—SEC: K5QIN, V.H.F. PAM: W5FPB. It is with deep regret that we record the passing of Verl Coleman, W5KCW, on Sept. 12. He will be missed by his many friends. The NMBC Net now meets at 7 A.M. on 3838 Mon. through Fri. NMEPN, on 3838 kc. has changed its time to 7:30 A.M. Sun. John C. Kanode, K5UYF, has been awarded the CHC 200 Plaque which was presented to him Oct. 15 by Lanier, President of the ABQ Chamber of Commerce. John is the 8th in the U.S. and the 16th in the world to be so recognized. Our heartiest congratulations, John. I would like to hear from our state ARCs with regard to the establishment of a state ARC (Continued on page 164)

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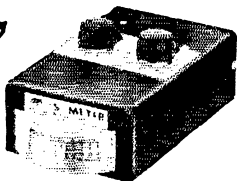
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council, whose primary purpose would be to coordinate and integrate the efforts and interests of the various phases of our hobby. If there is any interest in setting up an organization your SCM will be most happy to set up a meeting to discuss the matter. The Silent Key Flower Fund is now overdrawn; contributions would be greatly appreciated. This is a project that is worthy of the support of all. Traffic: W5UBW 74, W5ZHN 33, W5WZK 24, K5ONE 18.

WYOMING—SCM, Lind D. Branson, W7AMU—SEC: W7HII. The Pony Express Net meets Sun, at 0800 MST on 3920 kc.; The YO Net is a c.w. net on Mon., Wed. and Fri. at 1830 MST on 3610 kc.; the Wyoming C.D. Net is on Wed. at 1900 MST on 3537.5 kc.; the TWN Net daily at 2000 MST on 7060 kc.; the Wyoming Emergency Net at 1230 MST every day on 3920 kc.; W7BXS has returned from a thirty-day trip to the World's Fair and the West Coast, K7ONK is taking a physical examination for release from the Air Force, K7MGM is in the VA hospital with tick fever, W7CQL is in his new home, W7AMU still is under the doctor's care, W7DTD moved to Lander, Wyo. W7BKI's XYL has about recovered from a broken leg, K7MKR received a promotion in his job, K7MAT returned from Canada and is back on radio at home, K7OWL is busy feeding cattle and sheep for the market, W7FLO is 80 years old and on the air every day. Traffic: W7AMU 53, W7HII 40, W7AFC 30, K7ONK 30, W7BIIH 15, W7HDS 11, W7EUZ 6, K7TJW 3, W7TZK 2.

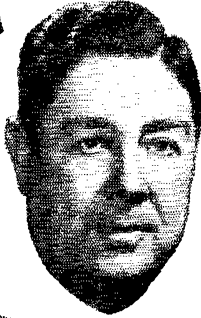
SOUTHEASTERN DIVISION

ALABAMA—Acting SCM, Walter W. Coleman, Jr. W4OXU—SEC: W4FQQ, RA1: K4YUD, PA1Ms: K4BTO, K4KJD, K4ZTT, S.S.B.: K4KJD. New appointments: K4IHX EC Alacon County, K4XUW EC St. Clair County, W4DFE resigned as RACES Officers, Jefferson County; and W4GET has been appointed, K4YUD and W4NML have Extra Class licenses, and Code Proficiency certificates for 25 w.p.m. and 20 w.p.m., respectively. W4DS has a new tower, W4YER has a new HT-37. Increases in Alabama amateur population: W4ACMS, W4AJN, W4ADYF, W4AGJF, W4AGNK, W4AISG, K4FPP, W4AJHL, W4AJGC and W4AJGD. New members of the AEND are W4IQC and W4IJE, W4IVN, W4IWP and K4BSK. The AENO meeting on 50.55 kc. at 1915 CST Mon., Wed. and Fri. has shown greatly increased activity and outstanding ability in handling traffic state-wide. The AENM S.S.B. Net is becoming one of the largest and most active of the Alabama nets. Traffic: (Sept.) K4AOZ 124, K4WOP 67, K4DJR 59, K4PFM 48, K4WSK 42, K4ZTT 37, K4FZQ 33, K4KDE 33, W4ABSE 26, K4HJM 22, K4KJD 21, W4BDW 16, K4BRZ 15, K4NUW 14, W4WGI 14, K4WWP 14, K4GXS 9, K4VVD 9, K4RTO 8, K4BSK 8, K4PRY 8, K4PIH 8, K4JDA 7, K4TDJ 7, W4AEEC 6, K4UMD 5, W4DS 2, K4RIL 2, W4DGH 1. (Aug.) W4CWF 6, W4DGH 1.

EASTERN FLORIDA—SCM, Albert L. Hamel, K4SJK—SEC: W4IYT, RM: K4KDN, RM RTTY, W4EHU, PA1Ms: 40 W4SDR: 75 K4LCE, v.h.f. W4RAU; s.s.b. W4CNZ. We appreciate the speedy radiogram reports but also would like the card form as well with any official news of yourself or your station for this column. W4BKC reports the Orlando ARC's new officers are K4UIZ, pres.; K4KRG, 1st vice-pres.; W4BVX, 2nd vice-pres.; K4JSS, treas.; K4NXT, secy. This club has been 100 per cent ARRL for the past three years. W44KZX comes up with a stacked ten-element job on 2 and W4AAME is sporting a 40-element job. W4NDL is being QRMD by the fifth addition to his brood. We hope K4COO sees an end to his gear troubles soon. A better OBS and traffic man is hard to find, W4EXM is now an electronic advisor to the Imperial Iranian Army in Teheran. He will soon settle in Clearwater when retired. We sincerely urge all EFLA ARRL members to cast a vote for their new SCM. This can mean much to you. Traffic: (Sept.) W44BMC 871, K4IWT 702, K4SJK 658, W4TUB 455, K4RNG 439, W44IHH 397, W4KTS 279, K4NTA 221, W4SDR 215, W4AKB 205, W4ADKG 189, W44JH 188, W4IET 168, W4BNE 162, K4BY 161, K4FMA 150, K4COO 141, W44GBM 136, W4BKC 134, W44AZZ 129, W4MIN 123, W4CNZ 121, K4AKQ 115, W44CJ 109, K4ILB 108, K4YOQ 99, W4EHW 93, W44BGW 87, W44DCI 82, K4KDN 82, W4NDL 78, K4LLI 72, W41RX 70, K4UIZ 63, W41IV 59, W4IYT 58, W4CVD 57, K4NVD 48, W4ERM 47, W4NIR 47, W4KCG 40, W4AAME 39, W44PGE 37, K4DAX 36, K4OSQ 36, K4YLY 36, W4QVJ 35, W4EAT 33, W4EFA 31, W4ESS 31, K6SXX/4 31, W4VXX 29, K4ENW 26, W4SVI 23, K4MZR 22, K4JWM 21, W4YPX 19, W4RBZ 13, K4MTP 13, W4AYD 12, W4HFR 12, K4NXW 10, K4YSP 10, W4LMT 8, W4LSA 8, W44LQ 7, K4CMK 6, K4VGD 5, W4DFZ 4, K4LCP 4, K4ZIF 4, K4FQP 2, W44KZX 2. (Aug.) W44AMC/4 159, W4KIS 62, K4ODS 27, W4VLH 25, K4LLI 20, W4WHK 16, W4HFR 15, K4LVE 11, W4BAV 10, K4UKF 9, W4KRC 8, W4QVJ 8, W4DTS 7, W44AI 4, K4VGD 4, W4BWR 3, W8LDU/4, 2, K4CMK 1.

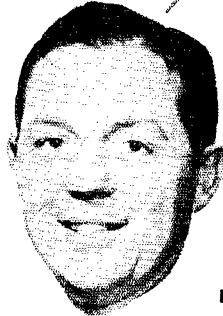
(Continued on page 166)

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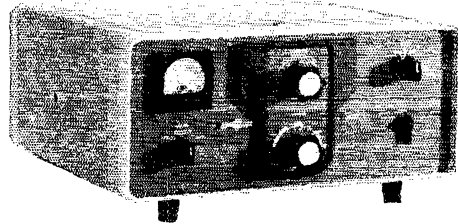
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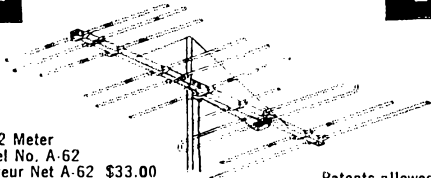
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WESTERN FLORIDA—SCM, Frank M. Butler, jr., W4RKH—SEC, W4MLE, PAM: W4WEB, RM: K4UBR. The 1962 Florida SET saw more ham handling more traffic than in any previous tests, SECs W4MLE and W4YT prepared a joint report which everyone should read. Tallahassee: W4MLE handled traffic to and from state offices during the recent floods in the Sarasota area. W44JQX (ex-K3NIX/4) kept a continuous contact with Panama City during the SET on 6 meters. Quincy: K4QDY has a new TX-33 JF beam and is busy hunting DX. Blountstown: K4NKE is active with an Apache and an HQ-100. Panama City: New officers of the PCARC are W44FIJ, pres.; W44GJO, vice-pres.; W44-FJE, sec.; K4VNR, treas.; W4GWQ, sgt. at arms. WN4JLV is a new YL ham. K4MZA has moved to Pensacola. W44GJO has a new tri-band beam and has modified the DX-100 for high power. W44FIJ now has RTTY gear operating. W44FJE keeps skulls with FL5A, Ft. Walton/EAFB: A recent EARS program included films on SAC long-range s.s.b. communications network. W4RKH has raised the 10-meter ground plane and is looking for ground-wave DX. EARS: W4SRX is sponsoring new code and theory class, taught by K4AAK. Pensacola: K4SOI worked Ft. Walton on 2 meters with his tower and ground plane. The PARC holds frequent transmitter hunts on 10 and 6 meters. K4QC reports 10 stations active on the MARS 6 Meter Net. W4FRJ and WOFPA are active on 29.560 kc. Traffic: (Sept.) W4MLE 354, K4VYF 158, W4BVE 110, K4VND 93, W44-FIJ 88, W4GAA 27, K4BDF 14. (Aug.) W4MLE 90.

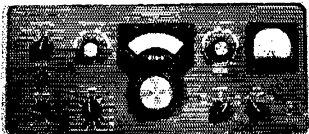
GEORGIA—SCM, James A. Giglio, W4LG—SEC: W4VE, PAM: W4KR, RM: W4DDY. The Atlanta Radio Club's station call was changed to W4DOC in a memorial service at the October meeting. Dr. Wm. Studer, K4ZSX, conducted the ceremony. W4FVH still is working with a diode power rectifier. He reports zener helpful in voltage surge control. K4KVV is running 100 watts to a homebrew 829 final on 2 meters. W4HYW had to enlarge the shack to make room for RTTY and v.h.f. gear. On his station activity report K4WVY names "school" as his major activity. K4NGI, with a Viking II, is maintaining weekly schedules with his OM, W3-OJL, on 40-meter phone. The prize for the oldest ham present at the Rome Hamfest was won by W4JL. The Confederate Signal Corps is starting a Novice class in November. Contact W4ORI or drop a card to P.O. Box 287, East Point, Ga. Yankees are welcome. The "Worked all Counties" Award is now sponsored by the Columbus Amateur Radio Club. W4PBK doesn't look at all like he sounds; we pictured him as rotund and bald. Congrats to K4BAI on making the highest c.w. score in the nation in the July CD Contest. K4TEA, K4ZYI, K4QPE, K4BYD and K4RHU also honored Georgia with excellent scores. W4CLA, W4KR and W4RQB are running TDQs and covering the state on 2. New appointments: W4ALJ as EC and K4EPZ as OBS. Traffic: W4DDY 165, W4PIM 153, K4WVY 121, W4HYW 30, K4FRM 26, K4YRL 18, W4VY 7.

WEST INDIES—SCM, William Werner, KP4DJ—C.D. Radio Officer: KP4MC, AIRRL QSL Bureau Mgr.: KP4-YT, Box 1061, San Juan 5, P.R. Hundreds of QSL cards awaiting your SASE. KP4AWH has a new 6LQ5 and has 39 countries and 47 states confirmed on 75-meter phone. KP4BCA, San Juan FC, has established the AREC Net on 28.740 kc, roll-call Thurs, 2230 GMT. KP4AYP is presently NCS, KP4CGB, NCS of the Antilles Emergency Weather Net, modulates an HT-37 on 3820 kc, and a Ranger on 7245 kc, simultaneously for complete coverage of the Caribbean. Stand by equipment at KP4CGB is a BC-610, an AR-88 and a vertical antenna. KP4CGB reports to 41N (3547 kc, daily at 0915 and 0230 GMT) as often as he can for traffic but he could use help from other KP4 stations. VP2AB has returned to Antigua and AEWN, KP4BEA, licensed as KP4 for a year, is close to DXCC-200. KP4AFL, Alavarez is very active with his new mobile Cheyenne/Comanche from all parts of the Island. KP4VY, Mayaguez, is on 60 meters besides 20, 40 and 80. KP4BEL, at Central Coloso, is on 6 meters with a Challenger and four receivers. KP4API is back at Cornell for his third year of EE after working on the Areibo radar project for KP4AXX. KP4API built a 50-watt 6-meter rig for mobile use in the States. KP4WT's grandson, KP4BCW, is on 50.2 Mc. The El Morro ARC Club meets the 1st and 3rd Thurs, of each month at 2330 GMT. On-the-air meetings are held the 2nd and 4th Thurs, at 2230 GMT on 28.740 kc. KP4AIS has a new KWM-2. KP4AMG stopped experimenting and is on 14-270 kc, s.s.b. with a 20A and a kw. linear. KP4AZ is repairing his parallel 4-400A linear. KP4ADY moved to a new QTH, 81 Ponce St., Hato Rey. His close neighbors are KP4s DJ, PJ, ATY, AQQ and AOK. KP4CH now is in charge of v.h.f. transmitters for the FAA at Intl. Airport. K4PUJ is leaving Washington, D.C., to live in KP4-Land. KP4AXB built an extra room on the house for a radio shack. KP4AAA is studying customs law in New York. Traffic: KP4CGB 520, KP4WT 108, KP4AFL 1, KP4AWH 1.

CANAL ZONE—SCM, Thomas R. DeMeis, KZ5TD—
(Continued on page 168)

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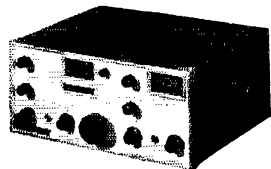


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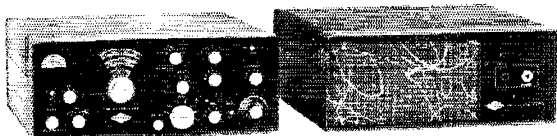
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KZ5CG was transferred to Puerto Rico and KZ5SW was moved to Florence, S.C. for the FAA. KZ5RW is in the U.S. on vacation. KZ5BL and KZ5BF are on the air with HT-37s and Drake 21s. KZ5VR and KZ5RV are back from their vacations. KZ5AQ will pack more power with his new DX-100. KZ5TD is on with an 11X-10 Marauder. KZ5DX is operating on 10 meters with a 7-watt rig. We find that the 3, 4, 5, 8, 9, 0 call areas are booming in here on the Citizens Band but activity on our 10-meter band is negligible, except for the week ends. KZ5MH is back in the States for good. KZ5AG is now operating from the U.S. as WA4GAH. KZ5SH was in KP4-Land for some schooling. KZ5DB is running a gal-lon from Fort Clayton. KZ5HO is operating with 8/line gear now. The CZARA discussed 20-meter band use and the extensive use of 141.-2 by countries in this area. Army MARS plans to start some kind of code instruction and practice facilities also a new 40-meter c.w. net. The Crossroads ARC held a ham auction Oct. 18 at the club house. Traffic: KZ5SS 78, KZ5VR 71, KZ5KR 21, KZ5OA 6, KZ5VF 6, KZ5OB 3.

SOUTHWESTERN DIVISION

LOS ANGELES—SCM. Albert F. Hill, Jr., W6JQB—Asst. SCM: Lyle G. Farrell, W6KGC; SEC: K6YCX. PAMs: W6ORS, K6ZM: RAJ, W6BHG. The following stations earned BPL certificates: K6EPT, K6MDD and W6WPF. Congrats, fellows! WA6UVR did a bang-up job at the L. A. County Fair and had many ham visitors. K6LTO is QRL with his new book and extensive traveling. WA6DCF and WA6MQF have RTTY gear on the air. WA6TWS is a new General and will handle liaison duty for the SoCal 6 Net. WA6QKM had a nice trip to the East Coast. W6VOZ lost his 80-meter Vee beam! W6AM got Gus in both Brundi and Rwanda! W6ORS is working hard with the Scouts and has a new boat! New officers of the Ramona Radio Club are K6GWH, pres.; W6TMY, vice-pres.; W6QVK, secy.; WA6UPV, treas. WA6UVV had an appendectomy. We wish you a speedy recovery Ziv! W6BJB enjoyed the Seattle Fair and the Pacific Northwest. K6KIUU is attending Santa Monica City College. WA6ROF moved to the San Diego section! K6ANY built a nice oscillo-cope. K6CYG has a tri-band beam on a 60-ft. tower. W6BAUN is a new call in Pomona. WA6YIT put the Ameco 6-watt preselector ahead of the converter! K6TYC has a 54-ft. crank-up tower in the air. New officers of the Palisades Radio Club are WA6LDV, pres.; K6CYG, vice-pres.; WA6MTV, secy.; K6JQH, treas. Support your section nets. On c.w. the Southern California Net (SCN) meeting nightly on 3600 kc. at 0300 GMT; on phone, the Southern California Six Net (SoCal 6) meeting daily at 0300 GMT on 30.4 Mc. Traffic: (Sept.) K6EPT 775, K6MDD 710, W6WPF 526, K6LWV 424, WA6KWV 416, W6GYF 355, W6QAE 281, WA6DJB 220, K6OZJ 132, K6YVN 116, W6BHG 109, WA6ROF 33, WA6KAW 23, WA6TET 10, WA6VIE 8, W6ORS 5, WA6OKR 3, WA6ORS 2, W6NKE 1, (Aug.) K6LWV 198, WA6TYR 150, WA6VIE 29, K6UMV 8, WA6AAH 2, W6NAA 2, WA6KVA 1.

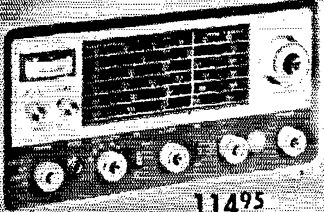
OPERATION 52

This year, as in past years, a group of Tucson, Ariz. amateurs will strive to put children hospitalized at the National Foundation for Asthmatic Children in touch with home on Christmas Day. Any ham who would like to aid in helping these children speak with their parents may get a list of towns needed and full details from K7HPV, Floyd Lake, Tucson, Arizona.

ARIZONA—SCM. Kenneth P. Cole, W7QZH—Asst. SCM/SEC: K7NIX, PAM: W7OIF, RM: W7LND. The Copper State Net meets at 1930 MST Mon. through Fri. on 3880 kc.; the Grand Canyon Net Sun. at 0800 MST on 3880 kc.; the Tucson AREC Net Wed. at 1900 MST on 3880 kc.; the Cochise County AREC Net each Sun. at 1400 MST on 7260 kc.; the Tucson 2-Meter Net at 1000 MST on 145.35 Mc.; the Arizona Interstate Net, C.W., Mon. through Fri. at 1900 MST on 3555 kc. The Maricopa County AREC Net will meet each Mon. at 0200 GMT (7 p.m. MST) on 28,620 kc. K7LJY has a new home-brew linear; K7BCW an Apache SB-10; K7LKA a GSB-100 and a GSB-201 and K7CET a new KVM-2. All amateurs interested in an S.S.B. Arizona Net should contact K7CET. The Maricopa County Civil Defense Unit, in an effort to strengthen their organization, has requested that more amateurs enroll in the RACES Program. Regular meetings are held at 1930 the 4th Thurs. of each month at the Underground Control Center. For further information, Maricopa County amateurs may call W7GEZ, telephone 273-1411, Ext. 48, W7JZL, Tucson, is con-

(Continued on page 100)

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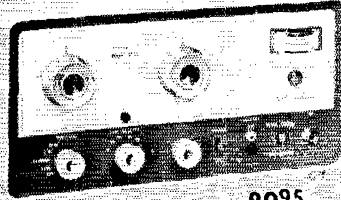


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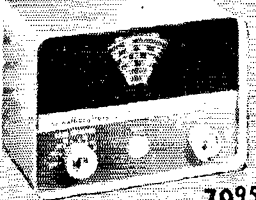


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A feature-packed CW/AM transmitter! 75 W peak input, AM slightly less on 6 m; 6, 10, 15, 20, 40, 80 m output; CW/AM transmissions; TVI-filtered; xtal controlled, provision for external VFO; 52 $\frac{1}{2}$ harmonic suppression tunable pi network & more. 13 $\frac{3}{8}$ x8 $\frac{1}{2}$ x6 $\frac{5}{8}$ "

20K44DX806, HT40K Kit, Wt. 19 lbs. \$89.95
20K44DX802, HT40W Wired\$109.95

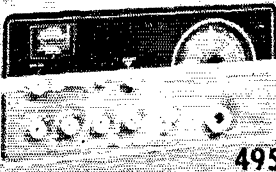


7995

HA5 Powered Heterodyne VFO

Deluxe self-powered heterodyne type VFO. Extreme stability, versatility. Illuminated dial calibrated for amateur bands 80 thru 2 meters, may be calibrated to WWV. 3:1 tuning ratio. Output freq. range: 3.5-4.0 mc, 7.0-7.5 mc, 7.8-8.3 mc, 8.333-8.833 mc; 5.0-5.5 mc VFO range. 7x5x8 $\frac{1}{2}$ ", Wt. 8 lbs.

20K44DX810, Model HA5\$79.95

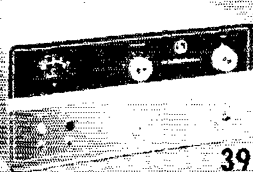


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HT37 Phasing Type Transmitter

Modern design, phasing type side band generator unit at a moderate price! Single sideband, continuous-wave, and AM output on 80, 40, 20, 15, 10 meters. 144W plate input; unwanted sideband down to 40db at 1kc; distortion products down 30db; instant CW calibration, precision VFO & more! 19 $\frac{1}{4}$ x9x15 $\frac{1}{2}$ ".

20K45DX349, Ship. wt. 82 lbs.\$495.00



39500

HT41 Linear Kilowatt Amplifier

Compact unit, employs 2 tetrodes with 250W plate dissipation. Input 50-75 $\frac{1}{2}$ matching, can be driven by 20 to 100W. Full wave rectifier, exceptional regulation. 80-10 m coverage; adj. pi network output; metered circuits; RF output meter; stand-by bias supply. Power in SSB/CW 1 kw DC through 20 m. 19 $\frac{1}{4}$ x9x17 $\frac{1}{2}$ ".

20K45DX498, Sh. wt. 97 lbs.\$395.00



27950

SX111 Dual Conversion Receiver

Top performance! Selectable sideband receiver covers 10-80 meters in 5 bands with a sixth band for 10mc crystal calibration with WWV. 5 steps of selectivity from 500 to 5000 cps with 1 μ v sensitivity all bands; tee-notch filter, plug-in 100kc crystal calibrator etc. 11 tubes plus rectifier. 8 $\frac{1}{2}$ x18 $\frac{1}{2}$ x11".

20K450X325, Ship. wt. 40 lbs.\$279.50

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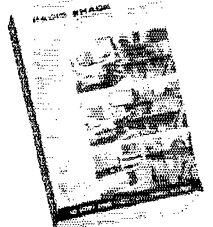
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HORNET V-75

ALL BAND VERTICAL ANTENNA

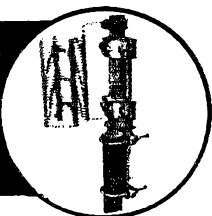
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ducting code and theory classes at the Elks Club every Fri. at 1930. Anyone interested should contact Jerry or the Old Pueblo Radio Club. W7LJN is convalescing at home after major surgery. His three 6146s are getting a good workout. The Arizona Amateur Radio Club of Phoenix elected K7PLO, pres.; W7FGW, W7OIF, W7QZH, W7UXX, W7YWF, K7CEH and W7MST, board of directors. Newly-elected officers of the Old Pueblo Radio Club are K7CRO, pres.; W7LZL, vice-pres.; K7EVZ, past vice-pres.; K7IPV, secy.-treas.; K7OCH, programs and publications. K7RDH ex-W4KCE, LX3PS, DL4PS, is now engaged in propagation and interference research for the Signal Corp. and Bell Aero-systems. You will find him on 20- and 40-meter s.s.b. Traffic: W0WHE/7, 170, W7AMM 133, K7CET 10, K7RUR 6, K7RDH 5.

SAN DIEGO—SCM, Don Stansifer, W6LRU— A meeting of "Old Timers" will be held Dec. 9 to form a San Diego Chapter of the OCWA. If interested, and if you have been licensed for 25 years, contact W6BKZ for more information. W6EJU and his NYL vacated in Hawaii in October. W6ZOW became the first Orange County ORS to earn a HPL award in nine years. Congrats, Marv. W6SFK was elected vice-pres. of the Anaheim Club to fill a vacancy. The club now has 90 full members. W61ROF, who moved from the Los Angeles section, becomes the second ORS in Orange County. He is an active traffic man and presently manager of P.A.N. W6DEY is control station for the 2-10- and 75-meter AREC nets in Orange County. W6VAA, Orange County EC, reports 62 AREC members, of which 31 are mobile. K6JPI is no longer SEC, but still is active in AREC matters and the communications chairman for the Red Cross. My personal thanks to Wes for his work as SEC. Until another SEC is appointed, the SCM will pinch-hit and assume the duties of SEC. W6CDF sports a new triband beam on his hill-top. K6ENX, in Escondido, is up to 309 countries. K6QXN was appointed EC for the La Mesa, Spring Valley Area by the SCM. K6BPL is chairman of the 1963 ARRL Division Convention to be held Oct. 11-13, 1963, in San Diego. The committees are being formed, and all local clubs are reminded to send delegates to the Council meetings held the 4th Thurs. of each month at Red Cross Headquarters. Clubs requesting San Diego Council information should contact either the SCM or W6RCD, present chairman. My Seasons Greetings and all the best for 1963 to all hams and their families in the section. Traffic: (Sept.) K6BPI 3917, W6LAB 3096, W6ZOW 642, W6EOT 328, W61ROF 130, K6IME 45, W6BDW 36, K6LKD 26. (Aug.) W6EOT 692.

SANTA BARBARA—SCM, William C. Shelton, K6-AAK—The section organization is shaping up and we hope to announce all appointees in the next issue. The WSSBA Annual Convention was held in Santa Barbara, Sept. 28-30 and was an outstanding affair. W6OJL is operating portable at Dunn School with a new G-76. K6PEC is active as EC for Oxnard and reports 20 members on the Oxnard Emerg. Net, which meets Tue. and Thurs. at 0500 GMT and 1630 Sun. on 3930 kc. W6TCX, OO, is performing a splendid job and reports regularly. The following have applied for AREC membership: W6PGA, K6DXW, W6EZA, W6OJL and W6OTU. The Simi Radio Club is interested in forming an emergency net and is headed by W6BILR. All clubs are requested to forward the names of their officers and dates of their meetings to the SCM. Active nets should also forward schedules to the SCM.

WEST GULF DIVISION

NORTHERN TEXAS—SCM, L. L. Harbin, W5BNG — Asst. SCM: E. C. Pool, W5NFO, SEC: K5AEX, PAM: W5AYX, RM: W5LR. Congratulations to the Irving ARC and the Brownwood ARC on receiving approval of their clubs for affiliation. This is proof that a group of amateurs are really interested in promoting our hobby and a realization of the assistance offered by the League. W5QKF, West Gulf Division Director, visited the Arlington ARC and gave a fine talk on the program of the ARRL and the future of amateur radio. Many hams from the area were present and enjoyed the meeting. Congratulations to Doc on being re-elected as West Gulf Division Director for another term. Waco recently held a hamfest with Lubbock holding its Sept. 30, Abilene Oct. 7 and Brownfield Nov. 11. Lubbock had a fine hamfest with 345 present and 251 preregistered. The Lubbock ARC is to be congratulated on the efficient manner in which the meeting was handled. It was planned by the youngest members of the club and for a group with no past experience it was handled like a group of veterans. I regret to inform you of the passing of a very active ham and a spark plug for the Lubbock Area. W5FVI passed away Sept. 24 just a week before the Lubbock hamfest. W5KNA is the new EC for Ector County. Chuck also is president of the Permian Basin ARC and has been an active ham for the past 21 years. Arlington State ARC's officers are now K5SXX pres., K5AKB, vice-pres.; K5IVQ, treas. Traffic: W5BKH 183.

(Continued on page 172)

AMECO CB-6 CONVERTERS
tube-type low-noise, high-gain converters. If easily changed. Specify IF.

CB-6K — 6 meter kit, 6ES8-rf Amp., 6U8-mix./osc. **\$19.95**

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CB-2K — 2 meter kit, 6ES8-1st rf amp., 6U8-2nd rf amp./mix. 6J6 osc. **\$23.95**

CB-2W — 2 meters wired and tested. **\$33.95**



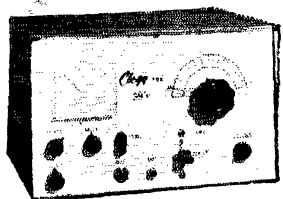
Model PS-1—Matching Power Supply — plugs directly into CB-6, CB-2 and all CN units.

PS-1K — Kit — **\$10.50**

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CLEGG 99'er 6 METER TRANSCEIVER

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 \$159.95.

ZEUS and INTERCEPTOR also in stock.

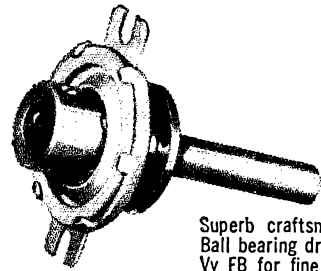
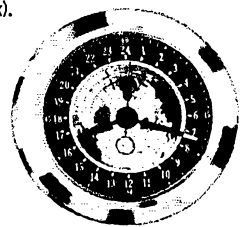


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Full comfort even after many enjoyable hours of continuous use. Superb comfort even for eyeglass wearers. Crisp, distortionless reproduction and high sensitivity allows you to single out that weak signal and hard to reach station. 600 ohms impedance, completely adjustable head harness. **\$24.95**

24 HOUR CLOCK

Chrome-plated 8" metal wall clock. Inner dial with south polar projection map of world indicates time around world. Polar projection dial adjustable for various time zones. Shipping weight 2 lbs. 110 v. 60 cy. **\$8.47**
12", 24 hr. clock, 110 v. 60 cy. without world map. **\$13.95**
(Prices include tax).



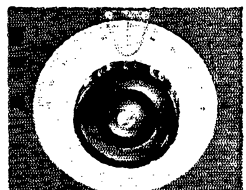
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Same as used in W2EWL SSB Rig—March, 1956 QST. Three sets of CT windings for a combination of impedances: 600 ohms, 5200 ohms, 22000 ohms. (By using center-taps the impedances are quartered). The ideal transformer for a SSB transmitter. Other uses: inter-stage, transistor, high impedance choke, line to grid or plate, etc. Size only 2" h. x 3/4" w. x 3/4" d. New and fully shielded.



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3 for \$3.49.
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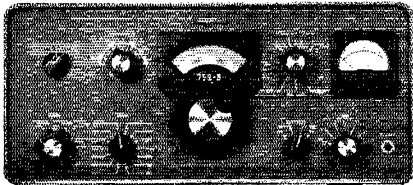
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2 METERS	MODEL CO-2A	15.00 net
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27 MC	MODEL CO-CBA	33.00 net

These models are ordered cut to exact frequency

30 to 50 MC	MODEL CO-30A	30.00 net
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OKLAHOMA—SCM, Adrian V. Rea, W5DRZ—K5KTW, our SEC, has been seriously ill in the hospital for sometime. We understand that Bill is now home, but it will be sometime before he is up and about as before. W5RST, a just-SCM, also is recuperating from an illness. K5BNQ had surgery but now is home. All are well-known Oklahoma amateurs, and good luck to all. K5ZCJ has acquired a 75-ft. tower. W5TMY is doing a good public service job making contacts into Oklahoma City. All Oklahoma amateurs are invited to check in on SSZ the slow-speed traffic net. It meets on 3682 kc. at 2130 hours CST. Thanks to W5CCK, editor of the Enid Club paper, and to the club for the list of amateurs in that area. New officers of the Enid Club are K5GQW, pres.; K5BBI, vice-pres.; K5CAY, secy-treas.; W5DET, asst. secy.; W5QMJ, custodian of club property. There is quite a bit of RTTY activity around the state. The latest stations are W5OOF, K5YBP, K5JKM, K5JGZ, W5AAJ and W5WEL. W5AAJ and W5OOF also are on 2-meter RTTY. Glad to have new stations on the traffic nets. The newest are WA5AQH, Antlers, and WA5DZB, Altus. K5MYS is back on the air after a delay caused by moving his business. Traffic: K5IRZ 215, K5TEY 119, W5CDF 80, W5DRZ 80, K5AUX 70, K5ZCJ 54, W5JXM 47, W5QMJ 47, K5QXX 45, K5LZF 40, W5JMQ 39, K5ZFF 33, K5CBG 25, K5DLP 23, K5VNI 21, K5DUJ 20, W5CCK 15, W5PNG 13, W5UYQ 12, W5WDD 7, K5JOA 6, K5ZEP 6, W5DNG 5, W5WAF 5, K5OOV 4, W5EHC 3, K5CBA 2.

SOUTHERN TEXAS—SCM, Roy K. Eggleston, W5QEM—SEC: W5AIR. The Corpus Christi Amateur Radio Club participated in The Victory over Polio Drive Aug. 5 and Oct. 7. On the first drive communications were furnished by the amateurs, Department of Public Safety, Sheriff's Department and C.B. On the Oct. 7th drive amateurs worked all 52 locations in Corpus Christi and Nueces County. This proves again that you can't beat the amateurs when it comes to dependable communications. Thanks to K5SJA, from Harlingen, and W5LMU, from Alice, for helping out, Amateurs in Corpus Christi and all along the coast participated in Hurricane Twist, a simulated hurricane. The Southmost Radio Club furnished communications for operation Gulp, Polio Drive, with KFI as Net Control, and 26 other amateurs. The following is a quote from the newspaper *The Valley Morning Star*, by Dr. John Welty, Chairman of the Drive. "The second high point was the radio communications by the Southmost Amateur Radio Club, which kept the operation running efficiently and smoothly." Well done, fellows. I have just received word that our West Gulf Division Director, W5QKF, has been elected for another two-year term without opposition. Congratulations, Doc. This only shows what amateurs in the West Gulf Division already know: we have the best. New ECs are K5YYD for Galveston and K5YDD for Kleberg County. The fellows and gals of the Valley already have begun work on the West Gulf Division Convention for '63. W5LRT has been appointed general chairman, and the petition for approval is already at Headquarters. New officers of the Houston Amateur Radio Club, Inc. are W5BBV, pres.; W5DWC, vice-pres.; K5QQG, treas.; K5LLB, secy.; K5BCU, mem. chmn.; W5LSE, program chmn. Traffic: (Sept.) W5AC 131, K5HDU 73, W5IAR 27, K5BHF 6, (Aug.) K5WIC 173, W5AIR 20.

CANADIAN DIVISION

MARITIME—SCM, D. B. Weeks, VE1WB—Asst. SCMs: A. E. W. Street, VE1EK, and H. C. Hilliard, VO1CZ. New appointments include VE1YQ as EC (Halifax). Recent visitors to the section include VE2MW and VE2BD. Congratulations and best wishes to VE1KO and his XYL on their recent wedding. Newly-elected officers of the Goose Bay Club include VO2DP, pres.; VO2AH, vice-pres.; VO2NA, secy-treas. VO2AI and VO2RC have transferred to the VE2 district. VE1S XK, QN and AHW are on 6 meters while VE1AHY is active on the same band from Sable Island. VE1S AGG, OD and AHW are on 2 meters. Welcome to VE1CI (ex-VE3CXB). VE1KJ has a new Valiant. VE1GI has transferred to Newfoundland. Congratulations to VE1TC, who passed the Advanced exam. VO2NA (erroneously listed as VO1NA, Oct. 1957) has picked up additional awards which include WDI (Finland) and K.K.K. (South Africa). Congratulations to VO1CD and his XYL on the arrival of a Jr. operator. VO1EM has been transferred to the W8 district. VO1S AC, BJ and EC have mobile rigs in operation. Wedding Anniversary congratulations to VO1AA (44th), VE1HE (38th) and their XYLs. Traffic: VE1RT 63, VE1OM 11, VE1ADH/3 5.

ONTARIO—SCM, Richard W. Roberts, VE3NG—VE3AYS visited Craighleith (for Rainbows). VE3NG visited North Bay. VE3AJA was host. VE3AML was Observer to the SET in Windsor. The Radio Society of Ontario, Inc., is sponsor of the ARRL Convention in Toronto and the plans are complete. From SEC VE3-AML's report the recent SET was a good one in Ontario. The QSL Manager urges you to send him self-addressed
(Continued on page 174)

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who are satisfied
with nothing less than **THE VERY BEST**

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The GOLDEN GUARDIAN (48B1)

TECHNICAL DATA

Impedance: 640 Ohms in and out (unbalanced to ground)

Unwanted Side Band Rejection: Greater than 55db

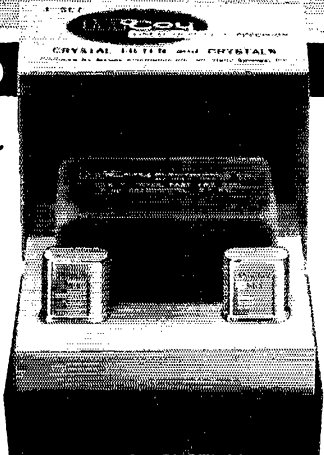
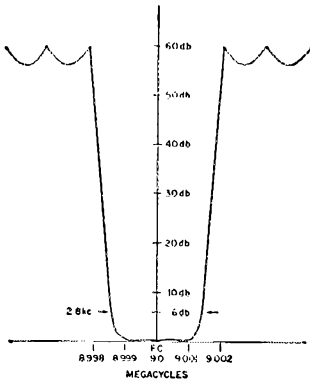
Passband Ripple: $\pm .5$ db

Shape factor: 6 to 20db
1.15 to 1

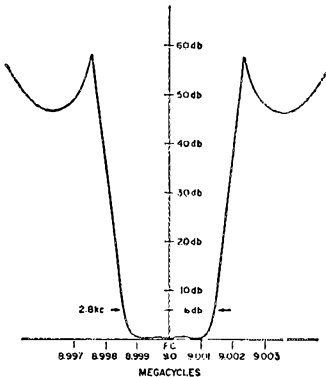
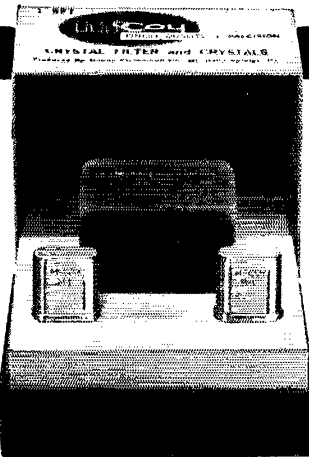
Shape factor: 6 to 50db
1.44 to 1

Package Size: $2\frac{7}{16}$ " x $1\frac{1}{32}$ " x 1"

Price: \$42.95 Each



The SILVER SENTINEL (32B1)



TECHNICAL DATA

Impedance: 560 Ohms in and out

Unwanted Side Band Rejection: Greater than 40db

Passband Ripple: $\pm .5$ db
1.21 to 1

Shape factor: 6 to 20db
1.56 to 1

Shape factor: 6 to 50db
1.56 to 1

Package Size: $1\frac{1}{4}$ " x $1\frac{1}{4}$ " x 1"

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Both the Golden Guardian and the Silver Sentinel contain a precision McCoy filter and two of the famous M-1 McCoy Oscillator crystals. By switching crystals

either upper or lower side band operation may be selected. Balanced modulator circuit will be supplied upon request.

Both sets are available through leading distributors. To obtain the name of the distributor nearest you or for additional specific information, write:

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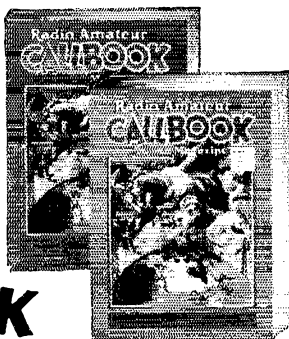
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stamped envelopes to pick up your QSL cards. VE3QE is the man. VE3CYR of Peterboro, is the recently-appointed net manager of the Ont.-Que. Net. VE2CI was visitor to VE3KJ. VE3ZI is on 144. Mc. The 2-meter gang in Toronto is starting a net on 144.144 Mc. VE2DNG, in North Bay, is looking for 2-meter contacts in Toronto. VE3BEY is on s.s.b. VE3ETM headed up the AREC gang in the Windsor Area for the SET. Our congratulations to our good friend VE3BQL, of the Gaza fame, who courted you ham radio and has now married DJ3YL. VE3DPO is manager of the Grey-Bruce Net. VE3EWO and VE3EWI are now Class A. VE3BVM has his ham TV station near completion. The Toronto Sky-wide Radio Club put out a fine club paper. The editor is VE3EXF. The Ont.-Que. C.W. Net invites all possible to participate. The Dufferin County ARC, VE3ZDC, was active at the Orangeville Fair. VE3EL was in charge. The Seaway-Valley ARC held a successful hamfest in Cornwall. VE3CVD reports the Kingston ARC is planning a big winter program. Traffic: (Sept.) VE3CYR 179. VEF3AS 140. VE3NG 126. VEC3FR 111. VE3ELQ 101. VE3DPO 81. VE3AML 64. VE3EHL 61. VE3BSY 58. VE3BAG 48. VE3ZB 45. VE3GI 42. VE3DRF 38. VE3AKQ 27. VE3UOW 27. VE3EUA 18. VE3ETM 14. VE3RN 13. VE3BAQ 9. VE3CE 9. VE3DH 9. VE3VD 5. (Aug.) VE3FES 134. VE3BSY 56.

QUEBEC—SCM, C. W. Skarsteit, VE2DR—Asst. SCM, Jean P. Achin, VE2ATI. For business reasons VE2AGM had to vacate the management of OQN. Activity on this net increased considerably during his term and he is highly commended for a job well done. The MARC held a successful Ham Party during September which was well attended by out-of-towners. Local support could be improved for such fine events. The main prize, a National receiver, was won by VE2ZN. Section interest as usual was great during the VE/W Contest. VE2NI, a perennial winner, worked some 400 stations without a roof over his head; VE2AJD is hampered by relay trouble. VE2s ANK, A1A1, AM and BNA run a traffic net on 160 meters. VE2BCB is proud of his new t.r. switch. VE2AUH skeds VKs weekly. VE2ACW hoisted a new Mosley beam 110 feet high. VE2ATY completed a homebrew S197A-180 watter. VE2BHT likes high-speed 80- and 40-meter c.w. with a keyer. VE2AQZ, just married, is teaching the XYL to call "CQ 2." VE2ANF is back in action after 10 years rest. VE2ATZ and VE2ADA are busy on 2 meters. VE2BHH received his Advance Class ticket. VE2AQV likes traffic work. VE2SI urges all concerned to avoid unseemly language and subjects on the ham bands. VE2SC is bothered by vicious h.t. line noises and in desperation is taking an extension course in Woodlot Forestry. The South Shore Club AREC meetings are held the 3rd Wed. of each month. VE2WMI, at Anticosti Island, sports a new KWM-2 and prefers s.s.b. VE2ATL reports: VE2AOS est maintenant mobile sur 75 m. VE2PY est de retour sur 20 m. avec un Ranger. VE2AMG a été réélu président de VE2DN. Félicitations à VE2EA et sa NYL: le mariage a eut lieu le 20 octobre. Traffic: VE2DR 80. VE2AGQ 42. VE2EC 29. VE2BG 25. VE2CP 24. VE2AJD 22. VE2ATU 15. VE2AQ 12. VE2BMK 10. VE2VA 10. VE2QG 4. VE2AGM 2.

ALBERTA—SCM, Harry Harrold, VE6TG—SEC: VE6FS. PAM: VE6PV. RAY: VE6AGN. ECS: VE6FK. VE6SS. VE6ABS. OPS: VE6CA. OOS: VE6HM. VE6NX. VE6PL. OBS: VE6HM. ORS: VE6BR. VE6WG. OES: VE6DB. VE6HO. VE6FA and VE6MJ attended the West Coast ARRL Convention, and then the World's Fair on their return. VE6ABS has joined the mobile gang. The AREC is doing well in the province. Listen around on 75 Sun. mornings if interested. The APN and PTN are going to make improvements this winter with a closely coordinated program between phone and c.w. nets. It will give better service to the whole district. How about others joining in this program? Check 3770 kc. Mon., Wed. and Fri. at 1900 MST. October was a busy month with clubs becoming more active, the SET program being held Oct. 6 and 7, the Scout Jamboree Oct. 20 and 21 and AREC nets assisting local police Oct. 31. Traffic: VE6HM 120. VE6BR 37. VE6AEN 18. VE6FS 16. VE6TG 11. VE6BC 8. VE6SS 5. VE6UH 4. VE6AJX 2. VE6BA 2. VE6SF 2. VE6SU 2. VE6AM 1. VE6CO 1. VE6WN 1.

BRITISH COLUMBIA—SCM, H. E. Savage, VE7FB —With fall here and winter coming clubs are electing new officers I sincerely request that each club inform me who its president and secretary are and report monthly on what is happening. VE7AC reports the first year of fruit farming was a great success and now winter with DX farming is next. VE7DH is wondering if the Nanaimo Area amateurs have paid their light bill. He never hears anyone. VE7AAF is back from his survey job and setting back into RM work with net elections and possibly the OPMAN (B.C.) will be ready for you netters. How about some net activity, VE7JQ? The Royal City ARA held a transmitter hunt with a very poor turnout. Next year will be different as there are three hundred motor vehicles licensed with their call signs so that means three hundred vehicles radio-equipped. VE7NE found the transmitter first. We heard VE7PS was looking but he

(Continued on page 176)

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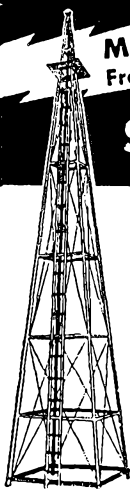
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also was lost. VE7ALU still is in Vancouver but hopes to get home soon to start some serious hamming. VE7BDW has a 20-meter beam and a new ham shack. Have you seen a copy of *Zero Beat*? It is the Victoria Short Wave Club's magazine and has been going for many years. Write to VE7AKY, Wilf Stevens, 1580 Kisher Ave., Victoria, for a copy. VE7QC is moving back to his old stamping ground, Merrit. Where are the Prince Rupert amateurs? VE7HE is on s.s.h. and working 20 meters with success. We never hear VE7ZY. Traffic: VE7BDJ 228, VE7AC 24, VE7AAF 12, VETAOY 10, VE7DII 9.

SASKATCHEWAN—SCM, Jack Robinson, VE5BL—VE5JW is the new secretary of the SARI. Any correspondence should be sent to 20 Elizabeth Crescent, Regina. VE5HP has been appointed as PAM. Certificate endorsements have been added to VE5HR as OBS, OPS, RM; VE5GI as OES; VE5HQ as OBS and OO. VE5GO is now on the air at Senior Citizens Home at Wadena. Two meters should be active this winter with VE5IS on at the present time and VE5JU, VE5QA and VE5TO busy converting surplus gear. The Moose Jaw Club will be the host for the 1963 hamfest at Moose Jaw. The new president of the Moose Jaw Club is VE5DF, with VE5-KZ as vice-president. Traffic: VE5HP 58, VE5LM 37, VE5JH 4, VE5KZ 2, VE5NX 2, VE5RE 2.

How's DX?

(Continued from page 94)

of his new HC8JU label pretty soon. He's no stranger to the Galapagos... CE8ZL/mm signs KC4AAA below 60° latitude aboard USS *Eltanin*... RCV's YV8AA gang may make it back to Avis island next month.

Hereabouts—VE8BC came to the end of his Yukon stay still shy one DXCC country and four WAS states. K6TZX writes of Russ's desperate last-minute all-night vigils to close both deals before returning to Saskatchewan... WA2EDV and VP9DL report much VP9D/mm fun aboard ketch *Rolling Stone* this summer with a handy KWM-1... K7AHO has proof that a ham need not go to the ends of the earth for some ham hospitality: "During a recent trip to Guaymas, Mexico, I became acquainted with amateurs in that area. When a ham knocks on the door of another ham in some other country, he is always welcome. It didn't take long to become good friends with XE2s DL JS LE QY and their families. Fishing in the daytime, ham friendships in the evening — what could be better! The Guaymas gang work mostly 40 phone although Guaymas Radio Club members are highly interested in c.w. They use commercial and well-constructed homebrew gear. I received a very nice letter of introduction from the GRC boys to other radio clubs throughout Mexico, and I look forward to my next visit to that country... Localisms via the club journalists: VE3s BWY BAC, VE6s NX and TF gun for 7-Me, single-sideband DX around 7195 kc... PJ2ME is conspicuous with his new DX-100 and 2B outfit... W5IGJ may be able to arrange skeals with hard-to-work United States for WAS-chasing overseas DXers... W8MILY of fresh Africa DX/penetration fame threatens Anguilla and/or Navassa output this month or next.

Ten Years Ago in "How's DX?" — Opening comments for December, 1952, emphasize that international acceptance of amateur radio has come a long, long way since the 1920s under ARRL's leadership... Twenty c.w. leads the DX bandwagon with the likes of CE5JB, EK1CW, ET8 2KZ 3R, FD8AA, HB1IL/H19, HE9LAA, JY1s AJ BB, KH0CB/K76, KM6AI/K6B, LB6 6XD 8QC, MB9BJ, MF2AG, M13s LK US, MT2KII, OE13s HL IIP USA, OQ5s CZ RA, ST2HK, SU1GB, TA1SS, VK1s KM JN, VS7s GV LB, YK1AI, ZC6JU, ZD1AE, 4U4J and 4W1MY... Twenty phone cougars up AG2AB, CS8AC, HB1JJ/HIE9, HZ1MY/VQ6, K1TIL, MF2AA, M13KE, OQ5BG, ST2GL, SU8 1PB 5FB, TA3AA, VS7EA, Y1AC, YK1AA, ZC5VR and ZD9AA... Fifteen phone guards its own with HB0CB/Prieste, KT1US, OQ5s BQ CP GU, SU1XZ, ZD7A and 9S4X... Forty c.w. is the band for G3AAT/OX, KS1AQ, SV5JN, ZDs 2DPC 4AL and 9S4L... Ten phone stays alive with Y1ZAM and ZD2CDI... Static centers on 80 cluster 'round F9QV/FC... CE3AC & Co. ready their Easter Island DX extravaganza for early consumption... Leaves asks South for a brand new ionosphere to replace the riddled job now extant... Photos of DUICE, JA6AA, YP909, KA2KW's tower, EA2s CA and CQ doll up the digest. **GET**



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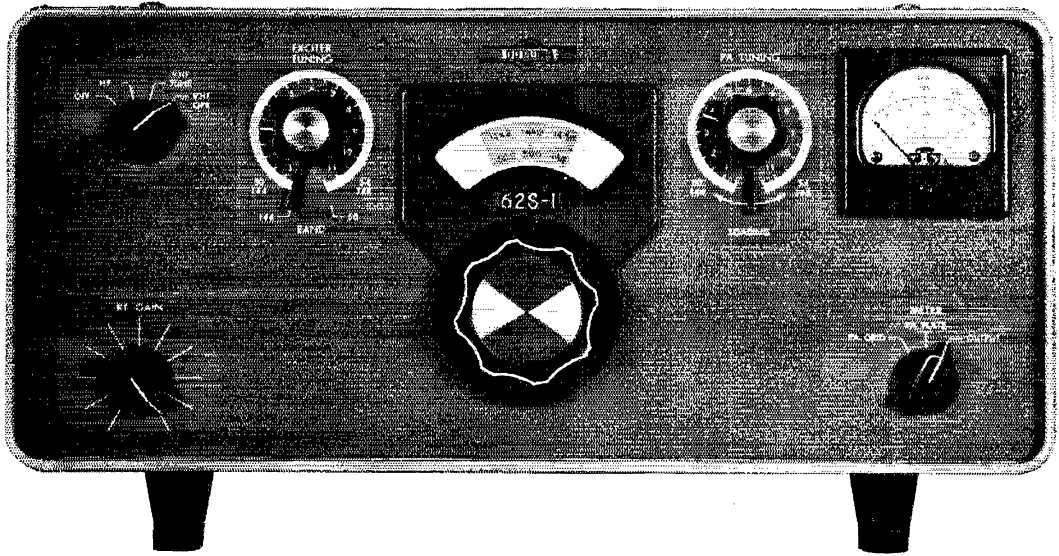
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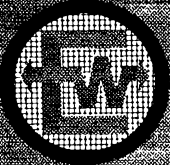
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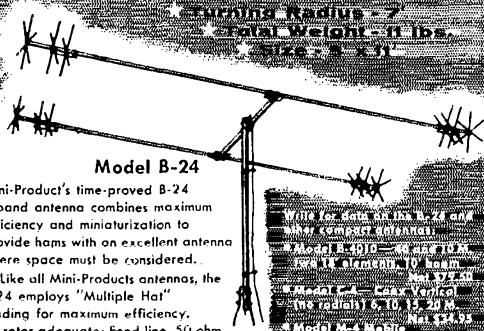
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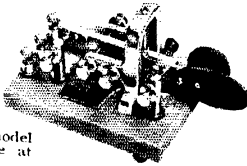
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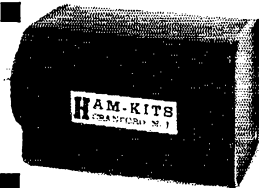
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(Continued from page 88)

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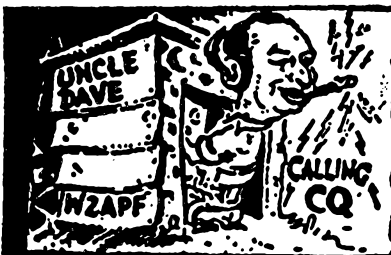
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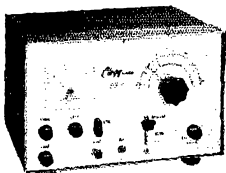
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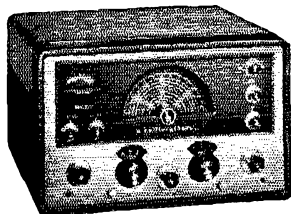
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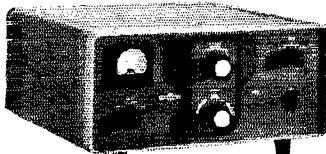
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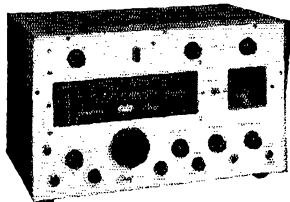


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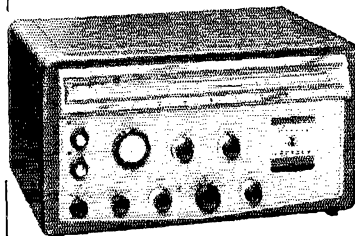
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Completely wired and tested with all tubes, Modulator, Power Supply, VFO, cables, etc.

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Power input: 200 watts PEP, 200 watts CW, 90 watts AM.

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Power input: 2000 watts PEP (twice average d.c.) 1000 watts CW, 800 watts AM.

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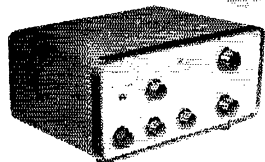
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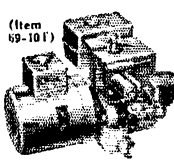
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A simple "flick of the switch" for 75 watt novice power. Don't let high cost rigs kill your hobby -- try WRL's high powered, low cost, 175 watt transmitter for 2 weeks. You must be 100% satisfied, or return postpaid for full refund. Terms: No money down -- \$5.00 per month.

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1000 Watt
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Two-Kilowatt P.E.P. Amplifier

(Continued from page 45)

made at reduced plate voltage and with a minimum value of excitation. Excitation should never be applied without plate voltage. Once resonance is established, the tube should be loaded up to a plate current compatible with the mode of operation, as shown in the chart of operating conditions. If the grid current is excessive the plate circuit loading is too light. Low grid current indicates that plate loading is too heavy. As a final check, the r.f. output (as observed on the output voltmeter) should increase in direct proportion to the excitation level. With an average voice, plate current should "kick" to about 360 or 400 milliamperes operating at a plate potential of 2500 volts. With 3000 volts on the plate, the voice current will read about 290 to 330 milliamperes. In either case, the grid-current reading will be approximately one-third the plate current reading.

The resting plate dissipation of the 3-1000Z runs between 400 watts and 720 watts, depending upon the plate voltage on the tube. It is possible to cut the quiescent plate current and accompanying plate dissipation to a negligible amount by inserting a 10,000-ohm, 10-watt wire-wound resistor in the filament center-tap return lead at point "X" in Fig. 1. The cathode bias developed by a small plate current flow through the resistor biases the tube to a few ma. of resting current. The resistor can be shorted out for proper amplifier operation by an extra set of relay contacts in the VOX circuit.

Finally, it should be noted that a pair of 3-400Z tubes connected in parallel may be substituted for one 3-1000Z with equivalent results. Additional air is required, in the amount of at least 30 cubic feet per minute at a back pressure of 0.4 inches of mercury. The blower shown in the parts list of fig. 1 should therefore be replaced with one of larger capacity. The Ripley No. 8472 type 3 motor and blower assembly will do the job. Separate parasitic suppressors (Z₁) should be used in each plate lead, of course.

There you have it - a complete 2-kw. p.e.p. input table-top amplifier capable of being placed on the operating desk, along with the exciter and the receiver. The amplifier emits an extremely clean signal. All distortion products, introduced by the amplifier, will be at least 35 decibels below the p.e.p. level when operating under the 2500-volt condition. **QST**

Six-Meter Transmitter

(Continued from page 60)

position of the g.d.o., carefully clip off equal lengths of the neutralizing capacitor wires until

(Continued on page 182)

FACTORY AUTHORIZED SERVICE ON RECEIVERS AND TRANSMITTERS

REPAIRS, modernization, calibration and alignment by competent engineers using factory standard instruments. Collins, Globe, Hallicrafters, Hammarlund, Harvey-Wells, National Co. Service representative for Hickok and RCA Test Equipment. Factory parts. All work guaranteed. Our twenty-sixth year

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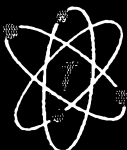
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So silent you have to look or feel to see if it's running!

Precision cooling for your rig. 60 cubic feet of air per minute—absolutely silently! No more hurricane roars from your shack. "Beat the heat" and save the gear. Only 7 watts. Measures 4½" square 1½" deep. Design proved in thousands of computers and other commercial equipment. Runs for years without attention. Only \$14.85



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the g.d.o. no longer indicates or is at a minimum. If the wires are about 1/8 inch away from the tube sides it is possible to go through the minimum and to return to it by varying the position of the wires with respect to the tube plates. When the final is neutralized, the wires project about 1/4 to 1/2 inches above the socket.

Connect the final power supply and connect a suitable load to J_2 . With the driver delivering a grid current of about 12 milliamperes, quickly dip the final plate circuit and adjust the loading so that the plate current is about 150 to 200 milliamperes. Readjust the final and repeat the tuning steps until the plate current is maintained at the proper level while delivering maximum output. Excessive grid current may be corrected by separating L_3 and L_4 slightly to reduce the coupling, or by increasing the value of the 6360 screen resistor. All controls should tune smoothly and the final grid current should drop to zero when the crystal or v.f.o. is momentarily removed. Tuning the final plate or loading controls with plate-screen voltage removed will not affect the grid current when the final is properly neutralized.

The low-power switch, S_2 , is used to limit the screen current during tune-up, or when the plate current is set below 125 ma., as in low-power operation.

Reasonable care and patience exercised during the construction of this little rig will pay off with both gratifying on-the-air comments and pride in owning a trouble-free, reliable piece of equipment.

For those of us who are willing to think big in terms of six-meter mobile operation, it is possible to make a potent, yet compact mobile installation with this rig, using a transistorized power supply and modulator. The latter may be built into a package matching that of the transmitter. **Q57**

Fifty Years of Amateur Radio

(Continued from page 69)

was to survive and grow it must dedicate its best efforts to the public welfare, — without monetary return. If the League had not stood steadfast on this principle through the years, Amateur Radio would have perished long before now. The tradition of public service they pioneered has grown as the years have gone by, and today stands as the mark by which we are judged the world over. But we cannot stand on our past accomplishments if we are to move forward. The responsibility for public service is our greatest challenge for the future.

Our membership has grown from a few hundred in 1914 to over 100,000 in 1962. We have a most able and devoted staff at Hartford. They are men of long experience in amateur affairs and they do an excellent job of presenting our viewpoint on domestic and international matters. Above all, they are

(Continued on page 184)

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We will pay for every good
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Sent to us before Dec. 31, 1962

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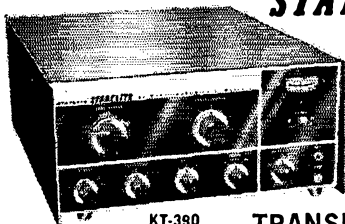
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COMPARE QUALITY!
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• 90 Watts Phone or CW on 80 Thru 10 Meters • Built-in 3-Section Low-Pass Filter • Clear, Chirpless Grid Block Keying
Dollar for dollar you can't beat this new Lafayette Starflite transmitter. Easy to build and operate, it glistens with quality and performance all-over. Features in addition to those listed above: 5 crystal positions and provisions for external, VFO, illuminated edgewise panel meter and pin-net work output for proper antenna match. Buy one now — we know you'll be satisfied with it.



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THE LAFAYETTE HE-30

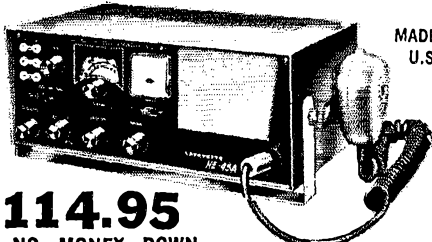
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Sensitivity is 1.0 microvolt for 10 db, Signal to Noise ratio. Selectivity is ± 0.8 KCS at -6db with Q-MULTIPLIER. TUBES: 6BA6—RF Amp, 6BE6 Mixer, 6BE6 OSC., 6AV6 Q-Multiplier—BFO, 2-6BA6 IF Amp., 6AV6 Det-AF Amp. ANL, 6AQ5-Audio output, 5Y3 Rectifier.

NEW LAFAYETTE HE-50A DELUXE 10-METER TRANSCEIVER



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U.S.A.

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- Highly Sensitive Superheterodyne Receiver Section for 28-29.7 Mc
- Effective Series Gate Noise Limiter
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- Illuminated Panel Meter for Plate Current and "S" Readings
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- Push-To-Talk Ceramic Microphone

Provides maximum convenience and flexibility in either mobile or fixed operation.

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388 Page 1963 Catalog 630

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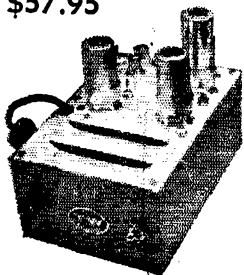
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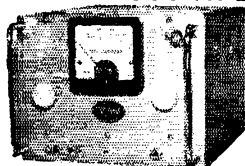
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NEW... TW-2 Transmitter



- Full 15 watts input on 50 mc (6360)
- Push Pull Modulator
- Meter Switching
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- Crystal & Key Jack on Front Panel
- Hi-Z Mike Input
- 6" W x 5" H x 7" Deep

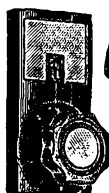
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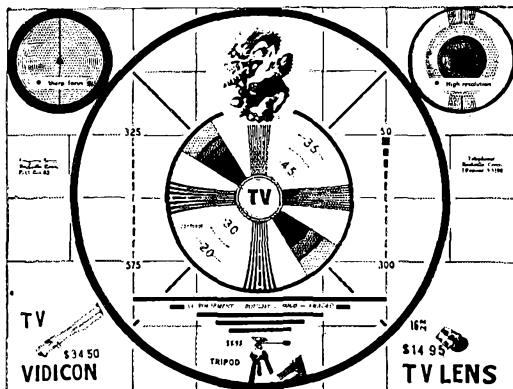
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Yet we have much to be proud of and a great deal to be thankful for in the heritage that has been given to us by the pioneers who are here tonight. If we can meet the future with the same perseverance and spirit of public service with which they did, I am confident we will carry on successfully.

The VB5AA DXpedition

(Continued from page 50)

"Can see now, B'wana. Only letters on sheet. That's all."

"What are the letters, boy, what are the letters?"

"Think other fella see us, B'wana. He pick up pole and come this way. Think I go now, B'wana. Best read letters yourself. Gume bye, B'wana."

"Blast it, Number One, come back here. You know I can't see through this mist. Blast this mist anyway . . . blast the light . . . ooops. I see that other fellow now . . . coming right at me. Hope the natives here are friendly. Steady now . . . raise your flag . . . let VB5AA wave gloriously . . . remember the Govern . . . steady man . . . go closer . . . closer. Just about read those funny scribbles . . . another few steps . . . I can just . . . % . . . R . . . 7 . . . B . . . B. ZR7BB??? What does that mean? But I'm VB5 . . . we're on the same . . . the Governor told me . . . he gave me . . . what's going . . . must be some mistake . . . that fellow, he's on top of my new counter . . . I can see him now . . . why he's it . . . can't be . . . he's ZR7??? . . . but I'm VB5 . . . same mount . . . we both . . . Gad Zooks . . . I'd know him anywhere . . ."

"I say, Gus old man."

"Danny, my boy."

QST

Correspondence from Members

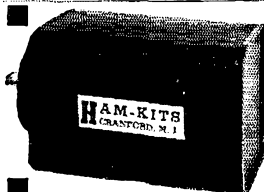
(Continued from page 36)

mation is all that is needed. QRU? Thank you for your assistance. — C. E. Dengler, W2LK, 1530 Highland Avenue, Rochester 18, N. Y.

QST

THE NEW "CRUSADE"

☞ The article, "It Seems to Us," in September, 1962, QST, is just what our wonderful hobby requires. With the advent of many newcomers, (myself included), we need a guiding hand to set us straight on the many little tricks of the trade. Will be looking forward to the new Crusade. — George Holden, VE7BBS, Victoria, B. C.



DUMMY LOAD

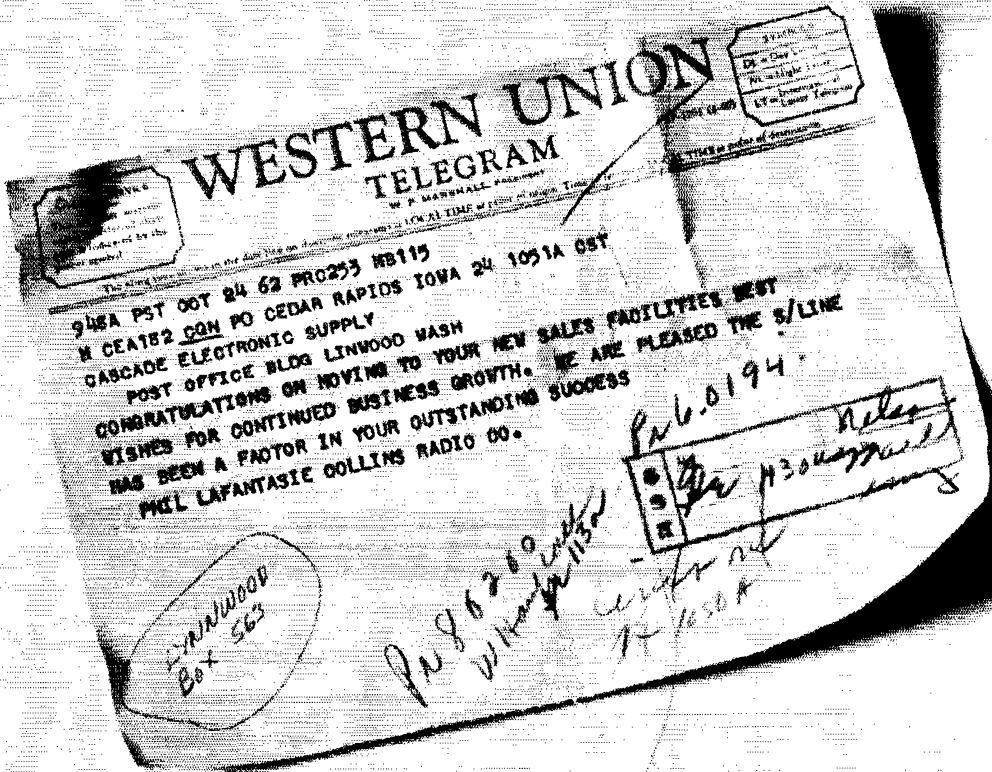
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THERE IS A TRI-EX TOWER TO FIT
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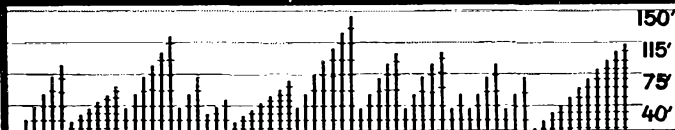
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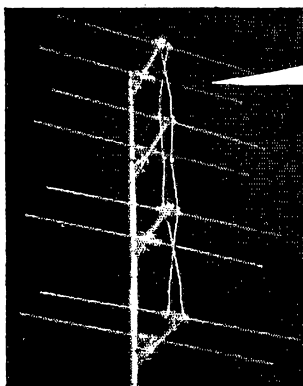
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HS-6105	105	870	745.00

GUY CABLE, PLATES, CLAMPS, ANCHORS, ETC. AVAILABLE IN KIT FORM AT LOW ADDITIONAL COST.



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32 & 64 ELEMENT STACKING KITS ARE AVAILABLE

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Coils wound on this form have an inductance range of .079 uh to 1.25 mh.

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Model 550A—Single gang, single pole, 5 position switch with UHF connectors. Price: \$8.25 each.

Model 551A—Single gang, 2 pole, 2 position special purpose switch with UHF connectors. Ideal for switching any device in or out of series connection in coax line circuits. Price: \$7.95 each.

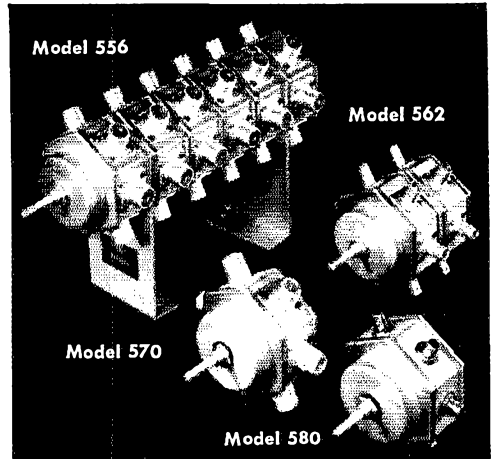
Model 560—Single gang, single pole, 5 position switch, same as Model 550A except with BNC type connectors. Price: \$11.95 each.

Model 561—Single gang, 2 pole, 2 position special purpose switch, same as Model 551A except with BNC type connectors. Price: \$9.95 each.

Model 570—Single gang, single pole, 5 position switch, same as Model 550A except with N type connectors. Price: \$13.35 each.

Model 580—Single gang, single pole, 5 position switch, same as Model 550A except with Phono type connectors. Price: \$7.35 each.

Multiple gang types, up to 6 gang for single pole—5 position switches, and as required for 2 pole—2 position switches, are made to order with any connector types listed above. Prices on request.



Model 556

Model 562

Model 570

Model 580

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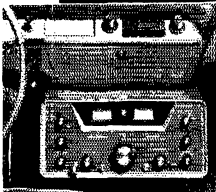
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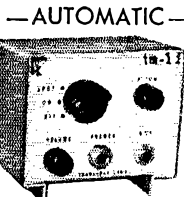
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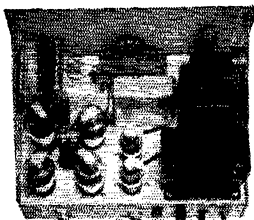
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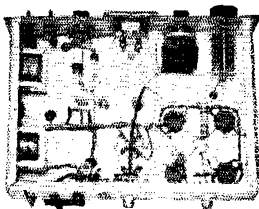
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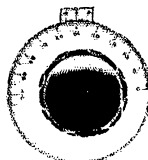
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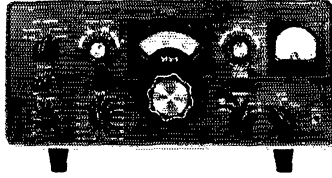
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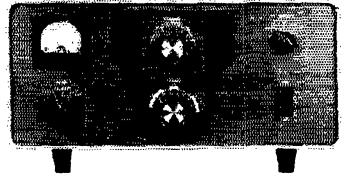
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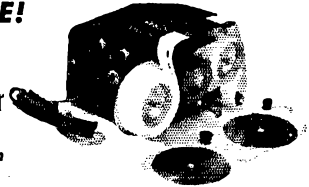
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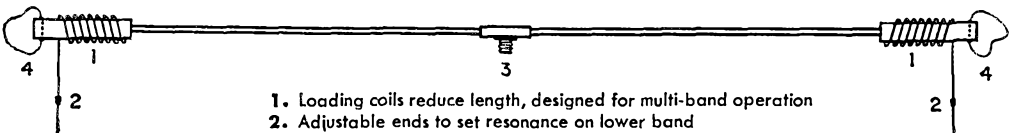
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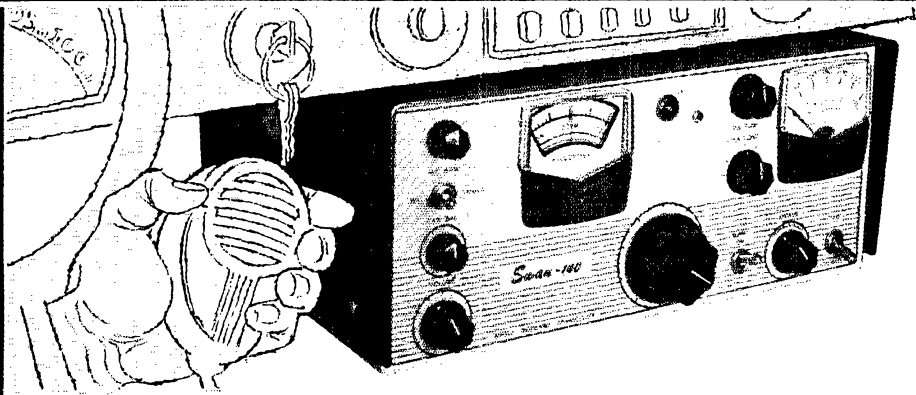
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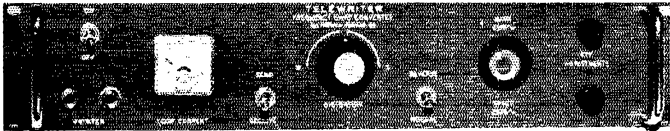
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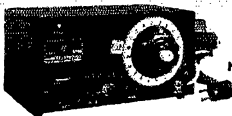


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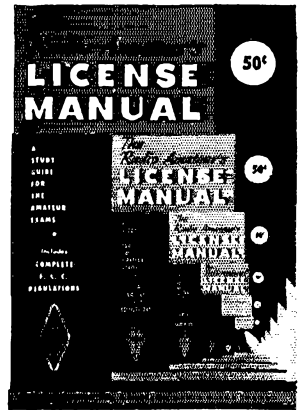
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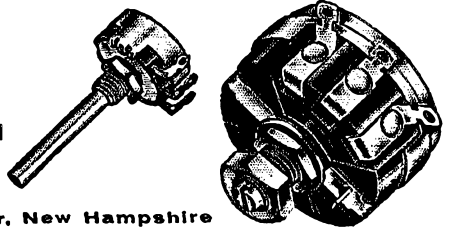
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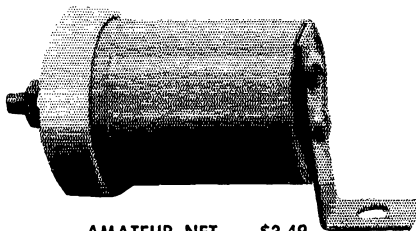
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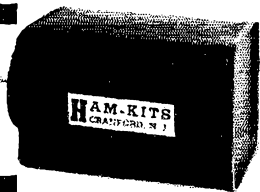


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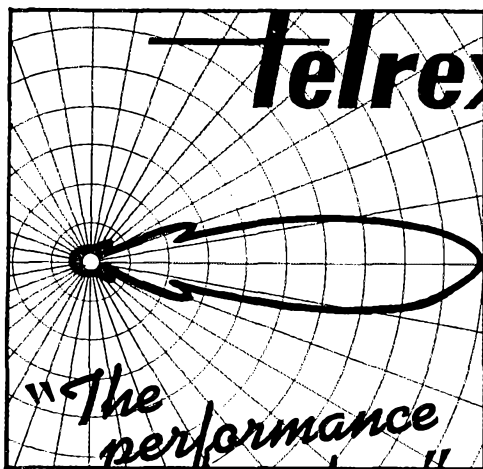
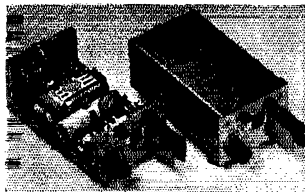
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NEW Johnson 500, \$685; mint Hammarlund 145-C, \$185; new Deluxe Vibronex, \$18.50; Heath OM-3 oscilloscope, \$45; Hallicrafters SR-34 6 and 2 meter transceiver, like new, \$275; NC-103B in factory sealed carton, \$380; Heath Cheyenne and Comanche mobile rig, mint, \$225; WA2LIM, Albuquerque, Jr. IN 1-1779, Flushing, L. I., N. Y.

COLLINS Owners work AM! Wired kit \$5.00! Instant switching! Install in five minutes! Kit Kraft, Harlan, Ky.

COLLINS Authorized distributor offers big bargains in tradings and demonstrators. 7553S, \$580; 325LS, \$495; 516F-2 AC supplies, \$99; MP-1 12 volt DC supply, \$174.50; 30L1, \$450; 75S1s, \$375; KWM-2, \$995.00; 500 cycle filter and BFO crystal for 75S1, \$50. All items completely checked and guaranteed perfect. No trades on used equipment. Electronics, Box 3687, Corpus Christi, Texas (W5GEL).

QSL & SWLS. 25¢. Splcer, 4615 Rosedale, Austin 5, Tex. QSL, SWL, CB cards that are different. Quality card stock. Samples 10¢. Home Print, 2416 Elmo, Hamilton, Ohio.

1047 Call QSLs (2 sides printed) 100 \$2.75. Samples free. Garienv, 2624 Kroemer, Ft. Wayne, Ind.

C. FRITZ QSLs guarantee greater returns! Samples, 25¢ deductible. Box 1684, Scottsdale, Arizona (formerly Joliet, Ill.).

QSLs. Twenty exclusive designs in 3 colors. Rush \$3.85 for 100 or \$6.90 for 200 and get surprise of your life. 5 days service. Satisfaction guaranteed. Constantine Press, Bladensburg, Md.

QSL Specialists. Distinctive Samples 15¢. DRJ Studios, 2114 N. Laverne Ave., Chicago 39, Ill.

QSLs "Brownie." W3CJ1, 3110 Lehigh, Allentown, Penna. Catalog with samples. 25¢.

QSL-SWLS. Samples 10¢. Malgo Press, Box 375 M.O., Toledo, O., Ohio.

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

QSL Cards. Call-letter D-cals. Samples 10¢, or send 25¢ for extra large selection and free "Danger, High Voltage!" card. Dick, W8VXK, Rte. 4, Gladwin, Michigan.

QSL-SWLS. 100 2-color glossy, \$3.00; OSO 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.

QSL, SWLS, WPE. Samples 5¢. Nicholas & Son Printery, P.O. Box 11184, Phoenix 17, Ariz.

QSLs, SWLS, XYL-OMs (sample assortment approximately 934) covering designing, planning, printing, arranging, mailing; eye-catching, comic, sedate, fabulous, DX-attracting, prototypal, snazzy, unparagoned cards (Wow!)! Rorers, K0AAB, 961 Arcade St., St. Paul 6, Minn.

CREATIVE QSL Cards. Free, new catalog and samples. Personal attention given. Wilkens Creative Printing, P.O. Box 1064-I, Atascadero, Calif.

SUPERIOR QSLs, samples 10¢. Ham Specialties, Box 823 Bellaire, Texas

QUALITY QSLs. New designs monthly. Samples 10¢. Giant 25, Savory 172 Roosevelt, Weymouth, Mass.

PICTURE QSLs. Cards of your shack, home, etc., made from your photograph. 1000, \$13.00. Rauml's, 4154 Fifth St., Philadelphia 40, Penna.

QSLs, 300 for \$4.35, Samples 10¢. W9SKR, "George" Vesely, Rte. #1, 100 Wilson Road, Ingleside, Ill.

QSL-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. Free Samples. W7IIZ Press, Box 183, Springfield, Oregon.

ATTRACTIVE QSLs: Large variety of styles, cartoons, colors. Personal ham stationery. Samples 25¢ (deductible). Paul Levin, K2MTT, 1460 Carroll St., Brooklyn 13, N.Y.

QSLs, 3-color glossy, 100- \$4.50. Rutgers Varityping Service, 7 Fairfield Rd., Somerset, N.J.

DON'T Buy QSLs 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¢. Agents for Call-D-Cal decals, K2VOB Press, 62 Midland Blvd., Maplewood, N.J.

RUBBER Stamps, \$1.00. Call and Address. Clint's Radio, W2LDD, 32 Cumberland Ave., Verona, N. J.

QSLs. Write for samples. Blanton's, Box 7064, Akron 6, Ohio.

QSLs? WPES? Highest percentage returns! Samples 25¢ (refunded). Sakkers, W8DED, Holland, Mich. (Religious QSL samples, 20¢).

HUNDRED QSLs, 80¢. Samples dime. Meininger, Jesup, Iowa.

QSL-SWLS. Samples 10¢. Wayne Anderson, WPE4BQC 625 Lee St., Dalton, Ga.

QSLs. New, attractive, dime. Filmmakers, Box 304, Martins Ferry, Ohio.

RUBBER Stamps for hams, sample impressions, W9UNY, 542 No. 93rd, Milwaukee, Wis.

TOP Quality rubber stamps, your call, name, OTH, choice of handle or moulding mountings: 3 lines, \$1.95; 4 lines, \$2.45. Send remittance with order to W0REU, Dobson, 1312 Delaware St., Leavenworth, Kansas.

QSLs, Stamp and call brings samples. Eddie Scott, W3CSX, Fairplay, Md.

RUBBER Stamp. Call, address, name. Case, ink-pad; \$1.00. K4ISA, Perry, Box 8080, Allandale, Fla.

QSLs; \$2.50 per 100. Free samples and catalog. Garth, Jutland, N.J.

RUBBER STamp, 3-lines, \$1.00. Travis, Box 612, Austin 63, Texas.

QSLs, Samples, dime. Printer, Corwith, Iowa.

QSL-SWLS. Get immediate and 100% response from all contacts. Reasonable, unusual samples 10¢ refundable. Joe Harms, W4AFJ (WIGET, W2JME, W3COP), 905 Fernald, Edgewater, Fla.

CANADA. Central Electronics 200V, \$950; Hammarlund HQ-180 with new accessory noise silencer, \$500. Heath Transistor Mohican receiver, \$120. Dr. G. A. Asche, Box 400, Hope, B.C., VETAOK.

CANADIANS: Sell whopping plate supply, 866As, pair transformers, 1000 watts, versatile, convert double triple, Converted R1155B receiver, Some QST's back to 1923. CQs. What offers? VE7CT, 17 Berkeley, Chilliwack, B.C., Canada.

CANADIANS! Complete mobile station: Cheyenne, Comanche, transistor and AC PS; Heath RF meter, Slim Jim mobile antenna, \$375. Write A. Lafontaine, VE2AKF, Box 1, Abbotsford, Que., P. Canada.

CANADIANS! Sell SX-111, Eico 720, Knight VFO, V-4-6, DK-60/2C valve Johnson LP filter, bug, VE3AHA, 234 Dunwoody Drive, Oakville, Ont., Canada.

MUHL Antenna traps now available; 80 thru 15M bands can be used on 88 foot lot with recommended configuration. Amateur net, \$18.00 pair. Send for literature. Muhl Engineering Co., Box 105, Greenville, Ohio.

GOING High power. Need tubes: 304TL, 833A, 810, 450TH, 750TL, etc. L. Huttner, 1890 East 5th St., Brooklyn 23, N.Y.

WILL Sell Apache for \$200. Have Marauder now. K8VHD, Benton Harbor, Mich.

STORM Warning Stations. Building our 12 weather station instruments. Plans \$2.00. Saco Press, Box 2513, South Bend, Ind.

WANTED: O-73/URT oscillator. Prefer one manufactured by Meridian, Inc., Stamford, Conn. State price and condition. W9TGI, 801 Glendale Rd., Glenview, Ill.

ESTATE Must sell station including KWS-1 and 75A-4. Write for list. Hank Frey, 39 Fast 10 St., New York 3, N.Y.

WANTED. All types Collins receivers. 511, K-388, R-390A, etc. Also Teletype and Kleinschmidt tape and page printers. Cash or trade for new amateur equipment. Write to Tom WIAFN, Alltronics-Howard Co., Box 19, Boston 1, Mass. Tel. Richmond 2-0048.

CUP-CORE Inductances, excellent for sharp or band-pass, 50 to 100 Kc. I.F. or B.F.O. 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. H. Woods, 2346 Clover Lane, Northfield, Ill.

WE Pay cash for used 2-way radio equipment. State model, price, quantity and condition. Communications Service, 3209 Canton, Dallas, Texas. Tel. RI 7-1852.

TUBES Wanted. All types, highest prices paid. Write or phone. Lou-Fronics, Inc., 131 Lawrence St., Brooklyn 1, N.Y. Tel. (LI) 5-2615.

FROM Anyone driving to Mexico will buy good mobile rig. "Revmax". Apartado 2807, Mexico City, D.F. 1.

WANTED: For personal collection: QSTs January through August 1916; ARRL Handbooks: Editions 1 and 5. WICUT, Box 1, West Hartford 7, Conn.

HEATH Apache with SB-10 Sideband, A-1 condx. \$250.00. HQ110 rcvr. \$185.00. H. Manning, Box 393, Macon, Ga.

SELL: B&W L-1001-A linear amp, with matching power supply, \$270; HT-37 SSB exciter, \$370; Drake 2B with speaker, Q-mult. xtal calib., \$280.00. All in exclnt condx or new condx. Lamb, 1219 Yardley Rd., Morrisville, Penna.

CHANGE X-tal frequency, including plated type. Safe method, ammonium bi-fluoride, containers, holders, instructions, complete, \$1.00. Deluxe model, \$2.00. Ham-Kits, Box 175, Cranford, N.J.

WANTED: Old wireless gear, tubes, magazines and catalogs before 1925. Amateur or ship equipment only. Please give complete information including prices. My purpose is to buy this equipment, put it in first-class shape and make it available either on a museum or demonstration basis to all amateurs who didn't live and operate during this era. W5VA, T. Frank Smith, P.O. Box 840, Corpus Christi, Texas.

ATTENTION Mobilizers! Heavy-duty Lacey-Neville 6 volt 100 amp. system, \$50; 12 volt 50 amp system, \$50; 12 volt 60 amp system, \$60; 12 volt 100 amp system, \$100. Built-in silicon rectifier alternators 12 volt 60 amp, \$100; 12 volt 100 amp, \$125.00. Guaranteed no ex-police car units. Herbert A. Zimmerman, Jr., K2PAT, 1907 Coney Island Ave., Brooklyn 30, N.Y. Tel. DEWEY 6-7388.

304TL tubes wanted. Also other xmitg and special purpose tubes. We will buy military or commercial transmitters and receivers with designations ARC, GRC, URR, 51 and MN. Air Ground Electronics Co., 64 Grand Pl., Kearny, N.J.

PROCEEDINGS Of the I.R.E. 1914 through 1949, 1923, 1928, 1931, 1932 complete. Will sell any copy or copies. Excellent price on entire lot. Mrs. Miriam Knapp, W1ZIM, 191 Beechwood Rd., West Hartford 7, Conn. Tel. 321-2055.

WANTED: All types of aircraft or ground radios, 17L, 61RF or S-388, 390, GRC, PRC, 511, RVX, especially any item made by Collins Radio, ham or commercial. Also large type tubes and test equipment in general. For fast cash action contact Ted Dames, W2KUW, 308 Hickory, Arlington, N.J.

HAM Discount House. Write us for lowest prices on ham equipment. Factory sealed cartons. Specify equipment wanted! H D H Sales Co., 327 Greenwich Ave., Stamford, Conn.

CASH promptly paid for your ham gear. Trigger, 7361 North River Forest, Ill. PR-8616.

TOROIDS: 88 mhy. with mounting hardware. Unused; like new. Information sheet included. \$1 ea. \$5/4.00 postpaid. KCM, Box 88, Milwaukee 13, Wis.

TELEVISION Camera Kit easy to build step-by-step instructions, suitable for Ham TV. Educational, Industrial, Medical uses. Craftsmen Instrument Labs, Inc. 60-30 34th Ave., Woodside, L.I., N.Y.

FOR SALE, complete instructions, including 28-p booklet, 1 24"x36" schematic for converting the AR713 transmitter to AM and SSB. \$2.50. Satisfaction guaranteed. Sam Appleton, K5MKI, 501 No. Maxwell St., Tulsa, Texas.

NEW And used ham gear. Top grades. Norm. K9HRT at Dahh Electronic Supply, 14 Javne St., Algonquin, Ill. Mail orders welcome.

SK-20 Tunable Preselector, calibrated 3.5-30 mc., boosts reception 3 "S" units. Complete kit, cabinet, built-in pwr supply, \$18.98 postpaid. Holstrom Associates, Box 8640-9 Sacramento 22, Calif.

KITS Neatly wired. Ship me kit and check for halt its cost. Excess of \$2 per hour refunded. Glenn Metzler, K3DHW, RD #1, Manheim, Penna.

HAM Gear repaired. Kits assembled. Cummings Electronics, W0QPO, Hot Sulphur Springs, Colorado.

JOHNSON 6N 2-meter converter; 14-18 mc. output, factory-wired, in exclnt condx. \$49. Hallcrafters S-38E, \$38. K11PT, Jericho Road, Middlebury, Conn.

SYRACUSE, N.Y. area hams can pick up at a saving! Shipped prices: RC-37R, \$40; RC-37S, \$42; ARC-5, \$24; RC-5, \$15; RC-19, ARC-4, BC-375, BC-433F, BC-453 O-Ser, R27/ARC-5 (40M), BC-459, MB-150 tuner, Sonar exciter, \$10 ea.; BC-696, BC-454, 6V dynamotor 600v at 1/75 or PE-73C, \$8; TU-7B, TU-8B, TU-9B, T-17, \$2 ea.; RC-34R crystals, \$1. Transformers: 1345/1345 5 a, \$14; 2350/2350 kw. offer, modulation, 15V UJT varimatch, \$35; 20V Collins \$2.50; FG-7B (model 15) Super, Pros BC-794B or RAS-2, S-77A, Kenecy ATC-1, TS-34AP scope, SCR-511, 120 tube types, 800 crystals, and 200 precision resistors. Much more. List, W2ZCZ, 33 Wexford Road, DeWitt, N.Y.

LATE G-75 with Sorensen AC P/S, xtal calibrator, speaker, dynamic mic., mobile mount, \$350.00. New 7094 tubes, \$11.50; 811A, \$4.00; 12VDC transistor P/S 500VDC CT 250 Ma., \$25.00; TE29 xtal calibr. \$7.50; Shakespear 20M Wonder Rod, \$6.00. Write: GBS201, Williams, 64 Prospect Ave., Hackensack, N.J.

HT-37, SX-111, antennas and accessories, Exclnt prices. Robert M. Wasyluk, 2138 Clearview, Apt. G.W., Waukegan, Ill.

SX101A like new, \$269 with speaker, B&W 5100B, \$289; Commanitor II 6 meter, \$139.00. Quisley, K4QHN, 1966 Hillview, Sarasota, Fla.

HORNET TR500 Beam, \$40. Used six months. Will ship within 50 miles. K3NKV.

ATTENTION: All U.S.A. hams: Unable to pay Canadian duty on brand new HT33B linear won at the recent National ARRL Convention. It is valued at \$1000. I would like \$800 or best offer. Roy, VE7BDR, 3399 Garden Drive, Vancouver 12, B.C., B.C., Canada.

FOR Sale: 4-1000A filament transformers 7.5 VAC @ 21 amps. Completely potted and shielded, \$16.50. Plate transformers 3600-0-3600 @ 1 amp, 110V and 220V primaries, \$35; 811A push-pull final amplifier complete with all coils 80-10 meters. Amplifier will operate either Class C or linear at 500 watts input, \$70. 811A push-pull, 500 watt modulator. Complete with speech amplifier, \$45.00. Peter W. Dahl, 5331 Oaklawn Ave., Minneapolis 24, Minn.

BARGAINS: New tubes: 250THs, only \$9 ea.; 150Ts, \$7 ea; 813s, \$6.50 ea.; 805s, \$2.50 ea.; National TML 15 KV split stator condenser, only \$9.00. Will swap on good General Coverage revr. Almost new 152 MT-3 Hy-Gain trap Tribander antenna complete, only \$39. David C. Manning, Box 563, Riverside, Mich.

SALE: Rotator AR22 control cable. Brand new, never used. W3KJ.

SELL: BC-779, K.W. tubes, parts and power supplies. Write to Ray Robertson, 37 Orden Pl., Morristown, N.J.

MODEL 15 Teletype printer and TD, exclnt, \$125; 630 television chassis complete, \$20. Eastwood, 868 Center Dr., Franklin Square, N.Y.

KWS-1 and 75A-4, Both in mint condx. Also station control; Collins spkr in Collins spkr table-type cabinet along with clock, standing wave meter and Ham-M rotor control and direction meter and operating lever. This is for the man who wants the best in the best condition. Photo on request, W8BBP, 5210 Three Mile Drive, Detroit 24, Michigan. Tel. TUxedo 4-3800 days.

SELL: Central Electronics 20A, with latest factory installed mode. Not a kit! \$130.00. Heath "Q" receiver, \$6.00; three 4-1000As, one new, \$35.00; two used but in gud condx, \$15.00 each. ART-13 still in crate, never hashed, \$40. All f.o.b. Don Ouellette, W4ZYM, 740 Edgewood Road, Indian River City, Fla.

HAMMARLUND Variables type MC, double spaced, 40 mmf., 30 mmf., 60 mmf., 100 mmf., \$1.00; Type MCD double spaced, 20 mmf., 40 mmf., \$2.25; APC's 50¢; Cardwell XR-1000-PS, \$8.00; Sola, #30275 transformer, \$19. W9A7A, Burlington, Wisconsin.

SELL, Swap or buy ancient radio sets and parts, magazines. Laverly, 118 N. Wycombe, Lansdowne, Penna.

BC-454 receiver, like new, converted to 6 volts, all tubes and volume control, \$15. 1 KW brute force AC line filter, \$5; 2 1/2 in. round Simpson meter B-100 10C volts, new, \$3.00; 4-813 tubes, gud, \$5 ea. You pay postage. W5SAR, Box 314, Guthrie, Okla.

HOMEBREWERS! Like new electronic parts for exciters, linears, power supplies. Will trade. Looking for parts, test equipment, S/Line gear. Send stamp for Bargain Hunters' List. W7HNV, 3113 Rocky Point Road, Bremerton, Washington.

COLLINS 32V3 transmitter. Exclnt condx. Used by little. Best offer takes. W0RVN, 132 Douglas St., Louis 7, Mo.

ENGINE Generator 115V 60 cycles 750 watts with 3 meters and cable, \$65; BC221 complete, \$50. Both in exclnt condx. W4GOOP, 151 Estates Dr., Santa Cruz, Calif.

SELL: HT-40 with HA-5 VFO. Both for \$145. Prefer you pick up. K4ZYA, Phone Pompano Beach, Fla. WH2-1189.

WANTED: Linear amplifier, Cash deal. John Wertz, P.O. Box 118, Springfield, South Carolina.

KWS-1, \$895, new condx. W5PYP, 5149 E. 31st, Tulsa, Okla.

SALE! Globe Scout 680 \$49.95; Globe 755 VFO, \$29.95; Heath AM-2 SWR Bridge, \$14.95; Shure 505C mike, \$14.95; Johnson TR switch 250-39, \$16.95. Bill Oringerdf, K5HXO, 410 Hall B, Stillwater, Okla.

WANTED: Marconi type D tuner, in gud condx. State price. Frank Riley, W8IG, 12234 Triskett Rd., Cleveland 11, Ohio.

SELL: Collins 310B-3, vy gud condx; \$125.00 Jimmie Joe Key, W5CDO, Ira, Texas.

FOR Sale: Central Electronics 200V, \$600; Hallcrafters TO keyer with 4-broplex, \$45; Drake 2A, with Q multiplier and tank \$225. All in mint condx. Mosley TA-33, one year old, \$50. Will deliver 200V within 150 miles. Will not ship. TA 33, sry. K9RZV, 1419 Ravinia Rd., West Lafayette, Ind.

SELL: AF67 Elmac xmtr. \$110; PMR 7 Elmac rcvr \$95; Master Mobile Mounts ant. with 40 meter coil and spring mount, \$25. All cables, relay and mike inc. V. L. Groff, Rt. #1, Allendale, Mich.

FOR Sale: Elmac PMR-7, AF67 and 1070 pwr. supply. In ex-cit wkg. condx. \$200. Lenard G. Mumm, 933 N. 24th St., Milwaukee 3, Wis. W9FYX.

SALE OR Swap: CQ Vol. 1, No. 1 to present. Also Radio Handbook, first edition through fourteenth edition. Make your bid. W6VOV, 4532 Paulhan Ave., Los Angeles 41, Calif.

SX-71, late model, with new RME DB-23 Preselctor, set new spare tubes, speaker, all manuals. Both units superb condx. \$155. Will ship. Roger Warren, K9UHH, 8715 Guilford, Indianapolis, Ind. Tel. VI 6-5275.

FOR Sale: Gas Generator 110/220 AC 350 watts continuous; PE214B almost new, including spare parts, \$75. Will not ship, sry. \$65. Minifon wire recorder P55S, \$75. Griffiths W2OQR, 39-82 65th Place, Woodside 77, L.I., N.Y. Illinois 7-1549.

SELL: 250TLs, 813, two 432 Mc waikie-talkies, 813 linear, pwr. supply, electronic keyer. Need electronic keyer BC-611. Write Cliff Fossum, Box 97, Casslake, Minn.

POCKET Rubber Stamps. Your call plus name and address. \$1.00. Ralph KOUNY, Box 238, New Ulm, Minn.

WANTED: Will pay cash for UTC CVM-5 modulation transf. or any 500 watt modulation transf. Must be reasonable. Write to W4MDQ.

MOBILE Station. Gonset G77, G66B, center-loaded Master Mobile ant. Heavy duty mount, new mike, 6-12-110V PS Complete. Need money for school. \$350.00 or your best offer. Bob, K6TKZ, 6, 1326 Arch, Berkeley 8, Calif.

FOR Sale: Heath DX-60, with PTT, factory-checked, \$70; Halcrafters SX-110 with Heath OF-1, \$125.00; Eico 730 plate modulator, w/control relay, factory wired, \$60. Will ship. Ted Paucek, K8YRV, 3190 Brookline, Berkeley, Mich.

FOR Sale: Johnson Challenger, 12VFO, TR switch and B&W low-pass, \$125.00; also Lafayette HE-35 6M transceiver with 6V pwr. supp., mike, xtal and mobile mounting brackets, \$50.00. K3AXB, Box 314, Republic, Penna.

FOR Sale: 1 Drake 2B, plus 2-BO spkr., "Q" multiplier, in mint condx., \$275.00; 1 only-Comm 6-2B, ex-cit, used but not abused, \$260.00. Original cartons. F.o.b. K3QGC, Redstone Furnace Rd., Box 136-B, Hopwood, Penna.

SIX Meter Communicator III with PTT ceramic microphone, xtal, all power cds. Plus special mobile mount, \$200. Mark Weiss, K6PBI, 4204 Stansbury Ave., Sherman Oaks, Calif.

FOR Sale: Drake 2B, xtal calib., and 2BO multiplier and speaker, six months old and in like-new condx. Don Leitschuck, Odell, Nebr.

FOR Sale: 75A4 factory-reconditioned, best offer over \$450. Dr. Henry Rohrer, 636 Sibley Tower Bldg., Rochester, N.Y.

SELL Gonset Communicator IV. Call between December 21 and January 2 or write anytime. K2CMF, Fishman, 76 Glenview Rd., So. Orange, N.J.

B&W 5100 plus 51SB, best offer over \$300. Sry. no shipping. Deliver reasonable distance from OTH. WA2EQO, Jan Ash, RD #1, Washington, N.J.

SENECA, v. fine condx., \$145.00; NC98, a beaut, \$85; TBS-70D Harvey-Wells 80-2 mtr. xmtr with factory pwr. supply and Heath VF-1 VFO, a terrific combo, \$50. Dave Monfried, 810 Vine St., Elizabeth, N.J.

FOR Sale: DX-40, VF-1 and homebrew modulator, \$75. K9IZF, H-2, Box 640, West Lafayette, Ind.

32V-1 spare 4D32, kud condx. \$190. W7FTR, 7734 39th N.E., Seattle 15, Wash.

FOR Sale: National 6 & 2 VFO, \$32.00; LW-51 6 meter xmtr, \$40; 6 meter converter with pwr. supply, \$30. 4 El. beam, \$15. F.o.b. Dick Mechner, 72 Pennwood Dr., Trenton 8, N.J. Tel. TU 2-741.

WANTED: DX-100-B or gud DX-100. Pis state condx and price. Lt. Williams, 809 5th St. South, Great Falls, Montana.

SELL: Collins 310-B which has been converted to bandswitching 80-10 with a B&W unit. No scratches, works perfectly, \$140.00. Also, Ranger—perfect, \$180. K8IKB, 1414 Tiffin Road, Findlay, Ohio.

HEATHKIT: HX-20, HR-20, HP-20. In ex-cit condx., \$400. R. Meyer, W2UJJ, 6015 5th Ave., Brooklyn 20, N.Y.

ATTENTION: Amateur radio equipment repaired, work guaranteed. L & S Electronic Technicians, Sid Levinson, WA2QOG, 393 South 3rd, Brklyn, N.Y. Tel. EV 4-7564.

FOR SALE: Will engrave on any color bakelite strip labels for controls, meters, etc. Write to D. F. Tripple, W4MDQ, for sample.

TRADE: Complete photographic and darkroom outfit; Speed Graphic 2 1/4 x 3 1/4, large carrying case, two flash guns. Complete set of filters, Federal enlarger, automatic washer, electric dryer, 11 x 14 tray and lot of miscellaneous equipment. Want: K-W Linear with power supply or a good medium power transmitter and Communications receiver. Sorry, but there is too much to pack and ship; pick-up deal. Don Farrell, WA2WEE, 207 Seneca St., Chittenango, N.Y.

10A, \$75; Central Electronics complete SSB trans, VFO and OT-1 add \$15, ex-cit cond. National RBH-2 (Navy) rcvr 3 to 6 Mc. Has 2RF stages, xtal filter "S" meter professional rec., \$75; Meza sycer key electric with 2 klystrons 2K25 micro-meter adj., 5Mc. per div., \$75; Hazeltine labs. Wavemeter self-contained freq. AA to H, \$20. Howard communications receiver current coverage good condx. \$35; Vibroplex bug, \$15; Ham Kits 1KW dummy load, \$7.00. All the above used. Send check. I will ship express same day. W2IXU, 308 Edgar Ave., Cranford, N.J.

QSO Record Forms on 4 x 6 file cards. New, different, \$1.00 for 100. W.B.ZBEV, George Roberts, 763 Eastern Parkway, Brooklyn 13, N.Y.

WANTED: Gonset converters, 30-40 and 40-50 Mc. (cat. No. 3247), (3251), new or used. Can use one or several for car club. Write, giving price and complete information. Gordon Gilley, 4119 Stickney Ave., Cleveland 9, Ohio.

STATION A and half as good as new. HT-32A plus HT-33A, only \$750. Latest 75A-4 with 500 cycle filter, \$500. New 100V, \$400. Extras free. Lower price for entire lot sale. Deliver within 100 miles radius of New York City. K2FC, Phone 316 Mayfair 1-6458 or you can write to 191 Parkway Drive, Roslyn Heights, Long Island, N.Y.

SALE: DX-40, Heath VFO and 40-meter dipole ant. with zpp feeders, in ex-cit condx. \$75.00. WA2BLL, 6 Stevens Rd., Nixon, N.J.

WANTED: Dual section Bud condenser, JC-1556. Rodenbach, 208 Broad St., Williston Park, N.Y.

GPR-90 receiver for sale, in ex-cit condx. \$300. L. O. Ester, 1165 Mitchell Dr., Marion, Iowa.

FOR Sale: TBX-2 transceiver, VFO and crystal, 40 and 80 meters, \$25. Vic von Hartmann, W6YPW, 611 Kent St., Petaluma, Calif.

FOR Sale OR trade: Viking Valiant transmitter, like new condx., \$195.00; Hammarlund 110C rcvr. \$145.00; P&H Linear amplifier, 800 watts PEP new \$146.50. E. R. Arms, W9PBL, RFD 11, Harrisburg, Ill.

DSC-500 Brand new, needs alignment, complete with Bud cabinet, \$80. W8VLB, Glenn F. Markley, RFD #4, Mansfield, Ohio.

WANTED: Junk or unrepairable SP-600 receivers. Also components. K4VWT.

MODEL 26 Teletype machine with table, manual, and well built I win Cities LU, all in top operating condx., \$100. Motorola motorcycle VHF FM rig; 2E26 final, fully converted for AC and in current operation on 146.94 mc. with manual, \$50; Daystrom (Heath) DM-348 CB transceiver converted to 10 meters, 5 xtal channels plus variable tuning of phone band, 10 watts input, 6-12-117 volt built-in pwr. supply, with manual, \$50. At these prices, you arrange pick-up and only inquiries enclosing \$ASE will be acknowledged. K8BLL, Box 77, Route 2, Stevensville, Md.

WHEATSTONE Tape perforator McElroy keyer DC supply complete, ideal club class or traffic, \$95. National HFS rcvr and power supply, \$40. Hewlett Packard 200BR audio oscillator, \$30. Solar 115v constant voltage transformer 500W, \$20. Ballantine Model 300 VTVM \$35. Westrex 51 type commercial FSK exciter with 4 ham-band xtals, \$90. Curta calculator, \$45. May deliver between here and Boston on trip east. Otherwise will ship collect. K7MSL, Carpenter, Wyoming.

HAMMARLUND Receiver HQ-180, new condx., \$325.00; Collins receive 75A4 with Collins speaker, in ex-cit condx., \$550. Output and reflected power meter and speaker enclosure, \$80. Heath Warrior amplifier 4-811, like new, \$200. Above equipment F.o.b. George Mahland, 23 Locust Ave., Eatontown, N.J.

SELL: Hammarlund HQ-170 and factory wired Valiant. Both for \$600. Jim Boyd W3UCI, 5026 Irquois St., College Park, Md.

HT-37, \$334.00, ex-cit, in original carton with instruction booklet. Used only a few hours. Scratchless. Box 271, Dudley, Mass.

RARGAIN! GPR-90 receiver, \$275. K2UFW, K1 8-3216.

HT-37, SX111, Eico 425 'scope, 324 sig. gen and 232 VTVM, all like new condx. Want: MG-TC, Charles Cole, 20 Round Hill Rd., Williamsport, Penna.

FOR Sale: NC-300 rcvr, \$200; Telrex 1B2E Triband beam, \$50; BC-221 freq. meter, \$65; 522 transceiver, \$15. Heath Balun, \$5. W5MUG, 2469 Paden, Jackson, Miss.

SELL: 20A C-E transmitter, perfect, \$175; Bandhopper VFO, \$80; 2B Drake rcvr, only month old, spkr. calib., \$265; LA1 Globe final, \$90. 23 Best of class, \$50; 100 mm lens, 4 carriers, \$95. Local. Conn. WE 3-5045, Norm, K1CKK.

WANTED: Heathkit Antenna impedance meter AM-1, new condx. With manual. L. R. Grauel, WA2WIN, 115 Ludlow Pl., Westfield, N.J.

FOR Sale: Home Built KW, grounded grid amplifier 6 ft. relay rack. Must be seen to be appreciated. Sacrifice for \$175.00. K2KRF, CO I-5971, River Edge, N.J.

SALE: DX-100 modified to B with GB keying and SSB kit; \$150.00; also F/W Ranger \$160. Both are in ex-cit condx. Forrest Smith; WRG DY, 720 Elizabeth, Kalamazoo, Mich.

SELL: Collins 32V-3 transmitter with D-104 mike and stand, low-pass filter like new condx., \$295.00; Deluxe Relay Rack cabinet, 66 9/16" high, grey finish, \$25; Ten meter, 3-el. beam, aluminum, 50 ft. 52-ohm coax, \$12.00. W6LAG, 246 Turf Court, Webster Groves 19, Mo.

FOR Sale: All A-1 factory reconditioned; 1-SX-101 Mark IIIA, \$285; Spkr. \$14; B&W 5100, \$275; 51SB, \$140; DB23 preselctor, \$35; Electro-Voice 664 mike, \$25; model 951 \$10; TH4 Thunderbird beam, \$80; Ham M rotator, \$80; 60 ft. tower, \$60; AN BH-1 Trim head rcvr, \$10. W9ET, Ted Cliff, 3 Elk Drive, Terre Haute, Ind.

Will Buy Collins 32S-1, 312B-4, 516F-2 together or separately immediately if price and condition right. R. D. Stimpson, 5910 Old Chesterbrook Rd., McLean, Va.

RECEIVERS, SX-96 (see QST, June 1955, page 42); \$150. RME 4350A, with spkr, used less than 10 hours (see QST, Sept. 1958, p. 44); \$145. Gonset Mobile police/fire fm. converter, Model 3251, 40-50 Mc., new, \$60. W1CIE, 144 Hopmeadow St., Simsbury, Conn.

SELL: Excellent: HT-37, HA10, HQ-170, K3DSM, Gene Mitchell, MO 4-0593.

JOHNSON Viking Thunderbolt KW linear amplifier. Factory wired. Ex-cit condx. \$350.00. Two Eimac 4-1000A tubes, unused (not government surplus) \$55 each. Both for \$100. W6IMC, 210 Alden Rd., Hayward, Calif.

McCOY, Silver Sentinel filter, like new condx. \$22. W2IP, 486 East 5th St., Mt. Vernon, N.Y.

FOR Sale: SX-101A, \$325.00; HT37, \$350.00. Both for \$660. K5MWU, Qtrs 1831B, Blytheville AFB Arkansas.

LAMPKIN 105B, v. rud, \$150 or trade for 2-way equipment. Lawrence Gooding, W4HF1, Rt. 1, Box 64M, Clarkton, N.C.

"FOR The operator that has everything." Samples 10¢. Call Signs, Box 933, Aurora, Ill.

FOR Sale: Globe Chief 90A transmitter with Eico 730 modulator. Both w/ gud shane. \$85.00. Bud Colclough, K2LLA, Hillsdale, N.Y.

WANTED: RTTY equipment. Model 14 or 15 page printer, keyboard, motor, any accessories. Also RTTY converter. Must watch budget carefully. Give description and lowest price in your first letter. Gene, K8UJQ, 87 Monroe St., Berea, Ohio.

WANTED: BC603 unconverted. William C. Belt, RFD 1, Glynndon, Md.

FOR Sale: My excellent Gonset G76 with Gonset 12V DC transistorized power supply, \$435.00; Gonset AC supply, spkr, unit \$105.00. Johnson 250W Matchbox, \$22.50. New factory wired Johnson Ranger in unopened factory carton. \$200. Karl Lipscomb, 87 Canterbury Lane, Joliet, Mo.

RANGER II, factory wired, \$250.00; SX-100, \$150.00; Viking 6 & 2 converter, \$50. All in like new condx, not a scratch! Telrex 6-ct. 6 meter beam \$25.00; CDR AR22 rotorator, \$20; Coax. xtals, etc. Sell complete station, \$450.00. K3UVR, Roger Holloman, Box 67, Mt. Airy, Md. Tel. 566.

SELL: NC240D Rx exc, \$130; Viking II w/VFO, like new, \$160; R-ver, \$10; Sonar FM exciter, \$15; Bud VFO, \$20; push/pull 6146 rig, \$75; 10 and 11 M, 3-el. Workshop beam, \$25. Prefer local deal. W3JUO, John Krowczyk, 1113 Edmonds Ave., Drexel Hill, Penna.

SALE OR trade: Heath Cheyenne and Comanche with fixed and mobile supplies. Want equivalent value general coverage revr or tape recorder. Replies from 200 miles radius given preference. K3GEO, 4229 Estates Court, Allison Park, Penna.

SWAP: Brand new 4-1000Z in original box with socket and chimney. WANTED - coverage receiver. Also have nearly new Gonset G-76 and DC supply for trade. WA2DGE, 169 Greenhaven Terr., Tonawanda, N.Y.

"HOSS Trader Ed Moory" plays Santa Claus; following demonstration equipment on sale: New SX-111, \$179; Collins 75S-3, \$64; Invader \$509; Clegg 99'er, \$135; 200-V, \$725; SX-101A, \$269; Sacrifice, used gear, 75A-4, \$459; Valiant, \$259; Ranger, \$139; Loudenboomer Linear, \$199; perfect Thunderbolt, \$289; Swan transceiver, \$209; HQ-180C, \$295; KWM-2, \$699; Johnson Invader, \$395; Johnson Pacemaker, \$195; HQ-140XA, \$125; Gonset Globetrotter, \$149; New TH-4 beam and Ham-M rotor, \$169; J.B. \$199; used Sonar transceiver, \$295; HT-37, \$339; 200-V, \$649; Collins 75S-3 unopened carton, \$569; also 312B-5, \$249; terms: cash, no trades. Ed Moory Wholesale Radio, Box 506, DeWitt, Arkansas, Phone WHitney 6-2820.

WANTED: Instruk manual for Link Radio transmitter, receiver; type 2210 ED2 Serial 72085 control unit type 2210-6B. W0FIZ, 509 E. Madison St., Rapid City, South Dakota.

NORTHERN California hams; Sell HT32 at \$345; 75S1 at \$340; Drake 1A at \$190; Harvey-Wells Z Match at \$49; KWM2 at \$85.00 (ex. Cash and carry. Col. E. W. Sears, K6QQI, 4725 Bridge Tr., Santa Rosa, Calif.

SELL: Valiant, factory w/t, \$275; HQ-110C with spkr, \$130. Both perfect and in like new condx. John Falcone, K3JMM, 207 Mattison, Ambler, Penna.

HRO-60T with coils A,B,C,D, spkr, calibrator, homebrew Select-O-Ject. In exc. condx. \$375. K1MLP, 37 Leary, Cochituate, Mass.

WANTED: URA8 or single CV/89 TTY converter. Collins R390 revr. Exc. condx only. Name your price, K9CNG, Phone 320, Vandalia, Ill.

COLLINS All like new condx; 75S1, \$325.00; KWM2 complete for mobile, \$975; WA2IZO, Bill Schiltrin, PY 6-9122, Levittown, L.I., N.Y.

DX-200 professionally wired. New condition. \$40. Sam Siegel, 1664 President, Brooklyn, N.Y.

WANTED: 500 or 800 cycle mechanical filter for 75A4, W2DTE.

FOR Sale: SP600JX w/manual. Gud condx. Best offer over \$300. Will ship. K7TKU, 694 Pennsylvania, Empire, Oregon.

SWAP For Ham Band receiver. Bolex 16mm movie camera, fully equipped, mint condx. Many extras. Want HQ-170, NC-300, SX-111, SX-101. All offers considered and answered. H. D. Riederan, K1UYG, 926 Main St., Winchester, Mass.

COLLINS 75A-2 heavy steel cabinet. \$20. Ross Moorhead, K7HWZ, Rte. One, Whitefish, Montana.

FOR Sale: Collins type J plug-in mechanical filter. 455 Kc center frequency, 2.1 Kc bandwidth. \$45.00. C. L. Boschen, 403 W. Tilden, Brownsburg, Ind.

COLLECTORS! Old tubes: UX201, 59, C484, UX232, MX-171A, 247, 230, CX374, 27, 226, UX280, UX210, UV242, \$1.00 each. Radiotron WD11. WD12 clear glass envelopes, brass base WD12UV, DeForest audion UX201, Isolante base, UV199, UX adaptor, UV201 brass base, WD12UV brass base, mercury envelope, Western Electric 101D-UV, \$5.00 each. Postpaid. W2ONK.

SELL: Panadaptor SP-44 in gud condx, w/instruk book, \$40. Andre Calatayud, 196-23 Jamaica Ave., Hills 23, N.Y.

BARGAINS! Equipment sold! Wanted! By other Hams in "Equipment Exchange Bulletin". Interesting sample copy free! Write: Brands, Sycamore, Ill.

SWAN Swa. Will swap my spotless SW-175 for your SW-120. Tired of the big roundtables. K3JZH.

SELL: SX-111 with spkr, almost new condx. \$200; QSTs 1938-1950. Sell complete, only \$20; Eico 710 grid dipper. \$30. W2NCG, 27 Wing Lane, Wantagh, N.Y.

FOR Sale: DX-100, \$125; AFG. PMR7. pwr. supplies. PSR-6-12, James 1050 and manuals, \$175. Wanted: KWSI or Viking KW, prop pitch rotorator, and 4000 VCT, 500 mills plate transformer. State condx and price. K2IMY, Manchester Heights, RD #3, Poughkeepsie, N.Y.

NEW Gonset G-76 Model 3338, serial A10311. \$375; National spkr, \$10; new xtal calibrator model XCU-300, \$10. Send certified check or m.o. Max Burch, KOVWZ, 342-10th Ave., No. Fort Dodge, Iowa.

FOR Sale: Heath Sixer never used, Viking Matchbox and Heath SWR meter, Hammarlund HQ-170. Best offer. Bob Gibson, 526 Park Ave., Norman, Okla.

SELL: Jennings vacuum variable 300 mmf 10KV, \$29; Eimac 3-400Z and SK-410 socket, \$25; B&W model 850A Pi-tank, \$25; Eimac 4CX50B's, \$10 ea.; Eimac air system sockets and chimneys for above, \$7.00 set, W.E. 416B's with grid rings, \$4 ea.; M. C. Jones directional coupler and indicator unit, \$20; Shure SSB mic, model 440 w/stand, \$15; Shure cond. \$1 multi-imped. mic w/lead, \$15; Eico grid dip meter #710, \$15.00; all items guaranteed, new and unused. Money refunded if not satisfied. W4TRP/6 R. J. Cleve, 1640 N. Kensington Ave., Santa Maria, Calif.

FOR Sale: Collins 75A-4, like new condx. with 0.5-0.8-1.5-2-3.1 Kc. mech. filters, recently factory overhauled, serial number 422. This is still the best receiver made, \$595 complete. Prefer local pickup, but will ship. Frazier, 12 Golden Isle Dr., Mount Dora, Fla.

H0170C revr, approximately 20 months old, just factory aligned, first certified check for \$275. Seneca complete with HB S12 modulator \$200. Walter McUmber, W8BAN, 1817 E. South St., Jackson, Michigan.

SELL: DX-40, \$55; VF-1, \$16, xtals, \$1.50. P. E. Novice station of month Rig, K1VMT H. J. Galloway, 46 Oak Hill Dr., Arlington, Mass.

SX-96 revr, \$185; SW-54 revr, \$45; T-60 xmtr, \$45. (F.o.b.) Tom, 2022 W. 69th Place, Chicago, Illinois.

TRADE: Viking 6N2 and Viking I. HG-10 VFO, Ameco CB-6, PV-50, for commercial SSB linear. All gud. Larry Eisenberg, W2KSH.

FOR Sale: Collins 75S-1 serial 11994, three months old, still in warranty, \$400; BC610E and BC614E, perfect in operation and appearance, \$200; Hallcrafters HT-9 postwar model, \$50; Collins 75S3, almost new \$75; W1DBS, John Savonis, 11 Dwight Court, New Britain, Conn.

SELL: SP600-JX14, gud, \$250.00; 75S-1, all xtals, c.w. and RTTY filters. Exclnt. \$450. \$550 value. W1LWV.

COLLEGE: Must sell Ranger \$170; NC-109 \$130; or your best offers, K8R1O/2 Eric Scheetz 166 Pawling Ave., Troy, N.Y.

TRADE: HT-32A, perfect, and vest-pocket beam for Clegg Zeus. Sidney Eisenberg, K2MBS.

COLLINS 75A4, two filters, just reconditioned and retuned by factory, \$525. Hallcrafters HT-9, one year old, exclnt condx, \$350. B. Smith, K6LYV, 1109 Boden Dr., Anaheim, Calif.

HQ-170C, used vy little, \$275. Elting, Hox 105, Perrysburg, Ohio.

SALE: 20M beam, AR-22 rotor, 32 ft. self-supporting tower, 150 feet RG-8/U rotor cable, \$75; 3-450TH type tubes, 1-2500 volt KW plate supply in 6 ft. relay rack w/ RF chassis, panels, NBFM exciter, \$95, F.o.b. Richard Snelcar, 5471 Norquedge Blvd., Youngstown 15, Ohio. Phone SW 9-5686.

FLMAC AF-67 excellent, \$85.00. Wm. Tozier, 2320 Nicolllet, Sioux City, Iowa.

SELL: HQ-145C, \$195. WA2ZVJ, 2115 East 27th St., Brooklyn, N.Y. Tel. SH 3-2525.

FOR Sale: Radio Craft, complete run; Popular Radio (2 issues missing); Radio & Television Maintenance, Riders Manuals 1 & 2, 23 Reasonable Other radio publications. Send for price list. Mrs. Dorothy Simpson, 85-39 152nd St., Jamaica 32, L.I., N.Y.

WANTED: Good mimeograph as gestetner. Rex, A. B. Dick. Also want Johnson Matchbox. Will trade ham items for above. H. Samkofsky, 201 Eastern Pkwy, Brooklyn 38, N.Y.

STANCOR ST-203A converted to 6 meters. Straight thru 6146 final, 35 watts, 3881's Class B modulators. Hi-Z xtal mike input. 400 volt power supply. Excellent quality signal. All for \$35.00. BC-454 revr w/2-tube 6-meter converter built on, plus 250 volt AC pwr. supply, \$20; Heath VF-1 VFO exclnt condx, \$15. Oscilloscope OS-8C/1U, mint condx, w/manual, \$60; BA-42 pwr. supply, gud condx, \$10; Mafoxy VF-12-353, 300 v. at 100 mls., like new, \$10. Make offers, might drop prices to clean shack. Boyd Walker, K1UXL, 66 Concord Rd., Billerica, Mass.

WANTED: Commercial or Surplus Airborne, Ground, Transmitters, receivers, test sets, 618S, 18S, 17L, 51R, ARN14, GRC, PRC, ARC27, ARC, Bendix, Collins, others. Ritco, Box 156, Annandale, Va.

POLYCOM 62B, illuminated S-meter, 3 mikes, \$325.00; filters: Drake TV-1000LP, B&W I KW 72 ohm, B&W I kw, 50 ohm, \$10 ea.; antennas: olex, 2MR-1114, Spiralray, 5-el, 2-mtr., 6M-42, Hy-Gain 12AU5 vertical, \$10 each; Dow DK60-CC coax relay, \$10; special: Telrex R360 rotorator, 5000 ft./lbs. torque, \$125. (new \$360) K2VEY, 503 Burrass Dr., Saddle Brook, N.J.

KWM-1 AC pwr. supply, Mobile Mount; DX adaptor, late model. Has lock & key, condx like new, with manual. Best offer over \$650. HT-33 full kilowatt exclnt condx, with manual, \$375. Seneca 6 & 2 a real good one with manual. Kit price, WA2OER.

SELL: VFO-Matic, for transceive operation with 75A receivers and 9 mc. exciters, \$90. F.o.b. Lamb, 1219 Yardley Rd., Morrisville, Penna.

NATIONAL NC-300 with calibrate unit, top condx. Reason for selling: moved up in class. First check for \$200 takes it. K3IVL, Charles Cram, 5817 Carlyle, Cheverly, Md.

SELLING Heathkit "Cheyenne" transmitter and HP-10 transistorized supply; Gonset G-12 converter, 3-band heliwhip antenna. Contact: Len Friedman, 108-43-63rd Rd., Forest Hills 75, L.I., N.Y.

NEW Hallcrafters SR-34, \$260; new Leica M3 with accessories, \$390; Neotone 2 meter cable, \$20; misc. parts, I. Seidman, 2160 Bolton St., New York City 62.

FOR Sale: RME 6900, Like new, \$260.00. Dom Gaudio, WA2ZTC, 4 Campagnolo Ave., Copiague, N.Y.

JOHNSON Viking Challenger, in gud condx, K8QDM, 1908 Francis Grand Rapids, Michigan.

KWM-1, A.C. supply, speaker Serial No. 1059, factory checked. Guaranteed, new condition, \$495. A. C. Culver, 530 Elizabeth Rd., San Antonio 9, Texas.

SX-99, gud condx, \$70; T-60 transmitter, never used, \$40; Knight VFO, like new, \$20. K8VZQ, 918 Eton, Toledo, Ohio.

YOUIRS For \$35: Exclnt Eico (315) signal generator, factory wired. K1DKB, 28 Grove St., Plantsville, Conn.

MERRY Christmas, Happy New Year, W6NSC-WGNSR.

FOR Sale: 153B B & W sideband generator with built-in pwr. supply. Never removed from its original shipping carton. Will sell to the highest bidder over \$100 received by Dec. 20th. Will ship express postpaid C.o.d. W3DKN, 734 West Foster Ave., State College, Penna.

WANTED: 100V or 200V Central Electronics transmitter. State serial no., condx, best cash price. Woodring Fryer, 235 Water St., Henderson, Ky.

POLYCOMM "6AC", 2 months old, \$250; Hy-Gain 153B 15-mtr. beam, \$20; Telrex 6-el. beam, \$22; CDR TR4A rotor, needs slight work, \$12; CDR 6-115 volt 175 watt inverter, \$30; Saturn "6" halo, \$10; D-104 w/G stand, \$20. All in ex-cit condx. Kellersman, Box 260, Mitchell College, New London, Conn.

SELL: Heath DX-40, \$50; Heath VF-1, \$10; Hammarlund HQ-110, \$160; D-104 mike, \$10; Dow-Key coax relay (117VAC), \$5. All in ex-cit condx. Sell the complete outfit for \$220. K9DKO, 681 Craigwoods Dr., Kirkwood 22, Mo.

WANTED: RM-22 remote control unit. Also cover for model 14 high base, typing reperfector, cover for FRXD, W4NZY, 119 No. Birchwood, Louisville 6, Ky.

JOB Wanted in electronics, machine shop or amusement machines, 23 years experience at Philco of Sandusky prior to closing of plant December 31, 1962. Skilled in radio troubleshooting and first class machinist, fixture designing, sheet-metal welding. Also 7 years experience in repairing and troubleshooting mechanical and electrical machines. Have family of 4 dependents. Available excellent references and other details. Charles A. Dudzik, W8KWK, 131 E. Ogontz Trail, Sandusky, Ohio.

FOR Sale: Ranger FW, PTT, mike, key, crystals, \$175. Gonset C63 speaker, tubes \$150. Edward Winters, 52-24 65 Pl., Maspeth 78, N.Y.

QSTS. Complete run July 23 to date. Cash and carry. Ninety dollars. George Kirchoff, 169 Riverside Island, Fox Lake, Ill.

SELL: Heath DX-35, \$25; AT-1 plus plate modulator and power supply, \$15; ElSCO GP-1 10 M ground plane, \$10; Gonset Triband mobile converter, \$15. All in ex-cit condx. Red Thurston, K2TFL, 125 Haring St., Closter, N.J.

MOVING! Must sell SX-101A, \$325.00; R46B, \$10; HT32, \$80; 1A33 \$65; Dow-Key TR switch, \$10; antenna tuner, \$30; MicroMatch, \$25; Astatic 10D with G stand, \$20. All equipment in new condition. Sorry no trades. W3MVK, Loring Fisher, 419 No. Webster Ave., Scranton, Penna. DI 7-5137.

NEW Pacemaker, never used, \$275; will finance and personally deliver 300 miles. Will swap toward Linhof 4X5 Super Technika. Walden C. Pierson, 510 Calvin Park South, Rockford, Ill.

GLOBE Champion 350 watts \$275 or best offer. C. Burrill, 23 New Ave., Wyandanch, L.I., N.Y.

FOR Sale! 75A4, No. 4871, KWS-1, No. 1439, presently at Collins for minor repairs and realignment. Will be shipped from factory direct to purchaser. \$1400 f.o.b., \$16E-1 d.c. supply, and 351-D-2 Mobile Mount for KWM-2, like new, \$225. Telrex element brackets for 13 and 20 M, \$100 for both, rated. James Craig, 1025 No. 34th St., Omaha 31, Nebraska. Area code 402, 556-4297.

HQ-110C \$155; Viking II with VFO, \$170. Will deliver within 50 miles of New York City. Ed Muller, 23 Fiske Pl., Brooklyn 15, N.Y.

EIMAC built 4CX1000A final (11/57 OST), the ultimate compact linear, \$395; Eimac built brute power supply for above, to 6000v at 1 amp, other voltages, gud industrial or ham (parts over \$300), best offer. Compact pwr. supply in 24" cabinet, to 4000v at 1 amp, solid state, parts over \$500, professional design, best offer. W1WNY, J. F. Ashton, 12 Top O'Hill Rd., Darien, Conn. 203-Davis 5-2125.

HEATH Mobile transmitter-receiver unit, ex-cit optg. condx w/M-P-1 pwr. supply, AK-5 base and mike, all ready to install for \$160.0 f.o.b. K4MJJ, R. W. Ackerman, Box 532, DeBarry, Fla. Phone NO. 8-4156.

HEATH Sixer 6-meter transceiver, in ex-cit condx, \$30; Heath O multiplier, \$7.00; Mohawk telephone answering machine, \$75 or trade all for Gonset Communicator, K3BO, 608 Maple Ave., Southampton, Penna.

SELL: National NC-240S receiver with Heath "Q" multiplier, \$100; Jeff Fein, WA2GMO, 1978 Stewart Ave., New Hyde Park, N.Y.

WANTED: High serial number 75A-4, must be in ex-cit condx. W7CFO/KL7, William Lutz, RCA Service Co., Nikolski, Alaska.

FOR Sale: NC-125, in gud condx, first \$100, you pay express. Roland Florence, K9BTE, 303 E. Division, Kewanee, Ill.

VIKING 500. Factory-wired, in ex-cit condx, \$575; Gone SSB, W8ZAW, Lawrence D. Sallee, 5958 Stewart Road, Cincinnati 27, Ohio.

MOHAWK: Expert wired, in perf. condx, \$180. You pay post-ack. W4ZSV, 225 Shirley Ave., Warrenton, Va.

MORROW Twins MB-565, MB-6E, RTS, 600S, TV 600A supplies. Iffy Mount, complete, \$350. K4AET, Gwynn, Va.

KWS-1, serial No. 1030, with spare 4CX250Bs, \$890. W5RKE, 604 Adams, Alamogordo, New Mex.

HT-32A, in ex-cit condx, in original carton: \$435.00. McRae, 82 Holder, Princeton, N.J. WA 4-0355.

WANTED: Manual for TDQ. Lee Kilinc, W8JUE, Shepherds-town, W. Va.

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.

WANT Tower, 50 ft., crank-up, fold-over. Advise make, condition, age and price and can you ship via a pick-up truck company. W9HAW, Frank O'Leath, Carthage, Ill.

TRANSMITTER Sale: Globe Champion 300, 275 watts AM. In perf. condx for 80-10 mtrs. Write for complete info. Price \$200. K4KHE, RFD 4, Franklin, Ky. Tel. JU 6-3975.

WANTED: Cabinet for DX-100B or Apache, W4VTS.

BEST Offer, any or all: NC-300 and if strip described OST Jan. 1957; OST and CO from 1953; KW pwr. supply parts. Getchell, Idona St., Cambridge, Mass.

FOR Sale: Johnson Ranger transmitter with push-to-talk, Gud condx, \$150. E. M. Wiser, 1534 Clifton Road, N.E. Atlanta 6, Ga. Tel: ME 4-2905.

LEECE-NEVILLE 12 volt 60 amp. system, \$40; S-85 with Hallifracrafters S-meter, \$70. Stan Kosciuk, K2AHZ, 155 Myrtle Ave., Irvington, N.J.

MORROW SBR-1 all band mobile converter. \$20; prop pitch antenna rotor, \$40; two 115v ac selsyn motors, \$10; PE-103 dynamotor \$5; BC-645 2 meter transmitter with tubes, \$10; all in excellent condx. Sold for best cash offer. Pyle, K1OKK, 120 Appleton St., Cambridge, Mass.

FOR Sale: Viking I, NC-173 and HT 18VFO, all in gud wkg condx. No reasonable offer refused for all or part. Russ Weissman, W2BRN, 14 Solar Lane, Scarsitown, N.Y.

COLLINS Sale: Hanker 136C-1 for 75A4 with instructions, new, \$49; 136A-1 for 75S-1 with instructions new, \$49; KWM-1 Mobile Mount new, \$39. Richard E. Mann, 7205 Center Dr., Des Moines, Iowa.

HT32A, \$475; 75S1, \$395; GSB101, \$275. All in mint condx. On 20M nightly. \$1095 takes all. W7YAM.

MISSIONARY Seminars are appealing to generous hams. Would you be willing to help establish a number of stations for training future missionaries? Your donated equipment, any gear in working order, would help educate future missionaries in radio, and would eventually become part of an African Missions radio network. Write A. Daly, African Missions Seminary, Dedham, Mass.

FOR Sale: COLLINS 75S-1 serial 11994 three months old. Still in warranty, \$400; BC61E and BC614E, perfect in operation and appearance, \$200; Hallifracrafters H-19 postpaid model, \$50; Collins 75S3, almost new, \$575; VIDBS, John Savonis, 11 Dwight Court, New Britain, Conn.

75A4, clean, \$400. TR switch, DB23, W. Grob, Columbia, Ill.

FOR Sale: KWM-2, \$850; 516F-2 AC pwr. supp., \$85; 516E-1 DC pwr. supp., \$200; 312B-5 control console, \$250; 351A-12 Mobile Mount \$75; MM-1 microphone, \$17.50; SM-2 microphone \$30; Del Schlump, 1808 Stevens Ave., Minneapolis, Minn.

VIKING Ranger, factory-wired, with keying mod. and push-to-talk, \$165.00. WA6MGO, 213 N. Dianthus, Manhattan Beach, Calif. Tel. FR 4-4318.

HT-33A for sale. New condition. Sixty hours logged. Prefer local sale. Unit now in operation. W7MPW, H. L. Van Ness, 3715 47 PL NE Seattle 5, Wn.

SELL: HQ-110C, \$150; Viking Adventurer, \$35; both in ex-cit condx. Also Heathkit RF meter and SWR meter, K. A. Berberian, 448 Old Cellar Rd., Orange, Conn.

SEMINARIANS Of the Missionaries of St. Peter and St. Paul are trying to set up a station. Can you help? Contact: Br. Mike Gill, Marydale Seminary, Memphis, Michigan.

GLOBE King 500A, in gud condx. Must sell, best offer. Trades accepted. K9COP, 2845 South 52nd St., Milwaukee 19, Wis.

LAMPKIN 105 freq. meter, \$130. Curt Fouse, 601 Reed St., Parkersburg, W. Va.

450TL, won at convention. W0GCO.

SSB Johnson Invader, 200 watts P.E.P. 90 watts AM, 200 watts c.w. factory-wired 6 months old. Hallifracrafters SX-101 MA, III, \$250, in mint condx. Will demonstrate. Bob Windsor, K9BHL, RR 2, Box 185, West Chicago, Ill. Area code: 312-231-0962.

AUTOMOBILE 115V AC generator, new, 2300 watts, \$149.50; KWS-1, perf., \$795; unused F/W SB-10, \$89; unused 75A4 noise-blanker, \$59; Tapetone TC-220 converter, \$39. photocopy set, \$15; stereo record-player \$24.50, audio sig.-gen. \$17; transistor stereo-preamp., \$29.50; Johnson 6N2 converter, \$45; stereo-amp. \$35; pair 4-00A's transcvr, \$45; ARC-5 VHF xmttr., \$20 and 432 Mc. amplifiers, Heath color generator, \$59.50; Trap Traveler \$34; transistor mobile supply \$20; Lakeshore Tommaster \$7; tubes, meters, really cleaning house! List sell/trade, W4API, Box 4095, Arlington 4, Va.

FOR Sale: Johnson TR switch, \$15; Heath Ref. pwr. and SWR meter, \$12; grid dip GD-13, \$17; ant. imp. meter AM-1, \$10; Heath cond. checker, \$17; Sonar FM exciter XE-10, \$15; 813 tube, \$10. J. S. Dzenzel, 4808 N. Ozark Ave., Norridge 31, Ill.

COLLINS 75A2, \$200; Heath Comanche \$70; "Lazy Linear" 300 watts, \$30; assorted RTTY terminal units, printers, tone generators, spare parts. Vanbrunt, 1003 No. Belgrade Rd., Silver Spring, Md.

WANTED: Telrex TC-99 or TM-30 beam, Gonset 2M Communicator, Sell DB-20 Presetector, spare tubes, ex-cit condx, \$20. Scope Heath OM-1 and voltage calibrator, \$35; 20M Hy-Gain 3-el. beam, full size, balun and 75 ft. coax, mounting poles, brackets, etc. \$45. Dick Marsino, W2UGM, 66 Columbus Ave., Closter, N.J. Tel. FO 8-1884.

FOR Sale: All following equipment in mint condx, like new. Will ship upon receipt certified check or money order. Prices F.o.b. Little Rock, 100V, used 25 hours orig. carton, \$550; Viking II with VFO, professionally wired, \$150; Johnson Ranger, sequence keying, professionally wired, \$120; Johnson Matchbox, small, \$30. W5WFE, 21 Shannon Drive, Little Rock, Ark.

SMALLER, warmer shack. Reducing ham inventory. Bargains like Morrow SBR-2, \$25; 500W multiband, Jan. 1954 OST, \$40; many more. Send stamped envelope for list. W1KZQ, Box 291, Baltic, Conn.

TRADE: Two 4-250A's and one 4E27 for three 3-400Z's. K9QVD, 1500 1/2 Ave., E. East, Bismarck, N.D.

SELL: Navigator F/W, \$110. Thunderbolt F/W, \$425; both in ex-cit condx, with manuals, both \$500; ex-cit NC-270, \$165; pair 4-00A's, new, \$32 each f.o.b. W4NWV, 112 Beverly Place, Greensboro, N.C.

SELL: Jennings UCS vac. variable capacitors, 10 to 300 mmf @ 10 Kv. Unused, \$20 each. K1TPI, 12-Liberty, Natick, Mass.

75A-4, serial 5361, \$550; KWS-1, perfect, extras, \$875; 75S-1, \$375; Drake IA, serial 1043, \$175; P&H LA-400C, \$139, W8WGA, Phone 513-2770-409.

SELL: Highest offer, Viking KW with righthand desk, Ranger, Pacemaker, Viking KW Matchbox, Johnson Electronic T-R switch, Johnson auxiliary audio amplifier, Johnson power divider, Johnson low-pass, Johnson rotomatic beam rotator, Hallcrafters SX-88 rcvr, matching speaker, K-46B, B-W lowpass, Mosley Trapmaster IA33 Tribander, RME 4300 receiver, RME 4301 Sideband selector, General Radio VTVM 1800A, General Radio wavemeter, Heath lab scope, 5 in. 0-10, Dumont 3 in. scope, Hickok Microvolt signal generator, Heath sig gen, small Heath grid dipper, Heath ant. imp. meter, Signatone and Bud code practice osc, Universal SWR ratiometer, Carl Shogren, 5916 N. Artesian, Chicago 45, Ill.

WANTED: Morse sounder, gud condx and tone, reasonable. W6LVK, 7810 Genesta Ave., Van Nuys, Calif.

DX-100, \$125; A1-NC 173, \$115; AF-67, \$90; complete mobile, \$175. Includes many extras, send for list. Prefer local deal but will ship F.o.b. Sheffield, W4ZPZ, 1518 Oriole, Greensboro, N.C.

SELL HQ-140X with xtal cal. and spkr, \$160. PMR-8, used only 3 hrs., \$150; VHF-152 with Ameco Nuvisator 6 mtr preamp, \$50. Will deliver within 60 miles Phila. Rob Little, W3ETB, Murray 8-8173.

AT College: DX-100, w/ DX-100B modifications, push to talk, \$150; RME 4350A rcvr, \$150 or best offer. All in excnt condx w/ manuals. F.o.b. or will deliver between L.A. and S.F. on US101. Ron Parks, WA6AUX, Box 1332, UCSB, University, Calif.

SELL: Cheyenne, Used as fixed station, perfect, \$80 with mike. K9SFL, Pardecville, Wis.

60G2C relay, Johnson LP filter, bug, VE3AHA, 234 Dunwoody Drive, Oakville, Ont., Canada.

CRYSTALS Airmailed: SSB, MARS, Commercial, CD, Novice, CAP, Net, etc. Custom finished FT-243, .01% any kilocycle 3500 to 8600, \$1.49 (10 or more FT-243, same frequency, 99¢); 1707 to 20,000 kilocycles \$1.95. Overtones above 10 megacycles. Fundamentals 10 to 13.5 megacycles, \$2.95. Add 50¢ ea for 10057¢, Hickok HC-67 u hermetic. Airmailing 10¢ crystal surface 5¢. Write regarding crystal needs. Crystals since 1933. C-W Crystals, Box 2065-Q, El Monte, Calif.

SELL: Viking 11, in excnt shape, \$125 or will trade for gud older rcvr. Eico F-M tuner, \$25, K4EZY, 5109 Sylvan, Richmond 25, Va.

XMAS Tube specials! 2014/6CL6/6197s, 8 for \$1.98; 4D32s, \$9.95, 815s, \$1.98, 872A's, \$2.49; 5BP1s, \$4.50. Send stamp for complete ham tube listing. Lou-Tronics, Inc., 131 Lawrence St., Brooklyn.

JOHNSON 500. In daily use. \$495.00. Will ship in original carton. W5DYL, P.O. Box 88, Forrest City, Arkansas.

COLLINS 75A-4, 312-1 spkr, 3.1 Kc filter, plus 800 cycle, 1.5 kc and 6 Kc filters, \$350; Telrex 10 meter beam, #10M-815, \$35 and 6 meter #153A, \$45 including 100 feet RG-8; Franstat voltae regulator 90-130V, 7.4 amps, \$15. 1634A tape code machine, \$25. Everything perfect. Priced F.o.b. W1RMS, 198 Euclid Ave., Waterbury, Conn.

SELLING: 32V3 Collins transmitter, fine condition, factory renovated. Also HRO-60 receiver, excellent, with coils A,B,C,D, AC, G, F included and upper and lower SB product detector included. Will sell singly. K1RNR, Box 268, Kennebunkport, Me. Phone WORTH 7-2044. Accept best offer.

20-A, factory wired, \$175. K5YXX, Box 72, Hollis, Okla. NC-300 Receiver, excellent, \$180. ART-13 transmitter, mike, control box, cables, dynamotor, \$45. Meissner signal shifter, like new condx, \$25. W9BTS, 4509 Guilford Rd., Rockford, Ill.

VIKING II, \$185; B&W TR switch; Heath VFO; 75 meter RCA AVT112A, rcvr and PS; 75 meter SSB transmitter. Want Drake 2B. John, 20 Belmont St., Brunswick, Me.

SELL: DX-40 VF-1, \$65; W2AZL con. pwr. supply, \$45; Teccraft 2 m. transmitter, pwr. supply, \$40. All excnt condx. **W2IND, 11 Gallalong Hill Rd., Elizabeth, N.J.**

SALE: Viking 122 VFO/w power supply, \$45; Speed-X bug, \$7; Bud Gimix, \$4; homebrew cathode modulator, xtal microphone, \$10; xtal calibrator, \$7, Cadet Wayne Brown, Box 3046, AFCW, USAFA, Colo.

75S-1, \$310; Central Electronics 600-L amplifier, \$160; CDR Ham-M rotor, complete, \$45; all equipment in new condition. Must sell at any sacrifice to pay college expenses. K5QNF, 1322 Chambers St., Vicksburg, Miss.

10B, OT-1, VFO and 200 watt homebrew linear. Vy clean, \$135.00. Fern, K4WYM, 3608 Susanna Dr., Lou, 13, Ky.

SELL: HT-32, in new condx, \$350. K2MRU, 556 Wittich, Westwood, N.J.

KWM-2A, no pwr. supply, \$825. Never mobile. New in summer of 1961. Mitchell, W4RQR, 5804 Accomac St., Springfield, Virginia.

WANTED: For my station in Chile, Collins 75S-3 or 75S-2, 10F-1 and 32S3 or 32S-1. Will consider KVM-2 instead of 75S-3 and 32S-3. Also need 516F-2 power supply, 312B speaker console. James W. Gadberry, CE4FW, 1807 Poplar St., Pine Bluff, Arkansas. Phone Jefferson 4-7330.

SELL: Hallcrafters SX-101A, Johnson Adventurer, Knight VFO, Speaker exceptional, \$350. Clive, 200 Oak Ave., River Edge, N.J.

SELL: Eddystone 898 dial unused, original carton, \$12.00 p.p. C. Nevel, 184 County Hwy., 39, Southampton, N.Y.

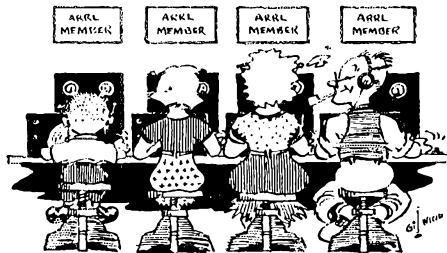
GLOBE Scout Deluxe, S-38E, make offer; Heath VFO, \$15. K0FRP, Oakes, N.D.

BANDIT 2000A in stock. Phone 4701. Wilco, Frankfort, Ill.

HYGAIN Beams: three-element Tribander solid traps, excnt condx, \$50; three-element 15 meter Monobander coaxial gamma match, \$15; Collins 331 u transmitter with 331 u AC power supply, in beautiful condx, \$550.00. Cash, all f.o.b. Maplewood, N.J. H. C. Vance, Sr., 33 Oakview Avenue.

WANTED: BC-946, BC-453, BC-454, 1.5 to 3 mc. unit, Bradley, 1238 Grant, Warren, Ohio.

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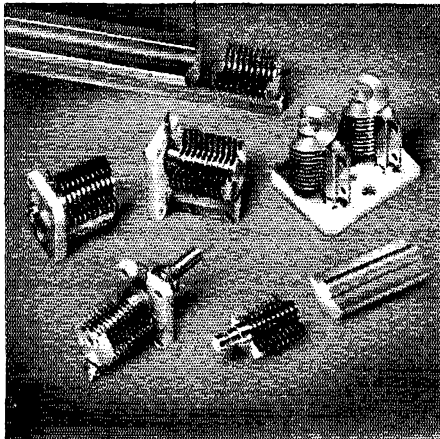
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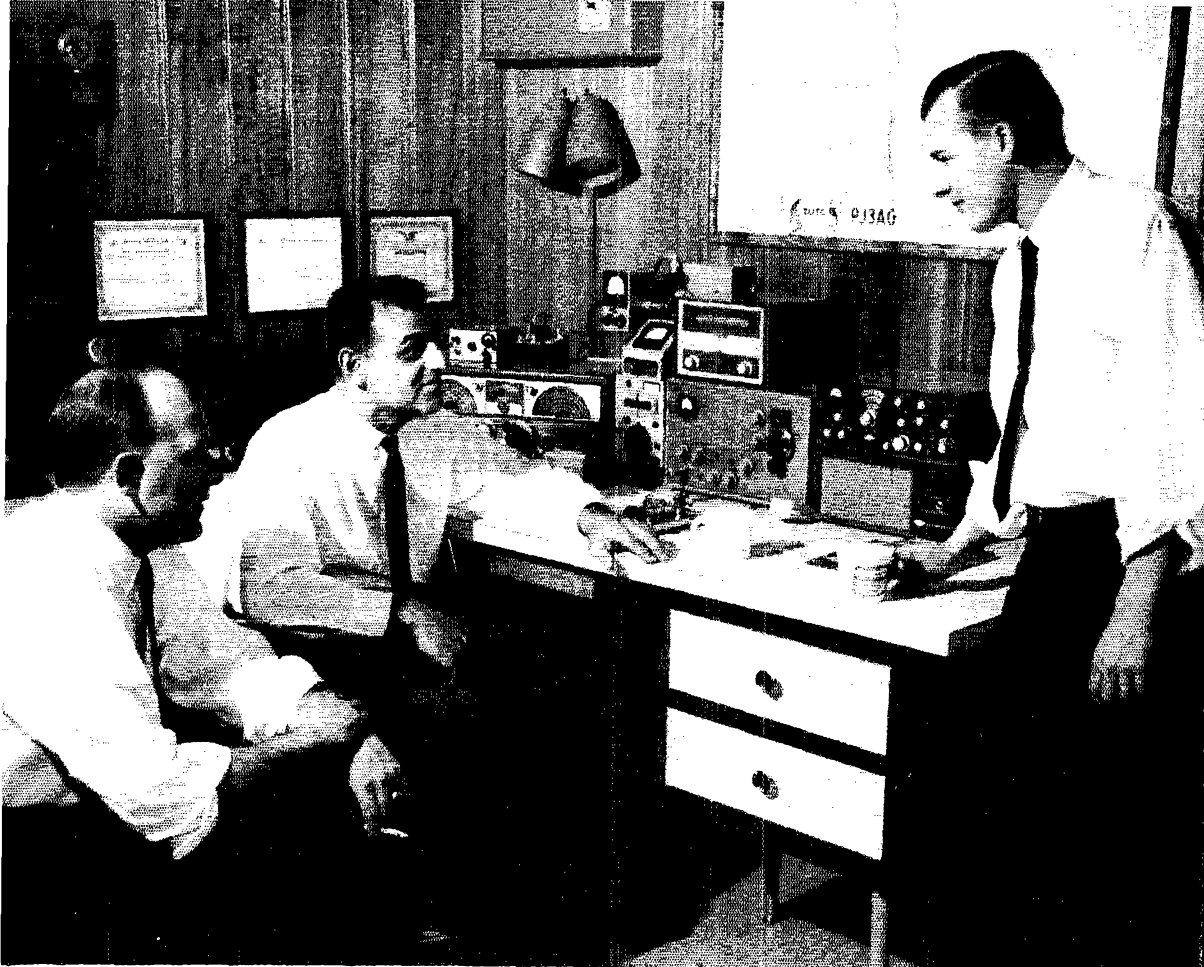
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George Lucas, W1ZYS, "Pops" Karentz, W1YLB, and Ray Churchill, W1VBI, enjoy an infrequent eyeball QSO at "Pops'" Millis, Mass., QTH.

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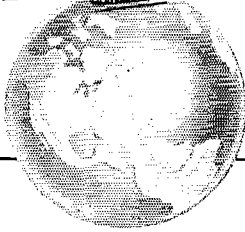
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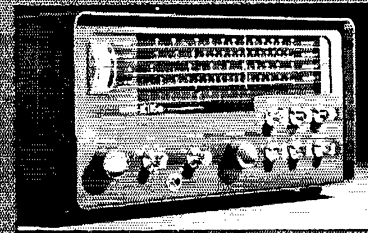
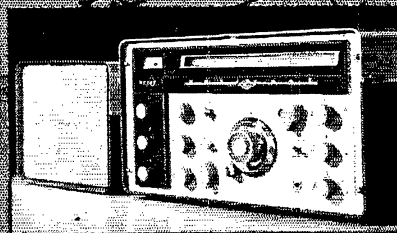
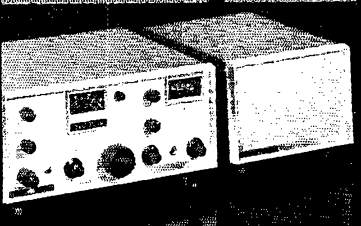
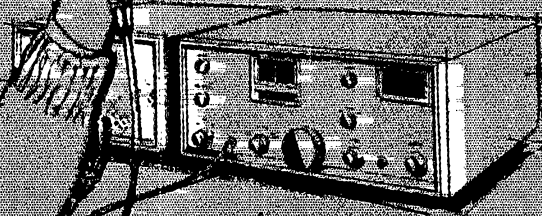
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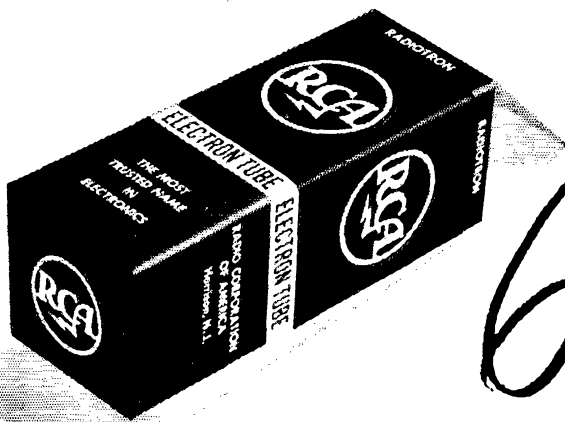
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Members Are Saying . . .

Our club has only limited funds but it truly has been our desire to give a reasonable amount. We did it by conducting a raffle. Local radio supply dealers very graciously contributed items, surely in the feeling that without the efforts of the League there would be no amateur radio as we know it today. — *West Seattle Amateur Radio Club, Inc.*

The hobby has been good to me — gave me constructive interests, introduced me to fine friends and enabled me to turn a hobby into a rewarding vocation. ARRL through *QST* was the sparkplug that made much of my good fortune possible. It is a privilege to contribute to ARRL's advancement. — *W2P/LT*.

I am a little alarmed that the funds are not increasing at a faster rate. In an organization such as ours all too often the membership is apt to take, like parasites, and not give in return. In my opinion many of our newer members do not fully realize what an utter state of bedlam would prevail without the League's sense of direction. It behooves every member of the League, old timers and newer members alike, to take stock of the need of the League for a newer, more modern, larger building and contribute immediately as best they can. — *K9BIV*.

Guess you know the line about "the road to hell being paved with good intentions." I had intentions to support the building fund way back in March, but I changed jobs, QTH (three times), and with the fishing season, fighting with the XYL, the drought, TV and other diversions, I just never got around to mailing off the check. However, it is now enclosed. — *W2KJY/4*.

I well remember the foundation of ARRL for I was in Hartford high school at the time and was a ham for several years previously. The vision of Hiram Percy Maxim and the energy and persistence of Clarence Tuska put the League into existence. From that time on ARRL has been a source of great interest and inspiration to me. I know of no hobby that has such a helpful organization behind it. I am happy therefore to enclose my contribution. — *W1BT*.

The maintenance of amateur privileges, the periodic reminders of the duties associated with those privileges, the publication of technical correspondence and training aids, and acting as a collective voice for nearly 300,000 individual amateurs comprise just a few of the things which ARRL has done for us, and from which we benefit. In appreciation, we wish to have a part in guiding the future through the enclosed building fund contribution. — *Kay Co. Amateur Radio Club (Okla.)*.

Wish I could send a larger contribution, for no amount would be adequate to express my appreciation to ARRL for the enjoyment League membership adds to our great hobby. — *K7QWR*.

Our long-standing affiliation with ARRL and the resulting representation enjoyed by our members makes our contribution seem like a small service fee all out of proportion to the benefits received. As a club, we congratulate the building committee on their progress and look forward to periodic reports on construction via *QST*. — *The Starved Rock Radio Club (Ill.)*.

The enclosed check isn't a lot, but we do want to help with the new building which is much needed. Amateur radio has meant a lot to us over the years and had a fair influence in determining the OM's life work. — *W2OBX, K2DGW*

We all feel indebted to ARRL for the many services extended to us as an affiliated club. There is no doubt in our minds that ARRL will continue in the future to meet and solve the complex problems that arise within the amateur fraternity as it has in the past. The added facilities will in fact strengthen the efforts of ARRL to coordinate the greatest hobby the world has ever known for increasing human understanding through personal contact. Enclosed is our check. — *Northern California DX Club*.

It gives me great pleasure to think I helped furnish a few bricks, a door knob, or perhaps a few floor tile. — *W9NAJ*.

We wish all amateurs were also millionaires and thus the building problem would be solved. Fortunately, however, you have the next best thing in loyal friends from amateur ranks. Enclosed is our check. Please hurry and finish the building; we want to inspect it before we make WAS on two. — *Massachusetts VHF Society*.

In ARRL I think the world of amateur radio has its strongest voice, and its most conscientious exponent. I think it stands firmest, and has a record of service to amateur radio without exception. In times to come the radio amateur will need even more strong protection of his rights — and a strong League is one of the best safeguards. My bank has already received instructions for my contribution. — *G3JMO*.

Made a couple of club talks here in Oklahoma and they had to pay me to shut up — hi! Enclosed are checks from the Electron Benders and the Tulsa Amateur Radio Club. And here's mine — I had to send it in self defense! — *K5KTW*.