

June 1954
40 Cents
50¢ in Canada

QST

devoted entirely to

amateur radio



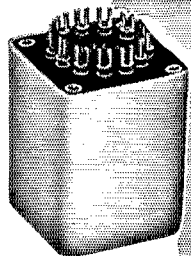
ULTRA COMPACT UNITS...OUNCER UNITS

HIGH FIDELITY... SMALL SIZE... FROM STOCK

UTC Ultra compact audio units are small and light in weight, ideally suited to remote amplifier and similar compact equipment. High fidelity is obtainable in all individual units, the frequency response being ± 2 DB from 30 to 20,000 cycles.

True hum balancing coil structure combined with a high conductivity die cast outer case, effects good inductive shielding.

Type No.	Application	Primary Impedance	Secondary Impedance	List Price
A-10	Low impedance mike, pickup, or multiple line to grid	50, 125/150, 200/250, 333, 500/600 ohms	50,000 ohms	\$16.00
A-11	Low impedance mike, pickup, or line to 1 or 2 grids (multiple alloy shields for low hum pickup)	50, 200, 500	50,000 ohms	18.00
A-12	Low impedance mike, pickup, or multiple line to grids	50, 125/150, 200/250, 333, 500/600 ohms	80,000 ohms overall, in two sections	16.00
A-14	Dynamic microphone to one or two grids	30 ohms	50,000 ohms overall, in two sections	17.00
A-20	Mixing, mike, pickup, or multiple line to line	50, 125/150, 200/250, 333, 500/600 ohms	50, 125/150, 200/250, 333, 500/600 ohms	16.00
A-21	Mixing, low impedance mike, pickup, or line to line (multiple alloy shields for low hum pickup)	50, 200/250, 500/600	50, 200/250, 500/600	18.00
A-16	Single plate to single grid	15,000 ohms	60,000 ohms. 2:1 ratio	15.00
A-17	Single plate to single grid 8 MA unbalanced D.C.	As above	As above	17.00
A-18	Single plate to two grids. Split primary	15,000 ohms	80,000 ohms overall, 2.3:1 turn ratio	16.00
A-19	Single plate to two grids 8 MA unbalanced D.C.	15,000 ohms	80,000 ohms overall, 2.3:1 turn ratio	19.00
A-24	Single plate to multiple line	15,000 ohms	50, 125/150, 200/250, 333, 500/600 ohms	17.00
A-25	Single plate to multiple line 8 MA unbalanced D.C.	15,000 ohms	50, 125/150, 200/250, 333, 500/600 ohms	17.00
A-26	Push pull low level plates to multiple line	30,000 ohms plate to plate	50, 125/150, 200/250, 333, 500/600 ohms	16.00
A-27	Crystal microphone to multiple line	100,000 ohms	50, 125/150, 200/250, 333, 500/600 ohms	16.00
A-30	Audio choke, 250 henrys @ 5 MA	6000 ohms D.C., 65 henrys @ 10 MA	1500 ohms D.C.	12.00
A-32	Filter choke 60 henrys @ 15 MA	2000 ohms D.C., 15 henrys @ 30 MA	500 ohms D.C.	10.00



TYPE A CASE
1 1/2" x 1 1/2" x 2" high

UTC OUNCER components represent the acme in compact quality transformers. These units, which weigh one ounce, are fully impregnated and sealed in a drawn aluminum housing 7/8" diameter... mounting opposite terminal board. High fidelity characteristics are provided, uniform from 40 to 15,000 cycles, except for 0-14, 0-15, and units carrying DC which are intended for voice frequencies from 150 to 4,000 cycles. Maximum level 0 DB.



OUNCER CASE

7/8" Dia. x 1 1/4" high

Type No.	Application	Pri. Imp.	Sec. Imp.	List Price
0-1	Mike, pickup or line to 1 grid	50, 200/250, 500/600	50,000	\$14.00
0-2	Mike, pickup or line to 2 grids	50, 200/250, 500/600	50,000	14.00
0-3	Dynamic mike to 1 grid	7.5/30	50,000	13.00
0-4	Single plate to 1 grid	15,000	60,000	11.00
0-5	Plate to grid, D.C. in Pri.	15,000	60,000	11.00
0-6	Single plate to 2 grids	15,000	95,000	13.00
0-7	Plate to 2 grids, D.C. in Pri.	15,000	95,000	13.00
0-8	Single plate to line	15,000	50, 200/250, 500/600	14.00
0-9	Plate to line, D.C. in Pri.	15,000	50, 200/250, 500/600	14.00
0-10	Push pull plates to line	30,000 ohms plate to plate	50, 200/250, 500/600	14.00
0-11	Crystal mike to line	50,000	50, 200/250, 500/600	14.00
0-12	Mixing and matching	50, 200/250	50, 200/250, 500/600	13.00
0-13	Reactor, 300 Hys.—no D.C.; 50 Hys.—3 MA. D.C.,	6000 ohms		10.00
0-14	50:1 mike or line to grid	200	1/2 megohm	14.00
0-15	10:1 single plate to grid	15,000	1 megohm	14.00

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More compact* . . . Tougher, shock-resistant

**...G.E.'s NEW
SERVICE-DESIGNED
5U4-GA!**

***20% shorter, 30% less diameter**

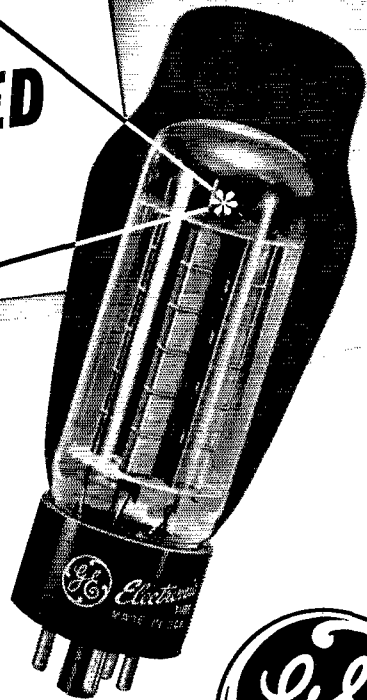
NEW DESIGN throughout makes the 5U4-GA a superior rectifier tube for your low-power rig. Trim in contour, saving of space, this new tube also will stand up under hard usage. As one of a pioneering series specially developed for TV-radio repairwork, the 5U4-GA is a tube you can count on for a full-time, long-time job.

● Ratings are good. Make this cross-check with another compact rectifier type, the popular 5Y3-G:

	RMS SUPPLY VOLTAGE PER PLATE	MAX D-C OUTPUT CURRENT	MAX PEAK INVERSE VOLTAGE
5U4-GA	450 v	250 ma	1,550 v
5Y3-G	350 v	125 ma	1,400 v

● Plenty of output! In dependability and long life, you get more for your money than ever.

● See the 5U4-GA at your local G-E tube distributor's! Keep in touch with him for other SERVICE-DESIGNED Tubes as they appear! All perform better, last longer, than the types they replace. *Tube Department, General Electric Company, Schenectady 5, New York.*



● **IN THREE WAYS** General Electric's new SERVICE-DESIGNED 5U4-GA is a better, sturdier rectifier tube than its prototype 5U4-G. (1) The straight-side bulb is smaller, trimmer, and stronger than the former bulb shown in shadow. (2) Mica supports brace the tube structure both top and bottom, instead of at top only. (3) Base is new button-stem type, with leads well separated, individually sealed off. They are no longer pinched together into a single pressed-stem seal that takes up extra space inside the envelope.

GENERAL  **ELECTRIC**


166-1B3

W9NZZ DESERVES CONGRATULATIONS



Mr. J. Stan Surber, Peru, Indiana, 46 year old short-wave radio "mailman." Winner of General Electric's 1953 Edison Radio Amateur Award for the outstanding "ham" public service of the year. W9NZZ is the only regular communications link with home for hun-

dreds of servicemen at Arctic weather stations. Last year he transmitted and received over a million and a half words in Morse code to and from such points as T-3, an ice island near the North Pole. His equipment: Collins 75A-3 receiver, 82V-3 transmitter.

 Mr. Surber's own account of how he kept on the air 8 hours a day for 353 days *without a miss due to equipment failure*

"During the year 1953, W9NZZ 'worked' the World's most northern stations (Alert and Eureka on Ellesmere Island; Mould Bay on Prince Patrick Island; Isachsen on Ellef Ringnes Island; and, Fletcher's Ice Island floating near the North Pole) in keeping traffic schedules, for a total of 353 days of 365. Of the 12 days missed, 4 of them were due to the necessity of my being out of town. The remaining 8 days missed were due to 'black-out' 20 meter conditions — not one day did equipment failure cause a 'miss.' Practically every day of the year the equipment is turned on at 7:30 a.m. and not turned off until just before I leave for

work as a train dispatcher for the Chesapeake and Ohio Railway, or approximately 3:30 p.m. Surely that is dependability!

"The fact that Collins transmitters and/or receivers are used in five of the six most regularly scheduled stations, adds much to this record of consistent communications via 20 meters. It is easy to understand how, with such equipment at both ends, schedules are kept, on frequency and on time.

"To me, the Collins 75A-3 with the 800 cycle mechanical filter, is the last word in CW reception — surely it is the answer to the CW man's prayer."

Naturally we take pride in the fact that Mr. Surber's equipment is *COLLINS*.

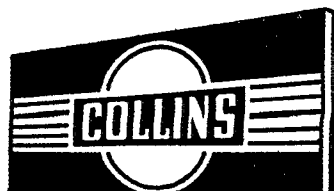
COLLINS RADIO COMPANY

11 W. 42nd St.
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1930 Hi-Line Drive
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2700 W. Olive Ave.
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Advertising

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OFFICES

38 La Salle Road

West Hartford 7, Connecticut

TEL.: AD 3-6268 TWX: HF 88

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Congratulations

FO8AJ

the CLIPPERTON ISLAND DXpedition

109° 13' W 10° 18' N 1954

RADIO _____ CONFIRMING QSO OF _____
AT _____ AM _____ ST UR _____ MC ^{CW} _{FONE} SIGS RST _____

RCVR TWO HALLICRAFTERS SX-88
XMTR TWO HALLICRAFTERS HT-20
VFO HALLICRAFTERS HT-18

PSE QSL TNX
73's



BOB DENNISTON WØNWX LEO OLNEY WØNUC
GENE O'LEARY WØVDQ VERN HEDMAN TOM PARTRIDGE

Clipperton Island was discovered by Captain Clipperton in 1708. Awarded to France in 1930, it is a small, low atoll two miles square in area lying 685 miles west of Acapulco, Mexico and inhabited solely by wild pigs. Our first landing attempt was aboard the "Sea-Rider"—we lost our sextant. Second try aboard the "Barco De Oro II"—lost diesel, sails and food. Landed successfully 1:15 PM Pacific Time, April 23, 1954.

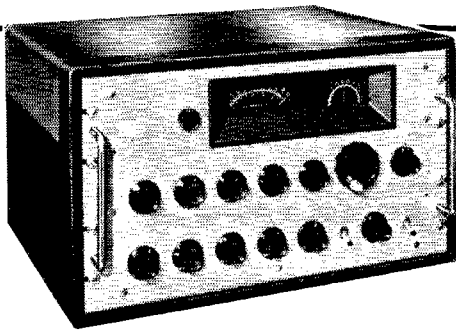
Thousands of amateurs all over the world who worked Clipperton Island will receive QSL cards like this.

to the Clipperton Island Crew!

Here is adventure in the highest tradition— an exploit that opened the eyes of the world to the tremendous potential and present value of amateur radio! Few incidents in recent history have so caught the public fancy as this hazardous landing on a remote speck of an island in the Pacific. The final success of

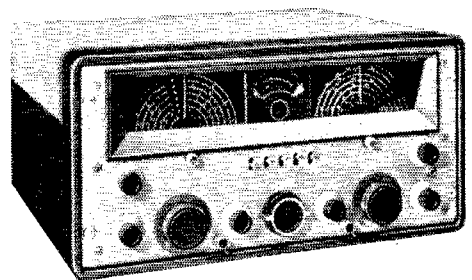
the project reflects great credit on every member of the amateur fraternity.

Hallicrafters is proud of its part in providing equipment for this worthwhile project. But the real credit, the glory, if you like, goes to the gallant crew that put out a good signal from Clipperton Island.



Hallicrafters SX-88s were the receivers used. This sweetheart of a receiver is an outstanding new design. Two RF stages, double conversion, super-sharp 50 KC second IF, crystal controlled second conversion oscillators and precision gear-drive tuning are a few of the features.

Regular Hallicrafters HT-20 transmitters were used at Clipperton Island. Completely TVI suppressed, this transmitter delivers 100 watts of carrier power with high level (Class AB2) modulation on any band. This compact, efficient design proved itself on Clipperton Island.



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Section Communications Managers of the ARRL Communications Department

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

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			Seattle 5
			Honolulu 17
			Boulder City
			Los Gatos
			Berkeley 9
			San Francisco
			Dunsmuir
			Turlock
			Charlotte
			North Charleston
			Winchester
			Forest Hills, Charleston 4
			Denver
			Bountiful
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is a noncommercial association of radio amateurs, bonded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio art and of the public welfare, for the representation of the radio amateur in legislative matters, and for the maintenance of fraternalism and a high standard of conduct.

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

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

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

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



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38 La Salle Road, West Hartford, Connecticut

Technical Consultant PHILIP S. RAND, W1DBM
Route 58, Redding Ridge, Conn.

Assistant Secretaries:
JOHN HUNTOON, W1LVQ LEE AURICK, W1RDV
PERRY F. WILLIAMS, W1UED
38 La Salle Road, West Hartford, Connecticut

DIRECTORS

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ALEX REID VE2BE
240 Logan Ave., St. Lambert, P. Q.
Vice-Director: Reginald K. Town VE7AC
2879 Gravelley St., Vancouver 6, B. C.

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217 Highland Ave., Salem, Ohio

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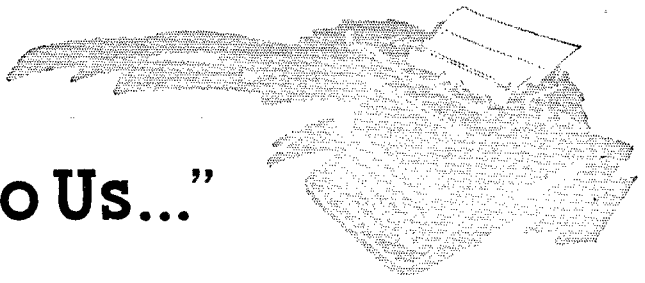
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A DAVID MIDDLETON W5CA
9 Kay Road, Tjeras, N. M.
Vice-Director: Carl C. Drumetter W5EHC
5824 N.W. 58th St., Oklahoma City 12, Okla.

"It Seems to Us..."



IT'S OUR JOB, NOW

We amateurs are now called upon to shoulder a considerably greater responsibility than ever before in maintaining the examination standards for amateur tickets.

As reported in detail in last month's *QST*, Novice and Technician exams will henceforth be given only through the mail procedure. To put it more directly in terms of what it means to us amateurs: Future applicants for Novice and Technician licenses will never see an FCC man. Their license examinations, both code and theory, will be conducted by us. We will administer the code test and supervise the written examination, certifying that it was conducted according to the rules. While the actual grading of the written exam will be done by an FCC engineer at his office, the certification of the code test will be our responsibility.

In addition, applicants for "standard" amateur privileges living more than 75 miles (instead of the former limit of 125 miles) from an FCC quarterly examination point are now eligible to take the exam by mail, in which case it is known as Conditional Class. Here again we shall have the responsibility of certifying the code test and supervising the written exam of a larger number of applicants.

The effect of these two new procedures is to place on the amateur body the task of conducting and supervising well over half of the total examinations given in the amateur service. Up until now something on the order of 10 per cent or less of all amateur exams have been conducted on a mail basis.

We know that amateurs will tackle this expanded job heartily, in full cooperation with aspirants to our hobby. We know, further, that amateurs will strive to maintain the high standards of examination procedure which have been established by Commission engineers over so many years. Forgive us, then, if we take a moment to moralize on our responsibility to the Commission, to ourselves, and — most important — to the institution of amateur radio. We do so largely because newcomers to our ranks in the last few years may

not be fully aware of the traditions in this respect, nor of the importance of the new responsibility we are now called upon to shoulder.

The examination standards are set up by the Commission. The dividing line (passing grade) is established in the amateur rules. Either an applicant passes, or he doesn't. When a Novice aspirant misses the code by a gnat's eyelash, through copying only 24 letters consecutively instead of the required 25, it may wring the heart of the FCC Engineer, but he doesn't let his sentiment interfere with his sense of fair play. He applies the same yardstick to each applicant.

It is of vital importance that we do the same. We're all human, and some of us may have inclinations to use our own judgment instead of adhering strictly to the rules . . . (we know Bill can copy 5 w.p.m. . . . he's just nervous today while he's taking the test . . . why, we've seen him take 8 w.p.m. solid at times . . . so it ought to be okay to certify him only for 5 . . .).

Let's not fool ourselves. We are being delegated the authority — and privilege — of conducting the examination, not of using our judgment on how it should be done. The rules of procedure are crystal-clear. We should follow them meticulously.

Let's be frank. The occasional unlicensed guy who has barely flunked his exam and then tries to bootleg receives, rightfully, all our indignant wrath and official prosecution. Ask yourself: Is he really any different from the holder of a ticket whose amateur examiner "fudged a little" on administering the exam?

The standards of amateur examination procedures are now to a large extent ours to uphold. The Commission has an outstanding record of fairness and impartiality over many years in its treatment of amateur applicants. We think it can be said in general that the past amateur handling of mail exams has been similarly held on a high plane. It becomes now an even greater responsibility on our shoulders to maintain these high standards. Any lessening, however slight, can only have an adverse effect on the long-term future of our hobby.

New Record on 10,000 Mc.

W7JIP and W7OKV Set 47.4-Mile 3-Cm. Mark

• When W7OKV and W7JIP worked just under 23 miles on 10,000 Mc., as detailed here, they did not know that a British record of 27 miles had been made previously. When they learned that their work was an American record, but not a world-wide one, they immediately went out to better it. On April 10th they extended their distance to 47.4 miles, a world record for the frequency. Next shot: 120 miles. Any challengers?

THE cover of May *QST* carried a photograph of the principal participants and some of the equipment used in record-breaking work on 10,000 Mc. On Saturday afternoon, March 13th, W7OKV/7 at Rocky Point, on the Columbia River north of Portland, Oregon, carried on 3-cm. communication with W7JIP/7, atop Mt. Scott, a 1000-foot elevation in southeast Portland. Signals were S9-plus over the path of 22.8 miles, a new American record for this band.

Gear used in the work was an ingenious combination of surplus conversion and home construction. The basic equipment included two klystron units from surplus APS-15 radar gear, two 30-Mc. i.f. strips from similar units and one

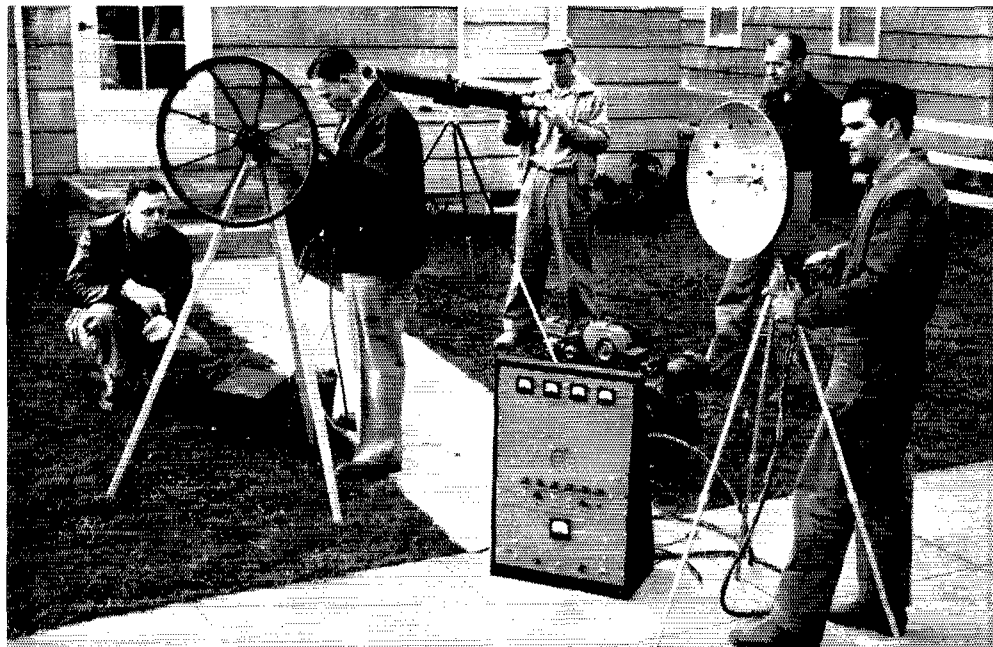
parabolic reflector and antenna stub. The other parabola was homemade. The klystron units included two 723A/Bs, two 30-Mc. preamplifier stages using 6AC7s, and the crystal mixer. Two surplus ASD radar receiver units were also used.

In one station a dual regulated power supply, with both positive and negative voltages variable from 0 to 450, was used on the shell and repeller of the klystron. In the other station two VR-150s maintained the klystron shell at a positive 300 volts. Negative repeller voltage came from two VR-105s, the applied voltage being variable from 0 to -210 through a 0.1-megohm potentiometer.

The klystron oscillators were frequency modulated initially by connecting a single-button carbon microphone transformer secondary in series with the negative leader to the repeller. Hum was troublesome when the transformer was mounted in the power supply, so it was moved into the space normally occupied by the relay in the i.f. preamplifier unit. A further improvement in modulation was achieved by going to the modulator arrangement shown in Fig. 1. This was tried after the record DX attempt and has since been incorporated behind the parabola of W7JIP's rig, as shown in one of the photos.

Modification of the klystrons to raise the frequency into the amateur band was done by

A final check of all gear is made before setting out for a 10,000-Mc. record attempt. At the left are W7OAY and W7OKV. W7JSK stands in the center with his telescope. At the right is W7JIP with W7HAE in the background. The rack-mounted rig of W7JIP includes power supplies and receiver i.f. and audio.

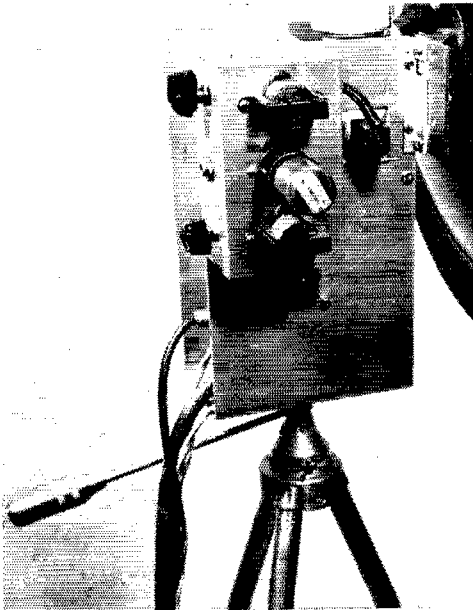




Len Garrett, W7JIP, searches for the signal of W7OKV/7, while Jim Rhoades, W7JSK, lines up the exact bearing with his homebuilt telescope. Location is Mt. Scott, a 1000-foot elevation in southeast Portland.



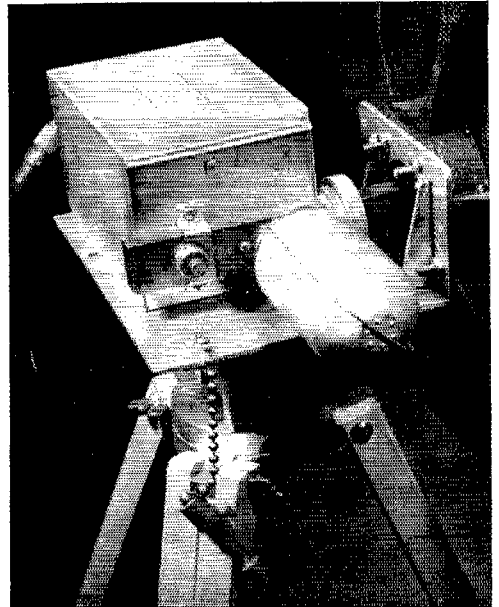
Close-up view of the antenna and pre-amplifier mount of W7JIP. Small chassis is the modulator of Fig. 1, a refinement added after the record attempt.



At Rocky Point, on the Columbia River north of Portland, Ralph Harris, W7OKV, lines up his homebuilt parabola on W7JIP/7. Charles Rose, W7OAY, checks arrangements on 144 Mc.



Rear view of the W7OKV parabola, klystron unit and i.f. preamplifier. Curve for the parabola frame was made according to Fig. 2. Equipment was powered by an emergency generator.



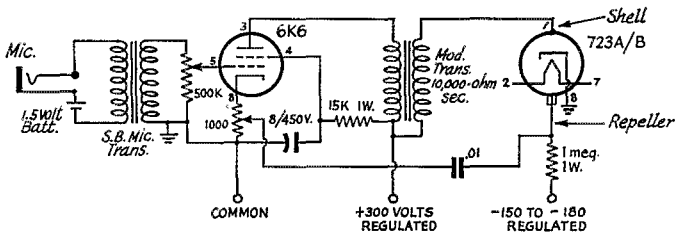


Fig. 1—Schematic diagram of the method used for frequency modulating the 723A/B klystron oscillator. The potentiometer at the 6K6 cathode is adjusted for best audio quality in the receiver.

following the instructions given by McGregor in February, 1947, *QST*.¹ The method of frequency measurement given in this article was also used in one station. Frequency measurements were also made using the "wireless Lecher wire" system described in September, 1948, *QST*, page 10. A refinement of this method uses a micrometer to move a metal vane in close proximity to the antenna termination. It is desirable to place the frequency as close to the low end of the band as possible, to take advantage of the already small amount of power output available.

Power output of some klystrons falls off more rapidly as frequency is raised than with others. If a choice of tubes is available, select the ones that have the highest possible output in the band. Crystals also vary considerably in effectiveness and should be selected for maximum signal/noise ratio. In these units the best results were obtained from 1N21B and 1N23B crystals with currents of 0.3 to 1 ma. from the klystron oscillator output.

An antenna termination was made after the pattern of that shown in McGregor's article. Flanges and RG-52/U waveguides were salvaged from the receiver fittings. The parabolic reflector for the W7JIP set-up was a surplus dish.

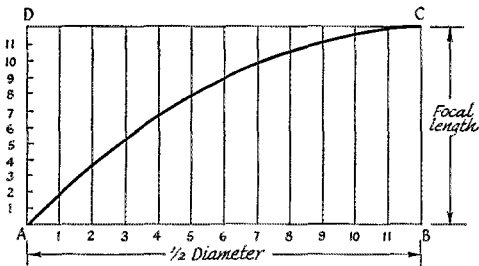


Fig. 2—Method for laying out a parabolic curve used by W7OKV. Line AB, half the dish diameter, is divided into a number of equal segments. Line AD, the focal length, is divided into the same number of equal parts. Lay a straight-edge on point 1 on AD and point C and mark intersection on first vertical line. Repeat from point 2 to C, marking second vertical line. Continue through all points in this way. Join points so marked with the aid of a French curve, or place pins at each point and bend a wire so that it touches each pin and mark along the wire.

W7OKV's reflector was homemade. Details of laying out a parabolic curve as used by W7OKV are given in Fig. 2.

A communications receiver with a very broad i.f. passband was tried as an i.f. and audio system

¹"Dishing Out the Milliwatts on 10 KMc.," McGregor Feb., 1947, *QST*.

following the crystal mixer, but it proved unsatisfactory because of the instability of the klystron oscillators. An SF Radar 30-Mc. i.f. strip provided a 3-Mc. passband. An r.f. gain control connected in the i.f. cathodes is an asset for close-in checking, and for reducing mixer noise at a distance.

The i.f. system is operated from a 150-volt regulated supply. An a.f.c. system similar to that used in microwave path-testing gear is used. The modulation is essentially f.m., so tuning slightly off-center (slope detection) produces reasonably good quality.

Signals over the paths of 22.8 and 47.4 miles were of excellent strength, so it is felt that contacts far beyond these distances will be possible. Other tests are to be made in the near future, the next at a distance of 120 miles.

Amateurs of the Portland area who assisted in setting up the equipment and clearing away brush included W7s DJI KBO HAE OAY and JSK. W7JSK brought along his homebuilt 118-power reflecting telescope to aid in spotting. Photographs are by W7PPQ.

— E. P. T.

Strays

Ever hear of the fellow who was RST 520? As noted by W1YYM, ARRL Oklahoma SCM W5RST has been W2RST and W0RST.

W0BLZ recently was thanked by a W7 for QSLing a past contact. The seven's call didn't ring familiar so W0BLZ asked him for the approximate date of their previous QSO. The reply: "May, 1932." — W0RRN

W4WWW answered W6FHR's CQ and then began to fade out. W4WWW then called W6FHR on W4WWW's frequency. Added coincidence: W4WWW turned out to be an old friend of W6FHR's family—neither W6FHR nor W4WWW had known that the other was a ham.

Hamdom's old-time traffic pushers will regret to note the passing of Howell C. Brown, W6BPU, past ARRL SCM, Los Angeles Section. In addition to other League affiliations and appointments, W6BPU was very active in Army Amateur Radio System doings in the 1930s and served as Radio Aide to the Signal Officer, 9th Corps Area.

Some Principles of Radiotelephony

PART II — Plain Talk About A.M. Fundamentals

BY BYRON GOODMAN,* WIDX

• Part I appeared in the May issue. Although Part II is complete in itself, it is highly recommended that Part I (and Technical Topics in this issue) be read before the second installment. — ED.

Modulator Power

Apparently, one of the most confusing points about a.m. radiotelephony is the need for modulator power. Since the Year 1 amateurs (and commercials) have been looking for a means for feeding a low-powered audio signal into a big transmitter and getting out a husky 'phone signal. They're still looking.

We can think of only two general classes of modulation systems. One would be where r.f. power fed into the modulated stage is controlled, and the amount of r.f. appearing in the output is dependent upon the instantaneous value of the modulating signal. This could be represented as in Fig. 7A, and a typical example is a diode-modulator circuit. The modulated stage is not an amplifier of any kind — it is simply a point where r.f. power from another source can be controlled by a modulating signal.

The other general class of modulation system would be one where a modulated amplifier stage is involved. Here a relatively small r.f. signal is amplified by the stage to deliver a large r.f. power output. Any such device will, of course, have a d.c. power supply associated with it, since the increased power must come from somewhere, and the amplifier actually only transforms the d.c. power into r.f. It doesn't do this job completely — some of the d.c. power is used up by the stage in the process. A high-efficiency amplifier might transform 75 per cent of the d.c. power into r.f. power, while an inefficient one might deliver only 30 per cent. If the efficiency of the modulated stage is constant over a given range of d.c. input voltage, we can modulate the stage by using the modulating signal to control the *input voltage*. This is illustrated in Fig. 7B. If, however, the efficiency (and input current) of the stage can be varied by the modulating signal, then we can modulate the output by using the audio signal to control the *efficiency* (and input power) of the stage. This is illustrated in Fig. 7C.

The first example of a modulator, shown in Fig. 7A, is seldom used except at low power levels, and is of little more than academic interest in this discussion. The other two examples are the ones commonly used in transmitters.

Let's examine the example of Fig. 7B more closely. Since we know (even without showing an actual circuit) that the modulated amplifier is taking d.c. power from the d.c. voltage source, we can represent the amplifier by a resistance capable of dissipating that power. Further, we have agreed that the efficiency of the amplifier is constant, so we also know that this resistance is a constant one (not changing in some way with applied voltage), or else the control of the

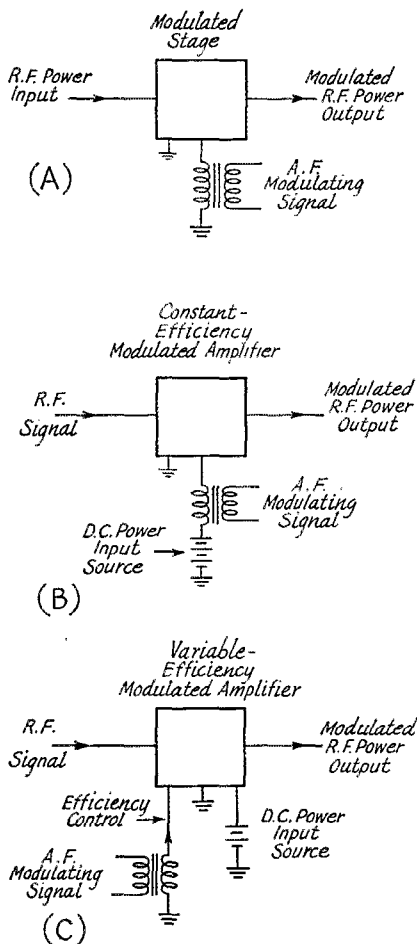


Fig. 7 — Three possible methods for modulating a radio signal.

(A) The modulating signal controls the passage of r.f. energy through the modulated stage. A diode modulator stage is an example of such a method.

(B) The modulating signal varies the power input to a constant-efficiency r.f. amplifier.

(C) The modulating signal varies the efficiency and input current of a variable-efficiency r.f. amplifier.

*Assistant Technical Editor, QST.

input voltage by the modulating signal must also vary in a similar manner. While this might be done, it would be an unnecessarily complicated system.

Thus we have a constant resistance, a d.c. source and an a.c. source connected in series, as in Fig. 8A. We have omitted any mention of r.f. now because we know that the r.f. output voltage is some constant percentage (the efficiency) of

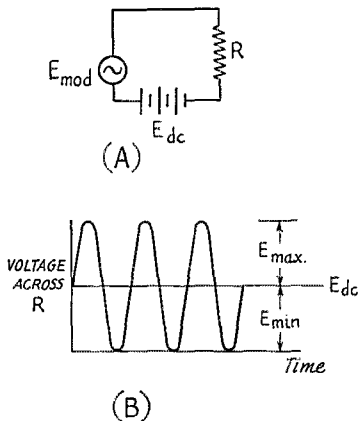


Fig. 8— Fig. 7B looks like (A) above to the d.c. power source and the modulating-signal source. (B) For 100 per cent modulation of the voltage applied to R in (A), the applied voltage will vary with time in this manner. E_{max} and E_{min} represent the voltage swings above and below the steady E_{dc} .

the input voltage. Our problem is to find what power, if any, must be furnished by the audio source, E_{mod} , for the maximum-permissible modulation percentage of 100.¹

The d.c. source puts a voltage E_{dc} across the resistor R , and the audio source, E_{mod} , also develops its voltage across R . Maximum modulation will occur when the voltage across R is being swung up to a value equal to twice E_{dc} and back down to zero, as in Fig. 8B. This is obvious, of course, and it can be seen that the maximum and minimum peak swings, E_{max} and E_{min} , are equal in value to E_{dc} .

To see what all this means in the way of power in R , let's first review what we mean by power. In a d.c. circuit it is, of course, simply I^2R or $E^2 \div R$. I and E have steady values, so it's easy to know what numbers to use. In an a.c. circuit, it's a little more complicated, because the current or voltage is not constant but is changing rapidly, as in any of the sine-wave representations we have shown so far.

In scientific circles, "power" is called the "time rate of doing work." It might be considered a special kind of average. To illustrate this double-talk, let's look at Fig. 9.

In Fig. 9A, a resistor R is connected to a voltage source, E_{dc} . We know that the current through the resistor is $E_{dc} \div R$, and it will be constant with time unless we change E_{dc} or R .

¹ Why the maximum-permissible modulation percentage is 100 was explained in Part I.—Ed.

Fig. 9B shows a similar case with an alternating voltage source, E_{ac} , and the problem is to find what peak value of E_{ac} will do the same work as E_{dc} is doing. Now the only work that the current does in flowing through the resistor is to heat it, so here is our common factor. We recall that the power dissipated in the resistor for the d.c. case, and hence the power supplied by the d.c. source, is I^2R or $E^2 \div R$.

We can draw a curve for this as in Fig. 9C. When we try to do the same thing for the a.c. circuit, we're stumped. At least we are until we treat each little period of time separately. Then it isn't too difficult. All we have to do is to take the value of current at that instant, square it, and multiply by the resistance. When we do this we get a new curve that looks like Fig. 9D. This turns out to look like a sine wave of twice the frequency of the original. You could call this a graph of the "instantaneous power" (but be careful how you use that expression, "instantaneous power"). What we want to find is how the a.c. of Fig. 9B relates to the d.c. of Fig. 9A when they both have the same heating effect on R . It's obvious that if the frequency of the a.c. were very low, the heat changes in R could be detected if we were brave enough to touch the resistance, but any a.c. we would be working with would be of a frequency high enough so that the heat changes during a cycle wouldn't be apparent. So at any practical frequency it must reach an "average" of some kind. The mathematicians will tell you that the "average" of a curve like this can be obtained by taking the area under the curve (shown shaded) for a given time interval and dividing it by the time. The answer is a single value that, working over the same time interval, would give the same total area. But the value of our power for the d.c. case is just the same thing — it is a figure that, over a given time interval, gives the area under the curve (shaded portion of Fig. 9C). You can tell by just looking at the two power curves that the peak "instantaneous power" for the a.c. case is a high value compared with the d.c. case.

It all works out, if you dive into the mathematics of it, that an a.c. with a peak-to-peak swing of 2.828 amperes has the same heating effect as a d.c. of 1.0 amperes. With a peak-to-peak value of 2.828, the peak value is half of this, or 1.414. If the peak value is 1.0, the d.c. equivalent value is 0.707. This d.c. equivalent value is called the "effective" or "r.m.s." ("root-mean-squared") value — it's what an a.c. ammeter indicates for you. There are devices known as "peak meters" that can indicate peak values for you — they're useful for measuring a.c. that is made up of more than a pure single frequency, where the relationship between peak value and r.m.s. value is not known as it is in this case.

Now let's get back to that modulator-power requirement. Referring again to Fig. 8B, we can recall that in this 100-per-cent-modulation case, $E_{dc} = E_{max} = E_{min}$. With our new-found knowl-

edge about a.c., we see now that the effective value of E_{mod} is 0.707 of the peak value, and since the peak value is E_{max} (or E_{min}), the effective value of $E_{mod} = 0.707 E_{max}$. Without knowing about the a.c., we knew that the d.c. source E_{dc} was delivering power to the load R that can be computed by

$$\begin{aligned} \text{Power supplied by } E_{dc} &= \frac{E_{dc}^2}{R} \\ &= \text{d.c. power} \\ &\quad \text{supplied.} \end{aligned}$$

Independent of this, the source E_{mod} furnishes power computed by

$$\begin{aligned} \text{Power supplied by } E_{mod} &= \frac{(0.707 E_{max})^2}{R} \\ &= \frac{0.5 E_{max}^2}{R} \end{aligned}$$

Since E_{max} has the same value as E_{dc} , we see that, in a constant-efficiency modulation circuit, with 100 per cent sine-wave modulation, the modulator must furnish power equal to one-half the d.c. power supplied to the modulation circuit.

There is one point you shouldn't overlook. We said nothing about the efficiency of the modulated stage except that it was constant. It might be only 40 per cent or it might be as high as 75 per cent, but we would still need the same amount of modulator power for 100 per cent modulation. We need power to swing the voltage around on the modulated stage, and there is no way around it. Of course, if the modulation percentage is less, we will require less power from the modulator. If the modulating signal is a complex one, like voice, in which the r.m.s. value is less than 0.707 of the peak value, then we will require less modulating power. But the modulating-power source should be capable of

delivering the power necessary for 100 per cent modulation with a sine wave.

By now you're itching to ask about the other modulation system, the one in which the efficiency is varied by the modulating signal (Fig. 7C). This looks like pay-dirt territory, because conceivably the unnamed "efficiency-control" circuit has a high effective resistance, and it won't take much modulator power to swing it all over somebody's half acre. Quite true. Such circuits can be made in which the modulating voltage can be developed across a high resistance and the power involved is low (control-grid modulation is an example). But you still pay a price. For a starting point, remember that we must swing the efficiency up and down about a mean level. It is obvious that the maximum efficiency that we can swing up to is the maximum the tube is capable of (maybe 75 per cent, with your fingers crossed). So our mean level, or "operating" point, will be down to half of this, or 37 per cent, in the best possible case. And because the efficiency is low, and the tube itself is dissipating most of the input power, the input to the stage must be lower than what could be run with higher efficiency. Otherwise the tube would overheat. The net effect is that the carrier output power is about one-fourth what would be obtained from the same tube and a constant-efficiency modulation system.

So back to the "constant-efficiency" modulation systems. You probably have recognized by now that plate modulation falls under this heading. The plate-modulation case is clear-cut: The modulator swing applied to the plate circuit must have a peak swing equal to the d.c. plate voltage, and this means a modulator-power requirement of one-half the d.c. plate power source. The tube can run at its best efficiency of as high as 70 or

75 per cent, and we can get out a husky and fully-modulated carrier, if we will supply the necessary (and perhaps expensive) modulator power.

How about screen modulation? The screen circuit doesn't take much d.c. power, so the modulator power requirements are low. Quite correct. But how do you go about getting that necessary "operating point," about which the screen voltage will be varied? If we make it the normal screen voltage for the tube used as an r.f. amplifier, we're going to swing it up to twice this voltage on peaks. Two things can happen. The tube can burn up because it's being overloaded. Or the output can increase without hurting the tube, showing that we weren't getting as much out in the first place as we could have got.

How, then, can we modulate this amplifier via the screen grid? The only way is first to find what the tube can do as a straight r.f. amplifier, and then cut the screen voltage back to about one-

(Continued on page 118)

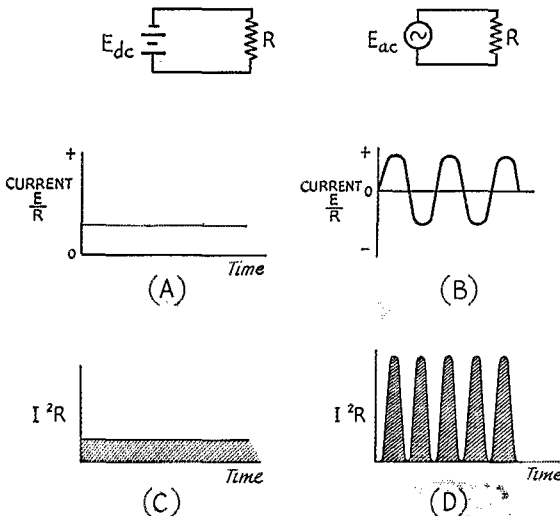


Fig. 9 — (A) A d.c. source and load R , with a plot of current vs. time.

(B) An a.c. source and load R , with a plot of current vs. time.

A plot of $I^2 R$ vs. time for the d.c. case (C) and for the a.c. case (D). Notice that each cycle in (B) gives two cycles in (D).

A Bandswitching 813 Rig with Pi-Section Output

10 Through 160 with 3 Stages

BY ROBERT M. RESCONSin,* WITRF

• Here is a straightforward three-stage bandswitching rig that will handle an output of up to 400 watts on all bands from 10 to 160. If you happen to have a surplus BC-375E in your attic, or know someone who has, many of the components can be used to cut down the cost.

I WONDER how many of the proverbial BC-375 transmitters are lying idle while their owners wonder what to do with the monsters. The one in my cellar has always taken all kinds of abuse, being gradually stripped of its excellent switches, dials, etc. However, it wasn't until more recently that the rotary inductor in the antenna circuit struck my eye and rang the bell. It's a natural for a pi-network final, complete with a dandy turn-counter dial. There's also a good variable in the same unit that will serve as the input condenser.

Before I had the thing stripped out of the chassis, the rig was starting to take shape in my mind. I was sure that with a little careful planning, it could be worked out. Almost automatically, I latched on to one of the stripped-out tuning units to provide a shielding enclosure that would make any sheet-metal man sweat to duplicate. With this was born a rig that has proved to be one of the most favorite ever to grace this shack.

Circuit Details

The circuit line-up, shown in Fig. 1, consists of a 6AG7 crystal oscillator-multiplier, an intermediate multiplier-driver using a 2E26, and an 813 final amplifier. The low-power stages are individually switched and tuned, to permit greater flexibility. Capacity coupling and parallel plate

* 215 Main St., Rocky Hill, Conn.

feed are used throughout. The amplifier output is provided with a matching network that makes use of the variable inductor L_7 and variable condenser C_{21} found below it in the antenna-tuning section of the BC-375. A separate inductor, L_6 , was found preferable for 10-meter operation and, for 160, additional inductance, L_8 , can be cut into the circuit by S_8 . The variable output condenser, C_{25} , is a small 300- μf . unit with receiving spacing. This condenser can be padded by the additional fixed capacitances of C_{22} , C_{23} and C_{24} , using S_6 .

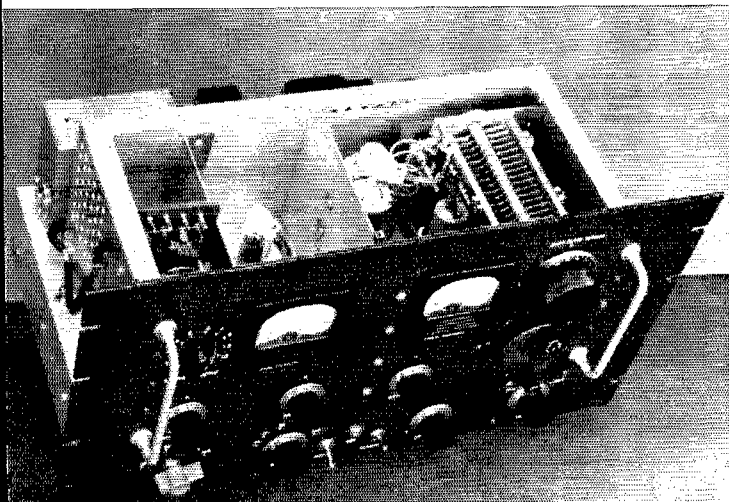
Cathode bias is applied to the driver stage, and the 813 is protected by a 6Y6G clamp-tube circuit while the oscillator is keyed. A small fixed link, L_2 - L_5 , is used to neutralize the 2E26. In this layout, the 813 did not require neutralization. It should be borne in mind, however, that in a different physical design, means may have to be provided to insert neutralization.

S_1 is the crystal selector, and S_2 is used to short the cathode of the oscillator to ground when a VFO is fed to the 6AG7. (The VFO should not be keyed.) Small mica condensers, C_3 and C_{15} , are cut in by the oscillator and driver bandswitches in the 160-meter position, adding enough capacitance to get the circuits on this band. The 30-meter tap on L_1 permits getting drive for the 813 on 15 by tripling from a 3.5-Mc. crystal in the oscillator output, and doubling in the 2E26.

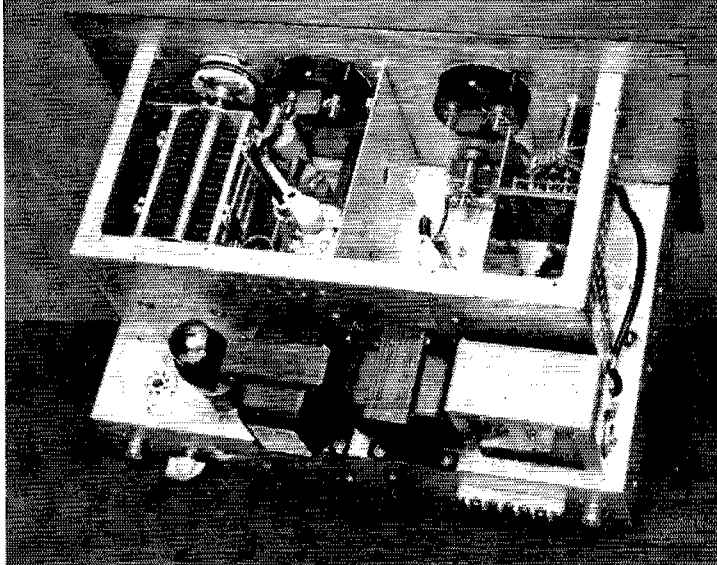
The potentiometer in the screen of the 2E26 is used to control the grid drive to the 813. S_3 switches the 25-ma. meter between the exciter + h.v. lead and the grid circuit of the 813. V.h.f. filtering is installed in all power-input leads, and all power wiring is done with shielded wire to minimize harmonic radiation. Both 6.3- and 10-volt transformers are included on the chassis.

WITRF's 813 transmitter, showing the arrangement of controls on the panel. The separate 10-meter coil for the pi-section output circuit is partially hidden by the 813.

QST for



Top view of the 813 transmitter. The shielding enclosure (in this instance taken from a surplus BC-375) is approximately $7\frac{1}{2}$ inches deep, 6 inches high, and 15 inches long. The two doorknob condensers at the top and bottom of the 813 plate choke in the compartment to the left are C_{18} and C_{20} . C_{25} is partially hidden by the compartment shield. In the section to the right, C_{14} , and the tops of the 2E26 and the 6AG7 are visible. C_6 is hidden by the crystal holder and selector switch. The 6Y6G and the two filament transformers are along the rear. (The aluminum box to the right contains the tube unit of the remotely-tuned VFO described in *OST* for January, 1953, and recent editions of the *ARRL Handbook*. The socket to the left is not in use.)



Construction

The transmitter is laid out on a $10 \times 17 \times 3$ -inch aluminum chassis, using the enclosure from a BC-375 tuning unit as the housing for the r.f. section. The standard rack panel is 10 inches high. The original partition shield is retained to separate the driver and final stages. The rotary coil, L_7 , and the pi-section input condenser, C_{21} , are mounted at the right-hand end of the chassis. The coil is placed with its frame resting on the chassis. It is necessary to drill four $\frac{1}{2}$ -inch holes in the rear of the enclosure to clear the rear assembly nuts on the coil frame.¹ The condenser is suspended above the coil on L-shaped aluminum brackets from the end wall of the enclosure.

The 10-meter coil, L_6 , is mounted between the rear terminal of L_7 and the rear stator terminal of C_{21} . The National R-175 plate choke, RFC_1 (modified as indicated under Fig. 1), is placed to the right and forward of the 813. C_{18} is suspended between the choke and the front stator terminal of C_{21} , while C_{20} is mounted on the chassis, near the bottom of the choke.

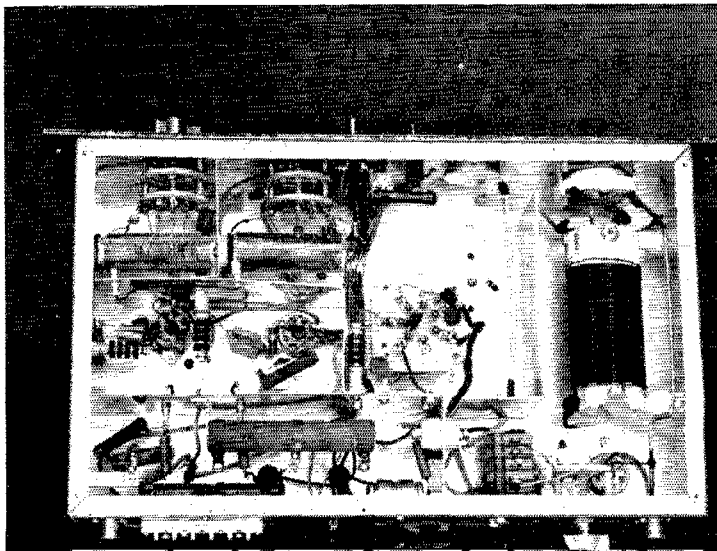
¹ It should also be possible to use the B & W 3852 rotary inductor, which has an inductance of $15 \mu\text{h}$., although it will probably be necessary to lay it on its side to fit it into the available space. — Ed.

The oscillator and multiplier tuning condensers, C_6 and C_{14} , and the pi-section output condenser, C_{25} , are mounted directly on the chassis. C_{25} is placed immediately in front of the 813. The width of the oscillator compartment at the left end of the enclosure is determined by the width of the Johnson 126-120-1 multiple-crystal holder. The selector-switch shaft, and the shaft of the oscillator tuning condenser, C_6 , are centered on this compartment. Then, the multiplier tuning condenser, C_{14} , is placed so that its shaft comes midway between those of C_6 and C_{25} . From left to right on the panel, S_3 , S_4 , the excitation control, and S_6 are spaced symmetrically along the lower edge, with S_3 , the key jack, and S_7 grouped at the center. S_3 and S_4 are lined up with their respective tuning-condenser controls. The meters may require shielding in TV fringe areas.

The two filament transformers and the 6Y6G clamp tube are lined up along the rear of the chassis. Along the back drop are the control for S_5 , power terminals, and coax connectors for r.f. output and VFO input.

Underneath, the two tapped exciter coils, L_1 and L_4 , are to the rear of their respective switches, each held in place by cementing it to a 1-inch cone insulator fastened to a wall of the

Bottom view of the 813 transmitter showing the internal shielding. The two exciter coils and their switches are at the upper left. Below are the 6AG7 and 2E26 sockets and associated components. The 813 screen voltage-dropping resistor and power-lead v.h.f. filter components are partitioned off at the bottom. To the right are the 160-meter output loading coil, and fixed padding condensers, C_{22} , C_{23} and C_{24} . The 813 socket is near the center.



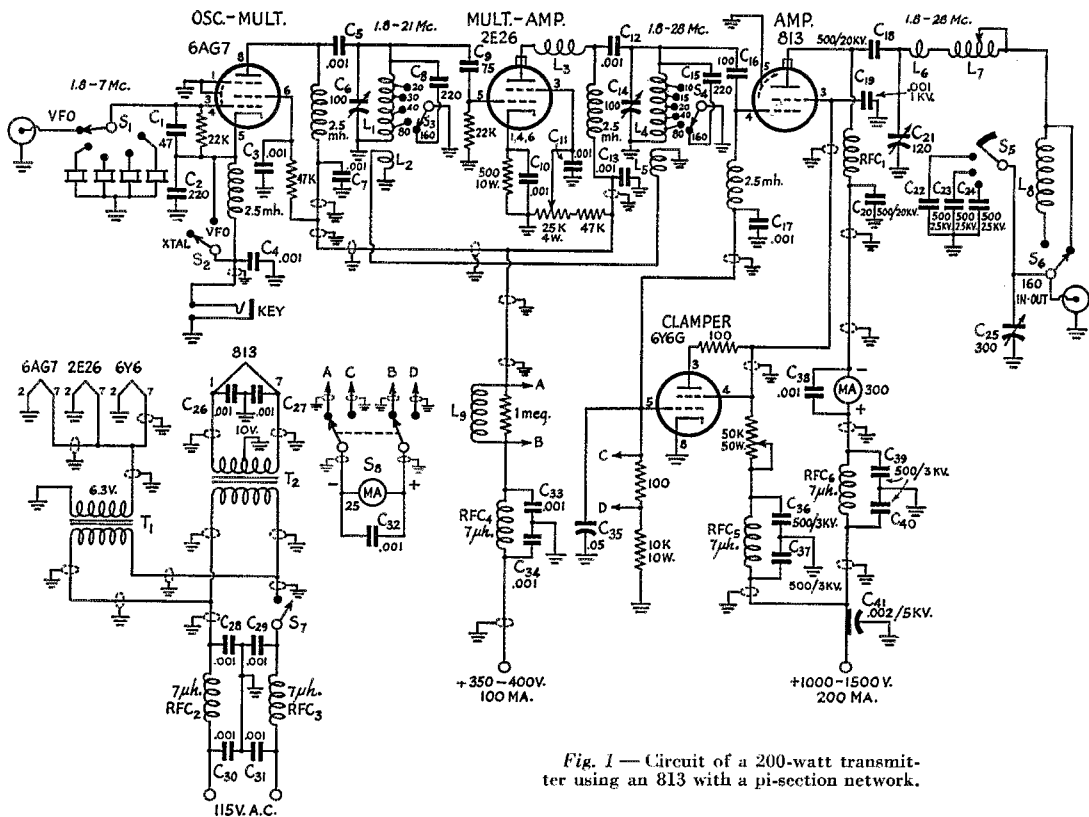


Fig. 1 — Circuit of a 200-watt transmitter using an 813 with a pi-section network.

- C₁, C₂ — Silver mica.
 C₃, C₄, C₅, C₇, C₁₀, C₁₁, C₁₂, C₁₃, C₁₇, C₁₉, C₂₆, C₂₇, C₂₈, C₂₉, C₃₀, C₃₁, C₃₂, C₃₄, C₃₆, C₃₇, C₃₉, C₄₀ — Disk ceramic.
 C₆, C₁₄ — Midget variable (Bud MC-1855).
 C₈, C₉, C₁₅, C₁₆, C₂₂, C₂₃, C₂₄, C₃₂, C₃₃ — Mica.
 C₁₈, C₂₀ — TV doorknob ceramic.
 C₂₁ — 3000-volt variable — see text (Cardwell MT-150-GS).
 C₂₅ — Midget variable (Bud MC-1860).
 C₃₅ — Paper.
 C₄₁ — Coaxial (Sprague 47P16).
 All resistors ½ watt unless specified otherwise.
 L₁ — 20- μ h. total — 48 turns No. 20, 1-inch diam., 3 inches long (B & W 3015 Miniductor) tapped at 8, 11, 17, and 31 turns from ungrounded end.
 L₂, L₅ — 3 turns No. 18 insulated.
 L₃ — 10 turns No. 18 air-wound. Length should be adjusted as necessary to suppress v.h.f. parasitic oscillation.

- L₄ — Same as L₁, tapped at 4, 6, 10, 20, and 31 turns from ungrounded end.
 L₆ — 5 turns No. 10, 1½-inch diam., 3 inches long.
 L₇ — 25 μ h. — Rotary inductor from BC-375E antenna-tuning section (see Footnote 1).
 L₈ — 56 μ h. — 60 turns No. 14, close-wound on 1½-inch form. (This form was taken from one of the BC-375 tuning units.)
 L₉ — Meter shunt — 44 turns No. 24 enam., close-wound on 1-watt 1-megohm resistor.
 RFC₁ — National R-175, modified as in QST, October, 1952; or 1953 or 1954 ARRL Handbook.
 RFC₂, RFC₃, RFC₄, RFC₅, RFC₆ — (Ohmite Z-50).
 S₁ — 10-position single-pole rotary switch.
 S₂, S₇, S₈ — Toggle.
 S₃, S₄, S₆ — Ceramic rotary.
 S₅ — Ceramic rotary, progressively shorting (Centralab P1S wafer).
 T₁ — 6.3 volts, 3 amp. (Stancor P-4089 or similar).
 T₂ — 10 volts, 5 amp. (Stancor P-4096 or similar).

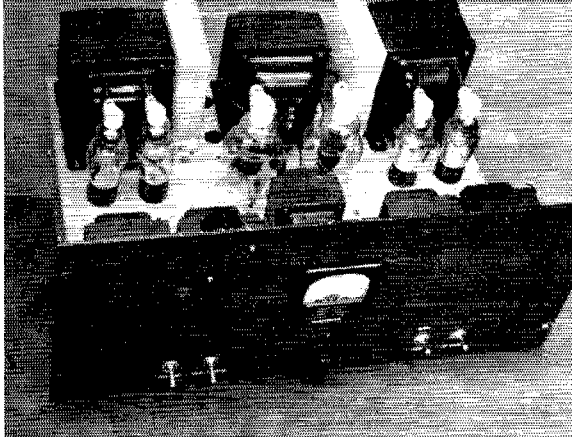
shielding which surrounds and separates them. The two exciter-tube sockets, with their associated components, and the parts that make up the v.h.f. filtering, are also set off from one another by walls of aluminum sheet. There is still another L-shaped shield between the 160-meter loading coil, L₈, to the right in the bottom view, and the 813 socket. The mica output padding condensers, C₂₂, C₂₃, and C₂₄, are grouped close to switch S₅, near the output connector. Coil dimensions are given under Fig. 1.

Operation

Components in the final stage are suitable for operation at a maximum of 1500 volts with

100 per cent plate-screen modulation, or 2250 volts c.w. While there are other combinations that might be used, the tuning table shows typical line-ups in arriving at the desired output frequency. With the 25-ma. meter switched to read exciter current, the current will peak to a maximum when the oscillator output circuit is tuned to resonance, and dip when the 2E26 is resonated. The multiplier stage can also be tuned by switching the meter to the 813 grid circuit, adjusting for maximum grid current. A grid current of 15 ma. should indicate adequate drive to the final. Until one has become familiar with the dial settings, he should check the frequency of the 2E26 output circuit with an absorption wave-

The modulator and dual high-voltage supplies for the 813 transmitter are combined in a single unit.



meter to make sure that it is tuned correctly.

The slider on the 50,000-ohm 50-watt resistor should be adjusted to give a screen voltage of 300 when the 813 is fully loaded and receiving normal excitation. This adjustment should be made, of course, with extreme caution, turning off the high-voltage supply each time before the position of the slider is changed.

The final stage should always be adjusted initially at reduced plate and screen voltage. This can be done by switching a resistance (see power-supply section following) in series with the primary of the high-voltage transformer. Reduction of power during preliminary tuning is advisable not only to make it easier on the 813, but also to save wear and tear on the rolling contact of the output coil.

match to a 50- or 75-ohm flat line on all bands except 160. Here the maximum capacitance of C_{21} limits the match to a minimum flat-line resistance of about 200 ohms. However, on 160, any link line likely to be used between the transmitter output and the antenna tuner will be but a small fraction of a wavelength long, so that at this frequency a mismatch of this order can be tolerated without incurring excessive voltages for the low-pass filter components.

The table shows approximate values of capacitance and inductance suitable for working into a 50-ohm line. These values are selected to provide a Q of 10 to 12 on 80, 40, and 20. On 160, Q is limited by the maximum capacitance of C_{21} to 5 or 6. On 15 and 10, the minimum circuit capacitance makes it impossible to attain a Q lower than 15 or 20.

In adjusting the output circuit when an antenna tuner is used, the input and output condensers should be set to the approximate values shown in the table. Then the roller coil should be set to tune the circuit to resonance, as indicated by the dip in 813 plate current. The antenna tank circuit should be resonated by watching for a peak in plate current. Then the coupling link at the antenna tuner should be adjusted until the loading is correct. The output circuit should be kept at resonance by slight readjustment of the input condenser, C_{21} , as required. If assurance of a flat coax line is desired, it should be checked and adjusted with an s.w.r. bridge, as described in the *ARRL Handbook*.

With the exciter stages operating at 400 volts, and adjusted to give an 813 grid current of 15 ma., the milliammeter should read a total of about 80 ma. with the key closed, and 60 ma.

Stage Tuning for Output on Various Bands

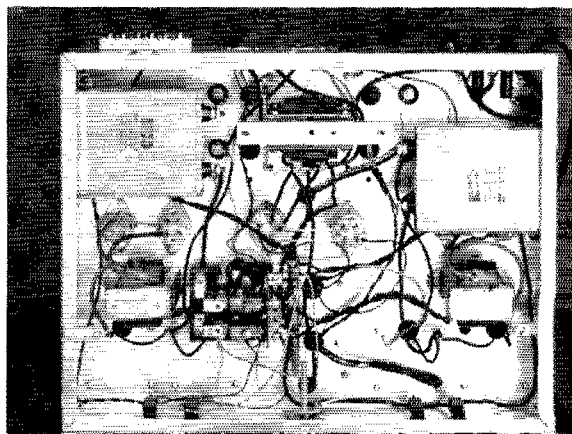
<i>Xtal</i>	<i>Osc.</i>	<i>Mult.</i>	<i>Final</i>	<i>Input</i> ¹ <i>μf.</i>	<i>Output</i> ¹ <i>μf.</i>
160	160	160	160	120	320
80	80	80	80	120	700
80	40	40	40	65	350
80	40	20	20	33	175
80	30	15	15	33 ²	260 ²
80	20	10	10	33 ²	280 ²
40	40	40	40		
40	20	20	20		
40	40	15	15		
40	20	10	10		

¹ Approximate values for 52-ohm output, except 200-ohm output for 160.

² See text.

You may have heard that a pi network will feed r.f. to anything from a knitting needle to a wire fence. However, the truth is that within the practical limits of components, the range of loads into which a network of this type will work satisfactorily is much more limited. Especially from the consideration that the use of a low-pass filter is an almost universal requirement these days, it is advisable to design the network primarily to feed a flat coax line coupled to an antenna tuner. The values given will permit a

Bottom view of the modulator and power-supply unit.



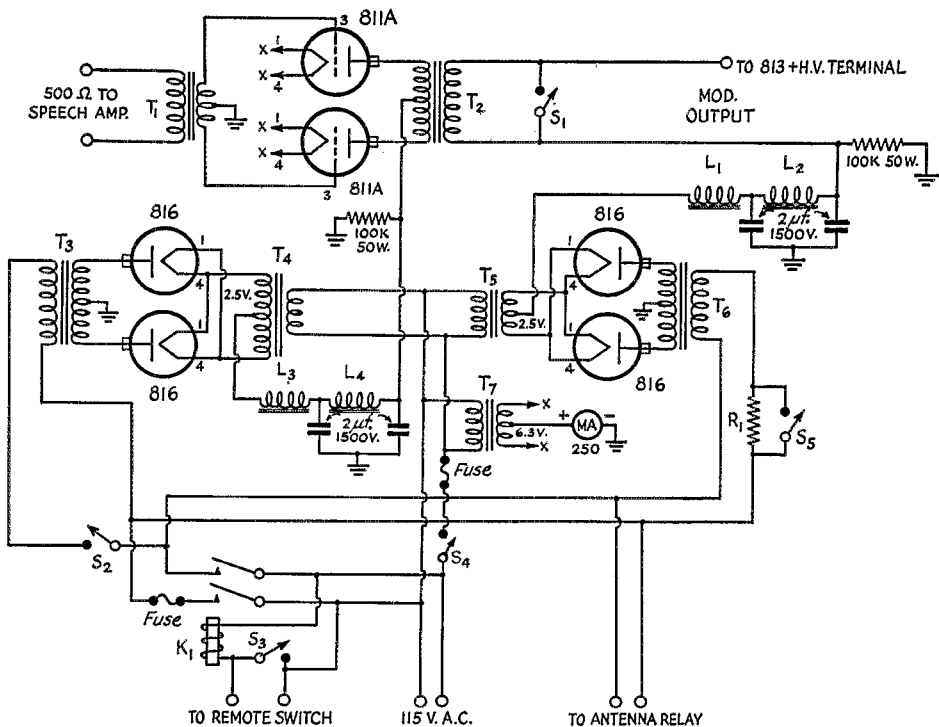


Fig. 2 — Circuit of the modulator and final amplifier power-supply unit.

R₁ — 500-watt electric-heater element.

L₁, L₃ — 200-ma. 2-12-hy. swinging filter choke (Stancor C-1401).

L₂, L₄ — 200-ma. 4.5-hy. smoothing choke.

K₁ — D.p.s.t. 115-volt a.c. relay.

S₁ — Ceramic rotary.

S₂, S₃, S₄, S₅ — Toggle.

T₁ — 500-ohm line to Class B grids — 1:1, pri. to ½ sec. (Stancor A-4765).

T₂ — 100-watt modulation transformer, 7200-ohm pri. to 15,000-ohm sec. (Stancor A-2908).

T₃, T₆ — Plate power transformer: 1000 volts d.c., 250-ma. (Stancor PT-8311).

T₄, T₅ — 2.5-volt 4-amp. filament transformer, 7500-volt insulation (Stancor P-6133).

with the key open. With the final operating at 1500 volts, and loaded to 200 ma., the screen current should be about 35 ma. With the key open, the plate current should drop to about 40 ma.

A Power-Supply and Modulator Unit

Fig. 2 shows the diagram of the final power supply and modulator I use with this rig. Photographs of this unit are included. Separate supplies are used for the 813 and the 811A Class B modulator. Each uses 816 rectifiers, and is provided with a double-section choke-input filter. Opening S₅ inserts R₁ (a 500-watt electric-heater element) in series with the primary of the 813 plate transformer for tuning up at reduced power. S₁ shorts the modulation transformer for c.w. operation. S₄ turns on all filaments in the unit. The d.p.s.t. relay, K₁, is used to control the primaries of both high-voltage transformers. This relay may be operated either by S₃ on the panel of the unit, or by an external switch at the operating position. K₁ also operates the antenna relay. The 250-ma. meter in the center tap of the filament transformer, T₇, supplying the 811As, reads modulator cathode current.

The chassis is 17 by 13 by 3 inches, and the

panel is 8¾ inches high. In the topview photograph, a plate transformer is placed in each of the rear corners of the chassis, with the modulation transformer in between. The rectifier tubes and the modulator tubes are paired immediately in front of their respective transformers. The filter chokes are also paired, close to the panel. The audio input transformer, T₁, is placed behind the milliammeter. Two of the filter condensers are mounted on top, at the rear of the chassis; the other two are underneath.

To the left on the panel are toggle switches S₄ and S₂. S₅ and S₃ are to the right. S₁, at the center, is a ceramic rotary switch.

The bottom view shows the placement of components underneath the chassis. Actually, they are mounted wherever a clear space is available after the parts on top have been mounted. The two rectifier-filament transformers are toward the front, while the modulator filament transformer is located to the rear. The relay is alongside the rectifier-filament transformer to the left.

The caption under Fig. 2 indicates modulator-transformer ratios suitable when the 813 is operating from the power supply described; i.e., 1000 volts, 200 ma.

50-Mc. TVI—Its Causes and Cures (Part I)

A 6-Meter Veteran Shows How To Live with Channel 2

BY F. E. LADD,* W2IDZ

• “Life begins at 50 (Mc.)!” Such is the slogan of a group of determined 6-meter enthusiasts of Northern New Jersey who have survived six years of adjacent-channel living with the country’s first Channel 2 TV station. Their ringleader, W2IDZ, here analyzes the causes of 50-Mc. TVI, in all channels, and points the way to its cure. The effectiveness of his methods is demonstrated by their TVI-free occupancy of their favorite band in an area where too many others have long since given up. You can live with Channel 2. Here’s how!

OPERATION on the 50-Mc. band has been a source of pleasure and satisfaction to many hams over the years. Situated as it is, midway between the most popular DX bands and the higher assignments of the v.h.f. portion of the spectrum, the 6-meter band takes on some of the characteristics of both. There is hardly a kind of propagation that doesn’t show up, at least once in a while, on 6, yet the band has all the desirable aspects of higher frequencies for local work.

But with TV Channel 2 in operation on a countrywide basis, 6-meter activity has almost ceased to exist in many areas. Too many hams have taken it for granted that simply because the band is adjacent to Channel 2 it is impossible to use 50 Mc. in a Channel 2 area without running into extensive neighbor trouble. The 6-meter gang of the New York area and in adjacent northern New Jersey ran into this trouble head on more than six years ago, and many gave up almost at once; some without a struggle.

The writer has operated consistently on 50 Mc. during the entire period. I now live in a semi-fringe area, yet I have never found any TVI that could not be cured. My average power input is 150 watts, and I use a 4-element beam. I can point this array in any direction, despite the presence of eleven TV antennas within 250 feet of my 50-Mc. beam, one of them only 40 feet distant. This condition is duplicated by several other W2 6-meter men who have refused to give in to the Channel 2 threat.

How do we operate on 6 without TVI with stations on Channels 2, 4, 5, 7, 9, 11, and 13 maintaining an 18-hour schedule daily? Before we answer the question let’s look at the nature of the problem. There are five principal sources

of TVI in 50-Mc. work: receiver overload; radiation of harmonics of the exciter and operating frequencies; intercarrier sound images; spurious radiation from receiving equipment; and audio circuit rectification. Let’s take them one at a time.

Receiver Overloading by 50-Mc. Fundamental: Contrary to common opinion, this is not primarily a function of the strength of the television signal. An overloaded TV set results when one or more of the tubes is driven into a nonlinear operating condition. This is in no way caused by the TV signal being weak. If the TV set is overloaded by a local signal, the interference will be almost as bad on a strong TV signal as on a weak one. It is strictly a function of the proximity of TV antenna and the transmitting antenna, combined with the selectivity characteristics of the set in question. Under some conditions the r.f. gain of the TV set may vary with the strength of the TV signal, so that a slightly different level of interfering signal may be needed to produce visible interference, but this is a minor factor in determining the point at which interference exists.

To obtain proof of these statements, I varied the signal strength of the Channel 2 signal on my own TV set, while running my 50-Mc. rig across the band. The power input was maintained at 100 watts, 100 per cent modulated with a 600-cycle tone. The 4-element 50-Mc. array was pointed at the TV antenna throughout the test, with the receiver tuned to Channel 2. Antenna separation is 40 feet. The TV receiver is an RCA 630TS, with a high-pass filter (to be described in a subsequent article) installed on the chassis close to the tuner. The transmitter is gang-tuned throughout and VFO controlled, so that the frequency can be varied across the band with the output maintained at a uniform level. The TV antenna was turned away from New York City, first to the north and then to the south, to make the TV signal very weak. Results are shown below in table form:

Interference Level	TV Antenna Position		
	On Station	North of Station	South of Station
None up to	52.5 Mc.	52.1 Mc.	51.0 Mc.
Perceptible at	52.6 Mc.	52.2 Mc.	51.1 Mc.
Objectionable at	53.1 Mc.	52.7 Mc.	52.2 Mc.

The TV antenna was turned either side of the line to the station until the same signal level was reached. Note that the frequency at which interference appeared was only 400 kc. lower on the north side. On the south side the TV antenna

* Bowers Place, Denville, N. J.

was turned toward the transmitting antenna, so that the interfering signal was much stronger. These results demonstrate that the strength of the amateur signal is far more important in establishing the interference level than is the strength of the TV signal. It is important to note that the first megacycle of the band was clear of interference, even under the most adverse condition.

Unbelievable as they may seem to anyone who has wrestled with the 50-Mc. Channel 2 problem, these figures show that even the fringe-area 6-meter enthusiast need not give up. A high-pass filter *can* be made that good. Traps and stubs will work often in the less severe cases, but they are narrow-band devices that depend on critical adjustment. The high-pass filter can be installed and forgotten.

The overload area is directly proportional to the effective radiated power of the 50-Mc. station. It is better stated in e.r.p. than in transmit-

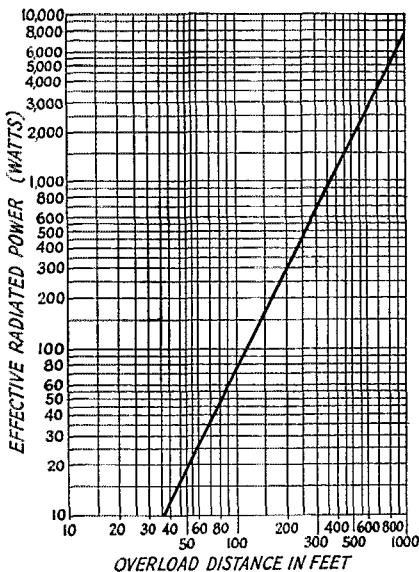


Fig. 1 — Average overload distance on Channel 2, when the transmitter is between 50 and 51 Mc. To get effective radiated power, multiply transmitter power output by antenna gain. Example: A rig with 60 watts output and an antenna with a gain of 9 db. (8 times) result in an e.r.p. of 480 watts. Its average overload distance on Channel 2 is 250 feet.

ter power input, as the gain of the antenna will extend the overload range. Even at its worst, the interference range is less than you might expect. My experience, borne out by several others in the area, shows that 150 watts input and a power gain of 9 db. in the antenna results in a maximum overload distance of about 250 feet. With an input of 10 watts and a similar antenna the overload range is approximately 65 feet. Average overload distances for various power levels (e.r.p.) are shown in Fig. 1.

¹ G.E. Ham News, Nov.-Dec., 1949.

² Tilton, "TVI Hints for the V.H.F. Man," *QST*, April, 1953, p. 16.

Transmitter Harmonics: In general, the only harmonic that can cause trouble in 50-Mc. work is the 4th. This falls in Channel 11, 12 or 13, depending on the operating frequency. A simple filter of the "Harmoniker" type¹ will prove more than adequate to keep this harmonic out of the transmitting antenna. Such a filter is described later in this discussion.

Care must be taken to prevent radiation of exciter harmonics, from the rig itself, from its power cabling, or by allowing the various harmonics of the exciter stages to be passed on by the final amplifier. The precautions needed to prevent such interference are by now standard practice. See any recent edition of the ARRL *Handbook*. The v.h.f. aspects of the problem have also been treated in detail in *QST*,² and in the 1954 edition of the *Handbook*.

Intercarrier Sound Images: This is an insidious type of interference in which the modulation of the 6-meter station is heard in Channel 2. It should not be confused with the BCI type of interference to be treated later. It can happen on sets that are not overloaded, and it may not be accompanied by picture interference. It happens only on sets of the intercarrier sound type, and is due to improper alignment, inferior design, or both. *It is strictly a TV set fault.*

To understand what happens in most cases of sound interference, let's review the operation of an intercarrier sound set. On all TV channels, the sound carrier is 4.5 Mc. higher than the picture carrier. On Channel 2 the picture carrier is on 55.25 Mc., the sound carrier is on 59.75 Mc. Both of these carriers are converted to i.f. in the TV set mixer and are amplified in the picture i.f. amplifier.

At some point following the second detector, the 4.5-Mc. beat between these carriers is fed to the 4.5-Mc. discriminator transformer to produce audio.

Let's see what develops if a 6-meter transmitter is on 50.75 Mc. and a TV set of this type is in close proximity. Conversion in the TV set takes place as before, except that we have a new signal being mixed that is 4.5 Mc. below the picture carrier (55.25 - 50.75 = 4.5 Mc.). The undesired converted signal is rejected by the picture i.f. amplifier of the TV set if it is properly designed and in good alignment. If the set is not properly aligned and if the picture i.f. is broad enough, the undesired mixed signal will ride through. The 4.5-Mc. beat generated in the video detector between it and the picture carrier of Channel 2 will get into the discriminator and we have sound interference.

As can be seen by this example, this is an image response of the picture i.f. system. Some sets are so bad that this trouble still exists when the transmitter frequency is 50.0 Mc., giving a beat of 5.25 Mc. Fortunately, only a few receivers are this bad.

Spurious Radiation from 50-Mc. Receiving Equipment: On one well-known bandswitching converter the oscillator is 7 megacycles above the signal frequency and radiates quite a signal on

Channel 2. Other converters or receivers may be guilty of the same thing.

The W2IDZ converter³ will not normally cause any trouble because the oscillator is on the low side. I said normally because if the converter is left on while transmitting it becomes very unhappy and radiates spurious signals. Other converters will undoubtedly do likewise. The cure is simple: Remove the B+ from the r.f. stages and first mixer of any receiving equipment while transmitting.

Audio-Circuit Rectification: This is the common trouble that has been with us since the earliest days of v.h.f. work. It is no great problem in 50-Mc. operation, as it shows up only where the r.f. field is very strong. If your antenna fires into a neighbor's TV set, broadcast receiver, phonograph or hearing aid, you're likely to run into it. The interference level is usually independent of the volume control setting on the receiver, showing up as a nontunable voice background. The cure is the same, whether the instrument being interfered with is a TV set, a midget broadcast receiver or an audio amplifier. It has been covered for years in the ARRL *Handbook*, so it needs no lengthy discussion here. Unlike most other receiver faults, it can be corrected at the transmitter — by going to frequency modulation or c.w., in place of amplitude modulation.

Solving the Neighbor Problem

Regardless of the power level you wish to use you must have your own house in order. You should be able to demonstrate that you can op-

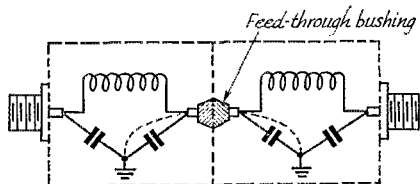


Fig. 2 — Schematic diagram of a low-pass filter for keeping the 4th harmonic out of the 50-Mc. antenna feed with 50- to 95-ohm coaxial line. Condensers are 62 $\mu\text{f.} \pm 10$ per cent 500-volt ceramic or silver mica. El-Menco CM-15 suitable for up to 250 watts. Coils are 4 turns No. 16 tinned, $\frac{3}{8}$ inch diameter, $\frac{3}{8}$ inch long. Box is 2 by 2 by 4 inches with center shield. Connect shorts indicated by dotted lines and resonate coils at 52 Mc. by adjusting turn spacing. Short turns of one coil by inserting coin or metal washer between turns while adjusting resonance of other. Remove shorts and filter is ready for use. Schematic shows approximate parts position.

erate without bothering any channel on your own TV set. This is the biggest part of the battle and it is not difficult. Your first step should be to build a high-pass filter for your TV set. Constructional details will be given in a subsequent article in *QST*. If you overload your own TV set, you cannot tell if interference your transmitter causes is the result of overload or of harmonics.

The next step is to build a low-pass filter for

³ Ladd, "A Bandswitching Converter for 144 to 21 Mc.," *QST*, April, 1951, p. 22.

the transmitter. If the power amplifier is not driven by a frequency-multiplying stage, the only harmonic likely to cause trouble in a strong-signal area is the fourth. This being the case, an elaborate sharp cut-off filter is not necessary. A half-wave filter of the "Harmoniker" type will

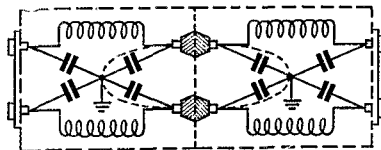


Fig. 3 — Details of low-pass filter for use with balanced lines, 150 to 600 ohms. Condensers are 20- $\mu\text{f.}$ 500-volt ceramic or silver mica (El-Menco CM-15) for powers up to 100 watts. Use 1000-volt rating for higher power. Coils are 8 turns No. 16 tinned, $\frac{1}{2}$ -inch diameter, $\frac{3}{8}$ inch long. Box should be about 2 by 4 by 4 inches, with center shield. Coils in each section should be about 2 inches apart. Connect dotted line shorts and adjust as for Fig. 2.

give 60 db. of attenuation at the fourth harmonic. This is more than adequate. Such a filter for 50- to 95-ohm coaxial cable is shown in Fig. 2. If open-wire line or Twin-Lead is to be used (150 to 600 ohms), build the filter shown in Fig. 3. If you are just building your transmitter, it would be desirable to add one of these filters as part of it rather than as an external accessory.

Either filter will keep enough of the fourth-harmonic energy out of the antenna so that if the harmonic still bothers the TV set, you may be fairly sure that the trouble is caused by direct radiation from the transmitter. The cures for direct radiation have been adequately covered in numerous articles on TVI reduction.² This problem is the same regardless of the amateur band the transmitter is on.

If your own TV set is still in trouble, it may be worth while to install a line filter on the set to prevent power-line pick-up; see Fig. 4. I have not had to do this, but such a filter can do no harm and may help on other bands as well as on 6.

As soon as you can demonstrate that your transmitter is clean, check with the TV set owners within the probable overload range (see Fig. 1) to determine which sets are in trouble.

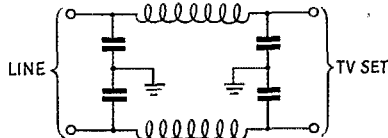


Fig. 4 — Line filter for installation on TV receiver. Coils are 40 turns No. 20 enamel, close-wound on $\frac{1}{2}$ -inch diameter form. Capacitors are 0.01- $\mu\text{f.}$ disk ceramic or mica. Attach filter on underside of TV chassis at point where line cord enters or, better, assemble the filter in a shielded box and mount on the rear wall.

Once this has been determined, you can do one of several things: Fix the sets yourself, attempt to have the owners' servicemen do so, tell them to go scratch, or refer the troubles to the TV set manufacturer. The really important thing

(Continued on page 114)

A Low-Cost Transistorized Code-Practice Oscillator

BY DAVID B. HOISINGTON,* W6CHB

• Transistors can now be obtained at such favorable prices that it's actually cheaper to use them than tubes in some equipment. The code-practice oscillator described here is an illustration—the total cost is well below that of an equivalent battery-powered tube oscillator.

Now that transistors¹ can be purchased for less than five dollars, there are many jobs that they can do better and more economically than vacuum tubes. This is particularly true where battery operation is desirable, for the transistor is much more efficient than the vacuum tube, requiring no heater power, will operate with very low currents, and with an efficiency as high as 49 per cent in Class A amplifiers!

The code-practice oscillator shown in the photograph and in Fig. 1 is an example of a unit which takes advantage of some of the transistor's good characteristics. It can be built for less than \$7.00 including the battery, but less the headphones and key. Since the battery current is only a third of a milliampere, good flashlight cells should last a couple of years.

The CK722 will oscillate readily at frequencies up to about 1 megacycle in a circuit similar to Fig. 1 if an r.f. choke is added in series with R_1 .

* Associate Professor, U. S. Naval Postgraduate School, Monterey, Calif.

¹ Clay, "Transistor Circuitry," *QST*, December, 1953.

It could thus be used as an i.f. test signal source. It is not suitable for higher frequencies because of the relatively low cut-off frequency of junction transistors.

The circuit diagram, Fig. 1, shows that a conventional Colpitts circuit is used with the CK722 PNP junction transistor. The collector

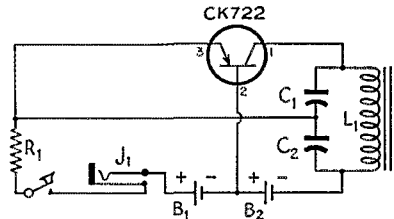


Fig. 1—Transistor audio oscillator for code practice.

C_1 —0.1- μ f. paper.

C_2 —0.25- μ f. paper.

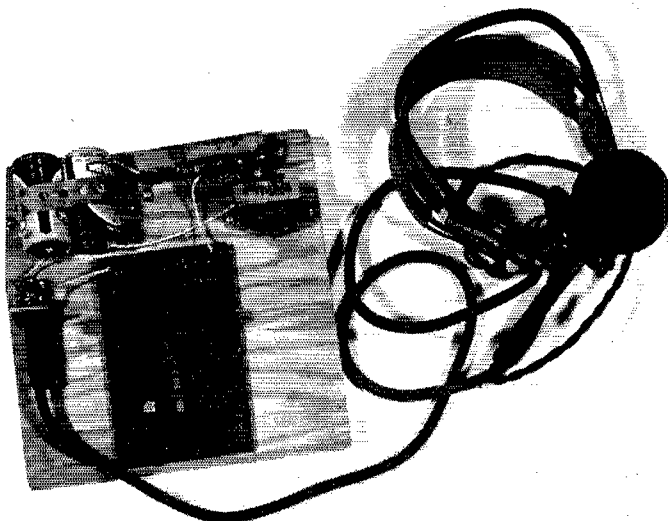
R_1 —4700 ohms, $\frac{1}{2}$ watt.

L_1 —Primary of 500-ohm line-to-speaker transformer (Merit A-3005).

B_1, B_2 —1.5-volt flashlight cells.

J_1 —Phone jack.

(Pin 1, next to the red dot on the transistor) may be considered analogous to the plate, the base (Pin 2, the center pin) to the grid, and the emitter (Pin 3) to the cathode. Any magnetic 'phones with an impedance of 1000 ohms or more may be used. Crystal 'phones could be connected across C_2 . None of the components is very critical. The primary (500-ohm side) of the small line-to-speaker transformer speci-



The transistor tends to get lost among the other components, but it's at the right-hand end of the terminal strip on which the condensers and resistor are mounted. The breadboard construction provides a firm base for the key.

fied has about the right inductance. If a different transformer is used it may be necessary to increase or decrease C_1 and C_2 to obtain a frequency around 1000 cycles. It is preferable to keep C_2

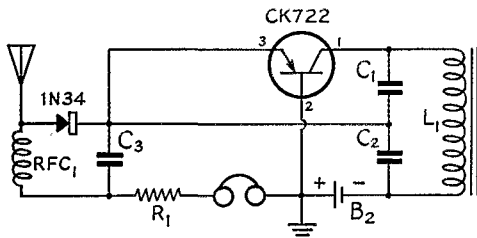


Fig. 2 — Transistor keyed monitor.

C_3 — 0.25- μ f. paper.

RFC_1 — 2.5-mh. r.f. choke.

Other components are the same as in Fig. 1.

larger than C_1 , but again the ratio is not critical. R_1 may be increased to 22,000 ohms or more if less volume is desired in the headphones.

The placement of parts is not at all critical. The unit shown was built on a breadboard about $8\frac{1}{2}$ inches square. The transistor may be seen between the terminal strip and the larger capacitor in the photograph, and is soldered directly into the circuit as are the flashlight cells. No off-on switch is needed since the collector current is only a few microamperes when the key is up. The dry cells must be connected with the polarities indicated. If the collector cell is reversed the current flow may be large enough to damage the transistor.

When no longer needed as a code-practice oscillator, this unit may readily be adapted as a keying monitor, by using one pole of a double-pole keying relay in place of the key, by power-

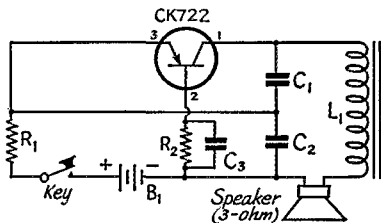


Fig. 3 — Transistor audio oscillator arranged for single-battery operation.

C_1, C_2, C_3 — 0.25- μ f. paper.

R_1 — 1500 ohms, $\frac{1}{2}$ watt.

R_2 — 33,000 ohms, $\frac{1}{2}$ watt.

L_1 — 20-mh. inductance.

B_1 — One or two 1.5-volt flashlight cells (see text).

ing the emitter circuit from a keyed low-voltage circuit in the transmitter, or by obtaining the emitter current from rectified r.f. voltages as has been done by Klein and Slusher.²

Fig. 2 shows the modified circuit for the latter case. The emitter dry cell, B_1 , has been replaced by an r.f. choke, crystal rectifier, and capacitor. Since the collector dry cell is retained, the circuit

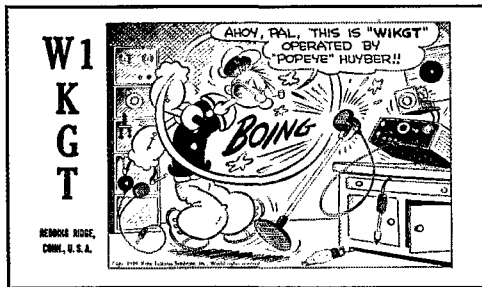
² Klein and Slusher, "A Self-Powered C.W. Monitor," QST, January, 1954.

cannot be said to be entirely self-powered. This cell is cheaper, however, than the components that would be required to replace it.

Fig. 3 shows a circuit that has been used by the author for single-battery operation. It will operate on a single dry cell, but two are required to give enough volume on the loudspeaker to be heard throughout a large room. Headphones could be connected in series with R_1 as in Fig. 1. This unit has been operating with the key down for three months and shows no signs of tiring. The current from the two dry cells is only 0.7 milli-ampere, so the cells should last for some months more! The dry cells could be replaced by a crystal, r.f. choke, and capacitor connected as in Fig. 2 for operation as a completely self-powered keying monitor.

Strays

A potential "S-Meter de luxe" was among topics discussed at the Institute of Radio Engineers March convention in New York City. It's a sensitive microwave receiver capable of detecting a signal power change of one ten-quadrillionth of a watt.



W6OPU's "Mickey Mouse" QSL (p. 49, March QST) prompted W1LIG to point out the "Popeye" cards of WIKGT. Permission and a drawing were given to WIKGT by a vice-president of King Features Syndicate in appreciation of Frank's efforts in 1949 when the official communicated with far-away friends via WIKGT's 10-meter 'phone.

W1WPR of the W1AW staff now has no doubts about the spelling of Punxsatawney, Penna. Chuck recently penned replies to four fast SWL cards from that town.

W5BTY rides a unicycle. Not only that, he's threatening to go mobile with it. — W5RST

W200G/2 and W2ESQ/2 will be active June 4th-6th from encampments at the Monmouth County and Morris-Sussex Counties (N. J.) Boy Scout Jamborees, respectively. W200G/2, operating from Brookdale Farm near Lincroft, will have 'phone on 3915 kc. and 146.7 Mc., c.w. on 3750 kc., and RTTY on 3620 kc. W2ESQ/2, to be located at Barbay's Farm near Andover, has scheduled 'phone activity on 7220 and 3950 kc., c.w. operation on 7080 and 3650 kc. Two-meter transceivers are to be used for intercamporee communications.

Mobile Loop Antennas

Some Considerations in Design for Low Frequencies

BY ROBERT E. WEBSTER,* W4IMM

• The suggestion that a loop antenna for low-frequency mobile work might have advantages over the conventional loaded whip has been made before. However, this article by W4IMM should be of special interest to mobilers because it points out important factors hitherto largely neglected, and compares them with equivalents in the loaded-whip system.

A LOOP ANTENNA has sometimes been suggested as a substitute for the conventional loaded whip for mobile operation at the lower frequencies (particularly 75 meters).¹ A sketch of the system is shown in Fig. 1. As most often used, it consists of the usual transmitting whip, 8 feet or so long, mounted at the rear of the car, and the b.c. or receiving whip on the cowl, the two being bent over to join, or connected with a length of wire. The base of one whip is grounded directly. The base of the other whip is grounded through the coupling and tuning circuit, and the car body completes the loop.

This system has some important operational advantages. Since the antenna is electrically short, the current is nearly uniform throughout its length, and the radiation resistance is independent of feeding- and tuning-element location. Therefore it can be fed at either end, depending on whether the transmitter is located in the trunk or at the instrument panel. Regardless of the end at which it is fed, the loop can be tuned conveniently by a simple series variable condenser within reach of the driver's seat.

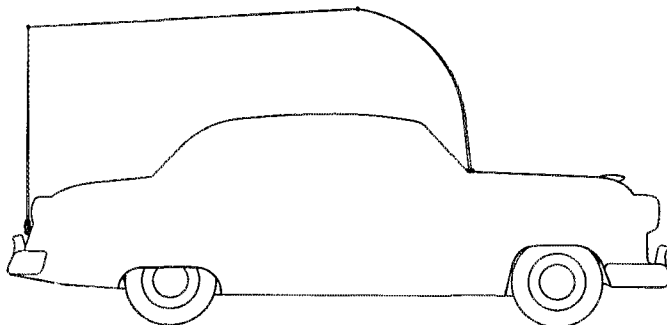
In articles that have appeared previously on the subject, little has been said about how effi-

cient such a loop might be in comparison with the loaded whip. In any antenna system using a radiator small in terms of wavelength, the radiation resistance is low, and the efficiency depends largely on the resistance that must be introduced in order to feed power to the radiator. Because the loaded whip antenna is equivalent to a capacitance of a few $\mu\text{mf.}$ in series with the radiation resistance, power can be fed to the antenna only by introducing considerable inductance to cancel the high series capacitive reactance. Even with a high- Q loading coil, unfortunately, the resistance introduced by the coil will be several times the radiation resistance at 75 meters. As a result, only a small fraction of the transmitter output will be realized as useful radiated power.

The loop antenna, on the other hand, is equivalent to an inductance, instead of a capacitance, in series with the radiation resistance. Therefore, to cancel the reactance in series with the radiation resistance of the antenna (tune the system to resonance), a condenser, rather than a loading coil, can be used. Since the losses in an air condenser are negligible compared with those of a large coil, it might seem that the loop would be greatly superior to the whip.

However, there is another factor that must be considered. The power that will reach the antenna in either case will depend upon the resistance introduced by the tuning and coupling system *relative to the radiation resistance of the antenna.* For instance, if the radiation resistance is 1 ohm, and the resistance introduced in feeding power to the antenna is 1 ohm, half of the transmitter power will reach the antenna, and half will be dissipated in the feeding circuit. However, it is equally true that if the radiation resistance is 100 ohms, and the feeding resistance is 100 ohms, half of the transmitter power will also reach the antenna.

The radiation resistance of an ideal loop may be calculated approximately by the equation:



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Fig. 1— Mobile loop formed by joining two grounded whips.
◆

*% Antenna Laboratory, Electrical Eng. Bldg., Ohio State University, Columbus 10, Ohio.

¹ Mitchell, "Loop-Type Antennas for 75-Meter Mobile," *QST*, February, 1951; Varnedoe, "QSYing the 75-Meter Mobile Antenna," *QST*, July, 1953.

$$R_R = 31,200 \left(\frac{NA}{\lambda^2} \right)^2 \text{ ohms,}$$

where N is the number of turns in the loop (1 in this case), A is the area enclosed by the loop in square meters, and λ is the wavelength in meters at the operating frequency.

For a loop with a circumference of 20 feet, the radiation resistance calculated for 4 Mc. is about 0.01 ohm. On the other hand, the radiation resistance of an 8-foot whip at 75 meters has been calculated² to be within the range of 0.4 to almost 1 ohm, depending on whether the whip is base-loaded or center-loaded. It is evident that for the same radiated power, the current in the loop must be from 6 to 10 times the current in the whip antenna (power proportional to the square of the current). And this means that the feeding resistance for the loop must be 1/36 to 1/100 of that for the whip for the same proportion of transmitter power to reach the antenna (same efficiency). It is apparent, therefore, that every effort must be made to keep the loss resistance of the loop conductor itself, as well as the feed-circuit resistance, to a minimum in terms of fractions of an ohm — not ohms. The internal resistance of a series r.f. ammeter, for instance, may be intolerable. Even if the loop mentioned above is made with 1/4-inch copper tubing, the loss resistance in the conductor alone will be about 0.16 ohm — 16 times the radiation resistance!³ It is obvious, too, that since one side of the practical mobile loop is formed by the car body, particular attention must be paid to bonding of body sections to assure a low-resistance path.

Fig. 2 shows the simplest method of feeding the mobile loop. The loop of 1/4-inch copper tubing with a circumference of 20 feet will have an inductive reactance of about 200 ohms. This can be tuned out with a capacitance of about 200 $\mu\text{f.}$, and it can be shown that this procedure yields minimum tuning-circuit loss. Loading coils are not needed and, of course, should be avoided to minimize loss resistance. The loop current flows through the pick-up link and connecting leads, so the link should have a minimum of turns and be constructed of large-diameter conductor to minimize skin resistance.

The current through the link (and therefore the loss in the link) can be reduced by using a capacitive divider circuit, as shown in Fig. 3, to transform the low antenna resistance to a higher value. The values of C_1 and C_2 may be approximated from the following:

$$X_{C_2} = \sqrt{RR_A}, \text{ and } X_{C_1} = X_A - X_{C_2},$$

where R is the desired load across the link, R_A is the antenna resistance, and X_A is the antenna inductive reactance in ohms.

² Belrose, "Short Antennas for Mobile Operation," *QST*, September, 1953.

³ This ratio is of about the same order as estimated for a center-loaded whip, loading-coil Q 300, including ground-loss resistance. However, it may constitute considerable improvement over whips using the general run of loading coils with lower Q s.

As an example, suppose it is desired to feed the previously-described loop at a 100-ohm level; i.e., with the link looking into 100 ohms.

$$X_{C_2} = \sqrt{(100)(0.01 + 0.16)} = \sqrt{17} \\ = \text{approx. } 4.1 \text{ ohms.}$$

$$X_{C_1} = 200 - 4.1 = 195.9 \text{ ohms.}$$

Therefore, $C_1 = \text{approx. } 203 \mu\text{f.}$, and $C_2 = \text{approx. } 0.01 \mu\text{f.}$

Now we have increased the impedance of the circuit which includes the link L_1 from approximately 0.17 ohms in the case of the circuit of Fig. 2, to 100 ohms, using the circuit of Fig. 3. For

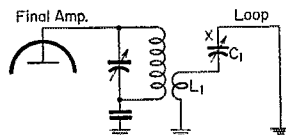


Fig. 2 — Feeding the loop with direct inductive-link coupling to the transmitter.

the same power output level, therefore, the current through the link will now be only about 0.04 times the current in the link of Fig. 2, and the power lost approximately 0.0016 of the power lost in the link of Fig. 2. The efficiency to be gained by the transformation will depend, of course, upon the actual Q of the link compared to the Q of other circuit elements.

Another important consideration is the insulation of the feed-through connecting the loop to C_1 , and the plate spacing of C_1 . If 10 watts is fed to a total loop resistance of 0.17 ohms, a current of about 7.7 amperes will flow in the antenna circuit. This current through the 200-ohm reactance of C_1 will cause a voltage drop of over 1500 volts. Therefore, point X in Fig. 2 or Fig. 3 will be at almost 1500 volts potential to

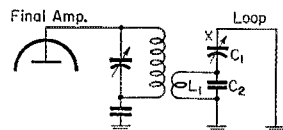


Fig. 3 — A capacitive-divider transforming circuit for reducing current through the coupling link.

ground (the drop across C_1 less only the drop across L_1 , which is relatively small). It is obvious that care should be taken in selecting a low-loss feed-through insulator.

In the foregoing, it is realized that there are factors that have not been considered. The principal one (and one that might well have considerable influence on the whip vs. loop comparison) is the relative amount of ground loss. This may vary widely in either case, and is difficult to evaluate. However, it is reasonable to suppose that average ground losses might be less for the loop antenna. The difference in radiation patterns is another factor that will influence the relative gains of the two antennas.

A Tubeless VFO for the 10A

Remote-Tuned Oscillator Circuit for 75-20-Meter Conversion Exciters

A SHORT WHILE ago we were asked about modifying Don Mix's remote-tuned VFO¹ to cover, among other things, the frequency range necessary for coming out on the 75-meter 'phone band from a Multiphase 10A Exciter. Such a modification is of course possible, but it suggested a more intriguing idea — why not just a remote tuned circuit in place of the crystal that plugs in on the front panel of the 10A, dispensing altogether with extra tubes and eliminating the necessity for any tinkering whatsoever with the insides of the exciter?

On several counts it seemed that this system should work: the oscillator power level in the 10A was certainly low enough, only 8 volts of r.f. being required at the injection grid according to the instruction book; the job was already being done by an untuned Pierce oscillator using the oscillator section of the 6BA7 mixer; and substitution of a tuned circuit for a crystal had worked very nicely with a 6AG7 oscillator in a small transmitter.² The big question was this: would the oscillator section of the 6BA7 be good enough to satisfy the rather critical stability requirements of single-sideband transmission? A subsidiary, but just about equally important, question was whether an arrangement that would plug into the crystal socket without any "inside work" would affect the stability, since of necessity the third (ground) connection would have to be made on the outside of the exciter cabinet.

We did not have a 10A in the lab, so a comparable oscillator-mixer circuit was assembled on a chassis and panel which simulated the 10A physical arrangement. Component values in the Mix VFO were scaled down to cover the 5-5.3-

Mc. range in an experimental layout. The results were highly encouraging — the drift was very low (which was not unexpected, in view of the fact that it is one of the outstanding features of remote tuning) and the voltage stability was excellent. There remained the question of whether it would drive a 10A in the same way as the crystal, so the unit was taken over to W1MBK, where a 10A is in regular operation, for a trial.

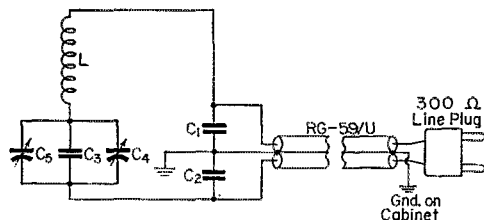


Fig. 1 — Oscillator circuit diagram.

C₁, C₂ — 680- μ af. silver mica.

C₃ — 50- μ af. silver mica.

C₄ — (Trimmer) 25- μ af. midget variable (Bud LC-1642).

C₅ — (Tuning) 20- μ af. midget variable (Millen 20920 with one stator plate removed).

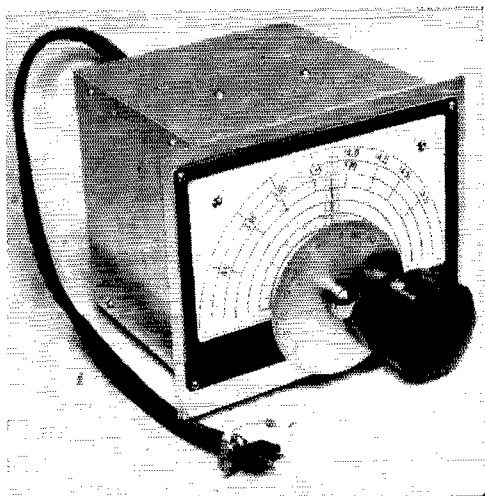
L — 40 turns No. 22, 1-inch diameter, 16 turns per inch (B & W 3015).

Plugged into the crystal socket, with the ground connection made to a near-by screw on the front panel, the transmitter operated in exactly the same way as with the crystal — not even a mill difference in the grid current in the Class B linear!

This was enough evidence that the idea was feasible, so at this point the experimental model was dismantled and rebuilt to improve the mechanical features. Originally, the components had been mounted directly on the walls of the 6 by 6 by 6 aluminum box, but the construction shown in the photographs was adopted as a means

¹ Mix, "Simple Remote Tuning for the VFO," *QST*, January, 1953.

² McCoy, "Let's Go VFO," *QST*, April, 1954.



This "Tubeless VFO" was made primarily for the 10A Exciter, but could be used equally well with similar conversion-type circuit arrangements using crystals in the 9-Mc. region. The 6 by 6 by 6 aluminum enclosure is provided with a separate panel of the same height as the box and slightly wider than the dial frame. Construction of the tuning mechanisms is described in the text.

of stiffening the assembly and making for convenience in construction; the upright member has all the parts mounted on it and all the work can be done outside the box. Also, it was soon found that a much slower tuning rate than was provided by standard dials was highly desirable in actual operating, so the somewhat Rube Goldberg-ish mechanism shown in the photograph was put together. It combines a National type ACN dial with a Type K and a large knob, and gives a step-down ratio of about 35 to 1. This makes it a pleasure instead of a torture to set the frequency to zero beat.

The circuit, shown in Fig. 1, is the customary series-tuned arrangement. The constants are the first ones tried; a bit of experimenting with different values might result in some improvement in stability, but the fact that the performance as is was considered entirely adequate tended to discourage spending more time on this aspect. For the same reason, no attempt was made to temperature-compensate the circuit; the total drift over a period of several hours was too small to be a significant factor in actual operating. The fixed condensers are all silver micas; one of the two variables is for tuning while the other is for trimming the frequency calibration. The coil is a length of B & W No. 3015 Miniductor cemented to a strip of polystyrene that is mounted on two 1-inch stand-off insulators. Since cementing the whole length of the coil means that each turn is anchored to the supporting strip, this method of mounting results in an assembly that is substantially free from vibration effects.

The first layout had used a tuning condenser with an integral mounting bracket (single hole), and was supported from the mounting bracket on a stand-off insulator of the proper height to line up the shaft with the dial. This turned out to be poor mechanically, since slight misalignment of the shaft and dial would cause a side thrust on the condenser shaft and twist the rotor-plate

assembly in relation to the stator. The net result was an undesirable amount of back-lash. To minimize this a double-spaced condenser was substituted, mounted by two studs to tie it down better than the single-hole mounting could. There is still need for careful alignment of the condenser shaft and dial, however, no matter what the type of mounting. This can be provided for by elongating the mounting holes for the supporting member laterally, and elongating the condenser mounting holes vertically. With the condenser and dial in final position, but with the dial set-screw not tightened, it should be possible to turn the dial while the condenser rotor stays stationary, indicating that both shaft and dial coupling are "on center."

The frequency range can be adjusted to suit individual conditions. The constants given in Fig. 1 are for a range of 5.0 to 5.35 Mc. so that both 75 and 20 meters can be covered with a crystal on exactly 9.0 Mc. One stator plate was removed from the tuning condenser to give the calibration scale shown in the photograph. More spread could be obtained by using a crystal at 9.1 Mc. and changing the oscillator range to 5.1-5.3 Mc., thus placing 4.0 and 14.2 Mc. at the same spot on the dial.

The connection between the oscillator circuit and the exciter is made through two 3-foot pieces of RG-59/U. These cables add about 60 μf . across C_1 and C_2 , respectively, so that the effective capacitance is close to 750 μf . each. The cable length can be varied within reasonable limits without affecting the operation or frequency range to any extent. The inner conductors terminate in a 300-ohm line plug fitting the crystal socket, and at this end the two outer conductors are bonded together with a piece of shield braid for grounding on the exciter. The outer conductors are similarly bonded at the circuit end and connected to the grounded junction of C_1 and C_2 .

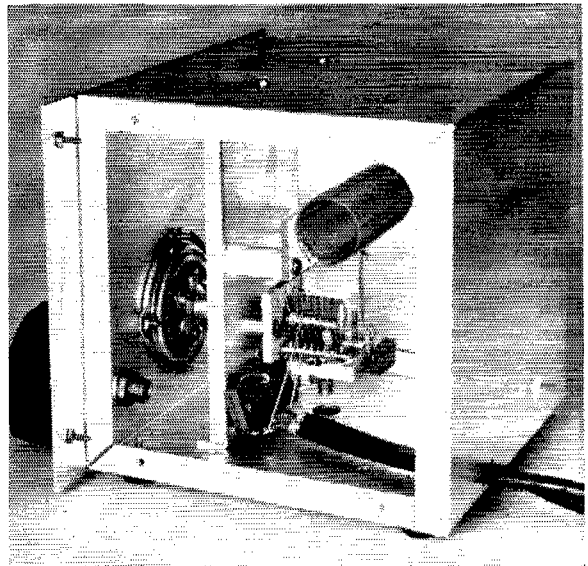
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The oscillator circuit is mounted on an aluminum bracket 3 inches wide extending between the top and bottom of the box. The bracket has its edges bent as shown to stiffen it. It is fastened to the top of the box by a piece of aluminum angle, the mounting holes being elongated to permit exact fitting.

The two fixed condensers (C_1 and C_2) in the lower foreground are mounted to a two-terminal tie-point strip which also provides connection points for the inner conductors of the coax cables. The mounting point for this strip is the only ground point for the circuit. The end plate of the trimmer condenser, C_4 , is visible behind the tuning condenser; C_4 is screwdriver-adjusted through the hole in the bottom of the box.

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TVI "Diplomatics"

BY F. D. ROWE,* W6FK, AND R. E. LAKE,** W6BV

• The authors of this article have had a combined experience of almost fifty years in handling interference matters. They have set down in words many valuable pointers you should remember when you go out on a TVI complaint.

MUCH is being said, and written, right now about the technical problems of TVI. Unfortunately, little has been said, or written, about the techniques involved in dealing with the human side of the problem. TVI will be with us until such time that receivers are able to do their share in rejecting it and we all consider the problem from a transmitting standpoint by being sure our own house is in order. Viewed from the technical side, it is not an impossibility to clean up receivers, transmitters and feed lines, but the problem in many cases does not end there. Those of us who have had experience in dealing with the human side of complaints can attest to the friendly or cantankerous nature of the animal, Man. It would, indeed, be a wonderful world if we all had a considerate and congenial disposition. This, of course, is wishful thinking so we must accept the situation as it is and get along as best we can. All is not hopeless, however, if we give full and unbiased consideration to the problem.

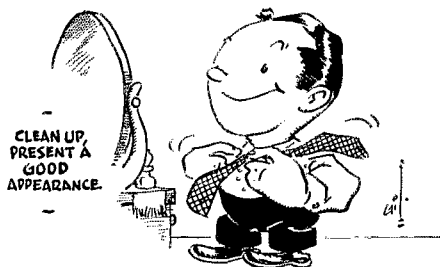
First, let us consider long and carefully Mr. T. V. Owner's viewpoints in the matter. He is trying to enjoy a TV program and some kind of interference comes in and spoils it. Remember, now, he doesn't know a thing about TV except what the salesman told him. Neither does he know a thing about radio, electrical or mechanical devices. He bought the set fully expecting it to reproduce TV pictures without any trouble. Now interference comes in, or the set itself goes haywire, and what does he do? Blows his top and in many cases blames that amateur next door or down the street. Why? Because it is known or suspected that a ham is located somewhere in the neighborhood. But mainly because he had heard that somebody said that they were told that amateurs were the cause of *all* types of interference. So there! All he has to do is get that guy off the air and his troubles are over! This is, no doubt, an old story to you, an active amateur. You have probably shrugged it off with the thought, "Dumb guy! I sure would like to tell *him* off!" Now just a minute! Suppose you are trying to snag that rare elusive DX station you have wanted for a long time. This same guy you

* Interference Investigator, Northern California Electrical Bureau; 1255 44th Ave., San Francisco 22, Calif.

** Communications Engineer, Pacific Gas & Electric Co.; 1915 Yolo Ave., Berkeley, Calif.

would dearly love to "tell off" turns on his razor and blankets out that rare DX and what do you do? Rant and rave and consider committing mayhem! *You!* who are supposed to realize, but probably forget, that Mr. T. V. Owner, who knows nothing about why interference spoils his programs, should suddenly be aware of the fact that he is interfering with *your* reception. Honestly, have you ever thought about this?

Now let's get back to the problem at hand. Mr. T. V. Owner is bothered by some kind of QRM that ruins his programs. He has made his complaint and you happen to be the one who must call on him to see what can be done. Before you go, check up on your appearance. Suppose you were just working on the car in your old clothes. Do you think it proper to call on Mr. T. V. Owner looking like this? No! You clean up, putting on your best bib-and-tucker to present a good appearance. This will go a long way toward



impressing him that ours is a clean fraternity and we always put forward a businesslike approach. This *must* be done since the very word, *amateur*, too often to him signifies that we are nothing but a bunch of tinkers, relegated to the "handy man" category. Because of this he has little faith in our abilities.

After proper introduction and salutations, you patiently listen to his complaint no matter how belligerent or nasty his attitude. You don't interrupt and get huffy at his derogatory cracks. A good listener is of prime importance to anyone who handles complaints, no matter what their nature. Keep an open mind on the whole picture for you never know ahead of time what you are going to run into. You must remember that he has built up a terrific resistance that must be later broken down in a smooth and satisfactory manner.

After his tirade (?) you then begin to explain the why, what and how of amateur radio and you state you will endeavor to find out just what the trouble is. Don't make the horrible mistake of jumping at conclusions and promise him the world with a fence around it before you know all the circumstances and details. You tell him that amateurs are but a small percentage of all inter-

(Continued on page 130)

• On the TVI Front

RAYTHEON ADVISES CONSUMERS ON TVI

That "one picture is worth a thousand words" has been proved with the advent of Raytheon's new "Service Saver" consumer booklet on TV servicing and interference problems. Based on the fact that about 90 per cent of all TV receiver troubles — whether internal or from external influences — can be identified by the pattern on the face of the picture tube, "Service Saver" presents forty photographs of substandard receiving conditions.

The booklet has been found to be of great help in the amicable solution of TVI problems. Ignition, diathermy, f.m. harmonic and other spurious interference normally laid at the door of the radio amateur are illustrated to consumers. To date many FCC field offices have requested the publication for use in TVI identification. The Department of Transport of Canada has also endorsed the approach.

Originator of the "Service Saver" is C. W. Hoshour, W9ELV, director of sales engineering for the Television and Radio Division of Raytheon. Interested amateurs may obtain a copy without charge by writing Department K, Raytheon Manufacturing Co., Receiving Tube Division, Newton, Mass.

UP-TO-DATE LIST OF TVI COMMITTEES

According to FCC, as of March 1st of this year there were 348 TVI committees functioning in the U. S. and possessions, a total of 328 communities being served. We reproduce this listing for the benefit of amateurs living in, or in the environs of, these cities.

Alaska: Anchorage, Fairbanks.

Alabama: Anniston, Birmingham, Mobile, Montgomery.

Arizona: Phoenix, Tucson.

Arkansas: Fayetteville, Ft. Smith, Little Rock.

California: Arcadia (2), Berkeley, Burbank, Coronado, Covina, Downey, Fresno, Fullerton, Inglewood, Long Beach, Marin County, Martinez, Modesto, Monterey, North Hollywood, Oakland, Orange County, Palo Alto, Pomona/Ontario, Richmond, Sacramento, Salinas, San

Bernardino, San Diego, San Francisco (5), San Jose, San Mateo, Santa Barbara, Santa Rosa, South San Francisco, Two Meter & Down Club (scattered locations), Turlock, Vallejo, Ventura, Walnut Creek, Westchester (in city of Los Angeles), Whittier, Woodlawn.

Connecticut: Darien, New Haven, Norwalk, Norwich.

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

Delaware: Wilmington.

District of Columbia: Washington.

Florida: Clearwater, Daytona Beach, Ft. Lauderdale, Jacksonville, Miami, Orlando, Pensacola, St. Petersburg, Tampa, West Palm Beach.

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

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

Idaho: Kellogg, Nampa.

Illinois: Berwyn, Broadview, Chicago, Decatur, Des Plaines, Freeport, Galesburg, Hollywood, Maywood, North Riverside, Princeton, Rock Island, Villa Park, Western Springs, Wheaton.

Indiana: Elkhart, Evansville, Ft. Wayne, Gary, LaFayette, Portland, South Bend, Vincennes.

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

Kansas: Leavenworth, Salina.

Kentucky: Lexington.

Louisiana: Baton Rouge, Lake Charles, Monroe, New Orleans, New Orleans (Algiers).

Maine: Augusta.

Maryland: Annapolis, Baltimore (2), Cumberland, Hagerstown.

Massachusetts: Boston, Fitchburg, Framingham, Lowell, New Bedford, North Adams, Pittsfield, Quincy.

Michigan: Allegan, Battle Creek, Birmingham, Bloomfield Hills, Detroit, Ferndale, Flint, Grand Rapids, Grosse Pointe, Grosse Pointe Park, Hazel Park, Lansing, Menominee, Mt. Clemens, Mt. Pleasant, Muskegon, Pontiac, Royal Oak, Traverse City.

Minnesota: Fairmont, Minneapolis, Red Wood Falls, St. Paul.

Mississippi: Gulfport, Hattiesburg, Jackson, Keesler Airforce Base, Pascagoula.

Missouri: St. Louis.

Montana: None.

Nebraska: North Platte, Omaha.

Nevada: None.

New Hampshire: Concord.

New Jersey: Atlantic City, Camden, Denville, Livingston, Morristown, Parsippany, Vineland.

New Mexico: Albuquerque, Sandia Base.

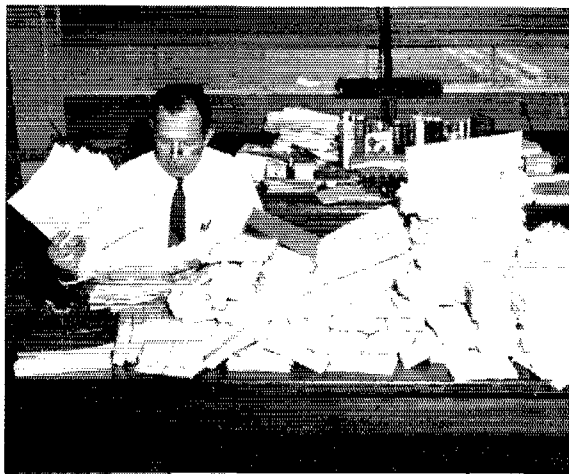
New York: Binghamton, Brooklyn, Corning, Elmira, Hornell, New York (2), Niagara Falls, Penn Yan, Rochester, Roxbury, Salamanca, Syracuse, Watertown.

North Carolina: Asheville, Charlotte, Dunn, Winston-Salem.

(Continued on page 130)

Philip S. Rand, W1DBM, ARRL Technical Consultant, inspecting approximately 25,000 letters and postcards received to date requesting his popular TVI booklet. Besides domestic mail, requests have been received from 26 countries and six continents. The third edition of this invaluable work is still available to amateurs. For your copy, send twenty-five cents in coin to cover postage and handling charges to Miss Anne Smith, Remington Rand, Inc., 315 Fourth Ave., New York 10, N. Y.

June 1954



Happenings of the Month

ANTENNA MAST OKAYED

Another blow for the cause of amateur radio was delivered recently by Judge John Gontrum of the Circuit Court for Baltimore County, Maryland, when he vigorously upheld the right of Robert C. Cheek, W3LOE, to erect a 60-foot antenna tower in the backyard of his residence. The League, through the office of its General Counsel, had given legal assistance to W3LOE. The decision well expresses the amateur spirit and reveals a fine understanding of the basic problem so often encountered by the amateur in dealing with local zoning officials. We suggest that you read the following text if for no other reason than to reaffirm your belief in the country in which you live:

. . . It appears to the Court that there is an effort on the part of the protestants to read into the zoning regulations an indefinite and variable standard of aesthetics or architectural good taste. The zoning regulations make no provision for any artistic or aesthetic code.

For some years we have been beset on all sides by busy and persistent planners, whose purpose apparently is to plan for every conceivable human activity and regiment us from the cradle to the grave with the resultant destruction of freedom. Nothing, they say in effect, is to be left to individual choice or caprice and little or nothing to normal growth and development. However, as yet we have no high official arbiter of architecture or commissioner of culture and it would be a tragic day for us, in my judgment, if we ever should have one. Some planning is necessary but the tendency today is to go to unreasonable extremes.

Both our Federal and State constitutions provide for and guarantee to every citizen certain inalienable rights and liberties. Under the Federal Constitution no State shall deprive any person of life, liberty, or property, without the due process of law. The Constitution of Maryland provides that the General Assembly shall enact no law authorizing private property to be taken for public use, without just compensation being first paid or tendered to the party entitled to such compensation.

Up until fairly recently property rights have been regarded as sacred as those of liberty but in recent years a growing number of short-sighted persons seem to hold the rights of private property as of little importance and value. This attitude is a threat to the fundamental principles upon which our American system is founded and one which must be met with firmness and vigor.

The general tendency today is to limit the use of private property. Under the terms public health, safety and morals, and the broad, vague and legally loose and elastic catch-all of "general welfare" much is being attempted and much is being done in the restriction of property rights. As public welfare particularly means different things to different people much uncertainty has been injected into the old understanding of the theory of private property.

It is, of course, legal for an owner of land to set up restrictions for a real estate development which include matters of an architectural and aesthetic nature but to invest public officials under a zoning ordinance with such broad powers would reduce the ownership of land to a legal fiction.

Property owners frequently, in purchasing home sites in restricted sections, submit themselves by private agreement to the opinion and decisions of the owners of real estate developments as to the design and type of construction of their dwellings and to many other restrictions, but there is nothing in our zoning laws to justify such an assumption of authority by the zoning officials or the courts. I know of no zoning official or court qualified to pass upon such a controversial matter as architectural good taste. What one generation considers offensive another may regard as a thing of beauty.

No doubt the early windmills among the dikes and canals of Holland were resented by worthy burghers as eyesores, but many windmills are to be observed in the landscapes of the old Dutch masters who apparently considered that windmills added charm to the lowland scenery. The same is true of the covered bridges, red barns, and old mills and

(Continued on page 35)

Maryland Governor Theodore McKeldin presents to Harold Archer, W3SKK, president of the Baltimore Amateur Radio Club, the proclamation designating June 14th-20th as "Amateur Radio Week in the State of Maryland." *L. to r.:* Shirley Ewing, state c.d. director; George Hannah, W3AFR, c.d. advisory committee; Arthur W. Plummer, W3EQK, ARRL SCM for Md.-Del.-D.C.; Governor McKeldin; W3SKK; J. W. Gisrael, jr., W3DC, club publicity chairman; Col. Frank Milani, Baltimore c.d. director; and Sam Powers, state c.d. communications officer. The text of the proclamation appeared in May QST.



silos of America; once scorned as examples of raw New World construction, today they are considered quaint and furnish inspiration to many native modern artists. Perhaps a future generation of painters will delight in depicting the steel towers and aerials which many of us today regard as fantastic and incongruous.

Although much violence has been done to the old conception of the inalienable constitutional rights of liberty and property, our courts have consistently ruled that zoning acts and ordinances passed under them are valid and constitutional only when the public health, morals, safety or welfare are concerned. Judge Hammond, in *Wakefield v. Kraft*, 96 Atl. 2nd page 29, referring to the case of *Chayte v. Maryland Jockey Club*, 179 Md. 390, said:

Restrictions can be imposed on private property only when justified for the protection of the public health, morals, safety or welfare. The Court restricted the application of the rule, saying: "We have been cited no case applying this principle to a situation or re-zoning from a higher to a lower class. In order to impose restrictions some valid exercise of the police power must be proven. But such power is invoked for the protection of the property restricted and not to give protection to the surrounding property. It is basic to the law of property that a man shall be allowed the widest use of his property consonant with the protection of his neighbors. In order to justify therefore a restriction of that use, it must be shown that such restriction is in some manner related to the police power of the sovereign."

The public safety, health, morals or welfare will in no wise be affected by the erection of the tower among the trees in Mr. Cheek's backyard. His home is still his castle within the narrow limits set by law as approved by the courts.

The Court is of the opinion that the Board of Zoning Appeals made no error in its ruling and its finding is affirmed.

John B. Gontrom, Judge

March 23, 1954

21-MC. M.M. GRANTED

In early April FCC took final action in Docket 10501, changing our rules effective May 21, 1954, to permit amateur maritime-mobile operation on

Approximately 100 amateurs attended the St. Louis Egyptian Radio Club's 1954 auction held for the benefit of the *Braille Technical Press*. The *Press*, a technical radio magazine for blind amateurs, is distributed without charge to those who are sightless. In this picture ERC members look on as club secretary W9YZE (right) tenders a check for \$205 to president W9PHO, himself sightless, who accepted the auction's proceeds on behalf of the *Press*.



OFFICERS' REPORTS AVAILABLE TO MEMBERS

Each year the officers of the League make comprehensive written reports to the directors. The Board has made these reports available to interested members, in a volume which also includes reports of the directors. The cost price is 75 cents per copy, postpaid. Address the General Manager at West Hartford, Conn.

the high seas in the 21-Mc. band (in addition to existing privileges in 28 Mc.). The Commission bases its decision largely on the fact that there is no written evidence to support the League's concern over the international aspects and that in its opinion there is no potential harm to the long-term interest of amateur radio.

Edward A. Roberts, W8HC

We regret to report the passing, in January, of Edward A. Roberts, W8HC, a former director of ARRL. A very active amateur for many years, W8HC served the Central Division (then including the present Great Lakes Division) for the 1935-1936 term.

AUSTRIAN BAN OFF

Largely due to persistent efforts on the part of the Austrian IARU member-society, *Osterreichischer Versuchssenderverband* (OVSV), extending over several years, authorities in that country have now granted amateur licenses and have rescinded their earlier objection to amateur communication filed with the International Telecommunications Union. As of April 1st ITU announced this welcome action, and FCC has now issued notice that American amateurs are no longer restricted from making OE contacts.

A Receiver for Flat Purses

Economizing with the Simple T.R.F. Regenerative

BY EDWARD E. HAYWARD,* W1PH

IN spite of the fact that the regenerative receiver is not too often seen in ham stations these days, I still feel that if care is used in its construction, a receiver of this type will outperform some of the cheaper superhets and will certainly cost far less. So, if you're finding it hard to scrape up that extra two or three hundred dollars for a superhet of the better type, give consideration to the lowly t.r.f. regenerative. Five or six years ago I built one of these little receivers¹ and it has been so satisfactory that I'm still using it as the regular station receiver.

The receiver shown in the photographs is quite similar to that model, except that plug-in coils are used. This makes it somewhat simpler to build and adjust, since the coils can be removed without the necessity for unsoldering them, and there are no switches to wire up.

* 15 Woodbine Terrace, Auburndale, Mass.

¹ Hayward, "The Coffee-Can Receiver," *QST*, Nov., 1952.

• W1PH has been using a three-tube regenerative receiver as the regular station receiver for a number of years. On the basis of "signals per dollar," he still finds it hard to beat. After all, an awful lot of DX was worked long before the superhet put in an appearance.

Also, it makes it easier to take advantage of parts likely to be found in the average small junk box. Even if all components must be bought new, the cost shouldn't run over \$20. While difficulty was encountered in getting the bandswitching model to work properly on 10 meters, the plug-in job, with lower stray capacitances, does very well on this band.

Circuit

The circuit is shown in Fig. 1. A 6K7 is used as a tuned r.f. amplifier ahead of another 6K7

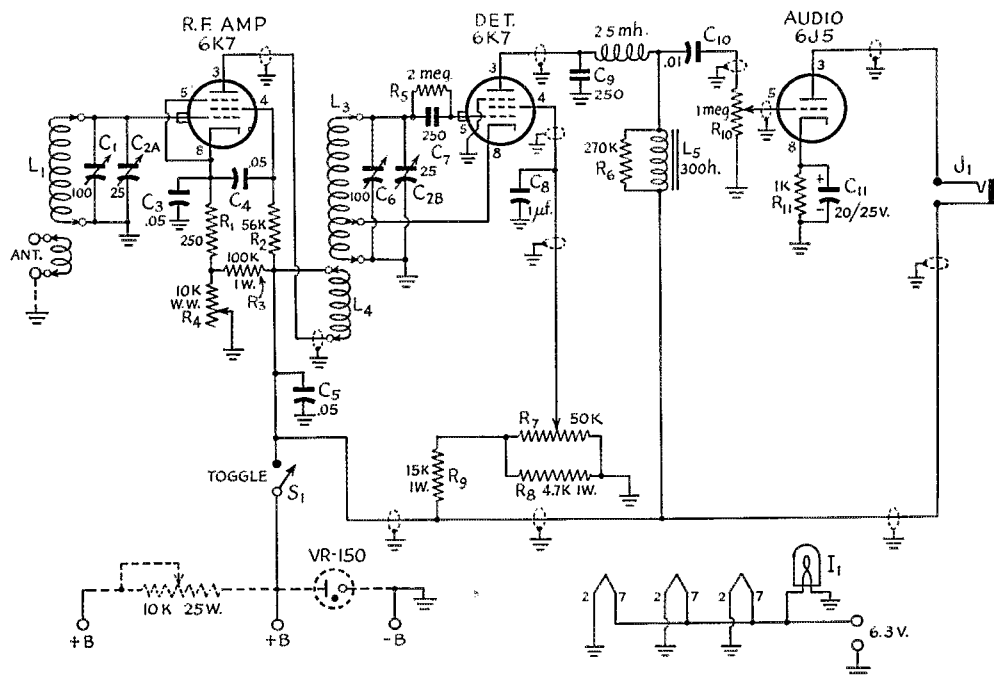


Fig. 1 — Circuit of the 3-tube t.r.f. regenerative receiver.

C₁, C₆ — Bud MC1875.

C₂ — Two Bud MC900, shafts ganged.

C₃, C₄, C₅, C₈, C₁₀ — Paper.

C₇, C₉ — Mica.

C₁₁ — Electrolytic.

All unrated fixed resistors — ½ watt.

L₁, L₃, L₄ Ant. — See coil table.

L₅ — See text.

I₁ — 6-volt dial lamp.

Connections shown in dotted lines are to be used for regulated voltage. See text.

used as a regenerative detector. This is followed by a 6J5 choke-coupled audio stage to provide good headphone volume. The bandspread tuning condensers, C_{2A} and C_{2B} , are ganged to a single tuning control. C_1 and C_6 are set individually, once for each band, so that the bandspread condensers tune over the desired band. The gain of the r.f. stage is adjusted by R_4 , while R_7 is the regeneration control and R_{10} the audio control.

Construction

The panel is 7 by 12 inches and the chassis is 7 by 11 by $2\frac{1}{2}$ inches. Both were made from aluminum sheet. I made the cabinet from some $\frac{3}{4}$ -inch wood I happened to have. It is lined with thin copper sheet tacked onto the wood. The cover is hinged so that it may be opened for changing coils.

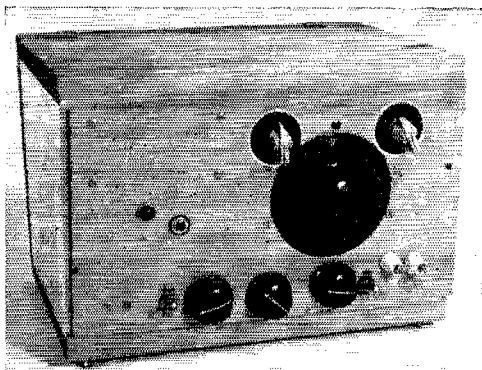
Shielding between the r.f. stage and the detector is important if the amplifier is to operate in a stable manner. I made two shielding enclosures out of a pair of large-size tomato cans. The bottoms were first removed. Then, using a 2 by 4 block of wood, I hammered the cans flat on one side so that they could be fastened against the panel with machine screws. They look quite professional after a couple of coats of enamel. In each can, the bandset condenser (C_1 or C_6) is placed near the top. These condensers should be of the shaft-hole-mounting type. The coil socket (for L_1 , or L_3) is mounted on spacers immediately behind the condenser, and the tube is to the rear. The ganged bandspread condenser, C_2 , is mounted on the chassis in the space between the two shielded compartments. Leads to the bandspread-condenser stators are brought out through holes in the sides of the cans.

The three gain controls, the plus-B switch, and the antenna terminals are lined up along the lower edge of the panel. The headphone jack is above and to the left.

Originally, the power supply was mounted on the chassis, but this was found undesirable from the considerations of hum and vibration. The audio stage is mounted on the chassis to the rear of the r.f. stages. The choke, L_5 , is not too critical. If an audio choke of 300 or 400 henrys (such as the Thordarson type T20C50 or UTC S-23) is not available, an ordinary interstage audio transformer may be used with its primary and secondary windings connected in series. The connection between primary and secondary should be switched, after the receiver is operating, to determine which connection gives the best response. Be sure to use shielded wire where indicated in Fig. 1.

Coils

Coil dimensions are given in the receiver coil table. The coils are wound on Bud or ICA forms. The detector coils require 5-pin forms. Five-pin forms may also be used in the r.f. stage, but only 4 pins are needed. However, it is a good idea to use 4-pin forms so that a mistake cannot be made in plugging in the coils. Bud type

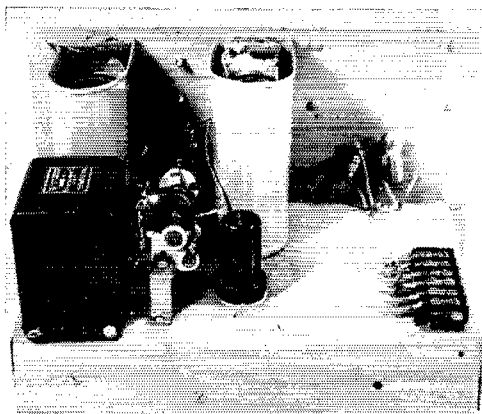


A three-tube regenerative receiver with tuned r.f. stage. The two bandset controls are above the vernier bandspread tuning dial (National AM or similar). The r.f. gain, regeneration and audio gain controls are along the bottom.

CF-594 and ICA type 1108B are suitable for L_1 and Bud type CF-595 or ICA type 1113B for L_3 for all except the b.c. and 1500-kc. bands. For the latter bands, Bud type CF-125 can be used for L_1 and type CF-126 for L_3 . L_3 and L_4 must be wound in the same direction, and the socket terminals wired as indicated in Fig. 1. L_3 is wound above L_4 on the form. The top end of L_3 must go to the detector grid, and the bottom end to ground. The top end of L_4 must go to the junction of R_2 and R_3 , and the bottom end to the plate of the r.f. amplifier.

Power Supply

This receiver will operate at any plate voltage between 150 and 250. Much better stability and less hum will result, however, if the supply voltage is regulated. This can be accomplished by connecting an adjustable 10,000-ohm 25-watt resistor in series from the positive terminal of the power supply to the plus-B terminal on the receiver, and then connecting a VR-150 regulator tube across the plate-supply terminals of the



Discarded tomato cans are used as shielding enclosures for the detector and r.f. stages. The r.f. stage is in the one to the left. A smaller chassis and cabinet could be used if desired. The exposed tube is the 6J5.

Receiver Coil Table

Band	L_1, L_2					Ant.	L_4	Space Between Windings
	$L_{\mu h}$	Turns	Wire	Length	Tap ¹	Turns	Turns	
80	17	23 ⁴	22 s.c.c.	c.w. ²	3	7 c.w.	20 c.w.	$\frac{5}{16}$ "
40	4	12 ⁴	20 s.c.c.	$\frac{7}{8}$ "	1 $\frac{3}{4}$	3 c.w.	6 c.w.	$\frac{3}{8}$ "
20	1	6 ⁴	20 s.c.c.	$\frac{7}{8}$ "	1	3 c.w.	3 c.w.	$\frac{1}{4}$ "
10-15	0.6	4 ⁴	20 s.c.c.	$\frac{3}{4}$ "	$\frac{3}{4}$	2 c.w.	3 c.w.	$\frac{5}{16}$ "
B.C.	200	100 ⁵	24 enam.	c.w.	10	10 c.w.	25 c.w.	$\frac{3}{8}$ "
500 kc.	800	150 ⁵	24 s.c.c.	c.w. ³	15	20 c.w.	20 c.w.	$\frac{1}{4}$ "

¹ Turns from ground end; ² C.w. indicates close-wound; ³ Wound in 3 layers of 50 turns each; ⁴ $1\frac{1}{4}$ -inch diameter; ⁵ $1\frac{1}{2}$ -inch diameter.

receiver, as shown in the dotted lines of Fig. 1. Pin 5 of the VR tube connects to plus, Pin 2 to minus. Starting at maximum resistance, the slider on the resistor should be adjusted, step by step, until the VR tube ignites with the receiver turned on. Be sure to have the power supply turned off each time before adjusting the slider on the resistor! If this regulating system is used, any power supply delivering between 200 and 400 volts should be satisfactory.

Adjustment

The receiver can be lined up on an incoming signal. Plug in the 80-meter coils. Set C_2 to maximum capacitance. Set C_6 at about half capacitance. Set R_4 and R_{10} for maximum gain (arm at end opposite ground). Starting at the grounded end, advance R_7 slowly to a point where a "plop" is heard followed by a soft hiss. This indicates that the detector is oscillating. Reversing the adjustment of R_7 back toward the ground end should stop the hiss, indicating that the detector is no longer oscillating. The most sensitive adjustment for c.w. reception is with the detector oscillating, but with R_7 adjusted close to the point where oscillation stops.

Now, with the detector oscillating for c.w. reception, adjust C_1 to the point where there is an increase in background noise. Next, slowly tune C_6 , listening carefully until the low-frequency end of the 80-meter band is located. If C_6 has to be turned very far, repeak C_1 occasionally. When the low end of the band has been found, record the setting of C_6 , and repeak C_1 . C_1 and C_6 should not need further adjustment until bands are changed. Simply tune C_2 to cover the band.

The receiver is adjusted for the other bands in a similar manner. Be sure to record the setting of C_6 for each band so that the band will not have to be relocated each time coils are changed. 'Phone signals are normally received with R_7 just below the point where oscillation starts. However, better selectivity on 'phone signals will result if the detector is put into the oscillating condition, as for c.w. reception, and the tuning

dial adjusted so that the carrier beat (whistle) goes to zero. Single-sideband 'phone signals are also received with the detector oscillating, adjusting the tuning dial carefully until the voice is heard clearly. Once set for any band and type of reception, it is seldom necessary to readjust the regeneration control. R_4 will be found useful in keeping strong signals from blocking the receiver. A doublet antenna, cut to the band, or other resonant antenna system works best, of course. For those who want to take an occasional listen on the ship-to-shore band at 500 kc., and the broadcast band, coil dimensions for these bands are included.

Using this receiver, I've been able to work not only hundreds of Ws but dozens of DX stations as well. But, even if you do intend eventually to buy a communications superhet, the small cost of this little receiver makes it an investment well worth while, while you're accumulating the cash for the big job.

Strays

A perennial subject for profound celebrations by c.w. men is a "flick"-type dot-speed adjuster for semi-automatic keys. Solder-wrapped alligator clips, weighted spring-type clothespins, and other unbecoming schemes have been evolved. Such makeshift lash-ups didn't satisfy Joe Mills, W8FYO, who designed and perfected his own version and named it the Vari-Speed. His handy gadgets now are available commercially for use with all makes and models of speed keys.

— . . . —

QST author Keats A. Pullen, jr., W3QOM, reports the theft of his elaborate home-built 100-watt transmitter and triple-conversion receiver. The rig is made up of three units: a 7F8-7W7-2E26 exciter, 4-65A final, and a control unit with meter and relay. Receiver features: two National AM dials, profuse panel controls, tuned first i.f. and plug-in r.f. coils; its 'speaker was not taken. A 24-hour control-type "Clockrola" also was stolen.

Supplementary Data on the Three-Control 813 Transmitter

More About the Six-Band 500-Watt Rig

BY C. VERNON CHAMBERS,* WIJEQ

DURING the last few weeks, Headquarters has been the recipient of hundreds of inquiries concerning the 813 transmitter that was described in *QST* for January, 1954. Many of the questions were related to the procurement of parts, some referred to constructional detail, others were of a more technical nature, and a few were aimed at any modifications or improvements that might have been made since the article went to press. Naturally, as is Headquarters' policy, each inquiry has received individual attention. However, it is felt that similar information should be of assistance to others contemplating the building of the rig.

In the following, any component designations — C_4 , L_9 , etc. — refer to Fig. 1, pages 14 and 15, *QST*, January, 1954.

Modifications and Improvements

The specifications for L_9 stated that the coil should be wound with $\frac{1}{4}$ -inch copper tubing. Actually, the inductor shown in the original photographs was wound with $\frac{3}{16}$ tubing. If $\frac{1}{4}$ tubing is used, L_9 should have 6 turns of $\frac{1}{4}$ -inch tubing, with an inside diameter of $2\frac{1}{4}$ inches, and a length of $2\frac{3}{4}$ inches. A $2\frac{1}{8}$ -inch form should be used to allow for spring in the tubing. Pipe can be found in this diameter. This coil is shown in one of the accompanying photographs.

With the heavier coil, it was deemed advisable to replace the original $\frac{1}{2}$ -inch coil-supporting insulators on the condenser frame with more rugged 1-inch cones (Millen type 31012 or equivalent). Leads between L_9 and C_9 are also made with $\frac{1}{4}$ -inch tubing.

In the original amplifier, C_8 was supported by heavy leads which connected to L_7 and RFC_1 . This arrangement resulted in some strain on the plate end of L_7 , eventually causing a slight deformation of the

• Correspondence indicates that the 813 transmitter (January, '54, *QST*) is going over with a bang. However, a few of the parts used in the rig have been difficult to locate in some areas. In addition, some of the gang have asked for supplementary data pertaining to construction, theory, and modification of the layout. This follow-up on the original article will attempt to augment previous data as thoroughly as possible.

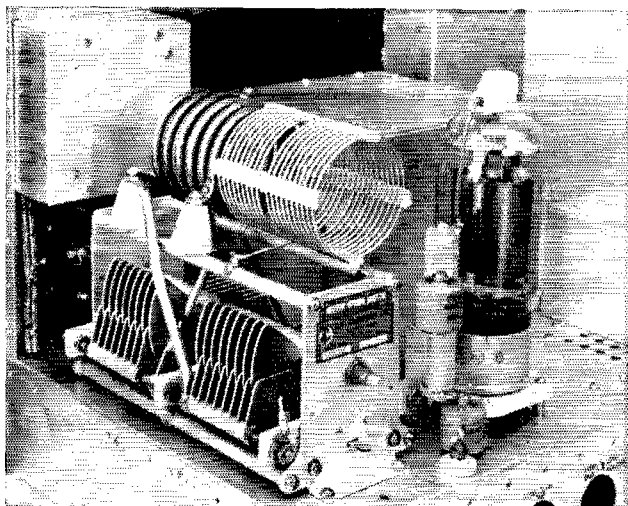
coil. In the new layout, C_8 is mounted between the top of RFC_1 and the rear-stator terminal of C_9 by means of $\frac{1}{2}$ -inch-wide aluminum brackets, as shown in the close-up view of the tank. This also removed C_8 from the immediate field of the tank coil.

Some sharp eyes have detected a discrepancy between the photograph on January *QST*'s cover, and the text regarding the VFO tuning condenser, C_1 . It is the last rotor plate that is removed, and the last stator plate that is bent to obtain the desired bandspread.

Principally to protect the plate milliammeter in case of accident, it is suggested that a fuse be added in the high-voltage lead. A photograph shows how a meter-back fuse holder (Littlefuse type 383002) can be mounted on a $\frac{1}{2}$ -inch isolantite cone just below the high-voltage terminal at the rear of the chassis. The holder is wired in series with the lead between RFC_3 and the posi-

* Technical Assistant, *QST*.

◆
A close-up view of the new multiband-tuner layout for the three-control 813 transmitter. L_9 is now wound with $\frac{1}{4}$ -inch copper tubing. The specifications for L_7 and L_8 have not been changed. The plate-blocking capacitor, C_8 , is mounted by means of aluminum brackets to the right of the plate tuning capacitor.



tive terminal of the meter, and holds a 0.5-amp. Type 8AG fuse.

A recheck of components shows that it might be a good idea to provide a larger safety factor for the 100- μ f. 600-volt coupling capacitor connected between the 6146 and the 813. This capacitor operates with positive 400 volts on one terminal, and the full negative grid voltage of the 813 on the other side, bringing the voltage up pretty close to rating. A pair of 200- μ f. 600-volt capacitors can be wired in series as a replacement, or a 1000-volt disk similar to the Sprague type 10GA-T1 can be used.

No doubt, many of those who have read "R.F. Chokes for High-Power Parallel Feed" in the May issue will ask about substituting the choke described in that article.¹ If space can be made available for the larger choke, the change is a desirable one. However, the choke specified in the original article was designed along similar lines and will give entirely satisfactory performance. It differs from the one described in the May issue only in that the losses are somewhat higher at the lower frequencies, since its inductance is lower. Those who are contemplating construction can easily provide sufficient space by placing the 813 a little farther from the tank condenser.

Locating Materials

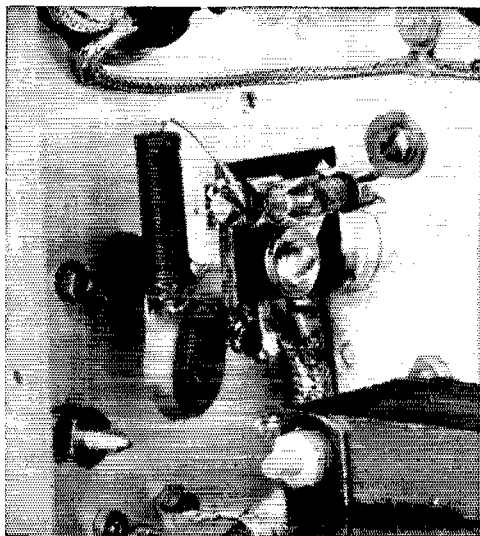
Many of the brands of components used in the 813 transmitter were selected because of certain electrical or physical characteristics. In some sections of this country, and particularly in foreign sections of the world (four countries heard from so far), some of these parts apparently are not readily available. Attempts to order them through local dealers who do not regularly handle one or more of the lines have resulted in delay. However, in only one instance that we know of has the difficulty been attributable to a manufacturer being out of stock. At the present time, all components appear to be ready for delivery to dealers, and it is just a case of finding one who will shoot the order along. If this doesn't solve the problem, it is recommended that the prospective buyer write directly to the manufacturer for information on how and where his products may be found.

A list of manufacturers' addresses, requested by many, appears at the end of this article. Remember, though, the manufacturer almost always prefers that your order pass through a dealer's hands.

Parts Specifications

A source of aluminum — both angle stock and perforated sheet — seems to be one of the greatest stumbling blocks in completing the 813 transmitter. Sheets measuring 30 by 96 inches are obtainable from Whitehead Metal at a cost of \$25.20 per sheet. If you can't use a full sheet, or can't find someone who will share a sheet with

¹ The 813 amplifier was used for testing the chokes described in this article.



The fuse holder is mounted on an isolantite cone that previously served as the tie-point for RFC_2 and the lead to the plate meter. C_{11} and RFC_2 are shown with the high-voltage ends mounted on a Millen type 37001 high-voltage terminal.

you, smaller quantities of similar material are handled by Radcliff's (see ad in April *QST*).

The Whitehead sheet used in the original model has the following specifications: Alcoa 2S-H14 aluminum, 0.051 inch thick, perforated with pattern No. 14, straight $\frac{1}{8}$ -inch holes on $1\frac{3}{4}$ -inch centers, 25 holes per square inch, open area 31 per cent. The perforated sheet advertised by Radcliff's has less open area, but would doubtless be equally satisfactory.

The sizes of the various pieces required for shielding the transmitter are as follows:

2 pcs. 12 by 17 inches (top of cover and bottom plate)

2 pcs. $9\frac{1}{2}$ by 12 inches (ends of cover)

1 pc. $9\frac{1}{2}$ by 17 inches (back of cover).

Type 63ST42 angle aluminum measuring $\frac{1}{2}$ by $\frac{1}{2}$ by $\frac{1}{16}$ inch was used at the corners of the perforated cabinet and along the top and the side edges of the panel. Approximately 8 feet of stock is required for the job. Actually, any type of angle can be used provided it is thick enough to handle self-tapping screws. Both Whitehead and Radcliff's carry the angle stock.

The aluminum boxes used to shield the meters, the VFO compartment and the multiplier-plate coils are made by ICA. Meter shields are Type 29804, the VFO box is No. 29843, and Type 29841 is used for shielding L_3 and L_4 .

Small Components

Both Allied Radio, Chicago, and Radio Shack Corp, 167 Washington St., Boston, Mass., handle the blower-motor assembly B_1 .

National type R-50 50-ma. chokes are used in the oscillator-cathode, multiplier-plate and grid circuits of the 6146 and the 813. National type R-100S 125-ma. chokes are used in the plate cir-

cuits of the oscillator, the buffer, and the 6146.

The selenium rectifier connected in the bias circuit for the 813 is rated at 65 ma.

Johnson type 135-55 insulators are used to carry r.f. leads through the chassis.

A National type ACD-1 right angle drive is used with the VFO-set control and the small tuning knobs are Types HRS-4 (single etched line) and HRS-5 (0-10).

The 1000-volt disk capacitor, C_6 , is a Sprague type 10GA-D1.

Almost any small 55-ma. audio or filter choke may be used in the screen circuit of the 813. The one shown in the bottom view of the transmitter is a Thordarson T-20C59.

Tekni-Labels No. 100 (white) are used to identify controls on the panel of the rig and No. 108 (black) mark the components on the rear wall of the chassis.

RG-8/U 52-ohm coaxial cable is connected between S_{2A} and J_2 of the output-coupling circuit.

Centralab ceramic Hi-Kaps, type D6-101, are used for r.f. coupling to the control grids of V_3 , V_4 , V_5 and V_6 .

Power-Supply and Audio Circuits

Circuit diagrams for low- and high-voltage power supplies for the 813 rig are shown in Fig. 6-59, page 176, 31st edition (1954) of the ARRL *Handbook*. The *Handbook*, page 262, also describes a Class B modulator designed for Type 811-A tubes, the type of modulator tube that most of the fellows seem to want to use along with the transmitter. Pages 247-249 of the *Handbook* furnish constructional details for a speech amplifier-driver for the 811-As.

Information concerning cathode modulation of the amplifier is included in the original article, upper left-hand column, page 14, January *QST*. (Also see footnote 1, same page.) The circuit for the simple grid modulator mentioned appears on page 250 of the '54 *Handbook*.

General Information

For those who ask if a Type 2E26 tube can be used instead of the 6146 as the driver for the 813, we can say that the substitution was tried, but excitation was inadequate at frequencies above 14 Mc.

Disk capacitors — connected across the meters — may be found useful as a TVI preventive measure if the transmitter is to be operated in a fringe area.

The fact that the amplifier in the original model was perfectly stable without neutralization does not necessarily guarantee that this will be true in all cases. It may need only minor departures from an exact duplication of the original to introduce sufficient feed-back for oscillation. If neutralization is necessary, one of the single-ended neutralizing systems shown on page 145 of the *Handbook* will not be difficult to add.

² Enlargements of the photographs shown in this article are also available at \$1.00 per print, postpaid.

Incidentally, following accepted practice, Fig. 1 does not show a ground connection to pin 5 of the 813. Failure to ground this pin may result in instability of the amplifier.

For one reason or another, some inquire about a substitute for the Type 5763. The most likely candidate for this assignment is the Type 6AG7. However, the latter tube has lower plate- and screen-dissipation ratings than the miniature tube, and has not actually been tried in the transmitter. It is much larger physically, of course.

As seen from the top view of the transmitter (the photograph on page 15 of January *QST*), the tube sockets are oriented with prong No. 1 facing in the following directions: V_1 and V_3 , left; V_2 , front; V_4 , V_5 and V_7 , left; V_6 (underneath the chassis), toward the amplifier end of the chassis.

With key up, the bias voltages for the 6146 and the 813 (measured across the 10K resistors) should measure approximately -85 and -100 volts, respectively.

In one or two cases there seems to have been some doubt concerning S_{2A} of Fig. 1. As shown in the diagram, the switch is set for output coupling at 3.5 and 7 Mc.

The multiband tank circuits employed in the transmitter have met with extremely wide interest. For an early issue of *QST*, an article is being prepared which will discuss the principles involved and other factors. It is hoped that this will serve to answer most of the questions that have been asked regarding circuits of this type.

Additional data on the plate tuning capacitor, C_9 , may be of assistance to those planning on plate modulating the transmitter. The Johnson 200DD35 is designed with an approximate peak breakdown rating of 3500 volts. The capacitor, as used in the 813 final, has no d.c. across it and, as a result, only the peak r.f. voltage need be considered. On a conservative assumption that the peak r.f. voltage will be approximately twice the d.c. plate voltage, the plate spacing should be sufficient for 100 per cent plate modulation with the 813 running at 1750 volts d.c. On c.w., it should easily take the maximum rating of 2250 volts for the 813, so long as the tank circuit is loaded.

The cost of the 813 transmitter has been estimated at approximately \$150.00. A pair of power supplies for the rig will probably cost nearly the same amount. Invariably, there are many who would like to purchase the original model of equipment described in *QST*, and the 813 is no exception! The chief reason, among many, for our long-standing policy against this is, of course, that it would be extremely difficult to satisfy everyone with one rig!

Although templates and blueprints for the chassis and the panel layouts are not available, we are able to supply 8 × 10-inch prints of any or all of the photographs illustrating the article, as mentioned on page 52 of *QST* for April.² To avoid any confusion, please identify any picture

(Continued on page 118)

Addendum: Some Principles of Radiotelephony

IF some of the comments are any indication, Part I of "Some Principles of Radiotelephony" (May, 1954, *QST*) left a few unanswered questions in the minds of readers who are not too familiar with certain basic aspects and concepts of alternating currents. The one idea that seemed to be most confusing, and consequently a subject that can stand further discussion, is "polarity" as applied to a.c. The same sketches that were used in the original article will be used as illustrations, with the same figure numbers for easier reference.

Direction of Current Flow

In the early days of electricity, when there were only the haziest conceptions of current flow, the only sources of steady current were some primitive forerunners of our present dry cells — there were no d.c. or a.c. generators as there are today. Based on early work, there were reasons (logical at the time) for assigning a "positive" (+) polarity to one terminal of these cells and "negative" (-) to the other terminal. When it became apparent that there was a "current flow" through any external circuit connected to the + and - terminals of the battery, it was logical to assume that this flow was from the + (abundant) terminal to the - (deficient) terminal. As a convention it leads to no trouble, and any student working with Kirchoff's Laws¹ for solving electrical circuits will encounter no difficulty if he follows the convention.

But when one gets further along and into vacuum-tube operation, he finds that the current flow is actually *electron flow*. And through a vacuum tube, where the electrons travel from cathode to plate, the old *convention* of current flow is exactly opposite to the actual electron flow. It is easy for this to be a little confusing, unless it is appreciated that it doesn't make the slightest bit of difference, in the solving of any problem, which way the current is considered to flow, so long as one is consistent throughout the problem. For example, one can solve a problem by using Kirchoff's Laws on the basis of current flow from + to -, or on the basis of current flow from - to +, and end up with exactly the same results so far as the magnitudes of the answers are concerned. There would have been no trouble at all if the ancients had decided that current flow was from - to +; they didn't, and so we have a little confusion from time to time. Just don't let it get you down!

¹ (1) The algebraic sum of the currents flowing toward any point in an electrical circuit is zero; (2) The algebraic sum of the product of the current and resistance in each of the conductors in any closed path in an electric circuit is equal to the algebraic sum of the e.m.f. in that path.

Graphs

If you are familiar with graphs, and you most certainly are if you followed the illustrations in the May article, you still may not recognize that here, too, there is a convention. In Fig. 2, for example, the vertical scale (marked "Diaphragm Position") is marked "+" above a zero point and "-" below. This is a convention in such presentations; moving up or to the right from zero we label the scales "+," and down or to the left the scale is marked "-." This convention is a universal one, so that in many instances the + and - signs are left off but are understood to be there. The - scales usually denote *negative numbers*, an algebraic concept you don't have to worry about now if you are unfamiliar with it. In Fig. 2

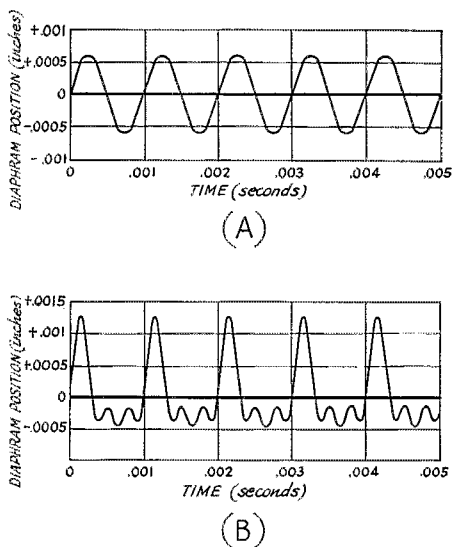


Fig. 2 — Hypothetical plots of microphone-diaphragm positions vs. time, as taken from a slow-motion movie. (A) A single audio frequency (rare in nature). (B) A more likely "complex" signal.

the negative portion of the time (horizontal) scale was omitted because it has no meaning — in other applications we might omit the negative portion of the vertical scale.

Polarity and A. C.

Now let's take a look at Figs. 4A and 4B. As mentioned in the original article, these two graphs are the same — they *look* different because widely-different frequencies are plotted to the same time scale. Under a magnifying glass, you might see that in Fig. 4A the curve goes up from zero to a maximum, back down through zero to a

maximum on the other side and back up, exactly as the curve in Fig. 4B. Because it does this² so many more times a second (the frequency is higher), adjacent cycles seem to run together, by comparison with the curve in Fig. 4B.

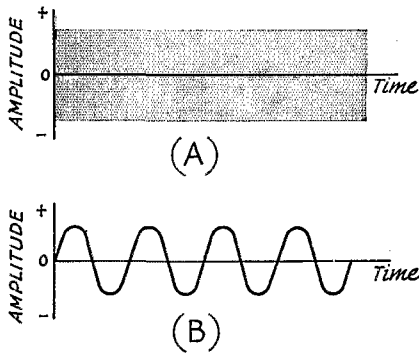


Fig. 4—(A) Plot of a constant-amplitude radio-frequency signal vs. time. Because the time interval is long, individual cycles are hard to see.

If the sketch could be expanded along the "Time" axis, the cycles would have the same shape as in Fig. 4B.

The vertical scales show "Amplitude"—it is easy to see what the author means by a "+" amplitude, but what can a "-" amplitude mean? Ah, but the author wasn't trying to indicate positive and negative amplitudes; he was indicating *amplitude* (voltage) and the *polarity* (direction of action) on the same scale. In other words, any point on the curve above the horizontal time axis indicates the amplitude of the voltage at that instant and that it was considered to be acting in the "+" direction (which, remember, can be arbitrary). Conversely, any point on the curve below the horizontal time axis shows the amplitude of the voltage and that it is to be considered to be acting in the "-" direction.

And "polarity of a.c." is no more complicated than that. The + and - of an amplitude scale indicates the polarity of the voltage at the instant being considered. A curve of alternating currents would look the same as Figs. 4A and 4B; and a - current is simply one that flows in the opposite direction to a + current. In a circuit involving a transformer, you can reverse the "polarity" at the secondary by reversing the leads to the primary (or to the secondary).

Positive and Negative Modulation

All of which leads to the last point about the article that seemed to give a little trouble. In Fig. 6 it was shown how reversing the polarity of a complex modulating signal could result in extended positive peaks on modulation. In practice it has been found that most voice signals are unsymmetrical,² and it is possible to take advantage of this fact and gain a little on the output from your 'phone transmitter, if the modulator can handle the job. The mechanics of reversing the polarity of the modulating signal is simple —

² Grammer, "Lop-Sided Speech and Modulation," *QST*, Feb., 1940.

you just reverse the two plate leads from the modulator tubes to the modulating transformer. The two possible connections are tried while watching the output on a 'scope, and if you're sharp-eyed you can detect a difference. It's an old trick, but some of the newer amateurs may not be familiar with it.

But let's make sure that you understand how reversing the "polarity" of the modulator makes the difference between Figs. 6A and 6B. The modulating signal was a complex one (Fig. 2B) — we called the single spike the + direction and the 3-wiggle side the - direction. If, when the signal is applied to the modulator, the transmitter output increases with the + part of the signal and the transmitter output decreases with the - part, we get the transmitter output of Fig. 6A. (Remember that it is "increasing" or "decreasing" with respect to the unmodulated or "carrier" level.) When we "reverse the polarity,"

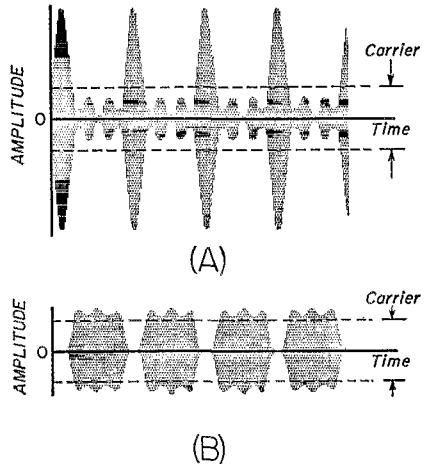


Fig. 6—Showing how positive peaks can exceed 100 per cent modulation. In each case above, the modulating signal is similar to that of Fig. 2B. In (A) the positive peaks (increased output) rise well above 100 per cent modulation. In (B) the polarity of the modulating signal is reversed, and it is obvious that the positive peaks cannot now go to 100 per cent modulation without overmodulation on the negative peaks (decreased output).

the original + part of the modulating signal now *decreases* the output, while the original - part *increases* the output. The signal of Fig. 6B is the result; the single spike reduces the amplitude to zero, and the 3-wiggle side only increases it a little. It may help in understanding Fig. 6 to trace the outline, or "envelope," and see how it reproduces the curve of Fig. 2B. Although Figs. 6A and 6B do not look alike, they would sound exactly the same in a receiver, except that the Fig. 6A signal would sound louder.

And notice that when the transmitter output increases, it increases on the + half of an r.f. cycle *and* on the - half of the r.f. cycle! That r.f. cycle is an a.c. wave, and each half cycle above the zero axis must be balanced by a half cycle below the axis.

— B. G.



Hints and Kinks

For the Experimenter



DOUBLE CONVERSION USING THE BC-348

THE 200-500 kc. tuning range of a BC-348 has been put to good use here at W3KQJ by employing it as a variable i.f. for a 7-Mc. crystal-controlled converter. This system provides excellent 7-Mc. bandsread without making internal changes in the receiver. The converter, a compact and inexpensive unit, is similar to the one described by W6UJD in *QST* for October, 1949.

— Jack Ditton, W3KQJ

DOUBLE-DUTY RELAY SERVICE

WHEN constructing a piece of miniature transmitting gear, it is frequently difficult to find mounting space for the control relays. This is particularly true in the case of under-the-dash mobile jobs which require compactness of design as well as several control circuits. Naturally, if a control circuit can be made to do double duty, it will help to minimize the problem. Fig. 1 shows one arrangement which allows a single relay to handle two entirely different assignments.

In Fig. 1, a s.p.d.t. relay is used for the switching of both the r.f. and d.c. components of a

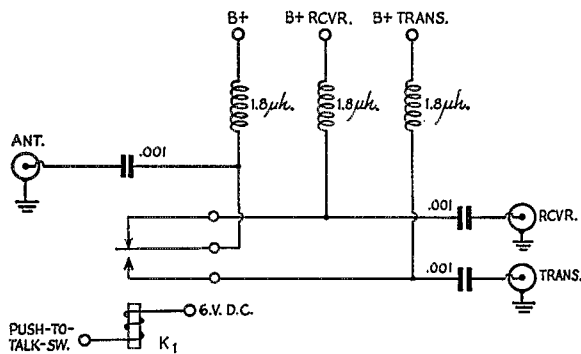


Fig. 1 — Circuit diagram showing how K6CPJ uses a single relay for switching both the r.f. and the d.c. components of a midget 144-Mc. installation.

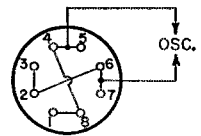
small 144-Mc. installation. Capacitors shown are all of the disk ceramic type and keep d.c. from the antenna system. Ohmite type Z-144 r.f. chokes are connected in series with the d.c. leads running to the common power pack, the receiver and the transmitter to prevent r.f. from backing up into these units. A different value of r.f. choke inductance should be used for a frequency other than 144 Mc.

— Ronald Kleban, K6CPJ

CRYSTAL SOCKET HINT

AN 8-prong tube socket wired as shown in Fig. 2 provides the maximum usable number of mounting positions for a crystal. With the socket

Fig. 2 — A novel way of connecting an 8-prong socket for use as a crystal holder.



so connected, it is impossible to insert a crystal without making connection to the oscillator circuit.

Incidentally, the undersigned claims no credit for the idea. It's just one of those stunts that turned up in a technical article and then seemed to receive no further mention. Let's hope that some of the fellows will find it adaptable to their next rigs.

— Joseph A. Unterkofler, WN3WZX

UTILIZING BURNT-OUT METAL TUBES AS CABLE PLUGS

EXCELLENT cable connectors can be made from tubes such as the 6H6, 6C5, etc. First, pry the metal shell loose from the base of the tube. Then remove the glass and metal components from the shell and unsolder the leads which connect to the base prongs. Drill a hole for a rubber grommet at the end of the shell and slip the grommet in place. After the cable has been passed through the grommet and the ends soldered to the base prongs, place the shell back on the base and crimp it securely in place with pliers or other suitable tool.

— Peter Baghdasarian, W1YHU

SOLDERING TO ALUMINUM

CONTRARY to popular belief, it is possible to solder to aluminum. The procedure for using ordinary solder is as follows:

- 1) Heat the aluminum enough to melt 50-50 solder. A blowtorch or a gas range is the best source of heat for large objects. Electric irons rated as high as 200 or 300 watts will not work unless the object to be soldered to is extremely small.
- 2) Melt a little solder on the part to be tinned.
- 3) Remove the piece from the flame and scratch the solder into the aluminum with a wire brush; reheat if necessary to keep solder molten.

(Continued on page 120)

• Recent Equipment —

The SX-88 Receiver

SOONER or later some wit is going to come up with the facetious remark that, "That new SX-88 is sure a lot of receiver — it's 20 inches wide and 18¼ inches deep." And while it's true that 18¼ inches is deep for a receiver and may occasionally pose a problem in finding operating-table space, there's quite a bit more to the story.

This Hallicrafters receiver has already been advertised extensively, so some of the data you find here may be old hat. Bear with us, however — some of it hasn't been in the ads.

The SX-88 is a double-conversion two-dial receiver that covers 0.535 to 33 Mc. in six ranges. The bandswitch also operates masks in back of the dials so that only portions of the scales, corresponding to the range in use, are back-illuminated at any time. To facilitate setting up on any amateur band, a 100-kc. crystal-oscillator "Calibrator" is included — when changing to a new ham band you throw the bandswitch, turn the "Calibrator" on, set the bandspread scale to some even 100 kc. within the ham band and set the bandset dial to a dot at the high-frequency end of the band. At this point you will be within easy reach of the 100-kc. marker signal so you rock the bandset dial, zero on the marker signal, and lock the bandset dial. The bandspread dial then reads directly in frequency, and you can, of course, check it every 100 kc. with the calibrator signal. The calibration marks on the bandspread dial are every 10 kc. on the bands up to and including 14 Mc. (they're every 20 kc. at 21 Mc. and every 50 at 28 Mc.), so it can be read easily to about 3 kc. (except on 21 and 28 Mc.), and closer if one is a good judge of distance. The

receiver has a lot of selectivity (as we'll elaborate on later), and there might be times during c.w. operation with high selectivity when a 3-kc. approximation of frequency wouldn't be good enough to allow one to return from some other part of the band to a signal he had been stalking previously. (As, for example, in a DX contest when you're trotting back and forth between several pile-ups.) For such cases, there are arbitrary markings on both the scale and the tuning knob that give a 0-200 scale for logging and reset.

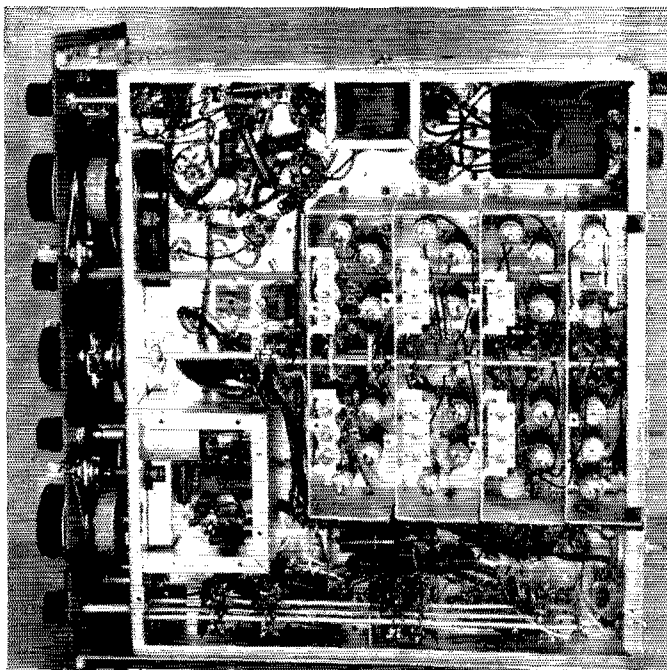
This receiver has no "selectivity" control and no crystal filter — it has a "Bandwidth" switch. This switch has six positions (not counting a seventh marked "Phono" for feeding a record player through the audio amplifier), and these positions are marked ".250," ".500," "1.25," "2.50," "5" and "10." These figures represent in kilocycles the 6-db.-down bandwidths of the 50-kc. second i.f. (the first i.f. is 2075 kc., except on one range), and the corresponding 60-db.-down bandwidths are .850, 1.50, 3.75, 7.5, 15 and 21 kc. If you dig back through old copies of *QST*, you will find that this degree of selectivity exceeds almost anything that has been described by home constructors, with only a few exceptions in the case of "super-selective" c.w. receivers. It certainly is better than anything that has been described in the way of graduated selectivity, because it goes all the way from a nominal 250-cycle bandwidth to one of 10 kc.

The two sharpest positions give the kind of selectivity that the "super-selective c.w." gang has been plugging for the past few years: no audio image at all on "the other side" of zero

◆

The SX-88 is well shielded underneath the chassis, and covers were removed for this photograph, to show the b.f.o. compartment (near front panel) and the high-frequency oscillator and signal coils. The oscillator coils are wound on ceramic forms and air trimmers are used; the signal circuits use polystyrene coil forms and mica trimmers.

◆



beat. On 'phone, the 5-kc. setting is used when there is no QRM, the 2.5-kc. bandwidth is right for s.s.b. reception of a.m. or s.s.b. signals, and the 1.25-kc. bandwidth is useful for tough QRM on a.m. or s.s.b. The b.f.o. should be used for exalted-carrier reception of a.m. signals at the 1.25-kc. bandwidth, although two operators reported that it isn't absolutely necessary — we rate them as "old pros" at copying 'phone and not necessarily typical.

The SX-88 has a five-position switch labeled "Response" and marked with such old irritants as "Bass Boost," "Hi Fid" and "Normal," and a couple of new ones marked "Comm 1" and "Comm 2." (Right about now you're wondering if the author has gone off his rocker, running some guff about a glorified tone control in the middle of a description of the selectivity characteristics.) The "Bass Boost" and "Hi Fid" positions are ones to be used with b.c. reception or phonograph-record playing, of course, and the "Normal" is the usual audio response of a communications receiver, dropping off at the higher audio frequencies to attenuate the background noises a little. The two sleepers, "Comm 1" and "Comm 2," are useful for 'phone reception, and should do a lot to overcome some of the criticisms one hears about the audio "quality" when using selectivity. These two positions provide attenuation at both the *high and low* ends of the audio range, to give a better over-all balance to speech received through a selective i.f. amplifier. (An S-76 was reworked along these lines in the lab about six months ago, and it made a whale of an improvement. All it required in that case was smaller audio coupling condensers and a couple shunting the grid resistors — it took the "boominess" out of speech in the higher-selectivity positions.)

Regulated heater current to the h.f. oscillator seems to be the trend. The SX-88 uses a 4H4 for the purpose — it should help where a high-powered transmitter drags down the line voltage during "transmit" periods.

The next remark may sound facetious, but it isn't meant to be. One of the most important design features of a receiver is the tuning knob(s) and mechanism. It is also one of the most controversial subjects when receivers are discussed. So about all we can do is to report that the tuning knob(s) of the SX-88 is weighted (to give some inertia to work against) and free-running enough to be easily spun several revolutions. The drive is spring-loaded gears. It takes $17\frac{1}{4}$ revolutions of the bandspread knob to cover the 500 kc. of the 80-meter band, 14 revolutions to cover the 300 kc. of 40 meters, 17 revolutions for the 350 kc. at 20, $7\frac{2}{3}$ revolutions for 450 kc. at 15, and 11 revolutions for 1700 kc. at 10 meters.

The S-meter is a dual-scale affair. One scale is the usual S1 to S9 and on up to +40 db., and the other is shown in microvolts input to the receiver. The instruction book points out that the microvolt scale holds closest on bands 2 and 3, a bit of information that may come as a shock to those who place the reliability of an S-meter's calibration just one notch above that of the standard-frequency transmissions from WWV. The S meter works from the plate current of the first r.f. stage, an a.v.c.-controlled stage, and, since the a.v.c. is unaffected by the b.f.o. and can be used with c.w. as well as with 'phone, the S-meter indicates on c.w. signals. However, the no-signal setting of the S-meter depends upon the setting of the "Sensitivity" (r.f. gain) control, so if the r.f. gain is backed off the S-meter is less responsive. With an a.v.c. and S-meter system like this, it means that a.v.c. can be used in the reception of s.s.b.

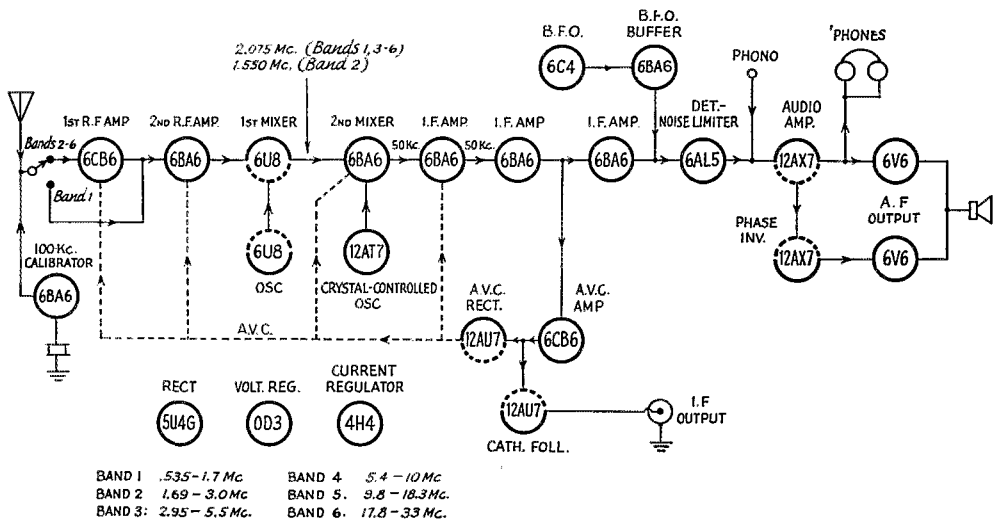


Fig. 1 — Block diagram of the SX-88 receiver. Only one r.f. stage is used in the broadcast range — all other ranges use the two r.f. stages.

The first i.f. is normally 2.075 Mc. Band 2 includes this frequency, however, so on Band 2 the first i.f. is made 1.550 Mc.

The 4H4 current regulator is in the heater circuit of the 6U8 1st mixer, for maximum stability under varying line-voltage conditions.

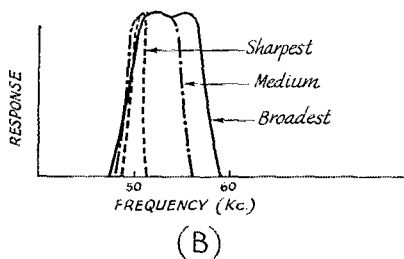
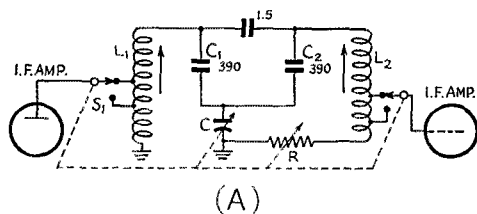


Fig. 2 — (A) Basic circuit of the variable-bandwidth i.f. used in the SX-88. The coupling is increased as C is made smaller, and the Q of L_2C_2 is reduced as R is increased. The stage gain is held constant with changes in bandwidth by tapping the grid and plate up or down on the coils.

(B) The effect of varying C and R in (A) is that the passband "grows" out to a higher frequency, as illustrated here.

signals, a feature that may prove useful in some of the s.s.b. round tables where the signals are at considerably different levels.

The receiver has other features that may prove useful to specializing operators. For example, there is a convenient cathode-follower take-off at the tail end of the 50-kc. i.f., for external connection to a teletype converter or an oscilloscope. There is an auxiliary gain control (inside the receiver cabinet) that cuts into the circuit when the "Rec-Standby" switch is thrown to "Standby." This enables the operator to switch on his transmitter and simultaneously reduce the gain of the receiver to a condition suitable for monitoring his own signal. This operation can also be performed by a remote switch, or the "Rec-Standby" switch can be used to control one's transmitter. A small neon bulb from grid to ground on the first r.f. stage is included to protect the receiver from high-level r.f. signals, but the operator is cautioned that r.f. on the antenna terminals in excess of 50 volts may destroy the neon bulb and antenna-stage coils.

The I.F. Amplifier

As an "old skirt-selectivity man," the writer was particularly interested in the 50-kc. i.f. amplifier, and we'll take a little time here to tell you how the SX-88 gets its wide range of bandwidths. The heart of it is, of course, the tuned circuits that are used. These are special coils tuned by a ferrite slug and surrounded by a ferrite sleeve. The special design gives a coil with a Q of 175 to 185 at 50 kc., as compared with the Q of 100 of the coils used in the S-76. An interesting

sidelight is that it was found impossible to obtain a Q of higher than 130 until a metal screw was removed from the ferrite core and a means was found for threading the glass-hard and glass-brittle ferrite.

Any skirt-selectivity man can build a sharp i.f. amplifier if someone hands him a bunch of $Q = 180$ coils, but the SX-88 i.f. has the various bandwidths mentioned earlier. This poses quite a problem, because the frequency must not be changed radically by the bandwidth-variation method, and the gain must be held substantially constant. This was accomplished by the Hallicrafters engineers in the general way shown in Fig. 2A. This simplified diagram shows a variable resistor ganged with a variable capacitor — in the actual receiver these are step-switched, of course. It can be seen that the smaller the capacity of C , the tighter will be the coupling between the two tuned circuits, L_1C_1 and L_2C_2 . Furthermore, the larger the value of R is made, the lower becomes the Q of the grid tuned circuit, L_2C_2 . By proper proportioning of the various values of C and R (at different switch positions), the wide range in bandwidth variation is obtained. One of the three 50-kc. i.f. stages has taps on the coils, as represented in Fig. 2A by the leads to S_1 , and this enables the gain of the i.f. amplifier to be held relatively constant over the entire range.

The midband frequency of this i.f. system does not remain constant — the low-frequency edge remains substantially constant. This is illustrated in Fig. 2B, and it is something the operator must remember if he is to understand fully the performance of the receiver as the bandwidth is changed. Here three conditions ("sharpest," "medium" and "broadest") are shown — the effect is as though the bandwidth "grows" to the higher frequency. It is pointed out here to explain what will undoubtedly puzzle some operators when they switch bandwidths and find that sometimes the carrier drops out and sometimes it doesn't. Obviously, it will depend on whether one has the carrier centered at around 50 kc. or on the high-frequency side of the i.f. passband.

The B.F.O.

The SX-88 has a three-position switch marked "C.W.," "A.M.," and "S.S.B." This is no magic switch that makes the tuning of s.s.b. signals an a.m. man's delight, but it is worth explaining. It is the usual b.f.o. "on-off" switch with something added. In the first place, the b.f.o. has a "b.f.o. buffer" stage between it and the diode detector. On "A.M." the b.f.o. is turned off, and on "C.W." extra resistance is cut into the cathode of the b.f.o. buffer, so that the b.f.o. voltage reaching the detector is less than when the switch is flipped to "S.S.B." With manual gain control, there seems to be sufficient b.f.o. injection for s.s.b. signals when the b.f.o. switch is on "C.W.," provided the manual gain is reduced sufficiently. However, the extra b.f.o. voltage on "S.S.B." is necessary when running with the a.v.c. on and the manual gain turned up, and that may be the rea-

(Continued on page 118)

1954 ARRL Field Day Rules

Annual Test for Emergency-Powered Stations, June 19th-20th

THERE'S not much time left for Field Day planning! Just about every amateur in the ARRL field organization already knows that June is Field Day month, and that FD packs more enjoyment into one week end than any other operating activity. To newcomers, though, we'd like to point out that this yearly activity is a test of emergency-powered stations in the field operating under conditions similar to those which might be encountered in an actual emergency.

Unlike many operating activities, this has come to be largely one in which clubs and other organized groups function as teams in setting up and operating single or multi-transmitter stations independently of normal power facilities. Even if you can't arrange to take part as a member of a Field Day group, though, you can go into action with your mobile rig, or set up a station afield alone or with a friend and enjoy the fun. Hundreds of stations and thousands of brother amateurs will be scanning the bands for you!

Each year, the annual ARRL Field Day grows more important as a demonstration of amateur radio's ability and willingness to provide communications in emergency. Since mobile units are considered indispensable in civil defense planning, clubs in particular are urged to get every mobile unit owned by their members on the air and to report their scores to ARRL for the special Aggregate Mobile club listings.

Simply call "CQ FD" on c.w., and "Calling any Field Day station" or "CQ Field Day" on 'phone. Then give the station you work a signal report and your ARRL section or specific location, and stand by to receive similar information.

Read the rules carefully. Then look at these examples designed to assist club secretaries and individual participants in tallying their scores.

Example 1

Assume a 25-watt rig wholly on batteries, not originating or relaying any messages, and not having more than two operators.

40 points (40 stations worked)
 $\times 3$ (power below 30 watts)

120
 $\times 3$ (all radio equipment independent of commercial mains)

360
 $\times 1.5$ (If Class B or C and everything on batteries)

540 claimed score

Example 2

Same as Example 1 but one Field Day Message to the NEC or SCM is originated and passed in good form.

65 points (40 QSOs + 25 points for FD Message)
 $\times 9$ (3×3 — power multiplier multiplied by independence-of-mains multiplier)

585
 $\times 1.5$ (everything on batteries)

877.5 claimed score

(Copies of all messages originated and relayed must accompany Field Day reports.)

1954 Field Day

Starts 4:00 P.M. Local Standard Time,* June 19th
Ends 4:00 P.M. Local Standard Time,* June 20th
* Not Daylight Time
(If in Hawaii or Alaska, see Rule 5)

Example 3

Assume the Podunk Hollow Radio Club (or, alternatively, any group of three or more licensed operators), portable at its FD site, operates two transmitters simultaneously. Each rig runs 75 watts input and batteries or generators furnish power. One message is started in good form (25 points), 1 is received and relayed onward (2 points), and 230 stations are contacted.

257 points (230 QSOs + 25 + 2)
 $\times 2$ (power input over 30 and under 100 watts)

514
 $\times 3$ (all gear independent of mains)

1542 claimed score

(No battery multiplier for either clubs or groups.)

Convenient reporting forms are now available from League headquarters upon request. You may make up your own forms, but please don't forget to include bands used, dates and contact times, calls of stations worked, signal reports sent and received, and sections or locations of stations worked. Reports must also show power inputs and power sources, location and call of station, number of transmitters in simultaneous operation, number of persons participating, club name (if any), and score computations. Get your summary in the mail by July 15th to have your results appear in *QST*.

Many clubs already have organized committees to handle the FD site, equipment and antennas, operating and maintenance teams, food, etc. Now's the time for every individual or group planning to take part to follow suit!

Rules

1. **Eligibility:** The Field Day is open to all radio amateurs in the sections listed on page 6 of this issue of *QST*.

2. **Object:** For portable and mobile stations to work as many stations as possible; for home stations to work as many portable and mobile stations as possible.

3. **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 Contest Committee.

4. **Entry Classification:** All entries will be classified according to number of transmitters in simultaneous operation. They will be further classified as follows: "A," club or nonclub group portable stations; "B," unit or individual portable stations; "C," mobile stations; "D," home stations operating from emergency power; "E," home stations operating from commercial power sources. Thus a club or group running three transmitters simultaneously will be in the 3A classification, or a mobile station with one transmitter will be in the 1C classification.

Portable stations are those installed temporarily, for FD purposes, at sites away from customary fixed-station loca-

tions. Portable equipment or units must be placed under one call and the control of one licensee, for one entry. All control locations for equipment operating under one call must lie within a 1000-foot diameter circle.

Group participation is that portable-station work accomplished by three or more licensed operators.

Unit or individual participation is that portable-station work accomplished by either one or two licensed operators.

Mobile stations are complete installations including power source and antenna, mounted in or on vehicles and capable of being used while in normal motion. If they utilize antenna supports not normal or suitable for use during motion, installations must be classified as portable instead of mobile. Each mobile entry call must be different from any other FD station participating.

Home-station participation is that work by fixed amateur stations not operating portable or mobile.

A transmitter used to contact one or more stations may not subsequently be used under more than one other station call during the Field Day period.

5. Field Day Period: The Field Day starts at 4:00 p.m. Local Standard Time (not Daylight Time) June 19th and ends at 4:00 p.m. Local Standard Time (not Daylight Time) June 20th. (Hawaii and Alaska sections use Pacific Standard Time.) All contacts must be made during this period. Class C stations may cross a time-zone line but may not receive credit for more than 24 hours of operation if they do so.

6. Bands: Each phone and c.w. band is regarded as a separate band. The following (and additional u.h.f.-s.h.f. bands) constitute separate bands: A1: 1.800-1.825 1.875-1.900 "east" or 1.900-1.925 1.975-2.000 "west," 3.5-4.0, 7.0-7.3, 14.0-14.35, 21.0-21.45, 26.96-27.23, 28.0-29.7, 50-54 and 144-148 Mc. A2: radioteletype and frequency-shift keying are grouped with A1, in the bands where they are allowed. A3: 1.800-1.825 1.875-1.900 "east" or 1.900-1.925 1.975-2.000 "west," 3.8-4.0, 7.2-7.3, 14.2-14.3, 21.25-21.45, 26.96-27.23, 28.5-29.7, 50-54, and 144-148 Mc. All forms of voice transmission will be grouped with A3, in the bands where they are allowed. (In Canada and Cuba, their respective phone bands apply.)

The use of more than one transmitter at one time in the same band is not allowed.

7. Exchanges: Signal reports and ARRL section (or specific location) must be exchanged in proof of contact.

8. Valid Contacts: In Class A, B and C, a valid contact is a completed exchange with any amateur station. In Classes D and E, a valid contact is a completed exchange with any station in Class A, B or C. Cross-band contacts are not allowed. Contacts by mobile stations may be made in motion or from any location(s). A station may be worked more than once only if the additional contacts are made on different bands.

9. Field Day Message: A Field Day Message is one originated by a Class A, B or C station and addressed to the SEC or SCM (see address in QST, p. 6) stating the number of operators, the field location, and the number of AREC members at the Field Day station. Only one Field Day Message may be originated.

10. Scoring:

Points: Each valid contact counts 1 point.

Message Credit: Credit for handling messages may be obtained only as follows: 25 points for originating one Field Day Message to SEC or SCM. In addition, each Field Day Message received for relay will score 1 point when received by radio and 1 point when sent onward by radio. No FD Message may pass through the same station twice. There will be a deduction of 10 points for mission of handling data or for defects in form. Copies of all messages originated and relayed must accompany Field Day reports.

Multippliers:

Power: Output-stage plate input under 30 watts: 3. Output-stage plate input over 30 and under 100 watts: 2. Output-stage plate input over 100 and under 1000 watts: 1. The plate input of a grounded-grid amplifier is its plate input plus the plate input to the driver stage.

Independence-of-Mains: All radio equipment independent of commercial power source: 3. All radio equipment not independent of commercial power: 1.

Battery Power (applies to Class B and C only): 1.5. The battery capacity or size shall in all cases be adequate to permit one hour's continuous operation of the station. Charging batteries from commercial mains while batteries are connected to transmitter or receiver voids the "independence-of-mains" and "battery power" multipliers.

Multippliers do not apply to Class D and E entries.

Final Score: The final score equals the total "points" multiplied by the "power multiplier" multiplied by the "independence-of-mains" multiplier (multiplied by the "battery power" multiplier, if applicable). Where different multipliers apply during the Field Day period, points are multiplied by the multiplier in effect at the time the points were earned.

11. Club Aggregate-Mobile Scores: Entries under Class C may be combined to form a "Club Aggregate-Mobile Score." The club name must be noted on the individual reports, and the club secretary must submit a claimed aggregate score. Credits to the extent supported by the reports submitted to ARRL will be allowed. Only bona fide members of the club, residing in the club territory, may contribute to the aggregate-mobile club listing.

12. Reporting: Mail reports or entries on or before July 15th. Reports must show bands used, dates and contact times, calls of stations worked, signal reports sent and received, and ARRL sections or locations of stations worked. Reports must also show power inputs and sources of power, number of transmitters in simultaneous operation, location of station, number of persons participating, class of entry, and score computations.

A.R.R.L. QSL BUREAU

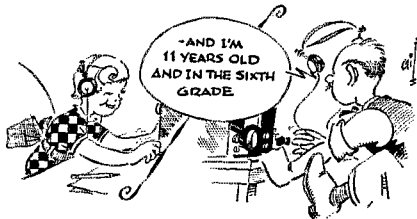
The function of the ARRL QSL Bureau system is to facilitate delivery to amateurs in the United States, its possessions, and Canada of those QSL cards which arrive from amateur stations in other parts of the world. Its operation is made possible by volunteer managers in each W, K, and VE call area. All you have to do is send your QSL manager (see list below) a stamped self-addressed envelope about 4¼ by 9½ inches in size, with your name and address in the usual place on the front of the envelope and your call printed in capital letters in the upper left-hand corner. For a list of overseas bureaus see p. 59.

- W1, K1 — J. R. Baker, jr., W1JOJ, Box 232, Ipswich, Mass.
W2, K2 — H. W. Yabnel, W2SN, Lake Ave., Helmetta, N. J.
W3, K3 — Jesse Bieberman, W3KT, Box 34, Philadelphia 5, Penna.
W4, K4 — Thomas M. Moss, W4HYW, Box 644, Municipal Airport Branch, Atlanta, Ga.
W5, K5 — Oren B. Gambill, W5WI, 2514 N. Garrison, Tulsa 6, Okla.
W6, K6 — Horace R. Greer, W6TI, 414 Fairmount St., Oakland, Calif.
W7, K7 — Mary Ann Tatro, W7FWR, 513 N. Central, Olympia, Wash.
W8, K8 — Walter E. Musgrave, W8NGW, 1294 F. 188th St., Cleveland 10, Ohio.
W9, K9 — John F. Schneider, W9CFT, 311 W. Ross Ave., Wausau, Wis.
W0, K0 — Alva A. Smith, W0DMA, 238 East Main St., Caledonia, Minn.
VE1 — L. J. Fader, VE1FQ, 125 Henry St., Halifax, N. S.
VE2 — Austin A. W. Smith, VE2UW, 6164 Jeanne Mance, Montreal 8, Que.
VE3 — W. Bert Knowles, VE3QB, Lanark, Ont.
VE4 — Len Cuff, VE4LC, 286 Rutland St., St. James, Man.
VE5 — Fred Ward, VE5OP, 899 Connaught Ave., Moose Jaw, Sask.
VE6 — W. R. Savage, VE6EO, 329 15th St., North Lethbridge, Alta.
VE7 — H. R. Hough, VE7HR, 2316 Trent St., Victoria, B. C.
VE8 — W. L. Geary, VE8AW, Box 534, Whitehorse, Y. T.
VO — Ernest Ash, VO1A, P. O. Box 8, St. John's, Newfoundland.
KP4 — E. W. Mayer, KP4KD, Box 1061, San Juan, P. R.
KH6 — Andy H. Fuchikami, KH6BA, 2543 Namauu Dr., Honolulu, T. H.
KL7 — Box 73, Douglas, Alaska.
KZ5 — Gilbert C. Foster, KZ5GF, Box 407, Balboa, C. Z.

YL NEWS and VIEWS

BY ELEANOR WILSON,* W1QON

Here's an introduction to a few of the really young Young Ladies of amateur radio. Somewhat uncharacteristic of their sex, they don't mind disclosing their ages at all! Within the wondrous world of from eight to seventeen years, they are bubbling with enthusiasm and pulsating with a



desire to see and learn and do all they can. They're proud of their ham tickets, and we're proud of them for getting them so early in life.

WN0SKB — Linda Grace Middleton (9) of Pueblo, Colorado — licensed in January, 1954, has worked six states on 80 c.w. Dad is W0NIT. Sister Jean, 11, ex-WN0NCB, is going to try for her General in June, along with her mother.

W9UDH — Marie Rantanen (11) of Milwaukee, Wis. — first licensed as a Novice in July '52, went on to Technician and General licenses as result of teacher W9MGT's (Leonore Zavodnik) amateur radio classes at the Browning School. Now a sixth-grader, she operates school station W9TBT and is looking forward to some intensive Field Day operating again this year.

KN2DSL — Merceda Ann Pilla (12) of Bordentown, N. J. — became interested in the hobby through her brother K2ART. She works 80 and 40 c.w.; has built a code oscillator and wired a "booster adapter."

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



W0IKJ



WN5AXC

WN5AXC — Margaret Mary Wanja (13) of Dallas — has QSLs from 36 states worked on 40 and 80 c.w. since August, 1953. She gets on the air each morning from 6:00 to 7:00 A.M. before going to her 8th-grade classes. Dad is W5EJV.

W6JPI — Margaret Hartley (14), San Mateo — was first licensed in 1950. She works 40 c.w. and 75 'phone regularly and credits amateur radio for a number of very interesting experiences.

W8ODC — Kathy Callanan (14) of Detroit — is the only ham in her family. She became interested in amateur radio through her school's radio club. She calls into the QMM Net regularly and has worked 30 states using a rig she built herself "out of the junk box at a total expense of 60 cents." Abetted by her interest in amateur radio, Kathy hopes to pursue an E.E. career.

W0IKJ — Carole Millett (14) of St. Cloud, Minn. — was licensed as a Novice when 12. Her father is W0RIL. A member of the Minnesota State Net, she enjoys 75 'phone when homework permits.

WITTE — Carolyn Bradley (15) of Marblehead, Mass. — was first licensed when 12. Now on 10 meters, she and her father, W1FIN, are planning s.s.b. operation on 75 presently.

KN2ECD — Nancy Schein (15) of Brooklyn — decided one day to build a one-tube receiver. Someone suggested that she get an amateur license — she thought about it awhile and did. She has built a two-tube regenerative receiver, a 2-meter and a 40-meter converter, and a power supply and transmitter for 2. There are no other hams in her family.

W3TTR — Eileen Joganic (15) of Pittsburgh — was first licensed in February '52 as a Novice and became General Class within a few months. A member of ARRL, RCC, YLRL and the Pittsburgh Amateurs' Association, she works 20 and 40 c.w. regularly. Her brother is W3SIC.

W7QWX — Mary Klock (15) of Troutdale, Oregon — first licensed as a Novice at 12, par-

W7QWX

W1YCU

W6JPI

W9UDH

W3UTP





WITTE



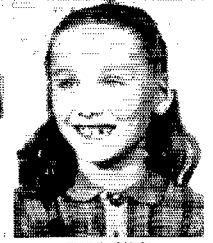
KN2DSL



KN2ECD



W3TTR



WN6SKB

ticularly enjoys contacts with other teen-agers on 75. Her father is W7NGG.

W1YCU — Judy Gage (16) of Worcester, Mass. — again an only ham in her family, received her license in March '53 as a result of classes conducted by the Central Massachusetts Amateur Radio Assn. She works 10, 20 and 75 with her Viking I and RME-45.

W3UTP — Sylvia Gramba (16) of Pittsburgh — is "strictly a c.w. gal" who works 80 and 40

as often as being a high school senior permits. She exclaims she's always amused when asked during a contact if her OM is licensed, too! Dad is W3CRK.

W2KAE — Lynn Lyra (17) of Rockville Center, N. Y. — is vice-president of the Long Island Unit of the YLRL this term. The daughter of W2CB, Lynn was first licensed as a Novice in July, 1951. Active on 2 and 40 meters, she participates regularly in the Nassau AREC Net.

Results, 5th Annual YL-OM Contest

Hearty congratulations to the YL and OM top winners in this year's YL-OM Contest — both W4s — YL W4KYI, Frances Krepp of Knapolis, N. C. and OM W4ARR, Robert Crane of Birmingham, Ala. Congratulations, too, to all of the top scorers listed in the following.

This year 177 logs were received — a considerable increase over the number received last year. However, as indicated by some of the following comments received from OMs, YLs could have been more plentiful; those YLs who were on seemed to enjoy the affair thoroughly.

Some of the OM comments received:

"My first YL-OM contest, with lots of fun and excitement, but thought there was a shortage of YL operators on c.w. Was surprised at such fine c.w. operating ability of the gals. Congratulations to all the ladies."

"Sad lack of YLs on 80 c.w. It was a great deal of fun and I am looking forward to next year."

"Lots of fun working YLs — good operators too. Hope you can get more stations on next year from the Midwest and West."

"This year I will register with you my annual gripe about scarcity of YLs in the c.w. section — hi!"

"Question: Comes contest time, where are all of the gals one talks with day after day?"

"This is my third year. This year's contest has inspired me to try for YLCC or YL WAS."

Special credit is due YLRL Vice-President Ruth Siegelman, W2OWL, for her extensive ef-

forts in the planning and "paper work" involved in this contest and the YLRL Anniversary Party.

It was necessary to change some scores because of errors in calculation or in the power multiplier used. Questions should be submitted directly to W2OWL at her Brooklyn, N. Y., QTH (1414 Wythe Place).

All suggestions received on how to improve the two contests will be turned over to the incoming vice-president about July 1st with the hope of making next year's contests still more successful.

SCORES, YL SECTION

Highest score: W4KYI, 27,993. *Highest 'phone scores:* W8HLF, 20,992.5; W1SCS, 17,220; W4STH, 13,066.5. *Highest c.w. scores:* W1FTJ, 12,220; W9JUI, 11,497.5; VE3AJR, 9,386.

Station	Aggregate	'Phone	C.W.
W1FTJ	12,220	—	12,220
W1QON	232.5	232.5	—
W1RLQ	1325.5	783	552.5
W1SCS	17,220	17,220	—
W1UKR	5082	5082	—
W1YYM ¹	6646	2346	4060
W2EBW	1755	—	1755
W2EEO	646	646	—
W2IQP	675	675	—
W2JZX	1008	1008	—
W2RUF	253	—	253

(Continued on page 126)

And here is the "littlest" YL of them all — Sharon Pakinas, WN7UOH, of Bothell, Washington, who has now turned eight but who was first licensed when just seven years old! (See page 10, Oct. 1953 QST.) Sherry has had "many" contacts on 40 and 80, and she's planning to try for her General Class license soon. Her mother writes that people find it hard to believe she is licensed at such a tender age — "When she is sending to someone, he usually comes back with: 'Did you say you are eight years old?? Please QSL and send a picture!'" Sherry's dad is WN7UOL.

June 1954



A.R.R.L. CONVENTIONS

SOUTHEASTERN DIVISION

Atlanta, Ga. — June 5th-6th

The Atlanta Radio Club is sponsoring the ARRL Southeastern Division Convention to be held June 5th and 6th in Atlanta, Ga.

The convention proper will be held at Robinson's Tropical Gardens, West Paces Ferry Road — a large hall with forced-air cooling that will seat 1500 people with plenty of level parking space adjacent to building.

On the evening of June 5th a reception will be held at the Marietta Motel starting at 7 P.M. At 9 P.M. all will adjourn to the steak house for a Dutch supper. At 12 midnight the Royal Order of the Wouff Hong will be "conferred" with W4KL in charge.

Sunday's activities will start at 10 A.M. with registration and general bull sessions. The famous white truck (and anyone who has ever attended an Atlanta hamfest knows what that is) will be parked in its usual place by the river all full of its cooling "refreshment." The program will start at 11 A.M. with technical talks by prominent personnel in the amateur field. At 1 P.M. a delicious Southern fried chicken meal will be served.

Reservations for the convention and hotel or motel accommodations should be mailed to A. J. Farr, 572 Wells Avenue, Hapeville, Ga. The Marietta Motel, near the convention site, has been reserved in its entirety by the club. Prices are \$6 single, \$7 double, \$8 double and single. Tickets for convention are \$3 in advance and \$3.50 at gate. Reservations must be paid in advance and closing date is June 1st.

PACIFIC DIVISION

San Jose, Calif. — July 3rd-4th-5th

The Santa Clara County Amateur Radio Association is sponsoring the ARRL Pacific Division Convention in the Civic Auditorium, San Jose, Calif., on July 3rd, 4th and 5th.

There will be an open forum preceded by group meetings, each of which will have a moderator and secretary. These meetings will include the whole gamut of amateur interests — traffic, DX, USNR, MARS, Emergency Comm., TVI, RTTY, s.s.b., and v.h.f.

A real innovation will be a barbecue, western style, with steak. There will be technical talks with speakers scheduled that have not been heard in the area before. Organization breakfasts are also planned.

The ladies have not been forgotten in that there will be theater parties, fashion shows, talent shows and a half-day bus trip around the valley with visits to all places of interest and lunch at a famous restaurant.

There will also be a mobile-installation judging contest, a 2- and 75-meter mobile hunt, and an exhibition of radio-controlled flight by the national champion.

Registration fee is \$6. Reservations can be made by writing SCCARA, P. O. Box 6, San Jose.

OREGON STATE

Klamath Falls — June 26th-27th

The ARRL Oregon State Convention, sponsored by the Klamath Radio Society, will be held at the Klamath Armory, Klamath Falls, Oregon, on June 26th-27th.

Preregistrations close June 12th. Those wishing to register early should address Luryne Conner, W7SBS, Lakeshore Drive, Klamath Falls.

Registration will begin at the Armory at 8:00 A.M. June 26th, with official opening at 11:00 A.M. Activities will continue through Sunday evening with the banquet scheduled for 6:00 o'clock.

Admission fee has been set at \$7 for all licensed amateurs and \$3 for unlicensed persons.

HAMFEST CALENDAR

FLORIDA — The St. Petersburg Amateur Radio Club is holding its annual state-wide Hamfest on Sunday, June 13th, at Philippe Park, near Safety Harbor, Pinellas County. There will be a contest, auction, entertainment for grown-ups, games for children, and amateur equipment for operation by licensed hams. All amateurs and their families and wives are invited. The admission fees are \$1.25 per person, for advance reservations up until June 6th, and \$1.50 per person admission at gate. Admission for children under 12 is 75¢. These prices include a delicious catered lunch. For further details, contact Bob Spiers, W4JOU, P. O. Box 908, St. Petersburg, Fla.

ILLINOIS — The Western Illinois Radio Club and North-east Missouri Radio Amateur Club will sponsor the 1954 amateur radio Hamfest and Family Picnic (basket lunch) at Eagles Alps, 2 miles north of Quincy on North 5th Street, Sunday, June 27th, from 10 A.M. to 5 P.M. All amateur radio operators and families in the Tri-State area of Illinois, Missouri and Iowa are invited. Many events are planned, including games for all ages, refreshments, auction of radio parts, and good old-fashioned fellowship and hospitality. Advance price \$1.00; at gate \$1.50. Transmitting frequencies: 3940 and 29,640 kc. For reservations contact George VanDeBoc, W9HQW, 703 South 18th, Quincy, Ill.

KANSAS — The Wichita Amateur Radio Club and the Air Capital Amateur Radio Association will co-sponsor a Hamfest on June 27th at Camp Hyde YMCA camp near Lake Afton, about 20 miles southwest of Wichita. There will be special contests for the OMs, YLs, XYLs, and kids. Bring your swim suits for a dip in the lake, your mobile gear for the three hidden-transmitter hunts (10, 75 and u.h.f.), and your basket lunch. Time is 8 A.M. to 5 P.M.

NEW MEXICO — Saturday and Sunday, June 5th and 6th, at the Little Walnut Picnic Area, 5 miles north of Silver City: 4th annual New Mexico State Hamfest. Stations will be set up on 10 meters and on 3838 kc. to direct incoming hams to the picnic area. Registration begins Saturday at 1 P.M., and a lively and varied program is planned. All amateurs passing through are invited to attend. It's all "dutch" so come prepared. Camping spots are available.

OHIO — The Jackson County, Ohio, radio amateurs are staging a Hamfest at Lake Alma State Park in Wellston, Ohio, on Sunday, June 6th. Former Jackson County amateurs are invited to attend a nice informal picnic, as are all amateurs in the vicinity. Round up the XYL and junior ops and bring your lunch. Swimming and fishing are on the agenda.

PENNSYLVANIA — The Uniontown Amateur Radio Club will hold its fifth annual Gabfest on the club grounds on Saturday, June 12th. Festivities start at noon. Club rigs will be on the air. Refreshments will be served as usual. The events planned include movies. Registration fee \$1.50. Interested amateurs not on club mailing list write W3PIE, P.O. Box 849, Uniontown, Penna.

ALBERTA — July 3rd and 4th, at Calgary. Advance registration \$4. Box 196, Calgary Stampede starts July 5th. Near Banff and Lake Louise.



Correspondence From Members -

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

"DECADENT DIEHARDS"

209 Maury Avenue
Charlottesville, Va.

Editor, *QST*:

In the April issue of *QST* there appeared a letter from Mr. Ginn, WH6BAQ, on the abolishment of the c.w. requirement from the examination for people who are interested in 'phone only if they are able to pass a harder examination in theory. I would agree with him and would, if I were to have such a license, be willing to accept a call that would automatically pick me out as having it. One method, for instance, would be to have a second number incorporated in the call (W4URJ might be possible). I freely admit that I have an axe to grind in one respect. I have a first-class Commercial 'Phone ticket and a Technician's license, so that it is only the code which is blocking me. However I believe that anyone whom the FCC is willing to let operate and repair commercial transmitters with their narrow tolerances should be permitted to operate 'phone in the ham bands provided they know the rules and regulations, and that this should be extended also to any other person with an equivalent amount of knowledge.

In one respect only do I disapprove of Mr. Ginn's letter. I don't think that name-calling gets us anywhere. However I think the idea is good.

— Neill McShane, W4URJ

199 Lock St.
Clyde, N. Y.

Editor, *QST*:

A plague of worms on Mr. Ginn's pineapples! . . . If the ARRL misses Mr. Ginn's four dollars, I will be glad to pay it to keep him out!

— Leslie J. Trude, W2GXV

407 Tilden Rd.
Egypt, Mass.

Editor, *QST*:

. . . The ability to send and receive code is a very useful one especially if you don't have enough money to modulate right off the bat.

— Phil Rand, W1YTA

Wainwright Drive
S. Woodstock, Conn.

Editor, *QST*:

. . . Please don't lose sight of the fact that c.w. is here to stay, and try to make 'phone boys out of all of us. If we want to work 'phone we will, but we will also keep our code speed up.

— Harold Chase, W1EES

310 6th Ave., N.W.
Decatur, Alabama

Editor, *QST*:

After reading the unprecedented note from WH6BAQ I got a real kick out of it (backward, of course) to think that an amateur should be selfish in desiring that some of our much crowded frequencies should be set aside for the "codeless gang." It seems to me that if anyone is not interested enough in amateur radio to go along with all the license requirements without griping about the code part of it he isn't a real amateur. Also, three or four c.w. stations can operate within the same bandwidth that one 'phone station will occupy, and be copied 100 per cent.

I don't agree with him on the phrase of "decadent diehards"; c.w. men will be on the air handling traffic successfully when QRM and WX conditions put the "phoners" off the air. While I lack a lot of being a good c.w. man, I enjoy it very much and would rather handle traffic on it

than 'phone. Have had a 35-w.p.m. certificate since 1939 and would like ARRL to make a few runs on up to 50 w.p.m., furnishing certificates therefor.

If c.w. isn't the most reliable method of communication, why are all press matters, via radio, sent on c.w.?

— C. E. Uptain, W4BFM

St. Raphael's Rectory
Dubois, Indiana

Editor, *QST*:

. . . Fortunately, I have company in my decadent plight. Who? The U. S. Navy and, I think, some others. Our Navy recently completed the Big Jim job, a c.w. transmitter with much more than a million watts output. I wonder if the "progressives" think the Navy should put the big rig on A3? It would almost seem to me the Navy must consider that c.w. might have some communications values that A3 lacks. Well, anyhow, if c.w. is good enough for our Navy, it's good enough for me.

— Rev. Joseph Terstege, W9LQE

2362 Elizabeth Ave.
Winston-Salem, N. C.

Editor, *QST*:

I happen to be one of those "decadent diehards that still insists on c.w.," and I think there are many others who feel as I do. I think an operator's license with no c.w. attached could never be classified as a real ham license. Maybe there should be a frequency for the guys who are too lazy to learn c.w., but it should have nothing to do with the regular ham frequencies. If some of the guys would try half as hard to learn c.w. as they try not to have to learn it, we would really have a lot of swell operators around. I wouldn't trade my bug for a mike any day, and if and when c.w. ever goes out of ham radio, a big part of me and a lot of other fellows will go out with it.

— James O. Chatham, W4TNF

7531 S.W. 63rd Court
South Miami, Fla.

Editor, *QST*:

. . . C.w. is an art, requiring a dexterous person to use a bug or key. A person who can effectively use both 'phone and c.w. is a true ham. Almost anyone can build or buy a modulator, but one has to acquire a good fist.

Nevertheless, a code test for those engineers or qualified radio men who want to experiment in the higher frequencies, seems ridiculous. Many qualified electronics authorities are hindered from developing and improving radio by such code tests. Stiffen the theory for the experimenters and continue the code tests for the communicators.

— Larry Shepherd, W4WGB

P. O. Box 385
Ririe, Idaho

Editor, *QST*:

It seems we still have a few diehards who hate c.w. and would like to see this fine art abolished. In my opinion they are just plain lazy in respect to trying to copy it and if they don't like c.w. they should keep away from it.

— K. B. Anderson, W7LQU

2135 Cornell Ave.
Fresno 3, Calif.

Editor, *QST*:

I have been General Class only a couple of months, and up until a little while before I took the test I, too, was all enthused about 'phone. However, after I got on c.w. a while, I began to enjoy it, and am now on most of my operating time.

— R. A. Scholl, K6BGR

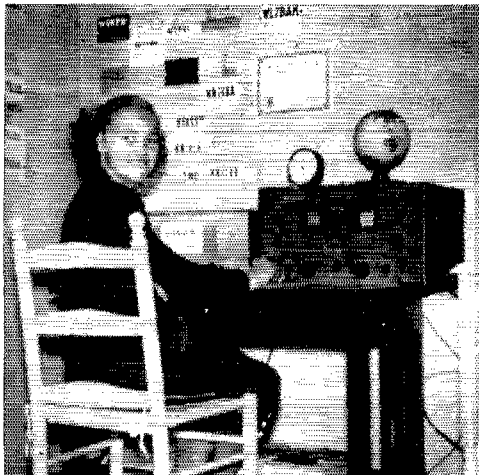
(Continued on page 132)

Results of the Novice Round-up—1954

THE THIRD Novice Round-up was rung in at 1800 local time January 9, 1954, and for the following two-week period helped make the term "Novice" a synonym for enthusiasm, willingness to learn and good operation. With more than 200 logs turned in, this annual Novice event stands as the most lively one to date. The over 154 WN/KN scores submitted evidenced the increasing interest of the Novice Class amateur in this activity designed expressly for him.

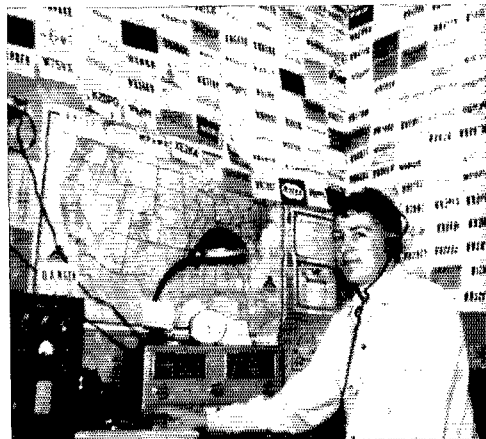
Good scores were the rule, not the exception. Contacts with 150 or more stations were achieved by KN2EIU, WN3WFJ, WN0OEB, WN0QDR, WN0QVO and WN0QWS. Multiplier totals were surprisingly high, with the following contestants attaining the 40-or-more section mark: KN2EIU, WN5BJA, KN6BFC, KN6CQT, WN8MSK, WN9YXM, WN0OEB, WN0QDR, WN0QVO and WN0QWS. Additional credit was earned by many participants possessing ARRL Code-Proiciency awards. The major portion of the Novice group certified at 15 w.p.m., with 11 WNs certifying at 20 w.p.m. or higher. W5VNW came forth with an appropriate comment in saying, "The word 'Novice' is certainly not a gauge of ability. Most of the WNs I worked were very FB operators, with smooth fists and excellent operating techniques — and speed, wow!"

Close section races were experienced in E. Mass., Louisiana and Virginia, with a very close battle particularly in Northern New Jersey. KN2EPP edged out KN2DNW by acquiring an extra section multiplier. Out of a possible 73 sections, WN0QDR of Winona, Minnesota, came up with 50, no mean accomplishment! Bob's neat accurate summary of exchanges makes note, too, of 46 states QSOd.



San Joaquin Valley and Pacific Division laurels go to 10-year-old KN6CQT. Ann totaled 41 sections through 97 contacts and still found time during January to qualify for a 20 w.p.m. ARRL C-P Award.

Two of the younger entrants manifested big abilities. The Md.-Del.-D.C. section, Atlantic Division, leader was eleven-year-old WN3WFJ. Ten-year-old Louise "Ann" Brierley, KN6CQT



The third highest number of QSOs was racked up by WN0QWS demonstrating Missouri ability in a big way with 162 in 40 sections, all on 7 Mc. John's 40 watts, doublet and NC-88 receiver have accounted for 750 40-meter contacts during a four-month period.

of Reedley, California, preceded all San Joaquin Valley and Pacific Division competitors with a snappy 4797 credits.

Leaders in their respective call areas were WN1ZDZ, KN2EIU, WN3WFJ, WN4CHK, WN5BJA, KN6BFC, WN7UBA/7, WN8MSK, WN9YXM and WN0QDR.

N-R Quotes

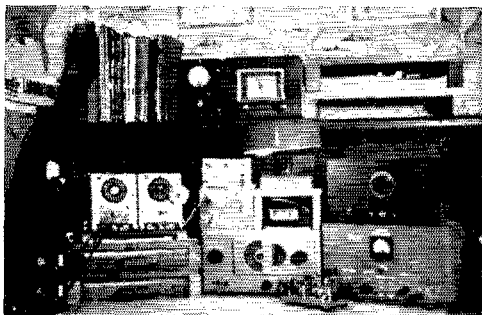
"Looks like I picked the wrong time to build my rig and my score shows it, hi!" — WN7UIY. . . . "Had a great time, the WNs are doing swell." — W7BED. . . . "In my opinion the contest started off with a bang, but I think it slowed up the last week. I worked six new states, my first VE2, VE4, and I passed my General Class exam." — WN9AEM. . . . "Many of the WNs would put us General Class hams to shame with their snappy operating." — W0HAW, *opr.* K6CUX. . . . "Enjoyed the N-R very much. I made a lot of new friends and was astonished to work so many non-Novice stations." — WN4BAN. . . . "A great number of the Novices I heard had remarkably good fists, two of the best being YLs." — W2EMW. . . . "Had better luck on 80 than 40; got 5 new states, too." — WN1ZID. . . . "Many of the fellows did very well considering QRM conditions on the 80-meter Novice band." — W9SZR/9. . . . "Great contest!" — WN9ASK. . . . "I hope to be back next year without the "N" in my call." — WN0PAN. . . . "This was the liveliest Novice Round-up of them all. Looks like a bumper

Top YL scorer, WN4BLR participated in the Virginia section scoring 141 QSOs in 35 sections. Kay's 60 watts to an 807 accomplished the feat, with moral support in full from 3 jr. ops and OM W4BVB.



crop of up-and-coming WN ops this year!"
— W4KFC.

A helping hand was supplied by many non-Novice stations during the N-R, as the following alphabetized scores illustrate. The calls in boldface are those of last year's participating WN/KNs, back this year to help the new Novice contingent. W1AW 355,¹ W1BDI 2500, W1GKJ 440, W1JYH 3232, W1MX 5106,² W1SAD 3844, W1VNX 2697, W1WPO 5546, W1YYM 396,



A snappy fist (certified at 25 w.p.m.) and the top Round-up tally belong to KN2EU, East New York. Ken rang up 175 QSOs with a multiplier of 46 for a commanding 9200 points. Station gear includes BC-454B, BC-455B and S-38C receivers, Heathkit transmitter and homemade antenna coupler.

W2EMW 1449, W2LS 1891, **K2BOF** 96, **K2BUI** 540, K2EGZ 660, W3NRE 1325, W3UZB 76, W3YBI 1596, W4BZE 2349, W4KFC 5670, W4OMW 702, W4ZSC 1664, W5VNW 1127, W5ZPJ 4, W6KJR 279, K6ALJ 34, K6CUX 351,³ W7BED/5 1360, W8KLZ 80, W9AZM 4680, W9DUA 320,⁴ W9KQY 920,⁵ W9RTP 46,

¹ W1QIS W1WPR W1YYM, oprs. ² W1YFM W4YHD, oprs. ³ W0HAW, opr. ⁴ W9VBV, opr. ⁵ W9EPO W9VBZ W9WWN WN9WYL WN9ZDO WN9ZDW, oprs.

Conditions notwithstanding, WL7AWL helped represent Alaska by giving 24 contestants an additional section. A home-brew 6AG7-807 rig, SX-71 receiver and long-wire antenna did the job for Monty.

W9SRZ/9 1416, W9UWU 3528, W9VBV 559, W9VBZ 2135, W9WAN 3808, W9WJV 2592.

SCORES

Scores are grouped by ARRL Divisions and Sections. The operator of the station listed first in each section is award winner for that section. *Example of listings:* WN3WJC 2144-58-28-17, or, final score 2044, number of stations 58, number of sections 28, total operating time 17 hours.

ATLANTIC DIVISION

WN3WJC.....2044-58-28-17	WN9ZZX.....603-64-9-2
WN3WKR....104-13-8-7	WN9BQN.....444-37-12-12
	WN9BQC.....180-15-12-4
	WN9AFR.....117-13-9-3
	WN9YRS.....115-8-5-2
	WN9ZXY.....60-5-4-10
	WN9ZMJ.....38-4-2-3
	WN9BQV.....12-4-3-6

Md.-Del.-D. C.

WN3WFJ.....5810-151-35-30
WN3WOR.....2610-72-30-38
WN3WIE.....1846-71-26-32
WN3WOT.....495-25-15-12
WN3YAV.....12-6-2-4

Southern New Jersey

KN2GLC.....3410-110-31-20
KN2EYF.....1012-44-23-11

Western New York

KN2GEE.....731-28-17-11
KN2EJF.....403-16-13-5

Western Pennsylvania

WN3VWJ.....2700-75-36-40
WN3WIL.....375-25-15-20

CENTRAL DIVISION

Illinois

WN9YXM.....6160-139-40-24
WN9YYB.....3168-84-32-33
WN9YYF.....2670-74-30-32
WN9ZOU.....2464-73-28-37
WN9YYG.....1512-52-21-6
WN9BRQ.....1260-63-20-15
WN9ASK.....672-42-16-16

DAKOTA DIVISION

North Dakota

WN0PYA.....1250-50-25-12

South Dakota

WN0QKV.....88-11-8-5

(Continued on page 122)





June 1929

... The editorial discusses a frequency-economizing plan wherein amateurs with self-excited oscillator rigs would strive to QSO stations on common frequencies.

... D. J. Angus, W9CYQ, writes on "Indicating Instruments for Amateur Transmitters," reviewing moving-iron, d'Arsonval and r.f.-type meter designs.

... "Photo-Electric Cells and Methods of Coupling to Vacuum Tubes," by Thornton P. Dewhirst, supplies practical information on several circuit variations.

... "Re: An Improved Superheterodyne," contributed by J. M. Grigg, suggests modifications for improved performance of the set featured in December, 1928, *QST*.

... *QST* Technical Editor Harold P. Westman provides data on "Two Recently Announced Tubes," the UY-224 screen-grid tube and the UX-245 low- μ power amplifier.

... "WHDC," by Stephens Miranda, is a story of the round-the-world cruise of 50-foot ketch-rigged sailing yacht *Nomad*, a ship widely contacted by amateurs.

... The second of a station description series, "W8BQ" enumerates features of the installation owned and operated by H. M. Walleze in Hazleton, Penna.

... "Facts About Glass Arm," by Walter H. Candler, discusses an old bugbear that has plagued code enthusiasts since the early days of landline.

... Uncle Jimmy, in "The Pied Piper of Hamelin," entertainingly sprinkles poignant lessons in basic theory throughout a 1929 edition of the famous old story.

Modifications on the Pigmy Powerhouse

Further experience with the 40-watt band-switching rig described in the April issue has prompted the author, W3HH/4, to suggest the following minor modifications:

1) Remove the plate of the VFO tube from the unregulated supply, and connect it to the 150-volt regulated tap. No change in the 2000-ohm 25-watt or the 6000-ohm 10-watt resistors is necessary.

2) Remove the 0.1- μ f. paper grid by-pass condenser, C_6 , from the VFO tube.

3) Remove the 50,000-ohm resistor in the grid lead of the second 6AG7. In its place, add a 10,000-ohm resistor to the grid in series with a 33,000-ohm resistor connected to the grid-bias-voltage line. By-pass with a 0.1- μ f. ceramic condenser at the junction of the 10,000- and 33,000-ohm resistors. Remove the 0.1- μ f. paper condenser, C_{11} .

4) Change the grid resistor of the 807W from 10,000 ohms to 25,000 ohms.

5) Shield the meter with a cut-down coil shield can 3 inches in diameter.

6) Replace the 0.1- μ f. paper condenser, C_{20} , with a ceramic unit.

7) Drill a cluster, consisting of five $\frac{1}{4}$ -inch holes, in the hinged cover, directly over the 807W, the rectifier tube, and at a point half-way between the two 6AG7s.

8) Fasten the lid with self-tapping screws.

Preview — DX Contest High 'Phone Scores

Here are some of the top 'phone scores claimed by participants in the 20th ARRL International DX Competition. Although the compilation seems indicative of activity during the contest period, each mail still brings huge stacks of logs and it's not too late for a dark horse to pull an upset! In the following tabulation of high W/VE scores, multipliers and contacts, an asterisk denotes a multiple-operator set-up:

W1ATE...	301,320	186	540	W6PWR...	64,326	71	302
W2SKE/2*	270,025	175	523	W4QM...	62,208	98	216
W3BES...	217,412	148	457	W3GEM...	60,858	98	207
W4KWY...	153,980	145	354	W9EWC...	60,652	118	172
W6YY...	125,514	114	367	W1JEL...	55,860	95	196
W9WZ...	124,000	128	389	W3IMV...	50,826	86	197
W4HQN*	122,400	120	340	W4NBV...	49,812	84	198
W3VKD...	113,850	115	330	W8YDJ...	46,920	92	170
W6YRA*	107,415	93	385	VE4RO...	43,945	85	173
W4DQH...	107,238	122	295	W8LKH...	40,304	88	157
W9AVJ*	96,291	117	275	W3JNQ...	35,550	79	150
W9JJP...	85,215	115	247	W1ZD...	34,861	71	164
W3GHS...	80,444	119	226	W3EQA...	32,956	77	144
W8NKF...	77,168	112	230	W5KBP...	31,302	74	141
W9VUL...	75,537	109	231	W6PRZ!	23,805	69	115
W3CUB*	73,632	104	236	W8NGO*	67,098	108	211
W8NGO*	67,098	108	211	W7MBX!	8724	39	72

*Highest claimed score received from this call area.

These are the leaders outside W/VE:

KH6IJ.....	175,044	58	1006	PY4KL.....	10,773	19	189
HP3FL.....	100,170	63	536	EA4DR.....	10,540	20	179
KL7AON....	70,431	51	464	PY3AGP....	9860	20	132
KP4YC.....	63,080	38	569	ET9A.....	9378	18	177
PJ2AF.....	40,902	34	413	VP1GG.....	9062	23	133
IJ1EQ.....	38,134	46	299	XE1TR.....	8717	23	127
KH6PM.....	33,480	40	279	PY1AQT....	8386	26	109
VP3YG.....	33,030	30	368	EI5I.....	7875	15	175
HE3RC.....	22,638	33	229	LU8DB.....	7500	25	100
YN4CB.....	22,437	27	280	CO2GO.....	7218	17	135
KG4AT.....	22,152	39	195	EA4DL.....	6783	17	133
XE1OE.....	18,678	33	190	CT1SQ.....	6575	25	88
G2PU.....	17,733	23	257	F7CZ.....	6454	14	155
CS3AC.....	16,560	18	314	KP4KD.....	6048	24	84
CO2BM.....	16,458	26	211	TA3AA.....	3904	16	113
XE2W.....	12,864	32	134	PJ2AB.....	5040	14	125
XE1QB.....	12,462	31	140				

As soon as the complicated log-checking process is completed, the final results of the contest will be carried in *QST*. Watch for that issue! A preview of high c.w. scores will appear next month.

COMING A.R.R.L. CONVENTIONS

June 6th — Southeastern Division, Atlanta

June 12th-13th — Rocky Mountain Division, Denver

June 26th-27th — Oregon State, Klamath Falls

July 3rd-4th-5th — Pacific Division, San Jose

Oct. 2nd-3rd — West Gulf Division, Kerrville, Texas

Oct. 16th-17th — Midwest Division, Des Moines, Iowa

(See detailed announcements on page 60)

How's DX?

CONDUCTED BY ROD NEWKIRK,* W1VMW

How:

Judging from this month's mail, "How's" readers are increasing in number. Jeeves thinks it's time we tested the three of you on your DX reading retentivity. It's a game you can play while waiting for 28 Mc. to open up and the puzzlers are based on material presented in "How's DX?" from January through May of this year. *Allons!*

1. The 1954 BERU Test was strictly for (a) 'phone, (b) c.w., (c) spark and facsimile, (d) G stations only.

2. Calls in the KG6RA-KG6RZ series are reserved for stations on (a) Iwo Jima, (b) Rapingamarangi, (c) Rota, (d) Guam.

3. Maximum ham power inputs authorized in the Territory of New Guinea and Israel, respectively, are (a) 50 and 100 watts, (b) 1.5 and 1500, (c) 150 and 150, (d) 100 and 250.

4. By choice, Monaco's resident 3A2s work (a) 14 Mc. only, (b) 'phone only, (c) 30-hour weeks, (d) v.h.f. and u.h.f.

5. While operating in the Windwards, G2RO used the call (a) VP2AO, (b) VP2RO, (c) VP2GRO, (d) G2RO/VP2.

6. A 10-year-old YL, the first Novice licensee on Yap, was issued the call (a) KC6NZ, (b) WC6ZA, (c) K1DDY, (d) KC6ZA.

7. LB is the prefix for (a) Jan Mayen, (b) Jan Mayen and Spitzbergen, (c) Norwegian stations operating outside the LA mainland, (d) portable work by Norwegian hams in all Norwegian territory.

8. CS3AC (a) is a MARS call not heard on ham bands, (b) is synonymous with CT3 on the ARRL Countries List, (c) is a ham station in the Azores operated by U. S. personnel, (d) counts as Africa for WAC.

9. The lower limit of the 15-meter 'phone band for FCC-licensed amateurs is (a) 21,250, (b) 15,250, (c) 21,200, (d) 21,450 kc.

10. VS4, VS5 and ZC5 are, respectively, the prefixes for (a) Sarawak, Borneo and North Borneo, (b) Brunei, Sarawak and Hoboken, (c) Brunei, Sarawak and North Borneo, (d) Sarawak, Brunei and North Borneo.

11. With respect to the DXCC Countries List, Kamaran Island is to Aden as (a) Andøy Island is to Norway, (b) Clipperton is to Catalina, (c) Joe is to Marilyn, (d) Fletcher's Ice Island is to Canada.

12. The high-scoring U. S. amateur in the 1952 "All-European" DX Test was (a) W3CRA, (b) WN5EFA, (c) W1VMW, (d) W2WZ.

13. From "How's" photos correlate the listings in the right-hand column below with those at left:

- | | |
|----------------------|--------------------------|
| A) KR6s AZ BA and IT | a) Antelope and gazelles |
| B) ON4FG-OQ5FG-OQ0FG | b) Bates and more Bates' |
| C) W9s UTZ and NZZ | c) Spectacles |
| D) EA4BH-EA9DD | d) "The Shirts" |
| E) EA9s DE and DF | e) KF3AB |
| F) Johnston Island | f) Seven-foot elevation |
| G) KJ6AY and KH6MG | g) Dark glasses |
| H) OQ5NK and JY1US | h) "Watch the birdie!" |

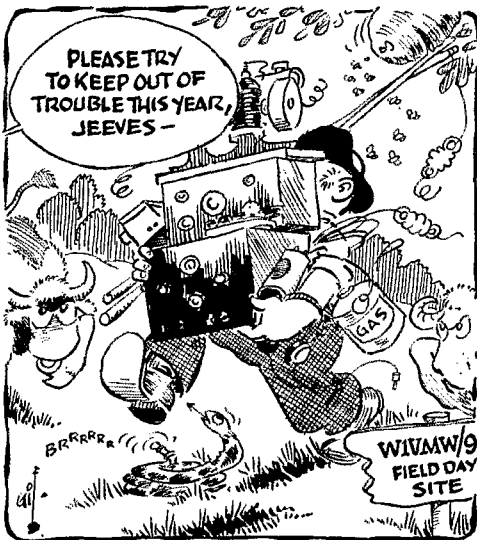
Jeeves outsmarted himself and can't find the master answer sheet. If he finds them in time they'll appear on page 58.

What:

Virgin ARRL DXCC Countries List timber was felled with a resounding *crash!* on April 23rd when an intrepid trio of Iowans put FO8AJ and Clipperton atoll on the air for a furious burst of eagerly-awaited multiband 'phone and c.w.

QSOs. After two harrowing weeks at sea on their second attempt to reach the island — this time they sailed from Acapulco de Juárez on April 7th — W6s NWX NUC VDQ and battered *Barco de Oro II* received an assist by Mexican naval boats. Two to target, shoved their HT-20/SX-88 combo ashore and began to regale the brethren on 14 Mc. at better than a QSO per minute. The boys couldn't linger long, however, and left Clipperton on the 26th while the leaving was good. A few of the DX-peditionary difficulties they overcame: severe squalls, shredded sails, treacherous currents, seasickness, ship Diesel conk-outs, sparse sailing wind, scant sun for navigational sightings, depleted supplies of lubricating oil and fresh food, generator trouble ashore, and homesickness for the familiar sight of tall W9 cornstalks in lieu of mountainous seas. Yet they managed around a thousand QSOs! Anyone else for Clipperton?

Although many DXers were QRL following the FO8AJ saga day by day and others were busy providing FO8AJ/MMI traffic outlet and assistance, the DX gang did accumulate a little stuff on the side. Continuing on the subject of *twenty c.w.*, then, we note that K2CRE's Viking II collected QSOs with CRYAN (37), FF8AZ (75), FM7WP (45), FP8AP (68), FQ8AF (85), GC2FZC (34), GD3FBS (45), ISLV (60), ISIAHK (8), OQ5PU (37), TF6SV (5), SPs 1KAA (82), 2KAK (82), 3AN (72), VQs 2AB (11), 4RF (29), ZEs 5JA (30), 6JJ (8), 3V8AN (7) and 5A4TG (15). Steve's ground-plane quickly brought him up to 80 countries worked CR6AI (47), CXs 5CO (18), 6AD (18), KAs 2JL (30), 2YA (70), KGs 4AC (38), 6FAA (90), VPs 6WR (20), 7NM (40), VQ3EO (39) and YV5BJ (85) got through to W4TJI in good shape W8DLZ, harrying the postman for a TI9AA pasteboard, took the measure of KT1UL (55), PJ2AE (65), VPs 2AD (70) and 6BM (35). Norm is on the very brink of DXCC membership with a 106/97 tally School set-up W3ULI, with W3MWL keying, worked CN8EG (50), CS3AC (35) of the Azores, OX3GL (49), VQ4s CF (45) and EW (58) W3AXT rose to 157/140 while collecting FY7YC, HAs 5KBX 7OL, JA3BB, KA9MF, LU3ZB, LZ1KDP, PZ1AL, SP2GS, VQs 2W 6UU, YO3RF, ZK1AB and ZS7D Thirty watts and a 3/2-wave wire got GD3UB, ZB2A and others for W8FEM EA9DF of Rio de Oro, YI2AM and ZC4IP were new ones for W1APU Odds and ends garnered here and there, by W2TXB: CE0AA, SUI5X and YU6EA. W6DZZ: HK1TH and VK1HM/ZC2 (29) 15-16 GCT of the Cocos-Keeling group. W6GPB:



* DX Editor, QST.

OY2Z and an LZ. W6ZZ: VR3A (ex-VR3D) of Fanning (50), JA1CD and KB6AY.

Twenty 'phone obviously is on the upswing. W2GBC's 100-wattor worked CR6BX, CT2AG, FM7WN, ST2NW TA3AA, VP8 2DL 3YG, VQs 3EO 4AC, ZB2A (170) 18 EST, ZD4BR and 5A3TC. Bill still stalks OE13AA (140), OX3AY (140), SU1MR (340), 4S7FG (140) and 4X4AH (122). . . . EA4CH told W4HQJ that CR8AB's 14-Mc. 'phone would be available shortly. W4HQJ is curious about the ZA1KAB A3er he worked in March. . . . W2TXB vocalized for T2ZZZ, SP3AN and ZD4BK. . . . W6YY finds VR3s C and D quite active on 20-meter 'phone. John also encountered VK9OK of Norfolk Island on voice who will remain there possibly three years. . . . VQ8AR (110) answered W2GLF, while W9LMC dallied with KG4AK (210) and VP1GG (105). . . . K2CRE awaits QSLs from KT1UX (310), TA3AA (145) and VP2KB (130). . . . W2KJG raised CN8s GL MM, EL9A, VP8 2GF and 3LF. . . . SWL Stan Bolton, Massachusetts, puts the finger on these active 14-Mc. 'phones: CT3AN, EA9AR, FF8AP, GDs 3UB 6IA, HHs 2AM 2PR 3RC, HI6EC, HKs 1DZ 4JO, HPs 1HO 1RW 3FL, HRIs AA FM FV JW KS LW, KG4s AE AK AU, K1TWX, OAs 1C 4AQ, PJ2s AB AF AL AO AQ CL, VP2DF, VP7NU, other VP voicers, YNs 1WR 4CB and 5A3TC. . . . The Newark News Radio Club has the 14-Mc. 'phone situation under close surveillance and has established the availability of this assortment: CN2AD, CRs 4AC 4AE 4AI 4AM 4AN 4AO 4SP 6AC 6AN 6CB 7AF, CS3AC, DUs 7SV 9VL, EAs 8AP 8AX 8BL 9AP 9AZ 9AB, ELs 3A 9A 19A, ET2US, FF8s AI FK (130) 14 EST, FK8AO, FQ8AB, FP8AP, FQ8s AG AK, GC4LL, GD2FRV, HA5KBB 8, HC8GI (135), HZ1AB (355), Trieste's IYAK (120) 10, IS1FT, IS1EHM, KA6IJ (225) K66ABN (287) 20, KJ6BA, KR6KS, KT1CH, KX6BU (280), LU7ZM 20, LX1DC, OD5AB, OE13LL (315) 10, OQ5s CX DE EC EI (130) 16, RU, OQ9DZ, OX3AY, OY5B, PX1DL (154) 16, SV6s WE WG, TA3AA, TG9s AA AI RB, VK9RS (170) 8 of Norfolk Isle, VPs 2DN (120-210) 15, 2GX 3HAG (100), 5BH of the Caymans, 7NS 8AM 8AQ, VQs 2DT (110) 15, 2FU 2OT 3RJB 4AC 15, 4AQ (110) 15, 4RN, VSs 2BS (150), 2DY 6CG (95) 7, 7AW (163) 12, 9AS, VU2CG, XZ2OM (30) 7, ZA1KAC, ZCs 3AB 6UNJ, ZD4s BF BK BM BO, ZE2s JA KR, ZP5CF 19, ZTs 3AB 3P 9G 15, 3V8s AN AS, 5As 2TZ 3TN 4TJ and the elusive AC4NC (120) 7-8.

This same organization lists a few forty-meter 'phone items you may be interested: CN8AA 20 EST, CX2CO (197), DU7SV (150), EA4DR, FF8AP (90), HK5AF (91), HRIKS (109), JAs 1CS 1GV 1WQ 2AK 2ES 2Q 3MD 6AK 6BC 6CX, KA5AT, KG6s AAY ABN AHD FAD (230), KJ6BA (220) 7, KL7s AWP BBP BNN CL, OA4V (193), PJ2s CE (61), AP, TG9AI (161), TI2OP, VKs 6HK 7, 7SK, VP8 2KM 2SE 2S1 3LF 5DX, YV5DE, ZB2A (85) 19, ZSs 1MP 6DW and 6KD. . . . Georgian W4AWO thinks 7-Mc. 'phone is worth some time: HH3CR (190) 7 EST, HP3FL (190) 7, KG4s AE (275) 22, AO (245) 23, KS4AV (225) 6, TI2VJ (225) 7-8, YN4CB (225) 3 and several VP9s were worked. . . . WIAPA builds up his breakfast appetite by chats with KC6KU (212) 6-7, KH6s AEP (250) 7, AWM (235) 7, FAA (201) 7, VP9s BH BK BO BU and YV5AU (245) 6, times EST. . . . VP3YG came back to W3RGQ, and we hear that AC4NC has been squeaking through on 7180 kc. around 6 EST.

Forty c.w. is productive at W4TJI: CE1BX (18), FK8AO (15), HRIKS (21), KB6BA (22), KG6SA (25) of Saipan, KX6BU (10), VK6LU (1), VP8 2SH 3YG (10), VQ3KIF (9), YV5FH (12), ZD2DPC (22), ZEZ3J (30), ZK1AB (13) and ZS3K (20) came back. These and others bring W4TJI to the 7-Mc. 61-country mark. . . . DM2ACM, BL2X, a KX6, LU6ZE, OQ5GL, Grahams' VP8AZ, and a ZS3 swelled W3AXT's buxom tally. . . . W3RGQ caught up with HC1FE, PJ2AE, VKs 6WT 7AL, VP8 4TJ 6GT, YU3AJK and numerous ZLs. Shely writes, "Sure wish the DX bug had bitten me sooner. I've had a ticket for four years and got interested in DX only last year." W3RGQ already is up to 75 worked. . . . WIAPA cleaned up on EA8BF, FA8DA, FF8AP, HK4DP, KB6AY, LZ1KDP, PJ2CE, VP8 4LZ 7NM 8AX (5) 20 EST, umpteen ZLs and ZS2A. . . . W5UUK, who has a WAC at the age of 14, sneaked up on DU7SV, FA9RZ, an FK8, HH2LR, JA8AI, KG6s AAY FAA, KH6AGX/KG6, KR6AA, a KX6 and VP2SH, all good 7-Mc. tiddits. . . . Fletcher's Ice Island's KF3AB (22) came back to K6EC, while W9VTP elbowed VP8AA (32), an A2 Grahamsland signal.

AUSTRIAN NATIONALS OFF BAN LIST

Austria (OE prefix) having removed itself from "banned" amateur status as of April 1, 1954, it is a pleasure to confirm here that FCC-licensed amateurs now are authorized to contact Austrian-citizen hams as well as OE13, MB9 and FK8S stations.

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

French Indo-China (Cambodia, Laos and Vietnam), Republic of Indonesia, Iran, Korea, Thailand.

Prefixes to be avoided: F18-XW3-5W8, PK (Netherlands territories excepted), EP-BQ, HL, HS.

Transient openings on fifteen 'phone frequencies bring significant turnouts as usual. W6ZZ doesn't miss many break-throughs: CP5EK, CX5AF, DU7SV, HRIJM, KA2FC, many KH6s, KL7ALJ, KW6BB, LU8FAO, OA4C, PJ2AA, PY2AJE, VP3YG, VKs galore and ZLs likewise answered Miles. . . . A Globe Trotter and a \$6 vertical collected radiotelephones CEs 2AJ 3NS 3QJ, OASM, PJ2AP, TI2EA, VP8 2KB 5DX 5EM 9BK, VQ4s AC AQ, YN1AA, YVs 2AP 5FL and sundry ZLs for W5QXX. Dave QSOd ZL2BN on five days running, which shows how steady 21 Mc. can be when it gets its mind to it. KG6AEL, JA2FC, OQ5s HL and RU got away. . . . OA4V (215) OQ5RU (237), ZEZJK (210) and several ZSs took K2CRE's bait. . . . NNRRC recommendations in the 15-'phone line: CN8MM (240), CP5AB, CR4AI, CR6s AY (240), BK BX 14, FF8s AK AP (205), HC1FS, HI6EC (240), HK5ER, VP8 1GG (229) 2AC 2CX, VQ2s DT (240), PL, YS1A (201), ZB1AJ, ZDs 1SW 4AB (207), ZP5DC, ZS3s AB 12 and BC. . . . On fifteen c.w. W6ZZ accounts for HK4DP, JA3s AC AF, KG4AT, KH6AGX/KG6, KL7RZ, KX6BU, LU1EP, PJ2AI, VP3YG, a few PYs and VKs.

A staccato static obligato raps the ears of eighty-meter stalwarts these days but W3AXT eked out CN8BJ, EA9AP, EL2X, SU1GH, YU3s BC BGH EU FT, YV5DE, ZL1CI, ZS3K and 9S4AX to reach the 64th 3.5-Mc. milestone. . . . EA8BF, FP8AP, TA3AA, YU1AD and ZS2A contacted W8EIS through the cracklings.

A few late-season one-sixty cleanings hither and yon: W2QHH: KH6IJ, ZL3RB. W3EIS: Gs 5RI 5VB 6BQ 6GM, GW3ZV. W9FIM: KH6s ARZ MG, ZL1MQ. W9PNE: KH6s IJ MG PM, ZLs 1BY 1MQ 3RB. W9RFT: KH6s IJ MG, VP7NM, ZE2OK.

The tranquility of the ten-meter range for the most part still is disturbed only by auto ignition racket. Yet we do have a few scattered reports of 28-Mc. DX success. W4NQM braved the rarified ionosphere and drew forth CXs 1GG 2BC 2GM 4CS, HPs 1HO 2HG, KZ5s GH JL, 18 LUs, Pys 1AGP 2TG 4DK, XE1GE, YV3s AU BB and ZL2BE. . . . Other catches reported, at W5BYI: CX7BA, LU8 4PA 7DDC, W4Y7B: HC1RT, LU8 1DCH 5DC, W5JCF: KP4OR, LU5DG. W5VNN: a CX1, LU4s CC and EC. . . . W2COT finds 10 pretty consistent between 12 and 14 EST. Bruce raised CX3BT, LU8 1DEB 1EQ 8DDI 9BJR, VP8s 6HR and 9BU. . . . All this 28-Mc. stuff is in the of A3 variety. With ZLs breaking through on ten meters can generally improved DX conditions be far behind?

Where:

G2RO, alias VP8 1RO 2AO 2GRO 3RO 4RO 5RO 6RO 7RO, VQs 1RO 2RO 3RO 4RO 5RO 6RO 8AY and ZD6RO (who!) writes: "All cards relating to contacts made during my previous two African tours have now long been despatched. A card has been provided for every contact without exception. Anyone who has not received an African card for an African 'RO' contact is cordially invited to apply for it." Bob further informs, "All cards relating to my recently completed West Indian tour are being filled in for despatch as rapidly as possible, but there are some 2500 of them and it takes time. . . . I am very glad to receive QSLs but there is no need to send repeated requests for my cards:

reply coupons and dollar bills are not necessary. Owing to the very large number of cards involved and the fact that all have to be obtained, written and despatched during my infrequent, brief and crowded stays in London, I am obliged to say that no cards can be sent direct; they must all go via bureaus." More on tentative G2RO DXcursions in "Whence." F7SHP's staff is distributing cards for F7 amateurs and has a pile of pasteboards on hand for ex-F7s now back in the States or reassigned elsewhere. If you fall in this grouping please send a large self-addressed and stamped envelope to F7SHP to permit delivery of your QSLs In our monthly QTH rosters, such as that to follow, don't be perturbed if you encounter a different address for the same station in two consecutive QSTs. Use the one most recently published — we rerun them as soon as data received makes them more complete and authentic. W1s ABA APU BTQ RDV TVJ WPO WPR YKH ZDP, W2GBC, W3AXT, W4TJ1, W6s DZZZ GPB MKH YY, W8HEV, W9s CFT KA, Ks 2BKU 6EC, DM2ABK and Mr. LeRoy Waite provide these QTH addresses:

AP2CR, C. Richards, Imperial Bank House, Lyallpur, Pakistan CR6CJ, Julio N. de Matos, Box 244, Nova Lisboa, Angola CR6CS, P. G. de Almeida Lopes, Calulo, Angola DL4CJ, A1/e W. R. Hughes, Box 155, 602nd AC&W Sqdn., APO 34, c/o Postmaster, New York, N. Y. . . . EL2X, N. L. Raymond, c/o PAA, Roberts Field, Liberia ETZZZ, Box 379, Asmara, Eritrea FF8AY, J. P. Bruler, Box 971, Dakar, F. W. A. FOBAJ, (QSL via Hallicrafters, 4401 W. 5th Ave., Chicago 24, Illinois) G3JFF/MM, (QSL via RSGB) FM7WP, Andre Leandre, Rte. des Religieuses, Fort de France, Martinique HK1TH, G. E. Tietjen, Air Box 814, Barranquilla, Colombia I5LV, Luciano Vecchio, Box 505, Mogadiscio, Somalia IT1ZGY, P. O. Box 300, Palermo, Sicily, Italy KASAN, APO 919, c/o Postmaster, San Francisco, Calif. KF3AB, 1983rd AACs Sqdn., APO 23, T-3, c/o Postmaster, New York, N. Y. TI2BX, Ted Westlake, c/o U. S. Embassy, San Jose, C. R. VK9WZ, Frank Anear, RAAF, Momete, Admiralty Islands via Sydney, Australia VP6AG, (QSL via VP6PX) ex-VQ3EO, (QSL to G8NV) YA1AA, c/o Airbase, Kabul, Afghanistan ZD4BR, Box 101, Takoradi, Gold Coast 3V8AN, (QSL via REF) 5A4TG, M/Sgt. P. Harris (W9TYB), Box 372, Tripoli, Libya.

Whence:

Asia — The Maharaj Kumar of Sikkim, AC3PT, writes that he, AC3SQ and AC4NC are the only currently active AC stations. AC3PT handles incoming QSLs for that area and is busily bouncing cards addressed to such as ACs 3B 4LA and 4Y The ubiquitous Mr. Roberts, G2RO, now embarks Aslaward on a tour that should permit him to put his potent 15-wattter on the air from places like Singapore, Malaya, Hong Kong, Sarawak, Brunei, North Borneo and Seychelles. Other even rarer stops are imminent. This particular safari should carry Bob through August, after which he'll undertake a similar DXcursion to the South Pacific. In his position as British Colonial Advisory Broadcasting Engineer, G2RO will have visited every British colonial territory and will have hammed from almost every one. As usual, the "RO" freqs will be 7030 and 14,060

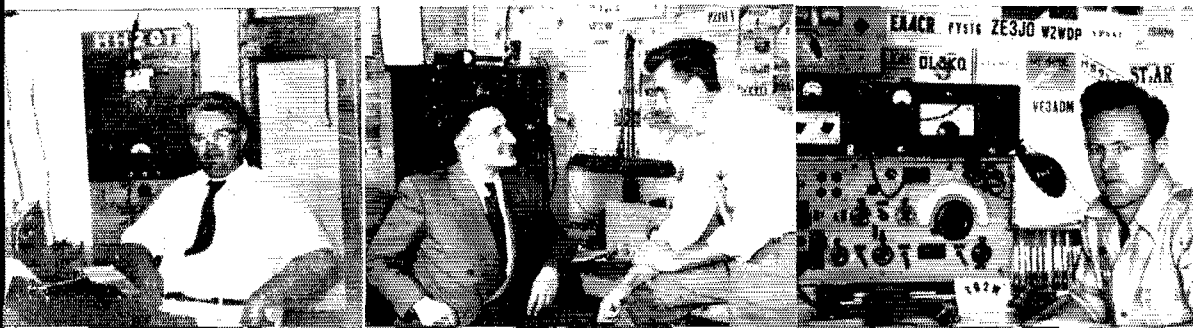
kc., with 7008- and 14,016-kc. spots available as spares This month sees the departure of W1VQG from Turkey and the staff of TA3AA. Ed will set up shop with the 461st Bomb Wing, Hill AFB, Ogden, Utah. He really gets around; W0VQG, J5VQG, W0VQG/D4, OX3BD, W0VQG/8, W1VQG and W1VQG/1 are other calls he has signed since the war. He's a M/Sgt. radio maintenance supervisor according to a TA3AA missive to W2UXG KASAN signs W5WZL when on this side of the water. Andy has been knocking 'em dead with 50 watts and a ground-plane on 20 'phone; a BC-342 receives W9TRD learns that an explorative research party — the President Peron Expedition — will take amateur radio along on a venture to India and the Himalayas. Keep an ear out for the calls LU2MA and LU0MA which may be used with various rare prefixes appended W9KOK calls attention to the existence of one AC4PP, a professional radioman who frequents the Lushai Hills area between Assam and Burma. But Mitch adds that ham radio for the present is a dormant proposition in Bhutan with no near future AC5 activity in evidence. Bhutan provides minimal grist for hobbyists; the place also has an untarnished rep as the only autonomy in the world never to have issued postage stamps.

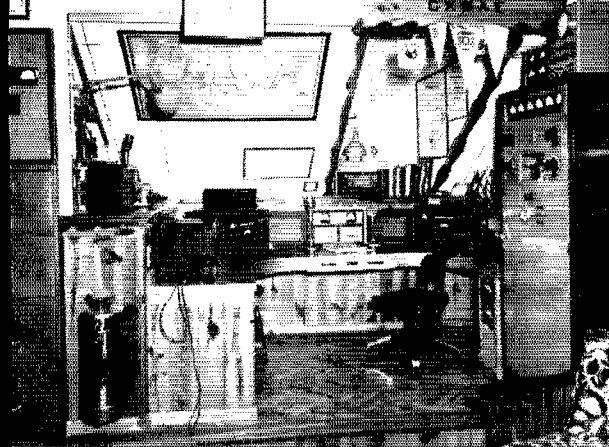
Africa — VQ8AR searches daily for W/Ks who need Mauritius. Raymond has a well-modulated signal on 14,110 kc. and is usually available between 1700 and 1800 GCT. W2GLF has VQ8AR's r.f. line-up as a 6L6 Clapp, 6L6, 6L6 and 807, plus an HRO Sr. receiver. Home of the legendary dodo bird, Mauritius also is interesting as one of the globe's most thickly populated places; its more than half a million inhabitants fill an island half the size of L. I., New York. But how about some more VQ8 licensees? W1BTQ finds that 5A4TG (W9TYB) remains quite active with 140 watts to 812As and a ground-plane. Paul QSLs conscientiously W1PWK's old call, CN8EG, appears to be in good hands again. K2GFQ tabs the new CN8EG as very active on 20 c.w. and 'phone with an Eldico rig, an 8-40B receiver and a folded-diaper radiator. He's W8PEX when back home in Michigan W8SHEV relays word of W6NZK's retained intention to do some VQ9NZKing later in the year. QSLs will go to the W6NZK home QTH VQ4EI is ex-MP4KAA-ZC4DT.

Oceania — W6YY provides interesting notes on Pacific doings: F0SAD keeps RA1s Island warm with a 10-wattter. . . . QSLs popped through from VK1s HM RG and ZC5VM. . . . ZL1BY got his wind-blown skywire back up just in time to make 860 W QSOs in a single contest week end. . . . ZL1GI finished his U. S. A. visit and returned to Auckland; VK2US and ZL2RC scheduled visits to the W6 balliwick. . . . ex-ZK2AA is back in N. Z. awaiting reassignment to another (rare, we hope) spot, possibly ZM6. . . . DU7SV continues to seek Ws on 3520 kc. around 0800 GCT. . . . Queen Elizabeth's ZC2 tour brought out some interesting facts about the place. The polity of the 27 Cocos Islands is feudal and there is no money used. One curious law binding on the mixed population of 1000 holds that natives who leave the islands can never return. The Cocos continue to be available by courtesy of VK1HM/ZC2.

Europe — EDR (Denmark) announces modification of its OZ-CCA award, a diploma now available world-wide and based on multiband contacts with OZ call areas 1 through

HH2OT, below left, isn't very far away but for years Haiti has been notoriously difficult to confirm. When not QRL with missionary work, the Rev. H. T. Cox — call him Herb — runs 40 watts on several bands to an 807 feeding a T2FD radiator and receives with an S20-R. HH2OT has earned a fine reputation on the QSL front. (Photo via W4HYW) At center W2BVS (right) holds interesting conversation with Ger Kooyman, PZ1WX-PA0WX, in Fred's Plainville, N. J., shack. Gerard radiops for KLM airlines and his on-the-air work as PZ1WX caused many "first Dutch Guiana" notations to be entered in the logs of DXers throughout the world. W2s EKU HK JME NMJ and YJ were other enthusiasts who joined in welcoming this prominent DX visitor. Incidentally, all W2BVS gear shown, including receiver, is homebuilt. (Photo by W2HK) VQ2W, right, operated by Pete Gollodge in Chingola, Northern Rhodesia, is a regular customer on 20 c.w. The rig with such an interesting panel runs 20 watts on several DX bands. (Photo via W9MOK)





One of the most stylish South American hamshacks we've seen in many a moon belongs to James N. Miller, CX5AF, of Montevideo. A 32V-2 excites two 4-250As at one kw. input, these modulated by 30FTLs. Collins 75A-2 and 75A-3 receivers are in view, while 75 feet above the shack are 3-element rotary beams for 28, 21 and 14 Mc. A 3-wire folded dipole does the radiating on 40. CX5AF also operates mobile (CX5ZAF) with an Elmac A54-H rig and Conset converter. The home-station frequencies are 7195, 14,195, 21,225 and 28,450 kc.; 3.5 Mc. is tried from time to time.



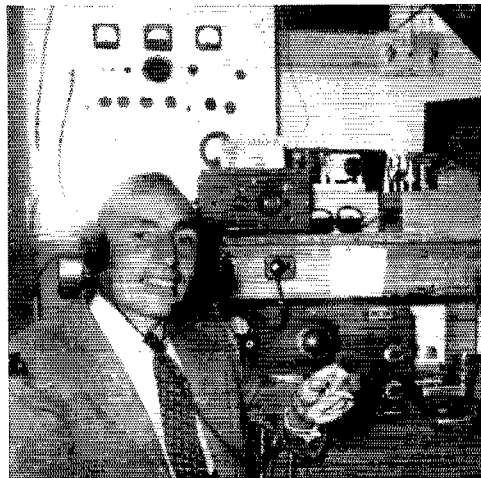
addressed to HVs 1A 1Z 1SP and 2JG but they're ungod so far as is known here MF2AA, Trieste QSL manager, is back on 20 'phone with a 200-watt 813 and 3-el. spinner. Bob is good for a fast QSL W1VXA soon leaves DL4AZ for Stateside after much experimental fun and 57 countries worked. DL4TS will take over DL4AZ's gear and will switch to the AZ call We hear that DL4MY plans a little DXpeditionary work in Andorra and Liechtenstein this summer, two-week stays scheduled in both vicinities G3JFF, gadding about the Atlantic on a British aircraft carrier, has been working 'phone and c.w. as G3JFF/MM on several bands From ex-OE1FF via W8HEV: "I've been operator at LX1AS for the last two months and helped many Ws get a new country. All OEs should receive official licenses, however, [soon]." W1WPO notes that IT1AFS is the first Italian YL to collect DXCC membership. She did it on 'phone W8PWB's QSL to EI1R was bounced by the EI QSL bureau; there are no EI1s PA8ZX, with a newly won doctorate in physiology, attends Nobel University for a year in Stockholm.

Hereabouts — FCC announces allocation of the call-sign series KC4AA-KC4AZ for amateur radio use on Navassa Island in the Greater Antilles. There has been no ham activity on the island since that of K4NI in the early '30s. When QSLs start coming through from the first enterprising postwar party to fire up on Navassa, the isle will receive consideration as a possible addition to the DXCC Countries List W2TXB, whose record stands at 227/195 (116/109, 'phone) could use a tip or two on how to get confirmations from VSIs DF DC CE, '49, and PK6VK, '51. Al hears that RSGB's bureau has as much difficulty keeping track of Empire forces ham personnel as we have with our own fast-traveling GI DXers W8HEV, QSL scribe for FM7WD, could use a lift toward a ZP6CR pasteboard With 243 countries under his DX belt, W8JN punches out a concise DX column for *Elter Waves*, organ of the Ohio Valley Amateur Radio Assn. Other OVARA men over the 200-mark are W8s BHW 239, FGX 239, BTI 235, JJW 205 and W4KVX 203 Overseas DX in need of No. Dak. can keep an ear open for W0DMK on 10 through 80 meters. Incidentally, all WAS aspirants would do well to check QST Station Activities pages for the calls of actives in particular states sought KP4KD, with a new and quieter QTH out of town, has his WPR sheepskin endorsed for 360 different Puerto Rican stations plus 20 WP4 Novices. Ev also is closing in on the Worked All New England award (p. 63, Sept. 1953 QST). KP4KD's alter ego is KP4KB Among the list of MARS prefixes appearing in the April issue you may have noticed AC3 (Dominican Republic), AC4 (Puerto Rico and Virgin Islands), AC5 (Canal Zone) and AG2 (Kwajalein and Johnston Island). Good thing they don't use 'em in the ham bands Regretfully we note the passing of DXer W6AYZ, brother of W6BYB and long-standing member of DXCC W2NUT wants tracers on OX3s BQ and GG worked in 1953.

9. Two OZs, three SMSs and one LA have qualified for the stiff European version. EDR intends a yearly activity to stimulate non-European award efforts. For OZ-CCA details write EDR Traffic Dept., Diplomas Section, P. O. Box 79, Copenhagen Bet you didn't know Red Skelton was a ham. Well, that's the moniker G3JOQ goes by and Red writes that he and three companion British Naval Reservists will sail to New York from the U. K. in a 61-foot converted lifeboat, the *Aries*, due Manhattan around the 12th of this month. Although *Aries* will not transmit on ham frequencies, its call GRVM will be heard on (A3) 2325, 2695, 3660, 3670, 4455, 5320, 8160 kc.; (A1) 4178, 6267, 8536, 12,534 kc. Red's home station will be manned by other operators during the voyage and if you hear *Aries* you may be able to pass reports directly to G3JOQ on 20, 40 and 80 meters. The vessel will head back toward England around June 26th and is scheduled to complete the rough round trip in mid-July We've been seeing QSLs



ZC4CA and station (below) put in quite a 160-meter effort last season as fellow Cyprus hands ZC4s JJ GF FB and PB, pictured above from left to right, encouraged and assisted. Generally poor Top Band conditions in the Mediterranean worked against them but you'll be QSOing these lads on other bands this summer.



Answers to grilling on page 55:

- | | | | |
|--------|--------|--------|---------|
| 1. (b) | 4. (b) | 7. (d) | 10. (d) |
| 2. (c) | 5. (c) | 8. (c) | 11. (a) |
| 3. (d) | 6. (d) | 9. (a) | 12. (d) |
13. (Ab, Bh, Ce, Dg, Ea, Ff, Gd, Hc)

At five points per sticklers 1 through 12, and 5 points for each part of question 13: 100 means you must have peeked; 90, you should have Jeeves' job; 80, you're really on the ball; 60 or 50, fairly good; 0, another doggoned v.h.f. man.

I.A.R.U. News



QSL BUREAUX 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 (bold-face type indicates a recent change from previous listings). Do not send foreign cards to A.R.R.L. headquarters except those for which no bureau is here listed.

For service on incoming foreign cards, see list of domestic bureaus in most QSTs (page 134 of April QST) under the heading, "A.R.R.L. QSL Bureau."

- Algeria:** Via France
Angola: L.A.R.A., P.O. Box 152, Luanda
Argentina: R.C.A., Avenida Libertador General San Martin 1850, Buenos Aires
Australia: W.I.A., Box 2611 W, G.P.O., Melbourne
Austria: Via ARRL
Austria: QSL Bureau (U. S. Occupation Forces), APO 168, % Postmaster, New York, N. Y.
Azores: Via Portugal
Bahamas: C. N. Albury, Telecommunications Dept., Nassau
Barbados: VP6PX, Wood Goddard, Bromley, Welches, Christ Ch., Barbados, British West Indies
Belgian Congo: P.O. Box 271, Leopoldville
Belgium: U.B.A., Postbox 634, Brussels
Bermuda: VP9D, James A. Mann, The Cut, St. Georges
Bolivia: R.C.B., Casilla 2111, La Paz
Brazil: L.A.B.R.E., Caixa Postal 2353, Rio de Janeiro
British Guiana: Desmond Yong, 22 Sussex St., Charlestown, Georgetown #16
British Honduras: D. Hunter, Box 178, Belize
Bulgaria: Box 830, Sofia
Burma: B.A.R.S., P.O. Box 376, Rangoon
Canton Island: Fred V. Carpenter, KB6AY, U.S.P.O. 06-50000, Canton Island, South Pacific
Ceylon: P.O. Box 907, Colombo
Chile: Radio Club de Chile, Box 761, Santiago
China: M. T. Young, P.O. Box 16, Taichung, Formosa
Colombia: L.C.R.A., P.O. Box 584, Bogotá
Cook Islands: Ray Holloway, P.O. Box 65, Rarotonga
Costa Rica: Radio Club de Costa Rica, P.O. Box 535, San Jose
Cuba: Radio Club de Cuba, QSL Bureau, Lealtad No. 660, Havana
Cyprus: Mrs. E. Barrett, P.O. Box 219, Limassol
Czechoslovakia: C.A.V., P.O. Box 69, Prague 1
Denmark: E.D.R., Box 79, Copenhagen, K.
Dominica: VP2DC, Roseau
East Africa: (VQ1, VQ3, VQ4, VQ5): P.O. Box 1313, Nairobi, Kenya Colony
Ecuador: Guayaquil Radio Club, Casilla 784, Guayaquil
Eire: I.R.T.S. QSL Bureau, % EI5Z, 23 Orwell Gardens, Rathgar, Dublin
Fiji: S. H. Mayne, VR2AS, Victoria Parade, Suva
Finland: SRAL, Box 306, Helsinki
France: R.E.F., BP 26, Versailles (S & O)
Germany (DL2 calls only): Via Great Britain
Germany (DL4 calls only): DL4 QSL Bureau, APO 757, % Postmaster, New York, N. Y.
Germany (DL5 calls only): Via France
Germany (other than above): D.A.R.C., Postbox 99, Munich 27
Gibraltar: E. D. Wills, ZB2I, 9 Naval Hospital Road
Great Britain (and British Empire): A. Milne, 29 Keechill Gardens, Hayes, Bromley, Kent
Greece: C. Tavaniotis, 17-A Bucharest St., Athens
Greenland: APO 858, % Postmaster, New York, N. Y.
Grenada: VP2GE, St. Georges
Guam: G.R.A.L., Box 145, Agaña, Guam, Marianas Islands
Guantanamo Bay: Leroy Davie, KG4AU, Navy 115, Box 13, F.P.O., New York, N. Y.
Guatemala: Manuel Gomez de Leon, P.O. Box 12, Guatemala City
Haiti: Roger Lanois, % R.C.A., P.O. Box A-153, Port-au-Prince
Hong Kong: Hong Kong Amateur Radio Transmitting Society, P.O. Box 541, Hong Kong
Hungary: H.S.R.L., Postbox 185, Budapest 4
Iceland: Islenzkir Radio Amatorar, P.O. Box 1080, Reykjavik
India: Amateur Radio Club, India, P.O. Box 6666, Bombay 20
Indonesia: P.A.R.I., P.O. Box 222, Surabaya, Java
Israel: I.A.R.C., P.O. Box 4099, Tel-Aviv
Italy: A.R.I., Via San Paolo 10, Milano
Jamaica: Thomas Meyers, 122 Tower St., Kingston
Japan (JA): JARL, Box 377, Tokyo
Japan (KA): F.E.A.R.L., APO 500, % Postmaster, San Francisco, Calif.
Kuwait: Doug Taylor, MP4KAA, Box 54, Kuwait, Persian Gulf
Lebanon: RAL, B.P. 1202, Beyrouth
Libya: See Tripolitania
Lucembourg: G. Berger, 40 rue Trevires, Luxembourg
Macao: Via Hong Kong
Madeira: Via Portugal
Malaya: QSL Manager, P.O. Box 600, Penang
Malta: R. F. Galea, 20, Collegiate Street, Birkirkara
Mauritius: V. de Robillard, Box 155, Port Louis
Mexico: L.M.R.E., Liverpool 195-A, Mexico, D.F.
Montserrat: VP2MY, Plymouth
Morocco: C. Grangier, Box 50, Casablanca
Morocco (Tangier International Zone only): P.O. Box 150, Tangier
Mozambique: Liga dos Radio-Emissores, P.O. Box 812, Lourenco Marques
Netherlands: V.E.R.O.N., Postbox 400, Rotterdam
Netherlands Antilles (Aruba): Postbox 80, San Nicolas, Aruba
Netherlands Antilles (Curacao): Postbox 383, Willemstad, Curacao
Netherlands East Indies: Hr. C. Loze, PK1LZ, Burg, Kuhrweg, 47 Bandoeng, Java
New Zealand: N.Z.A.R.T., P.O. Box 489, Wellington C1
Nicaragua: L. B. Satres, Bolivar Ave., 106 Managua
Northern Rhodesia: N.R.A.R.S., P.O. Box 332, Kitwe
Norway: N.R.R.L., P.O. Box 898, Oslo
Pakistan: Box 2002, Karachi
Panama, Republic of: L.P.R.A., P.O. Box 1622, Panama
Paraguay: R.C.P., P.O. Box 512, Asuncion
Peru: R.C.P., Box 538, Lima
Philippine Islands: Elpidio G. DeCastro, Philippine Amateur Radio Assn., 2046 Taft Ave., Pasay City
Poland: Polski Zwizek Krotkofalowcow, P.O. Box 320, Warsaw
Portugal: R.E.P., Travessa Nova de S. Domingos, 3-4^o Lisbon
Roumania: A.R.E.R., P.O. Box 95, Bucharest
Salvador: YS10, Apartado 329, San Salvador
Siam (Thailand): Frank Speir (W6FUV), Saha Thai, 4th Mansion, Raja Damnoen Avenue, Bangkok, Thailand
Singapore: P.O. Box 176, Singapore, Malaya
South Africa: S.A.R.L., P.O. Box 3037, Capetown
Southern Rhodesia: R.S.S.R., Box 2377, Salisbury
Spain: U.R.E., P.O. Box 220, Madrid
St. Vincent: VP2SA, Kingstown
Sweden: S.S.A., Stockholm 4
Switzerland: U.S.K.A., Postbox 1203, St. Gallen
Syria: P.O. Box 35, Damascus
Trieste: MF2AA, Major M.H.R. Carragher, HQ V.G. Police
Trinidad: John A. Hoford, VP4TT, P.O. Box 554, Port-of-Spain
Tripolitania: 5A2TZ, Box 372, Tripoli
Uruguay: R.C.U., Casilla 37, Montevideo
U.S.S.R.: Central Radio Club, Postbox N-88, Moscow
Venezuela: R.C.V., P.O. Box 2285, Caracas
Virgin Islands: Richard Spenceley, Box 403, St. Thomas
Yugoslavia: SRJ, Postbox 48, Belgrade

June V.H.F. QSO Party

*Fun for All in This June 5th-6th Activity —
Special Awards to Novices, Technicians, Multiple-Operator Groups*

ALL set for the June V.H.F. QSO Party? With conditions on the upgrade after the winter minimum, here's a great chance to pull in some new states and check out the new beam! The contest, open to all amateurs who can work on 50 Mc. or higher, runs from 2:00 P.M. Local Standard Time, June 5th, through 11:00 P.M. Local Standard Time, June 6th. Novices and Technicians, old-timers and multi-operator groups — *everyone* interested in v.h.f. work is urged to participate!

How To Take Part

A snappy "CQ Contest" or "CQ V.H.F. QSO Party" will put you in touch with other participants. When contact results, operators must exchange names of their respective ARRL sections for full point credit. See page 6 for a convenient section check-off list.

Scoring

The idea is to work as many stations on as many v.h.f. bands as possible during the contest period. Count 1 point for successfully-confirmed two-way exchanges of section data on 2 or 6 meters, 2 points for such QSOs on 220 or 420 Mc., and 3 points on 1215-Mc. or higher bands. The sum of station points earned is multiplied by a section multiplier, which grows by one when the same section is reworked on another band. A station may also be reworked for credit on additional v.h.f. bands. See Rules 4 and 5 for complete information on how to figure your final score.

Awards

To document the performance of participants in the V.H.F. QSO Party, a full report will be carried in *QST*. In addition, special recognition will be made as follows:

- 1) The top scorer in each ARRL section will receive a certificate award.
- 2) Certificates will be given to the top Novice and Technician in each section where three or more such licensees submit contest logs.
- 3) For the first time, a certificate will go to the high-scoring multiple-operator station in sections from which three or more multiple-operator entries are received. This new award category has been created to recognize and encourage the trend toward mountain-top expeditions, multiple-operator groups that often provide rare sections in the summer and fall v.h.f. contests.

Reporting

Whether your totals are large or small, send in your log at the close of the competition so as to be eligible for certificates and to aid in cross-

checking other claims. A simple tabulation of stations and sections worked (see box on page 60, June, 1953, *QST*) is all that is required. Write ARRL for free log forms.

Rules

- 1) The contest starts at 2:00 P.M. Local Standard Time, Saturday, June 5th, and ends at 11:00 P.M. Local Standard Time, Sunday, June 6th. All claimed contacts must fall within this period and must be on authorized amateur frequencies above 50 Mc., using permitted modes of operation.
- 2) Name-of-section exchanges must be acknowledged by both operators before either may claim contact point(s). A one-way exchange, confirmed, does not count; there is no fractional breakdown of the 1-, 2- or 3-point units.
- 3) Fixed-, portable- or mobile-station operation *under one call*, from one location only, is permitted.
- 4) Scoring: 1 point for completed two-way section exchanges on 50 or 144 Mc.; 2 points for such exchanges on 220 or 420 Mc.; 3 points for such exchanges on the higher v.h.f. bands. The sum of these points will be multiplied by the number of *different* ARRL sections worked per band; i.e., those with which at least one point has been earned. Reworking sections on additional bands for extra section credits is permitted. Cross-band work does not count.
- 5) A contact *per band* may be counted for each station worked. Example: W2QED (S.N.J.) works W1DBM (Conn.) on 50, 144 and 220 Mc. for complete exchanges. This gives W2QED 4 points (1 + 1 + 2) and also 3 section-multiplier credits. (If W2QED contacts other Connecticut stations on these bands, they do not add to his section multiplier but they do pay off in additional contact points.)
- 6) Each section multiplier requires completed exchanges with *at least* one station. The same section can provide another multiplier point only when contacted on a new v.h.f. band.
- 7) Awards: A certificate will be awarded to the high-scoring single-operator station in each ARRL section. In addition, the high-scoring multiple-operator station will receive a certificate in each section from which three or more valid multiple-operator entries are received. Certificates will also be given to the top Novice and Technician in each section where three or more such licensees submit logs. Award Committee decisions will be final.
- 8) Reports must be postmarked no later than June 23, 1954, to be eligible for awards. See the box on page 60, June, 1953, *QST*, for correct form, or a message to Headquarters will bring a lithographed blank for your contest report.

NATIONAL CALLING AND EMERGENCY FREQUENCIES

C. W.	'PHONE
3550 kc. 14,050 kc.	3875 kc. 14,225 kc.
7100 kc. 21,050 kc.	7250 kc. 21,400 kc.
28,100 kc.	29,640 kc.

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*.

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



CONDUCTED BY E. P. TILTON,* WHDQ

PERHAPS it should be in the "Correspondence from Members" section, but we feel that the following is as good lead material as we've seen in some time. It speaks for itself.

This is inspired by advice in your column in April *QST*. You reminded v.h.f. men to "make and keep appointments with the local gang." I feel that you cannot plug this idea too often, or too hard. Unfortunately, I think that my experience some years ago in trying to get going on 144 Mc. may be typical of what happens to many would-be v.h.f. converts.

At that time I was located 50 miles south of —, and about the same distance east of —. As these were the two main centers of v.h.f. activity in our part of the country, contacts on 2 were, for me, hard to come by. I consistently heard W— with a fine signal, but he seemed to work only other outstanding stations. I called him frequently, but always ended up listening to his QSOs.

Once I happened to get into a round-table with him as the result of calling another station at the same time he did. I told him how glad I was to work him, and expressed the hope that he would turn his beam my way more often. He explained that he did not have much time on the air, and gave me a polite brush-off. I never was able to work him again, except by the round-table method. It soon became obvious that he gave the same treatment to others who had not yet made the upper reaches of the 2-Meter Standings.

Then one night I finally landed an out-of-state contact; my first 2-meter DX. The operator of the well-known station gave me a poor report (which I undoubtedly deserved) and about then I discovered that I had inadvertently called him with my beam in the wrong direction. I asked him to wait while I turned around his way to get a better check on my signal, but this netted me only the brusque reply that he couldn't be bothered during a band opening. In a few seconds he was calling CQ again, looking for something rarer than I.

Personally, I'm hard-headed enough so that this sort of thing doesn't bother me too much, but I know of several other fellows who have run into similar cold-shoulder treatment and given up in disgust. It is hard to imagine our ever having too much occupancy of our higher bands. Perhaps more of the spirit of Point Four of the Amateur's Code would help to build activity and promote progress on 50 Mc. and higher frequencies.

In case you've forgotten, Point Four follows: "*The Amateur is Friendly . . . slow and patient*"

* V.H.F. Editor, *QST*.

sending when requested, friendly advice and counsel to the beginner, kindly assistance and cooperation to the broadcast listener; these are the marks of the amateur spirit."

The next few months are the best of the year for v.h.f. interest. We'll be hearing many new calls these nights. Let's see to it that none of them disappears later because of inconsiderate treatment on our part. Today's beginner may be tomorrow's leader. Need we say more?

220-Mc. DX Via Aurora!

How high can you go in frequency and still bounce signals off the aurora? This strangest of all v.h.f. propagation phenomena was first noticed on the 56-Mc. band in the late '30s, but it wasn't until 1949 that the first positive evidence of 144-Mc. aurora DX was turned up. Higher transmitter power, selective c.w. receivers and big antenna systems did the job. How, then, about 220 Mc.?

Tests with radar gear some years ago showed good echoes just above 100 Mc., but none with almost identical equipment at twice the frequency, and quite a few amateur checks have been made on 220 without significant success. Your conductor heard a faint aurora c.w. signal last fall in



W6ZJB 48	W6VY 48	W8OJN 39
W8BJV 48	W6MID 47	W8LFD 37
W6CJS 48	W6GNQ 46	
W5AJG 48	W5ONS 45	W9ZHB 48
W9ZHL 48	W5JTL 44	W9QUV 48
W9OCA 48	W5MLL 44	W9HGE 47
W6OB 48	W5JLY 43	W9PK 47
W8INI 48	W5JME 43	W9VZP 47
W1HDO 48	W5SEW 44	W9RQM 47
	W5VV 42	W9ALU 47
W1CLS 46	W5FAL 41	W9QKM 46
W1CGY 46	W5FSC 41	W9UTA 45
W1LLE 46	W5HLD 40	W9UNS 45
W1LBN 44	W5EBZ 38	
W1HMS 43	W5LIU 37	W0QIN 47
W1DJ 41	W5FXN 37	W0DZM 47
		W0NFM 47
W2AMJ 46	W6WNN 48	W0TKX 47
W2MEU 46	W6ANN 45	W0KYF 47
W2RLV 45	W6TML 45	W0HW 45
W2IDZ 45	W6IWS 41	W0MYG 44
W2FHL 44	W6OVK 40	W0JOL 44
W2GYV 40	W6GCG 35	W0TJF 44
W2QVE 38	W6BWG 29	W0WKB 43
W2ZUW 35		W0JHS 43
	W7HEA 47	W0PKD 43
W3OJU 46	W7ERA 47	W0IFL 41
W3NKM 41	W7BQX 47	
W3MQU 39	W7FDJ 46	W0BANY 43
W3RUE 37	W7DYD 45	W0SAET 41
W3OTC 37	W7JRQ 44	W0IQZ 34
W3FFL 35	W7BOC 43	W0IQY 31
	W7JPA 42	W0ICE 25
W4FBH 46	W7EIV 41	CO6WW 21
W4EQM 44	W7CAM 40	
W4QN 44	W7ACD 40	
W4FWH 42		
W4CFZ 42	W8NSS 46	
W4FLV 42	W8NQG 45	
W4OXC 41	W8UZ 45	
W4MS 40	W8CMS 43	
W4FNR 39	W8BFQ 42	
W4UIJ 38	W8YLS 41	
W4BEN 35	W8RFW 41	

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

a 220-Mc. test with W8BFQ, but it took the big aurora of April 11th to decide the issue.

W3LZD, Dunmore, Pa., W8DX, Detroit, and W8BFQ, West Richfield, Ohio, have all been set for 220-Mc. c.w. for several months, and have lost no opportunities to try the auroral path on that frequency. When W3LZD saw that the April 11th session was obviously developing into the biggest thing of its kind in several years, he concentrated on looking for known 220-Mc. operators on 144 Mc. At about 1800 he came across W8BFQ, and they gave 220 a try, but the peak of the evening's festivities had not been reached, and no signal was heard on 220. Next, at 2007, W8DX made the switch with W3LZD, and the first 220-Mc. aurora contact ever was under way. Signals were nearly as strong as on 144 Mc., and they sounded about the same. A second try with W8BFQ, this one successful, was made at 2245. The aurora effect was receding again by this time, but the 220-Mc. signal was only 6 db. below the 144-Mc. one.

These contacts are not 220-Mc. records, by any means, but they show that 220 can be used for this kind of DX work. It is the highest frequency known to have been propagated via the aurora. Some vague evidence of aurora effect has been seen in TV reception on channels as high as 11, but the exact nature of TV effects is hard to pin down. Next stop 420? Our present power restriction makes it unlikely, but with the antenna gain that can be built up at this frequency, who can say that aurora DX is impossible there?

April Aurora Best in Years

Not since 1950 or '51 has there been anything like the April 11th aurora. In the pile of correspondence reaching your conductor's desk, 2-meter stations in at least 20 states are reported worked. W0TJF, Brieclyn, Minn., and W0EMS, Adair, Iowa, are the most western so far reported. W4HHK, Collierville, Tenn., was hearing many W8s, 9s and at least one W3, so it spread farther south than usual. Stations in the middle of the area affected report that the number of signals was phenomenal. The session got under way about 1500 Sunday, and it ran about nine hours, so the turnout had a chance to build up to close to saturation.

W8WVX, Shiloh, Ohio, and W2UK, New Brunswick, N. J., were running on-the-hour schedules the entire day Sunday, so they were among the first to notice it, making their first aurora contact of the day at 1600. It took another hour to get the gang warmed up, but from then until 2300 there was no lack of signals! The optimum direction for antenna aiming changed frequently, and the owners of sharp-pattern beams were kept busy rotating for maximum signal. W4HHK says that most signals seemed to peak at about 30 degrees east of north. W8BFQ, on the other hand, says that this one seemed to swing farther west than most. She had never heard Minnesota and Iowa by the aurora route heretofore.

Though he got in only on the last 45 minutes, W8WRN, Columbus, Ohio, has 36 calls on his 2-meter heard list. W9PK logged 46 stations in 17 states, 5 U. S. call areas and VE3.

Signals on 50 Mc. were more or less readable on voice at times. W1CK, Hingham, Mass., heard a keyed signal just outside the low end of the band (the Collins Colossus?) at 1910 EST, and it was still in there when he quit at just before 2300. The signal peaked at S9-plus with the beam north, but was weak on the direct line to Cedar Rapids. Phil then found voice signals coming through readably, and he was able to work W1TAM, Berwick, Maine, and VE3AET, Lansing, Ont., on 'phone. Heard were VE3BBX, W1RMH and W2SFK. Auroral distortion was strong on all stations when the array at W1CK was aimed north. Even W1AKC, only 30 miles distant, and using a fixed beam aimed southeast, was showing a strong aurora growl.

VE3AET reports that nearly all the 6-meter signals he heard could be read on voice. His contacts included W2MEU, W9YL, W1ELP, W9VZP, W1CK and VE3CAU, on voice, and W2SFK on c.w. Heard were W0CJS, VE3SB and W1RMH. Reg feels that 1954 is building up as a good year for 50 Mc. There have been quite a few E_s openings, even this early in the season, and aurora has been more plentiful than in any comparable period for several years. This with sunspot numbers running very close to zero. Explanations?

The April 11th session netted a large number of reports, and these are very helpful. Study of auroral phenomena is

still being carried on at Cornell University and elsewhere, and detailed observations by amateurs are very helpful in this work. After they have been checked over for interesting ham angles, all aurora reports we receive are forwarded to W2TTU of the Cornell University Ionosphere Project for further study. Reporting forms are available to interested parties from this office. Keep them coming, gang;

RECORDS

Two-Way Work

50 Mc.: CELAH — J9AAO
10,500 Miles — October 17, 1947
144 Mc.: W6ZL — W5QNL
1400 Miles — June 10, 1951
220 Mc.: W5AXY, W5BDT — W5RCI
520 Miles — October 5, 1952
420 Mc.: W1RFU — W4TLM
410 Miles — July 26, 1953
1215 Mc.: G3QC/P — G8DD/P
100 Miles — July 26, 1953
2300 Mc.: W6IFE/6 — W6ET/6
150 Miles — October 5, 1947
5250 Mc.: W2LGF/2 — W7FQF/2
31 Miles — December 2, 1945
10,000 Mc.: W7JIP/7 — W7OKV/7
47.4 Miles — April 10, 1954
21,000 Mc.: W1NVL/2 — W9SAD/2
800 Feet — May 18, 1946

they'll be put to good use. Contributors for this month include W1s MMN BCN CK RFU, W2s UK TTU, W3LZD, W4HHK, W8s BFQ WXV WRN DX, W9PK and VE3AET. Many thanks!

Here and There

The big dish at W2SC is now working in very near its final form. The station has been in operation every Saturday afternoon recently, and even under the minimum conditions that prevail during that time of day, the signal has been something to behold. Checks indicate an antenna gain in excess of 25 db., and comparisons with stations of similar power using more typical amateur antenna systems bear out this gain estimate. The station has not been active during unusual propagation periods, other than a few hours one evening when an Atlantic Seaboard tropospheric opening was in progress. Stations from the Boston Area to Southern Virginia reported the signal many decibels above the next loudest station from any comparable distance.

Moon-reflection tests will be conducted each week end, transmissions being made for approximately half-hour periods at moonrise, at the period when the moon is most nearly directly overhead, and at moonset. The frequency is 144.69 Mc., and the transmitter power output is about 500 watts on c.w. Reports of any unusual reception of W2SC will be appreciated. On May 29th moon tests will be made beginning at 0915 and 1630 EST. On June 5th transmissions beamed at the moon will be made for 10 minutes before and 10 minutes after each hour between 0900 and 2300 EST.

Big-antenna fever is breaking out all over Ohio, according to W8WXY. Al says that W8UKS (an old hand at the big-antenna racket) and W8LAH now have 64-element jobs, and W8YIO got up 32 early in April. The fashion seems to be to use the basic 16-element system, *Handbook* style, in multiples of two or four. It reminds the big-antenna boys that it's a mighty good idea to have a good high comparison dipole available, and check the performance of any new project carefully against the comparison antenna. Too many arrays tend to show up rather miserably on a test like this.

Thinking in e.r.p. terms, W8WXY reminds us, will show why big antennas and high power pay off. An input of 100 watts and an antenna having a gain of 10 db. sounds like a pretty fair 2-meter station, but if you can go to a kilowatt input and a 20-db. antenna at both ends of a long-distance 2-meter circuit you can build up the effectiveness of the system sufficiently so that you will have really strong

signals where nothing existed before. All figures W8WJC-BFQ at something around 50 kw. e.r.p., which goes a long way to explain why that West Richfield signal is so widely heard. When you get anything in the way of a comparable station at the other end of a path of several hundred miles, it spells *reliability*.

As reported elsewhere in this issue, we have a new record for 10,000-Mc. two-way work. W7JJP and W7OKV, having found that 22 miles was easy, made some improvements in their gear and tried again at 47.4 miles on April 10th. No trouble was encountered on the longer path, and the strength and quality of the signals were excellent. W7JJP/7 was at the same location as before, Mt. Scott, just south of Portland, Ore. W7OKV/7 set up on an 1100-foot elevation near Rainier, Ore. Later in the spring the boys are planning an expedition to Mary's Peak, near Corvallis, for a 120-mile attempt. W7JJP and W7OKV are contemplating stirring things up a bit on 21,000 Mc., also. That 800-foot record has stood too long!

When we wrote in the May issue about plans for a trans-continental 2-meter relay, we had not heard of the May 22nd and 23rd expeditions planned by the Albuquerque V.H.F. Club. W5VWU writes that he, W5FAG and W5CA will be manning stations at high-altitude locations that week end (you'll be reading this a few days later, unfortunately!) and we hear from W6ZW that he will be on Mt. Graham near Safford, Ariz., the same week end. W5VWU's letter went out in mimeograph form to stations from W9WOK to the West Coast, so it appears that the effort was quite well organized.

We had a bit to say last month about the sad facts of production time in getting out a magazine. We first heard of this relay effort on April 19th. To get it into copy for the May issue (the last one that would do any good, promotion-wise) it would have had to be in our hands about one month earlier than we received it.

We do have the ARRL Bulletin service, however. By this means, we can reach many interested parties in fairly short order. Bulletins of special v.h.f. significance are sent not only to OBS stations, but also to the complete Official Experimental Station appointee list. They are transmitted nightly over W1AW, also, on all amateur bands from 144 to 1.9 Mc., 'phone and c.w., as well, so the word does get around. If you have something important that comes up too late for use in *QST*, let us know and we may be able to put out a bulletin mailing to help you out.

R.F. Amplifier Hints

A new r.f. amplifier triode designed for u.h.f. TV service was announced recently by RCA. Designated the 6BC4, it has characteristics quite similar to the 6AJ4, 6AM4 and 6AN4, already well established as favorites with v.h.f. men interested in better front-end performance. It is claimed that the 6BC4 is capable of performance slightly ahead of comparable types, both as to gain and noise figure, when used in grounded-grid applications in the u.h.f. TV band.

One feature of the 6BC4 should make for better 420-Mc. layouts. The arrangements of the tube pins is ideal for installation of the tube in trough-line amplifiers of the type described in August, 1953, and January, 1954, *QST*, and in recent editions of the *Handbook*. The socket for a 6BC4 can be mounted so that a shield across it is readily soldered to the grid terminals, leaving the two plate pins in one compartment of the trough and the cathode and heater pins in the other. In this respect, it has some mechanical advantage over other 9-pin u.h.f. miniatures, in the ease with which input and output circuits may be isolated from each other.

Like other tubes designed for mass production, the 6BC4 is in the low-price range, a factor of no mean significance to most of us.

In our 420-Mc. r.f. amplifier stages we have used r.f. chokes in the cathode and heater leads. VE2BX says that better stability and performance can be obtained if quarter-wave lines are used. At 420 Mc. such construction would add only a small amount to the over-all length of an amplifier assembly of the flashing-copper variety we've described several times recently.

Contrary to the general impression, adding a 6AK5 or similar r.f. pentode stage following the usual dual-triode cascode line-up does not necessarily create additional stability problems. In fact, says W9PK, the extra stage actually makes for better stability, as it loads the cascode down properly. The cascode-plus-pentode line-up, properly ad-

justed, has a slightly lower noise figure than that of a cascode alone. The extra tuned circuits improve rejection of spurious signals and may help in broad-banding the response of the converter across the desired tuning range.

R.f. amplifiers at 1215 Mc.? W8DX says it's easy to get good gain and noise figure in receivers for this frequency. All you need is a 416-A or 416-B tube and a 1215-Mc. version of the *QST-Handbook* trough-line r.f. amplifier. Dick says a 3-inch plate line did it, and the amplifier made an APR-4 receiver really come alive on 1200 Mc. Only problem is the tremendous heat generated by the tube's heavy plate and heater current. The trough line heats up like a soldering iron, and something other than polystyrene must be used for insulating material in its construction.

Amateur TV News

The American Amateur Television Society now has 80 members, according to W4MS. Converts may come a little slower from here on as the result of the price of the 5527 iconoscope tube having jumped by a factor of three, Eddie says. On the other hand, closed-circuit TV equipment now available commercially at somewhat less than broadcasting prices may encourage use of such gear for ham purposes.

W8DX has his camera chain working nicely, and is rebuilding his 420-Mc. final stage for use on TV, c.w. or 'phone. The output stage is a 5894A.

W3HIX, Philadelphia, has his camera and all associated gear operating and is also working on the r.f. section for the
(Continued on page 120)

2-Meter Standings

Call States Areas Miles			Call States Areas Miles				
W1HDQ	18	6	850	W6WSQ	3	3	1390
W1RBU	17	7	1150	W6BAZ	3	2	320
W1IZY	16	6	750	W6N7V	3	2	247
W1MNE	14	5	600	W6CGG	2	2	210
W1BCN	14	5	580	W6QAC	2	2	200
W1DJK	13	5	520	W6EXH	2	2	193
W1KCS	13	5	465				
W1MNM	10	5	520				
				W7JU	3	2	247
W2UK	23	7	1075	W7LEE	3	2	240
W2NLY	22	7	1050	W7YZU	3	2	240
W2ORI	21	8	1000	W7JJO	2	2	140
W2AZL	20	7	1050	W7RAP	2	1	165
W2QED	19	7	1020				
W2PAU	16	6	740	W8BFO	24	8	775
W2AMJ	14	5	550	W8WJC	24	8	775
W2BLV	14	5	450	W8WXX	22	8	1200
W2QNZ	14	5	400	W8WRN	20	8	670
W2UTH	13	7	880	W8DX	20	7	675
W2BPK	13	6	—	W8BAX	19	7	655
W2AOC	13	5	400	W8BBP	18	7	800
W2DFV	13	5	350	W8UKS	18	7	720
W2CET	13	5	405	W8RMH	18	7	690
				W8RWV	17	7	630
				W8WSE	16	7	830
W3QKI	22	8	820				
W3RUE	22	8	760	W9EHX	23	7	720
W3NKM	19	7	680	W9FVJ	22	8	850
W3KWL	16	7	720	W9EQC	21	8	820
W3LNA	16	7	720	W9BPV	20	7	1000
W3FEL	16	7	—	W9UOH	20	7	750
W3GKP	15	6	800	W9LF	19	—	—
W3IBH	13	5	570	W9ALI	17	7	800
				W9WOK	17	6	600
W4HHK	23	7	850	W9ZHL	17	6	—
W4AO	21	7	950	W9MBI	16	7	660
W4JFV	18	7	830	W9KLR	16	7	—
W4MKJ	16	7	665	W9BOV	15	6	—
W4OXC	14	7	900	W9LRE	14	6	780
W4JEC	14	5	720	W9DDG	14	6	700
W4TCR	14	5	720	W9FAN	13	—	680
W4LKZ	13	5	720	W9UIA	12	7	540
W4JFU	13	5	720	W9GTA	11	5	540
W4UMF	13	5	600	W9JBP	10	5	750
W4UDQ	9	4	850	W9DSP	10	4	700
W4WCB	9	4	650				
W4TLA	7	4	850				
				W0EMS	24	8	1175
W5RCI	20	7	925	W0GUD	22	7	1055
W5JTI	14	5	870	W0IHD	19	7	725
W5QNL	10	5	1400	W0ONQ	17	6	1090
W5CVV	10	5	1180	W0INI	14	6	830
W5AJG	10	4	1260	W0ZBV	12	7	1097
W5MWW	9	4	570	W0OAC	12	5	725
W5ML	9	3	700	W0WGC	11	5	750
W5ABN	9	3	780				
W5ERD	8	3	570	VE3AIB	20	8	890
W5VX	7	4	—	VE3DIR	17	7	790
W5VY	7	3	1200	VE3BQN	14	7	790
W5FEK	7	2	580	VE3BPB	12	6	715
W5ONS	7	2	950	VE3AQG	11	7	800
				VE1GY	11	4	900
W6ZL	3	3	1400	VE3DFR	10	6	800
W6PJA	3	3	1390	VE2AOK	7	3	440



Operating News



F. E. HANDY, WIBDI, Communications Mgr.
R. L. WHITE, WIWPO, Asst. Comm. Mgr., C.W.
PHIL SIMMONS, WIZDP, Communications Asst.

GEORGE HART, WINJM, Natl. Emerg. Coördinator
ELLEN WHITE, WIYYM, Asst. Comm. Mgr., Phone
LILLIAN M. SALTER, WIZJE, Administrative Aide

Operation Alert, June 14th-15th. ARRL Emergency Coördinators recently have been notified by the National Emergency Coördinator that FCDA has scheduled a major civil defense test for June 14th and 15th. The "testing of communications facilities" is high in the list of objectives. All 48 states are expected to participate, as well as Alaska and Canada. A mass attack by atomic weapons will be assumed in the biggest test yet staged by civil defense. This will be on the Monday and Tuesday before the ARRL Field Day. Not specifically an amateur show or even exclusively a communications matter by any means, it is up to us amateurs to put our best foot forward. AREC groups in RACES will have their work cut out. Groups whose RACES plans are not complete will dovetail plans into the community problem to assist in every way feasible. We've sent special forms to ECs so they can report plans for advance recruiting and organization and their local civil defense contacts. Additional report of results is expected when the test comes off. If not already lined up with a radio officer (c.d.) or ARRL emergency coördinator, every amateur is urged to get so lined up with those men without delay, to be ready for any exigency and to have a part in this exercise.

Coöperation is requested of all amateurs not in the test to avoid frequencies being used by organized groups in the conduct of this test. In the 80-meter band particularly, organized RACES networks will be using the RACES segments 3500-3510 and 3990-4000 kc. Other groups not yet fully licensed for RACES will undoubtedly be using other frequencies throughout the band. Official ears will be listening. Whether actively participating or not, let's all show our ability to clear the decks for action, just as we would in a real emergency.

DX Friendships and Tact. We're proud of the fact that international friendships rise above cold wars and political ideologies. There's no influence people-to-people quite so effective as amateur radio. To keep it that way the spirit of photo-for-photo and QSL-for-QSL is one to maintain!

The careless remark and throwing of one's weight around, and boasting or selfish planting of one's signal zero beat with one's fellows, regardless of our ARRL DX Code of fair operating practices (copy gratis anywhere on request) is the fastest way to throw all these wonderful fraternal values out of the window and work injustice on our fellow W/VE hams as well as ourselves personally! A West Coast amateur wrote recently to explain his feelings when a PJ misinterpreted his

call (QRM is sometimes unavoidable and not intentional) and remarked disparagingly of his work. He felt he was the sufferer from a false impression or the acts of other hams. We agree with his remarks, "We U. S. amateurs should be ever watchful of our own operating practices . . . we are definitely ambassadors of good will for our country when we enjoy foreign contacts and wish DX stations well. . . . Politeness should be our watchword in our international contacts."

June 19th-20th, ARRL Field Day. The rules for this big annual event are printed elsewhere in this issue. FD is for radio clubs, groups and individuals . . . the annual test of equipment and operators. Emergency-powered equipment and portable set-ups are primarily taken afield. But if you have a mobile, don't forget to arrange in some manner to give it a brief (at least) work-out during the FD test so the results may be contributed and reported as part of the club or group aggregate-mobile score for FD. The section on classification of entries makes provision for unit or individual field entries where you are *not* in Class A and where just one or two persons go out together for FD work. A separate battery-power multiplier gives encouragement to all such Class B and Class C (mobile) entries.

There's a thrill in operating afield not duplicated otherwise, however large or small the group and whatever the conditions. From the very first, the FD has been tops with all participating. In '48 and more recently our personal Field Day QSL carried the so-true slogan, "There's nothing like an ARRL Field Day!" So give the FD a whirl. See if you don't agree.

Field Day is dedicated to emergency communications preparedness. The rule that permits using more than one transmitter was designed to encourage amateurs to build as many low- and intermediate-powered transmitters as possible and make local FD operations feasible for as many operators as possible. We would also like to see every amateur station individually able to shift to 6-volt or other emergency power in the event of need. Such availabilities minimize the possibility of isolation for any community following hurricane or other disaster. Credits in the form of a low-power multiplier encourage working at lower power levels where individual operational ability is a top determinant of results. Go out with a FD group for fun and teamwork operations if you can. But remember that we also want reports of every individual test, too, however short the workout of self-powered gear under conditions of isolation from commercial power sources. You

can take pride in communications accomplishment and it typifies conditions in emergency to work from places where no other form of communication exists. BCNU in the FD!

— F.E.H.

WIAW OPERATING NOTE

The summer WIAW operating and general-contact schedule, effective June 1st, appeared on page 79 of May QST. See that issue for full information on when and where to look for the ARRL Headquarters station.

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 Sections. This notice supersedes previous notices.

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

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

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

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

Communications Manager, ARRL. [place and date]

3 La Salle Road, West Hartford, Conn.

We, the undersigned full members of the.....

..... ARRL Section of the.....

Division, hereby nominate.....

as candidate for Section Communications Manager for this

Section for the next two-year term of office.

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

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

— F. E. Handy, Communications Manager

Section	Closing Date	SCM	Present Term Ends
Yukon*	June 15, 1954	W. R. Williamson	Mar. 17, 1949
West Indies	June 15, 1954	William Werner	Aug. 15, 1952
Utah	June 15, 1954	Floyd L. Hinshaw	Feb. 18, 1954
Nevada	June 15, 1954	Ray T. Warner	June 15, 1954
New Hampshire	June 15, 1954	Carroll A. Currier	Aug. 15, 1954
Nebraska	June 15, 1954	Floyd B. Campbell	Aug. 15, 1954
Arkansas	June 15, 1954	Fred Ward	Aug. 16, 1954
Montana	June 15, 1954	Edward G. Brown	Sept. 1, 1954
Kentucky	June 15, 1954	Ivan C. Kelly	Resigned
Rhode Island	July 15, 1954	Merrill D. Randall	Oct. 1, 1954
Canal Zone	July 15, 1954	Nelson W. Magner	Oct. 1, 1954
Santa Clara Valley	Aug. 16, 1954	Roy I. Couzin	Oct. 15, 1954
Kansas	Aug. 16, 1954	Earl N. Johnston	Oct. 29, 1954
Western Massachusetts	Sept. 15, 1954	Roger E. Corey	Nov. 10, 1954

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

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.

Washington	Victor S. Gish, W7FLX	Apr. 15, 1954
Eastern Massachusetts	Frank L. Baker, jr., W1ALP	June 15, 1954
Idaho	Alan K. Ross, jr., W7IWU	June 17, 1954

In the Georgia Section of the Southeastern Division, Mr. George W. Parker, W4NS, and Mr. James T. Schliestett, W4IMQ, were nominated. Mr. Parker received 131 votes and Mr. Schliestett received 109 votes. Mr. Parker's term of office began March 18, 1954.

In the Connecticut Section of the New England Division, Mr. Milton E. Chaffee, W1EFW, and Mr. Elmer P. Balcom, W1KYQ, were nominated. Mr. Chaffee received 164 votes and Mr. Balcom received 118 votes. Mr. Chaffee's term of office began April 15, 1954.

DXCC NOTES

With the green light given for OE operation, DXCC credit now can be given for OE (nationals) cards dated April 1, 1954, and after (or before December 21, 1950). See pp. 33 and 56.

DX CENTURY CLUB AWARDS

HONOR ROLL

W8HGW...253	W2BXA...244	W3KT...241
W1FH...252	W3GED...244	W4BPD...241
W3BES...250	G8ZO...244	LU6DJX...241
G2EL...248	W8AM...243	PA8TN...241
W0YXO...248	GR6H...243	W8MEK...240
W6ENV...246	W3JTC...242	W6SN...240
W6VFR...246	W8NBK...242	PY2CK...240
	W2AGW...241	

RADIOTELEPHONE

PY2CK...232	XE1AC...215	W1MCW...208
W1FH...224	Z86BW...213	SM5KP...207
VQ4ERR...222	W1JXC...211	W8HGW...205
	W1NWO...210	

From March 15, to April 15, 1954, DXCC certificates and endorsements based on postwar contacts with 100-or-more countries have been issued by the ARRL Communications Department to the amateurs listed below.

NEW MEMBERS

W0ELA...209	G5JM...103	CN2AP...101
W6RYB...132	G8FP...103	DL6CV...101
W6YY...112	W1CG...102	CA7WJ...101
DL1SO...107	W9FAU...102	LA6O...101
DL1SD...105	ZE3JO...102	W1AW...100
VE7YB...105	W1MTG...101	W5CTM...100
W4AIX...104	W2NOY...101	W8YGR...100
W6KUR...103		W9RKP...100

RADIOTELEPHONE

IT1AFS...107	W4BVX...100	CT1QF...100
EA4CK...104	W6YY...100	DL1SD...100

ENDORSEMENTS

W3JNN...231	W6LRU...168	W2YTH...130
W6TS...230	W6NLA...161	W6YK...130
SM5KP...220	W2BRV...160	W9UXO...130
VE3QD...210	W6ATO...160	LA5Q...130
VE7ZM...201	W2ABE...153	VE3ADM...130
W8DAW...200	SM3AKM...151	CN2AO...125
G4ZT...191	W4LYV...142	PY5UC...123
W2KDF...190	W2ABM...141	FY6DU...123
W8UAS...190	W3AYS...141	OH3NY...121
W7HIA...184	W3AXT...140	W9ALL...120
W8MPW...181	W3YLL...134	OH7KV...120
W4JDR...176	W9ERU...133	G3VA...111
CN8MM...174	W9VIN...131	W9MQK...110
	W2BOY...130	

RADIOTELEPHONE

FA2CO...190	G8BD...141	G02BK...120
PY2AHS...154	PV4ZL...141	VE4RO...120
F9HP...151	VE7ZM...140	W1PST...112
LU4DMG...149	CO2BL...130	W3CGS...110
	W0HX...120	

CALL AREA LEADERS

W5ASG...233	W7AMX...236	VE4RO...219
	W9RBI...225	

RADIOTELEPHONE

W2APU...202	W5BCP...197	W9RBI...200
W3JNN...195	W6DI...195	W6NCG...145
W4EWY...172	W7HIA...175	VE3KF...163

With the AREC

All Emergency Coördinators will have received a bulletin announcing a nation-wide civil defense test on June 14th-15th called "Operation Alert." This is not just a communications test, but a test of all civil defense facilities and organization at all levels, federal through local. Canada will also participate.

Full details are included in the April Bulletin to ECs. This is just notice to all and sundry that such a test is to be held. If you have not heard of any plans to participate locally, inquire of your EC. Get after him if he hasn't done anything, or take other steps to get something done. Our lever in civil defense and RACES is the AREC. RACES is an amateur service. This is a big opportunity to prove what we can do, so let's not muff it. See you June 14th-15th!

It has come to our attention that the part played by amateurs in the tornado at Warner Robins, just south of Macon, Ga., last April (1953, that is), has never been recorded in *QST*. W4LXE, Macon EC, was called back from a fishing trip to take charge of the Macon AREC organization which was forthwith put into operation. W4JMW put the kilowatt station of W4LXE into operation, and within fifteen minutes of the initial alert on April 30th at 1720 EST, fifteen operators arrived at W4LXE. The 7.5-kilowatt gas-driven generator of the Macon Amateur Radio Club and a 100-watt transmitter were loaded into a truck. W4TGM contributed a receiver. Two autos and a truck carried equipment and personnel to a rendezvous point where the whole group went through the road block together. Included in the caravan were W4s JMW TED SFZ TGM SPD LQW UZS and several nonamateur helpers. W4s KPQ UJM and WXA were left to operate W4LXE; they were later joined by W4s WAI YWY and YWZ.

Arriving in Warner Robins, the group proceeded to the city hall, where they found their services welcomed by the mayor. Within fifteen minutes, W4LXE/4 was put on the air, and traffic handling began on 3995 kc. W4BOL and W4GGD set up a station at the Warner Robins railroad terminal, maintaining contact with W4BQU in Cochran, but later joined the group at city hall. W4UJC and W4TAZ handled some overseas traffic from Dry Branch, eleven miles east of Macon. At the city hall station the messages were flying thick and fast. W4LQW and W4ORD patrolled the stricken area in their mobiles. Operators at W4LXE/4 were assisted by national guardsmen and Warner Robins city hall employees. Foreseeing long-term operation, available personnel were divided into "shifts" for 24-hour continuous operation. This and all other details were supervised by "Stubby" Wilder, W4LXE, the Macon EC.

Thousands of amateurs stood by so as not to "foul up" this important operation. Among those not mentioned above who also participated in the emergency were W4s CFJ CYC CVY CSP EJC FWD IKR LPW OIL OKL PKT FFF TJN VYN YWV YWP, K4FAF, W2AEE, W5QVI, and W6TWZ/4. More than 1000 messages were handled at Warner Robins alone. Although the Macon gang

found much wrong with their operation, the mayor of Warner Robins said "I don't know what we would have done without you."

Amateurs figured prominently in an intensive search for the whereabouts of a kidnaped girl in Scarborough Township, near Toronto, last December. The girl was kidnaped on the sixth and since nothing had been turned up by the eleventh an intensive search of the surrounding country was conducted. The search was in vain, but amateurs coördinated communications for the searchers. VE3DLS was set up at the police station, and three mobiles went into operation on Friday. On Saturday EC VE3NG called out eight more. Having no success on Saturday, the search shifted to Pickering on Sunday, with VE3DFC/M at the Pickering police station acting as net control; later, VE3HZ/M took over as NCS. Fifteen mobiles were in action that day, with VE3SO acting as relay at Agincourt. VE3AJA and VE3NG at one time during the last hours of the search were dispatched to track down a report of freshly-dug graves, but the report proved groundless. However, the communications services rendered by the amateurs received high praise from officials of both Scarborough and Pickering. All mobiles worked on 3765 kc., the Canadian National Calling and Emergency Frequency. Others who participated, not mentioned above: VE3s AMB QS RB BSD IL AIS HE DPQ AIB DFA.

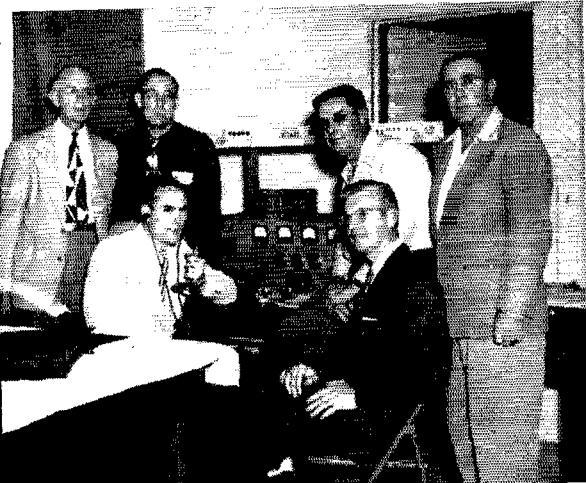
Ice, sleet and flood conditions isolated the towns of Clayton and La Fargeville, N. Y., last Feb. 17th. For two days amateur radio was the only means of communication out of the towns. W2QBG, in Clayton, operating on emergency power, kept the town in contact with the outside world. K2AHG organized a net on 3917 kc. to handle emergency traffic, and traffic was also handled on the frequency used by the New York State 'Phone Net, the Second Regional 'Phone Net and the Interstate 'Phone Net (3980 kc.). The initial alert came at 1030 EST by W2ZSE. W2NAI was instrumental in the proper conduct of nets involved in the operation. Following is a list of participants not mentioned above, compiled by Western New York SCM W2SJV: W2s AE BNA BO BSI DEL ESN EZS FDI GHU JNM KBH KHU KYJ KZY NOC QLK TEP TUS YFZ YJV YMN ZHU, K2s ACA AQY AYQ BEC BYO EST FAA.

A heavy snowfall in Tennessee and Kentucky on the night of February 28th precipitated an emergency starting at 0745 CST March 1st and continuing to 2300 March 2nd. Amateurs as usual did an excellent job handling traffic. Bristol, Gatlinburg and Kingsport were among the towns out off, and amateurs handled all traffic that normally would flow between towns. Amateurs also handled all TVA reports from the affected area. W4HIH in Gatlinburg got on the air with a low-power c.w. rig, but was unable to raise anyone after ten hours of trying. This shows the importance of monitoring both c.w. and 'phone emergency frequencies. W4FX in Knoxville was finally contacted by W4DTI in Savannah and the traffic began to flow.

W4ZJA, the station of the Bays Mountain Radio Club, acted as NCS for the area. Club members participating included W4s TYV PID LNF TYT VZM YEV TQO PAH OLM SWW DJ UWB CBU PHQ DMS BEV.

Amateurs in Kentucky were also active, with W4NBY prominent by his net control work. Further details of Kentucky operation are lacking.

Those known to have participated are W4s AEE AKB AQN ATW AWR AY AYQ BDB BND BUL BOE BTS CEI CRR CUH CYZ DAL ETS ERR FEI FX GBR



At a regular weekly luncheon meeting of the Kiwanis Club of Sanford, Fla., W4JZV set up a rig and gave club members a demonstration of the potentialities of amateur radio. That's W4JZV at the mike, with officers of the Sanford Kiwanis Club gathered about. Thirteen amateurs participated to make this demonstration a success.

GMC HBZ HHQ IIB JGS JHI KXX KUW LBD NCX PFP PIE PMR PQP PWC QAN RMS ROW RRS RRU RRV SVC SZE TPZ TRN TXO TYJ TYW TZD TZG UIO UKN UVR UWA VDK VFC VFL VQE VUA WBK WCE WGJ WKP WNJ WPY WRH WSZ WXM YEB YNK YPM ZJR ZXI ZZ GBR OEB HII UMZ THM FK RHK VJ ZZK AWM CAK CBU ANN SZP ZKK, W1s EOP NCF WOA, K2FAA, W3s FF NFX OPE OSV/3 YGE/8, W6ATB/4, W8s ACN DIE DW ZFF ZOO, W9s GIW HB LZL, W0FMX.

— W4RRV, SEC Tennessee

— * * * * —
A blizzard swept into western Ontario on March 3rd, crippled transportation and communications, threatened the food supply of thousands and isolated whole communities in Lambton, Kent and Essex Counties. With all other forms of communication gone, the AREC went into action. A net was quickly organized covering the stricken area. Operators kept an all-night watch, reporting on road conditions, weather information and welfare messages being passed to the various authorities. A state of emergency was declared in numerous areas. High commendation goes to VE3EAO for the excellent manner in which he acted as net-controller throughout the alert. Those participating in the emergency were: VE3s AGV AJQ ALE AOE AQE ATR BCP BSK BZJ DEX DFK DPM DPX FZ UJ UWO, VE4DX/3. Telephone and telegraph officials praised the amateurs for their part in getting messages through where usual methods of communications had failed. The Canadian Red Cross society credited amateur radio with supplying the only word from the isolated communities.

— VESIA, SCM Ont.

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At 0158 March 19th, Southern California experienced its heaviest earthquake in four years. Within three minutes there were eight local members of AREC checking into K6DY, EC in San Diego, and within fifteen minutes a total of twenty-three were on stand-by. Other members were not alerted, for the effects of the quake were minor, and the net secured at 0300 after two more lighter shocks. Those who checked in on the local emergency frequency of 3825 kc. within the first few minutes were K6DY, W6s QJH BZC PKV BKZ HRI, K6DBJ. The San Diego Tribune gave credit to AREC for their alertness.

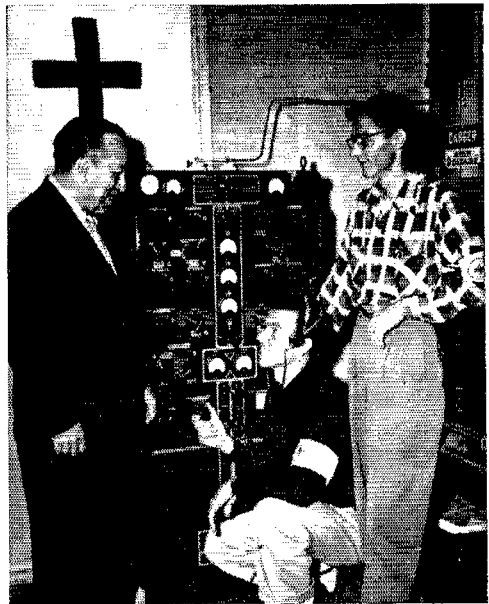
— W6VFT, SEC San Diego

— * * * * —
A tornado struck Anderson, Ind., at about 1800 on Mar. 28th, causing extensive property damage and disrupting communications in a ten-block area in the west central part of the city. W9NTI and W9DOK were the first amateurs to arrive in the stricken area, establishing contact at 2100 with the Indiana Phone Net which was called into emergency session at 2047 by W9KDV. Landline communications with Anderson were out for several hours. By 2300, W0WFB and W5WZZ were acting as net control stations due to skip. Anticipating a heavy load of welfare traffic, IFN scheduled operations during the day on March 29th, working with Anderson civil defense and Red Cross officials. Assisting stations are as follows: W9s BNV DKR DOK EGV ERB EUC GRN IZC JVF KDV LZI MEY NTA NTI QZI TZB UGH UTL WHL, W1WFM, W5WZZ, W7s MM PKX, W8s TSA WDE, W0WFB.

— W9LZI, SEC Indiana

— * * * * —
South Dakota had another of its winter ice and sleet storms March 12th, 13th and 14th, resulting in isolation of some 40 communities. About 125 amateur stations participated in net operations. In the three-day operation, 182 messages were handled including death messages, funeral arrangements, airport reports, road-condition reports, operating traffic for Milwaukee Railroad, location of travelers, relays of messages for Western Union, sports results for United Press, and antenna and power arrangements for the Corps of Engineers. South Dakota net managers W0PRL and W0NEO were assisted by W0s GDE KXZ and SCT. When skip got too long, W9WKN and W5KY acted as net controls. State police radio was heard to say that "amateur operations lightened our load remarkably." The Corps of Engineers, Pickstown, S. Dak., asked nets to remain in operation to handle traffic on Sunday.

Says net manager W0PRL: "The South Dakota 75 Phone Net showed the results of the routine sessions over the long months when the going got tough on the emergency sessions. All hands cooperated and did a fine job."



The Red Cross held a simulated tornado disaster in McAllen, Texas, on Feb. 28th. In the above photo W5AET, Red Cross Communications Chairman, talked with W5TVL (center) and W5SZB, who brought in and operated the Naval Reserve "TCS" transmitter at the neighboring town of Pharr, Texas, two miles from the "disaster."

Stations participating: W0s APL BGB BNA BQG BQS CAS CGF CJW CXM DIY DVD ENS EXX FBD FFP FGC FKE FLP EQV ERG UFL ZPJ OVS GCT FVO GCP GDE GQH HUX HWB HWM IUH KAS KFC KHZ KUW KXZ KYL KYN LXP MBF MMQ MZJ NEO OJQ OLB OXC OZC PBA PHR PRL QEK RMK RWM SIF SCT SOV SWR THF UVL VQC WUU ZWL ZVV ORJ DIT AZR KLX NGW PSD CMJ IWE HUU OZO FOZ ONV ZTR NIV LBS GNS PYP KXW KWW UMD CO BHA WEH ZYW BON ZAL WFO ICR GWH YMH MGW LTS IOK COM LXW WCH MXD MGM IER IOJ IUK DKE CJS PRN KLX WKB DOW TKN, W7s HDS TKS PKX, W9s WKN EEE, W5s OPQ KY WZZ.

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On Monday morning, March 1st, a heavy wet snowfall fell in the southern part of West Virginia and eastern part of Kentucky. It clung to communications wires and finally broke down all lines of communication in the area of Williamson, W. Va.; Pikeville, Ky.; Ashland, Ky.; and as far east as Bluefield, W. Va. W8GCZ at Princeton heard W8EKF trying to establish contact with Bluefield. W8GCZ telephoned from Princeton to Bluefield to set up contact to handle train reports from and to the dispatcher at Williamson. A similar arrangement was set up at Portsmouth via WSLEK. With the aid of W8HRU at Kenova and W4SBI and W8EKF at Williamson, trains were thus dispatched. This arrangement was continued for at least two days. All press wires were also disrupted, so W8GCZ arranged with WLOH at Princeton to come to his station and make a newscast. This was recorded at Williamson and rebroadcast over the Williamson station. Newscasts were similarly arranged each day following until regular communications lines were again in operation. There were several other amateurs participating from time to time.

— W8DFC, EC Princeton, W. Va.

— * * * * —
All SECs who reported for January also reported for February, and four additional ones for a total of fifteen reports, an improvement of one report from February of 1953. New sections reporting are Montana, Tennessee, Ontario and Alaska. Northern Texas' report for January arrived after May QST copy time. The number of AREC members thus represented (4284) was the highest ever reported, although the record number of SEC reports is 21.

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for March Traffic:

Call	Orig.	Recd.	Eel.	Del.	Total
K47LJ	283	3077	3180	177	6717
W2BTE	151	2105	2196	127	4579
W0TQD	17	1213	2104	19	4263
W6IAB	73	1529	1468	61	3131
W9JUU	48	1432	1360	131	3021
K4RAB	690	694	659	—	2078
W4PL	10	956	326	107	1399
K9AIR	47	884	875	39	1845
W5MNN	56	785	536	256	1633
W7BA	47	772	716	49	1584
W8SCA	6	733	718	3	1460
W9JUU	56	661	500	161	1277
W4YIP	13	665	546	116	1340
K4WAR	97	570	582	88	1337
K6FDG	322	495	454	34	1305
KJHFAA	112	578	498	75	1263
W4USA	43	543	9	540	1135
W8SWP	25	545	435	100	1105
K7FAE	36	520	457	63	1076
K6FCT	35	521	407	32	995
K6GFAD	25	474	447	27	973
W3WQI	31	445	425	65	966
W0NZZ	238	347	1	349	932
W8LYG	49	364	85	622	922
KL7AIR	40	395	292	59	886
W9VBZ	12	420	388	32	852
W3CUL	35	373	297	51	806
W7FGY	19	387	372	15	793
W0CPL	6	390	355	35	786
W4OQG	14	380	323	30	747
W2JOA	62	350	275	54	741
W9DO	9	361	298	72	740
W6KHQ	8	361	354	4	727
W6LZG	25	348	305	43	721
W2KFB	17	289	54	703	727
W2KEB	32	308	199	109	638
W2CQB	7	312	292	24	635
W3USA	77	176	262	86	601
K9WAE	563	10	15	0	588
W0GAR	5	285	287	7	584
W8QY	5	283	270	3	571
W2RUF	20	297	192	44	553
K5FEF	37	251	239	12	539
KZCQP	33	252	145	105	535
W4TYE	16	259	223	37	535
W6BLQ	12	238	257	19	532
W7SOT	6	283	253	8	539
W8FYO	2	255	226	29	512
W0BLI	11	253	212	31	507

Late Reports:

KL7AIR (Feb.)	54	1978	1820	82	3934
K4RAB (Feb.)	992	944	398	46	2850
K6FDG (Jan.)	407	395	367	26	1195
W3NRE (Feb.)	16	257	252	5	530

BPL for 100 or more originations-plus-deliveries:

W0QQQ	244	W0RTA	137	K2BWP	100
W3QVE	185	W9WOC	122	(Late Report)	100
W9UNJ	151	W0NTY	118	K6WAY (Jan.)	170
		W09YDX	105		

The BPL is open to all operators who report to their SCM a message total of 500 or more for 100 or more originations-plus-deliveries for any calendar month.

TRAFFIC TOPICS

Correspondence has suggested many reasons why accuracy is at a low ebb these days, from feverish speed with BPL in mind to squirmish or the shortcomings of 'phone (or c.w.) operation. Probably all contribute, but the basic reason is this: plain dang *carelessness*. It's easy to assume with crossed fingers that what you copied is okay and not bother to CFM if you're in a hurry, if you are sleepy, tired, angry or disgusted, if the QRm or QRn is bad. Too easy. "The ignorant are cocksure, but the intelligent are full of doubt." Use your heads, fellows. Be sure you have the message just as the sending station has it, *every time*. Traffic that is garbled, even if it reaches its destination quickly, is bad, not good, publicity for amateur radio. Let's get this straight: accuracy is axiomatic in handing traffic.

Three prominent non-NTS traffic nets have consolidated to form the "United Trunk Lines" (UTL). This event took place after the last QST net listing, before fall reregistration, but it is of such moment that we record it herewith separately. Effective April 12th, Trunk Line J (TLJ), Trunk Line Atlantic-Pacific (TLAP) and Hobo Traffic Exchange Net (BO) operate as UTL in three divisions: East, Central and West, under management of W2EC, W9TT and W6ELQ, respectively. The East Division will operate on 3570 kc, starting at 2015 EST, the Central Division on 3565 kc, starting at 2000 CST, and the West Division on 3570 kc, starting at 1915 PST. The announcement says: "A limited number of additional member stations is needed in certain

areas and UTL welcomes inquiries from interested traffic-minded amateurs."

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The Early Bird Transcontinental Net reports 31 sessions in March, traffic total of 881, which is an average of 28 per session. The net closed on April 23rd and will resume operation in the fall.

The North Texas-Oklahoma Traffic Net reports 30 sessions in March for a traffic total of 345. An average of 37 stations reported in each session.

Mission Trail Net reports 29 sessions, traffic 608, average per session 21.

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National Traffic System. Punctuality is getting to be a lost art, it seems. Tardiness obliges those who do report on time to stick around longer in addition to making less traffic handling possible in the normal net time. There is a limit to the amount of time the average traffic handler will or can spend in a net. If we stretch this limit by tardiness and consequent loss of efficiency, some of our best operators who are with us on a limited-time basis are going to have to curtail their participation.

Why can't we all QNI on time? If we did, the increase in our efficiency would easily allow us to take care of all our traffic. Reliability and punctuality are two essential qualities if we are to make NTS succeed. We cannot hold our nets open all evening, occupying badly-needed channels and taking up operating time. NTS nets meet, clear their traffic and QNF, releasing the frequency for another net if needed. If we all QNI promptly at the appointed time we can clear our traffic and QNX that much quicker. Many of our nets could stand a lot of improvement in this respect. Hw, OMs?

Net	Sessions	Traffic	Rate	Average	Representation
EAN	23	549	—	24	96.65%
CAN	23	455	—	19.7	100
PAN	27	648	—	24	96.30
IRN	23	351	0.42	15.2	96.27
3RN	42	236	0.46	5.6	90.48
4RN	46	329	—	7	69.57
RN5	40	402	—	10	48.75
RN6	52	695	0.50	13	22.12
RN7	36	167	—	4.6	—
SRN	19	88	—	4.9	82.46
TEN	71	1795	—	25.3	—
TRN	46	124	0.58	2.6	72.46
Sections*	399	2654	—	6.7	—

Summary	847	8493	0.58	10.0	100%
Record	847	8493	—	13.9	100

* Sections reporting: Iowa (TLCN), Ala. (AENB & AENP), Kans. (QKS & QKS-SS), NYC-LI (NLI), Conn. (CN & MCN), Wash. (WSN), West. Va. (WVN & W. Va. 'phone), Minn. ('phone), Los A. (LSN), Ind. (QIN), San Joaquin Valley (SJVN). A nice showing. Let's keep improving it.

PAN certificates have been issued to W6s GQY LDR YHM, W7s CZX KZ UMK FRU, and W0ZJO. W6UTV will take over PAN just for the summer, while W7NH rebuilds for higher power. Three sections made perfect IRN attendance in March (E. Mass., W. Mass. and Maine) with 40 different stations reporting in. 3RN discontinued its 1830 session April 1st. W6IEO has received a certificate for his work in RN6. W7KZ reports for RN7 in an "acting" capacity while we negotiate for a new manager. W0ITQ is resigning as TEN manager and W0DQL has been appointed to succeed him. VE3BUR reports improved interest on TRN.

Effective April 12th, a new Ninth Regional Net was formed. The new 9RN will serve as a unit of NTS *only*. W9UNJ is manager. The net meets at 1945 CST on 3660 kc.; trust all you fellows in Wisconsin, Illinois, Indiana and Kentucky will support it as your NTS regional outlet.

The Transcontinental Corps of NTS has been working smoothly, in the main. Several bugs are still to be ironed out, and some vacancies have occurred due to approaching warm weather. Area directors are: Eastern — W8UPB; Central — W9JUU; Pacific — W6JZ. Other members on the roster are: Eastern Area — W1AW W1EMG W1NJM W1TBS W2RUF W2ZVW W4AGC W4KRR W8DSX W8FYO W8RLR W8YCP VE3EAM VE3GI VE3TI W9JUU. Central Area — W4TAV W4AGC W5KRX W9JUU W9RDX W9UNJ W0SCA. Pacific Area — K6BDF W6IPW W6EFD W6KQP W6LDR W6PQP W6UTV W6WOC W7TGU W0EKQ W0IC W0KHQ W0ZJO.

Cameras are often active when a bunch of traffic men get together. Traffic men, young and old, will recognize a lot of the brasspounders present in this QMN gathering snapped at the Grand Rapids convention on February 27th. Left to right, we have W8s GTM EGI QIX ELW EOS YKC (Editor DARA/QMN Bul.), JDU SCW (QMN and EAN Mgr.), SJF URM (RM), ILP YMO DYH (ex-SCM, now with APCO), HKT IV and FX.



A.R.R.L.-AFFILIATED CLUB HONOR ROLL

This listing is published in line with the League policy for special recognition to all affiliated clubs whose entire membership consists of members of the League. It is a pleasure to present herewith the latest Honor Roll of such affiliated clubs. Clubs having 100 per cent ARRL membership are determined from information supplied in the 1954 affiliated-club Annual Information Survey; "100% ARRL Club" certificates will be sent each of these Honor Roll clubs. An additional QST Honor Roll will be published somewhat later this year to take care of those clubs reporting results of ARRL membership drives being conducted currently. Such list will include consideration of full reports from affiliated societies whose questionnaires gave incomplete information, and others that qualify for listing.

Albany Amateur Radio Club, Albany, Ore.
Amateur Radio Club of Augusta, Ga.
The Bandhoppers Radio Club, Ferguson, Mo.
Black Hills Amateur Radio Club, Inc., Rapid City, S. D.
Boulder Radio Club, Boulder, Colo.
Central Illinois Radio Club, Bloomington, Ill.
Central Kansas Radio Club, Salina, Kans.
Connecticut Wireless Association, Inc., Manchester, Conn.
Decatur Signal Depot Radio Club, Decatur, Ill.
The DX Club, Lansdale, Pa.
Electric City Amateur Radio Club, Dunmore, Pa.
Enid Amateur Radio Club, Enid, Okla.
Fort Stanwix Amateur Radio Association, Rome, N. Y.
Fountain City Radio Club, Fountain City, Tenn.
Frankford Radio Club, Philadelphia, Pa.
Haven Radio Club, New Haven, V. Va.
Hi-Plains Amateur Radio Club, Plains, Kans.
Inglewood Amateur Radio Club, Inc., Lennox, Calif.
Istrouma Amateur Radio Club, Baton Rouge, La.
Kaw Valley Radio Club, Topeka, Kans.
Middlebury Mike & Key Club, Middlebury, Vt.
Morris Radio Club, Inc., Morristown, N. J.
Neosho Valley Amateur Radio Club, Emporia, Kans.
Niagara Radio Club, Inc., Niagara Falls, N. Y.
North Shore Radio Club, Flushing, L. I., N. Y.
Pacifico Radio Club, Los Angeles, Calif.
Providence Radio Association, Inc., Providence, R. I.
Ridgewood Amateur Radio Club, Fairlawn, N. J.
Sandhill Amateur Radio Club, Hamlet, N. C.
Sandusky Valley Amateur Radio Club, Fremont, Ohio.
South Lyme Beer, Chowder and Propagation Society, South Lyme, Conn.
Southern Pacific Amateur Radio Klub, Eugene, Ore.
State Line Radio Club of N. Y. and N. J., Monsey, N. Y.
Suburban Radio Club, Clayton, Mo.
Sunrise Radio Club, St. Albans, L. I., N. Y.
Sussex County Amateur Radio Association, Sparta, N. J.
Tehema County Amateur Radio Club, Red Bluff, Calif.
T-9 Radio Club, Ipswich, Mass.
Tri-City Amateur Radio Club, Borger, Tex.
Waynesburg College Radio Club, Waynesburg, Pa.
Wichita Amateur Radio Club, Wichita, Kans.
Windblowers V.H.F. Society, Paterson, N. J.

CODE-PROFICIENCY PROGRAM

Have you received an ARRL Code Proficiency Certificate yet? Twice each month special transmissions are made to enable you to qualify for the award. The next qualifying run from W1AW will be made on June 16th at 2130 Eastern Daylight Saving Time. Identical texts will be sent simultaneously by automatic transmitters on 1885, 3555, 7125, 14,100, 21,020, 52,000 and 145,600 kc. The next qualifying run from W60WP only will be transmitted on June 6th at 2100 PDST on 3590 and 7138 kc.

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

Code-practice transmissions will be made from W1AW each evening at 2130 EDST. References to texts used on several of the transmissions are given below. These make it possible to check your copy. For practice purposes the order of words in each line of QST text is reversed during certain of the slow-speed transmissions. To get sending practice, hook up key and buzzer and send with W1AW.

Date Subject of Practice Text from April QST
June 1st: A One-Package Station for Two Meters, p. 11
June 4th: The Pigmy Powerhouse, p. 17
June 8th: Transmitter Hunting with the D.F. Loop, p. 32
June 10th: TVI Checking at Headquarters, p. 34
June 14th: Let's Go VFO, p. 23
June 18th: The Case for A-B Linear, p. 26
June 21st: Pulling the Collins 32V on 160, p. 38
June 23rd: Modifying the S-40 for S.S.B. Reception, p. 42
June 29th: The 1953 SET Skindig, p. 47

A.R.R.L. ACTIVITIES CALENDAR

June 5th-6th: V.H.F. QSO Party
June 6th: CP Qualifying Run — W6OWP
June 16th: CP Qualifying Run — W1AW
June 19th-20th: ARRL Field Day
July 2nd: CP Qualifying Run — W6OWP
July 15th: CP Qualifying Run — W1AW
July 17th-18th: CD QSO Party (c.w.)
July 24th-25th: CD QSO Party (phone)
Aug. 7th: CP Qualifying Run — W6OWP
Aug. 13th: CP Qualifying Run — W1AW
Sept. 5th: CP Qualifying Run — W6OWP
Sept. 13th: CP Qualifying Run — W1AW
Sept. 16th: Frequency Measuring Test
Sept. 18th-19th: V.H.F. QSO Party
Oct. 8th: CP Qualifying Run — W6OWP
Oct. 9th-10th: Simulated Emergency Test
Oct. 12th: Qualifying Run — W1AW
Oct. 16th-17th: CD QSO Party (c.w.)
Oct. 23rd-24th: CD QSO Party (phone)

AFFILIATED-CLUB CLASS INSTRUCTION

The following chart lists information as furnished by a number of ARRL-Affiliated Clubs. Further class details can be obtained by contacting the individual club through the address given in the "information" column.

	City	Affiliated Club	Information	Code	Theory
Alabama	Decatur	Decatur Amateur Radio Club	P. G. Lawrence, P. O. Box 9	X	X
California	Long Beach	Associated Radio Amateurs of Long Beach	R. E. Souter, 2347 Heather Ave., Long Beach, Calif.	X	X
	No. Hollywood	San Fernando Valley Radio Club	Cy Friedheim, 5749 Tujunga	X	X
	Red Bluff	Tehama County Amateur Radio Club	Andy McClure, R. 1, Box 370	X	X
	Redding	Shasta County Radio Club	H. A. Downard, Box 842	X	X
Connecticut	Hamden	Hamden Amateur Radio Association	R. Warren, 99 Armory St.	X	X
	Manchester	Manchester Radio Club	R. Reichenbach, 41 Center St.	X	X
Florida	Ft. Lauderdale	Broward Amateur Radio Club	Noble Smith, 1639 Funston St., Hollywood, Fla.	X	X
	Key West	Key West Radio Amateur Club	R. J. Marchand, Box 210	X	X
Georgia	Lakeland	Lakeland Amateur Radio Society	Mrs. M. Stoner, 318 W. Hunter St.	X	X
	Camp Gordon	Camp Gordon Radio Club	Jack Rodgers, Camp Gordon R. C.	X	X
	Carrollton	Carrollton Radio Club	G. L. Smith, 10 Alice Lane	X	X
	Marietta	Kennesawee Amateur Radio Club	J. W. Rich, jr., 209 Lemon St.	X	X
Illinois	Chicago	Hamfester's Radio Club, Inc.	P. Stanek, 9355 So. Peoria St.	X	X
	Du Page Co.	Du Page Radio Club	Robert Johnson, 4518 Oakwood, Downers Grove	X	X
	Quincy	Western Illinois Radio Club	L. E. Shaw, 76 So. Grandview	X	X
Indiana	Newcastle	Newcastle Amateur Radio Association	Roy A. Low, R. 1	X	X
	Richmond	Richmond Amateur Radio Assn.	H. L. Pyle, 1811 North "A" St.	X	X
Iowa	Iowa City	QSO and QRM Society of Iowa	Lee Blodgett, 747 Grant St.	X	X
	Mason City	North Iowa Amateur Radio Club	L. Shima, 605 East State St.	X	X
Kansas	Wichita	Wichita Amateur Radio Club	Frank Miller, 2369 So. Main St.	X	X
Maine	Portland	Portland Amateur Wireless Assn.	P. L. Brooks, 142 Mass. Ave.	X	X
Massachusetts	Bedford	Bedford Radio Club	M. C. Hobart, Bellows Hill Rd., Carlisle, Mass.	X	X
	Braintree	Braintree Amateur Radio Club	E. Doherty, 236 Wildwood Ave.	X	X
	Falmouth	Falmouth Amateur Radio Assn., Inc.	John T. Conover, Box 515, Woods Hole, Mass.	X	X
	Waltham	El-Ray Amateur Radio Club	W. G. Welsh, Research Division, Raytheon Mfg. Co.	X	X
Michigan	Niles	Niles Amateur Radio Club	D. Cusick, 2608 So. 13th St. Rd.	X	X
	St. Joseph	Blossomland Amateur Radio Assn.	A. Carpenter, 2503 Langley Ave.	X	X
Minnesota	Marshall	S. W. Minnie Radio Club	Alex Eaton, 236 W. Main St.	X	X
	Minneapolis	Minneapolis Radio Club, Inc.	Herb Patterson, 3111 12th Ave. So.	X	X
	St. Paul	St. Paul Radio Club, Inc.	Lydia Johnson, Box 512	X	X
Montana	Harlowton	Harlo Radio Club	E. L. Kasmussen, Box 1523	X	X
Nebraska	Crete	Crete Amateur Radio Club	Lad Hlavaty, 3508 "B" St., Lincoln, Nebr.	X	X
New Jersey	Atlantic City	Atlantic City Radio Club, Inc.	G. S. Giles, 106 No. Somerset Ave., Ventnor	X	X
	Hamilton Sq. Middlebush	Hamilton Township Radio Assn. Kariton Valley Radio Club	C. B. Polhemus, Gen. Delivery C. A. Ehrbacher, R.D. 3, Box 317, New Brunswick	X	X
	Morristown	Morris Radio Club, Inc.	F. W. Holstein, 24 Olyphant Dr.	X	X
	Parsippany	Par-Troy Amateur Radio Assn.	Harry Henderson, Box 261, Tabor, N. J.	X	X
New York	New York	Columbia University Amateur Radio Club	Chet Wolf, Box 32, Eng. Bldg., Columbia University, N. Y. 27	X	X
	Roslyn, L. I.	Northern Nassau Amateur Radio Club	Sidney Fritsch, 2 Center Drive, Flower Hill, Roslyn, L. I.	X	X
No. Carolina	Charlotte	Central High School Radio Amateur Club	J. M. Vaun, 1930 Plaza Court	X	X
Ohio	Akron	Buckeye Shortwave Radio Assn.	R. J. Nuss, R.D. 1, Box 138, Doylestown	X	X
	Ashland	Ashland Amateur Radio Club	Paul Kizer, 500 Lozier Court	X	X
	Cleveland	Westpark Radiops	Ed Gates, 3283 West 73rd St.	X	X
	Columbus	Columbus Amateur Radio Assn.	G. Harris, 212 No. Kellner Rd.	X	X
	Dayton	Dayton Amateur Radio Assn.	Mildred O'Connell, Box 44	X	X
	Middletown	Dial Radio Club	H. M. Haller, 1820 Clarendon Ave.	X	X
	Painesville	Lake-Geauga Amateur Radio Club	C. E. Dingley, 185 E. Jackson St.	X	X
	Toledo	Toledo Radio Club	J. L. Lyon, 457 So. Wheeling St.	X	X
Oklahoma	Ponca City	Pioneer Radio Amateurs	Larry Newlin, 823 No. Osage	X	X
	Sand Springs	Sand Springs Amateur Radio Club	S. L. Neely, 1121 No. Roosevelt	X	X
	Stillwater	Oklahoma A&M College Amateur Radio Club	Amma Miller, Room 403, Eng. Bldg., Okla. A&M College	X	X
Oregon	Medford	Rogue Valley Radio Club	K. Pasmore, 711 West 2nd St.	X	X
Pennsylvania	Lancaster	Lancaster Radio Transmitting Soc.	A. C. Jacoby, 589 No. Plum St.	X	X
	Lansdale	The DX Club	A. L. Godshall, Chestnut St.	X	X
	Philadelphia	Philadelphia Wireless Assn.	c/o Phila. C. D., Germantown Town Hall, Germantown Ave. and Haines St.	X	X
So. Dakota	Sioux Falls	Sioux Falls Amateur Radio Club	Dale E. Russell, 907 So. Prairie	X	X
	Vermillion	Prairie Dog Amateur Radio Club	E. J. Heins, RFD 1, Yankton	X	X
Tennessee	Cookeville	Tenn. Tech. Radio Club	Bill West, Box 1072 Tenn. Tech.	X	X
	Jackson	Jackson Radio Club	E. H. Rushing, 104 Scallion Rd.	X	X
	Kingsport	Bays Mountain Radio Club	R. W. Ingraham, c/o Tenn. Eastman Recreation Club	X	X
	Memphis	Midsouth Amateur Radio Assn.	Jack Bee, 4565 Helene	X	X
	Oak Ridge	Oak Ridge Radio Operators Club, Inc.	D. J. Fisher, Box 291	X	X
Texas	Edinburg	Rio Grande Amateur Radio Club	Bill Helmer, R. 1, Pharr, Texas	X	X
	Waco	Central Texas Amateur Radio Club	C. J. McCauley, 3108 Wenz Ave.	X	X
Vermont	Middlebury	Middlebury Mike & Key Club	Vera Warner, RFD 2	X	X
Virginia	Newport News	Peninsula Amateur Radio Club	W. A. Leyland, 116 Apple Ave., Hampton, Va.	X	X
	Winchester	Shenandoah Valley Amateur Radio Club	J. C. Morgan, Box 139	X	X
Washington	Walla Walla	Walla Walla Valley Radio Amateur Club, Inc.	Murray Fisher, Box 941	X	X
West Virginia	Fairmont	Mountaineer Amateur Radio Assn.	William Huff, Box 909	X	X
	Weston	Stonewall Jackson Amateur Radio Club	James McEwen, Box 488	X	X
Wisconsin	Green Bay	Mike and Key Club	O. D. Davis, 414 So. Jackson St.	X	X
Wyoming	Casper	Casper Amateur Radio Club	R. W. Lane, 2233 E. Yellowstone	X	X
Alberta	Lethbridge	So. Alberta Amateur Radio Club	B. Blackburne, 946 15th St. So.	X	X
B. C.	Nanaima	Nanaima Amateur Radio Assn.	Miss Edna Hemming, Box 176	X	X
	Victoria	Victoria Short Wave Club	D. Scholes, 1610 Pinewood Ave.	X	X
Canal Zone	Balboa	Canal Zone Amateur Radio Assn.	Elizabeth Bell, Box 72, Pedro Miguel, C. Z.	X	X

• 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, W. H. Wiand, W3BIP—SEC: IGW, RM: AXA, PAM: PYF, E. P. Nets: 3610, 3850 kc. The Lancaster RTS elected the following officers: GJA, pres.; RKN, vice-pres.; OY, secy.; UMX, treas.; KKG and EYY, dirs. ID reports the gang at International Resistance Co. formed a radio club known as the IECARC. The Club is located on the tenth floor of 401 N. Broad, Philadelphia. Meeting time is 5 p.m. the 1st Thurs. of every month with an open invitation to anyone to attend. The Club is on the air at present with a small rig using the call of YPF, while a 300-watt four-band rig is in the making. Skeds can be arranged to handle Philadelphia and vicinity traffic during the day between 1000 to 1030, 1230 to 1330, and 1630 to 1715 hours. If interested, contact ID. Club officers are 2CAG, pres.; K2DVB, secy.; KN2DUA, treas.; ID, act. mgr.; QWV, tech. dir.; ex-LAIJC, ed. dir. The Reading RC, with 75 members and guests present, enjoyed a lecture on "Transistors and Possible Applications in Amateur Radio" given by Mr. Howard Hall, of the Western Electric Co. The Club's code class, instructed by PVI, graduated five students to the rank of Novice: WN3s WYF, YNC, VKD, YLX, and YJL. Results of the February F.M.T. have just been received and congratulations are in order to LOX, MCQ, OCG, QZP, TFN, and VDE. The accumulative average error was only 23.7 parts per million with top honors going to LOX, with his precise measurements averaging 9 parts per million error. UQJ reports hearing signals from VIR, in Willow Grove, 85 miles from York, on the 435-Mc. band. NNV says 220-Mc. activity is plentiful in Delaware Co. EU spent a month in Chicago learning about color TV. OZV has a new vertical ground-plane in operation on 80 meters. CUL took time off from her busy traffic skeds to enjoy a vacation in sunny Florida. BES says he pushed real hard in the phone/c.w. DX Contests but not hard enough. Be that as it may, Jerry's past record in any contest is one to be proud of and will be long remembered by all. PYF was appointed Radio Officer for Northampton Co. and reports the county's RACES plan is ready for approval. KFK is back in business again after being QRT for a few weeks as a result of an operation. Traffic: W3CUL 806, BFF 443, NOK 172, AEO 85, UOE 79, GES 59, AXJ 52, BIP 46, ONA 40, PYP 40, PYY 32, VPY 31, TEJ 27, KAG 26, QLZ 24, MWL 22, DUI 18, OZV 17, ELI 8, GIY 8, OEZ 8, CDT 7, VN 6, ID 5, UCY 3, YPF 2.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA—SCM, Arthur W. Plummer, W3EQK—AYS reports two new countries worked on 21 Mc.; KL2X and YP3VG. CDQ wound up in bed with virus pneumonia after a strenuous week end of helping out with the Telethon for Crippled Children, March 27th and 28th. CVE transmits Official Bulletin 5 times a week. KG6FAA received honorary TCRN certificate for handling a large volume of traffic via 6KVY. The TCRN roster includes 6BAM, 2BO, 4SCE, 6KA, 4PL, 6KYV, 9UNJ, 9EBL, K7FBL, 9JTL, and 3CVE. EEB reports he got his share of DX traffic in March with 5 from KG6FAA and 1 from KA8RW; he also got 6 new ones in the DX Contest this year, making a total of 125 worked and 105 verifications. HC remains active in MDD and MARS. JZY reports activity in MEPN and Early Bird Nets. LUL is so busy he has had only 1 QSO in two months! MCG is holding his own with MDD. At the Mar. 16th meeting of ARA 8BTP, now 3YRK, gave an interesting talk on how they do things on Field Day in Michigan. TIV is mobilizing a new Elmac in his Chevrolet convertible. OYX is very active in MEPN, PRVN, and GCN. PKC reports activity in the Mike-Farad Net. USA has been operating in the ham bands while checking new equipment before moving into new quarters as MARS at Fort G. G. Meade. QZC visited 4YHD, and had a good bit of fun with p.p. 304TH final running a gallon

on 40- and 20-meter c.w. into 60-foot-high skywires. MCG and IKN operated MSK during the DX Contest. Ex-3TFR, now 4CAW, soon will be back among us as TFR again. PU has undergone several operations while in VA Hospital, Wilmington, Del. AED says his new Hallcrafters SX-88 is smooth. LUV's new 8005 final is being pushed up to 500 watts by an Elmac Transcriber. The Eastern Shore (Md. and Del.) Net is so large and active that stations have to wait as long as an hour to get in their two cents worth! At the last meeting of the BARCS in March JNN, the DX hound of Baltimore, gave a most interesting talk on DX. The Chesapeake Club heard an interesting talk on "Glass Antennas" by one of the Bendix engineers. IYE is back with 50 watts and 135-foot skywire from new QTH at 41 S. Brighton Rd., Wilmington, Del. MFJ is back on after testing new three-band beam designed by DZZ which he has mounted on 40-foot tower. LDD reports that in the recent c.d. drill for Cecil County assistance was given by 8CPN and 5ZOG, operating from Conowingo Dam and Susquehanna River Bridge, respectively, mobile on 2 and 10 meters. The Aberdeen Mobile Net is active every day at 0730 and 1700 while the fellows are going to and from work at the Proving Ground. Assistant RCs for Harford County are 7UJW, Aberdeen, 3SZY, Abingdon, and RMY BelAir, 4FF, ex-SCM for Virginia, has moved back to his native Maryland and has his original call, 3UE. ECFP has completely renovated his shack and installed new gear, including a Viking II, JE, Maryland EC, has appointed four Assistant ECs, BII, IFW, JCL, and NKY. Karl reports WBF, the State c.d. station, is coming along slow but sure. SPL reports the Kent County (Del.) Amateur Radio Club is teaching amateur radio to a class of 25 UXO reports activity at the Naval Air Fatuxent Hams Club with two BC-610s, an operating console, and appropriate antennas. UCJ is squirting 35 watts into the ether with an all-band job, limited to 80-meter c.w. at present, and is rebuilding his doublet and putting up a 35-foot whip. A special joint meeting of BARCS and Chesapeake members was held Mar. 26th to hear a most interesting talk by Atlantic Division Director VA. The BARCS staged another hidden transmitter hunt Mar. 21st with 16 mobile units taking part. Said transmitter was found by VVL. PZW again is in Greenland. Copies of a proclamation by Governor Theodore McKeldin of Maryland designating the week of June 14-20 as "Amateur Radio Week in Maryland" are available at fifty cents per copy by contacting SKK or DC, Traffic (Mar.) W3USA 602, CVE 293, WV 172, PZW 90, ECP 82, JE 81, COK 40, PKC 40, UE 29, JZY 18, CQS 16, FWP 15, HC 13, EEB 12, QCB 10, NNX 5, OYX 5, MCG 3, (Feb.) W3VAR 75, NPQ 24, MCG 15, DRD 2, IYE 2.

SOUTHERN NEW JERSEY—SCM, Herbert C. Brooks, K2BG—SEC: UCV, PAM: ZI. In Moorestown a new club has been organized, the Burlington County Radio Club. Officers are WKI, pres.; EVR, vice-pres.; and EBW, secy.-treas. ZQ is getting very close to WAS on 75-meter phone. This station also is active on 2 meters. K2BDK's dad now is licensed under the call KN2HEX. The SJRA was honored by a visit from 3YA, our new Atlantic Division Director. Congratulations to K2DWW on receiving his General Class license. It is with regret that we report the passing of BHH. Bob was a pilot for RCA and was returning from a business trip when the accident happened. HIA has been working DX on 40-meter c.w. Plenty of 2-meter activity is reported monthly in the Hamilton Twp. paper *Scuttlebutt*. DOX, CFP, and CPU put on a demonstration for the Boy Scouts at the Nottingham Way Armory. SVV has been giving instructions to Scout troops in his locality. WLN, recently discharged from the AAF, is operating at ZQ, Col. Sam Kale, VU, now is stationed in Turkey. Those holding PC appointments are requested to make monthly reports to the SEC. There are openings in several southern counties of the section for qualified men to serve as EC. Let's have some volunteers. Traffic: W2RG 109, K2BG 89, W2ZVW 65, ZI 40, HAZ 8.

WESTERN NEW YORK—SCM, Edward G. Graf, W2SJV—Asst. SCM: Jeanne Walker, 2BTB. SEC: UTH/FRL, RM: RUF, PAMs: GSS, NAL, NYS is on 3615 kc. at 6:30 p.m., 3925 kc. at 6 p.m. NYSS is on 3595 kc. at 7 p.m. Mon., Tues., Wed., and Fri., at 4:30 p.m. on Sat. NYS C.D. is on 3509.5 kc. and 3993 kc. at 9 p.m. Sun. NOTE: The C.D. Phone Net moved Apr. 11th to the FCC-assigned RACES frequency of 3993 kc. at 9 a.m. K2BFX QNLed CON each a.m. during March. DUC has a Johnson mobile rig. There are good turnouts in the Finger Lakes 2-meter Net each Fri. evening. The Policy Committee for the NYS Phone Net consists of OME and NJL for

NYC-LI, LIL and GDD for ENY, UNF and VEP for WNY. ILI has been designated OBS for the Net. On Mar. 29th during a severe snowstorm HSI/M, K2DVD/M, and LXE/M used their mobile rigs to transmit messages from stranded motorists to fixed stations who telephoned their homes. Stations taking this traffic were CBM and GVI as NCS, MYN, EFX, NZA, UXS, POA, PRI, K2GHF, and VE3DDO. Speakers at KBT meetings were PVL, SPS, and PPL. The Corning Radio Club's QRM reports the club project is building walkie-talkies. New RARA Mobile Club officers are ZS, pres.; AKM, vice-pres.; K2ACO, secy.-treas. ZS was the 1953 winner of the club award. The Elmira Area held its annual dinner meeting at Harris Hill Inn Mar. 16th. New officers of RAWNY are LXE, pres.; PPY, vice-pres.; KLF, rec. secy.; GBX, corr. secy.; TAX, treas. K2APT is working DX with a Viking II. KN2DWZ has the 807 going, R.X.W. has 32V-1 and 129X. NETN editor is K2DYB. The Amherst group is busy getting ready for Field Day. New appointments are JNM as EC for Oneida Co., YVI as EC for Livingston Co. Renewals: OVI as OPS, RJJ as ORS, YLAI as EC for Broome Co., VEY as EC for Wayne Co., ZOC as EC for Niagara Co., and CYD as EC for Onondaga Co. UXP got the bugs out of the crystal-controlled converter for 2 meters. QLI had the rig at the Corning Glass Works Hobby Show and a TV receiver next to it to demonstrate "no TVI." The Sidney ARC walkie-talkie contest was won by RZP, followed by MTB, MSI and TSX tied, GFD, JGI, and UPT. An NYS Net certificate was issued to K2EQR. The Wayne Co. AREC Net meets on 146.9 Mc. at 9 p.m. each Thurs. The RARA V.H.F. group held a "Fix-It Nite" at the QTH of UTH. Those working on their rigs were YIE, VVG, and QY. K2BVE has 120 watts on an 813 with cathode modulation. RARA DX Assn. members SAW, DOD, BJH, MA, FBA, TXB, CR, ZLI, DJW, and UTH were trying in the DX Contest. QRC has been appointed Asst. Mgr. of the NYS C.W. Net. Traffic: (Mar.) W2BTB 4579, RUF 553, ZOL 436, K2DYB 158, W2EMW 141, OE 100, DSS 77, K2ACA 71, W2ZRC 51, RUT 39, K2BZC 30, W2JMT 27, ABM 26, PZC 22, K2DGD 16, W2VEP 12, DVE 10, RQF 8, K2BVE 4, CUQ 2, W2RJJ 2, K2BFX 1. (Feb.) W2IPC 45, PGL 8, RQF 4.

WESTERN PENNSYLVANIA — SCM, R. M. Heck, W3NCD — SEC: CA. RMs: GEG, NUG, UHN, PAMs: AER, LXE. Traffic Net: 3585 kc., 7:00 p.m. We are pleased to welcome the Bucktail Amateur Radio Club, the Washington County Amateur Radio Club, and the Waynesburg College Radio Club and to congratulate them on their affiliation with ARRL. The Washington County gang was host to the WPARCC at the last meeting. WCARC delegates were IDO, SUK, and NRE, who inform us that the gang there is really getting things under control and set for many varied programs. The BARC bulletin reports the gang is pitching in to get the club transmitter and rooms in fine shape. IIX, TCP, and TMA are activating the 2-meter band and report low power does a good job in that area. More of the gang should join as 2 meters works fine in local AREC and c.d. work. The SCARC is digging in preparing for Field Day and reports SDV and SVJ spark-plugging a new mobile club in the Pittsburgh Area. Ex-DNO now is 9CWL in the Chicago Area. NKM still has a Vestco tower despite the neighbors' attempts to have the city find means to have it removed. MPO de-TVied with HT-20. UUH has cleared himself with all concerned. NRQ is interested in s.s.b. YDP has a new Viking. LOR has new 10-meter rig and LKA is preparing 400 watts on 'phone. RAE hopes to have a truck license soon and the emergency trailer then will be ready for action. The walkie-talkie units have been tested and reported fine for the use intended. POS presented fine battery cases for the units. WDK is a new RAE member and is active on 40-meter c.w. Traffic: (Mar.) W3WIK 966, NRE 274, YA 86, UHN 81, KUN 52, LMI 52, LXQ 43, NUG 32, SIJ 32, TSY 28, NCD 23, VKD 20, KNQ 18, NALJ 9, OEZ 8, MIZ 6, NCJ 2. (Feb.) W3NRE 530, NUG 34. (Jan.) W3NUG 19.

CENTRAL DIVISION

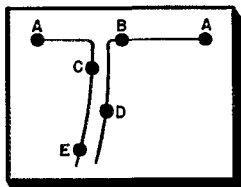
ILLINOIS — SCM, George Schreiber, W9YIX — Section nets: IEN (phone 3940 kc.); ILN (c.w. 3515 kc.). PAM: UQT. RM: BUK. EC: HOA. Asst. EC: VTL. EC Cook County: HPG. As of March 15th the Starved Rock Radio Club has been affiliated with ARRL for twenty years. A dinner was held to which XYLS and YLS were invited. Among the other guests were Director AND and Vice-Director UQT. The date for the now-famous hamfest is June 6th, the first Sunday of the month. The Tri-Town Radio Amateur Club has resumed publication of its bulletin, *The Oscillator*. BUK threatens to get out another issue of *IN Nuz*. HOA enjoyed a Florida holiday and spent most of the time in the sunshine catching up with his EC correspondence. EU is putting mobile radio in his forty trucks, calling on his long ham experience. WAX reports good reception of his OO notices and now has 25-w.p.m. certificate. DO and CGC/9 maintain daily skeds with JUJ to keep the traffic rolling into Illinois. JGL has been made boss newscaster of WGN-TV. MRK works for him as a cameraman. CEE passed the 1st class 'phone examination. YFB finished a VFO and has fun skipping around on 2 meters

seeking out local traffic. HUX finished the modulator and is giving the 'phone bands a try. SKR has been using a 15-watt portable rig just to show the big boys how it is done. UIN is keeping busy with his code practice sessions and has dozens of letters from his "customers." UTN, Rock Island County EC, added 11 members to his Corps, and BA, St. Clair County, just as many more. The St. Clair County Amateur Radio Club elected MDB, pres.; KRI, vice-pres.; RHA, secy.; DIB, treas.; SAY, sgt. at arms; and UWP, act. mgr. The Club puts out a sparkling bulletin. IDA is enjoying his new Viking VFO and Matchbox. HKA fired up his 250-watt mobile rig and also his electric organ. Kankakee-Iroquois Net members (3920 kc.) include RLD, AVS, HKA, OVI, ILW, IBU, UOG, KLD, NKR, QGO, FRM/8, QAY, MZH, FAMA, and SAL. JAC returned from a year in Korea and is at Scott AFB. The West Suburban Net has a mobile treasure hunt every second week. The South Town Emergency Net (Chicago) meets every Mon. at 7:30 p.m., 29,640 Mc. Officers of the Tri-Town Radio Amateur Club are OSD, pres.; UIK, treas.; and DSO, secy. NIU divides time between 20 and 40 meters. The Knox County Amateur Radio Club is redecorating its clubroom. IEN built the TVI-suppressed rig in Jan. QST and is happy. Because he is a Navy officer on duty in Chicago (CICW/9) gets to keep that call. He never knows where he will be assigned next by Uncle. OIN complains his traffic total was listed under QIN. SXL has a new jr. operator. JCF has built 75-meter 'phone rig. ZUJ is interested in the radio control of model aircraft. YIX in model yachts. HJF arbitrates their differences over receiver and transmitting circuits. PDH got a 4-125 free and talks about getting on the air. 5AOJ is trustee for K9WAE, Signal Corps ROTC station at the U. of I., and turns in a nice traffic total. ZOS, secretary of the Elgin Radio Amateur Service Club, writes a newsy letter on the doings of the members. Your reports are overdue if they arrive later than the 5th of the month. See you at Starved Rock. Traffic: (Mar.) W9DDO 740, K9WAE 588, W9WOC 134, YLX 109, W9NYDX 106, W9USA 102, SME 100, IDA 96, CTZ 92, WHF 73, MRQ 70, OKQ 58, SXL 50, UIN 46, LXD 41, MFX 41, LXJ 33, FRP 29, STZ 25, USI 24, W6CIW/9 18, W9UMV 18, BA 11, TBI 6, LGP 4, WFS 4, PHE 3. (Feb.) W9IDA 28, UMV 0.

INDIANA — SCM, George H. Graue, W9BKJ — We regret to announce the resignation of PAM DOK. His able leadership will be missed on IFN. Anderson was struck by a tornado Mar. 28th. Landlines were disrupted for several hours. NTI and DOK/AM were first on the scene and established contact with the Indiana 'Phone Net which then was called into emergency session. Stations cooperating or assisting were QZI of Anderson, SEC LZI, DKR, EGV, ERB, EUC, GRN, IZC, JVF, KDY, MEY, NTA, TZB, UGH, UTL, WFL, IWF, 5WZ, 7MMI, 7PKX, STSA, SWDF, and WFB. JBQ reports traffic for RFN as 46, NTA for IFN as 208. EGL is a new Novice at New Castle. VZP is mobile on 75 meters. BIA is Dean of Engineering at Youngstown College, Ohio. NCARC has plans for a club station. FJI has 10- and 20-meter ground planes. FOX is a new Novice in Evansville. YZO dropped the "N" and now is on with a Viking and Collins receiver. AOR is having a rough time contacting his YL, AOS, in the Novice band. MIZE, at DL4CT, contacts his parents via 'phone patches. Nineteen Evansville stations engaged in their first AREC drill, 12 mobile and 6 fixed on 29.6 Mc. A pick-up truck has been donated to TARS to pull the 3-kw. generator and house trailer as a communication center. ERB has a 1-kw. rig in the making. YVS acquired a 1-kw. generator. SMZ has a new Viking II, likewise PYII. MVZ can be heard on 160 meters with a peanut whistle. PAS increased power to 1 kw. FGQ was presented an Award of Merit at the LCARC banquet for his contributions to amateur radio. ZHJ has a 30-w.p.m. certificate. YB, at Purdue U., will solicit traffic during Gala Week. K2BBL is the station traffic mgr. The LCARC will have a booth at the hobby show, operating club station ZKW. UXK finally made WAS. The Calumet Area Net celebrated its second anniversary. EAS is a new ham in Indianapolis. RUC again is active on 20-meter c.w. IEZ is mobile on 147.3 Mc. KDY has a pair of 813s in the new rig. NH contacted two ZLs and three KHGs on 160 meters. ZSC is starting a 2-meter net in New Castle. Traffic: W9JUJ 3021, NZZ 935, TT 262, SNT 157, JBQ 151, STC 89, NTA 77, LZI 59, YWE 59, UQP 46, KDY 41, FYM 36, SKP 32, QR 23, VNV 24, DKR 18, NTR 16, DOK 14, CMT 12, PPS 12, ERB 9, KLR 8, NYK 8, DGA 4, EGQ 4, ZIB 4, NH 3, SMZ 2.

WISCONSIN — SCM, Reno W. Goetsch, W9RQM — SEC: OVO. PAM: ESI, GAY, RM: MQV, UNJ. Nets: WIN, 3625 kc. 6 p.m. daily; BEN, 3950 kc. 6 p.m. daily; WSPN, 3950 kc. 12:15 p.m. Mon.-Fri., 9 a.m. Sun. State mobile and c.d. frequency: 29,620 kc. ILR was elected president of the Kenosha Radio Club. CXY received BRAT award for February. WWJ is getting a Globe King. UIM is working on monitor and break-in. YLE has applied for appointment with Air Force MARS. RUB works WIN with a Heathkit transmitter and 7-Mc. doubler. QFX is building a mobile with 2E26 final. From OVO, the SEC, comes this reminder: "Don't forget that your AREC

(Continued on page 74)



RECALLING such well-known statements as "I do not choose to run," or "We was robbed," the grand-daddy of all dramatic utterances seems to have been spoken centuries ago by that old Greek philosopher, who drew himself up to full length before his king and disdainfully said "There is no royal road to Mathematics." Today, this same gentleman would inhale deeply and come forth with "There is no royal road to an All-Band antenna."

Before proceeding further, let's define this misnomer "All-Band Antenna." We have seen numerous articles in current radio magazines describing "All-Band" this or that and then, reading through, have found this term to include only the bands between 3.5 and 30 mc. Being primarily a VHF ham, my reaction to this was a mixture of fear of out-of-band operation, and of being slighted at the exclusion of my pet bands from the realm of accepted amateur operation. Having operated on 144 mc. for about eight years and as yet not having received an off-frequency citation, it appears that this term must be a misnomer. It obviously is intended to mean "All H.F. Bands," since the High Frequency range is that range of frequencies between 3 and 30 mc.

There has appeared from time to time, an "All-Band" antenna which appears to be very simple. It is an 80 meter dipole (approx.) fed off-center by a 300 ohm feed-line. Certain claims are made for it but, from talking with various hams, there seems to be considerable confusion regarding it. Like any "All-Band" system, it has its good points and its weaknesses. It apparently provides a reasonably good compromise on the various bands. It will load up and apparently work out satisfactorily. It does, however, have two weaknesses that do not seem apparent to many hams. It is not terminated in a resistive load and it must radiate from the feeders.

I have heard it reasoned that the line must be flat and does not radiate for the following argument. Suppose on 80 meters, a feeder were connected into the antenna at the center B. The feeder would be working into a 72 ohm resistance. This is right. Now, suppose the feeder is connected at A. It would now see a resistive load of several thousand ohms. This is right. Now, between these two points, there must be a 300 ohm point and if a 300 ohm feeder is connected there, the line will be terminated by a 300 ohm resistive load, and, therefore, the feeder will be properly terminated. This is wrong!

On the two opposite sides of the antenna wires and their extensions in the feeder, there will be points of zero (minimum) current every half-wavelength from A. Points D and E are a half-wavelength from points A (where there is obviously no current flowing) and, therefore are points of zero current. It is also obvious that D and E are not beside each other. Since at E or D there is no current flowing, the current flowing in the opposite feeder wire beside these points will radiate power as there is no current at D or E to produce equal and opposite fields to cancel the radiated power. Power is radiated all along the feeder as the fields of the two feeder currents are not equal and exactly opposite in phase as is necessary to prevent feeder radiation. Therefore, the feeders must radiate.

Further, the fact that the currents are not exactly opposite in phase means that the termination of the feeder cannot be a 300 ohm resistance, but has in addition a reactive component. This would be true at any point on the antenna except A and B at its resonant frequency. This reactance shows up by the fact that the final tank capacitor of the transmitter or the antenna trimmer of the receiver must be retuned for resonance when the antenna is connected. The NC-183D and HRO-60 as well as the NC-88, NC-98 and NC-125 receivers have variable antenna trimmers and can take care of this deficiency.

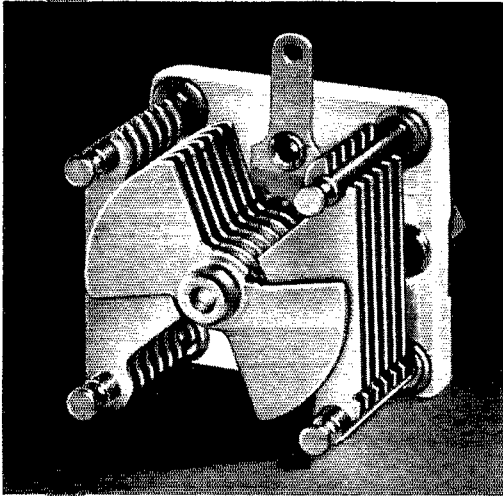
Of course, in spite of these short-comings, the "dern thing" seems to work and this is, I suppose, what really counts.

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HAMMARLUND

(Continued from page 72)

membership and mobile cards need endorsement each year by your EC. UNJ sent traffic for 5 continuous hours one Sunday. The Wisconsin State Phone Net is now an official ARRL net, with GMY as PAM and Net Mgr. LJV demonstrated 144-Mc. packet at MRAC meeting. UNJ is manager of 9RN. DSP was host at the Mar. 30th meeting of NWFC. With card No. 100 from LU5ZO (S. Shetlands) RKP makes DXCC. GIL ran up 200 contacts in the DX Contest. WN9YZS is a new call at Rhineland. WN9ZZJ is now W9ZZJ. In a recent windstorm, BTI and AFT lost their sixteen-element 144-Mc. beams, and DSL lost his 32-element beam. AFT is mobile on 144 Mc. Net certificates (WIN) were issued to CWS, CXY, 1BF, 1BQ, KKM, and PBB. Congrats to VBZ, who won the MEAC W9HBM trophy for 1953. KXS was elected chairman of the MAREC. FUS is chasing DX with a new 20-meter beam. LEB is using new modulators (810s) on the 144-Mc. rig. QIX is on 146.3 Mc. with a 522 and VHF-152A with outboard 6BQ7 preamplifier. KKK added EA6AW and VQ3EO to bring his country total up to 118. 500 watts to a BC-610 is being that potent signal from GUE, with Official Bulletins on 3950 kc. at 12 noon. Newly-elected officers of the WYRA are: RLB, pres.; VHA, vice-pres.; PBB, secy.; LED, treas.; RQM, custodian. Traffic: W9VBZ 852, UNJ 286, SAA 278, LUF 93, CXY 65, GMY 62, RTP 55, LSR 49, PBB 46, CWS 37, IQW 37, KWJ 31, LSK 21, WWJ 13, UIM 17, UTU 14, YLE 14, RUB 11, ZAD 11, QFX 10, RKP 6, APT 4, CFP 4, RQK 4, OVO 3.

DAKOTA DIVISION

NORTH DAKOTA — SCM, Earl Kirkeby, WØHNV — Reorganization and election of officers for the Red River Radio Amateurs, ILO, took place Mar. 26th. Elected for one-year terms were DNJ, pres.; LXB, vice-pres.; NQJ, secy.-treas.; FZJ, act. chairman; SEO, membership. The regular meeting night is the 2nd Fri. of the month at 8:00 P.M. All amateurs are welcome. This club is sponsoring a round-table discussion the 4th Sun. of the month at 4:30 P.M. on 3845 kc. Thanks to Wilma, NQJ, for all the above information. DNJ, LCL, and LMX are among those enjoying brand-new Viking IIs. PHB, jr. operator of LCL, has dropped the "N" from his call. IEM has a new 75- and 160-meter mobile going. The 75-meter Phone Net still is going strong but we don't hear much in the line of news from you guys. How about it? Traffic: WØFVG 80, EXO 52, LHB 41, NPR 15, JBM 11, HNV 7, KTZ 7, PHH 7, USY 7, CAQ 1.

SOUTH DAKOTA — SCM, J. W. Sikorski, WØRRN — Asst. SCMs: Earl Shirley, ØYQR; Martha Shirley, ØZWL. SEC: GCP. RAI: SMV. PAMs: NEO, PRL. Huron hams participated in the first Annual Hobby Show, setting up a station and handling more than 50 messages, with YPC, ILL, ZTR, TXX, NGM, and others operating. NGM is now s.a.b. on 40 and 20 meters. 125 stations operated in the March sleet storm emergency, handling nearly 200 formal messages. OLB has moved to Cologne, Minn. SMV has replaced him as RM. During the last half of the month the C.W. Net averaged 10 QNI for 8 sessions. The 75 Net averaged 26 QNI for 30 sessions, in addition to emergency operations. The 160 Net averaged more than 20 for 31 sessions. LXN received General Class ticket. New licensees are TAR, WNØTLO, WNØTBX, and WNØ-SWH. BLZ lost 8 antennas when the top 36 feet of the tower came down during the ice storm. OOL and OQZ have new keyers. BJH has been transferred to Rapid City temporarily by the telephone company. LTS was transferred to Bonesteel by the telephone company. Traffic: WØGDE 151, PHR 57, OLB 56, ZWL 56, NEO 55, BQS 22, SCT 22, RMV 17, GCP 13, BLZ 9, AYD 6, WNØQKV 5, WØLBS 4, RRN 4, MPQ 2.

MINNESOTA — SCM, Charles M. Bove, WØMXC — Asst. SCMs: Vince Smythe, ØGGQ. Your SCM, MXE, is visiting the KH6s so GGQ is taking over the column. 1YQF now is ØTPS, located in Minneapolis. DKJ, of Aberdeen, is operating portable in Minneapolis. 5ZBS has moved to Eveleth with a Viking I. John is building a 2-meter curtain. RHL, now at Offutt Air Force Base, is taking up flying. FDS has a weekly ssked with KH6GG on 3895 kc. DQL and TXX are conducting code classes on Wed. nights. GPQ is building 2-meter final with a pair of 4-65As. MJN now has 21 members reporting. Heard on s.a.b. this month were BPK, EEP, GGL, GGQ, LXB, PBL, RLL, and ZQJ. The Runestone Radio Club held a meeting on Mar. 20th with AGD as the speaker and mobile operation as the topic. Thirty-five hams attended the dinner and meeting. Let's all report news items concerning our station activities to your SCM promptly to assist in making this column interesting. We can't print it if we don't have the information. It will make most interesting reading in the future. Traffic: WØDQL 281, KLG 235, UCV 158, KFN 82, HUX 81, SWB 66, KJZ 60, CXM 49, AGD 48, LST 48, BUO 40, YFU 40, FCS 38, IRJ 38, FFU 30, LUX 26, TJA 25, GGQ 23, IKJ 22, GTX 17, PBL 16, CTW 14, HIN 13, ALW 12, CID 11, KNR 11, KYG 11, DYD 10, FYT 10, GQZ 10, LER 9, HAH 8, GWJ 7, FIT 4, JIE 4, LIG 3, NTV 2, YUN 2.

(Continued on page 76)

THE HQ-140-X...

HAS "MORE THAN MEETS THE EYE"!



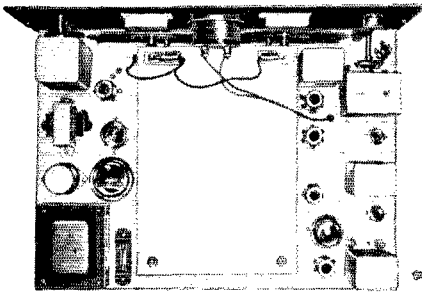
Just looking at the outside of an HQ-140-X communications receiver isn't enough, when you're in the

market for a new rig. Sure, it's in an attractive case that's built for rugged service; and the controls are comfortably placed for lengthy DX operations. But, it's what's inside the cabinet that's important.

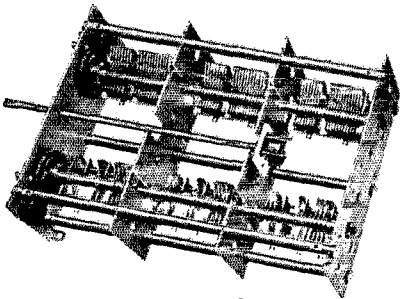
For example, the HQ-140-X offers a professional-type tube lineup. The use of a separate mixer (6BE6) and oscillator (6C4) contribute to the high degree of oscillator stability. Modern 6BA6's are used for the RF amplifier and for all three stages of IF amplification for maximum efficiency.

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Features like those described above rate high with 'hams' the world over. For detailed information on the HQ-140-X, write to The Hammarlund Manufacturing Co., Inc., 460 West 34th Street, New York 1, New York. Ask for Bulletin 691.



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Top View

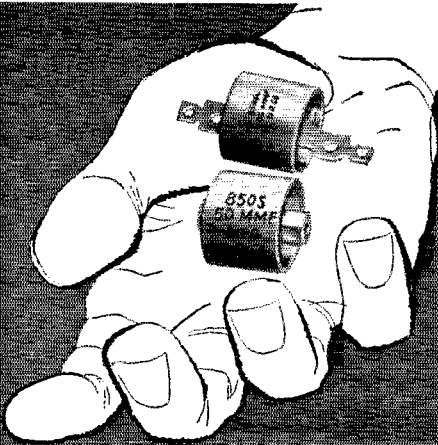


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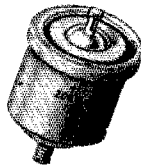
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DELTA DIVISION

ARKANSAS — SCM, Fred E. Ward, W5LUX — There was more activity this month than usual. Maybe it's the warm WX in the backyard shacks. PIP has finished school at Searcy and has gone to Oklahoma. ZZR has a new KW-1 rig. NDH has a new rig with T55a and is new OBS and OO appointee. HPL has renewed his EC appointment for the Fort Smith Area. We have a new EC for Greene County, CAF at Paragould. WUH is working 20 meters these days, and reports that UJT has moved to Washington, D. C. MU has renewed as EC for North Little Rock, and now has an Elmec rig and an S2OR complete set-up for emergency use. VTZ is building an all-band rig for mobile, and RWJ is building an all-band converter. Traffic: W5FMF 92, RWJ 14, VTZ 8.

MISSISSIPPI — SCM, Dr. A. R. Cortese, W5OTD — Send Field Day messages % ZZZ in Crystal Springs, Miss. TVI got the TVI out of his HT9, AYV has new antenna supports 40 ft. high. The North East Miss. Club will hold its next meeting June 13th at Columbus. The Club plans a hamfest for Aug. 1st at Columbus. IGW meets RN5 regularly. AMZ is a new ORS. The Copiah Amateur Radio Club is new and meets the 1st Thurs. of each month alternating between Hazlehurst and Crystal Springs. I would like to see more members joining the AREC. There still are appointments to be had. The RM is WZ. The SEC is KHB. DQL, 13 years old, is new in Jackson. TXK is hard at work with her radio class. YBH and WDY have some new 10-meter handy-talkies. The Gulf Coast Amateur Radio Club has a new call: CKN. Traffic: (Mar.) K5FBB 122, W5JHS 109, VQE 66, RIM 46, AMZ 12, OTD 10, YXZ 9, CFL 2. (Feb.) W5VQE 59.

TENNESSEE — SCM, Mark M. Bowelle, W4CXY — Twenty-six traffic reports for this month is mighty nice going. Please keep up the good work, folks. The first of March we had another communications emergency, caused by a snow and ice storm. In June the Union City gang will have traffic from their 100th birthday celebration. Watch for them and give them a hand. SKH set up at the Oak Ridge Hobby Show and missed BPL by six with 94 messages originated. The Memphis Club celebrated its 15th anniversary in April with a special program and a mighty nice turnout. Those of you old-timers who remember Dixie (Squinch Owl) Jones may be interested to know that we just received a letter from him. He and Cycloney are doing fine out in W7-Land. His call is W7IS, he hangs around 3645 kc. (40 and 20 wiggles his picture, he says), and would like to hear from any of the old AARS gang. DXer NJE reports a new country, FM7WN, while DXer PVD has 63 countries using his new beam and "Armstrong" (his strong right arm) rotor. BQG worked LU5 on 10 and Iwo Jima on 20 meters. FLW has by far the most active RACES crew in the State, considering his membership. This is the last report that this SCM will write as SCF takes over the job next month. It has been a real honor to serve such a fine group as we have here in Tennessee. Please continue to give Harry the same swell cooperation you have given me and BCNU around the bands. Traffic: W4PL 1899, YIP 1340, OGH 747, PFP 263, IIB 233, CXY 223, SCF 226, OEZ 194, SKH 94, WQW 78, TZD 38, HHH 37, DTI 30, TUO 28, UIO 28, RMJ 18, PVD 17, UWA 16, FLW 10, VJX 10, TIE 9, TYV 9, NJE 8, RRV 7, VJ 5, RET 2.

GREAT LAKES DIVISION

ENTUCKY — Acting SCM, Robert E. Fields, W4SBI — JUI spends most of his time experimenting with frequency-measuring equipment and is doing a bang-up job, too. OMW and EPA are doing fine as OOs. CDA is back on the air after a lengthy job de-TVing. Hope the Indians stay off the warpath. ZLK has a BC-457 on which he hopes to run 150 watts just as soon as he can build a power supply. NBY has been vacationing down among the palms, Florida that is. WXL has completed a new cathode modulator, but in so doing he dropped his input from 80 to 20 watts. WNH reports that participation as well as traffic on the KYN is on the upswing. The OVARS (Ohio Valley Amateur Radio Association) is a growing club. Membership is made up of both W4s and W8s. Officers are KVX, pres.; EPA, secy.; and OMW, editor. SBI, "Lum," still is on the air from the "Jottum Down Store" in case you fellows can hear my signals. SYD is back on the air again after a battle with the Indians (TVI). TUT, SXP, and KRY, three of the big wigs from the Somerset Net, are going strong, with KRY's gallon on s.s.b. (Sloppy Sidewinder Bogie). BAZ is keeping the KYN in the middle of the road pending appointment of an RM. YZE is one of the NCS on the KYN. Traffic: W4BAZ 139, ZLK 127, WNH 100, YZE 85, SBI 38, WXL 31, SYD 28, OMW 6, CDA 5, JUI 2.

MICHIGAN — SCM, Fabian T. McAllister, W8HKT — Asst. SCMs: Bob Cooper, 8AQA; Joe Beljan, 8SCW. SEC: GJH. New appointments: ORS to JKK, OPS to MLR. Overseas traffic conditions have been generally poor again this month, and it is reflected in the reports from our usual top scorers. The recent tornado "slerts" in the Southern Michigan Area found the gang "on the ball" but fortunately

(Continued on page 78)

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As a transmitter the "RANGER" is a rugged 75 watt CW input or 65 watt phone unit, with 100% AM modulation and pi-network antenna load matching from 50 to 500 ohms. Completely band-switching 160, 80, 40, 20, 15, 11 and 10 meters, it features high gain audio for dynamic or crystal microphones and complete TVI shielding and filtering.

As an exciter the "RANGER" will drive any of the popular kilowatt level tubes and serves as a high quality speech driver system for high powered modulators. Designed to permit basic control functions for the high powered stage right at the exciter. No internal changes required to switch from transmitter to exciter operation with all connecting leads TVI filtered inside the "RANGER" cabinet. High voltage B+, low voltage B+ and filament power, as well as the full 33 watts output of the modulator are available from power receptacle in rear so the "RANGER" can be used to power and modulate a complete VHF or UHF transmitter using a 6146 or similar tube in the final.

- Built-in VFO—improved version of the famous Johnson Model 122 • Can be crystal controlled—provision for two plug-in crystals. Crystal switching may be accomplished from front panel • Seven

- bandswitch positions, 160 through 10 meters • 100% AM modulation • 75 watts input CW; 65 watts phone • Smooth (break-in) oscillator keying.

- Simplified tuning . . . basic tuning controls for QSY are right on VFO dial escutcheon. (Simply set VFO, touch-up buffer tuning, touch-up antenna loading and dip final. Other controls needed only when changing bands or changing mode of transmission) • Broad

- tuning—reasonable frequency excursions made by readjusting only VFO setting • Pi-network output matches antennas from 50 to 500 ohms, tunes out large amounts of reactance • Beautiful appearance—rich lacquer maroon and grey finish, custom knobs and dials

- Compact size only 15" x 11 $\frac{1}{16}$ " x 9"—weighs only 45 lbs. • Easy servicing—complete unit slides out of cabinet after loosening two thumb screws and removing a few retaining screws • Effectively TVI suppressed—completely sealed cabinet, meter shield, shaft shields, L filters on all leads where there is slightest possibility of harmonic radiation • Modulator may be used as a high powered public address amplifier system for emergency or civil defense work. (Simply connect 500 ohm to voice coil transformer between modulator output plug and loud speakers) • Three circuit microphone connector, may be wired for push to talk operation • Coaxial output connector • Antenna relay jack.



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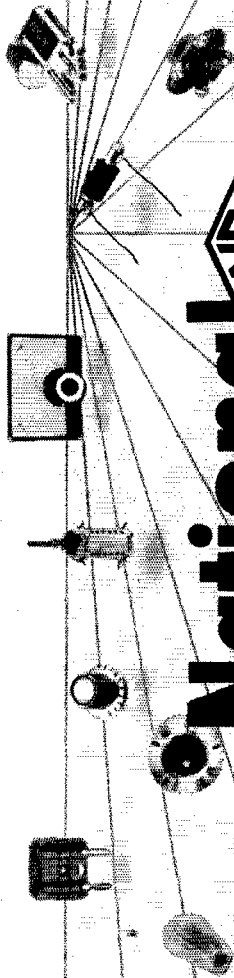
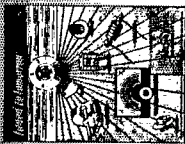
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no trouble developed. Preparedness pays off, fellows. Jackson and Detroit are working like mad on their c.d. set-ups; Jackson on 2 meters and Detroit on 10. Lightning DOES strike twice in the same place! NOH got it for the second time; this time it knocked out his power supply. The 6th annual Tri-State Radio Rifle Match was run off on April 3rd, with IV handling the scores for Grand Rapids while ILP took care of Detroit. The Niles/Buchanan Club has developed a new angle on "hidden hunts." At the last meeting they staged an unintentional hidden meeting hunt. Club officers and some of the members showed up for the meeting at Niles High School, some visitors landed at the club room in the Buchanan Firehouse, and the guest speaker of the evening appeared at the Buchanan High School! The "THN" Net now meets on 3663 kc. instead of 3702, because of non-participation of Novices. The BR Net reports 941 QNI during March, with 202 messages handled. Nice going, fellows. Cosmo (HSG) is resting at home following an illness caused by overwork in the State Senate. JXX is sporting a new 80-meter doublet, and THG comes up with his version of a "Y" doublet. AQA has been very QRL with house remodeling, and we assume the shack came in for its share, too. TIC also had a general clean-up and new paint job in the shack. OQ5CJ was a recent visitor in the Twin Cities, and made the rounds with the boys. New calls in the Lansing Area are QQH and QQL. SCS's XYL drew QOD and ex-JZD got QQQ. Doc says he will have to be a week-end operator; he won't have time to sign the call during the week! The official appointment situation is being reviewed at this time. Several appointees have not submitted reports for some months, so we can only assume that they are no longer interested in holding the appointments. Traffic: (Mar.) WSRJC 412, ELW 258, NUL 142, QJX 139, ILP 125, SJF 77, ZLK 72, IV 63, JYJ 61, NEK 60, JKK 44, FX 42, SCW 42, WVL 29, WXO 29, PCT 24, FSZ 23, AQA 20, TQP 19, HKT 13, LEN 12, WUTX/8 10, W8NOH 10, DLZ 8, MGQ 6, THG 6, EGI 4, TIC 4, DSE 3, SWG 3, JCP 2. (Feb.) W8WYO 108, SWG 3.

OHIO—SOM, John E. Siringer, W8AJW—Asst. SCMs: C. D. Hall, 8PUN (phone); J. C. Erickson, 8DAE, (c.w.); and W. B. Davis, 8JNF (adm.). SEC: UPB, PAM: PUN, RMs: DAE and FYO. New appointees are FYO as RM and LHV as ORS. Outstanding event in this section was the Dayton Hamvention drawing approximately 1300 people, 1170 of which registered for the prize drawing. 750 attended the banquet and 400 took their FCC license exams. The entire affair moved with clocklike precision and all present had nothing but praise to offer the Dayton gang. RO requested his BPL for March (Beer Poursers League). AL was awarded WANE and WNH certificates. ARO is building equipment for 2-meter operation. UZ, one of our most faithful QES reporters, is recuperating from a heart attack. PBX is battling the QRN on 160 meters. Jefferson County amateurs interested in AREC and RACES are urged to contact ERR at Box 129, Steubenville. Tel: ST 4-1362. HRN reports that the SVARC has 12 stations on its 1377-ke. net. The Cleveland mobiles have a lunch hour net on 29.160 kc. daily. HFF informs us that the new officers of the Toledo Club are CRA, pres.; BIQ, vice-pres.; ATN, treas.; YGB, corr. secy.; HFF, rec. secy. In the latest mobile hidden transmitter hunt, NBD won on 160 and IQZ on 10 meters. The OCARC met on Mar. 27th. Items discussed included amateur license fees, trophies for various contests, and other timely topics. It was announced that the Tusco Radio Club was awarded the Field Trophy. DSX will revive the slow-speed net, which was dropped by HOX. It will meet Mon. through Fri. at 6:30 P.M. on 3580 kc. The CACARC met Mar. 16th. It was announced that the Parma Club had joined. The Council will sponsor a Cleveland Area picnic early in August. GCP was praised for his excellent work in directing the TVI committee. From Hamilton we hear that new Novices are QIJ and QJH; new Generals are MWY, QLH, and QLF; and new Techs. are OUD and QJO. The Canton Club states its meeting program is as follows: 7:30, code class; 8:30, business meeting; 9:30, movies. TJJ gives on-air bulletins at 9:30 P.M., 29,000 kc. Sat. and Sun. Cincy's Mike & Key mentions that numerous members still are sadly crippled as a result of the recent dance. The GCARA *Ether Waves* contains a DX column by JIN. Seven Club members are over the 200 mark while a total of 20 have gone over the 100 mark. Columbiana County amateurs are requested to contact RZ regarding the forming of a county emergency net. Springfield's Q-5 informs us that the recent contest winners were IRT, JRG, and JNU, and that their leading DX men, namely IRT, HBJ, OCU, JNU, JRG, and RMJ were "slaying em" during the DX Contest. Toledo's *Shack Gossip* states that the Great Lakes Net picnic will be held on June 27th at the Napoleon, Ohio, Fairgrounds and that BN, BGY, IDC, DN, and AVB all vacationed in Florida. The DARA *Rf Carrier* commends FYO on earning his seventh BPL certificate. Special mention should be made of the splendid performances by CUJ and HB in the recent F.M.T. The Columbus *Carascope* tells us that KEM has moved to Cleveland, KVV is currently on 40-meter 'phone, the 2-meter gang has 100 per cent attendance on drills, EYE (our Vice-Director) has moved to Salem, and WXY is designing a novel s.s.b. rig. Eastern

(Continued on page 80)



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4X150A	1.0w	200w	2.0w	200w
4E27A	1.6w	500w	2.0w	380w

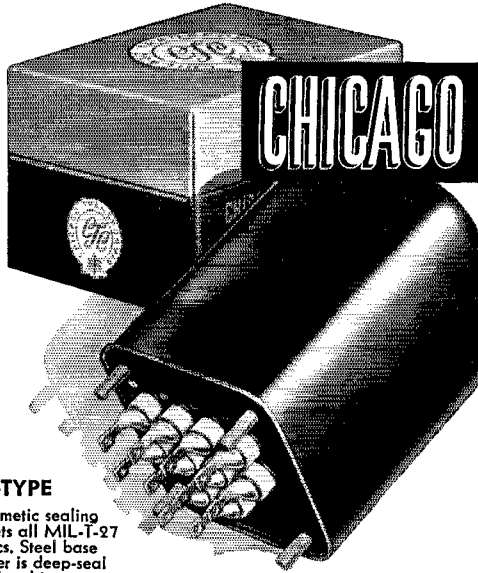
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Ohio Ham Flashes announces that MID made General Class, the MCRA banquet was a big success, YON has moved to Warren, CMS received a 50-Mc. heard card from Bulgaria, and MTC got a new VFO. Traffic: W8FYO 512, UPB 355, YCP 153, AMH 136, DAE 116, ARO 109, RO 109, IFX 89, HQH 82, GDB 56, RLR 56, AL 49, HUX 46, FSM 39, DG 37, NYY 35, AJW 34, SRF 25, GZ 17, TLW 17, CTO 16, KXG 14, WAV 13, LJH 12, LMB 12, QIE 12, RZ 12, YGR 12, DL 10, PBX 10, ET 9, HNP 8, JNF 7, HPP 6, HRN 6, KIH 6, NQG 6, WE 6, KZM 5, BLS 4, BPE 4, EQN 4, HFE 4, IAY 4, JNR 4, PBT 4, CRS 3, WYL 3, AYR 2, ILC 2, JIF 2.

HUDSON DIVISION

EASTERN NEW YORK — SCM, Stephen J. Neason, W2LI — SEC: RTE. RMs: TYC, KBT, PAMs: GDD, JQI, JFG. The SLRC has completed plans for Field Day and will be active on five bands. ZTZ will replace MRR, who has resigned as EC for Rockland County, and HQF will be the new C.D. RO. OKI has a revamped ARC-5 on 7 Mc. Best wishes to the newly-formed Ulster County Mike and Key Club. The new officers are PGE, pres.; RML, vice-pres.; YOK, secy.; K2BJT, treas.; KN2DRV, act. mgr.; and GFB, chaplain. PHO has installed a 3-kw. water-cooled generator for emergency power and makes use of it for operation on the YCD. BSH made 32 contacts in 12 countries on 14 Mc. with a new inside beam. The Yonkers Radio Club reports that a TVI demonstration given by BBV and NMI was an excellent show. New in Yonkers and a member of the YRC is KN2HGN. Dolly is very active on 3.5 Mc. K2CYS/2 is back on 3.8 Mc. with a new modulator. JFB is the proud papa of Richard John, all of ten pounds. The first licensed YL and member of the HHRL this year was presented with a certificate. Karen's call is KN2HDS. ILLI was the guest of the HHRL recently. Also on the agenda was a talk on antennas and couplers by OIT of CBS Radio. The meeting was conducted by President PCP. The SARA was the sponsor of an excellent exhibit at the Schenectady Hobby Show. The theme was "Starting in Amateur Radio," with Novice gear as the main attraction. Best of luck to HSM, who is leaving for W6-Land. K2EKE is our new EC for Putnam County. RTE is back on the air with his 64-element 144-Mc. beam. MRQ has his new 200-watt rig on 7 Mc. Traffic: (Mar.) K2BJS 150, W2EOM 123, K2EQQ 42, BE 35, W2ILI 34, GDD 30, APH 22, KBT 21, K2CYS/2 19, W2BSH 9, MRQ 6, TYC 5, WSS 5, PIO 3. (Feb.) K2EQQ 79, W2KBT 24, K2CYS/2 8.

NEW YORK CITY AND LONG ISLAND — SCM, Carleton L. Coleman, W2YBT — Asst. SCM: Harry Dannels, 2TUK. SEC: ZAI. PAM: JZK. RMs: VNJ, LPJ. K2EG resigned as manager of 2nd Regional (e.w.). LPJ is taking over and has been appointed EM. VNJ reports NLI (e.w.) has good traffic and attendance and operating conditions much improved. ZAI reports a Florida vacation FB, and that VKF, BVN, and HXV also went South working mobile with BVN/mobile. Staten Island c.d. supervisor now is KN2GOU. Weekly code and theory classes are held in the Staten Island control center by ZNK. KGN reports a semi-surprise drill with a visit by the mayor. TUK is back on the air. GP returned from Tennessee for the summer. The Amateur Radio Society of Forest Hills H.S. obtained the call K2GSW. VRY is trustee, EEL, pres.; JOA, vice-pres.; K2AKJ, secy.; and K2DGE, treas. GSW is on 10 meters. ASL, GSZ, K2IDM, and KPQ are new members of the New York Radio Club. The New York State Assembly denied distinctive call letter plates to New York amateurs. KN2DZL is doing good work with a Heathkit transmitter on both 40 and 80 meters. The New York State Phone Net on 3925 kc. has organized a policy committee to assist in operation of the net. OME and NJL are the committee members from this section. QPQ and ZPG are active in MARS. The Brooklyn c.d. control station gang has been promised proper equipment and facilities for the station after many complaints to the city fathers. K2CUI blew up his modulator which cut the activities down. Traffic generally has been holding up well in both the 'phone and e.w. nets with four stations making the BPL with over 500. Traffic totals for March were exceeded only by December (5147). The figures are given because of the large number of requests for same. Dec.: 5147, BPLs 7; Jan.: 3543, BPLs 2; Feb.: 4733, BPLs 7; Mar.: 4882, BPLs 4. The Tuboro RC celebrates its 20th year during 1954. LGK reports they are going to Shohola for Field Day. PF reports his son IVA, age 16 on Feb. 8th, joined MARS as the youngest member under the new rules. KFV and his XYL, KEB, still is the top traffic family with a total of 1341. EEO is active in TCPN. AEE is conducting Novice classes and has applied for WAS after getting Utah. Columbia U. ARC elected FXP, vice-pres.; AIP, comm. mgr., and K2DDC, secy. BO has moved to Massapequa. K2CQP had a Florida vacation. RWQ is working on a 6146 final rig for all bands. PZE is trying to eliminate the Indians. OMG is in a new QTH but is having trouble getting a decent antenna up. JCI and CLG are VFO on 2 meters. GP completed the Heath GDO and has been working DX on 3.5 Mc. and trying out 'phone. Congrats to NAI, mgr., and NOC, asst. mgr., of the 2RPN (1000, 3980 kc. Mon. through Sat.) for their FB net opera-

(Continued on page 82)

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tion. More than one net will adopt their "call up" system. Frequency checks showing errors in parts per million: AIQ 10.8, AZS 48.8, CLA 52.3, AEV 110.3, F. B. Haas 150.1. Many reports arrive late for inclusion in QST. Please try to mail not later than the 1st of the month. Traffic: W2JOA 741, KFV 703, KEB 638, K2CQP 535, W2BO 455, VNJ 389, IVU 379, JZX 178, EC 142, LPJ 140, AEE 125, GP 76, NJL 74, JCI 62, GXC 59, K2DEB 56, W2EEO 43, L GK 30, IN 13, PF 12, NYE 9, KGN 8, OME 8, OBU 6, AZS 4, JBQ 4, K2CUI 1.

NORTHERN NEW JERSEY — SCM, Lloyd H. Manamon, W2VQR — SEC: NKD. PAM: CCS. RM's: NKD, CGG, WCL. Activity on 160-meter 'phone is on the increase. JKH and KXD are on every Sunday morning and are looking for new contacts. This band is excellent for daytime ragchewing and you fellows are missing a good bet by not getting up there. DXD is leaving for an extended trip around the world. He will be away from the home QTH for about four months. CFB is on JN with new 150-watt rig, K2BWP. Our youngest traffic man (age 14), made BPL again this month. CQB made BPL for the third month without a break. The Radio Section, Communications Dept., of the Bloomfield Civil Defense Council, is publishing a monthly news letter entitled *The Signal*. It is a very fine two-page publication and a lot of credit goes to ZPD, the editor. K2BEV has a new jr. operator in the family. Bergen County Net activity, as reported by CVF, shows an average of 130 stations reporting in on the weekly drills. K2DYB, Net Mgr. for NETN, would like more stations to report in on 3746 kc. Mon. through Sat. at 1600 hours. HXP is hard at work organizing the RACES program in Fanwood. ZPD is heading up a group of RACES personnel in Bloomfield. They are currently installing 144-Mc. equipment in ten of the Bloomfield public school buildings. KN2HDD is a new station on 3.7 Mc. in Bogota. The teen-age contingent at QW, the RVRC station, is showing up the old-timers as far as operating goes. The club secretary has to take a mail sack to the post office to collect the QSL cards. All of this activity is on the c.w. bands, which is good training for the Novice members. K2CTL is trying all bands with the new General Class ticket. NIE is back on the air from the newly-renovated shack. K2BWP is on 144 Mc. with a new rig. K2EBL has worked the bugs out of the new half-kw. rig on 144 Mc. K2DHE will be back on s.s.b. with a new rig. This time it will be a pair of 809s in the final. New Jersey RACES units will take part in the nationwide Civil Defense Alert planned for June 14-15. Traffic: W2CQB 635, JCO 246, K2BWP 217, W2EAS 129, K2DSW 43, W2FPM 38, DXD 21, NIY 7, CFB 6, CJX 4.

MIDWEST DIVISION

IOWA — SCM, William G. Davis, W0PP — WIT reports from the old home town informing me of the forming of a new ham club with a constitution and by-laws. The reports indicate that many of the boys worked FOBAJ. Six members of the Newton Club went up for ham tickets in April. BBZ reports no activity. What an understatement! WN0SMG, of Redfield, is going up for General Class ticket. At the Sioux City Club's meeting of Mar. 16th CGF was given an award by Mr. V. F. Gates, manager of Western Union, for handling traffic for the company in December, 1953. CGF is another of our blind hams and we all know how they overcome their handicap. They are to be commended. NGS is getting a big kick out of his first DX. BVE made A-1 Operator Club. PPQ and TGQ are new members of TLGN. BDR was given nice publicity over radio and TV stations for his work during the ice storm. The Newton Club made it also for their work during the same storm. RFT is back after a long maritime cruise. PUR now has 500 watts on 75, 40, 20, and 10 meters. LXC is going out for DX. FDL reports the Red Cross 32V rig is passed around the club membership for training. It's time for you fellows to renew your appointments. Please look to them. It will help me over the hump if you will do this, fellows. You know I'm tied up for awhile in my work at WEO. TV. Traffic: (Mar.) W0SCA 1460, CZ 223, NGS 136, ERF 131, OZO 94, QVA 91, GXH 74, BLH 64, LXC 44, SEF 19, PUR 14, FDL 3, NYX 2. (Feb.) W0ERP 42.

KANSAS — SCM, Earl N. Johnson, W6ICV — SEC: PAH. RM: KXI. PAM: FNS. The Wichita Amateur Radio Club held its annual banquet Mar. 3rd with 119 attending. DEB was M. C. and 3 awards for outstanding work were presented. The best 'phone award went to AOG, best c.w. man was ABJ, best all-around ham was RC. Special commendations were given to AOG and RC for their efforts in c.d. work. Incidentally, the WARC will hold a hamfest June 27th at Camp Hyde, 21 miles west and south of Wichita. The Wichita amateurs put on an extensive c.d. drill with RC as communications officer and BVQ as radio officer. The Wichita-Sedwick C.D. has a main control station, an alternate, and three zone control stations with liaison between all on 2 meters. EUS, MZT, NLV, and SIJ are new JARS of KCK directors. Wyandotte High of K.C. expects to have a 500-watt rig on 40 and 75 meters soon. New officers of the Atchison Amateur Radio Club are EBB, pres.; EUF, vice-pres.; TUH, reelected secy.-

(Continued on page 84)

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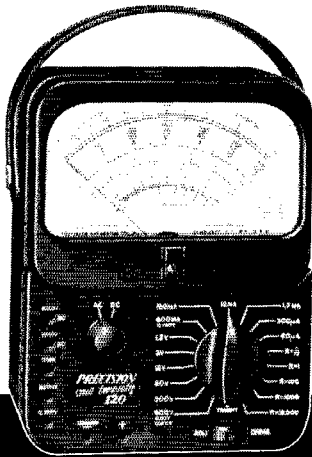
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treas. DRB, EOT, and ZUX made excellent measurements in recent F.M.T.s and are now Class 1 OOs. LEA, MXG, and SIG are new OBSs. PAH has mobile in the car to QSO you fellows on your way to picnics this summer. DLC, of Olathe, has retired and will permanently locate there. The KVRC is getting new Viking II, HQ-140, and emergency plant for e.d. work. Traffic: W0BLI 507, NY 330, FEO 280, QQQ 271, EOT 132, SIG 81, FDJ 77, YOS 63, NFX 57, BET 51, MXG 44, KSY 34, KFS 32, DEL 29, ICV 29, YFE 23, PSL 24, SVE 21, LOW 20, MLG 18, GCH 15, RBO 14, TNA 12, FNS 11, JDX 10, VBQ 9, W4YVO/0 6, W0LIX 6, EIM 4, ABJ 2.

MISSOURI — SCM, Clarence L. Arundale, W0GBJ — SEC: VRF, PAM; BVL, RMs: OUD and QXO, Harry LaMerta, old-time 9SC, recently passed away. The Rolla Amateur Radio Association elected the following officers: WN0RTR, pres.; BZM, vice-pres.; DRI, treas.; RXE, secy.; and HUQ, trustee. The club project is building a new transmitter for the Red Cross club station. WN0SPU succeeds JHY/4, who is in the Navy, as secretary of the SMARC. LVW made an excellent record in the recent F.M.T. RLM, who is running 1 kw. to a pair of 250THs, added a 75A-2 to his station and also got his WAS certificate. LMK is on 2 meters, NNY is mobile with a Gonset Commander, Gonset VFO, and Morrow 3BR-5 converter. HUI has a new Elmac receiver for the mobile rig. LQC is operating mobile. WN0RTW received his RCC certificate. EEE is active on MEN, CIA and his XYL, HOD, added a 75A-3 to their station. FLN had an exhibit set up at the open house held by the Institute of Technology. Because of a change in employment KA must curtail traffic activities. BVL reports the Early Bird Traffic Net closed for the summer with the advent of daylight saving time. The Suburban Radio Club members meet each Tue. night on the air on 29,400 kc. BPL certificates go to CPL and GAR. GAR has added some new traffic schedules. New AREC members: MRT, NDP, PWO, ZSU, and ZVS. Appointments: OPS — FLN, EC — LMK, OO — RLM. Traffic: (Mar.) W0CPI 786, GAR 584, QXO 380, BVL 300, CBJ 139, IJS 106, ZLN 90, ECCE 57, EFW 50, ZVS 48, FLN 42, EBE 41, BZK 31, CKQ 30, KA 29, BUL 23, HUI 20, LQC 20, KIS 19, OUD 17, WAF 15, CXE 10, NXA 10, TSZ 9, QMF 6, QWB 4, BPD 2, NXY 2, PDR 2, QWS 2, WN0RTW 2, (Feb.) W0BVL 305, IJS 104, ZVS 31, RLM 8. NEBRASKA — SCM, Floyd B. Campbell, W0CBH — Asst. SCM/RM: Tom Boydston, 0VYX, SEC: JDJ. The North Platte Club is on 3948 kc. Mon. at 6:30 P.M. for local news and out-of-town traffic. ERM is the Net Control Station. ERM is OBS, PZH has new VFO and checks in on the Mon. night sessions. AIN now has a country total of 43. RDN is busy with a new home. JDJ has been Acting C.W. Net Manager. PQB had the highest score in the Midwest Division in the January CD Contest using c.w. HQQ, OHP, JDJ, and BXJ are new 2-meter stations in Lincoln. HXH is using twelve-element 2-meter beam. There now are 4 s.s.b. stations active in Omaha. BIR and his XYL, BIQ, are now in Minnesota. GDZ is on 40 meters with 400 watts. GDZ is EC for Sidney Area. AFG is using HT-9 on 75-meter 'phone. UOB is on NEB C.W. Net. GDZ is trustee of the Soo Radio Club at Sioux Ordnance Depot in Sidney (W0RTC). The Ak-Sar-Ben Club is holding meetings in the fire station at 7500 North 30th, Omaha. GI Z and the boys at Sidney have been incorporated into the Ordnance Depot's emergency communication system. This includes weather, c.d., air raid, etc. CBH has his Panadaptor rewired and in use. BBS is using voice control with KWQ and EXP close behind. The Midwest Division Convention will be held in Des Moines early in October. K0AIR is on RTTY (MARS). Operators are Stu, 0MGC; Ruby, 5WSG; and Anne, 3UML. Traffic: (Mar.) W0TQD 4263, K0AIR 1845, W0RDN 340, ZJF 139, FQB 116, HTA 73, VYX 63, JDJ 42, MAO 27, AEM 24, EGQ 16, LRK 15, K0WBF 12, W0LGT 11, JHI 8, CBH 7, ISV 7, K0FBD 6, W0BEA 6, MPE 6, QHG 6, ERM 5, ZNI 5, KLB 4, RAM 4, UPY 4, FTQ 3, KGA 3, NHS 3, ASI 2, DDP 2, HQN 2, HXH 2, IAY 2, LEF 2, NGZ 2, OFL 2, PPT 2, UVU 2, (Feb.) W0JDJ 61.

NEW ENGLAND DIVISION

CONNECTICUT — SCM, Roger C. Amundsen, W1HYF — Although EFW got more votes than KYQ in the SCM election they did tie for traffic totals. Congrats to Milt and thanks to LKF, STU, FOB, RRE, and KYQ for helping out for the past couple of years. VB and DAV, both of whom have been hiding while HYF was SCM, broke back into activity this month. Glad to see you again. CN and CPN had a swell second annual dinner on Mar. 26th at Waverly Inn in Cheshire. Willimantic has a new club with UED, pres.; RRE, vice-pres.; VNY, secy.; MHF, treas.; COB, TVI. ZZU is a new Novice in Stratford. The Tri-City 10th Annual Hamfest was held on April 10th. ZZK is a new Novice in Southington. TSZ and TYQ want ORS appointments. YYM is working VKs with ease. ZDX is a new reporter. ORP is getting ready for Field Day. NFG has a new Super-six. CGD, YON, VW, and CKU worked in the F.M.T. The Choate School Radio Club now is affiliated. On March 18th the Hamden ARA and the Port Hale Mobile Club with the Yale RC honored Capt. Carlson

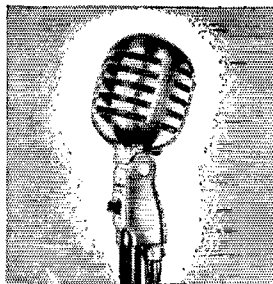
(Continued on page 86)

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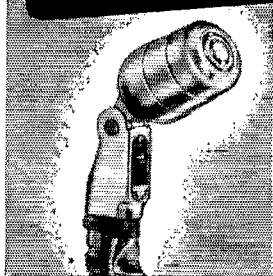
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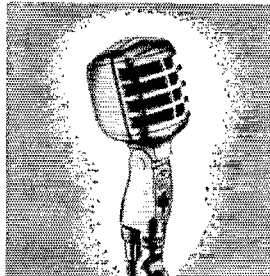
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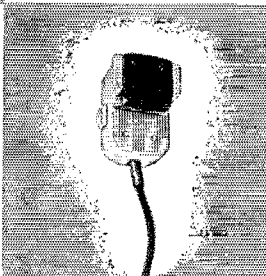
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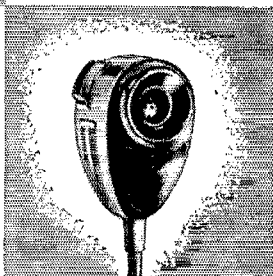
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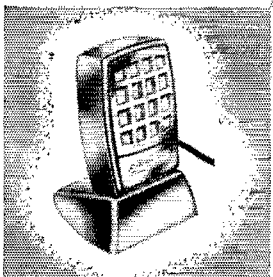
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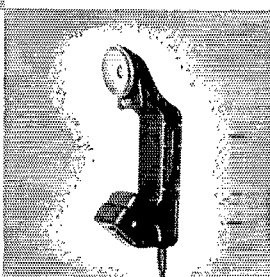
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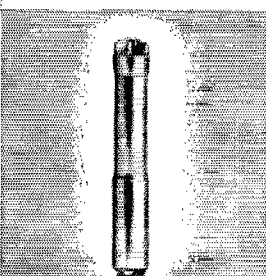
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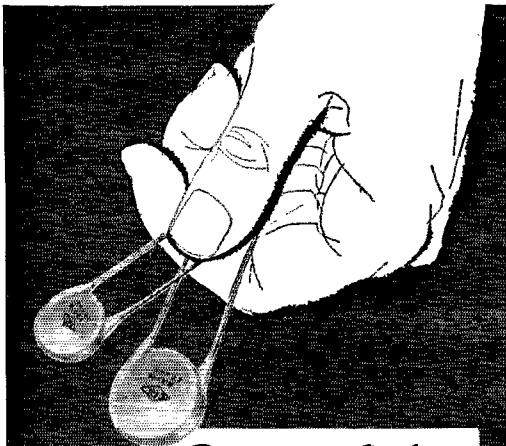
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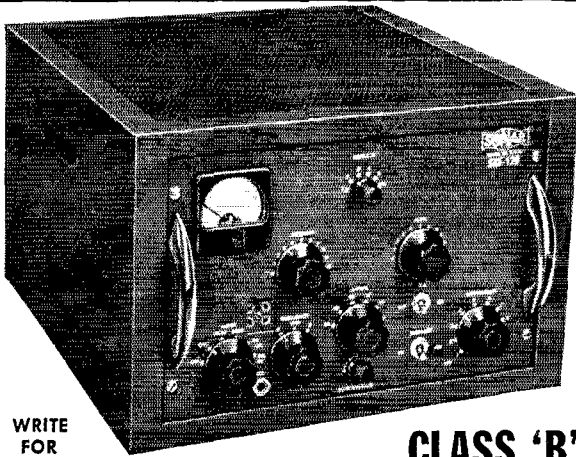
of *Flying Enterprise* fame. RDV is now on with a Viking II from his new location and works all bands. Don't forget to send your reports to EFW (QTH page 6) from now on. 73, gang. Traffic: WISJO 196, EFW 158, KYQ 158, AW 145, UNG 105, RRE 93, NJM 79, YBH 64, LIG 60, BVB 57, YYM 53, HYF 49, FTM 46, WNH 46, RFJ 45, VOV 44, QJM 43, BDI 36, AYC 26, RGB 26, LV 19, KV 16, ZDX 11, GIX 7, VOS 4.

MAINE — SCM, Bernard Seamon, WIAFT — SEC: BYK. PAM: BTY. RM: OHT. With the usual summer silence of the Sea Gull and Pine Tree Nets there is not too much activity to report. The C.D. Net will continue to meet until further notice on 3993 kc; with BYK as NCS on Sunday mornings at ten. Don is trying very hard to get his RACES organized and in business. Please give him all the help you can. In the event of any disaster listen on 3060 or 3093 kc, for information as to what to do. WN1VLU has dropped the "N." Congrats, OMI! The same applies to WN1YXC. Huzzah to you, too. The "OX" Net is meeting Mon. through Sat. at 2000 hours on 29.5 kc. If you want a real bang-up good time don't miss the ham-fest to be held at the Sons of Italy Hall in Lewiston June 20th. There will be prizes, tricks, stunts, and, last but not least, spaghetti and meatballs. Tickets may be obtained from Ed Hudon, LYK, 14 Lisbon Street, Lewiston, Maine. The price is unknown at this writing. Rita, UZR, has a fully-equipped darkroom. We are anxiously awaiting developments. EEEY, at Farmington Falls, is very much interested in 2-meter work and wants to find some kindred souls. See you at Lewiston. Traffic: WIOHT 123, LKP 86, VYA 61, UDD 34, AFT 23, LXR 22, BX 16, BEU 12, BTY 12, KAS 10, WTG 9, WAU 8, RBD 7, EFR 4, WSV 4, LXE 3, PTL 3, JIS 2, TGW 1.

EASTERN MASSACHUSETTS — SCM, Frank I., Baker, jr., WIALP — New ECs: RUU Easton, YYV Norwell, VIN Carlisle, TJW Falmouth, DWY Beverly, LQQ Hamilton, SIX Haverhill, AWO Wenhams. Appointments endorsed: As ECs — VVZ E. Bridgewater, AWA North Reading, QGJ Woburn, FEC Middleboro. As OPSs — LQQ, QGJ, UXL, SS. As ORS — SS. As OBSs — LQQ, UXL. As OOs — LQQ, NF, TVZ, JNV. As OES — KNW. As PAM for 6 meters — AWA. Sorry to have to report the death of JCK, who was an active ORS and RM for 80-meter c.w. ACB, on 10 meters in Quincy, is a new ham. WN1AJC, 11 years old, is on 2- and 80-meter c.w. YMV is the son of ZTC. Heard on 10 meters: KG, UIIN, WCW, UVO, NXX, AFV, WPH, WME. RUJ is on 75 meters. NAV is on 20 meters. UKO is Net Control of the Deep Sea Dragnet on Thurs. QLT has a 40-watt rig on 80 through 10 meters. WU has 600 watts on 80-meter c.w. HWE has WANE certificate No. 40. BB is conducting a Static Noise Survey in conjunction with 160-meter DX. TNK is building a mobile rig for 10, 20, and 75 meters. AT gave a talk on his transmitter before the South Shore Club. Region 5 Radio Comm. held a meeting with DFS, KTG, OYE, NJN, ALP, and RM present. BGW is on RTTY most of the time. LLY, Arlington EC, reports that their mobile net assisted in the Heart Drive with Auxiliary Base. VPT has a new Lyseo ground plane for 10-meter C.D. Sector Net. ONV needs 4 for DXCC on c.w. QLT has the Falmouth Net going good with LYV, UXG, DVS, LVN, NFB, TJW and 4ZYW/1 reporting in on 3585 kc. DWY, Beverly EC, reports some hams in his City have mobile rigs while others are building 2-meter rigs. GL is the new call of ex-YRQ. BPA and GN are in Ipswich. SIX reports that his city bought 10 Gonset Communicator IIs and a Viking II and HQ-140X. AWO is mobile on 2 and 75 meters. HIL is mobile on 75 meters and rebuilding the 500-watt rig. MKW reports that the 2-meter c.d. net is well organized. Region 5 Comm. is on the 220-Mc. band for c.d. work. VCZ has a Viking. BRK and QXX are on 2 meters. BSY, IIF, BW, AYG, BB, BGW, MKW, and WK took part in the February F.M.T. ALP had a very nice letter from 7HUV in Tucson, Ariz. The Hingham c.d. group and 7 mobiles went to Norwell to give a demonstration for the c.d. officials. RZF is active in several nets. The Southeastern Mass. ARA has a new operator training program going. QLT reports that the Falmouth Amateur Radio Assn. is holding regular meetings and the net is active. BB reports that on the last drill they had SBT, CMW, DJ, OIR, MQB, NMX, HFJ, BDU, TQT, and BB. They are forming the Winthrop Mobile Radio Corps on 2 meters using the same frequency as the fixed stations. SBT/1, DJ, and BB were on 6 meters for a net drill. GAG arranged the recent half-hour broadcast on "Radio Amateurs Place in the Community" from WHIL. The Cape Cod Area Region 7 is getting pretty well organized for c.d. work with UUM, BCN, MFI, OAO, QG, MNF, MKW, TQS, UE, TJW, MBQ, and PMC. EK has 832 on 6 meters. UH has a new vertical antenna for 20 meters. QMU is rebuilding for the 807 rig. JOW has f.m. on 6 meters using 2C26. DYS has 6146 on 6 meters. Newton C.D. is going f.m. on 6 meters. QMN is putting 90 watts on 6. 2, and 1 1/2 meters. LNU is building crystal converter for 6 and 2 meters and a new modulator for 160 meters. RM is mobile on 6 meters. ZSZ and ZPI are doing some operating at TYN. Traffic: (Mar.) W1EMG 308, MME 135, LM 134, UKO 109, AVY 92, EPE 62, UE 47, WSN 47, UTH 39, BY 33, TY 25, QLT 23, IBE 22, AOG 13, VVA 12, WU 12,

Continued on page 88)

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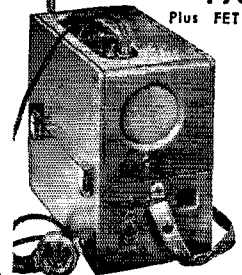
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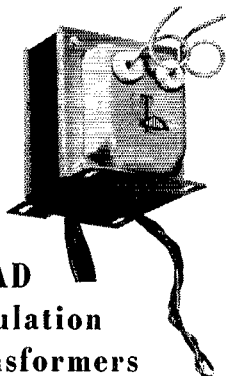


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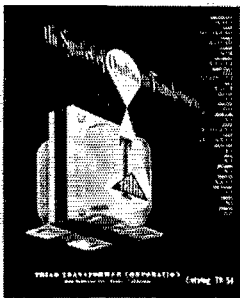


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QON 8, FGT 7, CTR 6, BB 4, HWE 4, NUP 4, HIL 3, LLY 3. (Feb.) WIEPE 30, CTR 6.

WESTERN MASSACHUSETTS—SCM, Roger E. Corey, W1JYH — SEC: KUE, RM: BVR, PAM: RDR. WMN meets at 7 p.m. Mon. through Fri. on 3560 kc. UPE, UPF, UPH, and UPF (yes, that's all one family) took a winter vacation to Cape Cod. UPE has been working DX on 40 meters. VKY has rebuilt his rig. HRV has been forced to give up his traffic work temporarily but will return to the nets soon. ULF was chosen Woman of the Week by a Worcester concern and presented a sterling trophy in recognition of her amateur work in the tornado. UKR is the new Net Manager of the Deep Sea Drag Net. JOU spoke to the HCRC on the principles of the oscilloscope. WCG and VE2AKJ/W1 are new ORS and are active on WMN. WDW received his 30-w.p.m. CP certificate. YPY checks into TAN frequently. TVJ is up to 44 countries with his 100 watts. RFU has a new 75-watt rig on 220 Mc. and is looking for others interested in 1215-Mc. work. PIU has a new 5-over-5 on 2 meters and a new 6-meter beam up 35 ft. BNO has built a new 50-watt, 6146 6-meter transmitter. UVI has been holding code classes for local license aspirants. HAZ has a new HRO Sixty. A hearty welcome to WNs ABD, AJX, and ZRB, all new Springfield hams, and congrats to ZIO, who dropped the "N" from his call recently. TTL now is on s.s.b. with a full lattice rig. The Region 3 Sector 4 Net is going strong with BDV, WEU, NTT, MCL, RIN, and YCW among those reporting to NCS NAX. ZPJ, the Whittinsville High RC, is the first WM club to affiliate with 100 per cent ARRL membership. Look for them on 75 and 80 meters. WEU is having good luck with a 28-Mc. ground plane. YHU has a new Technician Class license. NTT has a brand-new pine-paneled shack. BDV renewed ORS, OPS, and EC appointments. WEF landed 7 new countries in the DX Contest. Traffic: W1TVJ 207, UKR 123, HRV 102, BVR 73, RRX 25, SRM 25, HRC 23, DVW 16, JYH 15, WDW 14, VE-2AKJ/W1 11, W1MNG 10, WCG 9, JAH 2, BDV 1, OBQ 1.

NEW HAMPSHIRE—SCM, Carroll A. Currier, W1GMH — SEC: BXU, RM: CRW, PAM: AXL, ZYK is at Oakwood School in Poughkeepsie, N. Y. ZCH now is in Manchester. New hams in New Hampshire are ZFD, N1ZSF, and N1APG. VGX has his rig at Exeter Academy. The Nashua Mike & Key Club's new officers are YJD, pres.; UXR, vice-pres.; NAZ, treas.; QJH, secy.; OMZ, act. mgr. The Club held its Annual Banquet and Dance at Howard Johnson's. The PCARC has a new net called the Zero Beaters, with YMJ as NCS. JWJ has walkie-talkie in operation for c.d. work. TEA and WQP are mobile. Anybody interested in WANE certificate, write to PCARC, Box 622. YMJ has a new 50-foot tower. We are glad to hear that PFU is coming along fine after suffering a broken hip and is at home. Anyone interested in a New Hampshire 'phone net, write AXL of your willingness to cooperate in such a venture. POK is now VFO after many years of using crystals. Congratulations to BFT, Evans Radio, on the new catalog. ONX is now in Lancaster. TBS, they say, has YL trouble. WUU has skeds with his brother, UNV, at Portsmouth, Va. NHEN has an FB net Sun. at 1300 on 3850 kc. Any ambitious youngster or oldster is welcome in N. H. C.W. Net, at 1900 on 3865 kc. Traffic: W1WUU 59, COC 42, GMH 38, CDX 28, POK 21, FZ 6.

RHODE ISLAND—SCM, Merrill D. Randall, W1JBB — SEC: MLJ, RM: BTV, RIN meets every Mon. through Fri. at 1900 on 3540 kc. R. I. 'Phone meets every Sun. at 1100 on 1890 kc. RINN meets every Mon. through Fri. at 1830 on 3743 kc. Something that we should have mentioned a long time ago is the prospering 2-meter R. I. Net Sun. at 1000. Any of you fellows interested, just tune in to 146.9 Mc. at the above time and get and give an earful. JFF tells me that it is not unusual to have 15 present on a Sunday. A big welcome to SNA — glad to have him aboard. ULG reports great mobile success with his new mobile rig. KFL and N1ZXX are one father-and-son combo that really is clicking. It would be interesting to know and publish just how many family combinations we have here in Rhode Island. Give me the word and I'll pass it along. 4CVO/1 handled some of the traffic resulting from that terrible school fire near Buffalo. BBN has worked all 67 New England Counties. That, we think, is a record! If you guys don't get your tickets in for endorsement, we won't have a legitimate ORS, OPS, etc., in Rhode Island. Traffic: W1BTV 104, BBN 78, IMY 57, TGD 21, AIT 19, YKQ 14, W4CVO/1 14, W1VQP 5.

VERMONT—SCM, Robert L. Scott, W1RNA — PAM: RPR, RM: OAK, VTPN, 3860 kc., 0930 hours Sun. only. VTN, 3520 kc., 1700 Mon. through Fri. 3MIN, 3860 kc., 1200-1300 Mon. through Fri. All ECs are requested to forward their reports to RNA until further notice. AXN reports receiving certificates for WNH and WANE. TAN is giving classes in code and theory Thurs. for the Rutland County C.W. Radio Club. KRV is active again as ORS. The Brattleboro Tri-County Radio Club has tentatively set the date of the 1954 Vermont hamfest as Sept. 10th. More as soon as a definite date is established. It is suggested the above listed nets be contacted for up-to-date information. Traffic: W1OAK 164, RNA 115, JLZ 61, FEW 61, AVP 49, IT 47, TAN 24, VZE 24, BJP 20, TLI 15, ELJ 11, KRV 10.

(Continued on page 90)

MALLOBY HAM BULLETIN



Heat Is No Problem...

MALLOBY CAPACITORS Can Take It!

Heat is the worst enemy of conventional 65° C. electrolytic capacitors.

However, when you use Mallory Capacitors in your equipment, you're well protected against this enemy—for heat is no problem—Mallory electrolytics can take it!

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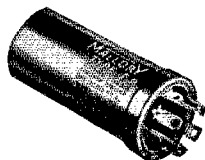
Poorly made electrolytic capacitors, especially those fabricated with little regard to cleanliness of raw materials are particularly subject to heat failure, for heat accelerates the corrosive effects of even infinitesimal amounts of chloride salts permitted to remain within the capacitor cartridge at the time of manufacture.

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D103T • DeLux 10m 3-El. T match, \$25.95. 1—8' Boom, 1" Alum. Tubing; 3—6' Center Elements, 1" Alum. Tubing; 6—6' End Inserts, 3/4" Alum. Tubing; 1—T Match (4'), Polystyrene Tubing; 1—Beam Mount.

S104T • Std. 10m 4-El. T match, \$24.95. 1—12' Boom, 1" Alum. Tubing; 4—6' Center Elements, 3/4" Alum. Tubing; 8—6' End Inserts, 3/4" Alum. Tubing; 1—T Match (4'), Polystyrene Tubing; 1—Beam Mount.

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NORTHWESTERN DIVISION

ALASKA — SCM, Dave A. Fulton, KL7AGU — KL7TI is the new SEC. Jim has some good plans for the section for AREC but will need the help of all hands. All those interested, write TI at Box 1238, Juneau. CP is the new president of the Anchorage Amateur Radio Club. The Anchorage Club plans to participate in Field Day. Any other takers in the Territory? AH finally conceded that low power is not the answer and recently quadrupled his power. TI is set up at the new QTH on Douglas. PI still is giving a lot of the DX stations their first KL7 contacts. AON is building a new four-element beam for 20 meters. ZG is the proud owner of a new SX-88. Those rare DX stations must be hard to copy. LV has installed a Viking mobile and reports good luck with it on a recent mobile trip to the States. EC has left on a well-earned vacation. ATL is building a new final. Traffic: (Mar.) KL7AIR 886. (Feb.) KL7AIR 3934.

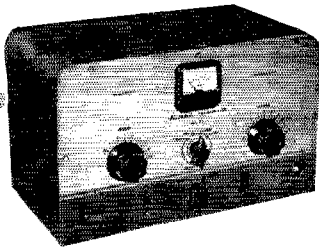
IDAHO — SCM, Alan K. Ross, W7IWU — Moscow: IJX writes that activity there is almost non-existent. Ririe: LQU has a new YL jr. operator "well modulated and plenty of excitement." Kellogg: RQG is applying for OPS appointment. He is a member of the Montana 'Phone Net and the FARM Net and has rigs on 80, 75, 40, and 2 meters. Lewiston: New hams are WN7VRF and WN7VOU. WN7VIO is on 80-meter c.w. with 60 watts. Father and son TLW and TLV dropped the "N" and purchased a B&W transmitter. IDZ, the EC, had to curtail drills because of a case of the mumps. The Army Engineers requested a list of equipment available for their "on paper" simulated flood. Shoshone: QZV, the EC, reports on a demonstration of ham radio for the Rotary Club, with RWL and MKS assisting. Later, a similar demonstration was given for the high school, with outside contacts with NJU, RKL, ACD, BDL, and TGY. Boise: CPY visited our Club Apr. 2nd. RHN moved to Boise.

MONTANA — SCM, Edward G. Brown, W7KJG — Montana mobiles are considering QSY from 3910 to 3995 kc. and FTO is obtaining crystals. The Central Montana Radio Club has a good start on a fund for emergency power supply. Many hams traveled from outlying areas to attend the ARRL TVI demonstration. Thanks are due Headquarters for making the Montana stop possible. Since TV stations are popping up all over Montana a TVI committee will be necessary and those in the fringe areas will want to know of these committees so they can get help with their problems. As fast as these groups get going, please advise your SCM so he can pass the word along. SFK is mobile with an Elmac transmitter and reports 14 hams with Brady addresses. TKB handled traffic for the Governors of both Montana and Wyoming last month. Hank says he needs only Africa for WAC on 80 meters. QYA reports two new ham calls in the area, V1Z of Geyser and VMB of Lewistown. Thanks, MM, for the report on the FB emergency drill held in Great Falls and vicinity. Traffic: W7CZ 41, TGU 34, TKB 18, SVF 16.

OREGON — SCM, John M. Carroll, W7BUS — BUS, our SCM, was kicked by a horse and suffered a broken leg. He is in a cast in the hospital, so this report is hurriedly being put together by ex-SCM MQ. Glad to pinch-hit for John, but not under these circumstances. However, I am glad to report that both John and the horse are doing "about as well as can be expected." AJN, the RM, sends in an FB report that OSN held 22 sessions with 100 per cent check-ins for PHJ, total OSN attendance of 183, and traffic handled 48. The net picked up five new stations in March. EDU reports that IEF now is fully mobile on 75 and 10 meters. HA has moved to Eugene and will help operate the new TV station there. EZR reports Field Day preparations for the Rogue Valley Radio Club with some special rigs to be used. RE is doing some 2-meter work and is having TVI troubles. FUN also is building some 2-meter gear. LNG is having TVI troubles. KTL has licked TVI with a homemade low-pass filter. SCY now has a 'phone patch and a foot switch and also has a 115-volt a.c. generator for emergency power. PRI is installing a mobile rig. ADX also is mobile now. MYQ, who works for CAA, has left Pendleton and is in Montana. KR had an attack of arthritis and was laid up for several weeks. FLS reports that single sideband really clears the frequency from QRM, and then goes back on conventional transmission to hold his QSOs. This was reported by one of his friends. Traffic: W7AJN 40, TBT 29, HDN 28, BSY 10, SCY 6, EDU 3, ESJ 3.

WASHINGTON — SCM, Laurence M. Sebring, W7CZY — SEC: QZF. RMs: FIX, OE, PAMs: EHH, FGY, OE, operating portable from Spokane, gets good results from his BC-474 6-watt rig. AIB is associate manager of WSN. The VARC was represented at the Puyallup Hobby Show with two Novice rigs and a Viking and worked 22 VK/ZLs, VP3, and JA2 on 80 meters. The VARC attended the Tacoma Amateur Radio Society meeting. The VARS now is affiliated with the ARRL. FWD has completed 4 solid years of WSN attendance with the exception of 2 days at the National Convention, 2 days at the Oregon Convention, and 1 day at the organization of TARS. QJB worked Japan from his 14-Mc. mobile. BMK has a new Elmac AF-67 with Windom antenna. JWC has new 32V-3 Collins. IIP

(Continued on page 92)



Heathkit AMATEUR TRANSMITTER KIT

MODEL AT-1

\$29⁵⁰

SHIPPING
WT. 16 LBS.

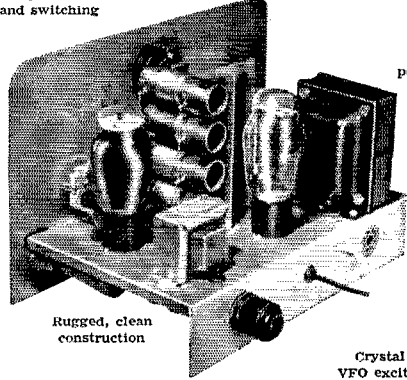
Range 80-40-20-15-11-10 meters
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105-125 volts AC 50/60 cycles 100 watts
Size - 8 1/8" high x 13 1/8" wide x 7" deep

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Single knob band switching

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52 ohm coaxial output



Rugged, clean construction

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Crystal or VFO excitation

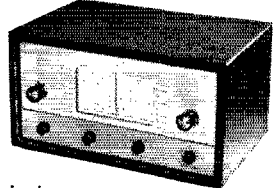
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535KC to 35MC

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12AV6.....Detector - AVC - Audio
12BA6.....BFO oscillator
12A6.....Beam power output
5Y3GT.....Rectifier
105-125 volts AC 50/60 cycles
45 watts



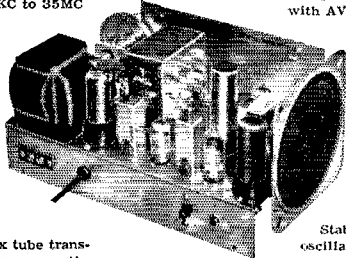
MODEL AR-2

\$25⁵⁰

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Proxylon impregnated fabric covered plywood cabinet. Ship. wt. 5 lbs. No. 91-10. **\$4.50**



Six tube transformer operation

Noise limiter - standby switch

Stable BFO oscillator circuit

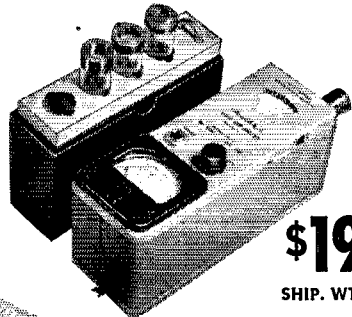
5 1/4" PM speaker - headphone jack

A new Heathkit AR-2 Communications Receiver. The ideal companion piece for the AT-1 Transmitter. Electrical band spread scale for tuning and logging convenience. High gain miniature tubes and IF transformers for high sensitivity and good signal to noise ratio. Construct your own Communications Receiver at a very substantial saving. Supplied with all tubes, punched and formed sheet metal parts, speaker, circuit components, and detailed step-by-step construction manual.

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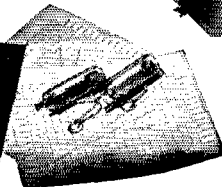


MODEL GD-1A

\$19⁵⁰

SHIP. WT. 4 LBS.

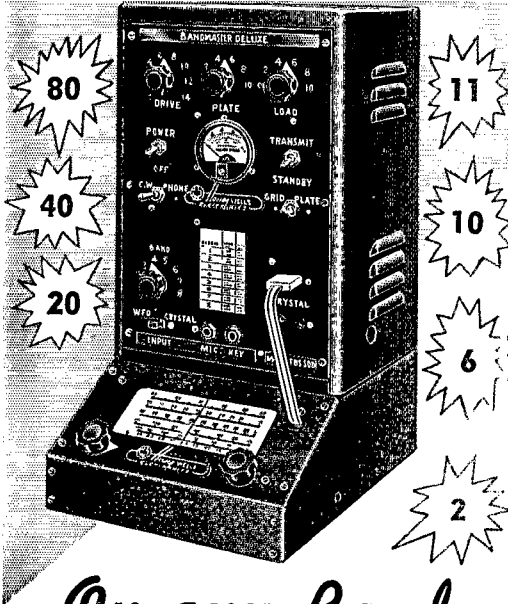
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TO RIGS WITH TWICE
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gave a talk on inverted antennas at the Seattle Norhend Club. VI acquired a new daughter-in-law. PGY is using ground plane on 20 meters. HRC and CO are working out fine on RTTY. KZP has gone hi-fi. EUY and CZY attended the Western Regional CAP Conference in San Francisco. BA received his WAC certificate. Traffic: W7BA 1584, K7FAE 1076, W7PGY 793, SOI 530, HAK 233, KT 180, EHH 86, OE 71, UMK 69, APS 51, AIB 44, RXH 42, OEB 37, BG 31, QOU 26, ZU 23, FWD 20, SJJL 20, BLX 15, EAU 15, EYW 10, HDT 8, AMC 7, GAT 6, BMK 4, CWN 2, NWP 1.

PACIFIC DIVISION

HAWAII — SCM, James E. Keefer, KH6KS — Bill of KG6ACS, Warren of KX6BH, and Dave of KH6AJF have all been transferred Stateside. They may be found at W6IQD. Channel 4 TV has made its appearance in Honolulu and Hawaiian amateurs are rapidly becoming 5th-harmonic conscious. KASAB again states that he wants traffic skeds on FSK radioteletype. KA7RC is now Net Control Station for the Far East Traffic Net. KH6FAA, KA8AB, KG6FAD, and KA7LJ made BPL in March. KH6AJF missed BPL by 2 points. Traffic: (Mar.) KA7LJ 6717, KA8AB 2078, KH6FAA 1263, KG6FAD 973, KH6AJF 489, (Feb.) KA8AB 2850.

SANTA CLARA VALLEY — SCM, Roy I. Couzin, W6LZL — Field Day and the coming conventions are the two items of interest among the different clubs these days as the weather starts turning nice and blossoms begin to appear on the fruit trees. MMG reports the NPEC is making big plans for Field Day, also he is heading back to W1-Land for his yearly safari. UTV is the new manager of PAN and also is in charge of Field Day activities for the SCCARA. FON is keeping busy on MTN and admiring the new call plates. YHM is keeping active on several nets in spite of the press of business. AIT is slow on traffic but hot on the new VFO being built. K6BBD caught a bad cold and was off 'phone for two weeks so tried a little c.w. He needs Wisconsin for WAS. UJF and UJF are mobiling to Anchorage, Alaska, and hope to locate there. CAZ is the proud owner of a set of license plates. QIE has a new 40-foot vertical antenna under construction. JIV has a single sidewinder almost ready to go. Chuck says that after all the work involved it had better be good. Code and theory classes are really catching on, as reported by the clubs. The NPEC has a group going with 20 Boy Scouts interested and the SCCARA has over 80 signed up in a very well-managed set-up. The Monterey Bay Radio Club had the Fort Ord members take charge in March for a very interesting evening. The Mountain View Amateur Radio Club showed the sound film "Eimac Success Story" just as originally shown on TV. Traffic: W6YHM 156, FON 56, UTV 38, AIT 13, MMG 7, K6BBD 3.

EAST BAY — Guy Black, W6RLB — Asst. SCMs: Harry T. Cameron, 6RVC; Oliver A. Nelson, 6MXQ, SEC; WGM. RMs: IPW, JOH, PAM, LL, ECs: AKB, CAN, CX, DNX, FLT, NNS, QDE, TCU. Literally hundreds of amateurs in all communities took part in the a.d. drill held on April 8th, manning their mobile units and fixed stations in civil defense headquarters in every community. For the first time the state-owned-and-supplied radio equipment in the Disaster Communication Service band (1750 to 1800 kc.) was used in a drill, and in most places it was manned by amateurs. Fellows, did you know that your amateur license is the only operator license you need to operate in this non-amateur service? See FCC rules §20.34(b)(1). The 6-meter net in Region 3 was very effective, and seems to have stimulated a great deal of extra 6-meter activity. JZ and WGM have Gonset Communicators and operate their "bedroom portable" late in the p.m. NDR, a new OES in Napa, is especially interested in 220 Mc. SDN reports a 220-Mc. round table is held Sat. at about 9 p.m. SXI is back in the Mt. Diablo Radio Club after being away since 1948. The gang out that way has sworn off kw. rigs on Field Day, and has elected HOF the Field Day chairman. EY made the best score in the February F.M.T. with 32.4 parts per million average accuracy. QVI is building up an operating console. NQJ is working on a radio-controlled boat. JGF is an AAF cadet. CBF is working on a mobile installation; AKB has a Viking driving a 4-125A, and is getting ready to help put on the Wouff-Hong ceremony on the July 3-5 Pacific Division Convention. There are five active amateurs in Lake County, reports FLT, the EC at Clear Lake Highlands. They are RQE and QBE, also at Clear Lake Highlands, RQL at Middletown, and RKO at Kelseville. NYH now is on with a single sideband kw. The Hayward Radio Club has been asked to take charge of civil defense communications in Hayward. CAN is going to conduct code classes; he is working on an ultra compact 2-meter job. HBF finds it's easy to work DX with 50 watts. ITH reports he puts out Official Bulletins on TT. Rose reports that the YLRC is very active in San Francisco and meets the 3rd Tue. PYH reports himself, FDJ, BOU, and SEW are on the air with teletype. Others interested are CGG, YGG, LZE, ZSS, ASJ, and AAQ. NQJ has 300 watts on 2 meters. Traffic: (Mar.) K6FDG 1305, W6IPW 367, K6BDF 219, WAY 153, W6JOH 116, AKB 65, QPY 10, YDI 5. (Jan.) K6FDG 1195, WAY 441, BDF 249.

(Continued on page 94)



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Stranding	Solid	Solid	7x30	7x30	7x30
Nom. Diam (inches)	.145	.265	.310	.210	.220
No. Pairs	1	6	6	Not Paired	Not Paired
Insulation Thickness (inches)		.010	.010	.010	.010
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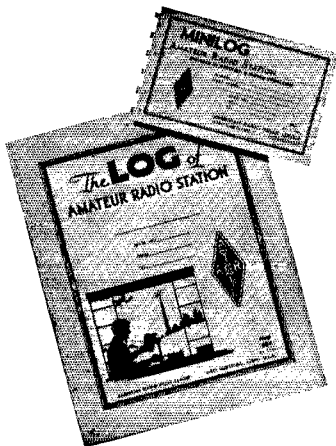
A.W.G. and No. Condrs.	22-4	22-3	22-5	22-7 18-2
Stranding	7x30	7x30	7x30	7x30 16x30
Nom. Diam (inches)	.168x.276	.140	.170	.245
No. Pairs	2			
Insulation Thickness (inches)	.015	.010	.010	.010 .018
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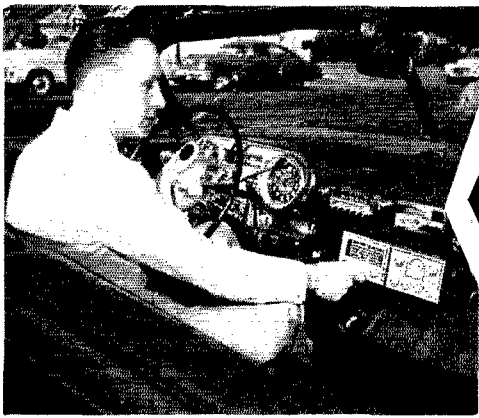
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SAN FRANCISCO—SCM, Walter A. Buckley, W6GGC—EC; NL, HARC: A new call in Eureka is KN6DVV. ØBRA is moving to Scotia. 7UPR is back in Eureka for a visit from his home in Montana. 6BWV won the local club's QSO Contest and received a grid dipper as a prize. The SFNSY Club held its annual dinner at Veneto Restaurant attended by 48. New officers elected are CHP, pres.; UOQ, vice-pres.; ZHO, secy.; K6AMB, treas. Director Ray Cornell introduced Cdr. Thomas and Sidney Fass. NZ, JWF invited all interested to inspect CXO (Red Cross station) any Thurs. night. The 29ers is planning Field Day for the first time and working all bands. The Mobileers is busy planning a picnic for June 6th in Oakland Regional Park. ITH was guest speaker at a recent SFRC meeting. He spoke on teletype and brought gear with him. K6NAK, from Chico, visited and met many of the boys he already has talked to via MTN. Congratulations to the new officers of SCRA and sorry I had to pass up the invitation to attend the meeting, which fell on the same night as the CCRC meeting. The HAMS visited the Berkeley gang and had a meeting via 2-meter mobile en route. The TARC still holds monthly meetings at the QTH of OZG at Tiburon. YLRCSF: QMO and PCN report 20 paid-up members in the ladies' club. Congratulations to 6SWP, K6FCT, and W6GQY on the BPL totals. UEV and Ann attended the SFNSY dinner. George now is QRV Mill Valley and can be heard on 80-meter c.w. and RTTY. Local calls heard in the recent C.W. DX Contest were W6s WB, ATO, BIP, AWT, GPB, GQK, and LV. CBE reports he is working hard testing mobile and 144-Mc. gear and bought a BC-221. GQA made one of the top scores in the recent Frequency Measuring Test. 4WXH/6 is trying for NCS of the Bay Area Net Thurs. nights. The AREC roll is called on 3.9 Mc. at 10:30 a.m. each Sun. "H" bombs and c.d. are the main topics of discussion. S.F. AREA checks in every Mon. night on 145.35 Mc. NL is Net Control. CCRC: The amateur radio calendar is making a big hit and is well filled up with activities. Local hams and W7s on the Mission Trail were sorry to learn of the death of the 9-year-old son of PHT. Jamsie was a sweet youngster and loved by all who met him. NAC and GHI are so busy with boys in the Scouts that they aren't heard much on the airwaves. XYLs were invited to join the local Shipyard Club as an auxiliary group. BMY is sporting a new G.M. car. MXJ is going s.s.b. on 75 meters. Congratulations to RLP and his XYL on the birth of a new daughter. IFZ's car was hit by a truck. PAZ's mobile was hit by a jeep. OPL has moved to San Mateo. Thanks to the invitation from FON and WGO the dinner at San Jose Mar. 13th was much enjoyed. Twenty members welcomed HLZ, president of the Mission Trail Net. The Bay Area gang is planning a mobile trip to the Fresno Hamfest. MWF worked ZLIACG, ZLIDK, ZLZAMA, VE2CS, and ZL3RK via 40 meters ground plane. Traffic: W6SWP 1105, K6FCT 995, W6GQY 571, PHT 350, QMO 103, K6NCG 83, W6GCV 58, GGC 17, MWF 8, BIP 4.

SACRAMENTO VALLEY—SCM, Harold L. Lucero, W6JDN—Asst. SCM; Gerald R. Hobbs, 6TMP, and Ronald G. Martin, 6ZF, SEC: JEQ, PAM: TYC, RM: IEO, OBS: IEO, K6AKF, ILZ, OPS: IEO, JDN, OMR, ORS: FYK, IEO, JDN, REF, ECs: AYU, EXP, IEO, JKA, NCV, SIY, SLV, OES: QAC, OOs: BIL, FYK, FXI is mainly heard on 80-meter c.w. OMR plans a 4-250A rig. FXI will have 813s at new QTH. OOP goes all bands. The Mt. Shasta bunch reports two new hams: KN6DUX and KN6DUY. The Dunsmuir Amateur Radio Club is going great. Officers: IEO, pres.; ILY, vice-pres.; HVB, secy-treas. The DARC has classes for six prospective hams. JDN is building portable gear to take to Trinity to leave for future snow-storm emergencies. K6ASX will have JDN's old rig on as soon as school grades improve. K6AWR is on 'phone and c.w., 40 and 75 meters. DDC is working a lot of 40-meter 'phone getting good DX after midnight. IOM is on 40 meters. ILY has troubles with BCI and local landline. HVB is heard on 40- and 75-meter 'phone. CFU and his XYL, LIG, are being heard quite regularly on 40-meter 'phone. ASE (Roseville) is firing on the Shasta Daylight, working 75-meter mobile when off his run. ASM works 40 and is experimenting on 6 meters. From the Tehama County Amateur Radio Club we have the boys requesting 12 appointments. The Chico gang reports activity not great. K6AJU is compiling a directory of local amateurs and has 30 listed. WVR has come to life after a long silence. LHP located in Paradise. ICO is forming a TVI committee. The GERC held a successful auction. SBH was heard on 160 meters. SLV is recovering from surgery. K6NAK checks into MTN; also hear K6BMM check-in on Grandpappy's Net Sun. How about it in Chico, fellows, let's get some appointments applied for and see if an increase in ARRL activity can't be made. To make more sections out of the existing one we have to build up ARRL membership and increase appointments in a more tangible way. Let's all do our part. Lots of traffic has been coming off RN6 and NTS. The Sac. V. Net was put into operation Apr. 1st. IEO, new RM, is working with RN6. 3655 kc. has been picked; the net meets Mon.-Fri. 2030 EST. We invite check-ins from all over Sac.V. The net will be conducted under ARRL net procedures and is part of NTS. Get behind SVN, check in and have fun in doing so. EKP, Yuba City, reports the show on the road, a dozen stations soon in an

(Continued on page 96)



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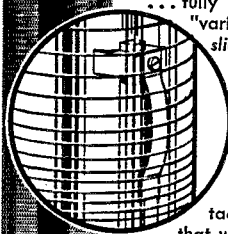
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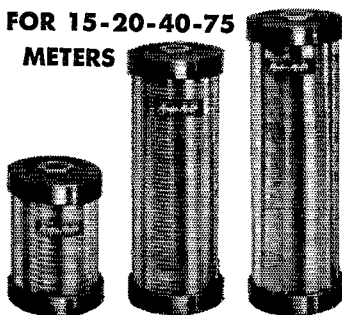
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emergency net, with four check-ins nightly on 145.8 Mc. New club in Yuba City has RFB, pres.; IU, vice-pres.; WCW, secy.; and DMA, treas. RLF (ORS) is active on MTN and NCSing on MTN c.w. net. OPY has offered to help as NCS, is also Asst. R.M. The Dunsmuir Amateur Radio Club Certificates of Achievement are given on showing of QSLs from 5 Dunsmuir hams. Others on MTN 'phone net: EII, DTW, K6FR, SOB, EXP, and SIY. From the Shasta County Amateur Radio Club comes the good word that there is a lot of activity with trends toward mobileers. ATQ has built a small transmitter for the forthcoming mobile hunt. OJB is making a 2-meter rig. KTF is working mobile DX, two KL7s and a KH6. A recent journey was made to the Chico Radio Club by SXF, ATQ, KTF, AKF, and UFR from the Shasta Radio Club. SXF has completed an all-band mobile. K6AKF is overhauling his m.g. for F.D. PTX is the proud owner of a new Super-Pro. ETT, ELO, and TDB do fine DX on 10 meters. AMB has a new mobile. Here's to an even bigger and better section. Traffic: W6IEO 267, JDN 160, RLF 86.

SAN JOAQUIN VALLEY — SCM, Edward L. Bewley, W6GIW — SEC: KRO. RM: OPU. PAM: ZRJ. The Turlock Club handled radio communications during the Stanislaus County Teen-Age Safety Economy Run. 250 cars travelled a 106-mile route, and mobile stations along the route reported the progress to local broadcast stations, which delivered a running commentary of the activities to the public. Hams participating were ADB, DIY, SQN, SQR, ERE, QER, KU, UOO, PZV, KRO, GIW, AXI, BII, and K6CINT. ZRJ reports the new rig is working FB and he is building a mobile rig. K6BGM joined the YLRL and also is active on SJVN. UDX is using 40 watts on 80-meter c.w. and is working for WAS. GRO gave a lengthy explanation on phonetics and ham radio while in a barber shop. Unknown to Keith, a reporter was present and printed it word for word in the local paper. Fourteen members of the Stockton Club visited the Turlock Club, and mobiles were guided to the meeting place by ERE and SQR. SJCEN has been changed from Thurs. to Tue. nights. The Fresno Club was very busy preparing for the hamfest held May 1st. K6ECH, a new station in Stockton, is active on 2 meters. ZNL has been giving talks to various clubs on ham radio. BNP joined the Silent Keys. Traffic: W6OPU 65, EBL 14, ZRJ 11, K6BGM 6, W6GIW 2.

ROANOKE DIVISION

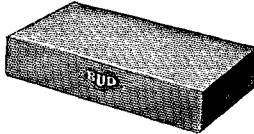
SOUTH CAROLINA — SCM, T. Hunter Wood. W4ANK — During the month of March the Governor signed into law a bill that authorizes supplemental automobile license plates for South Carolina hams. This bill was introduced and passage expedited by Representative Emma Jane McDermid from Rock Hill. It was sponsored by the Rock Hill amateurs who expended considerable effort over a long period and deserve a "well done" for their success. A number of Columbia amateurs assisted by providing contact with officials of the Highway Dept. A regular hamfest and ARRL Section Convention was held near Columbia Apr. 4th sponsored by the Columbia group. Our Roanoke Division Director, MWHL, was guest speaker, with ZIZ, BPD, ANK, DX, and HMG also on the program. Mrs. McDermid described the license plate bill and advised that she believed full plates were a possibility in the future. HMG reported on the conference with the Highway Department. FM has his NC-183 back from the factory after overhaul. ZIZ reports that an informal luncheon club net operates on 3930 kc. from 11 A.M. to 1:30 P.M. daily and invites anyone who can report to check in. K4WCZ has received a BC-610. WN4BAN is a member of the Palmetto Amateur Radio Club and is on 40 and 80 meters with 75 watts with a new Viking II and is looking for South Carolina contacts. Traffic: K4WCZ 156, W4ANK 59, ZIZ 28.

VIRGINIA — SCM, John Carl Morgan, W4KX — Ex-SCM FF, now in Maryland, has been reissued his original 1915 call, 3UE. YVO now is 9SVE. HQN did nobly in the DX Tests; he made DXCC in 4 week ends. VMF reports BMS in the middle of an attempt by the Alexandria City Council to legislate against hams by controlling the erection of antennas. The Falls Church Squirts got the high school club station going with the call BRN. IA has taken up where he left off when he went to Japan and is again NCSing VN. BYZ now has General Class license and is looking toward ORS. OWV is on the air from new Harrisonburg QTH with no TVI now, which is good since he works for WSA-TV. LW has issued another fine section bulletin. Anyone not receiving same is missing much and should write Dick requesting to be put on the list. KX really surprised the VFN by checking in, on 'phone, Mar. 6th, his first A3 signal since 1927. KRR continues to be our top traffic-handler. Listen in on most any net long enough, and you'll surely hear Fred. The SVARC sold the old site and club house and is taking bids on a new site. YZC reports a flock of new ones in the Falls Church Area: APM and APQ and WNs CEO and EMN. TFX says school work QRMs hamming. Does Pappy IA also get in that picture, Phil? By the time this appears it will be vacation time, but please, OMs, take time out from annoying the fish, bugs, weeds, or YLs to send in a report. The younger contingent really is right in the swim. Remember, squirts, we'll be (Continued on page 98)

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AC-405	7"	7"	2"	18	.99	AC-418	12"	17"	3"	14	3.18
AC-406	7"	9"	2"	18	1.08	AC-419	13"	17"	2"	14	2.82
AC-407	7"	11"	2"	18	1.20	AC-420	13"	17"	3"	14	3.36
AC-408	7"	12"	3"	18	1.41	AC-427	10"	17"	4"	14	2.97
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happy to entertain your applications for the various ARRL appointments. “Ask the man who has one.” He’ll tell you they offer you the opportunity to expand the pleasures of ham radio. Traffic: (Mar.) W4KRR 167, FV 163, FF/3 39, YZC 39, HQN 25, CFV 19, OWV 9, UHG 9, LK 6, IA 5, LW 5, TFX 3, TYC 2, WBC 2, JUJ 1. (Feb.) W4KRR 361, CFV 33, FF/3 21, SNH 17, TYC 12, OWV 9, VMF 6, IA 5, UHG 5, WDZ 5, LK 3.

WEST VIRGINIA—SCM, Albert H. Hix, W8PQQ—SEC: YPR. PAM: FGL. RMs: DFC, HZA, AUJ, GBF. JQS is converting the GO-9 transmitter and will be on with 250 watts c.w. and 150 watts ‘phone. EMQ, AFB, LS, NLT, CLX, QHG, IWB, PQQ, FRP, and a couple of other hams from Bluefield all attended the Dayton Hamvention. PZT is building new frequency-measuring equipment for OO work. YPR has completed the 20-meter rig and will spend some time on that band this summer. NYH has a new Elmac mobile transmitter and is quite active. KXD, WHR, GEP, and WVF are all doing good jobs in assisting ETF as NCSs on the ‘phone net. NLT has new mobile installation which works very well. DMF moved to Florida. All got married. The Stonewall Jackson Radio Club held a banquet at Jackson Mills which was well attended. The Princeton Amateur Radio Club is sponsoring a picnic Sun., June 13th, at Fountain Park, close to Princeton, and expects a good turnout. The MARA is making plans for a big Field Day this year. HZA worked 15, 20, 40, and 80 meters in the DX Contest. MME is working out quite well with a Viking transmitter. DIE has a new Viking transmitter. Traffic: W8AUJ 320, GEP 68, HZA 60, ISB 26, KWL 22, DFC 10, NYH 10, ISB 9, IXG 7, PQQ 4, YPR 4, MBA 2.

ROCKY MOUNTAIN DIVISION

COLORADO—SCM, Karl Brueggeman, W0CDX—SEC: MMT. Your SCM wants to thank all who sent in cards and information this month. MMT was appointed SEC replacing AAE, whose term expired. We all want to thank Hank for the fine job he did and wish Marie the best of luck. KHQ reports the CSSN is about to fold because of lack of attendance. The Net meets Mon., Wed., and Fri. at 1730 on 3545 kc. Let’s all get on and put the Net on a paying basis. K0WBB is NCS for the Hi-Noon Net. APK has a new 5-band VFO home-built mobile. ERR is on 3845 kc. every week day from noon until 2 a.m. for Denver traffic. AGU has a Sonar SRT-120. IA reports not much luck on the evening MARS schedule and thinks a daytime sked would work out better for the G.L.s who do not have a home QTH. If you have any comments, pass them along to Gene. IUF operated an SCR-583 via hand generator at the winter scout camp on Wolf Creek Pass. QAZ took part in the recent DX Contest with good results. LCE is the new secy.-treas. of the Grand Valley Radio Club. 7CNM and 0PXZ are building a 2-meter mobile emergency rig. GDC has a new tower, part of which is over a tin-roofed garage. PXZ is having trouble getting his beam up. It is on a clothesline post now but since he bought his XYL a new drier, she wants the pole down. Maybe he’ll get it up on the house now. See you at the Convention. Traffic: W0KHQ 727, SDW 481, RTA 158, EKQ 100, APK 76, ERR 70, IA 11, AGU 7.

UTAH—SCM, Floyd L. Hinshaw, W7UTM—75-meter mobile antenna installations were given a good airing at the UARC meeting by BLE in March. LRV is overhauling his receiver in anticipation of some 10-meter activity, sunspots permitting. JVA is the proud owner of a new 75A-3. HFE/7 and sons SLL and SLM hold daily afternoon skeds with DXV, father and grandfather respectively, on 80-meter c.w. QDJ is now signed up with the Ogden c.d. group. Speaking of c.d., more stations are desired north of Ogden and any who can be asked to please contact GPN in Ogden. The Salt Lake City c.d. group is increasing its activities through more intensive use of 6 and 2 meters. The following have taken the lead on 6 and 2 meters and are urging more of us to follow their example: JPN, EWX, LCA, SP, and K7FCN. Their motto is “Fry it and you’ll like it.” Traffic: (Mar.) W7UTM 51, HFE/7 10, QDJ 2. (Feb.) W7HFE/7 22, QDJ 4.

SOUTHEASTERN DIVISION

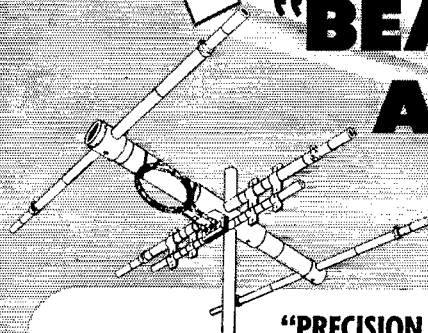
ALABAMA—SCM, Joe A. Shannon, W4MI—ARR has added WAS/YL to his YL/CC, both firsts in the section. AVY now has General Class ticket. The Mobile Club has started a new code and theory class, with AAN doing the code honors and ZUL the theory. MEM, YCO, DZF, VYI, MI, and ARR are new mobiles. CRY is new on ‘phone and making several nets with Viking II. KIX and EJZ have new c.w. break-in systems going. TXO meets as many as seven nets some nights. 2-meter activity in the section is increasing and the Huntsville Club is busy planning a 2-meter mobile net to augment the 10-meter mobile net. The Decatur and Florence groups are busy with hamfest details for the ‘fest to be held in Decatur in August. More later on their plans. WOG reports that DX is rather scarce on 40 meters, while AUP tells us that 160 offers good contacts. AUP also says that he has only a few states to go for WAS/mobile. He gets them in the early morning going to work. Traffic: W4KIX 105, EJZ 65, YAI 61, WOG

(Continued on page 100)

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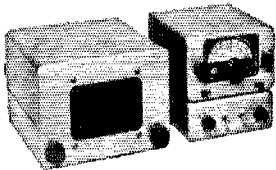
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per; adjustable squelch; Filtered, regulated vibrator pack; PM speaker; 6 or 12V operation.....\$119.50

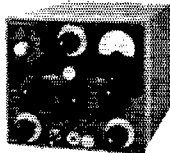
JOHNSON VIKING MOBILE VFO

Small VFO designed expressly for mobile use. Temperature compensated. Size only 4" x 4 1/4" x 5". Sufficient output to drive any straight pentode crystal stage as an amplifier. 68H6 osc; 68H6 isolation amplifier/freq. mult; OA2 voltage regulator. VFO, in kit form, less tubes. \$29.45 VFO, factory wired and tested, less tubes.\$44.95



JOHNSON VIKING MOBILE TRANSMITTER

Power packed mobile. 807 final. 60 watts input; push-pull AM modulation; Gang tuned. Bandswitching 75-40-20-15-10 VFO or Xtal controlled; illuminated meter. Complete Kit, less tubes.\$99.50 Wired and tested, less tubes.\$144.50



ELMAC PMR-6A RECEIVER

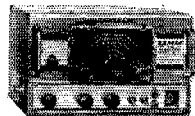
6 Bands: 10, 15, 20, 40, 80, 160 plus Standard Broadcast—Dual Conversion —10 Tubes.....\$134.50 PSR6 or PSR12—6 or 12V, DC supply. \$24.50



PSR16—AC.....\$24.50 PSR116S—with built-in S meter\$35.50

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Squelch and Noise Suppressor

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56, CRY 32, DXB 32, VY 24, TXO 21, YRO 21, RNX 20, EBD 18, PWS 18, KNW 15, TKL 13, BJI 12, OR 11, BFM 9, MKV 2.

EASTERN FLORIDA — SCM, John W. Hollister, jr., W4FWZ — Check with your local civil defense about the nationwide drill to be held June 14-15. ARRL Field Day will be June 19-20. Send me your FD reports, please. Bradenton: TAS says the gang is getting swell QSLs through the Chamber of Commerce. Manatee Club visitors included 3CUL, 3VR, 9JXY, 1VIS, and IUOC. Brooksville: TWR reports NRT and DQG are now on. Deland: W5 needs 144-Mc. stations in Sanford, Daytona, and New Smyrna to expand the net. Ft. Lauderdale: The Broward Social Net is skipped by JZB on 29.4 Mc. JVF reports code classes are held at WN4ZZQ, Gainesville: TJU and EHU have a swell RTTY set-up. Howey-in-the-Hills: W6 is new EC for Lake County. His new antenna farm includes Hertz, three-element, "J," and "V" for 75, 10, and 40 meters, from 25 up to 50 feet. Jacksonville: C.d. meetings on RACES at Tallahassee and Jacksonville by the State C.D. Advisory Committee were held by FWZ, MS, and IM. NFC is mobile with Elmac running 50 watts, Key West: 3YHO/4 is EC and DRT is OBS. Miami: AWR dropped the "N." Flamingo Net transmitter hunts are reported by MVR, SDI, and IEH. U3X and NJM won the last two. MVR and SDI are using ground-planes both fixed and field use. The Dade Club uses telephone company films on microwaves and coax. LVV explained ARRL field appointments. Flamingo Net activities committee: FID, QAJ, VGT, IEH, YW is a new OO. IYT now is EC for Dade. MVR reports plans for enlarging AREC and getting started for RACES. The Dade Emergency Net is skipped by PBS. ZPO is NCS for the Novice Hurricane Net. New Port Richey: UMJ is mobile with a Harvey-Wells. Ocala: DVR reports progress installing c.d. communications network. St. Petersburg: Those assisting at the Largo Fair amateur booth were AVA, DMK, TDK, LAB, TKE, EPC, TY, VEE, and VOZ. Traffic: W4PJU 1378, TYE 535, DVR 459, PZT 315, BMY 176, LDM 83, WS 54, KZC 36, LVV 36, IYT 23, KJ 15, TJU 14, TWR 11, FWZ 9, UHT 2, WEM 1.

WESTERN FLORIDA — SCM, Edward J. Collins, W4MS/RE — SEC: PLE. PLE has returned from K7L-Land. CGY is working all bands. PAA and MUX have new 32V-3s. UUF is working 144 Mc. ZUN is on 4 Mc. ZFL is trying 20-meter 'phone. FDL is on the air again. DAO/DEF is building stand-by receiver. ACB is working in the c.d. HQ has been appointed Pensacola C.D. Radio Officer. BFD is becoming interested in amateur TV. PQW has his mobile unit perking F.B. RZV is busy on the Dagwood Net. UCY is happy over the 10-meter openings. The Pensacola gang is getting the 10-meter mobile net going for emergency work. 29 Mc. is the emergency mobile frequency in Florida. PLE is looking for candidates as EC. NN is DX man on 75 meters. ZPN is building a bigger rig. NOX keeps traffic moving for the G.I.s. QK is dusting off the mobile gear. WN4BGG is getting a VFO. BKQ is sporting a whip on the car. ENS is a newcomer to Pensy. GRO has a new antenna for 75 meters. JREV/4 keeps his 20-meter skeds. SOQ has the neatest shack we have ever visited. EQR is getting on 2 meters. MS is trying to get an Elmac for the car as well as a complete TV camera. AXF and HJA are out of the hospital. SZH is leaving the section. CDE is on 75 meters from Blountstown.

GEORGIA — SCM, George W. Parker, W4NS — PAM: LXE, RM: MTS. Nets: (GCEN) 3995 kc. at 0830 Sun, and 1900 Tue, and Thurs., mobile roundup Sun, at 1300. (ATLCW) 7150 kc. Sun, at 2100. The Augusta Radio Club and Camp Gordon Radio Club will hold their annual ham-fest at Julian Smith Park, Augusta, on July 24th and 25th. The main prize will be a Johnson Viking II. OKL will answer all inquiries. The recent tornado in Macon took out antennas, shack, and half the roof at SPD. YMV reports that the Kennehoochee Radio Club is holding regular code classes. The Club's recent emergency drill went off in good style with IUD, YFR, TTD, ZCP, NT, UPG, UAT, YMV, and VVN participating. WRV underwent surgery recently but is back on the air. UCW attended the IRE meet in New York. LNG reports from Huntsville, Ala., where he is doing a bit of Army duty, that he still is active on 2 and 6 meters. WN4ZQP is a mother now. It's a boy for HDC and a YL for CFJ. TJS is going sideband. DXA and TVN are a new father-and-son team in Atlanta. ZDD now is General Class. IMQ has a new home-brew mobile. DQK is a new ham in Pearson. WN4BWD, XYL ZWT, now is active on MARS. DND, EC for Clark County, is getting the gang at Athens organized. LXE, EC for Bibb County, and the gang at Macon did a fine piece of work in the recent Macon tornado. All appointees are reminded to send in monthly reports to their SCM and SEC. Traffic: K4WAR 1337, W4USA 1135, ACH 223, IMQ 195, FOE 164, OCG 113, ZWT 77, MTS 30, NS 18, WN4BXV 2.

SOUTHWESTERN DIVISION

LOS ANGELES — SCM, Howard C. Bellman, W6YVJ — Asst. SCM: William G. Coe, 6KWQ. SEC: QJW. Asst. SECs: HKD and KSX. PAM: PIB. RMs: BHG (for LSN) and GJP (at large). Asst. RM (LSN): MBW. Of paramount importance is the placement of SCR as EC and Chief Radio

(Continued on page 108)

IF YOU WERE TO DESIGN THAT "DREAM" MOBILE RECEIVER



wouldn't you

first of all, consider your own operating convenience and . . . the SAFETY of yourself and your passengers, by arranging all normally-used tuning controls on a remote basis where they could be reached conveniently without taking your eyes off the road ahead? Wouldn't the same considerations that apply to the use of your rear view mirror apply equally to the positioning of any "S" meter that might be used?

wouldn't you . . . want to incorporate the type of circuitry that would put your mobile receiver on a par with your home station communications receiver?

wouldn't you surely include "Squelch" to eliminate between-carrier noise and background? A really effective noise clipper? A BFO for CW, SSB or merely to spot weak phone carriers?

wouldn't you certainly employ dual conversion . . . one high frequency input I.F. to eliminate image, followed by a real low frequency I.F. with multiple tuned circuits to restrict the pass-band...to provide effective adjacent channel rejection?

wouldn't you want the I.F. portion to be small in size but to include a self-contained power supply with provision for both 6 and 12 volt inputs? And a built-in loud-speaker? And all units joined by patch plugs and cables so that they could be easily removed for installation in a different car? Naturally, provisions for an external "S" meter?

if you would

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includes tubes and crystal. Does not include Super-Six converter or "S" meter.

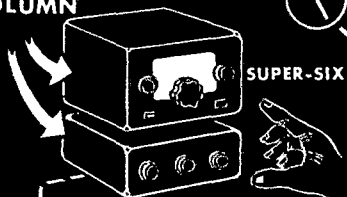
SUPER-SIX
6 band converter

Net . . 52.50

SEE THEM AT YOUR DEALER

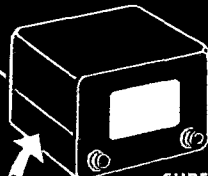
MOUNT ON STEERING COLUMN

Provision for external meter



SUPER-SIX

FINGER TIP CONTROL



SUPER-CEIVER

MOUNT ON FIRE WALL
or in rear trunk

(provision made for external speaker connections)

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SIX BAND CONVERTER

SUPER-CEIVER

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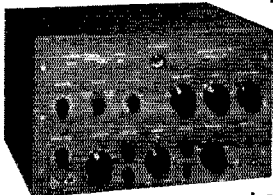
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by Bill Cummings, W1RMG

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

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Officer for Glendale C.D. and Disaster Council, per our SEC. QJW reports a total of 1132 full and 52 supporting members in our section AREC line-up. He has asked me to emphasize that all incidents of emergency services in which the fact the amateur had call sign license plates played a part should be reported to the SEC. CG is sparkplugging Temple Dis.-C.D. group training and organization for 2 meters (later 220 Mc.) RTTY. The Fifty Club had a radioastronomy talk in March. BEG is renewing OBS appointment. There has been a terrific slash of personnel in the appointment field here, and although the policy is not on the strict side in our section, for appointment retention certain basic musts will be met before our circle of appointments becomes any larger. LDR is a re-ORS and WFF, one of the fast boys, also is destined for this. QVN will enjoy PAM privileges. YVJ and his XYL enjoyed the annual sumptuous installation banquet of the Association Radio Amateurs of Long Beach at the Sierra, whose service equalled the Ambassador Hotel. Close to 100 attended. PIB tells of 11,000 applications for ham plates. He also relates a thrilling Civil Air Patrol and amateur radio (American Legion Net) assist in the Imperial Valley. LGP is new NCS for Golden State Emer. Net. 3965 kc. QVN tells a good one about fixed stations drowning out mobiles which tried to rescue a car with two people in it during a recent flood. They had to resort to land-line. The first issue of the *West Coast Ham Ads*, free to about 2000 hams, and edited by JRE, has been received. WII announces that from July 27th to Aug. 5th a National Soaring Contest will be run and hams are wanted to assist downed glider pilots. 0HAW is going back to Kansas for a summer vacation. EBK writes loads as usual. Thanks, Johnny. He says that the Mt. View Radio Club meets the 1st Thurs. at New Central School, Baldwin Pk. LYG, battling over 1000, wants a "relief op." Anyone know of any old soldiers who would like to check into the old Soldiers Home? See George. We understand ESR is very ill. AM, with ADP, BXL, GFE, and JID, were the DX team and bagged ZLIBY and ZLIMQ on (oh no) 160 meters. USY, NCS LSN, was heard. Traffic: (Mar.) W6LYG 922, MBW 291, FMG 204, JQB 186, CMN 133, USY 110, K6BWD 99, W6BHG 91, LDR 90, PZN 81, HIF 28, CBO 27, NTN 26, GJP 18, EYH 9, AM 8, TRF 7, YSK 5. (Feb.) W6LDR 87, MBA 43, HKD 26, UGA 15, GJP 4.

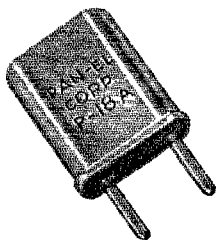
ARIZONA — SCM, Albert H. Steinbrecher, W7LVR — Asst. SCMs: Kenneth P. Cole, 7QZH; Dr. John A. Stewart, 7SX. SEC: OIF. PAM: KOY. Arizona 'Phone Net: Tue. and Thurs. 7 p.m., 3865 kc. Arizona C.W. Net: Tue. and Thurs. 8 p.m. 3515 kc. Arizona Novice Net: Tue. and Thurs. 6 p.m., 3704 kc. In March history was made in Arizona with the License Bill passing both Houses of the Legislature and being signed by the Governor. Operation "Superstition," the annual Don's Trek, was a huge success with the following participating: JYH, NAP, OAS, OIF, OQF, OUE, PMQ, QJS, QZH, RBA, RIJ, RUX, RXY, SUI, UDI, UNL, and VKS. New calls in Arizona are PAB in Mesa, PAC in Wickenburg from Oregon, and VKD in Wilcox. 90IM now is VIJ in Tucson. New General Class licensees: STV, UXO, and VAX. OIF is back on the air with a new exciter and a rebuilt rig. New Novice: VKQ. NEL now is on 75 meters in Phoenix. GYK probably has the distinction of being the first "Portable Equus," having ridden horseback for 200 miles to the Phoenix Rodeo, and maintained contact with home and the Arizona Net. Please send in station activity reports. New licensees: Please write your SCM giving data on your station, etc. Appointments for OBS, ORS, and OO are open. Traffic: W7QFQ 123, KOY 122, LAD 83, LVR 70, PLM 18.

SAN DIEGO — SCM, Don Stansifer, W6LRU — Asst. SCMs: Tom Wells, 6EWU; Shelley Trotter, 6BAM; Dick Huddleston, 6DLN. SEC: VFT. ECs: KUU, FJH, QJH, HRI, DEY, K6DY, W6WYA, IBS, BZC, KSI, DLN, HFFQ. PAM: JPM, RM; ELQ, K6DBG is a new OBS in Orange County with QSTs on 3980 kc. Tue. and Thurs. at 1830. WNN, a new OBS, is active on 144 and 420 Mc. KN6DVD and DVE are Novices in La Mesa. New stations appearing on 144 Mc. include BTN, LRU, and BLZ. IBS and BYE have new 100-watt rigs on 144 Mc. NBJ, mobile and CDF, fixed, were instrumental in having a suspected drunken driver arrested while NBJ and family were on a Sunday drive. GDF called the local police at the request of NBJ, and an arrest was quickly made. The Hobo Net is now the United Trunk Line and is very active on 80-meter c.w. Van, ex-operator at IAB, now is W6FUN in Arkansas after his discharge from the Marine Corps. The Convair Club is very active training prospective hams and operating both on Novice bands and phone and c.w. on all bands. Officers are FAY, pres.; FWF, vice-pres.; TVM, secy.; K6CZE, treas.; FFY, station custodian. The club call is K6DBS. Hugh has resigned as prexy of the Imperial Valley Club as he has been discharged from the Navy and is moving to the Bay Area. The new president is AWZ. AWZ and BR gave a fine report on the problems of color TV at the May Imperial Club meeting. The hidden transmitter hunt, sponsored by the Coronado Club in May, had the boys guessing, but fun was had by all participating. K6EC and 8KJR, father and son, are busy building a 14-Mc. beam. 8KJZ and 8JAX were recent visitors in San Diego. The Coronado Club will be operating all bands during Field Day. The Rohr Aircraft hams are forming a club. QKY now is a

(Continued on page 104)

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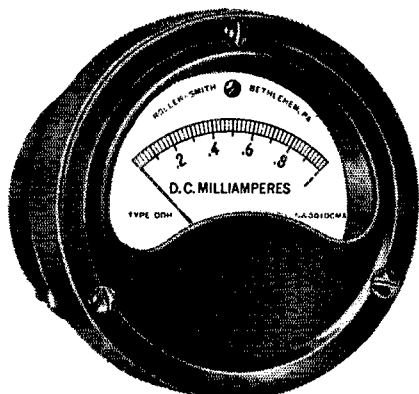
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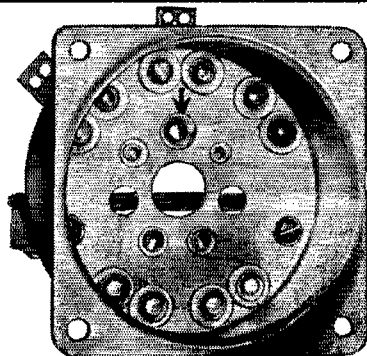
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chief warrant officer, USNR. KN6EFF is a Novice at Dona Junior High Club. Traffic: W6IAB 3131, IZG 721, ELQ 532, BKZ 54, FCT 19, CRT 10, CHV 5.

SANTA BARBARA — SCM, Vincent J. Haggerty, W6IOX — TAE reports from Adak, Alaska, where he is stationed as a Navy radioman; he operated KL7BBP and KL7AIZ and wants contacts with this section. LB reports the San Luis Obispo Club's new officials are NGJ, pres.; ENR, vice-pres.; K6BOU, secy.; EGB, treas. and trustee of club station, CNY. While recuperating from a broken arm, OXJ contemplates the purchase of an HQ-140X. IHD reports from Arroyo Grande, where he is completing a 2500-watt unit for the radio club. MSG is going high power on 2 meters. FYW sent in ORS and RM certificates for annual endorsement; other appointees should do likewise at the time of the annual expiration date of certificates. QIW was top traffic man in the section this month and is eager to stimulate traffic net activity in the section. Traffic: W6QIW 122, K6NBI 78, W6FYW 6.

WEST GULF DIVISION

NORTHERN TEXAS — SCM, T. Bruce Craig, W5JQD — SEC: RRM, PAM; IWQ, RMs: PCN and QHI. The AREC report for the month sure does look good, with a steady gain of 13 for a total of 275. Two-meter activity has increased in the section with SPW and SNX reporting regular schedules from Slaton (south of Lubbock) to Amarillo. URL, in Fort Worth, is working with CVW to establish a link across North Texas for a 2-meter net, and reports that the need is for more 2-meter clubs. AQG, RHW, and QFN are other 2-meter stations reporting. UIJ reports the Lamesa Club now has an Onan 3-kw. portable generator. WBW has replaced BWB as president of the Lamesa Club. WBW has moved to Dimmitt. CSX and CIM are new calls in Lamesa. KUP is mobile again. VYI and OM YVM visited LGY. PWS is back on the air. PTZ has low-power rig on 40 meters. HDM is now mobile. DBD is in Tucson, Ariz. DON is an old "ham" with a new call in Lubbock. GF is putting out about 40 watts on c.w. now. If you are in a club, please insist that some member be appointed to send in a station activity report to the SCM each month. It will greatly assist in making this a good column. This section needs a new more OBS. Write your SCM for application blanks. TPU is the newest EC. Traffic: W5TFB 192, KP8 182, BEH 122, PAK 114, WFP 103, DR 64, CF 30, GER 29, AHC 26, DVT 15, HBD 14, RDG 6, LCY 5, OCY 4.

OKLAHOMA — SCM, Dr. Will G. Crandall, W5RST — Asst. SCM: Ewing Canady, 6HIQ, SEC: CKQ, PAMA: SVR, ROZ. Wanted: One RM. Will someone eligible please volunteer as Oklahoma needs a Route Manager to coordinate its c.w. traffic nets? YQO needs only Vermont to complete WAS on c.w. The Aeronautical Center Amateur Radio Club entertained about 25 prospective hams at its April meeting. GWD/5 and HGC are working together on their rigs to their mutual advantage, reducing local interference. 75-meter mobiles seem on the increase with better efficiency. Many of the Army MARS stations have received their BC-669s and some have them on the air. A definite increase of MARS interest and activity is noted, probably because of the policy of issuing surplus equipment. The Tulsa gang has a good turnout for Sunday emergency roll call and usually has a hidden transmitter hunt afterwards. Comanche County (Lawton) also has a good showing. I am glad to see the development of more mobile loops as with a little organization it will be fairly easy to track down some of these intentionally-interfering stations who disrupt net traffic-handling. I would like to see published instructions on how to zero beat a station or net without tuning the final for several minutes. Traffic: W5YZB 155, SWJ 119, GVS 116, PML 81, MQI 68, MFX 60, YQO 57, STR 54, KY 53, SVR 39, ITF 31, FEC 26, VEP 26, HQZ 25, TNW 23, ADC 21, EHC 20, ESB 19, LX 18, PNG 14, VAX 14, ROZ 13, WTA 13, VBG 7.

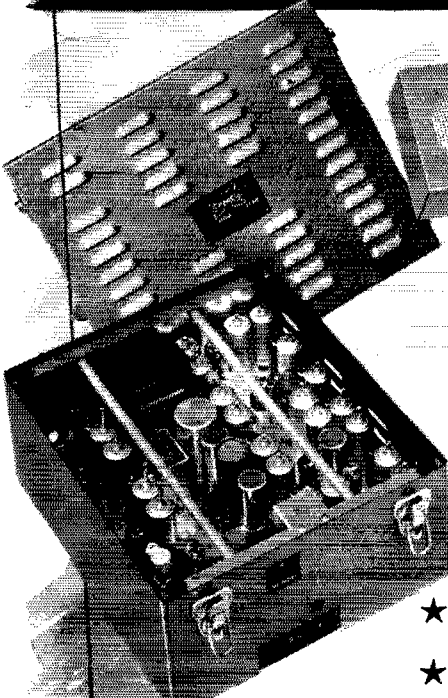
SOUTHERN TEXAS — SCM, Dr. Charles Lermaglich, W5JFF — BW and DRA are planning a trip to Houston. The Temple ARC had a family picnic on Mar. 14th. The Club now holds regular Sunday on-the-air drills at 8:15 a.m. The Temple boys are going mobile. Among them are DDX, GKR, JIB, LM, PNP, TTF, UKY, and VRN. WDW is building a modulator and expects to be blasting 75 meters with a BC-457. 4TRY/5 is doing an FB job as EC at Harlingen A.F. Base. RSN, BYL, and TRY are checking into STEN. ZMG has a new Viking and 40-ft. vertical. CMM is leaving for the Philippines. TRY is going mobile. 6IZT is conducting code and theory classes. The following officers were elected recently by the Houston ARC: JFF, pres.; ADZ, vice-pres.; CE, treas.; Wade, secy.; YES and NMG, board members. Plan now to attend the STEN Convention to be held in Kerrville May 29th and 30th. The ARRL West Gulf Division Convention also will be held in Kerrville Oct. 2nd and 3rd. Details may be obtained and reservations made through FNH for both. The 4th Annual New Mexico State Ham Picnic will be held near Silver City, N.M., June 5th and 6th. All hams are invited and full details may be had from the N.M. Breakfast Club, which meets every morning between 0700 and 0830 MST on 3833kc., or contact ZU, SCM New Mexico. Your SCM is holding up work on his new kw. to visit ARRL Headquarters and the

(Continued on page 106)

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MOBILE PACKAGE

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25- 50 MC - 25 Watts Output } 8/4 Amps.
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- ★ Change from 6 to 12 volts by merely reversing voltage selector plug.
- ★ Rugged construction with heavy duty power relay and fuse for engine compartment mounting.
- ★ Dual frequency provisions built in every unit.
- ★ Readily obtainable 6 volt tubes and vibrator used. 6146 Final amplifier.
- ★ Can be mounted under dash or almost anywhere. Case 11"x12 $\frac{1}{2}$ "x5 $\frac{1}{2}$ ".
- ★ Low cost maintenance with COMCO color code tuning.
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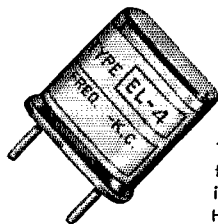
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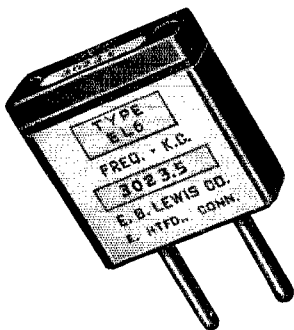
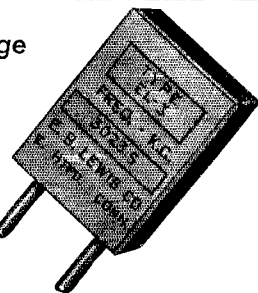
**GOV'T TYPE
CR-18/U**

1,000 KC to 15,000 KC on
fundamental. 486" pin spac-
ing, .050" diameter.
HERMETICALLY SEALED UNIT

General Usage

**GOV'T TYPE
FT. 243**

450 KC to 15,000
KC on fundamental
1/2" pin spacing,
.093" diameter.



Aircraft

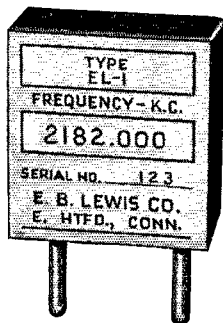
**GOV'T TYPE
CR-1A/AR**

600 KC to 15,000
KC on fundamental,
1/2" pin spacing,
.125" diameter.

**Mobile and
Marine**

**GOV'T TYPE
CM-1**

450 KC to 15,000 KC on
fundamental 3/4" pin spac-
ing, .125" diameter.



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F.C.C. in Washington, D. C., to get the full particulars as to what is going on. Look for my report next month. Traffic: W5MI 1633, FJF 31, W4TRY/5 7.

NEW MEXICO — SCM, G. Merton Sayre, W5ZU — SEC: MYL, PAM: BIW, V.H.F. PAM: FPB, RM: NKG. New officers of the Tularosa Valley ARC are KDX, pres.; JMM, vice-pres.; RFK, secy.-treas.; SEP, prog. ch.; RFF, stn. mgr.; NEH, pub. ch. New appointees: AFB, BIH, and QHK as OO; WNU as ORS. QHK was one cycle high in the February F.M.T. and his average error with two readings was 4 parts per million. The fourth annual New Mexico State Ham Picnic will be held June 4-5 seven miles north of Silver City, N.M., at the Little Walnut Camp Ground. All hams from surrounding states are invited. There will be hidden transmitter hunts, mobile judging, a movie Sat. night, swapfest, gabfest, program, and a big picnic. DNT and DUB are new Novices in the State. ARB has a Viking II, UJV has a new mobile. The Albuquerque V.H.F. Net is going to 146.802 Mc. so Novices can participate. NSJ and WQS are stirring up interest in 430 Mc. ZFS is getting on there, too. SUY reports four new Novices and more are trying. He has the new 829B rig completed. The New Mexico Breakfast Club on 8838 kc. is very popular. Bill, K5FEF, made B.L. Traffic: K5FEF 539, W5LLG 44, HJF 31, WPA 30, UJV 25, ZU 20, CEE 15, BIW 14, NUN 10, BIH 9, YWG 9, RFK 8, BZA 6, WBC 3, BZB 1.

CANADIAN DIVISION

MARITIME — SCM, Douglas C. Johnson, VE1OM — Asst. SCM: Fritz A. Webb, 1DB. New appointees are as follows: SEC: RR, PAM, OC, EC for N.S.; DQ, Asst. EC for N.S.; FQ, OO; WD OPS; LY, OES; PQ. Visitors to the IRE Convention in New York City were WL, QZ, and OM. Ex-VE1AT now is VE2XB in Quebec Bush. HJ is active from new Dartmouth QTH. DQ is getting the 3.8-Mc. mobile dusted off for summer operations. SE, secretary of MPN, reports 19 more members eligible for net certificates. BN had an average accuracy of 31.4 parts in one million for two measurements in the February F.M.T. VO1D reports the following Newfoundland news: IP is rebuilding, IH is active on 40 and 20 meters, LI is going mobile, IM is back in town, IR is working on 20-meter beam, IX has sold the rig and is planning QRO, IZ has Lettine 240 rig, IAB has new QRP portable, IAC and IAO are moving into new QTHs. IAB is mobile, IAH is back on 75-meter QRP, IAI is on 10-meter 'phone, 2AA is on 'phone, 2B has new parallel 4-125As, W2IOL/VO2 is QRL traffic on MARS, W4WOU/VO1 worked a W4 on 10 meters while mobile, W1QDM/VO1 is back Stateside in W3 now. Traffic: (Mar.) VE1FQ 261, VO6U 173, VO6B 143, VO1T 45, VE1ZM 42, W4WOU/VO1 31, VE1WK 25, VE1QM 23, VE1QT 22, VE1UT 21, VE1-AAR 16, VE1OM 16, VO1D 7, VE1DB 3, VO2AA 2, (Feb.) W2IOL/VO2 89, VO1T 51, VE1UT 23, VO1D 4.

ONTARIO — SCM, G. Eric Karquhar, VE3IA — The Emergency Corps of Hamilton, made up of members of the Mohawk Radio Assn. and the Hamilton Amateur Radio Club, put on a very successful simulated emergency test before a large gathering of Beach Home and School Assn. It was held on the same evening that a real emergency was taking place at the western end of this section when a blizzard crippled communications and isolated many localities. AJR reports lots of fun in the YL/OM Contest. AUU, newly-appointed ORS, has completed redecoration of his shack. A hearty welcome to DTP, a newcomer to our fascinating hobby. A very interesting talk on the origin and manufacture of crystals was delivered by Mr. David Eisen to a well-attended meeting of the Westside Radio Club, Toronto. News reaches your scribe via the grapevine of two hamfests, both highly successful, held at Scarborough and Oshawa. May we request that news to be sent us via ham radio, mail, or personal contact. Congratulations to DBD and his XYL on the arrival of a jr. operator. Hamilton ARC members were treated to an excellent film showing of the Hydro Electric Power Commission's tremendous undertaking of conversion from 25 cycle to 60 cycle. The Gray-Bruce County Radio Club has well-attended twice-monthly meetings. The Kitchener-Waterloo Radio Club members were guests of the Bell Telephone Company in a conducted tour of the local exchange. The Ottawa Ski Patrol has done yeoman work during the past winter. Some two hundred skeds have been kept and much traffic of an emergency nature has been handled for the St. John Ambulance Brigade. Congratulations are extended to WT on his election as president of the Burlington Chamber of Commerce. R. G. Anthes, of T.V. Engineering Dept. of Canadian Westinghouse, spoke on the "Basics of Color Television" before the Mohawk Radio Assn. Traffic: VE3ATR 161, BUR 154, AJR 109, KM 55, GH 52, NO 41, IA 27, AUU 23, BQL 22, DU 22, AOE 17, DQX 14, EAB 9, VZ 6, EAU 5, VD 2.

QUEBEC — SCM, Gordon A. Lynn, VE2GL — It is with regret that we add another old-timer to the list of Silent Keys. LP, who had been active for more than 20 years, was well known throughout the Province and, while an old-time amateur, was only 47 years old. The sympathy of the gang is extended to his XYL, ADL, UN, the station of the McGill University Radio Club, having a membership of 40 with rigs of 807 in November to 304TH in February, (Continued on page 108)

tvⁱ PROOFED**

*Certified Field Measurements**



Actual measurement of radiation using RCA field intensity equipment. Note close proximity of TV antennas without TVI.

TVI Proofed. What does it mean? Below are excerpts from Certified Field Intensity Measurements using factory calibrated commercial measuring equipment of Eldico TR-1TV amateur transmitter.

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***TVI-proofed means special circuitry, shielding, and filtering to eliminate spurious and harmonic energies that result in television interference.*

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EXCERPTS FROM FIELD REPORT

Transmitter

Eldico TR-1TV
Final—4E27A/5-125B
Power input—300 watts
(1500 V.D.C. at 200 ma.)
Modulation—400 cy tone—100% A.M.

Antenna

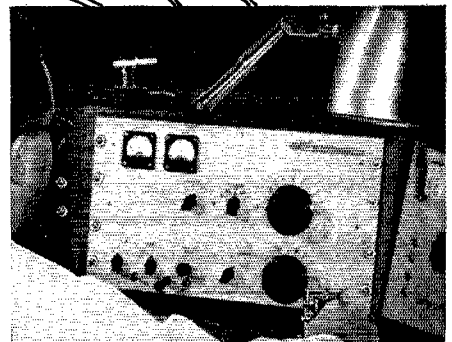
3 Element rotary beam
52 ohm coaxial feed

Measuring Equipment

RCA Model 301
RCA Model 308

Results

Fundamental—14,250 KC—750,000 $\mu\text{v}/\text{m}$
2nd Harmonic—28,500 KC—132 $\mu\text{v}/\text{m}$ (75 db. down)
3rd Harmonic—42,750 KC—107.5 $\mu\text{v}/\text{m}$ (77 db. down)
4th Harmonic—57,000 KC—32 $\mu\text{v}/\text{m}$ (87 db. down)
Higher order harmonics in noise level



Exciter Final TR-1TV in operation in W2UOL's console.

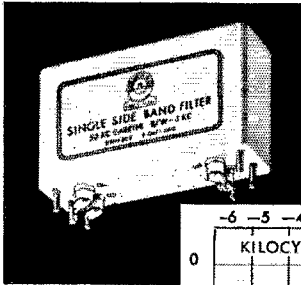
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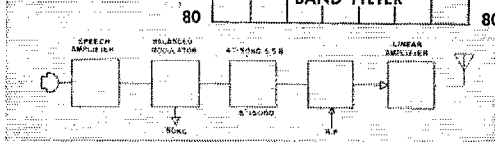
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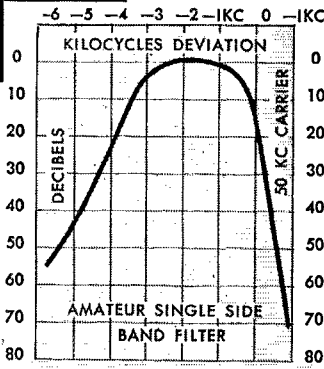
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has worked over 200 stations in 52 countries, and will be closing down at the end of May for the summer. New officers of this club include ACK, pres.; ATG, vice-pres.; AQL, treas.; and AQE, secy. AQT will leave for Kingston at the end of the term where he will be heard from VE3RCS. BK finally has gotten back on the air. ADK is in the hospital for surgery. AGF has an R201 receiver, triple diversity job, over 100 tubes! OB took part in the Frequency Measuring Test with good results. EC continues skeds with AEM, ACS, RJ, APT, and AGP. WK is putting up a new doublet replacing the Zepp and worked KV4AA and KV4AP on 160 meters. The Hull gang held its annual party on Mar. 19th with the grand prize being won by VE3KF. Traffic: VE2DR 262, BB 44, EC 34, LO 28, GL 24, LM 20, ATQ 15, GK 6.

ALBERTA — SCM, Sydney T. Jones, VE6MJ — WC reports that conditions have improved on 7 Mc. and the Maple Leaf Net is handling traffic again. OD has lost the title of the "Romantic Station," his daughter having been married. YD was heard to complain that with three daughters he is always in the dog house. YN and his XYL made a fast trip to the city and took in square dancing. FB and GW now are holding forth on 14 Mc. XD has moved to a new location in the city. MJ has built a new scope for modulation checking. WS is busy installing mobile in the new car. YE and IE are holding regular skeds on 3.8-Mc. 'phone. JJ proposes to vacation in the East for a few months. PV has a new rig under construction. MD is sporting a new C2 frequency meter. NX, WS, and MJ have received membership in the A-1 Operator Club. ZR is in charge of plans for the annual Field Day. Your SCM will welcome reports for inclusion in this column. His address may be found on page 6 of any issue of QST. He also will welcome any request for field organization appointments such as ORS, OPS, and OO. Qualify for one or more of these appointments and enjoy your amateur radio that much more. Traffic: VE6HM 69, OD 37, WC 14, MJ 6.

BRITISH COLUMBIA — SCM, Peter McIntyre, VE7JT — Thanks to AKG/7 for his letter. At least one person took heed of my request for letters. Of course the island correspondence was there as usual. Some of the fellows in Victoria and Nanaimo were visited and their points of view obtained. Thanks for the hospitality, fellows. The March transmitter hunt was run by the VARC with ABI and AOB as the operators. It was on 2 and 75 meters. AHP came in first with the help of ND and Green. Without their help yours truly came in third, followed by HE. Next in order were EW, XQ, and AV. AHP made good use of a very good bit of d.f. equipment and on the logging map he pinpointed the spot within two blocks. Good going, Les and Ted. Our V. I. correspondent says that ALL, JI, and DH are active on 2 meters with AHH, AQS, AQB, and NT on and off and SH temporary QRT. WO/M was railroaded to look after the affairs of the mobile club for the coming year. There are over thirty mobiles in Vancouver of which only 50 per cent are really active. Let's go, fellows, get in touch with WO and let's have some bang-up mobile activity this summer. The AREC still maintains a good check-up and new members are checking from new parts of the Province. Welcome, fellows. Traffic: VE7QC 44, DH 31, FS 4.

MANITOBA — SCM, Leonard E. Cufé, VE4LC — AI, AO, and KG were visitors to the Sportsman's Show in Winnipeg in March. The Amateur Radio League of Manitoba, Inc., had stations set up on 20 and 75 meters and handled a considerable amount of traffic. EQ will be heard with new all-band rig using 813 in the final. AY has been laid up. OS is reported to be the proud possessor of one of the finest collections of both new and antique recordings. RA has moved to Brandon, where he is in charge of the new D.O.T. office. OB is active from Flin Flon on the 75-meter 'phone band. JK is rebuilding. WØHNW was a visitor to Brandon recently renewing old acquaintances. SC is busy with 144-Mc. rig. JF has a new Viking II rig. HL, DE, RN, and FD were visitors to OS at Carmen recently. KN has been having trouble with her rig. YM may be heard on 75 meters occasionally. VE8AS is a new one at Flin Flon. AZ will not be on 'phone for sometime as his speech has been impaired by the loss of all his teeth. Our congratulations to BN and his XYL on the birth of a YL Jan. 6th. VE7XV, ex-4HV, passed through Winnipeg Mar. 27th on his way to Coal Harbour, Vancouver Island, and asked if we would pass his regards along to the VE4 gang. 3ABU, ex-4BS, now is at Armstrong, Ont., and is looking for the gang on 80- and 40-meter c.w. New and re-issued appointments this month are BV, RJ, NO, JS, AP, BR, GS, GT, QG, TX, UR, ZA, DD. Traffic: VE4AZ 8.

SASKATCHEWAN — SCM, Harold R. Horn, VE5HR — It has been good to see more activity on the bands now that conditions have improved. The 'phone net has picked up again and welcomes new members. If your call is missing from roll call it is because of your inactivity and you will be replaced if you wish. BG has had his ticket endorsed for 28-Mc. 'phone and is looking for contacts. Ex-8WM is the new Radio Inspector at Saskatoon. Bill will be heard mobile and from his home station before long. Welcome to our midst. GO has resumed activities from Canora after wintering in Ontario. WM was appointed Moose Jaw Area EC, with RR as Assistant EC. JO has his mobile on 14 Mc. now. RL is on 75-meter 'phone at last and is going mobile, too.

(Continued on page 110)

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BRAND NEW—30 watts input on 2 meters... built-in speaker and phone jack... uses carbon mike... easily converts to any other frequency up to 250 mc.
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Super Pro Table Model RECEIVER USED—perfect condition and appearance. Complete with tubes and power supply.....\$225.00

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HIGH FREQUENCY RECEIVER DEMONSTRATOR—Complete with coils, tubes and power supply.....\$125.00

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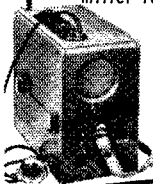
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MASTER MOBILE Hy-Q—center loading for 20, 40 or 75 meters.....\$13.95

MASTER Hy-Q Coils—for 20, 40, or 75 meters.....each \$6.95

MALLARD Hi-Q Base Loading Coils. 20 meters.....\$8.95
40 and 75.....each 7.95

SHERRICK Lucite 'Clip-in' Coil

Housing—with coil for 20, 40 or 75 meters...including 10-meter clip \$15.00

Top and Bottom Sections to complete whip.....\$6.95
Clip-in Coils.....each 4.00

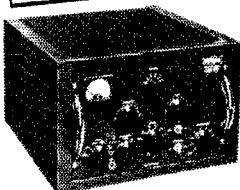
MASTER MOBILE No. 100-96S—10-meter stainless steel (96") whip antenna. 3/8-24 thread base.....\$5.25

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Same—in Stainless Steel.....14.95

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Complete Kit with Tubes.....\$159.50

Factory Wired and Tested.....198.50

External VFO Head.....19.95

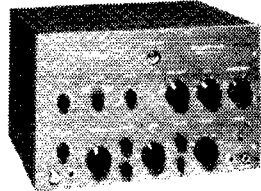
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Portable Mobile Receiver

A complete 10-tube dual conversion, communications receiver. Provides coverage of 6 bands from 10 to 80 meters as well as broadcast and 160 meter band.

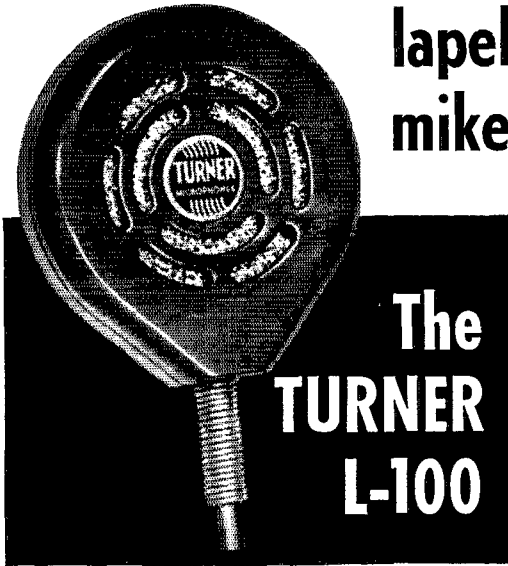
Dimensions: 4 1/2" high, 6" wide, 8 1/2" deep. Weight: 6 1/2 lbs.

Complete with tubes.....\$134.50 (less power supply)

PSR-6 Power Supply for above.....\$24.50 Specify 6 or 12 volts operation

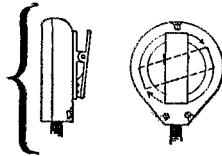
PSR-1165 115v. AC Power Supply with Built-in S Meter.....\$34.50

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Models L-100, L-100C (with clip and 20 ft. cable) List price.....\$12.50

Models 100, 100C (without clip and with 7 ft. cable) List price.....\$8.00



HR, LU, JK, and TL attended a Moose Jaw Club meeting to discuss hamfest and other matters. Congratulations, fellows, on the fine work done in amassing the highest traffic totals for many months. Keep it up. Don't forget Field Day and let's make it one of the best yet. Traffic: VE5DS 46, CI 89, HR 30, RE 26, OB 8, DN 6, GX 6, LE 6, CW 5, MA 4, DH 2, MX 2, WH 2, QL 1.

WWW-WVVH SCHEDULES

FOR the benefit of amateurs and other interested groups, the National Bureau of Standards maintains a service of technical radio broadcasts over WWV, Beltsville, Md., and WWVH, Maui, Territory of Hawaii.

The services from WWV include (1) standard radio frequencies of 2.5, 5, 10, 15, 20 and 25 Mc., (2) time announcements at 5-minute intervals by voice and International Morse code, (3) standard time intervals of 1 second, and 1, 4 and 5 minutes, (4) standard audio frequencies of 440 cycles (the standard musical pitch A above middle C) and 600 cycles, (5) radio propagation disturbance warnings by International Morse code consisting of the letters W, U or N, together with digits from 1 through 9, indicating present North Atlantic path conditions and conditions to be anticipated. (See June, 1952, *QST*, p. 19, for details on interpretation of forecast symbols.)

The audio frequencies are interrupted at precisely one minute before the hour and are resumed precisely on the hour and each five minutes thereafter. Code announcements are in GCT using the 24-hour system beginning with 0000 at midnight; voice announcements are in EST. The audio frequencies are transmitted alternately: The 600-cycle tone starts precisely on the hour and every 10 minutes thereafter, continuing for 4 minutes; the 440-cycle tone starts precisely five minutes after the hour and every 10 minutes thereafter, continuing for 4 minutes. Each carrier is modulated by a seconds pulse, heard as a faint clock-like tick; the pulse at the beginning of the last second of each minute is omitted.

Tubeless VFO

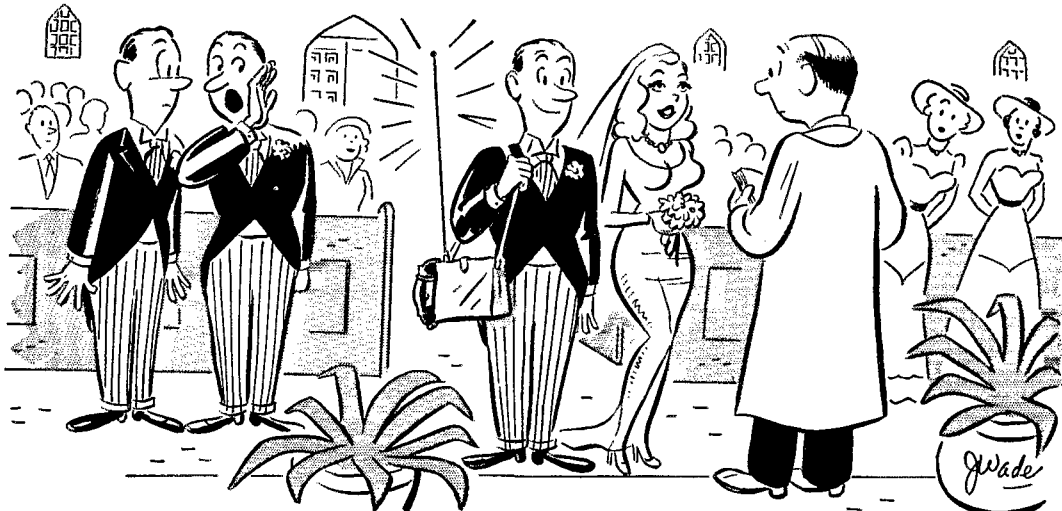
(Continued from page 29)

This is the only ground on the circuit; the vinyl covering of the cables insulates them where they go through the rear of the box. A single ground point was used in order to prevent chassis currents through multiple paths, a condition that sometimes is responsible for a "burbling" in the oscillator frequency.

The unit has been in regular use at W1MBK since getting into its present form, and the results have been highly satisfactory. The d.c. voltage on the oscillator section of the 10A is unregulated, so it would not have surprised us if some f.m. had showed up, but a careful check against a small amount of inserted carrier (and also on straight a.m.) showed no identifiable f.m. effect. The signal characteristics are identical whether this unit or the BC-457 that formerly served as a VFO is used. — G. G.

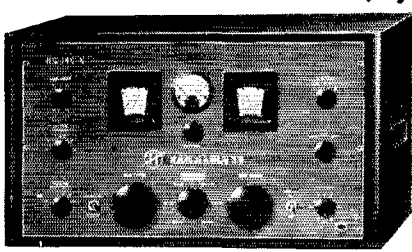
**SWITCH
TO SAFETY!**



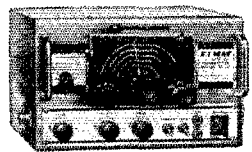


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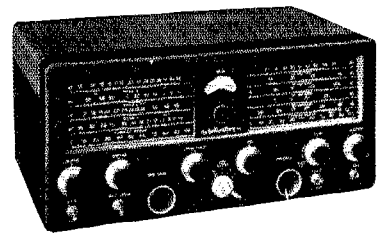
75 watts CW input, 65 phone. Bandswitching 160 through 10 meters. Self-contained VFO, modulator and power supply. TVI suppressed. Model 240-161.
Net \$179.50

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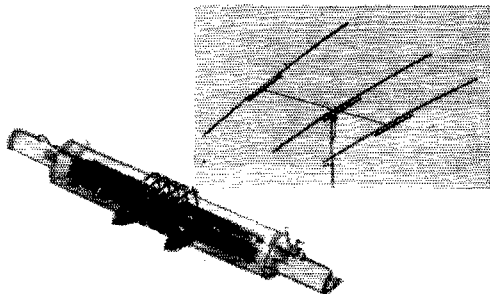
Rush copy of latest Catalog.

Name _____
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NOW AVAILABLE!

Pre-Wound Coils for the VEST POCKET BEAM

as shown in QST, May, 1954



BELOW: Close-up — ABOVE: Installation

TUNED—READY TO INSTALL

Set consists of three coils (reflector, director and driven element) wound on $\frac{3}{4}$ " polystyrene bars complete with coil covers and end plates. Driven element coil includes 5-turn link for 52-ohm coax line.

All coils are wound and tuned by W0QFG and W0VZC, designers of the VEST POCKET BEAM. Coil assemblies are complete and ready to install.

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3 COIL
ASSEMBLIES

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Since the element lengths for the VP Beam are about the same as those for a 10-meter beam, it is a simple matter to convert to 20-meters provided the inside diameter of the center section is $\frac{3}{4}$ ". Bring your 10-meter beam out of moth balls and start working on 20.

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VP
BEAMS

VEST POCKET BEAM CO.

6635 Delmar Blvd., Room 324, St. Louis 5, Mo.

Radiotelephony

(Continued from page 15)

half. The plate current drops to one-half (approximately) of its previous value. If then we think of the screen circuit as the R of Fig. 8A, we see that we can swing the screen from this value up to a safe peak value or back down to zero, for 100 per cent modulation. But here's the unhappy part. When we modulate the screen, we have an efficiency-modulation system quite parallel to control-grid modulation, and the output obtainable with a screen-grid-modulated stage runs just about the same as it does for control-grid modulation of the same stage. Screen-grid modulation may be a little easier to apply and adjust in some cases, but it is no end-of-rainbow pot-of-gold deal. Clamp-tube modulation is simply a resistance-coupled version of screen-grid modulation.

You may run into "cathode modulation," which is a combination of grid and plate modulation. Here again you don't get something for nothing — the more modulator power you can supply, the more nearly the system approaches plate modulation and maximum output for a given r.f. amplifier tube.

Peak Power Input

Some time you're going to run into a sage who will mention that the "peak power input" to your 100 per cent plate-modulated 'phone rig is 4 times the unmodulated d.c. input, and as proof he will point out that on positive peaks the voltage is doubled on the modulated stage. (This is the same as the peak of E_{max} in Fig. 8B.) He will show that the doubled voltage is equal to $2 E_{dc}$ and that therefore the power is $(2 E_{dc})^2 \div R = 4 E_{dc}^2 \div R$. Then he'll try to confuse you by asking where this extra power comes from since your modulator and d.c. supply together only furnish a power equal to $1\frac{1}{2} E_{dc}^2 \div R$. Don't let him snow you — you just remember back to those earlier paragraphs about "instantaneous power" and ask him where the power is hiding on the negative peaks!

The power delivered by the a.c. source, E_{ac} , is an average figure as measured by any practical measuring equipment. In other words, the meter looks at the various "instantaneous powers" over a cycle, averages them (the values in Fig. 9D) and comes up with an answer. The a.c. source, E_{ac} , is working hard some of the time and coasting some of the time to come up with the figure indicated by the meter — your heckler is picking one small fraction of the time and trying to confuse you with it.

Linear Amplifiers

As a last resort in your search for power, you may wonder about modulating a low-powered stage and then building up the power level in a following (linear) amplifier. If the modulated stage is really low-powered (5 or 10 watts r.f. output), and the following linear amplifier has high sensitivity (requires little driving power), you can sometimes gain from this system in

(Continued on page 114)

RADIO SHACK EXCLUSIVE! — \$18.50 FAIRCHILD 1/4" DRILL

With 90-Day FAIRCHILD Factory Guarantee!

\$ 9⁹⁵

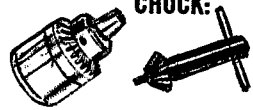


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Ship. wt. 3 lbs

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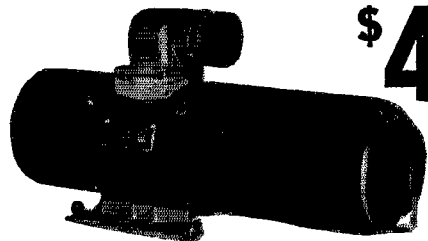
\$1⁰⁹

Trailer-load special purchase for "do-it-yourself" fans, labs, schools. Top quality no-brush no-streak pushbutton spray paints and plastic at record low prices. Alkyd enamel paints include new colors and new Appliance White for kitchen units! Ship. wt. 1 1/2 lb. per can.

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16-306Q	Gold Leaf
16-300Q	Pure White
16-933Q	Appl. White
16-932Q	Gloss Black
16-308Q	Flat Black
16-309Q	Indus. Gray

Ord. No.	Color
16-301Q	China Red
16-303Q	Royal Blue
16-934Q	Light Blue
16-935Q	DK. Green
16-302Q	Br. Green
16-304Q	Yellow
16-931Q	Orange
16-936Q	Pink

PE-101C DYNAMOTOR FOR 6, 12V MOBILE OPERATION!



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REG. \$45.00 VALUE! SAVE \$40.12

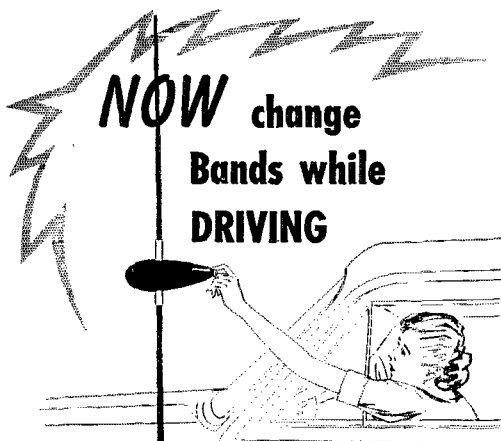
A sensational value you see once in a blue moon — and then only at Radio Shack! Brand new — made by Wincharger Corp. for aviation use, but easily converted according to conversion and descriptive data INCLUDED with unit. Search no more for PE-103 or equivalent because this is IT and priced like you want it — \$4.88.

Converts to furnish: 6VDC in; 300V @ 90 ma. and 160V @ 110 ma.; 12V in; 610V @ 150 ma.; and 325V @ 125 ma. secondaries. Base mtd., size: 13" x 4". Absolutely new and in original cartons. Unless we find more, quantities are LIMITED. Ship. wt. 12 lbs. Order No. R-5091Q.

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NEW... Bassett
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**Puts 6 Band Operation
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**Just Turn
The Knob**



Here is real convenience in a mobile antenna that mounts within easy reach on fender, giving you instant change to all mobile bands without stopping or getting out of your car. You simply flip frequency change control to the desired band. Coverage is from 3.5 Mgc. to 30 Mgc. adjustable while in motion. Streamlined plastic "teardrop" houses all components; provides low wind resistance, actually enhances appearance of vehicle.

EASILY MOUNTED—The Bassett Model ATR-6B Mobile Antenna comes equipped with standard $\frac{3}{8}$ " threaded fittings for use with standard whip rods. Will handle 100 watts. Readily mounted anywhere on vehicle.

**SEND FOR FOLDER AND NAME
OF YOUR NEAREST JOBBER**

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BASSETT BLDG.
FORT LAUDERDALE, FLORIDA

terms of over-all size, weight and *total* power consumption. It hasn't found too much favor in amateur circles because the efficiency of the amplifier is lower than for a plate-modulated amplifier, and a kilowatt input to the amplifier only gives a carrier output of about 300 or 350 watts. This gives a plate-modulated kilowatt input station a power advantage, since he may have a carrier output of 650 or 700 watts.

Linear amplifiers are inefficient on a. m. because their operating conditions must be adjusted to handle the signal swings above and below the carrier amplitude. If the carrier can be reduced some of the time (controlled-carrier telephony), or eliminated (single-sideband telephony), linear amplifiers show to much better advantage.

If you have come this far, and we didn't lose you somewhere along the way, you should have a fair start toward understanding radiotelephony. It should be a help in evaluating "new" modulation methods when someone springs one on you.

[Part III of this article will appear in a subsequent issue. — Ed.]

50-Mc. TVI

(Continued from page 25)

is to go on the air and *stay* on. You have every right to do so!

Remember that a commercial high-pass filter capable of doing the 50-Mc. job is not as yet available and that the average TV serviceman has not heard of the 6-meter amateur band. This leaves the TV set owner in a rather helpless position. If you are willing to operate consistently until you are sure of the extent of the interference, you might then write to the manufacturers giving case histories of the various sets. This approach would probably do a lot of good in the long run. I should have taken it myself but did not. I built several filters and traps for installation in neighbors' sets. A suitable trap is shown in Fig. 5.

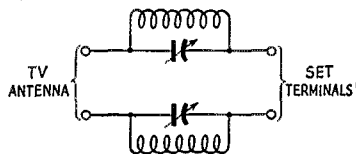


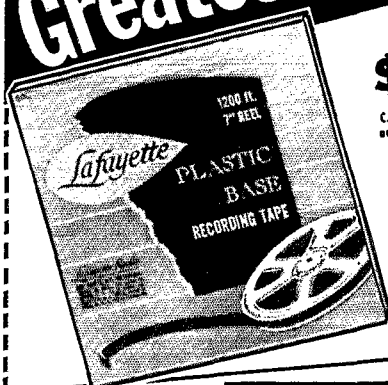
Fig. 5 — Dual trap for insertion in antenna line to TV set. Trimmers are a dual ceramic 7-45 μ f. unit. Coils: 6 turns No. 16 enamel, $\frac{1}{2}$ -inch diameter, $\frac{1}{2}$ inch long. Install trap in TV line at antenna terminals and tune for minimum interference. This type of trap is useful mainly for mild interference cases. A more effective treatment is the high-pass filter to be described in a future article.

Most of your neighbors will probably be willing to buy the parts if you will make filters. In my case, some sets were cleaned up by hanging the filters on the antenna terminals. On others the filter had to be installed on the TV set chassis before curing the trouble. The standard excuse for not working on someone's TV

(Continued on page 116)

Lafayette Greatest Tape Buy Ever!

1200 FT. REEL
Genuine Plastic Base
RECORDING TAPE



\$1.89
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LAFAYETTE made a terrific deal with one of the leading manufacturers of recording tape to supply you with their regular tape which sells for almost twice our price. WE GUARANTEE ABSOLUTE SATISFACTION OR YOUR MONEY BACK. The finest, professional-quality recording tape obtainable. Highest performance for thousands of playings; Red Oxide Base in a smooth, uniform coating; greater signal strength; with maximum fidelity; uniform frequency response from 40-15,000 cps at 7 1/2" per second; and freedom from background noise and distortion. Each reel is individually boxed. Shipping weight 10 oz.

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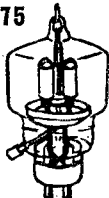
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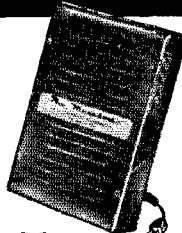
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Type 5BP1. Perfect for OSCILLOSCOPE USE. Green fluorescence—medium persistence 6.3 volt heater; Anode No. 2 Voltage 2500; 11 pin med. magnal base. Shpg. Wt. 3 lbs.

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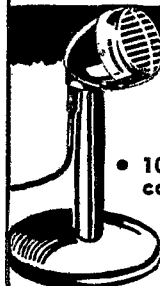


MASCODE MODEL ABV AUTO. ALL CHANNEL VHF 3 TUBE TV BOOSTER

Features a new low-noise cascade circuit. Fully automatic — no tuning. Best for all TV receivers, old or new. Boosts all channels 2 to 13 — automatically! Brings up station strength an average of 18 times on all channels 2 through 13. Low noise factor (approximately 6). Automatically turned on and off by the TV set. Concealed behind TV receiver. Mount it and forget it. Employs new 6BK7-A tube for snow-free reception with new high gain-low noise TV receivers. 3-tube circuit includes two 6J6 tubes in push-pull, cross-neutralized RF amplifier circuit. All-metal cabinet, brown, hammertone finish. U/L approved. Undistorted sound and picture on all 12 channels. Engineered for maximum performance. Size 9" x 5" x 3" Shpg. wt. 4 lbs. MODEL ABV VHF-TV BOOSTER. List \$39.50

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Top Quality CRYSTAL MIKE



\$575 • —52 db output level
• Range 30 - 10,000 cps

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A really fine microphone by a manufacturer known the world over. Use for amateur broadcasting, public address and home recording. Can be used with floor stand. Shpg. wt. 2 1/2 lbs.

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Primary 117 VAC; Plate voltage 670 V.C.T. at 280 ma—tapped at 230 V—30 ma; rectifier 5 volt at 3 amp, Fil. #1—6.3 volt at 8.3 amp, Fil. #2—6.3 volt at 1.2 amp. Exact replacement for Arvin Model TE332 Part No. EB25696. Shpg. Wt. 12 lbs.

4.50 TR-23 4.50

Lafayette Radio

DEPT. V F

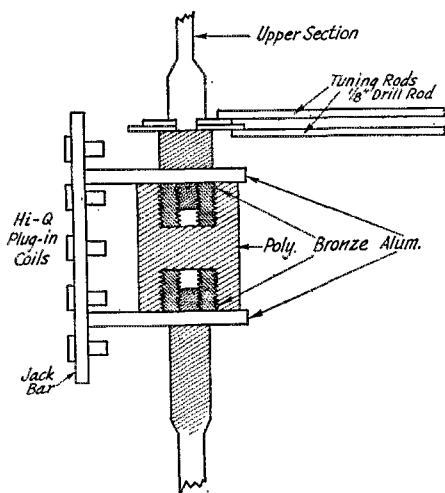
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AS SEEN in QST

"The Hot Rod"

Sept. 1953,
page 18



Antenna Mounting Details

Better Antenna?

Look through the last twelve issues of *QST* at the

27 articles, covering

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set is that you will be blamed for all future troubles with that set. I am glad to say that this has not happened to me. I have installed eight filters within 250 feet and five traps beyond that range. One of these filters is on my own set. This is the total number of sets that I have had to work on. *The installation of these filters has enabled me to operate on 50 Mc. and on all lower frequency bands without overload troubles.* You may justifiably argue that it is not the amateur's responsibility to correct overload troubles, but may I point out that *I am on the air at any time I wish.*

Correcting Sound Interference on Channel 2

The five traps that I have installed beyond the 250-foot range were to cure intercarrier sound image responses of these TV sets. This type of interference has probably discouraged more 6-meter hams than any other. They hear of a case of sound interference some distance away and immediately assume that they are bothering hundreds of TV sets. No assumption could be more erroneous. In most cases the sound interference can be cleared by proper use of the fine tuning control. Some sets will give trouble until properly aligned, and the performance of these sets is invariably improved by alignment. Sets that are real bad actors are usually scattered over a large enough area to make one believe that he faces an impossible situation. It is impossible if you are a timid soul. If you have red blood and stick with it, you will find that the cases of TVI that you hear about immediately are about all that you will have. The number of sound-interference cases can be greatly reduced by operating below 50.3 Mc. The space between 50.6 and 50.9 Mc. should be avoided in any Channel 2 area if possible.

In the last year, 6-meter activity in northern New Jersey has picked up. Eight 10-watt transmitters of a type designed by the writer and known as the "Lil Lulu" have been consistently operating without any serious TVI. The worst offender of all has had three cases, his own set and two others. Does this sound like an impossible situation? Some of our old-timers have apparently been impressed because they are getting back on. Several more of these little rigs are under construction.

Don't underestimate what can be done with 10 watts. Give a clean, low-powered rig a chance. You will find little or no TVI and you will work out. W2WCM worked 15 states in the first year of operation even though he missed many of the best band openings. Once you are convinced that it can be done, you may wish to increase power. By then, you will know what to expect and will find that higher power can be used if you wish to expend a little effort. This effort has been no more on my part than that expended in writing this article. See you on 6 soon!

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LOW TERMS

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Bob and Ted Henry, with stores in Butler, Mo. and Los Angeles, Calif., carry complete stocks of all ham equipment for immediate delivery. Bob and Ted, being hams themselves, know you want easy terms, truly top trade-ins, low prices, and fast delivery, and you get them all from Henry.

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Henry *wants* to trade and he trades *big*. YOU get truly liberal allowances on your equipment. Tell us what you want to trade. We also pay cash for used equipment.

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You get the best terms anywhere because Henry finances all the terms with his easy time payment plan. 10% down (or your trade-in accepted as down payment), 18 months to pay.

complete stocks

Henry has *everything* in the amateur equipment field, new or used . . . transmitters or receivers, and Henry has the NEW equipment **FIRST**. Here are a few items you can order now:

B&W 5100.....	\$442.50	National NC98.....	\$149.95
Elmac PMR6A or PMR12A.....	134.50	National NC88.....	119.95
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Collins 32V3.....	775.00	Gonset Super-6.....	52.50
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Babcock MT5B.....	119.50	Gonset Communicator II.....	229.50

Prices subject to change without notice. A few prices higher on West Coast.

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Shortening achieved effectively by extremely High Q center coils in combination with end-flared elements. A completely practical electrical and mechanical design, field-tested by cooperating amateurs for nearly a year. This is a miniature beam so widely discussed on 20 meters.

OTHER FEATURES:

- Rugged, lightweight, designed for TV rotor.....
- Single 52 ohm coax line balanced at antenna for complete symmetry.....
- Excellent front-to-back ratio.....
- Low standing wave ratio.....
- **FACTORY ADJUSTED!** No subsequent tuning required

Net \$59.50 (less line)

GONSET COMPANY

801 South Main St., Burbank, Calif.

813 Transmitter

(Continued from page 39)

that you wish to order by referring to the page number on which it appears.

Undoubtedly, this follow-up on the 813 rig will not provide an answer to every question that can be asked about the unit. As heretofore, we will be more than pleased to continue corresponding directly with individuals who run into problems.

Appendix

Allen D. Cardwell Mfg. Corp., Plainville, Conn.
Insuline Corp. of America (ICA), Manchester, N. H.
E. F. Johnson Co., Waseca, Minnesota.
Radcliff's, Box 547, Postoria, Ohio.
Tekni-Labels, 232 No. Glenoaks Blvd., Burbank, Calif.

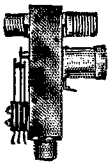
Recent Equipment

(Continued from page 46)

sons for the two positions. Or it may be there to minimize the phase distortion at the detector that can result from insufficient b.f.o. injection. In any event, we found that we needed it when receiving s.s.b. signals with the a.v.c. on and the manual gain turned up. Of course, just having a switch marked "S.S.B." doesn't solve all of the problems of receiving a s.s.b. signal — you still have to tune one in more carefully than you do an a.m. signal, and we wouldn't want you to assume otherwise. But with the wide range of available selectivity, the boosted b.f.o. injection, and the slow tuning rate, the SX-88 engineers did not overlook the features considered necessary for good s.s.b. reception. — B. G.

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Type DKC
1000 Watts
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FEATURES:

1. AC types entirely free of hum, guaranteed equally as silent as DC. Transmit contact pressure now increased to over 100 grams; receiver contacts 45-50 grams.
2. Causes negligible change in s.w.r. up to 100 mc.
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4. External SPDT switch available (Optional).
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See your distributor — if he has not yet stocked Dow Co-axial relays, order from factory. Send cheque or money order, or will ship COD. Prices net FOB Warren, Minn. Shipping weight 9 oz. Dealers' inquiries invited — literature on request — Watch our ads for line of open type relays, using our new magnet.

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Strays



The ham population of the Syrian Desert is undeniably sparse but QST really gets around. Note the catchy name of the area shown dotted above, this called to our attention by W6BCS.

FEED-BACK

In the 2-meter rig described by W1VLH in April QST, the detector tuned circuit should be center-tapped. This information was omitted from the description of L10, page 13.

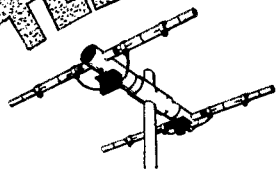
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A precision, pre-tuned 20 meter array with a rotating radius of less than 11 feet! Constructed to the TELREX high standards for mechanical strength, yet . . . the "MINI-BEAM" weighs only 12 pounds! So light that a good TV rotator will handle it with full safety!

PERFORMANCE? Just check these specs. against ANY beam! 15 db front/back ratio. 4.6 db gain over a full size reference dipole. 1:1 SWR at 14,250 kc; better than 1.3:1 at phone band edges! 7 ft. boom, 2" O.D. with 2½" reinforcing sleeve. Telescoping elements 9' 9" each side of center loading coupling coil. Built-in receptacle for 52 ohm coax.

Pretuned! No cut and try!

TELREX 2 element 20 meter "MINI-BEAM"\$77.50

ORDER NOW! Immediate delivery (until demand swamps production and lab pretuning facilities!)

ROTATOR FOR THE "MINI-BEAM"

Heavy duty, with built-in thrust and radial ball bearings. Direction indicator meter in control box. Reversible. 115.v. AC. Weather-sealed. Permanently lubricated for life.

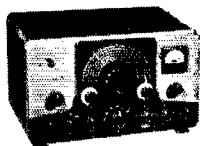
RADIART NEW TR-4\$32.37

Control and indicator cable for TR-4 rotator, per foot..... .04

Write for complete TELREX catalog, IT'S FREE!

HARRISON HAS IT . . . First!

The NEW Johnson Viking "RANGER"
 LOOK AT THESE FEATURES!



- TVI suppressed
- Built-in VFO (9" linear scale)
- Panel crystal sockets
- Band switching—10 to 160
- 75 watts CW—65 watts phone
- 6146 final—1614 modulators
- Pi output to antenna, or to KW final
- Compact, modern cabinet 15"x12"x9"

Complete RANGER xmtr. kit, with instructions\$179.50

FACTORY wired and tested (write)

Write for FREE descriptive literature!

Small PROP PITCH MOTORS

Harrison has the desirable small ones (only 42 lbs.) Will support and turn ANY combination of beam! 1 RPM. Reverses with SPST switch. Modified, hash filtered, ready to run on 24 - 32 V.AC\$29.95
 Special 110 V.AC xmtr. 7.95



HARRISON HAS IT!

in stock



KW-1

1000 WATT TRANSMITTERS

Complete with tubes \$3,850.00

75A-3 Receiver\$530.00

32V-3 Transmitter\$775.00

HARRISON HAS IT!

The New

B&W



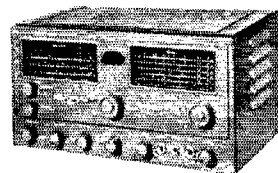
5100 Transmitter

\$442.50

HARRISON HAS IT!

THE NEW
National NC-98

IN A CLASS *by itself*



\$149⁹⁵

Speaker in matching cabinet..... 11.00

HARRISON RADIO

224 Greenwich St. • N. Y. 7, N. Y.
 Barclay 7-7777

JAMAICA STORE: Hillside Ave. at 145th St.

Hints & Kinks

(Continued from page 48)

4) Allow complete cooling before the actual soldering operation is started.

Aluminum is ordinarily hard to solder to because it oxidizes rapidly. However, by brushing molten solder into hot aluminum, the oxide is actually removed and the solder is brought into direct contact with the metal, thus assuring a good electrical and mechanical bond. Once the aluminum is tinned it is very easy to solder.

Obviously, this process cannot be used on delicate parts or hard-to-get-at places. But it is certain that anyone who does much work with aluminum will find the idea useful.

— Ray Orloski, W9SED

World Above 50-Mc

(Continued from page 63)

transmitter. He expects to be on the air soon, using a modified Philco u.h.f. converter for reception.

OES Notes

W6PIV, Sacramento, Cal.: Additional information on Robert Dollar Oscillator for overtone operation, originally reported in September, 1953, *QST*, and used in equipment described in March and April, '54, issues. Effect of varying the feed-back capacitance reported incorrectly in the first two *QST* mentions of this crystal oscillator by your conductor. Ken points out that varying the larger of the two capacitors between 0.0005 and 0.01 μ f. may have little effect on the feed-back, but decreasing the smaller increases regeneration.

At the frequencies ordinarily used in overtone oscillator work, dropping the smaller capacitor below 30 μ f. makes the crystal oscillate weakly on its fundamental, but not on its overtones. With most crystals, 40 μ f. seems to be about the low limit, and the 50-500 combination works well with a wide range of crystals. Ken says that our use of the circuit for fifth-overtone operation of a 3.5-Mc. crystal in the 21-Mc. converter of March *QST* has started the boys trying fifth-overtone use of higher-frequency crystals. Results appear to be similar to those found with other circuits; some crystals "go" and others don't. To put it more accurately, it is possible to get fifth-overtone oscillation with almost any crystal, but it is much more tricky with some than with others. Something like half of all crystals we've tried in the 7-9-Mc. region work readily on the fifth overtone. With the rest, it's a matter of careful adjustment, and usually low output, if any. With crystals ground for overtone operation it is quite another matter, of course, and 3.5-Mc. rocks seem to take off readily on the fifth and even higher overtones.

W6OHQ, Piedmont, Cal.: Unusual tropospheric opening encountered while mobile in motion, between Auburn and Suisun. Date, Feb. 7th, is ancient history by now, but events of sufficient general interest to justify reporting at this late date. Encountered heavy ground fog when approaching Roseville, and about this time heard W6EHN, Bakersfield, about 300 miles. W6NTV, Tulare, W6OPP, Bakersfield, and several Fresno stations heard with up to S8 signals, while still in motion. W6EKP, Yuba City, and W6AUO, Sacramento, were working most of the DX, but K6CKH, Auburn, who is 1600 feet above sea level, was above the fog line and was unable to make any contacts. Bay area stations some 100 miles or so to the southwest were apparently unaware of the opening.

Wayne reports that Tuesday at 2115 is 432-Mc. time. Participants include W6s DXJ MJV (San Jose Area) SDN GGV JAA (San Francisco) AJF (Sonoma) OHQ/M MXQ (East Bay) and UOV BDO VQV and YEQ (San Mateo-Redwood).

W8HCD, Dayton, Ohio: Teletype and television main interests. Working with W8PTF and W8HOH on a.f.s.k. on 2. A 5527 iconoscope nearly completed, with ideas from article in June, 1947, *Electronics*. First OES report written on teletype machine.

BUY OF A LIFETIME!
TRIED AND PROVEN THE WORLD OVER



LETTINE MODEL 240 TRANSMITTER WITH MOBILE CONNECTIONS AND A.C. POWER SUPPLY

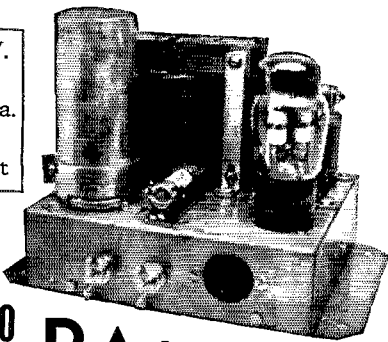
This outstanding transmitter has been acclaimed a great performer throughout the world. Excellent for fixed station, portable or mobile operation. Air wound plug-in coils used for greater efficiency — never obsolete — will take any new freq. An outstanding buy, direct from our factory, ready to operate. **NOVICES!** Save money. Buy only once. The 240 operates in the 80 and 40 meter Novice Bands, as well as the General Class Bands.

The 240 is a 40 to 50 watt Phone-CW rig for any freq. from 1.7 to 30 mc., complete with: (8 x 14 x 8) cabinet, A.C. power supply, 40 meter coils and crystal and tubes; 6V6 osc., 307 final, 6U4G rect., 6SJ7 crystal mike amp., 6N7 phase inverter, 2 6L6's PP mod. for excellent audio quality. Weight 30 pounds. TVI instructions included. 90 day guarantee. Price \$79.95.

\$25 deposit with order — balance C.O.D.
80, 20, 10 meter coils \$2.91 per set, 100 meter coils \$3.60. Also for CAP, Broadcast, M.A.R.S., Marine, State Guard, Civil Defense

LETTINE VFO & ANT. TUNER NOW IN STOCK
LETTINE RADIO MFG. CO.

62 Berkeley Street Valley Stream, N. Y.



500 V.
at
225 Ma.
d.c.
output

\$29.50

PALCO

Mobile Power Supply Kit

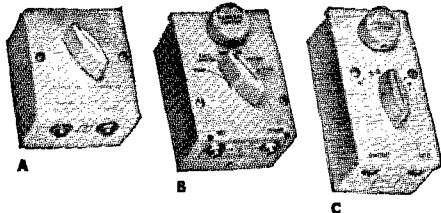
- ★ Input 6 V d.c. @ 35 Amps
- ★ No battery drain when on standby
- ★ Instant start and stop — no waiting
- ★ Low current, low voltage switching eliminates heavy duty relays in battery circuit
- ★ Heavy duty communications type vibrator for dependable, long life
- ★ Small, compact, rugged. Shipping weight 14 lbs.
- ★ Chassis 6" x 7". Overall height 6 3/4". Mounting plate 6" x 9"
- ★ In kit form only. \$29.50 FOB Indianapolis. Order from

PALCO ENGINEERING CO.

150 West 75th Street Indianapolis, Ind.

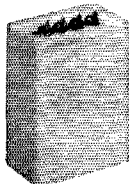
LOOK STEINBERGS LOOK

JACK BOXES



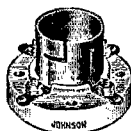
(A) BC-345, 3 1/2" x 3 1/2" x 1 7/8" aluminum, 2 standard open-circuit jacks, 3-position switch, 6-contact banana plugs and jacks.
 (B) BC-1366, 4 1/4" x 3" x 2 1/4" aluminum, 1 standard open-circuit jack, 1 3-circuit mike jack, 150,000 ohm volume control, 5-position switch, 11-contact banana plugs and jacks.
 (C) BC-213, 5 1/4" x 2 3/4" x 2 1/4" aluminum, 1 standard open-circuit jack, 1 3-circuit mike jack, 150,000 ohm volume control, 4-position switch, 8-contact banana plugs and jacks.

YOUR CHOICE 30¢



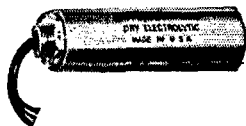
8/8/8 MFD.
500 V. D.C.

Triple 8 mfd. 500 working volt D.C. oil-filled condenser, common negative, solder terminals, hermetically sealed, 5" x 3 3/8" x 2 1/4"..... **\$1.95**
 Dual 8.5 MFD, 1000 volt..... **\$2.95**



TUBE SOCKETS

For 4-prong tubes 866, 809, 811, 100th etc. Heavy phosphor bronze side wiping contacts, metal shell, white porcelain base. Regular list \$1.50, while they last..... **45¢**



Triple 8 mfd. 450 V. electrolytic upright can condenser, separate negatives, all leads insulated from can. Nationally known mfr. Reg. dealer **59¢** net \$2.58..... **ONLY 10 for \$5.00**



PHOSPHOR BRONZE AERIAL

125 ft. of the finest aerial wire obtainable. 42-strand phosphor-bronze with linen center. Will not stretch, very high tensile strength, diameter approximately same as No. 14 copper, very flexible. Excellent for transmitting or receiving antenna, control cable, guy wire. Regular list \$4.95..... **90¢**

MINIMUM ORDER \$2.00. Send 20% deposit with COD orders. Please include sufficient postage or instruct us to ship by Express Collect. Overpayment will be refunded by check.

Single Sideband



X-4 SSB EXCITER

Only 6" x 6" x 6", 10 watts peak output. Same type crystal filter used in SS-75. Output frequency 3.6 to 4 MC. Provision for VFO input or crystal operation. Power required: 6.3 V., 1.6 A., 200-300 V.D.C., 80 MA., 45 V. bias. Wired, tested, aligned, **\$69.50**. Kit form..... **\$49.50**



ELENCO X-4 VFO

Only 4" x 4" x 2". Modified Clapp circuit, very stable, finest components. Plugs into X-4 Exciter, tunes 3.6 to 4 MC. Upper or lower sideband selection. Wired..... **\$24.50**



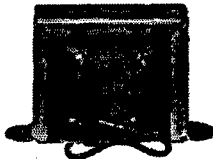
VOICE CONTROL

For voice control of X-4 Exciter and your receiver. Only 4" x 4" x 2". Power required 6.3V 6A., 200-300 VDC 10" **\$19.95** MA. Wired and tested..... **\$19.95**
 X-4 Mixer, one band, 40 or 20 meters **\$19.95**
 Power Supply for operation of all X-4 equipment..... **\$49.50**



WRIGHT T-R SWITCH

For break-in operation on CW, AM, or SSSC. Use one antenna for transmitting and receiving. It's instantaneous! No moving parts, no power needed to operate. Coax fitting for connections to feeder and receiver. Will handle 1 Kw. With 75 meter plug-in coil... **\$9.95**
 40, 20 meter coils, **\$1.75** each



FILTER CHOKES

8 Henry 100 Ma., 100 ohm DC resistance. 2" high, 1 7/8" wide, 2 3/4" mtg. centers..... **93¢**
 15 Henry, 50 Ma., 150 ohm DC resistance. 1 7/8" high, 1 1/4" wide, 2" mtg. centers..... **59¢**

4D32 tubes, brand new..... **\$18.95**
 Patch cord, PL55 plug on 5 ft. 2-wire cord..... **.75**
 8 Henry, 300 Ma. cased choke..... **3.50**
 4 Henry, 350 Ma. cased choke..... **3.95**
 Dual 8.5 MFD, 1000 volt oil-filled condenser..... **2.95**
 3-conductor Coiled Kord, 6 ft. extended..... **1.79**
 Coax angle plug..... **.45**

Steinbergs

Phone CHerry 1880

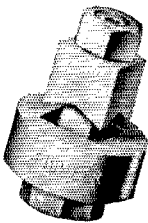
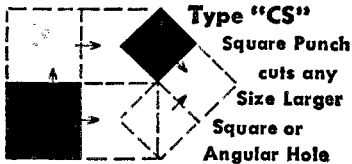
633 WALNUT STREET • CINCINNATI 2, OHIO

Your order will receive my personal attention and will be shipped the same day order is received. We distribute all top-flight amateur lines... let us know what you need.
 73, Jule Burnett WBWHE


PIONEER CHASSIS PUNCHES

Cut    

ROUND • SQUARE • ANGULAR • KEYED HOLES



For mounting IF's, Terminal Strips, Sockets, Plugs, Meters, Controls, Xfmr's, Switches, Panel Lites, Etc.

SQUARES		ROUNDS		Simple Hand Wrench Screw Action	
5/8	\$2.95	1/2	\$1.95		
1 1/8	\$3.25	5/8		1 3/8	
3/4	\$3.50	1 1/4		1 1/2	
7/8	\$3.85	1 3/8		1 3/4	
1	\$3.95	1 1/2		2 1/4	\$5.65
KEYED		1 1/4	\$2.15	1 1/2	\$2.60
1 1/4	\$3.50	1 3/4	\$2.30	1 3/8	\$2.95

"AT YOUR FAVORITE DISTRIBUTOR"

PIONEER TOOL CO.

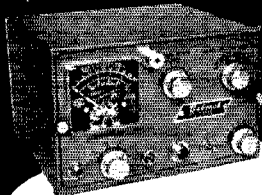
LOS ANGELES 16, CALIFORNIA

Go Mobile

NEW BABCOCK

MT-5B

MOBILE D-X MITTER
6 Band Bandswitching



5" x 8" x 7" deep

Vibration-Proof, Shock-Proof, Small, Compact

New exclusive meter, D'Arsonval movement, new crystal oscillator circuit using 6CL6 tube. VFO-TXL crystal switch and VFO connector now on panel. Same professional performance and fine quality as found in Babcock military radio equipment. Constant solid signal, every tube, every part tied down. Lifetime gray Hammertone metal case, easy to install. Examine—compare—buy Babcock!

Price complete with tubes, plugs and instruction book, Ham net. \$119.50

Contact your dealer or write for literature

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Export, Frazar & Hansen, 301 Clay St., San Francisco, USA

Novice Round-up

(Continued from page 68)

Minnesota

WN0QDR.....8950-159-50-38
WN0RLI.....4107-111-37-35
WN0QDP.....3675-95-35-27
WN0PNF.....2077-67-31-25
WN0QHS.....2016-74-24-34
WN0NJZ.....1328-63-16-17
WN0QDJ.....1197-57-21-35
WN0QQM.....561-33-17-12
WN0QZR.....350-25-14-6
WN0QJV.....165-15-11-20

KN2DKW.....2580-86-30-5
KN2EVF.....936-52-18-19
KN2DNZ.....160-16-10-3

N. Y. C.-L. I.

KN2GDE.....2134-97-22-39
KN2DZD.....24-2-2-1

Northern New Jersey

KN2EPP.....2314-82-27-18
KN2DNW.....2132-82-26-26
KN2EPD.....88-11-8-12
KN2GLQ.....25-5-5-1

DELTA DIVISION

Arkansas

WN5BHA.....624-29-16-12

Louisiana

WN8NGU/5.....2607-69-33-40
WN8AOV.....2480-60-31-14
WN8ZAK.....2170-70-32-38

Tennessee

WN4ZBP.....110-11-10-1

MIDWEST DIVISION

Iowa

WN0PAN.....1584-72-22-22
WN0QQH.....1430-55-26-22

Kansas

WN0QVO.....7564-167-42-39
WN0QNI.....2408-71-28-15

Missouri

WN0QWS.....6480-162-40-37
WN0RQO.....1470-60-21-31
WN0RBI.....1275-51-25-11
WN0QIA.....1020-36-20-12
WN0PWN.....44-2-2-1
WN0RTW.....12-4-3-1

GREAT LAKES DIVISION

Kentucky

WN4AUE.....2528-79-32-11
WN4BAX.....300-20-15-17

Michigan

WN8MSK.....4680-107-40-26
WN8OHT.....820-41-20-5

Ohio

WN8ODT.....3220-100-28-26
WN8ODE.....1242-39-23-12
WN8OMY.....656-25-18-15
WN8NTZ.....560-25-14-4
WN8NFG.....532-23-14-4
WN8OFG.....504-26-14-10
WN8OIM.....468-26-18-4
WN8OJM.....290-14-10-40
WN8NGS.....216-24-9-2

WN0OFM.....840-35-24-13
WN0RNH.....720-30-18-4

NEW ENGLAND DIVISION

Connecticut

WN1YNP.....2910-77-30-14
WN1YWT.....624-24-16-20
WN1YNB.....616-34-14-11
WN1ZID.....451-26-11-28
WN1YQQ.....136-17-8-3

Maine

WN1YVN.....198-12-9-3

HUDSON DIVISION

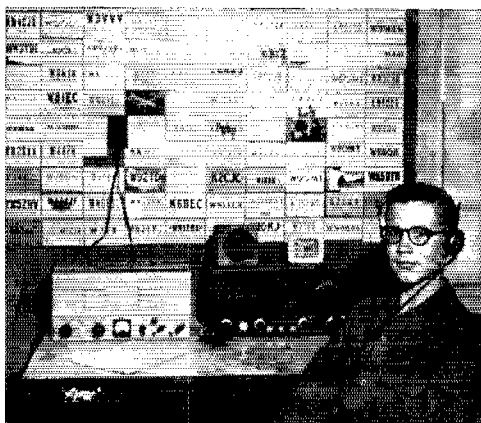
Eastern New York

KN2EJU.....9200-175-46-36
KN2DKU.....3016-101-26-30

Eastern Massachusetts

WN1ZDZ.....5655-130-39-34
WN1YNI.....4917-134-33-37
WN1ZLG.....2160-80-27-32

(Continued on page 124)



With four months operating experience, WN5BJA of Brownwood took the North Texas lead, tabulating 5236 points. Conrad uses a folded dipole for 80, and separate vertical ground-planes for 15 and 40. DX to date includes KP4, VE, KH6 and ZS.

24 HOUR
SERVICE ON ALL
STOCK ITEMS

Uncle Dave's Radio Shack

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FORT ORANGE RADIO DISTRIBUTING COMPANY

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Summertime

... and the great outdoors beckons. It's hunting, fishing and ham equipment. If you want to hear real fish stories or need help on ham problems, call Uncle Dave W2APF—he will gladly help you.

VIKING MOBILE TRANSMITTER KIT



\$99.50

Amateur Net
Immediate Delivery

SUMMIT RC 1A



2 mtr. conv. with tubes and xtal.

SPECIAL while they last... **\$35.00** ea.

SPECIALS CLEARANCE

STANDOFF INSULATORS, low loss steatite, nickel plated base and top.
1/2" x 1 1/2" — 12c ea.; 10 for \$1.00
1/2" x 2 1/2" — 17c ea.; 10 for \$1.45
3/4" x 4 1/2" — 43c ea.; 10 for \$3.20
3/4" x 6 1/2" — 59c ea.; 10 for \$4.75
FEED THRU INSULATOR, ceramic.
For 1" hole, 41c ea.—10 for \$3.25
For 1 1/2" hole, 45c ea.—10 for 3.50
INSULATOR, cone type
1 1/2" high, 18c ea.—10 for \$1.50
3" high, 43c ea.—10 for 3.25

TUBES—standard brands
6AK5 69c ea.—6 for \$2.50
6C4 39c ea.—6 for 2.00
MINIATURE VARIABLE CONDENSERS
Screw driver adjustment.
25 mmfd....25c ea.—5 for \$1.00
140 mmfd....75c ea.—4 for 2.50
SOCKET, 7 pin min., mica filled, shield base10 for \$1.00
SWITCH, phenolic sec., 2 d., 3 p., 3 pos., NS....29c ea.—4 for \$1.00

SONAR SRT 120 TRANSMITTERS

All bands 120 w. CW, 100 w. phone



Switches to all six bands. TVI suppressed, with 10 tubes.

SRT 120 Kit \$159.50
Wired and Tested at Factory, \$198.50
SRT 120P Kit \$198.50
Wired and Tested at Factory, \$279.50
Including Power Supply in Deluxe Case
VFO 120 \$119.95
Wired and Tested

New ELMAC TRANSMITTER AF-67 Trans-Citer

\$177.00

Net

872A surplus tubes ea. \$2.25
866A surplus tubes ea. 95c

FOREIGN TRADE SOLICITED

CABLE SPECIALS

4 cond. rotor.....per 100' \$2.50
6C 59/U 6c ft.....per 100' 4.00
RC 58/U 6c ft.....per 100' 4.00
RC 8/U 14c ft.....per 100' 9.00
Kilowatt twin lead, clear poly insulated, 12 ga. cond. 9c ft. 100' 5.00

Extra Special
DYNAMOTOR GN45B
4V in., 400 V 140 MA out. Complete with connection dia. 7/8" m and bracket. Will go Parcel Post. **\$19.95**

872A surplus tubes ea. \$2.25
866A surplus tubes ea. 95c

Trade-ins TOP ALLOWANCE

Mobile Special

NEW SHIPMENT

Hand mike, single button carbon. Complete with cord and plug. Finest made.

\$2.50 Ea.

Post Paid
Dozen lots, \$25

ANTENNA ROTATOR SPECIAL

Will hold up to 200 lbs.

\$29.95

Complete with 100 ft. 4 Cond. Control Cable

Collins 32V-3 Transmitter



\$775

VFO Controlled, Bandswitching, Cangedtuned. Covers 80, 40, 20, 15, 11 and 10 meters; 150 watts CW; 120 watts phone; entire RF section enclosed in metal shield. (In Stock)

COLLINS 75A-3 RECEIVER

\$550

With Mechanical Filter and Speaker

PARTIAL LIST OF USED EQUIPMENT

Hallcrafters S 51 — new condition.....	\$ 99.95
Millen 90800 Exciter.....	45.00
Sonar FM Exciter.....	50.00
Sonar MB 611.....	25.00
Morrow 3BR-5 — new condition.....	45.00
Micro-Match MMI.....	35.00
Web Transmitter 10 Meters 25 Watt.....	25.00
National 5886 Power Supply—new condition	25.00
Hammarlund Comet Pro with speaker.....	50.00
Thordarson 100 Watt all band transmitter	95.00
Collins 32V3 like new demonstrator.....	695.00
Webster Chicago wire recorder model 78	50.00
Wilcox Gay 78 RPM wireless record player-brand spanking new.....	10.00
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Hallcrafters HT9 (No coils).....	100.00
Hallcrafters S53A — new condition.....	75.00

4-ELEMENT YAGI for CHANNEL 4

Can be cut for 2 meters

\$2.75 each

JOHNSON VIKING II



\$279.50

(In Stock)

Kit, complete with tubes—less crystal, key and mike.

Wired and Tested, \$337.50

GONSET COMMUNICATOR 2-Meter Transmitter Receiver

Model 3026
\$209.50

Model 3025
\$229.50



Operates from either 115-Volt AC or 6-Volt DC source.

I have a few Link Transmitter/Receiver units, police motorcycle type. Approximately 1700 kcs. Some with power supply. **\$15** each Shipped express or freight

Electric "HAM" Clock
Agala by popular demand
24-Hour with GMT Indicator

\$11.95 Ea.

Regular \$15

ON-AIR LIGHTS

Use 6-Volt Pilot Lamp

5" x 2 3/8" x 1 1/4"

\$1.95 ea.

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TELEPHONE ALBANY 5-1594



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Submit resume or address request for personal interview to D. Bellat, Personnel Director.

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Bloomfield, N. J.



One of the foremost Dakota Division WNs, WNØRLI of Minnesota computed 4107 points through 111 QSOs in 37 ARRL sections. Henry operates 40 principally, using a TR75-TV, SX-73 and long-wire antenna.

WN1YJB..... 550- 35-11-11
WN1YWY..... 330- 22-15- 4
WN1YZM..... 18- 6- 3-14

ROCKY MOUNTAIN DIVISION

Colorado

WNØOEB.....7840-160-49-39

Utah

WN7TFK..... 266- 19-14- 5

Wyoming

WN7UZR..... 345- 23-15-14

Western Massachusetts
WN1YXV.....2288- 68-26-21
WN1ZIO..... 720- 40-18-27

New Hampshire

WN1YZL.....1330- 60-19-16

Rhode Island

WN1YNE..... 672- 38-14- 9

SOUTHEASTERN DIVISION

Alabama

WN4AVY.....0045-140-39-39

Eastern Florida

WN4ZTW..... 496- 31-16-12

WN4AGP..... 429- 19-11- 2

Western Florida

WN4CHZ.....1410- 47-30-13

Georgia

WN4BXX.....3434- 88-34-24

WN4BXY.....1612- 62-26-22

NORTHWESTERN DIVISION

Alaska

WL7AVP..... 144- 18- 8-28

WL7AWL..... 96- 24- 4-27

Oregon

WN7UPB.....1092- 42-21-27

WN7UMA..... 184- 23- 8- 7

Washington

WN7UBA/7...1980- 66-30-19

WN7VAL..... 320- 32-10-13

WN7UQJ..... 171- 19- 9-40

WN7UIY..... 138- 23- 6-14

PACIFIC DIVISION

Santa Clara Valley

KN6BAC/6.... 850- 34-25-19

KN6CLM..... 504- 53- 8-13

KN6BZG..... 81- 9- 9- 7

Sacramento Valley

KN6DGE..... 80- 10- 8- 3

San Joaquin Valley

KN6CQT.....4797- 97-41-35

SOUTHWESTERN DIVISION

Los Angeles

KN6BFC.....5617-137-41-34

KN6DAC..... 551- 29-19- 9

KN6DDO..... 2- 2- 1- 1

San Diego

KN6BPL.....1248- 42-24-38

WEST GULF DIVISION

Northern Texas

WN5BJA.....5236-119-44-35

WN5CBT.....3434-101-34-30

WN5ATU..... 189- 27- 7- 8

WN5AXZ..... 16- 4- 4- 7

Southern Texas

WN5BLA..... 900- 26-22-14

WN5YXW..... 250- 10-10-14

WN5ZVU..... 72- 9- 8- 2

WN5AUF..... 4- 2- 2- 1

New Mexico

WN5AWN..... 35- 7- 5- 1

NEW SUPER POST TOWERS for TV ANTENNAS in FRINGE AREAS

TOWERS of STRENGTH to LAST A LIFETIME

Self supporting tower built up of galvanized steel sections. No guy wires necessary. Easy to erect. Safe and resistant to high wind. Available in heights 33 ft, 47 ft, 60 ft, 73 ft, 87 ft, and 100 ft, with bases in proportion.

FRINGE AREA TV BUYERS MUST HAVE SPECIALLY BUILT TOWERS for CLEAR RECEPTION

Tower and the TV set go hand in hand as a package sale to rural TV buyers. Provides an extra sale and profit to dealers. An excellent fast selling accessory for jobbers and dealers.

TERRITORIES OPEN for JOBBER DEALER FRANCHISE

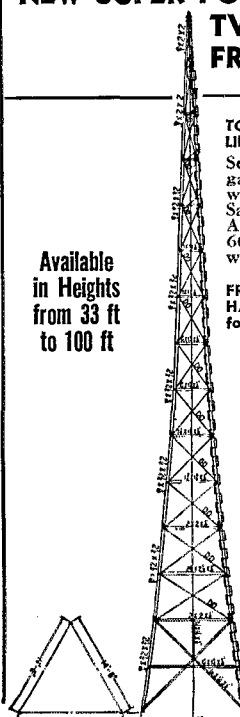
Write for complete structural details, packing, prices, discounts, and territorial assignment.

Manufactured by

AERMOTOR CO.

Dept. 6206, 2500 Roosevelt Road,
Chicago 8, Ill.

BUILDERS OF STEEL TOWERS
SINCE 1888



Available in Heights from 33 ft to 100 ft



Leo I. Meyerson, WØGFK
C.U. on 10-20-40 & 75 Meters

Pay Only 10% Cash Down 18 Months to Pay on Major Equipment

Now it is easier than ever to buy from WRL. Pay as little as 10% down and the balance in 18 months. No red tape — we handle our own financing. We will give you a generous trade-in allowance on your present equipment. We have over 600 reconditioned used items — with new factory guarantee. Send for free list. You will profit most when you deal with WRL — THE WORLD'S MOST PERSONALIZED RADIO SUPPLY HOUSE and "LARGEST DISTRIBUTOR OF AMATEUR RADIO TRANSMITTING EQUIPMENT."

Use WRL'S EASY PAY PLAN
10% Cash Down • 18 Months to Pay



"The GLOBE KING XMTR is tops on the Ham Bands"

Dear Leo:

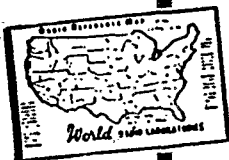
I want to tell you how much I have enjoyed my Globe King ever since I purchased it. It has been on ten and seventy-five and reports on audio quality are all excellent. You are to be congratulated on the excellent workmanship in constructing The Globe King. In my estimation, The Globe King Xmtr is tops on the Ham bands.

Sincerely yours, 73
Leonard H. Syriac WISYX

NEW TVI MODEL 400 C
GLOBE KING XMTR
TVI SCREENED CABINET NOW
STANDARD EQUIPMENT

\$28⁰⁷ PER MONTH
(18 Months)

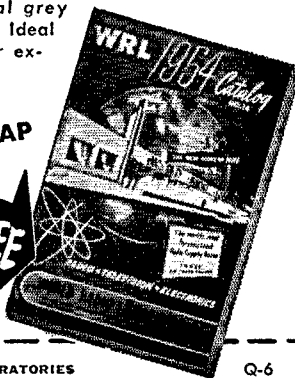
\$51.50 (\$495.00 Kit Form) (\$515.00 Wired)
(Cash Down)



RADIO REFERENCE MAP

25¢
HANDY
WALL
SIZE

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Q-6

WORLD RADIO LABORATORIES
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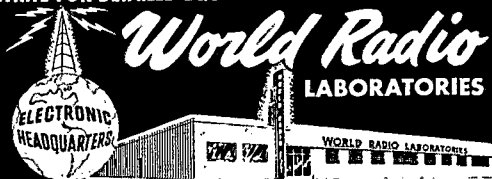
Please send me:

- New Log Book 25¢
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- Radio Map 25¢

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- Globe King Info
- Globe Champion Info
- Used Equipment List

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City _____ State _____

WRITE FOR DETAILED EQUIPMENT SPECIFICATION SHEETS



WRITE - WIRE - PHONE 2-0277 COUNCIL BLUFFS, IOWA

COMPLETE BAND SWITCHING NEW MODEL 40A GLOBE SCOUT

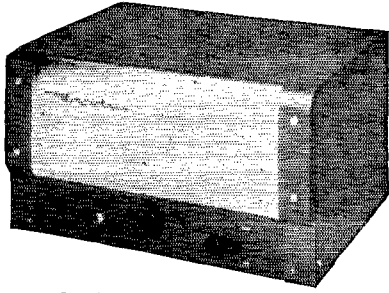


\$8⁹⁵ PER MONTH (12 Months)
KIT FORM \$89.95
WIRED \$99.95
\$10.00 Cash Down

LATEST TRIUMPH OF THE WRL ENGINEERING STAFF Complete bandswitching 160 thru 10M transmitter with combination pi-network antenna tuner which will work into any antenna. Three-stage modulator allows 100% modulation of final. Has complete power supply. XMTR housed in new special grey TVI screened cabinet. Ideal XMTR for the novice or experienced ham.

NEW MOTOROLA

Home Unit Monitor Receiver



Now available—the new Motorola Monitor or Alert Receiver, for operation in the 25-50 mc. and 152-174 mc. ranges. Optional selective signaling, emergency 6 VDC power supply, and red-yellow-blue-white light alert cabinet attachments. Ideal for amateur, as well as public safety, civilian defense, industrial and commercial radio systems.

For further information write to:

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Communications & Electronics, Inc.

Amateur Sales Dept.—QST-6

1327 W. Washington Blvd., Chicago 7, Illinois

Attention: Harry Harrison, W9LLX, Tel. Taylor 9-2200 — Ext. 161

Electron

Tube

Technicians

We now have openings for work in the fabrication and processing of experimental electron tubes.

Applicants should be high school graduates with a natural aptitude for working with small parts. Experience in electronics, precision benchwork and experimental tube work is desirable.

Address resume of experience and training to...

Hughes

RESEARCH AND DEVELOPMENT LABORATORIES
 Technical Personnel Department
 Culver City, Los Angeles County, Calif.

YL News & Views

(Continued from page 49)

W2DYO	918.75	—	918.75
W3MDJ	5152	5152	—
W3RXV	3029	3024	5
W3UTR	1402.5	202.5	1200
W4BLR	3437.5	—	3437.5
W4KYI	27,993	27,993	—
W4SGD	7605	7605	—
W4STH	13,066.5	13,066.5	—
W4TIE	680	—	680
W4VJX	8010	5985	2025
W4VTO	2079	2079	—
W4ZDA	339	84	255
W5SPV	6440	6440	—
W5WUX	3723	3723	—
W6GQZ	1428	1428	—
W6JZA	5760	5760	—
W6QGX	13,000	13,000	—
W6QMO	513.75	225	288.75
W7OOY	3480	3480	—
W7TGG	924	924	—
W8ATB	270	270	—
W8HLF	21,572.5	20,992.5	580
W8HWX	7215	7177.5	37.5
W8KLZ	212.5	—	212.5
W8MBI	1080	1080	—
W8NNH	1504.5	1504.5	—
W8SJE	2352	—	2352
W9AQB	2262	2262	—
W9JUI	11,497.5	—	11,497.5
W9LOY	589.5	364.5	225
W9WZL	1403	—	1403
W9YBC	975	945	30
KZ5DG	1350	1350	—
VE1ABT	4374	—	4374
VE3AJR	9386	—	9386

¹ Also worked phone-to-c.w. 4 contacts in 4 states.

SCORES, OM SECTION

Highest score: W4ARR, 1,826.25. Highest 'phone scores: W1BFT, 1,207.5; W8AJW, 1,039.5; W9CMC, 882. Highest c.w. scores: W2SAW, 552.5; W9VBZ, 531.25; W8SDD, 517.5.

Station	Aggregate	'Phone	C.W.
W1BFT	1717.5	1207.5	510
W1JYH	348.75	202.5	146.25
W1LQ	101.25	—	101.25
K2BWP	378	378	—
K2CYS/2	125	—	125
W2JML	255	255	—
W2NTY	225	—	225
W2NOC	535.5	280.5	255
W2OLT	180	105	75
W2SAW	552.5	—	552.5
W2VL	319.5	229.5	90
W3JSJ	101.25	—	101.25
W3KUN	286	88	198
W3QLW	318	280.5	37.5
W3RVG	169	165	4
W3SIJ	255	—	255
W3STV	123.75	—	123.75
W4ARR	1826.25	1612.5	213.75
W4GMY	273	273	—
W4IA	100	—	100
W4JUI	395	135	260
W4KL	280	—	280
W4NTT	470	210	260
W4OMW	409.5	214.5	195
W4TFD	125	—	125
W4TFX	297.5	—	297.5
W4WRH	247.5	247.5	—
W4WTY	267.75	144	123.75
W6MES	112	112	—
W7SFK	105	105	—
W8AJW	1039.5	1039.5	—
W8FRD	315	—	315
W8RO	131	6	125
W8SDD	652.5	135	517.5
W8YGR	240	—	240
W9CMC	1047	882	165

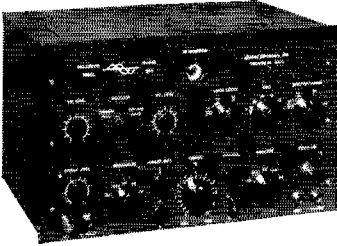
Continued on page 128)

NEW - IMPROVED MULTIPHASE SSB EXCITERS

8 TIMES THE VOICE POWER
VOICE OPERATED BREAK-IN

REDUCED HARMONIC TVI
SWITCHABLE SIDEBAND

MULTI-BAND OPERATION
SSB, AM, PM AND CW



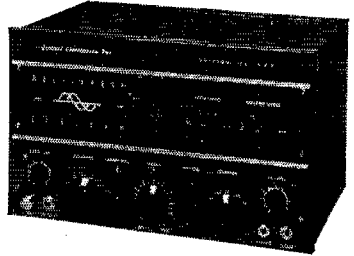
MODEL 20A

- 20 Watts Peak Output SSB, AM, PM and CW
- Completely Bandswitched 160 thru 10 Meters
- Magic Eye Carrier Null and Peak Modulation Indicator

Choice of grey table model, grey or black wrinkle finish rack model.

Wired and tested \$249.50
Complete kit \$199.50

CHECK THESE
FEATURES
NOW IN BOTH
MODELS



MODEL 10B

SUCCESSOR TO THE POPULAR
MODEL 10A

- 10 Watts Peak Output SSB, AM, PM and CW
- Multiband Operation using plug-in coils.

Choice of grey table model, grey or black wrinkle finish rack model. With coils for one band.

Wired and tested \$179.50
Complete kit \$129.50



SIDEBAND SLICER MODEL A

IMPROVES ANY
RECEIVER

Upper or lower sideband reception of SSB, AM, PM and CW at the flip of a switch. Cuts QRM in half. Exalted carrier method eliminates distortion caused by selective fading.

Easily connected into any receiver having 450-500 KC IF. Built-in power supply. Reduces or eliminates interference from 15 KC TV receiver sweep harmonics.

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Complete kit \$49.50

- Perfected Voice-Controlled Break-in on SSB, AM, PM.
- Upper or Lower Sideband at the flip of a switch.
- New Carrier Level Control. Insert any amount of carrier without disturbing carrier suppression adjustments.
- New Calibrate Circuit. Simply talk yourself exactly on frequency as you set your VFO. Calibrate signal level adjustable from zero to full output.
- New AF Input Jack. For oscillator or phone patch
- CW Break-in Operation.
- New Gold Contact Voice Control Relay. Extra contacts for muting receiver, operating relays, etc.
- Accessory Power Socket. Furnishes blocking bias for linear amplifier and voltage for optional VFO (Modified BC458 makes an excellent multiband VFO.)
- 40 DB or More Suppression of unwanted sideband.

WRITE FOR
LITERATURE

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Perfected Voice Operated Break-in with loudspeaker. Prevents loud signals, heterodynes and static from tripping the voice break-in circuit. All electronic — no relays. Plugs into socket inside 20A or 10B Exciter.

Wired and tested, with tube \$12.50

AP-1 ADAPTER

Plug-in IF stage — used with Slicer, allows receiver to be switched back to normal. Wired and tested, with tube \$8.50

PS-1 NETWORK

Plug-in prealigned 90° phase shift network and socket available separately for use with GE Signal Slicer and SSB Jr. \$8.95

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MOBILE ANTENNA LOADING COIL

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\$14.⁹⁵

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The New VIKING RANGER

Viking Ranger Transmitter-Exciter Kit, less tubes.

\$179.50

FEATURES . . .

• Built-in VFO • Also provision for two plug-in crystals • Seven bandswitch positions, 160 through 10 meters • 100% AM modulation • 75 watts input CW; 65 watts phone • Smooth (break-in) oscillator keying.

• Pi-network output matches antennas from 50 to 500 ohms, tunes out large amounts of reactance • Compact size only 15" x 11 1/4" x 9" — weighs only 45 lbs. • Effectively TVI suppressed — completely sealed cabinet, meter shield, shaft shields, L filters on all leads where there is slightest possibility of harmonic radiation.

As a transmitter the RANGER is a rugged 75 watt CW input or 65 watt phone unit, with 100% AM modulation and pi-network antenna load matching from 50 to 500 ohms. Completely band-switching 160, 80, 40, 20, 15, 11 and 10 meters, it features high gain audio for dynamic or crystal microphones and complete TVI shielding and filtering.

As an exciter the RANGER will drive any of the popular kilowatt level tubes and serves as a high quality speech driver system for high powered modulators. No internal changes required to switch from transmitter to exciter operation with all connecting leads TVI filtered inside the RANGER cabinet. High voltage B+, low voltage B+ and filament power, as well as the full 33 watts output of the modulator are available from power receptacle in rear so the RANGER can be used to power and modulate a complete VHF or UHF transmitter using a 6146 or similar tube in the final.

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ELMAC	★	MORROW
MASTER	★	S. & W
MOBILE	★	ELECTRONICS
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LEECE-NEVILLE ALTERNATOR

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AT REGULAR HAM PRICES !!

Write for a quotation on the system for your auto or boat

C & G Radio Supply Co.

Wholesale Distributors
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Tacoma 2, Wash.

PHONE
BRoadway 3181

W9KA	195	—	195
W9OMM	450	450	—
W9RKP	125	—	125
W9VBZ	531.25	—	531.25
W0HFP	612	612	—
W0IUB	130	—	130

Keeping Up With the Girls

On April 11th five Massachusetts YLs participated in a panel discussion on a local broadcast station. The program, designed to inform nonamateurs about the hobby, was excellently presented by W1s SVN TRE VYH WOS and YPH. OM WIPZ acted as moderator. . . . YLs who helped furnish amateur communications at the Rudoso, New Mexico, Sports Car Races in February were W5s BZB RFK and TDB. . . . W8DQO, Marge, is now W9DLW in Tomahawk, Wis. . . . KN2GLL, Evelyn reports two new YLs in Livingston, N. J., to keep her company: KN2GPX, Pat, and KN2GWP, Marcia. . . . W8HWX, Lil, has made her YL WAS. . . . New officers of the South African Women's Radio Club are Pres. (and Edress of *YL Beam*) ZS1GT, Daphne; V.P. ZS1JC, Erika; Secy. ZS1MU, Pat. . . . W5RFF, Deloris, is enjoying aeronautical mobile on 75. . . . Highlight of the March meeting of the L. I. YLRL Unit was a talk by W6NZP, Evelyn, on her eight months of traveling and "ham visiting" in Africa. Evelyn has been appointed national chairman of the Amateur Radio Communications Net for this year's All Women's Transcontinental Air Race which starts from Long Beach, Calif., July 3rd. Evelyn is taking over for W2JZX in this capacity this year.

The YLRL Chairman for the Canal Zone this term is Elizabeth "Sis" Bell, KZ5AE, of Pedro Miguel. She's also secretary of the Canal Zone Amateur Radio Association; vice-president of the local YL unit, the QRMarys; and assistant to the Southeastern Division director of the ARRL. Licensed in July, 1952, Sis' favorite band is still 10 meters, its poor conditions notwithstanding. Her OM is not a ham, but he is "interested," and both are taking a course in electronics. Three young junior ops and work with the Canal Zone Corps of Engineers round out the picture of Sis' activity.



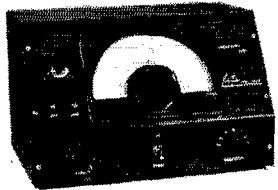
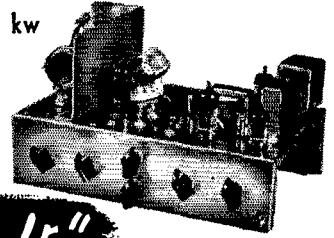
Silent Keys

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

W1BUC, Charles H. Wiley, West Hartford, Conn.
W1JCK, Stanley J. Slupstikas, South Boston, Mass.
W2UG, Lucien D. Bonduaux, Dumont, N. J.
W2VEK, William N. Whipple, Fultonville, N. Y.
W4RPD, Robert H. Collier, Louisville, Ky.
W5ON, Labon A. Hoskins, Houston, Texas
W6ABH, Albert L. Clark, Independence, Calif.
W6BNP, Willis B. Miller, Fresno, Calif.
W6BPU, Howell C. Brown, Pasadena, Calif.
W6CUX, William H. Newman, Los Angeles, Calif.
W6L7E, James F. Moran, Manhattan Beach, Calif.
W6NO, Charles H. Cross, Oakland, Calif.
W8DI, Emil E. Hertz, Cleveland, Ohio
W8HC, Edward A. Roberts, Shaker Heights, Ohio
W8VJK, Irel H. Snyder, Dayton, Ohio
ex-98C, Harry A. LaMertha, St. Louis, Mo.
W0KVV, Carl A. Lehman, Yankton, S. Dak.
W0UBN, Herman F. Wagner, North Platte, Nebr.
W0UOT, David H. Schroeder, Tama, Iowa
W0YKK, David D. Seroggs, jr., Appleton City, Mo.
KL7RR, Frank W. Prince, Juneau, Alaska
VE4CO, Frederick Crease, Winnipeg, Manitoba
VE4ZK, John Gordon, Winnipeg, Manitoba

NOW... Single-Sideband for Everyone!

- ★ Up to 50 watts output as transmitter or use as exciter up to 1 kw
- ★ Ideal for mobile use — both 6.3 and 12 volt filaments
- ★ Operates on any 300 to 1000 volt power supply
- ★ More watts per dollar — available as kit or wired



HETRODYNING VFO

For use with 9 mc SSB generation Bandswitching 160 thru 10 meters Built in 1000 kc Crystal Standard. Only \$146.50

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- Famous General Electric phasing-type sideband circuit . . . superior in operation and performance.
- Operates on SSB, AM, PM, and CW . . . excellent exciter for driving your AM rig as linear final. The ideal transmitter for the novice!
- Socket for crystal control. Connector for external VFO such as shown at left. Plug-in coils for 160 thru 10 meters.
- Combined anti-trip voice control plug-in unit can be added any time as optional equipment. \$23.50 additional.
- Furnished with 3" x 11" face plate for cabinet or rack mounting.
- Available in kit form with punched chassis, pre-wound 9 mc coils, main pre-laced cable harness, all component parts and knobs. Coils and crystal for 80 M band included. Less power supply and tubes.

Write for complete literature on special SSB component parts.

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CASCADE
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Provides:

- HIGH SENSITIVITY — Sensitivity better than 1 micro-volt. Gain approx. 30 db. Noise approx. 4 db.
- COMPLETELY STABLE. C.W. on 144 mc. NO mechanical modulation. Pure D.C. note. No drift.
- RUGGEDLY BUILT — Suitable for mobile application.
- USE WITH ANY COMMUNICATIONS RECEIVER — Availability with output at I.F. frequencies 6-10 mc., 8-12 mc., 10-14 mc., 12-16 mc., 14-18 mc. We recommend use at I.F. output 14-18 mc.
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- Available (SPECIAL ORDER) for other CD or industrial frequencies. Also available for Collins receivers.
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Fig. 6-34 — The sweep-tube transmitter is housed in a hinged cover metal cabinet . . . 10 watts output on 80 and 40 meters; built-in power supply and antenna coupler; uses inexpensive TV-type tube. It's just one of the many transmitters described in the 1954 Radio Amateur's Handbook: 800 pages, plus hundreds of photos, diagrams, tables and drawings.

RADIO AMATEUR'S HANDBOOK

\$3.00

\$3.50 U. S. Possessions and Canada, \$4 elsewhere

**THE AMERICAN
RADIO RELAY LEAGUE, INC.**
West Hartford 7, Connecticut

On the TVI Front

(Continued from page 31)

- Ohio:* Canton, Cincinnati, Cleveland (6), Columbus, Conneaut, Dayton, Greenville, Middletown, Newcomertown, Springfield, Wadsworth, Zanesville.
- Oklahoma:* Clinton, Lawton-Fort Sill, McAlester, Ponca City, Tulsa, Wagoner.
- Oregon:* Astoria, Bend, Eugene, Medford, Pendleton, Portland, Roseburg, Salem, St. Helens.
- Pennsylvania:* Allentown, Altoona, Belle Vernon, Belleview, Bethlehem, Boyertown, Bucks County (East & West sections), Chalfont, Dubois, Easton, Greenburg, Harrisburg, Kingston, Labaska, Lebsnon, Lewisburg, Lock Haven, McKeesport, Myerstown, New Brighton, Oil City, Philadelphia (2), Pittsburgh, Reading, Scranton, Selingsgrove, Sharon, Solesburg, Wilkes Barre, York.
- Rhode Island:* Westerly.
- South Carolina:* Charleston, Columbia, Florence.
- South Dakota:* Mitchell, Rapid City, Sioux Falls.
- Tennessee:* Bristol, Chattanooga, Jackson, Knoxville, Memphis, Nashville, Oak Ridge.
- Texas:* Beaumont, Brownsville, Corpus Christi, Deepwater, El Paso, Ft. Worth, Galveston, Houston, Lubbock, Midland, Orange, Pasadena, Port Arthur, San Antonio, Texas City, Woodsboro.
- Utah:* Ogden, Provo, Salt Lake City.
- Vermont:* Middleburg.
- Virginia:* Fredericksburg, Newport News, Norfolk, Petersburg, Richmond, Roanoke, Staunton, Winchester.
- Washington:* Bellingham, Bremerton, Ellensburg, Ephrata, Everett, Kennewick, Pasco, Richland, Seattle, Spokane (2), Tacoma, Vancouver, Walla Walla.
- West Virginia:* Dunbar, Fairmont, Huntington, Morgantown, Nitro, Parkersburg, St. Albans, Weston.
- Wisconsin:* Eau Claire, Green Bay, Kenosha, La Crosse, Madison, Marinette, Milwaukee, Neenah, Racine.
- Wyoming:* Casper, Cheyenne, Cody, Gillette, Powell, Sheridan.
- Others:* MARS Net — Eight Western States; Interference Committee: Fourth Airforce; Hamilton, Calif.

TVI "Diplomatics"

(Continued from page 30)

ference causes, and, unfortunately, due to misunderstanding and lack of proper information, get the blame for most all kinds of trouble. You do this in an explanatory manner, never in an "I know it all and you are dumb" attitude. Since he may be a total stranger to you, or, at best, an acquaintance, ask him how the kids are, how's fishing, or business, etc., because by this time if you are a good diplomat — and you should be! — you will have found out a lot about him. If you adopt this attitude you will be surprised how he will warm up to you.

Now down to cases. With someone operating the transmitter you discover the trouble to be fundamental blocking that will require a high-pass filter, or there is a defect in the set requiring service. You don't blame his receiver as being a pile of junk! No! A thousand times no! He paid good money for it and the manufacturer certainly knows how to build TV sets and *you*, an amateur, passing judgment on it? No! Never! These are bound to be his thoughts. You tell him this trouble can happen to most any set. You avoid confusing technical terms as much as possible, using simple language he can understand. You tell

(Continued on page 152)

URGENTLY NEEDED

BC-221 Frequency Meters. Can use any quantity and any nomenclature provided only that the set is complete with original calibration book.

Phone Ayer 300 **Weston Laboratories, Inc.**

LITTLETON, MASS.



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WHITNEY-JENSEN
PUNCH

3/32" TO 9/32"

Does a quick, clean job. Smooth-action, powerful, light, easy to handle. Fast-change punch and die. Thousands in use.

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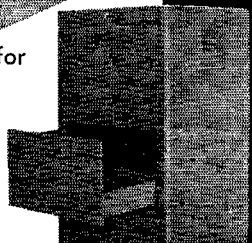
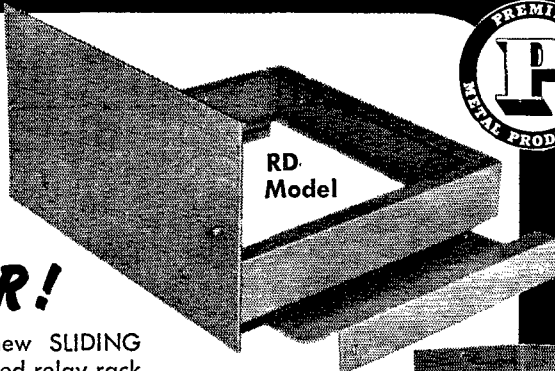
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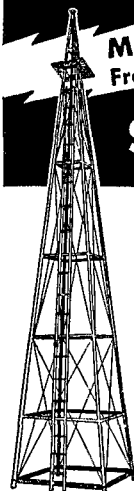
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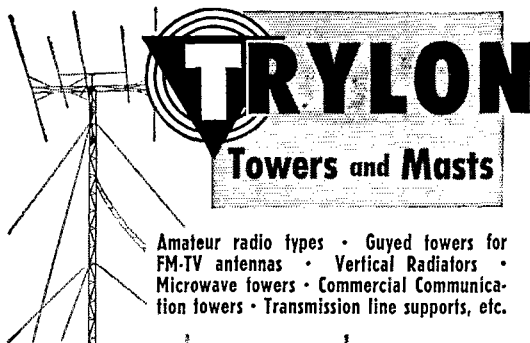
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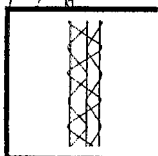
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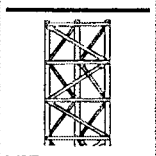


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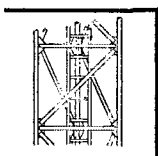
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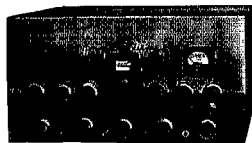
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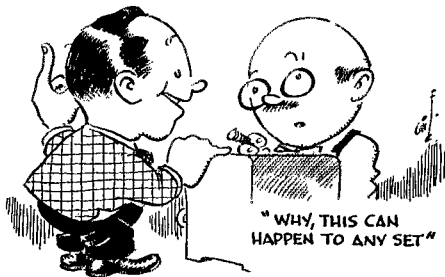


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him that the manufacturers will, in the future, probably build TV sets so designed that will go a long way toward keeping out QRM. He is no dummy and will make a mental note to ask the salesman, when he buys his next set, if it will be free of ham QRM. Thus, we amateurs will have one more convert who will help foster the cause of better receiver design.

If you should discover that his neighbor next door is using a heating pad or some other device causing QRM you don't jump down the neighbor's throat and rush back to tell Mr. T. V. Owner what the trouble was. If you are wise, you will use the same diplomacy on the neighbor that you did on the TV owner. In establishing good will it is very essential that all parties concerned understand the problem and act accordingly. Keep remembering that you are the center of all the ruckus and can ill afford to antagonize anyone concerned with it all.

If the problem is beyond your scope be honest about it and tell Mr. T. V. Owner you will have to have help since interference investigation is a specialized field but you will see to it that he gets further attention. Don't hesitate to tell him that in some cases interference reduction or elimination has its limitations but the problem is not entirely hopeless.

Then, and only then, can you rest assured that he is pretty well convinced you were sincere in your efforts to help him out.

Correspondence

(Continued from page 51)

7919 20th Avenue
Brooklyn 14, N. Y.

Editor, *QST*:

... We have our bands because ham radio benefits the country. One reason for this is that we constitute a vast reserve of communications specialists in times of emergency. And c.w. is the simplest and surest way to communicate with a minimum of equipment. When complex equipment is not around, or refuses to work, a c.w. man can get on the air with the parts from an a.c.-d.c. receiver, or less. If a 'phone man loses his mike or if it becomes inoperative, he's lost. The c.w. man needs only two pieces of wire, or the plate switch on the rig, and the vital communications link is established.

— George Kravitz, W2OTR

34 Stephen St.
Montclair, N. J.

Editor, *QST*:

... At first I was reluctant to learning the code, but now I'm sure glad I did learn it and am able to appreciate its value. It's hard to appreciate anything without actually

(Continued on page 184)

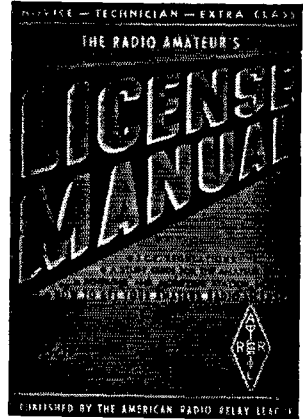
UP TO DATE . . .

THE brand-new 32nd edition of the Radio Amateur's LICENSE MANUAL is complete, up to date, and revised to include the latest information on amateur licensing. Contains the new mail-examination regulations, all the dope on frequency privileges for the various class of amateur licensees, details of the U. S.-Canada Reciprocal Operating Agreement and code-practice schedules. And of course, it has the current FCC examination schedule.

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THE construction of these antennas has been completely revised to provide a lighter weight beam consistent with our quality of merchandise.

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COLLINEAR antennas for the two-meter CD and CAP frequencies are also available.

If your local Distributor does not have our literature, write direct and kindly send us his name.

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witnessing it, and you might be missing a great deal if you only stuck to 'phone and never gave c.w. a try, as I know I would have if I hadn't learned the code. I like to work 'phone and c.w. both, on all bands, and when the going gets too rough for my 40 watts on 'phone, I can always turn to the c.w. band and work out consistently, running the rig at its full power input of 53 watts.

— Arnold J. Seipel, W2NEP

New Bloomfield
Missouri

Editor, QST:

I agree with WH6BAQ — why require the code? Or for that matter, why require any license? Why not give unrestricted rights to the amateur frequencies to code-dodgers and lids that go on 'phone as soon as, or before, they get their Novice license. Unrestricted, that is, above say 30,000 megacycles.

— Bruce Bridger, W0SAK



M. A. R. S.



AA2USA-K2USA Dedicates New Home

On March 19, 1954, Maj. General K. B. Lawton formally opened the new Fort Monmouth, N. J., MARS radio station AA2USA-K2USA. This splendid station has six individual studios separated by air-spaced double plate glass, completely soundproofed, and a lounge room furnished in rattan. All wiring is concealed, and all studios have semicircular consoles.

Studio 1: for MARS operation; has two SP-600 receivers, Viking and HT-20 transmitters, tape recorder.

Studio 2: for MARS operation on the higher frequencies; has alternate amateur 10-meter position, tape recorder, three-position console.

Studio 3: for amateur 10 and 20 meters; has five-position console, Collins 30K-1 transmitter, HRO receiver, beam control for a stacked "10-over-20" 70 feet high.

Studio 4: for amateur 80 and 160 meters; has five-position console, Globe Champion transmitter, Super-Pro receiver, controls for TVI-proofed BC-610.

Studio 5: for amateur 40-meter band; has Viking and Super-Pro.

Studio 6: for amateur two-meter position; has Gonset Communicator, converted ARC-4, NC-100 converted for "two"; also positions for RTTY, s.s.b. and 420-Mc. equipment.

Other antennas are a 16-element two-meter beam on a 90-foot steel tower, ground-planes, doublets. All antennas are fed with coax cable.

In a separate room is a 20-position code practice table and a 20-place constructional bench.

Look for AA2USA-K2USA on the air!

First Army Has Youngest MARS Member

Edward S. Talley, youngest MARS member, was born in Brooklyn, N. Y., on February 8, 1938. He first became interested in ham radio as a result of watching his father, David Talley, A2PF, operating his station during MARS schedules.

When the Department of Defense announced that the age limit for MARS was lowered to 16 years, Edward immediately became interested in MARS. As soon as he reached his 16th birthday on February 8, 1954, he applied for MARS membership and was assigned the call A21VA.



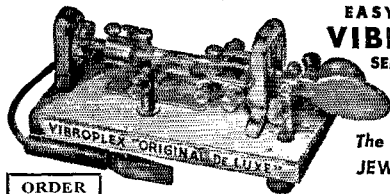
25 WATTS \$19.95

The Hart — 25 CW transmitter kit is an outstanding buy! It comes complete with all necessary parts including power transformer, punched chassis, tubes, 80 meter coil, wire, solder, detailed instructions and even a novice band crystal. Shipping wt. 6 lbs. 40 meter coil and crystal kit only \$3 extra. Order today or write for details.

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Headquarters for NEW portables, all models and styles of type. Also, REBUILT standard and portable typewriters with ALL CAPITAL letters and other styles of type. Immediate delivery. Get our prices before you buy!



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- 3 ELE 15 METER** 18' 2" SQ. BOOM, Tilting beam mount, 1 1/4" ele. @ \$74.95
- 3 ELE 15 METER** 12' 1 1/4" ROUND BOOM, Fixed beam mount, 3/4" ele. @ \$30.95
- 3 ELE 10 METER** 12' 1 1/4" ROUND BOOM, Fixed beam mount, 3/4" ele. @ \$28.50

All above kits furnished with either "T" or Gamma match. Write for complete listing.

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78 RPM

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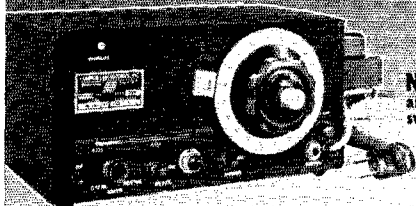
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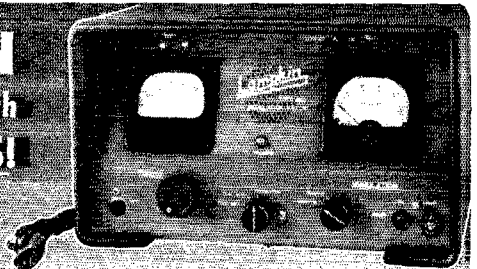
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Low Frequency — FT-241A for SSB, Lattice Filter etc., .093" Pins, .486" SPC, marked in Channel Nos. 0 to 79, 54th Harmonic and 270 to 389, 72nd Harmonic. Listed below by Fundamental Frequencies, fractions omitted.

49¢ each — 10 for \$4.00		99¢ each — 10 for \$8.00	
370	393	414	456
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375	396	418	481
376	397	419	483
377	398	420	484
379	401	422	485
380	402	423	486
381	403	424	487
383	404	425	488
384	405	426	489
385	406	427	491
386	407	429	492
387	408	430	493
388	409	431	494
390	411	433	495
391	412	434	496
392	413	435	497

99¢ each — 10 for only \$8.00

CR-1A SCR 522-14 Pin, 1/2" SPC	FT-171B — BC-610 Banana Plugs, 1/2" SPC
5910	7350
2030	2266
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2065	2290
2082	2300
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2125	2320
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2155	2350
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Special — 200 KC or 500 KC in FT241A Holder — only \$1.79 each

Add 20¢ postage for every 10 crystals (or less).



528 TENTH ST., N.W.—Wash., D. C. Dept. Q

FT-243—.093" Pin Dia.—.486" Pin SPC for Ham and General Use.

49¢ each — 10 for \$4.00

4035	5437	5950	6800	7610	7900
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4165	5500	6240	6825	7640	7925
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4260	5675	6273	6875	7650	7950
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4330	5706	6300	6925	7675	7975
4397	5725	6325	6950	7700	8206
4490	5040	6350	6975	7706	8225
4495	5750	6373	7450	7720	8260
4535	5773	6375	7473	7725	8273
4735	5780	6400	7475	7740	8275
4840	5806	6408	7500	7750	8300
4930	5840	6425	7506	7773	8325
4950	5852	6673	7525	7775	8630
4980	5873	6675	7540	7800	8693
5030	5875	6700	7550	7825	8690
5205	5880	6706	7573	7840	
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1015	6100	6600	7200	8075	8500
2125	6125	6606	7250	8100	8525
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3640	6150	6648	7306	8140	8575
3680	6175	6650	7325	8150	8600
3735	6200	7000	7340	8173	8625
3760	6440	7025	7350	8175	8650
3800	6450	7050	7375	8200	8700
3885	6473	7073	7400	8340	8733
3940	6475	7075	7425	8350	
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Channels 10 and 12

Foundation coils and condenser

for 80 meter VFO or ex-98¢

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W3PPQ in Mar. '54 CQ



U. S. N. R.



Amateur radio station K6NCB is located in the Naval Reserve Electronics Program office at the headquarters of the Eleventh Naval District, San Diego, Calif.

This station maintains a 'speaker watch on 3825-kc. 'phone and on 7200-kc. c.w. between 8 A.M. and 4:30 P.M. PST Monday through Friday.



Licensed amateur operators at K6NCB are, left to right, Commander B. A. Wambsgans, USNR, W6WOY; M. H. Fair, ET1, USN, W6PXW; and J. N. Smith, SN, USNR, K6BMX.

The frequency 3825 kc. is the San Diego AREC frequency. It is busy most of the time with the many mobiles in the area.

The equipment at K6NCB consists of an NC-120 and an SX-28 receiver; a BC-610, an ARC-5 and a T-350XM transmitter. The transmitter on 3825 kc. is run at low power but can be increased to a full power of approximately 600 watts.

Besides the amateur activities, the transmitters are used by NQG-2 for net control of daytime Naval Reserve circuits.

Peninsula Club

Antennas and antenna couplers featured a meeting of about 30 members of the Peninsula Amateur Radio Club at the Marshall Courts Community Center, Newport News, Va. Walter A. Leyland, club president, presided.

Captain R. R. Hay, USN, W4LW, chief of communications for the Supreme Allied Command, Atlantic, demonstrated an antenna coupler with automatic tuning controls. Commander E. J. Beall, USNR, W6BVY, district reserve electronics program officer for the Fifth Naval District, displayed an L-section antenna coupler with r.f. voltmeter.



W9UIN's daughter, a student of the code, has no trouble with the letter "Y". She's also a fan of *Dragnet*, you see. *Dumm-de-dum-dum*.

For Selectivity
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Dr. Qwak (Willard Wilson — W3DQ) also has B & W, Collins Xmtrs, National, Hallcrafters, Johnson, Elmac, Gonset, etc. . . . all for prompt delivery, and on the easiest of terms. Write today.

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- (1)—Vertical radiator (extending to 33' or 66' as specified), consisting of telescoping 12' aluminum tubing sections. Diameter of outside tubing 1 1/4", either antenna.
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Note: Sufficient tubing overlap is provided to permit exact resonance length adjustment anywhere within specified band.

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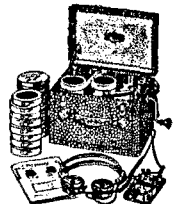
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Having made no investigation of the advertisers in the classified columns, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

QUARTZ—Direct importers from Brazil of best quality pure quartz suitable for making piezo-electric crystals. Diamond Drill Carbon Co., 248 Madison Ave., New York City 16.

MOTOROLA used communication equipment bought and sold. W5BCO, Ralph Hicks, 204 E. Fairview, Tulsa, Okla.

SUBSCRIPTIONS. Radio publications. Latest Call Books, \$3.50. Mrs. Earl Mead, Huntley, Montana.

WANTED: Cash or trade, fixed frequency receivers 28-42 Mc. W9VIV, Troy, Ill.

WANTED: All types of aircraft radios, receivers and transmitters. Absolutely top prices. Dames, W2KUW, 308 Hickory St., Arlington, N. J.

ATTENTION Bargain hunters! Dozens of real trade-in values including Collins, Vikings, Nationals, Hallicrafters, Elmac, Gonset, RME, Morrow, Harvey-Wells. Write for free bargain bulletin. Complete stocks, all leading brands. We trade and sell on time. Burghardt Radio Supply, Watertown, South Dakota.

DON'T Fail! Check yourself with a time-tested Surecheck Test. Novice, \$1.50; General, \$1.75; Amateur Extra, \$2. Amateur Radio Supply, 1013 Seventh Avenue, Worthington, Minn.

WANTED: Early wireless gear, books, magazines and catalogs before 1925. W6GH, 1010 Monte Drive, Santa Barbara, Calif.

TUNING shafts for ARCS, 274N, ARN7, ARB, RU16, \$2.00; MC211A, 35¢; MC136, \$2.50; 274N, racks and mountings, \$1.00; BC348 potentiometers, \$2.00. All new. L.I. Radio, Box 474, Montrose, Pa.

CODE slow? Try new method. Free particulars. Donald H. Rogers, Fanwood, N. J.

POSTCARD brings you free information on our new Amateur Desk Signs and money-saving club purchase plan. Hawkins Distributing Co., Paquattuck Terr., East Moriches, N. Y.

WESTON Laboratories, Inc., of Littleton, Mass., will purchase, for cash, your BC-221 Frequency meter or any of the following: TS-173, TS-174, TS-186, TS-323, TS-13, TS-35, TS-34, APR-4 receivers or tuning units. Write, giving full details.

FOR Sale: 221 P in 221A case, \$50.00; Collins 310C-2, \$70.00; 453, \$15.00; 459, \$15.00; 342D, \$60.00. Frequency multiplier as per '53 Handbook, \$25.00; 829 B, \$7.00. All items are in excellent condition. Stamped envelope brings full description. W3VCN, Worton, Maryland. Money orders only.

VERY sweet baby mobile antenna satisfies XV L mobile antenna problem. Beautifully chromed, only 4 feet high. High Q weatherproof plug-in loading coils. Changes bands instantly. Top section resonates antenna to operating frequency. Becomes regular car whip when coil is removed. Perfect for Gonset, Elmac, Viking, etc. Bandswitching transmitters. Tiny but effective on all bands. Replaces regular cowl or fender broadcast whip. Easily installed in a few minutes. Coils available 75 through 10 meters. With mounting hardware and one coil, \$12.95 each. Specify band. Other coils, \$2.75 each. W6VS, Bill Davis, 225 Cambridge Ave., Berkeley 8, Calif.

MOBILE operating station for sale. Bandwitching 10-watt 5-through-160v transmitter (8N7 modulates 5763). Morrow 75-20-10 converter. Philco 9-tube radio. TNS noise suppressor. Mallory 200 Ma. Vibrapack, dash control unit, panel meter (S-meter, modulation, crystal and band indicator), RCA microphone. All plug-in, relay-controlled. E. S. Winlund, W1K1, 80 Timber Trail, Wettersfield, Conn.

URGENTLY need AN/APR-4 items. New high prices. Littell, Far Hills Branch, Box 26, Dayton 9, Ohio.

SELL: NC-125 receiver and speaker; Admiral 16" TV, Triplett tube-tester, model #3413, all in excellent condition. Charles Horn, 325 E. 163rd St., New York 51, N. Y.

URANIUM. Big samples. Radioactivity guaranteed. One dollar. No stamps. E. E. Fletcher, W5WRS.

QSL'S? SWL'S? Get America's finest and largest variety of supergloss QSL samples, 20¢ (refunded), Rus Sackers, W8DED, Ham Print Shop, P.O. Box 218, Holland, Mich.

QSL's-SWL's Meade W6KXL, 1507 Central Avenue, Kansas City, Kans.

QSL-SWL cards, Sensational offer, Bristol stock 500 1 color \$3.95, 2 color \$4.95, 3 color \$5.95, Super gloss \$1.25 extra. Rainbow cards. Samples. QSL Press box 71, Passaic, N. J.

QSLs. Samples free. Albertson, W4HUD, Box 322, High Point, N. C.

QSLs! Two colors, \$2.00 hundred. Samples for stamp. Rosedale Press, Box 164, Asher Station, Little Rock, Ark.

QSL: 150, \$2.00. Samples 10¢. Credited. Bob Garra, W3UQL QSL Service, 414 Mahoning St., Lehighton, Penna.

QSLs, SWLs. High quality. Reasonable prices. Samples. Write to Bob Teachout, W1FSV, Box Q124, Rutland, Vermont.

QSL's, SWL's. Fair prices for excellent quality cards. Eleven styles for you to choose from. Samples, 10¢. Almar Printing Service, 423 Barker Bldg., Omaha, Nebraska.

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

QSL samples. Dime, refunded. Roy Gale, W1BD, Waterford, Conn.

QSL "Brownie," W3CJI, 3110 Lehigh, Allentown, Penna. Samples 10¢; with catalogue, 25¢.

QSLs. Custom-made or stock! State which. Samples, 10¢. C. Fritz, 1213 Briargate, Joliet, Illinois.

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

QSL-SWLs, samples, 10¢. Malgo Press, 1937 Glendale Avenue, Toledo 14, Ohio.

QSLs. Taprint, 205 South, Union, Miss.

QSLs. Amateur radio's favorite QSL printer. Samples catalog, 25¢ refunded. Stronberg, P.O. Box 151, Highland Sta., Springfield, Mass.

QSL-sational 3-D card. Free samples. 2-color specials. Acme Printers, 707 W. 8th, Los Angeles 17, Calif.

QSLs! "America's First Choice!" Samples 10¢. Tooker Press, Lakehurst, New Jersey.

QSL-SWLs. Samples, dime. Bartinoski, Burlington, Vt.

QSLs, samples free. Fenstermacher, W9ZFD, P.O. Box 254, Steger, Ill.

QSLs. Quality with economy. Samples 10¢. Stinnette, W4AYV, Umatilla, Florida.

QSLs: \$30.00 for one million (also sold by the hundred.) Ham's new "Super-Speed Specials" are FB. Samples 10¢. Robinson, W9AYH, Dept.-R, 12811 Sacramento, Blue Island, Ill.

QSLs. We've printed a million for hams all over the world. Samples 10¢, refunded. V.Y.S. Print, 1704 Hale, Ft. Wayne, Indiana.

QSLs. Beautiful 3 colored, for \$2.85 per 100. Samples for stamp. Fast service. Satisfaction guaranteed. Constantine Press, Bladensburg, Md.

BUILDING up shack: will offer generous allowance for certain used equipment toward purchase price of new Ford. Ross, K2GDO, salesman for Jerry Kauter, Inc., Lakewood, N. J.

WANTED! Extra Class ham, commercial tickets, wants full-time position, available June first, Box 175, Chelsea Square, New York 11, N. Y.

SELL: 25-watt Hammarlund AM transmitter, five bands, shock-mounted, wooden cabinet, NC-57; BC-1068 for two meters; BC-406. Nelson Bigelow, 712 Louisiana, Lawrence, Kansas.

USED 820 image orthicon tubes, \$50.00 each. Fine for amateurs or experiments but resolution substandard for commercial TV. J. M. McDonald, W8HF, 140 West 9th St., Cincinnati 2, Ohio.

TRADE: Chalanalyt, Hickok tube-tester, Jackson condenser tester and Talkaphone Want; Outboard motor and tape recorder, Floyd D. Howard, W5KUJ, 1422 Woodland St., West Monroe, La.

ELMAC: A-54H and 142R-A transmitter and receiver brand new in factory sealed cartons, also power supplies, terrific discount. Spring housecleaning, used Morrow 3-band, Stancor ST203A with VFO. Mac, W4NJE, Box 246, Lewisburg, Tenn.

PERFORATED Sheet Aluminum 18 gauge with 1/16" holes. Easily worked with hand tools or cut to your pattern. Perfect for shielding. One dollar per square foot. Minimum order four feet. Write for bulletin. Nortmann-Durfke Company, 2740 S. 32nd Street, Milwaukee 46, Wisconsin.

QST —Low price on Bound Volumes 15 (1931) through 28 (1944) (except Volumes 22 and 25) substantial reduction for all 12. Also have October 1916 and December 1916 issues in excellent condition. Will trade either for any one of following copies; January 1916 through July 1916; will trade both for one December 1915 copy. L. A. Morrow, W1VG, 99 Bentwood Rd., West Hartford 7, Conn.

SX-71, new, never used, and still in original factory carton. Hard pressed for ready cash. Must sell: \$210.00. G. S. Bones, Jr., W9MHC, 2717 N. New Jersey St., Indianapolis 5, Ind.

MUST sell rig cheap. Write for list. J. Hairgrove, W5MXK, 516 Morton St., Richmond, Texas.

SALE or trade: Complete 150 watt mobile installation. Transmitter, Gonset receiver, generator dynamometers, everything. Want: SSB exciter or top-notch receiver. W5YRC, Kyle, Texas.

TRANSMITTER 350 watts TVI proof enclosed shielded 4 ft rack panel mounted consisting of Millen Final, Millen Exciter with tubes. Coils for 10, 20. Speech amplifier and clipper. Modulator PP-81s with own power supply. 1450V final power supply. Kenyon transformers throughout. B&W lo-pass filter. Prefer sell locally. Best offer over \$275.00. Val Martin, W2UVI, Tel. RI-9-4506.

THORDARSON transformer, 1500 or 1800 volts DC, 300 ma., \$15. Two 4E27 pentodes, new type with ventilated base, used 100 hours, \$17 each. One older 4E27, \$12. Bell 10 watt amplifier, \$15. R. W. Emott, W2AI, E. Madison Ave., Florham Park, N. J.

CALL letters. Two inch, red reflecting, weatherproof. Self-sticking to auto, signs, chassis. 60¢ set. No stamps. R. Boyce, 52 Bennett St., Waltham, Mass.

TRADE—Have \$200.00 worth of brand new model gasoline engines. Trade for Elmac, Babcock or any good factory built mobile transmitter in perfect condition. K6BTH, 123 Forbes Ave., San Rafael, California.

KILOWATT for sale. 6AG7-6146-PP813s. National multi-band tanks. Simpson meters. Bud enclosed 42" rack. Extra panels, chassis parts, full range power supply, Low TVI. Best offer. W6MRR, 618 Cherokee, Los Angeles, Phone: Hollywood 7-0397.

FOR Sale: Viking II and VFO, \$335. E. Marriner, W6BLZ, 528 Colima St., La Jolla, Calif.

SELL: Viking I, with stable VFO, \$150. SX-28 with speaker, \$85.00. Pickup only. W1KXV.

BARGAIN! Hammarlund Super-pro SP400-SX (postwar model, definitely not surplus) complete, power supply, original speaker, perfect, one owner: \$250.00. Buying new Collins. W2SUC-Ex-SV0AB, 2739 Wallace Ave., New York City OL-2-8959.

TRADE: Winchester rifle, Mod. 70 super grade. 22 Hornet, with Weaver KV scope and gun case. Practically new: \$260.00 value. Will exchange for ham receiver of equal value. Al Stark, W2PZS, 61 Piedmont St., Worcester, Mass.

BC-610B, with speech amp. coils, and tuning units 10 to 160, spare tubes, 75A1 with speaker, VFO, mike, bug, 40 ft. steel tower, 10 m. Workshop Beam, Penna-rotor, C. Smith, W9BCD, North Kansas City, RR 45, Missouri.

3-Element 20-meter Hy-Lite beam, perfect condx. \$49.00; Hammarlund Comet Pro and peak pre-selector, \$29.00. W2LFB, 13 Shepard Pl., Nutley, New Jersey.

FOR Sale: BC-453 (Q 5'er) converted to 110 VAC, best offer, or trade for Conset 3-0 or Super Six converter. Bob Edwards, W4ASD.

WANTED: TVI proof, bandswitching VFO crystal xmitter. Cash and/or Congo and Cuba stamp collection. W8CGG, Box 321, Doylestown, Ohio.

WANTED: Johnson Rotator with indicator and change-over relay and whatever cable length available; give condx and best price. C. Buchanan, W8RWZ, 1737 Fairway, Springfield, Ohio.

WANTED: Receiver HRO-129X or better. Also a good mobile rig. WNSOJG, Baty, Weston, Ohio.

WANTED: Used HRO-50T1 with coils and speaker. Also front panel only of Navy RRG (HQ-120). Ward, W9NWT, 9536 S. Hamilton Ave., Chicago 43, Ill. Tel. BE 8-7758.

TBS50-D: One year old, moderate use, with ten Bliley 75 fone xtals: \$115.00. J. C. Robinson, K2AKW, 11 Montview Kd., Summit, N. J.

FOR Sale: 20-meter beam, Johnson, \$50.00; rotator for above top mount, \$45.00; Panadapter, reconditioned from factory, \$75.00; four 810's, \$7.50 each; BC-W45 RCA modulation transformer, screen winding, \$30.00; tubesteter, Philco, \$25; 75A3, in carton, \$450.00; Eico 5" scope, \$40. Andrews, W2STW, 518 Mayfair St., Vineland, N. J.

YOUR Call in modern, attractive, white raised letters on black bakelite, measuring 2" x 6 1/2", \$2.50, postpaid. Weiman, W2BCP, 4514 Ave. K, Brooklyn, N. Y.

NOVICES and hams! Get "Signal Stretcher" Antennas, \$10 and \$15, and 75-watt power-plus transmitters, \$59, complete. Also surplus supplies. Atlanta Electronics, Box 7193, St. C, Atlanta, Ga.

TELETYPE: Sell Model 12 complete, also 21A printer, PE103. Lemon, W6DOU, 158 B Street, Hayward, Calif.

SELL: BC-1306 with GN-58 with most of original accessories: \$75.00. C. Rice, W5PYL, 1911 Swain Road, Stockton, Calif.

SELL: Wilcox #3 receiver, \$25; Wilcox CW-1 receiver, \$25; GR 72A VTM, \$50; Federal L-1 signal generator, 8-330 Mc., \$350; RCA RAK7 receiver, \$55; GR LRS secondary frequency standard, \$585; GE VYZ1 decade scaling unit, \$95; Radiolabs RP3MB speech inverter (scrambler), \$95; Stancor ST203A 10-11 meter mobile xmitter, \$35; Conset 10-11 converter, \$15; Federal speech amplifier terminal telephone and teletype simultaneously in voice channel, \$450; BC-W45, \$10; BC-1016 tape recorder, \$45; WE 124-B amplifier, \$95. All guaranteed in perfect electrical and mechanical condition. F.o.b. Moraga, Calif. W61TH.

FOR Sale: Coast Guard R138 receiver advertised in Dec. QST, 200 Kc. to 18 Mc. range, equal to NC-125: \$50.00; Lettine 240 xmitter and antenna tuner with xtal mike, xtals and coils for 80 and 20 meters, value \$113.85. Sacrifice: \$98.00. Also VFO and power supply, page 186 of Handbook, \$25. Fred Schwartz, K2BYX, ES-3-3205, Brooklyn, N. Y.

75A2 and speaker, like new, \$345.00, HRO-50T1, jam up, two coils, spkr, xtal calib. NBFM \$325.00, 2 Collins 32V2 xmitters, one excellent, plus new 4D32, \$475; other like brand-new, \$500. Bob Sturman, W5OV, 512 Rankin St., N. E., Atlanta, Ga.

32V-1 for sale: \$350.00. Going SSB. Will consider swapping locally. Saltus, K6AVF, 711 Billow Dr., San Diego 14, Calif.

REFLECTORIZED aluminum cal signs. Regular 2" x 2 1/2", \$1.50. Jumbo size, 4" x 12", \$2.00. Overnight service. J. Whitley, W2LPG, 133 Airsdale Ave., Long Branch, N. J.

SALE! Lettine Mod. 240 Xmitter in nice condition, shielded, coils 10 and 20 meters, \$48.00. H. Ellison, 241 Franklin Ave., Aliquippa, Penna.

FOR Sale: Conset 10-11 converter with noise-limiter, \$20; SCR-522 transmitter, \$200.00; E-459A brand new, \$17.00; BC459A converted as VFO (used with BC610) \$3.00 and Mark II tank radio, \$35.00. All freight charges c.o.d. John E. Nosbaum, W9BTP, 2540 W. Gunston St., Chicago 25, Ill.

SALE: Eldico antenna tuner, r.f. meter, 40, 20 and 15 band with coils, in new condition: \$30.00. C. R. Raymond, Bunker Hill, Illinois.

SWAP or sell: NC-125, like new; RME-43, W6FCT. John Andersen, Ord, Nebraska.

HIGHEST prices paid for BC610 transmitter, JB-70 junction box, BC939 or BC709 tuning units, BC014 speech amplifier and all BC610 coils and tubes, TS184/AP spectrum analyzer, G. K. VTM model 1800A, Dumont 334A scope, Boonton Q meters, model 260A and 190A with accessories. Transmitting tubes 3C22, 3C45, 3D21A, 3E29, 4C35, 4D21, 4-125A, 5C22, 450TL, 723AB, 810, 813, 829B, 832, all W.E. tubes. We buy all types: receiving, transmitting, industrial. "TAB", 111 Liberty St., New York 6, N. Y.

SALE or trade: BR870VA Variacs, B&W JCL turret, RCA Kw modulation trans. Need: Grid dip osc., Millen exciter, Meissner signal shifter. Send for list. W2ABL, Edwards, 10 Elm Dr., Neptune, N. J.

WANTED: SSB transmitter. Write to Box 633, Goodyear, Arizona.

30-METER Station: Eldico TR75, 60 watt xmitter, \$55.00, prepaid. One BC-454 receiver with 110 volt power supply, \$15.00, prepaid. Jannick, W9PPV, 1811 N. Lowell, Chicago 39, Ill.

SELL: Viking I xmitter, in excellent condx, \$150.00. Beaubien, WITTC, Millers Falls, Mass.

SELL: Lyco transmitter, model 600-R, new, used for 10 hours, \$100. W1GKK, 109 Gallup St., North Adams, Mass.

SELL: Meissner EX signal shifter, de-TVI'd per QST, 10 to 80 meter bandswitching, 5 watt output, \$50. Bert Green, W2LGC, 51 Elmira St., Hicksville, L. I., N. Y.

FOR Sale: Collins 32-V-2, HQ-129X, SCR-522, Wilcox fixed frequency covr, Mod. 12 teletype with sync motors, keyboard, converter and V. K. Keyer, Magnacord PTO-JAH. Snyder, W6LHS, 1146 Oak St., Fargo, N. Dakota.

FOR Sale: HT-9 trans., latest model, complete, tubes, coils 10-40-80-160 m. spare tubes, new, 3-814, 4-6L6, like new, \$250. Glenn H. Winters, W9SJH, Rt. 4, McHenry, Ill.

SELL: KW, BC221 VFO, bandswitch exciter, pp 813, TVI filter, antenna tuner, \$250; cannot pack or ship. W5QLY.

FOR Sale: QST magazines: 1946 through 1952. In perfect condition. Speech amplifier. Mrs. Darrell Downard, Waterson Trail, Fern Creek, Kentucky.

VAN Sickle displaying all National receivers, offers big trades, easy terms. W9KJF, Gene Van Sickle, Van Sickle Radio Supply, Ft. Wayne, Indiana.

ATLANTIC City vacation. Kilowatt accommodations at low power prices. Luxury rooms with private bath and radio, or budget special rooms with running water. Garden-like atmosphere in quiet location yet near everything. Write for information or reservations. Commodore Hotel, 715 Pacific Ave., Atlantic City, N. J. Phone 4-6993. Ben Robin, W2BIC, Manager.

FOR Sale: Eldico 2-meter receiver and xmitter, like new, \$1.00, cables and Radiat 454, 300 V, 200 Ma. to operate same, \$25; new ARC 5 receiver 1.5 to 3 Mc. \$25.00; Command recvr. .5 to 1.5, Mc. like new, slight modification, \$20; RCA AVT 112A xmitter, like new, \$35; 522 xmitter, rack panel mounted, with meter and coax relay; Power supply for 322 with D.C. for relay, \$30. VHF signal generator I-130-A, 100 to 155 Mc., \$30. RA-10 recvr, new, \$27.50 control box for same, \$6.00. W5LBD, Box 323, Uvalde, Texas.

SELL: RCA 500 watt modulation transformers, new, \$25.00. Free delivery within 25 miles of Cleveland, W8TWO, 4763 Grace Road, North Olmsted R.F.D. 2, Ohio.

COLLINS 32V3 transmitter. Like new. Will sacrifice, \$550. Dr. P. H. Iaccarino, 506 Orange St., New Haven, Conn.

FOR Sale: BC221C, in good condition, original book. Best offer over \$45.00. L. Gerald, 1500 Cayuga Ave., San Francisco, Calif.

SELL: 82" Wb cabinet rack CR-1773. Cannot ship. Make offer to K. Conrad, Akron, N. Y.

RADIOS for sale: Motorola FMTRU, 15 v. mobile transmitters only, 15 watts on 2 meters. Robert Reutter, W0DOA, RFD #1, Box 319, St. Louis 24, Mo.

WANTED: Bandswitching transmitter and receiver, tape recorder, test and mobile equipment. Geo. A. Laine, W2NXP, 222 E. 7th St., Brooklyn, N. Y.

FOR Sale: Silver 701 transmitter, schematic, all coils 80 to 6 meters, \$30.00. Also local only, SX-25 for \$65.00. H. I. Griffiths, 39-82 65 Place, Woodside 77, L. I., N. Y. Illinois 7-1549.

WANTED: December 1915 QST and all 1916 except October. Sell: 115V DC/AC 500 watt Pincor rotary converter, \$20.00. W0RF7, 919 W. 9th St., Waterloo, Iowa.

2-BC-611-E Handy Talkies, new, freq. 3885 Kc, best offer. Rosenblatt, W6QW, 586 Castro St., Hayward, Calif.

REMEMBER Blossomland Amateur Radio Association's Hamfest picnic, July 25 at Warren Dunes State Park, 15 miles south of St. Joseph, Michigan on U. S. 12, 10 meter transmitter hunt. Bring gear for swap and shop. Registration fee \$1.00 in advance for \$1.25 at park. Advance registration through Al Carpenter, WNBORM, Secy-Treas., St. Joseph, Mich.

SSB FT-241-A crystals. Individually activity-tested, measured, marked, exact frequency guaranteed. Guaranteed satisfactory, \$1.00. Orco Products, Box 51, Downey, Calif.

COMPLETE 1946-1953 QSTs, 15¢ a copy; 86 CQ's, 1945-1953, 10¢ per copy. W8BSB.

FOR Sale: Mims rotator and indicator, plus 100 ft. shielded control cable all perfect condition, first \$200. W1CPI.

FOR Sale — Thoradson modulation transformers 300 watt multi-match 115, 500 watt 4000, 6000, 8000 ohms to 4000 ohms \$25; Filament transformers center taps 12 volts 7 amps, 10 volts 6 1/2 amps, 10 volts at 8 amperes \$3 each; Swinging chokes 15-5 henrys \$00 ma \$5, 25-5 henrys 550 ma \$10; Filter choke 20 henrys 550 ma \$10, 10 henrys 2 amperes \$15; Bridge rectifiers for 866's on chassis with filament transformer 3000 volts \$7.50 each; Telrad BC834-18A frequency standard \$25; transmitting condensers, meters, etc. Will crate and ship C.O.D. E. Dale Trout, Box 703, Elm Grove, Wisconsin.

FOR Sale. Make an offer. All inquiries answered. Vibroplex Standard; Sylvania 3" Oscilloscope; PE103; Master HYQ75 (New); Master 13C Mount; MicroMatch Silver Q'er; MicroMatch MM1; Electro-voice Speech Clipper (New); National TMC150 Condenser; HyLite 3ET10 Beam; Radiat Tele-Rotor and indicator; Zenith 12" TV, good condition; Lambda MM2 Modulation Scope; Johnson 200ED 30 Condenser; Thoradson 6414 10V Filament Transformer; B&W 10TEL; 10BVL; 40BVL; 20MCL; Morris coil winder; Stancor P6004 Transformer. Wilbur M. McDonald, Dadeville, Alabama.

HANDIEST gadget the c.w. man ever had. Variable speeds for your bug key. Whether QSO or traffic, you can change speeds instantly to suit the receiving operator. Chrome plated. Send \$1.00 with make and model key to J. A. Hills, 8165 Inwood Ave., Dayton 5, Ohio. W8FY0.

COLLINS 32V3 Xmitter, little used, spare 4D32, ant coupler with Simpson meter and B&W coils, push-tact D104 mike. Complete FOB Worcester \$630.00 Also HRO-60 receiver complete, like new \$425.00 FOB Worcester. W1KC, 240 Moreland St., Worcester, Mass.

WESTERN Electric No. 18A Mobile Transmitter for 10-6 Meters, 6V dynamotor with instructions, \$20.00; VHF-152 with 2 meter Regency booster, \$45.00; TB-35, \$3.00; Two Solo Cat. No. 95280 filter chokes, \$5.00 each; Converted prop-ship motor, \$10.00, All items FOB. W3VAM, 1805 Gilbert Ave., Hagerstown, Maryland.

OSCILLOSCOPE in metal cabinet, modeled after Dumont 208B, balanced deflection, recurrent or triggered sweep, accessory circuits, complete schematic, Mendelson, 105 Leslie St., Newark, New Jersey.

FOR Sale: UTC Mod PA 310 Plate Transformer, 9200, 8100 and 7000V each side of center, 105, 115, 210, 220, and 230V Pri, UTC Choke Mod PA 10, UTC Fil. Transformer Mod 121 and a 2MFD 5000VDC Oil Cond. No reasonable offer refused. W3PQR, Nick Medore, 549 Farnsworth Ave., Clairton, Pa.

TRANSFORMER, Plate and all, New, Pri., 0, 106V, 112V, 118V, 124V, 200V, 220V, 60 cy. Sec., 2400V C.T., 300 Ma., 10V 6A, 2.5V 10A, available at \$14.00 ea. FOB. W2HUN, 90-05 56 Ave., Elmhurst 73, N. Y.

WANTED: BC-464 Radio Control target plane receivers. Any condition if audio chokes intact. F. Schwartz W4KFK, 204 6th Ave. No., Nashville 3, Tenn.

TRADE for what have you. (1) Jeannette Rotary converter, w/ filter, LA19 115 v. D.C. to 115 v. AC. (1) Carter Rotary converter D1060C 115 v. DC to 115 v. AC. Warner, 21 Linden St., Massapequa, N. Y.

FOR Sale: W4DFWF Half KW-Phone-CW xmt. Described in June and July '51 CQ. On the air at present time. Antenna tuner with changeover relay and coils for 10 thru 60. Spare tubes, \$300.00. Also 40 and 60 meter Command xmt's with power supply and modulator. 40 meter rig has Clapp osc., \$50.00. Will deliver big rig 150 miles. Extra for crating. W8ASL, Harry Wherry, R#1, Convoys, Ohio.

TRADE or Sell: Like-new Gonset Super-3; UTC 250 watt modulation xformer; RCA broadcast mike; 100 watt vfo mobile xmitter 80-40-20. Want Elmac PMR6A with pwr. W9OUF, 138 Chandler Blvd., Macomb, Illinois.

UNUSED, Factory wired, DeTVT, Complete 150w. Phone-CW Transmitter 100 or heat offer K2DQH, Chris Lane, North Street, Harrison, N. Y. Rye 7-0114.

DX Men, send for DXerama, a Ham's digest of DX operating awards offered by amateur radio organizations in 32 awards together, contains up to date information on requirements for all awards together with ample space for logging QSO's required for each. \$1.00 postpaid in U.S.A. or possessions, \$1.25 foreign. Sam Frain, W3AXT, RFD #1, Box 127, Lancaster, Pa., U.S.A.

FOR Sale: Gasoline powered DC generator. Ultra conservative Navy ratings: 500V at 65 ma and 12V at .86 amp. Ideal for Command transmitter. Like new \$60. Navy Command transmitter, 3-4 mc, new, partly original. Metal and loading coil, \$17.50. C. W. Schwenzler, W8MQR, Woodville, Ohio.

SWAP or sell: VHF 152; HF 10-20; Browning Freq. Standard; Two meter receiver; HRO Power Supply; Mobile Transmitter; Complete 200 watt SSSC Transmitter; Cased 5000 volt 3" meter; WE D167020 Dual Bridge Variators #1; Finished Xtal Blanks 5.3 to 8.3 Mc, 10 for \$1, W9QFZ, 2318 Second Ave., Council Bluffs, Iowa. **WANT** to purchase RCA Type CV-3a fixed frequency 30 to 40 mc. receiver unconverted. State price and condition. W9MTU, Box 828, Anderson, Indiana.

FV-LITE 3 element 10 meter beam with 100 feet of RG8U. \$25. W6GVS, 798 Sherburne St. Paul, Minnesota.

FOR Sale: Brand new HQ-140x, in original carton, \$230.00. Robert Champlin, Jr., W2BKC, 311 Bryant Ave., Springfield, N. J.

FOR Sale: 32V2, Aelo, commercial 10M mobile rig with PE-103, cable control, w/ Gonset, all for \$68.00. 12 speaker, \$4.00. Eico signal generator, \$8.00. RCA TV, \$3.00. George Kravitz, 7919 20th Avenue, Brooklyn 14, N. Y.

DYNAMOTOR 12v in 425 output 270 m. \$15.00. PE103 Dynamotor 6v in 500v @ 175m with Triband Gonset Converter, \$40.00. Premax mount and base and loading coil 8 ft whip, \$10.00. Power supply for Harvey-Wells Bandmaster homebuilt, \$19.00. Meissner 150B complete xmitter and coils 500 watts, \$150.00, set alone or swap for Viking 1 or II. John Rache, W10SC, Edgewood Road, Kensington, Conn. Baldwin 5-3771.

HRO 50T receiver, A, B, C, D Coils. Select-O-Jet, and matching speaker, original cartons, excellent condition complete price, \$250.00. WITNG, 436 Terrace Ave., West Haven, Conn.

SELL - PE103, cables, never used, \$25. BC1306, tubes, plug, \$7. 1U75 six meter rig, 3-815's, 5 xtals, no PS, \$12. Lester six meter converter, \$K output, built-in PS, tubes, \$15. Tubes: 829, 827, 815, 1V50; 2E22, 1. F.O.B., Rochester, Mich. W81LP, 603 Ludlow.

SELL: Collins 30-J 600 watt input phone and CW transmitter, \$275. Boehme automatic keyer and McElroy 3-key perforated tape puncher for Morse code, \$145. AR-88-D, \$250. #241 Dumont scope, \$245. 12,000 ohm 110 vdc relays, 1.75. Teletype printers. Want BC-342, BC-312, 75A, 32V, 310 xmitter, technical manuals. Will trade. Tom Howard, W-1-AFN, 46 Mt. Vernon St., Boston 8, Mass. (Richmond 2-0048, 2-0916).

WE'RE Moving W1JR and Mockingbird Hill to Cincinnati June 26. If you beat the movers you can get some real bargains. I two Temco 75CA TVI-Proofed, KW final and Modulator never, never used, two 10/20 3-el rods, beams, 125' KD Windchaser Towers, VHF152A, DB22A, RAK-5, 2000' RG8U, Hundreds Transmitting Tubes and back issues IRE, QST, CQ, RADIO. Write for appointment. See or will send full details. Richelieu, 218 Senator Place, Cincinnati.

FOR Sale, complete 2 Meter Station Sonar MB-26 X-ter & Sonar SK-3 Rcvr, with power supply for fixed operation, with mike & xtal & all inter-conn-cables & plugs. Has been completely checked by mfr. Will ship via express prepaid in U.S.A. Total amt., \$90.00. G. Jacobson, 1152 C.I. Ave., Brooklyn, N. Y. K2ERV.

FOR Sale: Collins 32V2 in perfect condition with laboratory job of shielding in cabinet and around final and external circuits filtered against TVI, with two spare 4D32 final tubes, price \$450. Sixty foot steel tower with heavy duty base insulator to make vertical radiator, earth anchors, turnbuckles and guys, price \$90. Will sell as package transmitter, tubes, tower and accessories \$500 cash and carry from my residence. Prefer sell in Washington, D. C. - Baltimore area. H. A. Crossland, W3DX, 20 Norbeck Road, Manor Club Estates, Rockville, Maryland, Phone LOckwood 5-8603.

SELL SX-71 \$149.00, RAK6 15-600kc receiver \$29.00, 3-30 Gonset with clipper \$20.00. New Gonset clipper \$6.50. Miscellaneous parts-tubes. Want HRO50T coils E, F, G, AC. Morrow 5 band converter, Elmac transmitter, KW modulation transformer, 8 lbs, #16, 18 or 20 enamel or covered copper wire. Baker, 5049a Murdoch St., St. Louis 9, Mo.

HI, Fellow! Useful as well as beautiful! Neckties with your handle, call and antenna towers handprinted in contrasting colors. Write Henry Schanding, W3RRF, Harrington, Delaware.

TRADE-Sell: Six never used 810s, three 805s. One B&W CX70B Butterfly with disk neutralizers. One B&W 10HDV1 coil. Murphy wall safe. Used magic equipment. O Gauge scale model Lionel Hudson, two railed. Want 813s, 6140s, 500Ma Triplet 3" w/ant. 300 watt Polypedance modulation transformer, Condensers and transformers for 813 transmitter in January QST. Larry Kleber, Beldere, Illinois.

SELL: Hammarlund Four-Twenty xmitter with Four Eleven modulator, BU-348-H AC receiver; VHF-152 converter. Good condition, \$50 each, \$140 takes all. K2BBT, 110 West Prospect St., Hopewell, N. J.

CHOKO on these. All new. Kenyon T-177, 12H-500 mils 14.00. T-160, 11H-300 mils 7.00. UTC CG-104 10H-350 mils 10.00. S-37 20H-550 mils 9.00. Two big ones. 0H-20 amps 25.00 each. W. C. Doonan, WIAMO, 9 Wicklow St., Malden, Mass.

FOR Sale: Johnson Viking II transmitter factory wired, one year old, less than 25 hours operating time, perfect condition, can't tell from brand new, \$250.00. BC-345-F receiver, some modifications, in good condition, \$30.00. Will sell both for \$275.00. J. A. Butler, W9KEM, 168 So. Edison Ave., Elgin, Ill.

PE-101-C Dynamotors, brand new, original cartons, GE models, 610V 150Ma plus 325V 125Ma with 12VDC, 300V 90Ma plus 160V 110Ma with 6VDC. Conversion data included. Weight 13 lbs. \$4.45; Send for list. Farr Electronics, Box 273, Lexington 73, Mass.

JOHNSON Viking Ranger, the new completely self-contained exciter-transmitter with built-in VFO is now available in kit form. Write for prices on wired and tested unit. This does not replace or supersede the Viking II transmitters. Trading accepted; time payments available. Write to Carl, W1BFF, Evans Radio, Concord, N. H.

SELL or Swap, HRO-60, coils A, B, C, & D, in A-1 perfect shape. First \$400.00 or will consider trade for Hi-Fidelity Amplifier. Tuner, and related equipment, an E. Newman, Linden Drive, Natchez, Mississippi.

SELL: 813 transmitter, see page 179- 1953 Handbook, two power supplies, Vibropole key, 75 crystals for 80 thru 20 meters, 3 boxes parts, transformers, capacitors, \$100. Anthony Buzzoni, 28 Roosevelt St., N. Y. C. 38, Worth 2-1938.

ELMAC A-54H, 40m, in \$100. BC-696, 20. Dual Vtr pwr supply for both. \$35. Marcon receiver, new, \$7.00. Dow Key, \$10.00. Eldico TR-75-TV, \$40. Triplet #630 VOM, \$30. K2EXB, Copake, N. Y.

MOVE Forces Sale: Hallcrafters HT-20 transmitter, new condition in original container, \$375.00. K2CWZ, Quarters 176-B, Governors Island, New York 4, New York.

75A 1 - Like new, \$275.00. Thordarson Fil. Transf. for 872, a, s. \$5.00. Two mercury Relays 115 volt coils, 110v, 35 Amp load, \$7.50 each. Six 1mf, 3,000 V. Filter Cond. \$3.00 each. Two 2mf, 4,000, 750 each. Thordarson Freq. Choke Nr. T-20C57 600Ma, 7.50 Volt, \$12.50. Three New 872's, s. \$5.00 each. Two slightly used 872's, \$4.00 each. Thordarson Plate transf. 1500 & 1200 V. 500 Ma, \$15.00. Coax. Relay used about 30 Min., \$7.50. Triplet Freq. Meter, Model 3256, \$8.00. J. H. Robinson, W5BG, 522 Cumberland St., Dallas, Texas.

TELETYPE model 12 complete with cover, keyboard, table and spare parts, \$150.00. Model 26 complete with cover and keyboard, \$175.00. Need model 15 parts. W6BUI, 1886 So. Broadway, Denver, Colorado.

TRADE - Lamplin 105-A Freq. meter, 100 kc to 56 mc continuous; excellent condition for Communications Receiver for ham use in good condition. W4OLZ, 4112 Trenholm Rd., Columbia, S. C.

SELL or trade KWRF final with Elmac 4-250A, four meters, grid and screen supply, rack panel commercial appearance, no plate supply. Also modulator KV, Thordarson transformers, 810's, excellent condition, rack panel, no plate supply. Wanted 4000 vdc filter condensers, an fixed vacuum 12 and 25 mmid. W5DA, 4425 Boisjeux, Dallas, Texas.

WANTED: HRO coils - Charles Liese, 12 Hub Lane, Levittown, N. Y.

NEW Surplus Special! RG-8/U Cable 100 ft., \$5.95; 250 ft., \$13.25; 500 ft., \$25.00. RG-59/U 500 ft. \$26.50. Coaxial Connectors - PL-259 5 for \$2.25; SO-239 5 for \$2.00. New Oil Condensers - 4MF 600V, \$1.25; 10MF 600V, \$3.25; 4MF 1000V, \$1.59; 8MF 1000V, \$3.25. Postage extra. Request free bulletin listing tube values and visit our new store for thousands of bargains. Want to buy or swap - ham receiving, surplus equipment, surplus parts, and electronic equipment. Lectronic Research, 419 Arch St., Philadelphia, Pa.

FOR Sale, Hallcrafters S38, \$28.00. Sky Buddy, latest model, \$25.00, both like new and guaranteed. W3ALX, 934 Wyoming Street, Allentown, Penna.

Viking II, 1 yr. old; Viking VFO; NC 183, matching speaker; 3 element 10 meter Beam; Johnson Low Pass Filter; Antenna Coupler with coils for 10, 20, 40, and 80; WRL Fone Patch; Heathkit Grid Dipper; Astatic T3 Mike with push to talk desk stand. All in guaranteed excellent operating condx. \$525.00 or best offer for works or individual items. W1VAN, 18 Earle St., Norwood, Mass.

WANTED: Your var surplus and amateur equipment. Cash or trade for new Viking, Hammarlund, National, Gonset, Elmac, Hallcrafters, Telocator, etc. Especially want complete or any part of: AR-13, D-17, DX-12, APN-9, BC-312, BC-342, BC-345, TCS-BC-610, BC-614, BC-939, BC-729, ARC-1, ARC-3, BC-221, LM, Test equipment RTA-1B, Teletype, Keyboard perforators, any Collins equipment, Manuals, AR-88, 32V, 75A. What have you to trade? Alltronics, Box 19, Boston 1, Mass. Richmond 2-0048, 2-0916.

HRO-50.T1 with speaker, A, B, C, D, E, F, coils, crystal calibrator, excellent condition, \$250.00. BC-342N with speaker, excellent condition. \$65.00. W6VOU, 1230 Wilson St., Fairfield, California.

COLLINS KW-1 and Collins 75A-3 receiver with 3kc and 6kc mechanical filters. All in "factory new" condition. Transmitter \$400.00, receiver \$525. W6AGZ, 6513 Blucher Ave., Van Nuys, California.

COMPLETE 300 watt all band fone-cw transmitter for sale, 813 final, 841 modulator, Meissner signal shifter VFO, \$300 or best offer. W4PJG, Box 647, Ft. Myers, Fla.

COMPLETE 300 watt mobile rig. Viking Mobile, Morrow 3BR, center loaded antenna, dynamotor, with all cables and harnesses, extra battery needed. As unit, \$150 or best offer. Also VHF 152, \$40 BC 453, \$15. Will also trade for SSB equipment. Jim Brown, W9VEQ, 5324 Belle Plaine Avenue, Chicago 41, Illinois.

FOR Sale: All new in cartons. Electro-Voice 726 Microphone, \$37.50. Terado Super DC to AC converter 75 watts, \$20. Simpson 303 VTM, \$50. GE time meter, \$7.50. Exide battery 28 volt, 63 amp., \$35. J. W. Craig, Jr., W5VRO.

HRO50-T1, 6 coils, \$300. S40, \$59. Hickock scope, \$79. Want S76 and Antennascope, W3VIM, 4113 Slater Ave., Baltimore 6, Md.

SELL: SX-17 plus Browning Preselector, newly aligned, \$45. New PE 94 (for SCR 522), \$2.50. Brand new pair 250TH's in sealed cartons, \$22 each, \$42 for pair. New SCR 522, \$25. New BC 906, \$22. Shipping charges collect. S. Tucker, W2HLT, 51-10 Little Neck Pkwy, Little Neck 62, N. Y.

SELL: HQ-129X with speaker, original cartons, \$185. Also Globe Scout transmitter, clean, \$75. Irwin Hyman, 12 West 87 Street, New York City.

BC342N excellent condition never used before, includes original speaker and instruction book. \$85. B. Spiegel, W2SZZ, 3 Stuyvesant Oval, N. Y. C.

VIKING I deTV'd with VFO, Ant relay, balun coils, \$250. SX-71 with speaker, \$200. Express collect. W8PBT, 3304 Lenox Drive, Dayton 9, Ohio.

FL 8 audio filters, help eliminate QRM — 2 for \$2.50 prepaid or 2 for \$3.00 with FL 55 and 76 attached prepaid in U. S. only. BC 348 shd. 4 in. (HT 54) BC 433 compass receiver, \$5.00. Thordarson T-30W55 Public address amplifier, \$5W output, perfect condition, \$65.00. 2 ea new 250 TL, \$20.00 for both or will swap for 4-125, 4-250, 4-400, 810 etc. Wanted mobile receiver or converter. M. D. Haines, W5QCB, 1316 S. W. Military Drive, San Antonio 4, Texas.

NATIONAL NC183D's \$279. These are exceptionally clean, fellas! Electronic Labs, 2444 "D", Lincoln, Nebr.

REAL bargains: New and reconditioned Collins, National, Hallcrafters, Johnson, Elmac, Gonset, Babcock, Morrow, RME, Millen, Lyso, others. Reconditioned S38, \$29.00; S53A, \$59.00; S40A, \$69.00; S76, \$129.00; NC125, \$129.00; NC183, \$199.00; HRO50T1, \$399.00; HRO50T2, \$399.00; NC57, \$69.00; NC68, \$39.00; HQ129X, \$169.00; SP400X, \$249.00; VHF152A, \$39.00. Gonset Tri-band, \$29.00; S40B, SX71, SX42, SX62, HFS, HRO5, HRO7, NC183D, SX28A, Collins 75A1, 75A2, 75A3, 32V1, 32V2, 32V3, Viking 11, many others. Shipped on trial. Easy terms. Write for free list. Satisfaction guaranteed. Henry Radio, Butler, Mo.

SPRING Cleaning: 80 foot steel welded tower in ten foot sections with hinged base, \$95.00 F.O.B. S-53A perfect condition, \$65.00 F.O.B. Gonset Commander with VFO and Harvey Wells 500 volt AC power supply, like new, \$145.00. Two 2 in. x 4 in. 400 volt Cornell-Dubilier type TJU condensers, \$15.00 each, postpaid. Johnson 200ED20 Split Stator, \$5.00 postpaid. Type P4E Sincrocscope, \$35.00 F.O.B. New TV tube Rauland 12LP4, \$15.00 F.O.B. BC-659J with PE-120A never used, \$45.00 F.O.B. Surplus, never used, tubes, postpaid: 813, \$9.50; 4E27, \$17.50; 100TH, \$9.00; 2E26, \$2.00; 836, \$4.00. Two BC-191 150 watt modulation transformers, postpaid, \$6.00 each. K2EQT, 156 Locust Avenue, West Long Branch, New Jersey.

FOR Sale Collins 310B1 all coils, manual, tubes, spare 2E26, 5R4GY 3, 6A67's de-TV'd. \$200.00. F.O.B. Rockford, Illinois, R9HP, East Htd 8, Conn.

SELL QST October 1925 thru September 1954. Excellent condition. Best offer over \$100.00. Hallcrafters receiver SX9, \$35.00. M. H. Barnard, 7403 Holly Ave., Takoma Park, Md.

BUY from Government, Radio, Electronic Equipment, Tubes, parts, etc. Government's Latest Listings, \$1.00. Surplus, Box 213, East Hartford 8, Conn.

MOVING! Must sell following: Heath 0-3 scope, \$20.00; Unmodified 522 with tubes, \$24.00; SX-28, \$115; 300 MA filter choke, \$6.00; 500 MA, \$7.50; Collins 75A2 speaker, \$10.00; BC221, \$85.00; BC696, \$17.00; Motorola 84" deluxe cabinet rack, \$55.00; Bus radio, \$8.00; T17 mobile mike, \$2.00; Eastman 35 camera, \$35.00. Want 5' or 6' rack and variac. F.O.B. Omaha, W0WQE, 4466 Bedford, Omaha, Nebr.

PANADAPTOR — BC 1031-A converted to 500 K C. 1F for use with 75 A-1 perfect condition, \$80.00. W0PMH, 2935 South Clermont Drive, Denver, Colorado.

WILL Trade — practically new Zeiss Contessa Camera with F/2.8 lens with ER case for late model Elmac A-54 or A-54H transmitter in good condition covering 75, 40, 20, and 10 meter bands. Contact Captain W. L. Fountain, Box 388, Wadesboro, N. C.

VIKING II transmitters, VFO's (new), kits and wired; Concertone Tape Recorders, Terrific trade-in! Want receivers, mobile and audio equipment, frequency meters, surplus gear, KP-81's. Sample trade-in allowance: PE-103, \$40.00. Telco (Amateur Radio Equipment Division), Azurelee Dome, Malibu, California. Globe 6-2611.

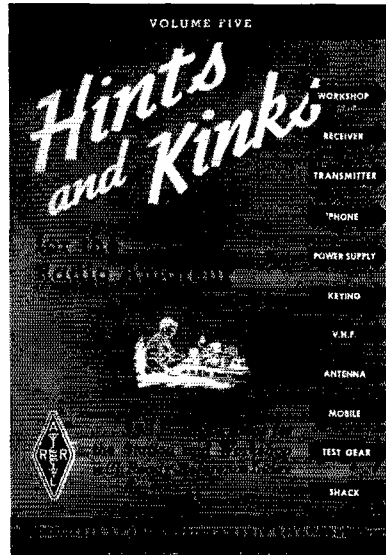
AMATEUR Paradise vacation spot. Livingstone Lodge and Log Cabins, Mascoma Lake, Enfield, N. H. Swim, Fish, Boats, Sports. 100 acres, Eleven buildings, Churches, Recreation building, Main Dining Lodge, 75 and 40 Meter Rig in Lobby, Family groups, 25th year, Low rates, Booklet. Al. Livingstone, W2QPW, 12-01 Ellis Ave. Fair Lawn, N. J.

CLEANING up Shack. 522 complete unaltered — 511 alpenstock packie-talkie new complete with book — BC455 new. Best offer on above. Meisner #1-1020 signal shifter, tested calibrated never used sixty dollars. Hallcrafters S-72 notable new condition fifty dollars. Hundred dollars both above. 250TH some use, tests new, seven fifty. W7CPY.

We are now in our new ultra modern building with fresh stocks to serve you. Bargains! with new guarantee: S-72, \$69.50; S-40A, \$75.00; RME-45, \$99.00; HRO Senior, \$99.00; Lyso 600, \$99.00; S-27, \$109.00; SX-43, \$129.00; S-76, \$149.00; SX-71, \$169.00; SX-42, \$189.00; HRO-50, \$275.00; 75A1, \$275.00; HT-17, \$32.50; EX Shifter, \$69.00; Globe, \$39.50; Harvey Wells S-72, \$79.00. Deluxe, \$99.00; Viking I, \$199.00; Elmac A-54, \$99.00; HT-9, \$199.00; Globe King, \$295.00. WE NEEDED used receivers: We give highest allowances for S-20R; S-40A; B; NC-57; NC-100; NC-125; SX-24; SX-25; HQ-129X; and similar receivers. Free trial. Terms financed by Leo, W0GEO. Write for catalog and best deals to World Radio Laboratories, 3415 West Broadway, Council Bluffs, Iowa.

VERTICALS, Wave-guide aluminum. Adjustable. 6-11, \$5.95, 10-20, \$12.95; 10-40, \$24.95. Write Norm Theobald, W6MRR, N. C. Theobald & Co., 618 Cherokee, Los Angeles, Cal.

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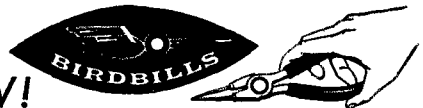
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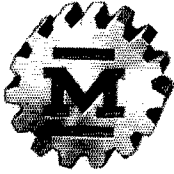
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- Send descriptive literature

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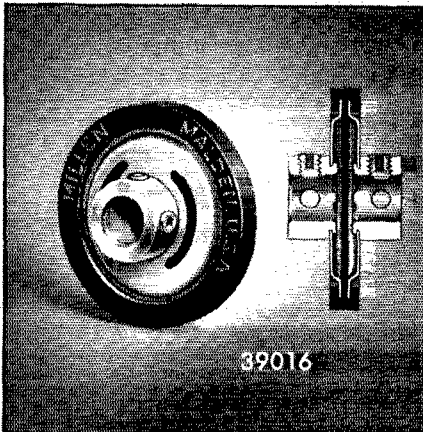
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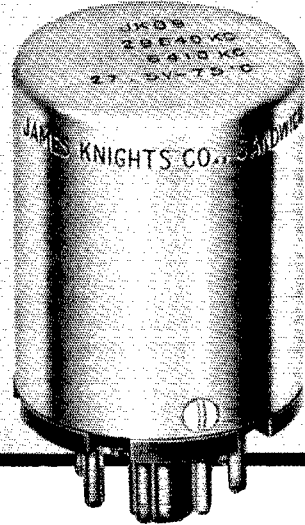
compact, light, economical

new oven

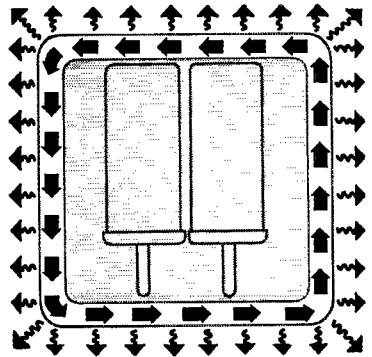
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- Only 1.28" dia. x 1.70" high and weighs only 1.5 oz.
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- Will meet a specification of $75^{\circ} \pm 1^{\circ}\text{C}$ over a temperature range of -55° to $+70^{\circ}\text{C}$.
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Patented JK "Thermaflow" Design—Temperature, like water, seeks its own level. Instead of trying to "dam up" heat within the oven, by use of massive heat retaining elements, the JKO9 oven is designed to permit a uniform loss and uniform replacement of heat. Heat is simply replaced as it is lost from the low mass, high conductivity shell. And within this shell the crystal unit remains wrapped in a blanket of warm air. Because sufficient heat is always lost by the shell none need be yielded by the crystal.



JKO9 Heat Exchange Pattern



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SYMBOL OF SERVICE

Through Research, Stability, Availability

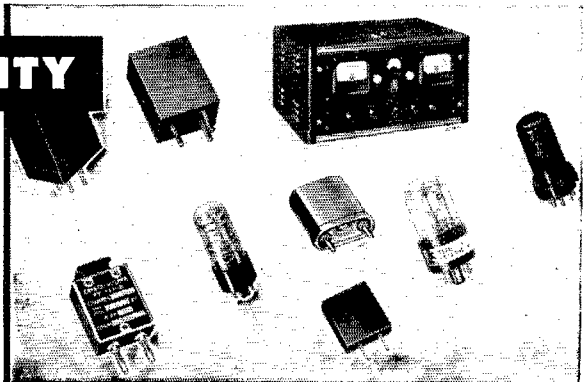
The compact, light, inexpensive JKO9 matches the performance of many ovens employing multistage heaters and massive heat-retaining elements. It houses one or two crystals, plugs into an octal tube socket, is available with a choice of heater voltage from 6 to 28 volts. It is another JK step in the advancement of miniaturization and extreme stability. Write us for complete engineering information.

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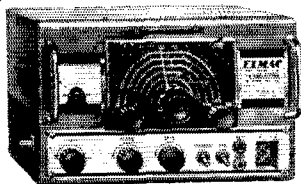
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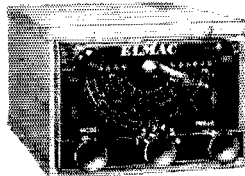
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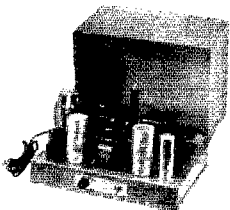
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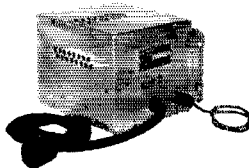


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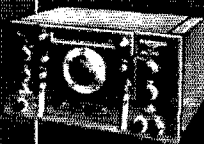
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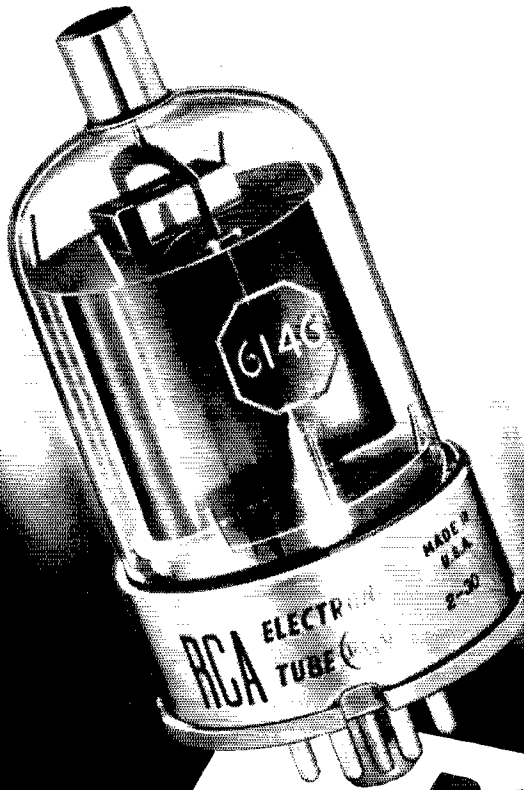


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HARRISON, N. J.

BOARD MEETING HIGHLIGHTS

The Board of Directors of the American Radio Relay League, Inc., this year held its meeting in Denver, Colorado, May 14th and 15th. Present officers were reelected and Percy C. Noble, W1BVR, New England Division Director, was newly elected as an additional Vice-President.

In frequency matters, after careful examination the Board instructed that its 1952 request of FCC for a special mobile voice band 3775-3800 kc. be withdrawn and that comment be filed with the Commission in Docket 10927 expressing approval of the principle of non-segregation for specialized interests in the amateur bands. FCC is also to be asked to expand the 40-meter Novice band to read 7150-7200 kc. as earlier requested by the League. Additionally, the General Manager was directed to seek removal of the present power limitation in the 420-Mc. band and continue efforts to increase amateur privileges in the 1800-2000-kc. range. The Planning Committee was requested to study the possibility of adding pulse emission to 1215-Mc. privileges, and to take cognizance of the general matter of amateur operation on the high seas.

Examining other regulatory matters, the Board directed that League comment be filed with FCC endorsing those aspects of a recent Commission anti-radiation proposal which will reduce interference to the Amateur Service from excessive television receiver radiation by establishing standards and limits for spurious radiations. ARRL's Planning Committee was instructed to study the amateur license structure from the standpoint of incentives to progress. Action of the Executive Committee in protesting fees for amateur licenses was additionally endorsed by the Board.

The Headquarters was asked to prepare a brief History of Amateur Radio for publication in *QST*, and to make the story additionally available in booklet form as background for newcomers to our hobby. The Planning Committee was instructed to study possible rearrangement of League Divisions to provide a more equitable distribution of members represented by each director. Although deciding not to add the Membership & Publications Committee as a permanent ARRL fixture, the Board continued it for another year and asked the Committee to undertake a study of various League publications. A suitable "maple leaf" overprint was ordered placed on membership certificates issued to Canadian amateurs. Funds were continued for travel by SCMs, QSL Managers and SECs to promote the organization work of the League in the field, especially in emergency and Section organization matters. The Board specifically endorsed the action of the Executive Committee in its 1953 autumn election eligibility rulings and deemed it unnecessary to amend the Articles of Association as concerns eligibility requirements.

For accomplishments in TVI matters the Board expressed its thanks and commendation to the Field Engineering and Monitoring Bureau of FCC, to TVI committees, to ARRL Hq., and more specifically to L. G. McCoy, W1ICP, and the League Technical Department for the numerous demonstrations conducted in major cities around the country. Additional bouquets were tossed to President Dosland for arrangement of the FCC visit to League Hq. in January; to Vice-Directors, Assistants, SCMs, SECs and QSL Managers for their fine work on behalf of amateur radio; to the staff for its assistance to amateurs and local counsel in matters involving municipal ordinances; and to Alice V. Scanlan, Chief Accountant and Assistant Treasurer upon the completion of 25 years ARRL service. A resolution was adopted expressing the deep regret of the Board at the passing of radio pioneer Edwin H. Armstrong.

Among other actions taken were the urging of more field contact travel by the Hq. staff; establishment of medallion awards for amateurs achieving three-time membership in the Brass Pounders League; additional staff attention to administration of the National Traffic System; a study of the problems of the handicapped in amateur radio; a request of the General Manager to secure next year the issuance of a commemorative stamp honoring amateur radio; and the extension of the host Director's responsibility in the conduct of a national convention.

Minutes of the meeting will appear in July *QST*.