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QST

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amateur radio

Dots—Mic-ke— ANNUAL A.R.R.L. FIELD-DAY, JUNE 25th-26th

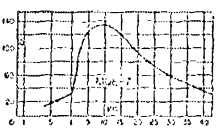
LARGEST PRODUCERS IN THIS FIELD FOR TWO DECADES...

HIGH Q INDUCTORS
FOR EVERY APPLICATION

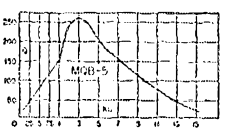
FROM STOCK... ITEMS BELOW AND 650 OTHERS IN OUR CATALOGUE B.

MQ Series
Compact Hermetic
Toroid Inductors

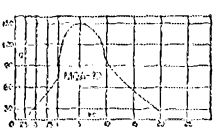
The MQ permalloy dust toroids combine the highest Q in their class with minimum size. Stability is excellent under varying voltage, temperature, frequency and vibration conditions. High permeability case plus uniform winding affords shielding of approximately 80 db.



MQE
15 stock values from 7 Mhy. to 2.8 Hy.



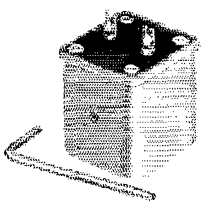
MQA
19 stock values from 7 Mhy. to 22 Hy.



MQB
12 stock values from 10 Mhy. to 25 Hy.

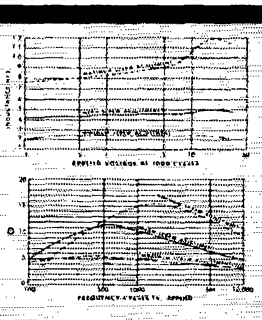
MQ drawn case structure.

	Length	Width	Height
MQE	1/2	1-1/16	1-7/32
MQA	11/16	1-3/32	1-28/32
MQB	1-5/16	2-1/16	2-13/32



VIC case structure

Length	Width	Height
1-1/4	1-11/32	1-7/16

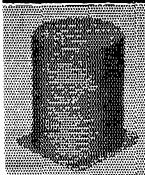


Type	Mean Hys.	Type	Mean Hys.
VIC-1	.0085	VIC-12	1.3
VIC-2	.013	VIC-13	2.2
VIC-3	.021	VIC-14	3.4
VIC-4	.034	VIC-15	5.4
VIC-5	.053	VIC-16	8.5
VIC-6	.084	VIC-17	13.
VIC-7	.13	VIC-18	21.
VIC-8	.21	VIC-19	33.
VIC-9	.34	VIC-20	52.
VIC-10	.54	VIC-21	83.
VIC-11	.85	VIC-22	130.

VIC Variable Inductors

The VIC Inductors have represented an ideal solution to the problem of tuned audio circuits. A set screw in the side of the case permits adjustment of the inductance from +85% to −45% of the mean value. Setting is positive.

Curves shown indicate effective Q and L with varying frequency and applied AC voltage.



MQL Low Frequency High Q Coils

The MQL series of high Q coils employ special laminated Hipermalloy cores to provide very high Q at low frequencies with exceptional stability for changes of voltage, frequency, and temperature. Two identical windings permit series, parallel, or transformer type connections.

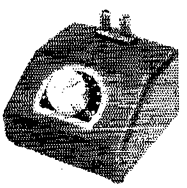
MQL-1	2.5/10 Hys.
MQL-2	5/20 Hys.
MQL-3	50/200 Hys.
MQL-4	100/400 Hys.

MQL case
1-13/16 dia. X 2-1/2" H

DI Inductance Decades

These decades set new standards of Q, stability, frequency range and convenience. Inductance values laboratory adjusted to better than 1%. Units housed in a compact die cast case with sloping panel ideal for laboratory use.

DI-1 Ten 10 Mhy. steps.
DI-2 Ten 100 Mhy. steps.
DI-3 Ten 1 Hy. steps.
DI-4 Ten 10 Hy. steps.

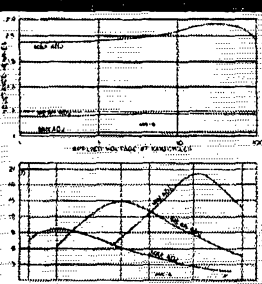


DI DECADE

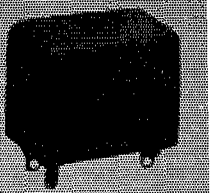
Length	4½"
Width	4⅜"
Height	2⅞"

HVC Hermetic
Variable Inductors

A step forward from our long established VIC series. Hermetically sealed to MIL-T-27 . . . extremely compact . . . wider inductance range . . . higher Q . . . lower and higher frequencies . . . superior voltage and temperature stability.



Type No.	Min. Hys.	Mean Hys.	Max. Hys.
HVC-1	.002	.006	.02
HVC-2	.005	.015	.05
HVC-3	.011	.040	.11
HVC-4	.03	.1	.3
HVC-5	.07	.25	.7
HVC-6	.2	.6	2
HVC-7	.5	1.5	5
HVC-8	1.1	4.0	11
HVC-9	3.0	10	30
HVC-10	7.0	25	70
HVC-11	20	60	200
HVC-12	50	150	500



HVC case structure.

Width	Length	Height
25/32	1-1/4	1-7/32

SPECIAL UNITS TO YOUR NEEDS

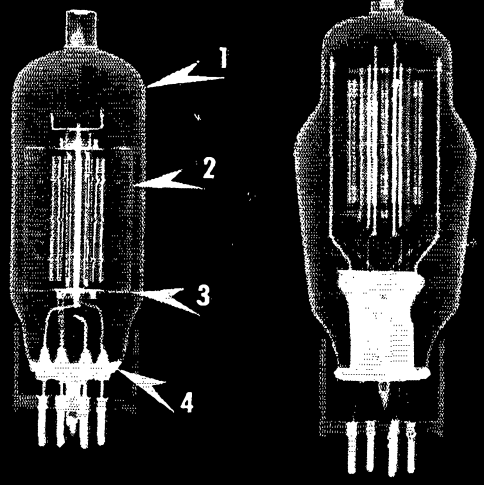
Send your specifications for prices.

UNITED TRANSFORMER CO.

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

NEW SERVICE-DESIGNED 6BG6-GA

Diameter 24% less than prototype! Seated height 13% less! See X-ray pictures at right for standout design improvements in General Electric's new tube—priced same as the 6BG6-G it replaces!



NEW 6BG6-GA **OLD 6BG6-G**

1. New bulb is straight-side, much smaller and sturdier.
2. Redesigned, more shock-resistant tube structure.
3. Bottom mica, as well as top, now contacts the glass envelope, for greater rigidity.
4. Button-stem base gives shorter, better-separated leads, for improved heat conduction and superior tube r-f characteristics.

For mobile work, choose G.E.'s all-new 6BG6-GA... compact, sturdy, high-voltage tested!

ONE tube or push-pull, the 6BG6-GA is ideal for your new mobile or portable rig—final-amplifier or modulator service.

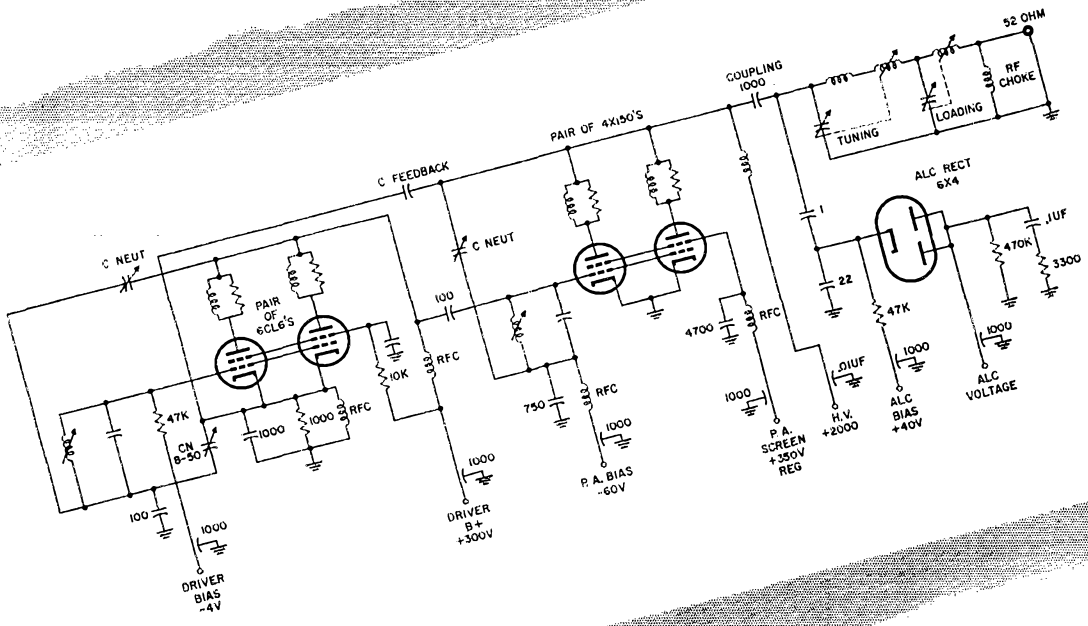
General Electric's new beam power pentode is streamlined in size, and as rugged as they come. The tube takes tough mobile operating conditions in stride. A high peak plate voltage rating means you'll have little or no tube arc-over from voltage fluctuations. To further assure this, *every* G-E 6BG6-GA is factory pulse-tested at absolute maximum voltage.

20-watt plate dissipation per tube helps you get the power you need out of a small rig . . . and at a budget receiving-tube price. Also, here is a tube specially designed and built to perform, to last—one of General Electric's famous Service-Designed types, which TV technicians coast-to-coast are installing in critical sockets.

Your local G-E tube distributor has the new Service-Designed 6BG6-GA. See him today! *Tube Department, General Electric Company, Schenectady 5, New York.*

GENERAL ELECTRIC

166-183



DISTORTION FREE SSB

at its finest *Collins* KWS-1

Reduced bandwidth requirements—one of the foremost advantages of SSB is effectively utilized by the linear operation and low distortion of the KWS-1. Class AB_1 Operation of the PA, RF feedback from PA to driver stages and bridge neutralizing circuits in both the power amplifier and driver stages provide a high degree of linearity. Additionally, an automatic load control circuit limits excitation peaks allowing a higher modulating level to give the effect of audio compression without introducing undesired distortion. Overall, the distortion products are down more than 35 db. These are but a few of the design features incorporated in the KWS-1 to insure the improved performance of single sideband transmission.

See your nearest Collins distributor

COLLINS

QST

JUNE 1955

VOLUME XXXIX • NUMBER 6

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

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38 La Salle Road
West Hartford 7, Connecticut

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—CONTENTS—

and ready to "scramble".....

America's Armed Forces, alert and on guard, are ready to swiftly defend our country or to strike back at the enemy. Hallicrafters is alert to this emergency which requires dependable electronics equipment. Our facilities are *now* developing, perfecting and producing secret equipment for the Air Force and other branches of the service. The unmatched experience of over twenty years in electronics, plus the lessons gained in producing vital communications during World War II and the Korean conflict, make Hallicrafters a "Primary Producer" for the United States Armed Forces.

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4401 West Fifth Avenue, Chicago, Illinois

HALLICRAFTERS FACILITIES ARE NOW BEING USED FOR THE DEVELOPMENT AND PRODUCTION OF: GUIDED MISSILE CONTROL EQUIPMENT • COMMUNICATIONS EQUIPMENT • COUNTER-MEASURE EQUIPMENT • COMBAT INFORMATION CENTER • HIGH FREQUENCY ELECTRONIC EQUIPMENT • MOBILE RADIO STATIONS • MOBILE RADIO TELETYPE STATIONS • PORTABLE TWO-WAY COMMUNICATIONS EQUIPMENT • RADAR RECEIVERS AND TRANSMITTERS (ALL FREQUENCIES) • RADAR EQUIPMENT.

NOW AVAILABLE AT NO EXTRA COST

SSB

PR CRYSTALS FOR 75 METER AND 20 METER PHONE...IN THE 5 TO 5.5 MC. RANGE

Now you can enjoy commercial crystal stability on SSB at amateur prices. Because of increased demand, PR is now making available Type Z-2 Crystals in the 5 to 5.5 MC. range at $2.95 . . . for use with SSB exciters, such as the 10B and 20A for operation in the 75 meter and 20 meter phone bands. Pick your frequencies (integral kilocycle) and order from your dealer at this new, low price. Formerly PR crystals in this range were available only in commercial types selling for several times this amount.

$2.95

5.0 MC. to 5.5 MC. Range

On SSB, where stability becomes of utmost importance, there's nothing like crystal control with PRs . . . negligible drift (limited to less than 2 cycles per MC. per degree C). You can avoid the continuous annoyance of drift by depending on PRs . . . then you KNOW where you are, *and you know you will stay there!*

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Since PR CRYSTALS 1934

USE PR AND KNOW WHERE YOU ARE

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

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ABOUT SINGLE SIDE BAND THESE ARE THE FACTS

"talk power" equivalent to 1 Kw. AM **in the new Hallicrafters Linear Power Amplifier Model HT-31**

• MORE COMPLETE • MORE RUGGED • MORE RELIABLE

More complete—Engineered with a wider range of antenna impedance—50 to 600 ohms.
More rugged—Components surpass even the most rigid commercial specifications. Heavier transformers for less heat, and an exclusive Hallicrafters feature, a blower to further reduce heat!
More reliable—on-the-air tests assure you of dependable performance.
Here in one compact package is a full band switch power amplifier covering 80-40-20-15-11 & 10 meters that's easy to drive, highly stable, extremely versatile, and engineered to Hallicrafters world-famous quality.

SPECIFICATIONS
Plate Power Input—500 - 510 watts.
Power Output—330 P.E.P. on 80 meters with slightly less on 10 meters.
Drive Power for 80 meter input 10 watts P.E.P. maximum on lowest frequency.

FEATURES
1. Continuous frequency coverage from 3.4 Mc. to 30 Mc.
2. Pi-network output for efficient harmonic and T.V.I. suppression.
3. Major T.V.I. suppression built in.
4. Does not require an antenna tuner as will feed loads from 50 to 600 ohms.
5. Full power capabilities available on CW because high stable, time proven circuitry does not require trick overload protective devices.
6. No special selection of R.F. amplifier tubes required.
7. Total tube replacement cost including high voltage rectifiers, amateur net only $14.20.
8. Full metering of all important circuits.
9. Power input in watts shown on meter.
10. May be mounted in relay rack.

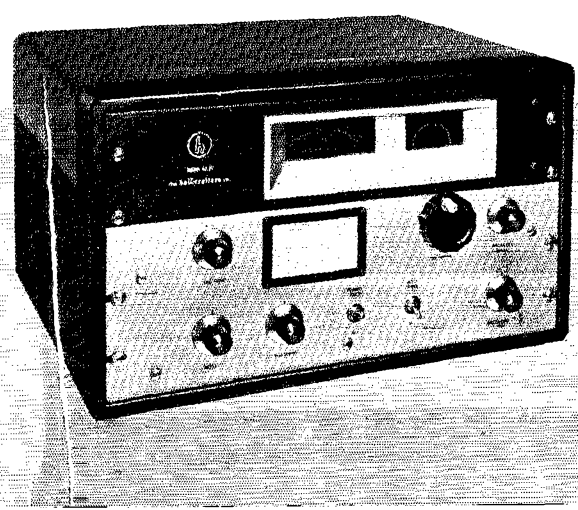
CIRCUIT DETAILS
This power amplifier employs two 811-A zero bias triodes in parallel. The input system is designed to be fed from a 50 - 70 ohm unbalanced line and requires a maximum of 10 watts drive on 80 meters. The grid tank circuit is balanced to provide all band neutralization. The output tank circuit is a continuously variable pi-network which provides a high degree of harmonic suppression.

TUBES
2—811-A Triode amplifiers
2—866-A Rectifiers
POWER OUTPUT
P.E.P.—330 watts
CW—275 watts
PLATE POWER INPUT
P.E.P.—500
CW—450
FRONT CONTROLS
Grid Range
Grid Tuning
Meter—Plate/Grid/Power Input Watts
Plate Voltage On/Off
Power On/Off
PA Tuning
Antenna Loading—Fine
Antenna Loading—Coarse
Physical details:
Grey black steel cabinet and brushed chrome control knobs. Piano hinge top. 10¾" x 19 relay rack panel—over all size 20" wide x 12¼" high x 17¼" deep—shipping weight 100 lbs. approx.
POWER
105/125 V—50/60 cycle AC

hallicrafters
Chicago 24, Illinois

Engineered to performance, not to price!

Model HT-31 Linear
Power Amplifier $395.00



THE AMERICAN RADIO RELAY LEAGUE, INC.,

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

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

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

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

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

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Dept. of E.E., Penna. State University
State College, Pa.
Vice-Director: Charles O. Badgett W3LVF
725 Garden Road, Glenside, Pa.

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HARRY M. MATTHEWS W9UQT
702 So. 8th, Springfield, Ill.
Vice-Director: George E. Keith W9QLZ
RFD 2, Box 22-A, Utica, Ill.

Dakota Division

ALFRED M. GOWAN . . . . . WØPHR
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1912 Beech St., Pine Bluff, Ark.
Vice-Director: George S. Acton W5BMM
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Great Lakes Division

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708 Ford Bldg., Detroit 26, Mich.
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Vice-Director: Clayton C. Gordon W1HRC
65 Emerson Ave., Pittsfield, Mass.

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837 Park Hill Drive, Billings, Mont.
Vice-Director:

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909 Curtis St., Albany 6, Calif.
Vice-Director: Harry M. Engwicht W6HC
770 Chapman, San Jose 26, Calif.

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428 Maple Lane, Danville, Va.
Vice-Director: Theodore P. Mathewson W4FJ
110 N. Colonial Ave., Richmond, Va.

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Vice-Director: Walter M. Reed . . . . . WØWRO
1355 E. Amherst Circle, Denver, Colo.

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Vice-Director: Randall E. Smith W4DQA
902 Plaza Court, Orlando, Fla.

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

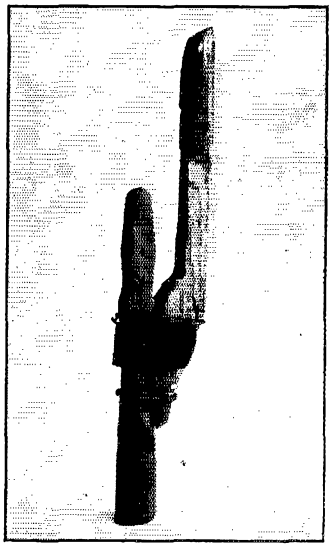
West Gulf Division

ROBERT E. COWAN W5CF
3640 Encanto Drive, Fort Worth 9, Texas
Vice-Director: John F. Skelton W5MA
1901 Standish Dr., Irving, Texas

"It Seems to Us..."

THE WOUFF HONG

In an institution as old as amateur radio, traditions and symbols of the art appear and become a part of it. Our traditions are many, among them our long record of self-policing, our dedication to public service in emergencies, our amazing versatility in experimentation, our instant response to the call of our country in time of war. But of the symbols, only one — aside from the ARRL diamond — has become a part and parcel of the framework of amateur radio, the symbol of its finest traditions, its long and glorious history.



That symbol is the Wouff Hong.

Every ham should know its origin. It seems to us that it is time to retell the story of this famous and beloved part of the very fabric of amateur radio. Even though we told the whole story in exactly these words only two years ago, we find — in club meetings, at conventions, and in correspondence — that whenever the Wouff Hong is mentioned there is the inevitable question, "Say, just what does that mean and where did it come from?"

It started back in 1917, in the very earliest days of ARRL and *QST*, when an anonymous amateur, writing under the title "The Old Man," created a wonderful series of humorous stories in the magazine. In a pithy, irascible style he assailed all that struck him as criticizable about ham radio operation of the period in his famous "Rotten Radio" series, beloved to this day by all who read them. He pitilessly exposed the poor operating practices of the day, yet did it in a way which drew chuckles even from those recognizing themselves as the special targets of his ire.

In one of those stories, "Rotten QRM," he launched forth with examples of some of the poor sending cluttering up the band in a particular QSO to which he was listening. The gibberish included the words "wouff hong" which, apparently, was being used by someone on somebody else.

It turned out to be one of those priceless pieces of spontaneous word invention. Instantly, it caught on with the gang. Although T.O.M. himself admitted at the time he didn't know exactly what a wouff hong was, it quickly became something with which both to attack bad operating practices and to discipline their perpetrators. Within three months, the editor of *QST* found it necessary to write an editorial on the growing demand from the gang for wouff hongs. How rapidly this situation might have developed had not World War I intervened is a matter of speculation. But the tradition had been established, the Wouff Hong created in the minds of thousands of amateurs as some mythical instrument of torture to be used in enforcing good operating practices in amateur radio.

When *QST* resumed after the war, one of its first contributors was T.O.M. In an early 1919 issue he contributed an article on "Rotten Starting" to work off steam on the slowness with which our government was getting around to let us operate again. At the conclusion of this article appeared the following: "In the meantime . . . I am sending you a specimen of a real live wouff hong which came to light out here when we started to get our junk out of cold storage. Keep it in the Editorial sanctum where you can lay hands on it quickly in an emergency. We will be allowed to transmit soon and then you will need it."

The object was duly received at Hq. The Editor, fully mindful of the historic significance of the occasion, took the instrument to one of the first Board meetings in New York, May 3, 1919, subsequently duly reporting in *QST* that "each face noticeably blanched when the awful

Wouff Hong was . . . laid on the table." By an action still a part of the League's official records, that Board voted that the Wouff Hong be framed and hung in the office of the Secretary of the League. There it remains to this day.

We know the significance of the Wouff Hong. We don't know the significance of its weird shape. Not even the beloved T.O.M. (revealed, after his death, as none other than our first president, Hiram Percy Maxim) ever explained that. Nor was the precise manner of its use ever prescribed, although it perhaps may be guessed with a little imagination. But as the years passed, it continued to grow in the affections of amateurs the country over, old-timer and youngster alike. It became the inspiration of the Royal Order of the Wouff Hong, the amateur secret society of ARRL conventions. Today, it is thoroughly entrenched in the lore of amateur radio as its most sacred symbol.

The Wouff Hong! — see it when you next visit ARRL Hq.

A.R.R.L. CONVENTIONS

WEST GULF DIVISION

Fort Worth, Texas — June 10th–12th

A typical "cow-town" welcome is assured all radio amateurs and others interested in amateur radio who attend the 24th Annual Convention. Your hosts will be the Kilocycle Club assisted by the Convair Amateur Radio Club, who are all out to provide a most enjoyable and instructive visit.

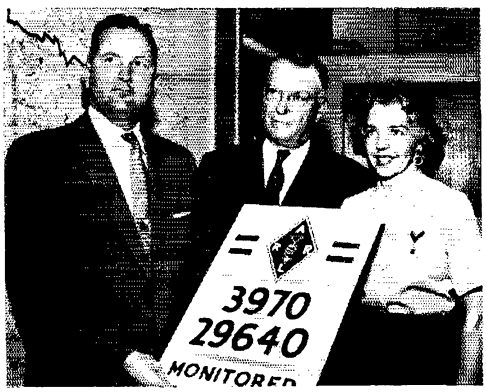
The air-conditioned Hotel Texas is Convention headquarters and all sessions will be held there, as well as the entertainment. The pre-Convention party and dance on Friday will be held in the Pioneer Palace.

Speakers from ARRL, FCC, and manufacturers will feature practical talks rather than technical papers, and there will be interesting displays of some of the very latest equipment. Chief among the activities will be a hidden transmitter hunt, mobile contest, code contest, and of course, a Wouff Hong initiation.

A luncheon for the ladies will be held in the Hotel Texas Keystone Room, followed by a style show, sightseeing tours and complimentary coffee for all. Licensed YLs will have a breakfast Saturday morning without extra cost, and six group luncheons are planned for Saturday.

Pre-registration is $8 prior to June 1st and $8.50 thereafter. All checks should be made payable to Kilocycle Club Convention Account, and should be mailed to Kilocycle Club, 1125 Fort Worth National Bank Bldg., Fort Worth, Texas.

Thirty of these enameled signs will call attention to the frequencies monitored for the convenience of West Gulf Division Convention-bound hams. Displaying the sign, *l to r:* Jordan A. Jones, W5KVA, ARRL Director Cowan, W5CF, and Mrs. Jones.



SOUTHEASTERN DIVISION

St. Petersburg, Fla. — June 11th–12th

The St. Petersburg Amateur Radio Club welcomes you to the biggest and best convention ever held in the Southeast. There will be entertainment for everyone in the family every minute. Two full days of fun and activities for the entire family have been planned.

Featured will be a picnic, catered banquet, contests, auction sale, MARS demonstration, mobile hunt, Wouff Hong ceremony, fishing, swimming, lectures and demonstrations on c.d., s.s.b., RACES, MARS, TVI, etc.; ladies style show, beach party, meetings, tour of TV station, amateur TV program, technical and nontechnical films, sightseeing, Merit Award presentation and manufacturers' displays. Many interesting speakers.

Convention headquarters will be the Suwannee Hotel, 5th Avenue and 1st Street North, St. Petersburg. Rates per day are $4 single, $7 twin bedroom, $9 triple bedroom. Motel accommodations will also be available at approximately $3.50 per couple. Reservations will be made upon request. For reservations, write to Bob Spiers, SPARC, P. O. Box 4026, St. Petersburg, Fla. Tickets, $7 for adults, $1.50 for children under 12, do not include the banquet.

NORTH DAKOTA STATE

Bismarck, N. Dak. — June 11th–12th

The big ham event of the year in North Dakota, June 11th–12th, starts with a banquet on Saturday at 7 P.M. Stags $3, ladies $2.50. All the chicken you can eat, entertainment, a brief program and dancing at the Bismarck Municipal Country Club. There will be a Wouff Hong initiation for those who are interested.

The Convention session will be held at St. Mary's Central High School Gym on Sunday. Tickets per family $2.50; food and refreshment at share-the-cost prices. Time 9 A.M. to 5 P.M. Advance registration may be made for both events. For reservations and other information write A. L. Anderson, 911 Crescent Lane, Bismarck.

COMING A.R.R.L. CONVENTIONS

June 10th–12th — West Gulf Division, Fort Worth, Texas
June 11th–12th — North Dakota State, Bismarck, N. D.
June 11th–12th — Southeastern Division, St. Petersburg, Fla.
July 30th–31st — Canadian Division, St. John, New Brunswick
August 12th–14th — Roanoke Division, Old Point, Va.
October 15th–16th — Central Division, South Bend, Ind.
October 22nd–23rd — Midwest Division, Omaha, Neb.

ARE YOU LICENSED?

• When joining the League or renewing your membership, it is important that you show whether you have an amateur license, either station or operator. Please state your call and/or the class of operator license held, that we may verify your classification.

A Broadband Antenna for 75 Meters

Impedance Data on a Fan-Type Dipole

BY CHARLES C. CAMILLO,* W9GZJ, AND RICHARD M. PURINTON,** W1SX

• **This article describes the results of measurements on one form of broadband dipole, constructed in the thought of reducing load variations throughout the 75-meter 'phone band. Other approaches are suggested for the amateur interested in experimenting with antennas for use on 80, 40 and 20.**

ORDINARILY, the mention of TV to the amateur inspires thoughts of interference and irate neighbors. However, the design of TV antennas has focussed attention on antenna measurements and antenna characteristics to a degree that merits the attention of amateurs interested in antenna design.

The writers have been interested for several years in the design of TV antennas. Both are active on 75-meter 'phone and both were interested in finding an antenna design which would perform in a uniform manner over the range from 3800 to 4000 kc. There also is considerable interest in c.w. operation, and therefore a design was sought which not only would perform well in the 'phone section of the band but would also work satisfactorily over the range of 3.5 to 4 Mc.

The most obvious solution to the problem of designing a good broadband antenna was the conical type using the minimum number of wires possible to produce the effect of a radiator of large conical section.

Some time ago, the Collins Radio Company suggested a simple conical- or fan-type dipole as a good broadband antenna for an amateur transmitter.[1] Other references to such an antenna are to be found in the literature, but nowhere were there any measurements to indicate what might be expected from a fan or conical design at 3.5 to 4 Mc. Modern literature is extensive on conical-type antennas in the v.h.f. and u.h.f. ranges.

To determine what might be expected of a conical design having reasonable dimensions, an antenna was constructed in which each half of the dipole consisted of two wires joined together at the center of the dipole and fanned about 8 feet at the extreme ends of the antenna. A beginning was made with an over-all length of 120 feet and tests were made while the antenna was pruned until resonance at 3900 kc. was achieved with an over-all length of 107 feet. The Collins literature mentioned earlier had indicated a length of approximately 110 feet for the 75-meter 'phone band. During the pruning operation the standing-wave ratio of the 52-ohm RG-8/U transmission line was observed using a Millen r.f. bridge. After the resonance point had been reached, measurements were continued with a General Radio 916A r.f. bridge.

The antenna height for all the measurements was about 35 feet, which is a common height for many 75-meter antennas.

The photographs illustrate the configuration of the antenna, and the wire saddle and weight employed to hold the wires in a horizontal plane. The spreader is an 8-foot length of light-weight aluminum tubing flattened and pierced at the ends for attachment of the antenna insulators. The two wires were individually insulated on each side of the dipole at their outer ends.

Tests were made with the fanned wires in both the horizontal and vertical planes, with no noticeable difference in operation or in the measurements for either plane.

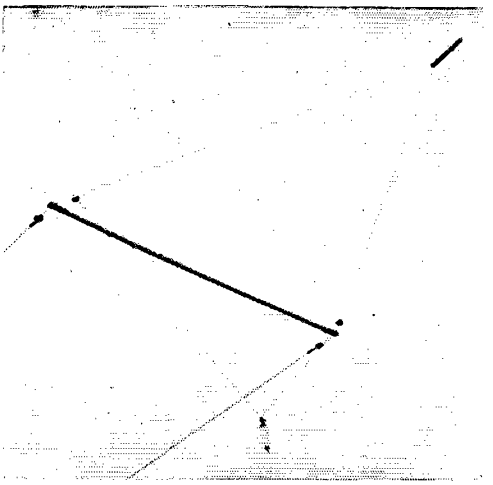
* 4358 South Artesian Ave., Chicago 32, Ill.

** 12 Oakland St., Lexington 73, Mass.

1 "Antennas with 52 Ohm Coaxial Feed Lines," published by Collins Radio Company, Cedar Rapids, Iowa.

♦

The "biconical" or fan-type 75-meter antenna at W9SZ, on which the measurements discussed in this article were made.



Saddle and weight arrangement used to hold the spreader in a horizontal position.

The characteristics of the antenna were found to be quite suitable for 75-meter 'phone operation and for c.w. operation between 3.8 and 3.5 Mc. It had been estimated that the antenna might be expected to perform reasonably well on the 20-meter band, also. Measurements were taken on the 75- and 80-meter bands, the 40-meter band and the 20-meter band. The results and actual operation confirmed the estimate that 20-meter operation might be obtained with this design.

Table I gives the values of impedance at the terminals of the antenna. The values of resistance and reactance are shown, along with the v.s.w.r. that would be exhibited by these values in reference to a 52-ohm coaxial transmission line such as RG-8/U. The table indicates that the antenna is very close to resonance at 3.9 Mc. as was found with the Millen s.w.r. bridge. However, throughout the 3.5- to 4.1-Mc. range the values of reactance are of such magnitude that they can be tuned out easily by any of the conventional methods. Measurements were carried up to 4.1 Mc. to determine the effect of an additional increase in frequency beyond 4.0 Mc.

Fig. 1 gives a comparison of the characteristics of the fan-type dipole and a conventional full-length dipole with a single wire each side of center. The resistance and reactance characteristics of the fan-type dipole are plotted on the basis of the measurements made.[2] Data points for the conventional dipole were obtained by calculation from information in the *ARRL Antenna Book*. Resistance and reactance are shown for percentage departure above and below the resonant frequency. While the resistance values for each type of dipole remain fairly constant over the frequency range, there is a very noticeable difference in reactance variation. The fan-type dipole shows a more gradual reactance slope than the conventional dipole over the entire 75–80-meter band. Actual numerical comparison of the slopes shows that the reactance of the conventional dipole changes twice as fast as the reactance of the fan-type dipole.

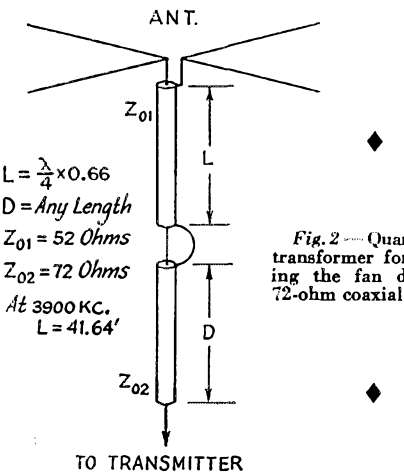


Fig. 2 — Quarter-wave transformer for matching the fan dipole to 72-ohm coaxial line.

[2] The rise in the resistance component of the fan dipole impedance in the lower part of the frequency range is contrary to the theoretical behavior of radiation resistance as the antenna is progressively shortened. It is possibly the result of the presence of other conductors in the vicinity, or may be associated with the antenna height, which was 0.15 wavelength in these tests.

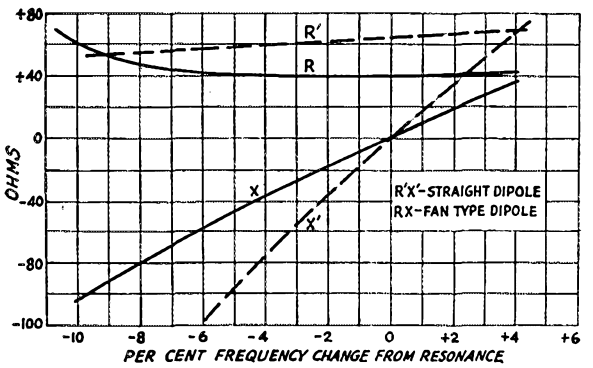


Fig. 1 — Impedance characteristics of fan-type dipole as compared with a conventional wire dipole. Fan-dipole values are measured; conventional-dipole values are theoretical.

Other Bands

Table II gives the values of resistance and reactance of the antenna in the 40-meter band. Although the reactance appears to be large, the antenna can be successfully tuned for operation within this band. However, it must be pointed out that if connected to a 52-ohm coaxial line, the resistive values of the antenna indicate that this type of operation would represent a poorer compromise than is usually acceptable.

Table III gives the measured values of resistance and reactance on the 20-meter band. In this case it is found that the reactance is small and the values

of resistance are much closer to the 52-ohm impedance of the transmission line. Therefore, operation of the antenna in this band would be much more practical than on 40 meters. Thus, it is apparent that the antenna operates well on the 75- and 20-meter bands, whereas on 40 the performance would not be acceptable.

Matching Possibilities

The tables indicate that a better match for 75-meter operation might be obtained with a quarter-wavelength transformer. A quarter-wave section of RG-8/U coaxial cable inserted between the antenna terminals and an RG-11/U 72-ohm coaxial cable would match approximately 37 ohms at the antenna. It is obvious that such a transmission line and matching transformer would provide optimum matching conditions for operation between 3800 and 4000 kc. It will be noted that below 3800 kc. the resistance of the antenna rises and more nearly matches a 50-ohm transmission line than the combination of a 72-ohm coaxial cable together with the quarter-wave matching section of 52-ohm cable. Fig. 2 shows the 72-ohm coaxial feed system with the 52-ohm matching section dimensioned for operation at 3900 kc. Another suggestion which would provide a close match at 75 and 20 meters, and at 40 meters as well, is indicated in Fig. 3, in which RG-22/U or RG-22A/U coaxial cable can be used with a simple d.p.d.t. relay to provide 95 ohms impedance for 40-meter operation and approximately 47 ohms transmission line impedance for operation at 75 and 20 meters.

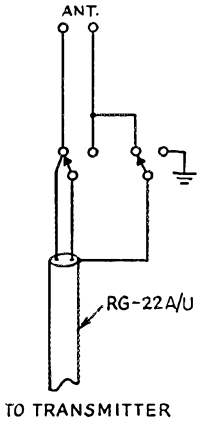


Fig. 3 — Suggested switching arrangement for changing the characteristic impedance of the shielded transmission line to give a better match on different bands. Switches are thrown to the right for 7 Mc.; to the left for 4 and 14 Mc.

General

In all of the measurements, the antenna was fed with a single RG-8/U coaxial line of 52-ohm characteristic impedance. The data, however, are referred to the antenna terminals. It is well to point out that in order to reduce unbalanced currents on the surface of the shield braid, the feed line must be brought away from the antenna at a right angle.

The antenna was installed and tested at W9SZ near Lemont, Ill., and was operated over a period of several months. During that time it was found that numerous other amateurs were using similar antennas for broadband operation on the 75-meter band. W9AOV and several other members of the Illinois Emergency Net were found to be using antennas based on the Collins suggestions. Another was W9DKU, and W8PUN reported that he had been using such an antenna since 1937. All of the amateurs contacted were very much interested in the measurements which were being made, and reported that excellent results had been obtained. With this general type antenna the end spreading varied among the users from 8 feet to 12 feet.

Incidentally, the shortening which is achieved by the spreading of the ends of the fan-type dipole may be helpful to the amateur who must install his antenna in a restricted space, whether he is interested in broadbanding or not. It could be expected that the length reduction of approximately 10 per cent which applies at 75 meters would apply also at 40, 20 and 10 meters and permit the antenna to be installed between two appropriately spaced trees or within the amateur's lot lines.

TABLE I

Impedance of Fan-Type Dipole — 75-Meter Band

Frequency, Mc.	*R, Ohms*	*X, Ohms*	*V.S.W.R.*
*4.10	42.85	+37.90	2.2
4.00	39.75	+14.55	1.5
3.90	39.00	−9.36	1.4
3.80	39.00	−32.20	2.1
3.70	43.65	−58.50	3.2
3.60	50.90	−88.40	4.8
3.50	78.00	−114.3	5.2

*Listed only to show change with increase in frequency.

TABLE II

Impedance of Fan-Type Dipole — 40-Meter Band

Frequency, Mc.	*R, Ohms*	*X, Ohms*
7.0	177	+260
7.1	140	+234
7.2	104	+218
7.3	114	+208

TABLE III

Impedance of Fan-Type Dipole — 20-Meter Band

Frequency, Mc.	*R, Ohms*	*X, Ohms*
14.00	22.8	−46.7
14.10	34.8	−62.4
14.20	29.6	−48.3
14.30	29.6	−52.0
14.35	31.2	−55.6
14.40	31.2	−56.7

Parallel 6146s in the Mobile or Fixed-Station R.F. Assembly

Increasing Power Input to 180 Watts C.W. or 135 Watts 'Phone

BY C. VERNON CHAMBERS, W1JEQ

• The addition of a second 6146 to the "R.F. Assembly for Mobile or Fixed-Station Work"[2] converts the unit into a full-fledged fixed-station transmitter. As modified, the rig retains the original features of appearance, compactness and operating convenience found usually only in more expensive commercial gear. And, of course, if you're interested in using it for that purpose, the rig can still be operated mobile.

FEBRUARY, 1955, *QST* [1] made reference to the addition of a second 6146 to the mobile or fixed-station transmitter.[2] The modification, now completed, should interest those who wish to operate with parallel 6146s in the final.

When converted, the transmitter loses none of the original features except for the addition of one tuning control. The new dimensions are 6¼ by 7⅞ by 9 1/16 inches and the permissible power input level has been increased to the full ICAS ratings of a pair of 6146s. One very important consideration is that in spite of its small size, the unit is not difficult to construct — even when starting from scratch — nor does it require any special constructional aids or practices. Modification is not expensive. Very few of the original parts need be discarded or routed to the junk box and the cost of new parts — other than another 6146 — is a minor item.

In the text to follow, frequent reference will be made to the original schematic diagram of the transmitter. Therefore, Fig. 1, page 12 of *QST*, October, 1954, should be on hand as the following material is studied.

The basic problems in increasing the power were those of getting enough excitation for the 6146s without adding to the original 5763 tube line-up, and in redesigning the amplifier plate circuit for the higher power level.

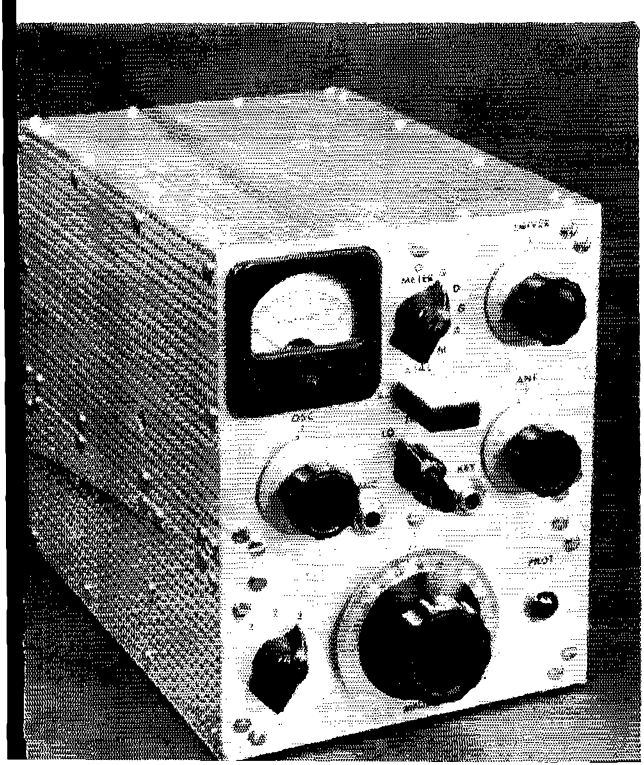
Oscillator Circuit Modifications

Originally, the oscillator plate circuit, C_2-L_1, tuned no higher than 7 Mc. and, as a result, it was necessary to operate V_2 as a quadrupler when driving the final at 28 Mc. This did not give adequate drive for two 6146s. Therefore, the arrangement shown here in Fig. 1 was devised. The inductance of L_1 has been reduced to 2.2 μh., and will tune, with C_2 and S_3 adjusted, to either 7 or 14 Mc. Thus, with the tank resonated at 14 Mc., it is only necessary for V_2 to double frequency for output at 28 Mc.

The oscillator plate circuit works as follows: With S_3 set at position *1*, both C_7 and L_1 are out of the circuit and the circuit is the familiar choke-coupled arrangement. Then, with a 3.5-Mc. crystal in use, the

[1] Chambers, "Supplementary Data on the R.F. Assembly for Mobile or Fixed-Station Work," *QST*, Feb., 1955.

[2] Chambers, "An R.F. Assembly for Mobile or Fixed-Station Work," *QST*, Oct., 1954.



Front view of the modified r.f. assembly. The tuning control for the amplifier plate circuit is centered on the extension at the bottom of the panel. The oscillator plate switch, S_3 and the pilot-lamp jewel are to the left and right of the tuning dial. Strips of perforated aluminum are used to increase the height and depth of the cabinet.

3.5-Mc. output from V_1 may be used to drive V_2 either as a straight amplifier or as a frequency doubler. Substitution of a 7-Mc. crystal gives

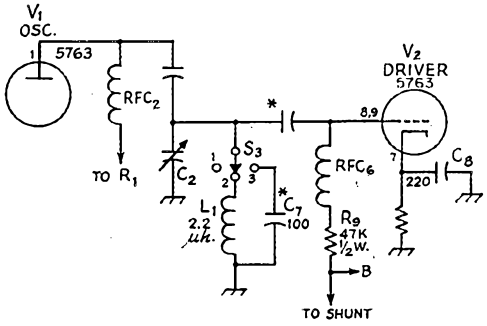


Fig. 1. — Schematic diagram of the revised oscillator plate circuit for the 6146 transmitter. C_7, RFC_6, and S_3 are additions to the original circuit. Values for C_8, R_9 and L_1 have been altered in the new arrangement. * Indicates a mica capacitor.

L_1 — 12 turns No. 24, ⅜ inch long, ⅝ inch diam. (B & W 3008). See text.

RFC_6 — 0.5 mh.

S_3 — 1-pole 5-position (3 used) ceramic switch, wired for progressive shorting (Centralab PA-10 section mounted on PA-300 index assembly).

7-Mc. drive for V_2. With crystals in the 3.4 — 3.5-Mc. range, S_3 at position *2*, and C_2L_1 resonated at 10.5, 13.5 or 14 Mc., adequate drive is supplied for doubling in V_2 to 21, 27 or 28 Mc., respectively. A 6.8-Mc. crystal and position 2 of S_3 may also be used when driving V_2 as a doubler to 27 Mc.

Position *3* of the oscillator switch and capacitor C_7 are required because the C_2L_1 combination will not otherwise cover the complete 7- to 14.85-Mc. range required. The operating range of the circuit is shifted to include 7 Mc. when C_7 is switched across L_1.

Driver Circuit Revisions

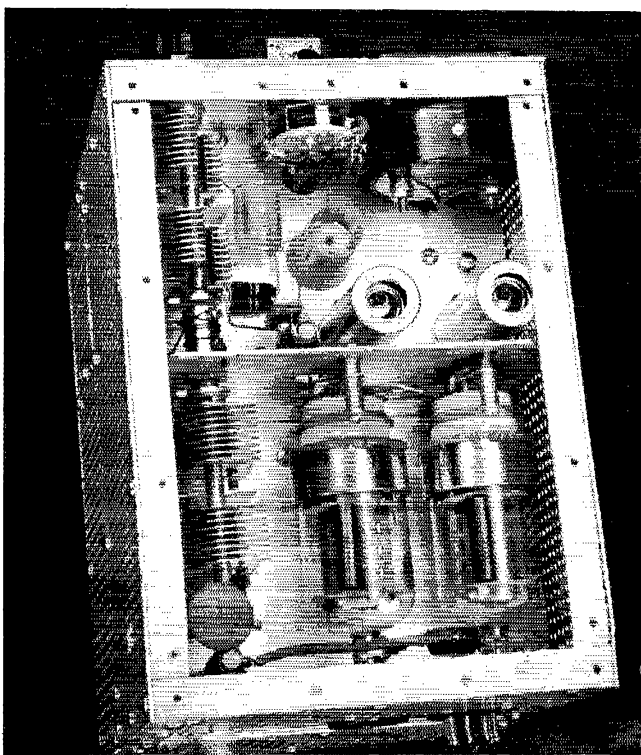
In reworking the driver circuit, it proved desirable to reduce the grid lead (R_9 of the original circuit) to 47K. With this change, it seemed advisable to employ the r.f. choke now shown as RFC_6, to prevent loading of the circuit by the lower value of resistance.

Not quite so obvious in the new Fig. 1 is the reason for reducing the by-pass capacitance (C_8) to 220 $\mu\mu$f. This value allows the driver stage to function normally at frequencies above 14 Mc. On the other hand, it also makes V_2 somewhat degenerative at the lower frequencies where instability may otherwise be a bit of a problem. The degeneration stabilizes the circuit when working V_2 as a straight amplifier, and may be employed in this instance because there is an abundance of output from V_2 at the lower frequencies.

On the plate side of the driver tube, it was necessary to use new values of inductance in the multiband tuner to compensate for the additional shunt capacitance introduced by the grid of the second tube. Heretofore, we had aimed at values that would result in low C at 28 Mc. However, with a tuning capacitor of reasonable size, this results in relatively little separation between 7- and 21-Mc. resonances. In other words, when operating at 7 Mc., there may be some danger of output also at 21 Mc. To make the separation between resonances as great as possible, the frequency ranges were shifted so that 14 Mc. comes at maximum capacitance, and 7 Mc. near minimum capacitance.

Just how well this system works out is shown by the dial calibration (see tuning chart) for C_3. Notice that 7, 28 and 21 Mc., in that order, resonate at dial settings of 10, 28 and 54, respectively. In other words, there are at least 18 dial divisions between any two of the three adjustments. At the high-capacitance end of the tuning range there are 8 dial divisions between the 3.5- and 14-Mc settings.

The layout and the wiring of the driver plate circuit remains unchanged. L_3 is now 6.8 μh., a



Top view of the parallel-6146 transmitter. The new 6146 is located at the bottom right-hand corner as seen in this view. The metal shaft coupler originally used for ganging the split-stator capacitors now serves as a pulley for a string drive for the amplifier plate tuning capacitor. L_5 is mounted on the plate caps of the 6146s.

22-turn length of B & W type 3012 Miniductor. L_4 now has an inductance of 1.8 μh.

Loading resistor R_3 in the first model has been retained for the original reasons. However, a value of 7.5K, obtained by connecting two 1.5K 1-watt resistors in parallel, is now used.

To make initial adjustment less critical, the two multiband tuners are no longer ganged. A separate control is installed for the output tuner.

The Modified Amplifier Circuit

The addition of another 6146 to the final amplifier made necessary several major, but not difficult, alterations.

The four inductors, L_6 through L_9, must be replaced. New values of inductance are required, as in the grid circuit. Dimensions are given in Fig. 2.

A high-frequency parasitic oscillation was suppressed by the center-tapped choke, L_8. All attempts to utilize the original parasitic choke were ineffective.

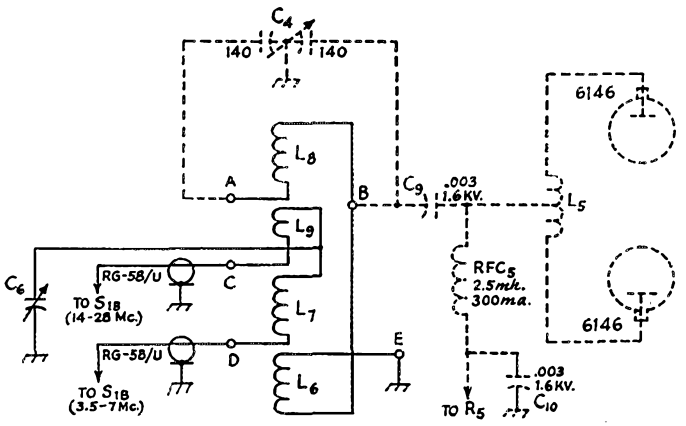


Fig. 2 — Schematic diagram of the amplifier plate circuit for the parallel 6146 transmitter. Dashed lines indicate components located in the amplifier tube compartment. Terminals *A* and *B*, the feed-through insulators used originally to support the L_8–L_9 assembly, now support L_8. *C* and *D* are ½-inch cone insulators and *E* is a metal post. The physical arrangement of the terminals is similar to that shown in the bottom view of the transmitter.

C_9, C_{10} — Centralab DD16-302 or DD30-302.
L_8 — Parasitic choke: 14 turns No. 18 enam. on 1-watt resistor (any high value) as form, tapped at center.
L_6 — 6.6 μh. — 13 turns No. 14, 1⅜ inches long.
L_7 — 5.2 μh. — 10¾ turns No. 14, 1⅜ inches long.
L_8 — 1.7 μh. — 4¾ turns No. 14, ⅝ inch long.
L_9 — Inductance and length adjustable; 1½ turns No. 14; see text.
NOTE: L_6 through L_9 made from 2-inch diam. coil stock (B & W 3900). See text for additional data.
RFC_5 — National R-300S.

A set of 0.001-μf. disk ceramic capacitors for the cathode and the screen terminals of the 6146 should be installed directly at the new tube socket. The original capacitors will not serve both 6146s.

The control-grid, heater and screen terminals of the 6146s should be connected in parallel. Ground returns for the new tube are made directly to chassis as were those of the first tube. Connecting the cathodes together allows both 6146s to be keyed through the original keying jack, J_1. The variable padder capacitor, C_5, has been removed from the plate tuner. No replacement is required.

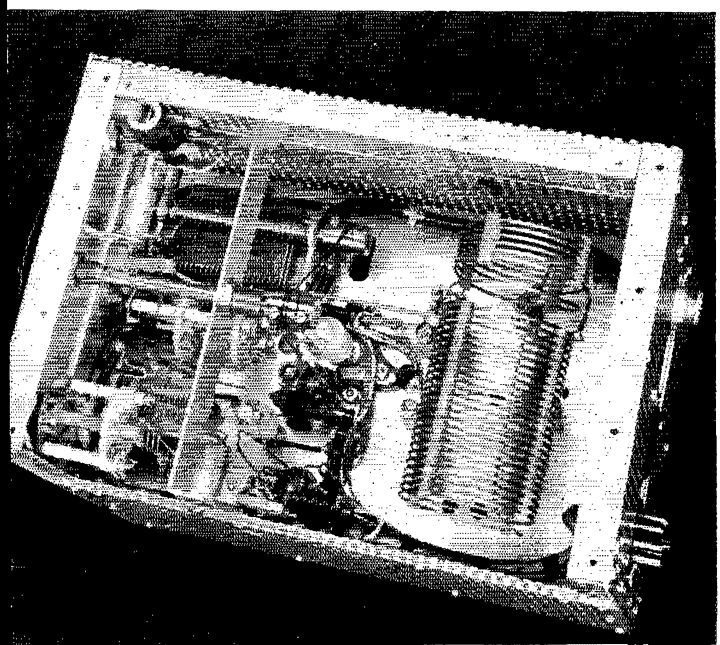
The following is a list of component changes:

1) Grid-leak resistor, R_{11}: now 15K, 1 watt.

2) Screen-dropping resistor, R_4: now 20K, 25 watts.

3) Plate r.f. choke, RFC_5; must be rated for at least 300 ma. d.c.

4) Plate-meter shunt, R_5: resistance reduced to provide 50 times multiplication for the 10-ma. milliammeter.



♦

As seen in this bottom view of the transmitter, L_8 is located at the upper right-hand end of the chassis, just above the 1½-turn coupling coil, L_9. The L_6L_7 assembly is directly below L_9. The cold end of L_7, located approximately at the center of L_6L_7, is grounded to a metal post to the right of the coils. R_4 is mounted on the panel extension at the upper left-hand corner of the unit and S_3 is below the drive shaft for C_4. The oscillator plate coil, L_1, is mounted on the side wall to the right of C_2. A metal bracket, mounted between walls of the cabinet, 3½ inches to the rear of the panel, supports a bearing for the drive shaft. The oval slot to the rear of C_6 provides through-chassis clearance for the drive string.

♦

5) Plate blocking capacitor C_9, and by-pass capacitor C_{10} in Fig. 2: now 0.003-μf. high-voltage disk ceramics.

General Circuit Changes

Not shown on any of the diagrams of the transmitter is a 6.3-volt pilot lamp now connected to the heater line, installed principally to balance the new panel arrangement.

The plate-voltage input terminals of the transmitter have been by-passed for TVI. A 0.001-μf. 1-kv. disk is connected between pin *4* of J_4 (original circuit diagram) and ground, and a 500-$\mu\mu$f. 3-kv. disk is connected between pin *3* of J_4 and ground.

Construction

Before starting construction — either a modification or new — the supplementary data [1] for the first model should be reviewed. In addition, a comparison of the photographs of both versions will clearly illustrate that most of the original construction remains intact.

The cabinet is 3 inches higher than before. Strips of perforated aluminum, attached to the sides and the rear of the box, provide the increase in height. These extensions and the original members should be overlapped on the inside by narrow strips of aluminum held in place by machine screws, lockwashers and nuts. If a 3-inch extension is added to the panel as shown in the front view of the transmitter, the crack between sections may be sealed by bolting a narrow strip of aluminum (inside the unit) in place. The bottom view shows how ½ × ½-inch angle is used at all outer edges of the cabinet and the panel extensions.

As shown in the top view of the transmitter, installation of the second 6146 requires no displacement of original components. The method of mounting the new tube socket is identical to that described for the first. A row of ¼-inch ventilating holes should be drilled in the chassis plate below the envelope of each 6146. The metal shaft coupler, used originally to gang the split-stator tuning capacitors, C_3 and C_4, is no longer fastened to the tail shaft of C_3. Instead, only the setscrew at C_4 is tightened; the setscrew at C_3 is loosened so that it can turn freely on the shaft of C_3. The coupling is now used as a pulley for a drive string for C_4. Before mounting L_4 on the terminals of C_3, free the outside end turns of the coil from three of the four support bars so that they may be spread for adjustment.

The lengths of the three pieces of No. 34 enameled wire used as the plate-meter shunt, R_5, should be shortened to approximately 18 inches. This gives a full-scale meter reading of 500 ma. with the meter switch set at position E-E_1 in the earlier circuit.

A bottom view of the transmitter shows the mounting of the amplifier plate coils, and Fig. 2 identifies the supports for these inductors. The L_6–L_7 assembly is made from a single length of coil stock clipped, without breaking the support bars, to provide windings of 13 turns (L_6) and 10¾ turns (L_7). Start with a 27- or 28-turn length of material, to provide extra wire at each end that may be straightened out and used

(Continued on page 130)

Tuning Chart for the 6146 Transmitter

Oscillator — V_1					*Driver — V_2*				*Amplifier — V_3, V_4*						*Link Cir. — C_6, S_{1B}*		
										Dial C_4		*I_p*				*Dial — C_5*	
Xtal. Mc.	*Sw. Pos. S_3*	*Dial C_2*	*I_p Ma.*	*Output Mc.*	*I_g Ma.*	*Dial C_3*	*I_p Ma.*	*Output Mc.*	*I_g I Ma.*	*50-Ohm[1]*	*Bulb[2]*	*50-Ohm[1]*	*Bulb[2]*	*Output Mc.*	*Sw. Pos. S_{1B}*	*50-Ohm[1]*	*Bulb[2]*
3.5	1	0	19	3.5	0.5	90	9	3.5	5.5	90	90	220	175	3.5	LO	100	100
3.5	1	0	19	3.5	0.5	10	11	7.0	4.8	24	21	225	205	7.0	LO	46	36
3.5	3	55	16	7.0	2.6	98	12	14.0	4.1	98	100	225	225	14.0	HI	58	22
3.5	3	55	16	7.0	2.6	54	12	21.0	3.9	54	58	230	230	21.0	HI	8	100
3.5	2	42	14	10.5	2.7	54	12	21.0	4.2	54	58	230	230	21.0	HI	8	100
3.4	2	14	20	13.5	2.5	30	12	27.0	3.8	35	33	220	215	27.0	HI	100	70
3.5	2	10	16	14.0	2.5	28	12	28.0	3.5	32	29	240	225	28.0	HI	100	75
6.8	2	14	17	13.6	2.9	30	12	27.0	3.9	35	33	220	215	27.0	HI	100	70
7.0	1	28[3]	22	7.0	0.1	10	14	7.0	5.5	24	21	225	205	7.0	LO	46	36
7.0	3	55	14	7.0	2.7	98	12.5	14.0	4.4	98	100	225	225	14.0	HI	58	22
7.0	3	55	14	7.0	2.7	54	12.5	21.0	3.5	54	58	230	230	21.0	HI	8	100
7.0	2	10	14	14.0	3.0	28	13	28.0	3.9	32	29	240	225	28.0	HI	100	75

[1] Bank of Ohmite type D-101 resistors used as dummy load. [2] 150-watt lamp used as load. [3] C_2 used as excitation control.

Better Selectivity in Mobile Reception

The R23/ARC5 as an I.F. Amplifier

BY RAY A. TELL,* W2TZI

• To improve receiver selectivity in his mobile installation, W2TZI has replaced the usual car-radio i.f. with the 85-kc. i.f. of a surplus Command receiver. In this article he describes the conversion that gives better performance at little expense.

ALMOST everyone who has operated mobile, especially on the 75- and 40-meter bands, using the regular car radio as an i.f. amplifier for a converter, has soon come to the conclusion that such a system is far from ideal. In looking about for something better, I hit upon the idea of substituting the 85-kc. i.f. of a surplus R23/ARC5 receiver for the broadcast tuner. The R23 will be recognized as the unit that has been so popular as an inexpensive Q5-er. These units are still available at reasonable prices on the surplus market. The converter in this case is a Gonset, having a 1430-kc. output.

New Circuits

To adapt the R23 for use with the converter, several changes were made. The original r.f. input and r.f.-mixer coupling circuits were replaced with circuits tuned to the output frequency of the converter. The high-frequency oscillator circuit was converted to crystal control at a frequency appropriate for frequency conversion from the converter output frequency to the 85-kc. i.f. of the R23.

Fig. 1 shows the new r.f.-input, r.f.-mixer coupling, and h.f. oscillator circuits. The Pierce oscillator circuit is used.

To convert the 1430-kc. output frequency of the converter to 85 kc., an oscillator frequency of 1515 kc. is required. Crystals for this frequency are not available, except on special order. However, I found that surplus crystals for 1525 kc. can be obtained for 99¢ (U. S. Crystal of Los Angeles). Changing the output frequency of the converter from 1430 to 1440 changes the calibration of the converter by only 10 kc. and, if you are fussy, the oscillator circuit can easily be retrimmed by this amount. (Instructions are included in the Gonset instruction manual.)

A noise limiter and vibrator supply with a voltage-regulated tap for the oscillator of the converter were added. An additional stage of audio was inserted between the diode detector and the audio output tube, and the output transformer was replaced by one suitable for feeding a loudspeaker. The output with the original arrangement is rather low for loudspeaker operation in a car. Fig. 2 shows the circuits of the noise limiter and audio stage. Fig. 3 shows the rectifier and filter circuit for the vibrator power supply.

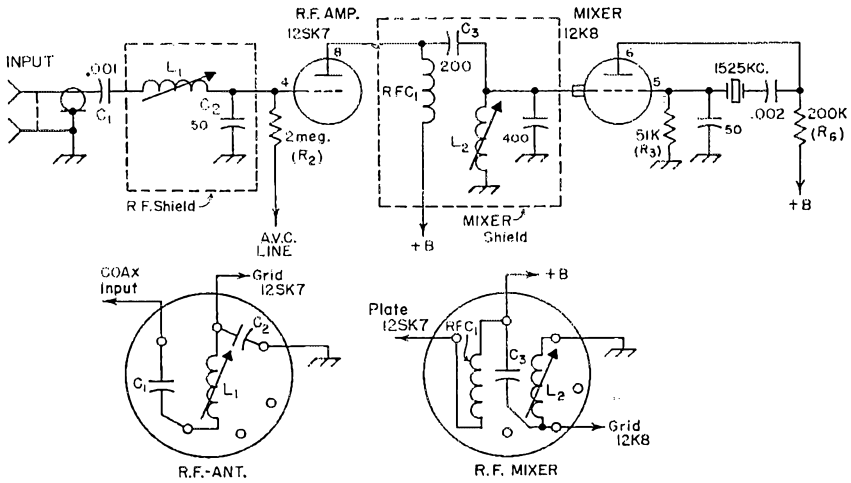


Fig. 1 — Revisions in the r.f. and mixer circuits. Capacitances less than 0.001 μf. are in μμf.

L_1 — 100 turns No. 38 e.s.c., scramble-wound 3/8 inch long on CTC LS5 3/8-inch iron-core form.

L_2 — 56 turns No. 34 enam., close-wound on CTC LS5 3/8-inch iron-core form.

Resistors are those already in the R23 unit. Lower diagrams show connections to r.f. and mixer receptacles.

* 240 Yarmouth Rd., Rochester 10, N. Y.

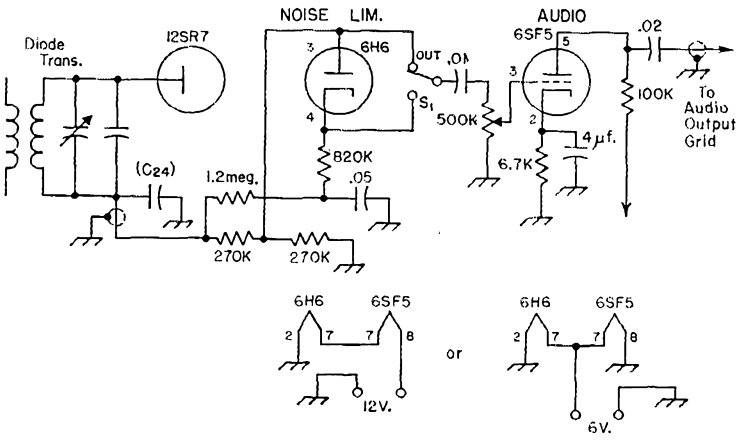


Fig. 2 — Diagram showing circuits and connections for the noise limiter and audio amplifier.
Capacitances are in μf. Resistors are ½ watt. S_1 — Toggle switch.

The supply, minus the filter, was salvaged from a defunct car b.c. receiver.

Fig. 3 also shows the plug-and-receptacle connections between the i.f. chassis and car battery, and between the i.f. chassis and the converter. Fig. 3C shows how a plug may be wired to operate the receiver and converter from an independent 250-volt supply. In this arrangement, the vibrator pack is disconnected when the plug for the external supply is substituted for the battery-supply plug of Fig. 3A. If a supply delivering more than 250 volts is used, a suitable dropping resistor should be inserted in series with the No. 2 terminal.

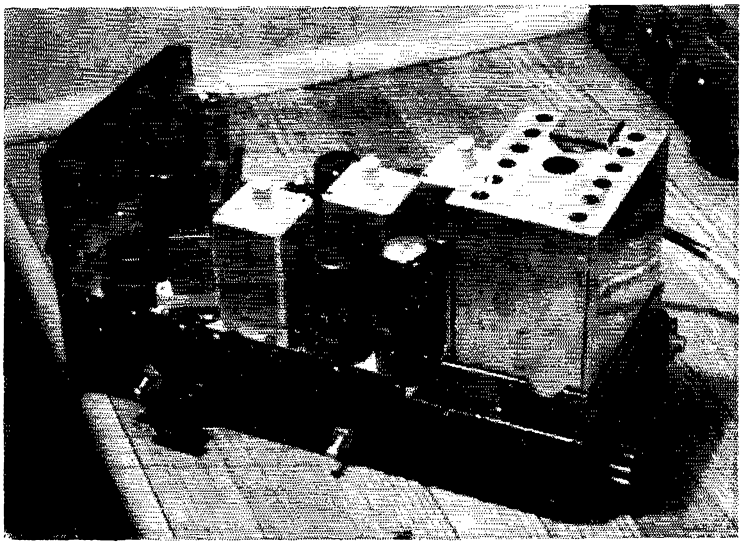
Removing Unneeded Parts

The first step in the conversion is to remove the components that will not be used. The tuning-capacitor gang, dial assembly, antenna connectors, and the antenna-coupling capacitor should be removed. The 100-μμf. capacitor (C_3)[1] on the r.f. plug base to the left, and the 200-μμf. capacitor (C_8) on the oscillator plug base to the right (as viewed from the front) are not needed. The 51K resistor connected to (C_8) should be removed and reconnected directly from Pin 5 on the 12K8 socket to ground, as shown in Fig. 1.

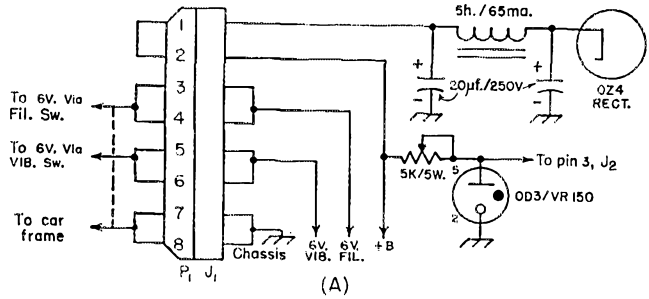
Underneath, the area nearest the panel is cleared by removing the plug-in r.f. coil assembly (No. 9630), the front control connector, the variable antenna trimmer and its neon tube, and the 3-μf. by-pass to the left. The tubular capacitor (C_{11}) from Pin 6 of the 12K8 socket to ground, should be removed. Before disconnecting wires to the front connector, the wires going to Pin 1 (r.f. gain), and Pin 5 (b.f.o. switch) should be labeled for future reference.

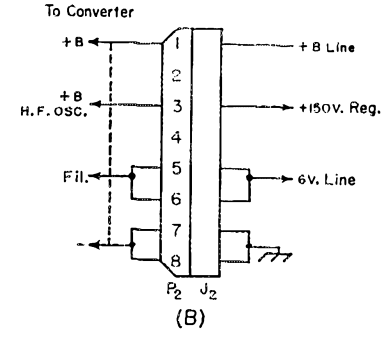
At the rear of the chassis, both dynamotor and power-control connectors should be eliminated, and the following components associated with them removed: the filter choke (L_{15}, No. 5634, right rear corner, as viewed from the front) and the capacitors connected to the ends of (L_{15}); the triple capacitor (No. 5413 in metal can next to L_{15}); the metal-can choke between (L_{15}) and the audio output transformer (No.

[1] Symbols in parentheses indicate those shown in the original schematic of the R23.



A surplus R23/ARC5 converted for use as a mobile i.f. amplifier. The new tubes and crystal are near the panel. A vibrator pack is mounted in place of the dynamotor. R.f. connection to the converter is made through a short length of coax cable.





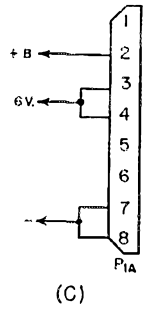


Fig. 3 — Connections to power-supply receptacles and plugs.
J_1,P_2 — Male octal.
J_2, P_1, P_{1A} — Female octal.
The filter choke is Triad C6X.

5631); the output transformer (No. 5631) and the capacitors and neon bulb connected across its windings. Before disconnecting the control connector, the wire to the central pin, Pin 7 (B+) should be labeled. Also, after removing the connections to Pin 5 (screen voltage) these connections should be transferred to the B+ lead.

Also to be removed are the two resistors (R_{18} and R_{19}) to which the diode transformer secondary is connected, and the 12A6 cathode by-pass (C_{30}, No. 5416, on the left side of the chassis, center metal can).

Reconstruction

The first step in the reconstruction is to mount three octal sockets in line across the chassis in the space formerly occupied by the tuning-capacitor gang. The one to the right (as viewed from the front) is for the 6H6 noise limiter, the one in the center is for the new audio tube (12SF5 or 6SF5), and the one to left is for the OD3/VR150 voltage-regulator tube. An octal socket, an octal male connector, a coax connector, and phonograph connector should be set in the rear edge of the chassis. Holes should also be drilled in the left-hand side of the chassis for two toggle switches (b.f.o. and noise limiter) and the audio volume control. Individual preference may, of course, place these controls elsewhere. (After installation, I brought a flexible-shaft control for audio gain out to the instrument panel). The holes in the panel are covered by fitting a piece of aluminum sheet over the panel.

The tubes in the original model have 12-volt heaters, and these are wired in series-parallel for 24-volt operation. Rewiring of the heater circuits will not be necessary in the case of a 12-volt car system, if 6-volt equivalents are substituted for the original tubes. The 6F6 is a suitable replacement for the 12A6. The original tubes may be used in a 12-volt car system by rewiring the heaters in parallel, of course. A 6-volt car system will require both wiring the

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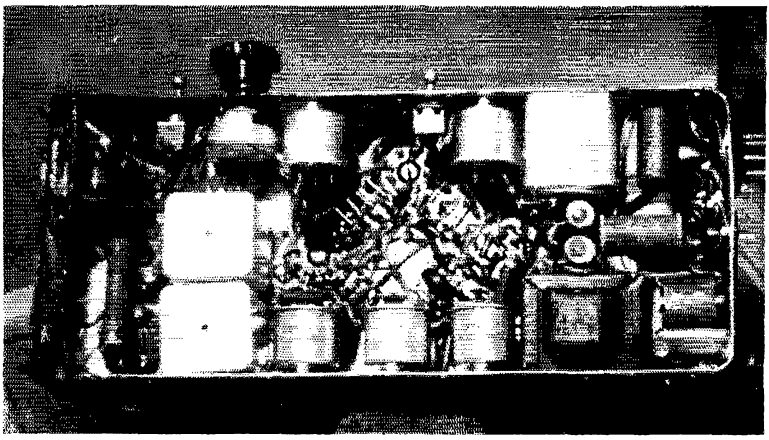


Bottom view of the converted unit. Power-supply filter components are tucked away at the rear end of the chassis. The audio gain control and two toggle switches are mounted along the upper edge in this view.

This clever linear amplifier uses four parallel-connected tetrodes in a grounded-grid circuit. It can be driven by an s.s.b. exciter capable of 20 watts peak envelope power output. The cabinet is only 14½ by 9 by 10 inches deep.

A 200-Watt Grounded-Grid Linear Amplifier

Unusual Design Using Four Modified 1625 Tetrodes

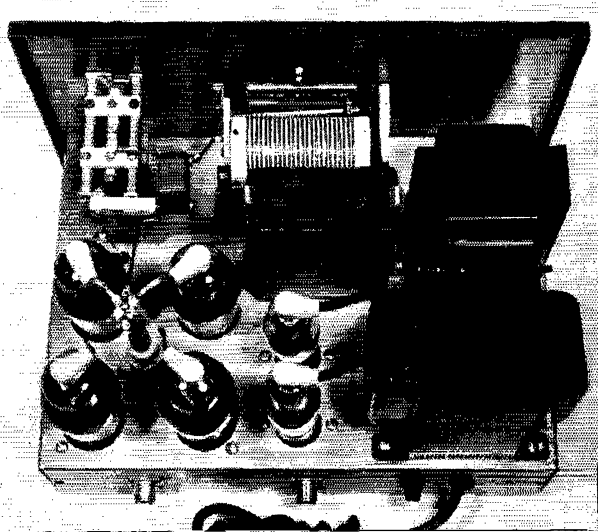
BY E. L. HOOVER,* W9SAR, AND R. L. PECK,** W9MOW

• Here is the design for a compact self-contained linear amplifier that shows considerable ingenuity. Some of the old hands in ham radio will be taken back to the "good old days," when it was the custom to operate on the available vacuum tubes by de-basing them or sawing slots in the base. In this case, the authors show how to get a new tube type from a conventional design.

GROUNDED-GRID amplification in linear service has several advantages over conventional circuits. The amplifier is degenerative, which adds to its stability. It has been found that it produces slightly better linearity than conventional circuits using the same tubes.[1] And, of course, the greater part of the power required to drive the grounded-grid amplifier appears in the output along with the amplified signal. The disadvantage of using the 807 or 1625 in this type of operation is that the beam-forming plates are connected to the cathode. The signal appears on the cathode, and the beam-forming plates form good coupling capacitors to the plate. This couples the input and output circuits and causes instability. We thought that we would be able to stabilize an amplifier with these tubes if there were only some way to ground the beam-forming plates directly, since this would help to isolate the input and output circuits. Checking various makes of 1625s showed that, in many instances, the beam-forming plate lead was attached to the cathode lead in the cathode pin. Bases were removed by applying

* 1311 South 28th St., Lafayette, Ind.
** 5 North Earl Ave., Lafayette, Ind.

[1] Puckett, "Notes on Grounded-Grid R.F. Power Amplifiers," *QST*, Dec., 1954.



A top view of the linear amplifier shows the r.f. tubes at the left, clustered around the r.f. choke. The two small tubes are the 816 rectifiers used in the 1200-volt power supply. The variable inductor will be recognized as the antenna loading coil from a BC-458 Command transmitter.

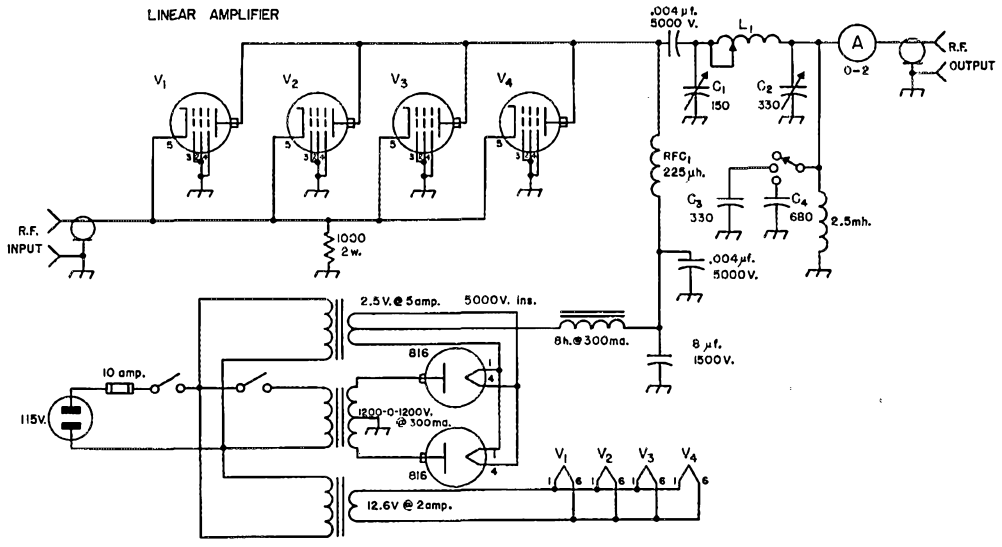


Fig. 1 — Schematic diagram of the grounded-grid amplifier. Capacitor values in μμf. unless otherwise specified.
C_3, C_4 — 600-volt silvered mica capacitor.
L_1 — 2.0 μh. roller-type variable inductor (from BC-458).
RFC_1 — National R-175A.
V_1, V_2, V_3, V_4 — Modified 1625 — see text.

heat from a large torch. The cathode and beam-plate leads were then separated and new 6-pin bases reinstalled, using the same cement that the manufacturer uses. They were then baked in an oven at 90 degrees C. to harden the seal.[2]

The modified tubes were found to do an excellent job, and further simplification of design was now possible. Using four of the tubes in parallel brought the cathode impedance down to about 50 ohms, so it offers a good load for most popular exciters.

Since the input circuit of the grounded-grid amplifier is a low-impedance load for the driver, it is possible to do away with any input tuned circuit; the d.c. return for the 1625s is made through the exciter output tap or link. A word of caution here — be sure there is no d.c. on the exciter link, because the 1000-ohm safety resistor would short it to chassis.

We found that no bias or screen voltage was required at 1200 volts on the plate. Each tube draws about 10 ma., so the power supply is constantly bled with 40 ma., thus eliminating the need for a bleeder.

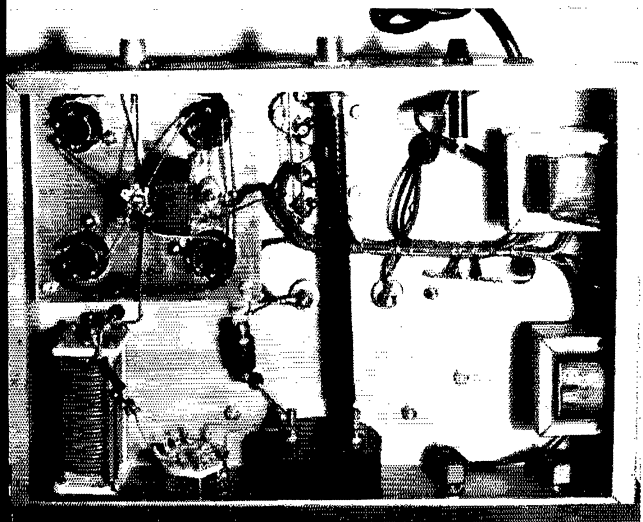
Now, with no screen and bias supply and no input tuned circuit, it was possible to design and build a compact amplifier. We chose the pi-network output circuit with variable inductor to cover 75, 40 and 20 meters. We felt that 15- and 10-meter operation was impractical because of the high output capacitance of the four tubes used in parallel. The circuit diagram is shown in Fig. 1.

Construction

The unit is constructed on a 10 × 14 × 3-inch chassis, and a 5¼ × 5¼-inch subchassis on which are mounted the plate r.f. choke and four 6-pin tube sockets. This subchassis is mounted 1¼ inches below the main chassis deck. The cold end of the r.f. choke is by-passed through a 0.004-μf. capacitor to a soldering lug

(Continued on page 128)

[2] The modified tubes can be obtained from P & H Electronics, 5 N. Earl Ave., Lafayette, Ind. Cement for doing the job yourself can be obtained from the same source.



This bottom view shows how the four r.f. tube sockets are mounted on a small platform. The 2.5-mh. choke across the output circuit is to prevent accidental shock from the antenna system in the event that the plate-blocking capacitor should short circuit. Filament transformers are mounted on the side of the chassis.

Elementary TV Trouble Shooting

Practical and Simple TV Set Testing

BY JAMES KENNEDY,* W7MID

FROM experience in the field of television servicing, plus personal acquaintance with many amateurs, we've realized that lots of hams don't understand the basics of what cooks in a TV set. This article is offered with the hope that it may present a better understanding of their operation and spare someone a service bill once in a while. Not too often, though; we're still in the business!

This isn't going to be one of those articles which tells you the microseconds of each pulse; we won't even show you a picture of a pulse. So long as the pulses are in your set, be happy!

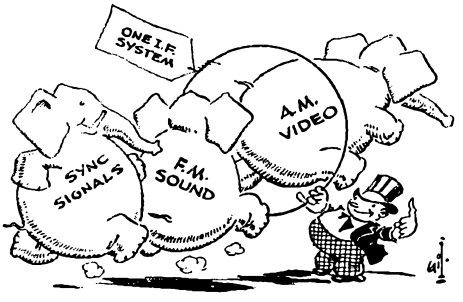
• No, we haven't forgotten that our cover says, "Devoted entirely to amateur radio." We're making an exception in this case because W7MID is passing along some good, sound practical hints on how to size up TV receiver troubles, and most hams are called upon at some time or another to "Take a look at this set and tell me what's wrong." Even if you don't plan to lift a finger ever to help a TV looker, we're sure you will find this article entertaining and helpful.

The Signal

The signal from a TV station is pretty much a conglomeration. The sound is f.m., and the picture, or video information, is a.m. The two carriers are always separated by exactly 4.5 Mc., with the sound carrier always the higher in frequency.

Along with the picture information there are pulses that lock the receiver with the transmitter. These pulses are given a much higher percentage of modulation than the video signal so the two can be more easily separated at the proper time. The video information never exceeds 75 per cent modulation of the carrier, while the synchronizing pulses rise up to 100 per cent. A clipper, like your noise limiter, is used to separate them.

Oddly enough, all this stuff — the f.m. sound, a.m. video and synchronizing signals — can be passed through one i.f. system, but it's gotta be wide! A width of 4 Mc. is the aim, but many sets settle for 2.5 or 3 Mc.



The Receiver

A TV set, from antenna to second detector, is quite like a superhet, except for the bandwidth of the i.f. strip. There's an r.f. stage (usually a cascode type in modern sets), a mixer and a local oscillator. The output of the mixer is either around 25 or 45 Mc., depending on set design, with the higher-frequency i.f. being favored in the newer sets, since the 4-Mc. bandwidth of the 25-Mc. i.f. puts it next door to our 21-Mc. band.

The i.f. amplifier consists of three or four stages, with each stage tuned to a slightly different frequency within the desired range of, say, 21 to 25 Mc. The net result is to amplify uniformly the desired bandwidth of 4 Mc. This is the "stagger tuning" you hear about, unless the

-ANOTHER KIND OF "STAGGER TUNING"

XYL uses the term when you retune the set after a few quick ones.

The output of the i.f. amplifier goes to a second detector, which is usually a 6AL5 or a crystal such as the 1N64.

You can spot the foregoing sections of the receiver easily, because the tuner is behind the knob which you use to change channels, and the i.f. stages are usually in a row right behind the tuner. The i.f. amplifier uses miniature tubes like the 6CB6, 6AG5, or 6AU6, and the i.f. coil trimmers are generally seen as brass screws sticking up through the chassis. Note we say "generally," because this article is being written without any particular set in mind. Some sets may have the i.f. coils above the chassis in cans just like those in your receiver, but most of them use the cheaper method.

The video, or picture information from the

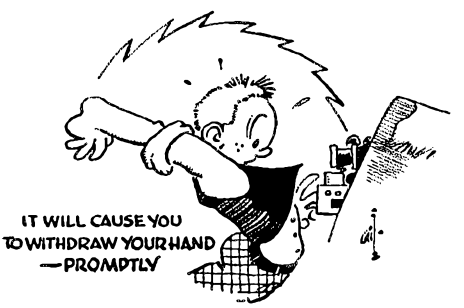
* Kennedy Radio and TV Service, 4511 N. 8th St., Phoenix, Ariz.

second detector, goes to the video amplifier, which is simply a voltage amplifier designed to amplify uniformly from zero to 4 Mc. It is usually one stage, but may be two, and the tube may be a 6AC7, 6CB6, 12BY7, or almost any tube the manufacturer happened to have lots of. The output of the video amplifier goes to the picture tube.

Trouble Shooting

We've now followed the video information from the transmitter right up to the picture tube. While it's still fresh, let's consider some of the troubles in this section. Nearly all cases of trouble in the tuner, i.f. or video stages of a TV are tube failures. These tubes all have about 150 volts applied to the plates and screens, which is fairly conservative, so they give a lot less trouble than the tubes in the deflection circuits which are pushed to what in some cases seems to be "super ICAS" ratings. The tubes in the tuner, i.f. and video sections generally have about the same temperature to the touch, so when you're looking for trouble, a cooler tube, even though its heater is lit, may indicate that it has given up the ghost.

Now, if you're going to start putting your sticky fingers inside the set, let's have a word of caution. If you have lots of time, the safest way is to turn off the set before putting your hand inside. If the picture tube is glass, the high voltage is fed to it through a rubber section cup on the side of the tube. The wire carrying the high voltage is supposed to be well insulated, but keep your hands away, nevertheless, as it may be old and worn. If your set has a metal picture tube, practically the entire section of the tube inside the set is at high potential. If you're in doubt, turn off the set and short out the picture tube to the chassis. If the side of the tube is "hot" electrically, there will still be a respectable spark even with the set turned off. The voltage on the picture tube is pretty high, from ten to fifteen thousand volts, but the current is very low. Still it wouldn't do you any good to get hit with it if you have a bad heart. Moreover, it will cause you to withdraw your hand so promptly



you'll leave plenty of skin on anything that gets in the way. So watch your step.

To continue with the front end and i.f.: The r.f. amplifier, if a 6BQ7 or 6CB6, often shorts out and puts 60-cycle hum on the screen, which causes the bottom half to be dark and the top half light, or vice versa. The i.f. tubes may cause the same trouble, but not as often. If the oscillator tube quits in the tuner, there will be no sound or picture getting through, but there will be plenty of noise on the screen from the i.f. tubes. This appears as snow. The oscillator tube is often half of a 6J6 or 12AT7, with the other half being the mixer. The tuner must be operating properly to give enough signal to override the noise generated in the i.f. stages, so if the picture is unusually snowy, look into the condition of the r.f. amplifier and mixer tubes.

If one of the i.f. tubes fails in a strong signal area, there may be enough signal leaking through the internal capacity of the bad tube to put a weak, snowy picture on the screen, while the sound may be nearly normal. The best bet is to substitute tubes you know are good, one at a time, until you hit the right one. If the set has series heaters, you should turn off the set before unplugging any of the tubes, because some sets have resistors shunting the heaters, and if the tube is out of the circuit too much current will flow through the shunt resistor and burn it out. If the set has selenium rectifiers and you can't see anything that looks like a power transformer, it more than likely has the heaters in series.

Most sets nowadays are of intercarrier design, which means that the f.m. sound and the a.m. video signal are amplified in the same i.f. system. Since, as mentioned earlier, the sound carrier is spaced exactly 4.5 Mc. above the video carrier, any place the two get together they'll produce a beat-frequency equal to their difference frequency, and in most sets this beat of 4.5 Mc. is trapped out somewhere along the i.f. system or in the video amplifier by a circuit turned to 4.5 Mc. The resulting f.m. sound is amplified through one or two sound i.f. stages at 4.5 Mc. It goes then to a ratio detector and the audio amplifier. The sound i.f. coils are gnerally in shielded cans; the sound i.f. tubes are nearly always 6AU6s, with the ratio detector being either a 6AL5 or the diodes of a 6T8. Either a 6AV6 or the triode section of the 6T8 is the usual first audio amplifier.

The main service trouble with the sound system, aside from tube burnouts, is mushy sound, caused when the ratio detector transformer drifts out of adjustment. This transformer is an i.f. can right next to the sound detector tube, and you can correct the mushiness by adjusting the bottom slug of this transformer with an alignment tool. A half turn should be enough. Some manufacturers have thoughtfully bored a hole in the bottom of the cabinet so you can reach in and make this adjustment, while the others have put the extra hole down as an unnecessary expense.

Of course, the sound i.f. tubes burn out occasionally, with resultant loss of noise. In some sets the audio output tube is used to drop the voltage down to 150 volts for other tubes in the set, instead of using a dropping resistor. That is, about 360 volts is applied to the plate and screen

of the audio output tube, but instead of grounding the cathode of this tube, it is heavily bypassed and run to the plates and screens of the other stages, perhaps the i.f. stages, so that the voltage drop through the 6V6 or 6L6 reduces the voltage down to the proper value for the i.f. stages. You can see, then, that if anything goes wrong with the audio amplifier, it can affect the picture in this kind of circuit. The only way we can prepare you against this type of thing is to suggest you get a look at the schematic of the set before knocking yourself out. The first time we bumped into one of these we measured the voltage at the grid of the audio output tube and found it to be a positive 150 volts. This would seem to indicate a leaky coupling capacitor from the first audio stage, but such wasn't the case. When we finally got the schematic, we found the set used just such an arrangement as described above, and the grid *was* at 150 volts positive with respect to ground, but not with respect to the cathode, which is what counts. It's a constant stream of things like this which keeps one from ever getting much of an ego built up about TV servicing ability!

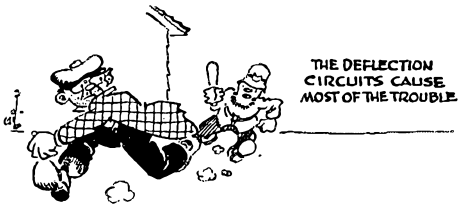
Power Supply

The low-voltage power supply hasn't been covered thus far. Filter capacitors *do* short out but not as often as you would expect. You will find capacities of 40 and 80 μf. at 450 working volts to be common sizes. The main item of failure is the 5U4G rectifier; they're usually good for a year of operation unless the set is an especially "economical" type. Some sets use two 5U4Gs in parallel, which is what is really needed. A weak 5U4G can cause complete loss of picture if it's very weak. We've found sets where there was enough voltage to operate the sound system, but not enough to operate the high-voltage power supply, so there would be sound but no picture or brightness on the screen. Generally, when the picture starts shrinking, either from the sides, or from top and bottom, or both, a new 5U4G should be tried. The same thing holds true for selenium rectifiers, except that they are more trouble to change.

Deflection Circuits

Now we've covered just about everything but the deflection circuits, which cause most of the trouble. The electron beam has to be moved across the screen from side to side as well as up and down, and changing currents in the deflection coils, or yoke, are what do the trick. To have the beam move properly, the waveforms have to be steep sawtooth types, with high peak voltages, which puts quite a strain on any parts associated with the deflection circuits.

The horizontal deflection system moves the beam quickly across the screen from side to side, while the vertical deflection system moves the beam slowly down the screen at the same time, to paint a quick picture on the screen. Where there is a dark spot on the scene being transmitted, the electron beam is cut off so the screen is dark, and where there is a bright spot in the scene the beam intensity is increased, so more electrons hit the screen and cause it to fluoresce. This is done so rapidly that the eye sees the complete scene instead of the individual dots or dashes that paint the picture.



Now consider the vertical and horizontal deflection circuits as a couple of transmitters, the old-style "Master-Oscillator Power-Amplifier" type. The electron beam moves slowly down the screen, while being swept rapidly back and forth horizontally. The vertical oscillator operates at a low frequency of 60 cycles. It's nearly always a triode, such as a 6C4 or half of a 6SN7, and the oscillating circuit is usually an RC multi-vibrator. The oscillator drives the vertical amplifier, which is connected through the vertical output transformer to the vertical deflection coils around the neck of the picture tube. If something fails in either oscillator or amplifier, you'll have just a straight line horizontally across the face of the screen, or if the thing is working just halfway the screen may be filled just part way vertically, or the picture may have the top half folded on top of the lower half, or it may be impossible to lock in the picture at any setting of the "Vertical Hold" control.

Just about any part in the vertical deflection circuit can give trouble, and does. But, just as in any trouble-shooting attempt, try changing tubes first. The vertical output tube may be a 6K6, 6AH4, 12BH7 or 6S4, all connected as triodes. They have a pulse of around 1000 volts on them, which is a strain for any receiving type tube. A 'scope is the best instrument for determining whether the oscillator is driving the amplifier properly, if the trouble can't be cured by changing tubes.

Things are not as simple in the horizontal deflection circuit, which operates at a frequency of 15,750 cycles, or about 15 kc. The same type m.o.p.a. circuit is used, but the economizers figured out a way to develop the high voltage for the picture tube from this circuit. The picture tube won't light up without the ten or fifteen thousand volts needed to make the electrons tear down and hit the screen on the face of the tube, and there won't be any high voltage developed unless the horizontal deflection circuit is working properly. So, if the horizontal oscillator or amplifier fails, you don't just get a white line running vertically down the screen as you'd expect. You don't get a darned thing on the screen, because there's no voltage being developed to make it light up. Besides this, to make matters worse, there is also a "boost" voltage developed

from the same circuit, which is fed back usually to the vertical amplifier tube, so that if the horizontal section is cutting up, the voltage in other parts of the set may be off quite a bit, just to add to the general confusion.

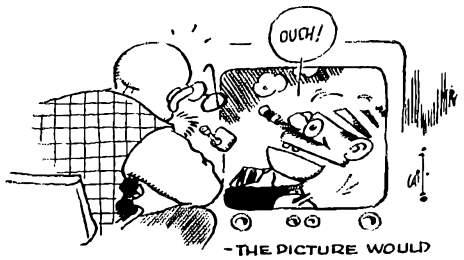
The horizontal oscillator is usually a 6SN7 or its smaller counterpart, the 12AU7, and the coil for this circuit may be mounted in a can like an i.f. coil, or it may be a slug-tuned coil on the back of the set, marked "Horiz. Hold." The oscillator feeds the amplifier, either a 6BG6 (in the older sets) or a 6CD6 or 6BQ6. The plate coil for the amplifier, called the "flyback transformer," is usually one of the components mounted inside a cage to keep bugs and kids out. The horizontal amplifier tube looks like an 807 or 2E26, and they've been used in a number of ham rigs.

Also inside the cage is the high-voltage rectifier, which is either a 1B3 or 1X2. These tubes are rated about 15,000 volts at half a milliampere or so, and they have a very low drain filament, which makes it feasible to light the filament by coupling a one- or two-turn loop over near the horizontal output coil to pick up the 15-kc. r.f., thus avoiding the expense of a filament transformer insulated for 15,000 volts. The horizontal output coil, or flyback transformer, matches the output tube to the horizontal deflection coils in the yoke just as an audio output transformer matches an audio amplifier tube to a 'speaker. But at the same time, the flyback transformer steps up the 15-kc. signal and applies it to the plate of the high-voltage rectifier, which changes it to d.c. This d.c. is then sent up to the picture tube. Since the frequency is 15 kc., instead of 60 cycles, the ripple frequency of the d.c. is high, and therefore very easy to filter. All that's needed is a 500-$\mu\mu$f. 20,000-volt ceramic capacitor, plus the capacity of the picture tube itself, which amounts to another 500 $\mu\mu$f.

We mentioned the synchronizing, or "sync" pulses at the beginning of this article; at the second detector, the sync pulses are picked up and fed into a sync amplifier and/or sync separator. This part of the set may be just one tube in the cheaper sets, or up to half a dozen tubes in the more complicated versions.

There are two sync pulses, one to trigger the horizontal sweep circuit and the other to trigger the vertical sweep circuit. When both sweep circuits are in step with the sweep circuits in the camera at the station, then the electron beam in your picture tube is right in step with the scanning beam at the station and, assuming the video information has come through your set in good shape, your picture will correspond with the one being televised.

The vertical sync pulses are relatively long compared with the horizontal sync pulses, which simplifies the problem of separating them. A weak sync-separator tube may cause the picture to "roll" at the slightest provocation, or to fall over sideways and break up into pieces. You can see the vertical pulse on your screen by reducing the contrast, turning up the brilliance, and operating the "Vertical Hold" control so the pictures roll slowly. The vertical sync pulse is the black mallet-like form between the frames of the picture. It should be darker than any portion of the picture, because it has a much higher percentage of modulation than any of the picture portions, and the greater the modulation percentage, the darker the picture. If the sync pulse isn't much darker than any part of the picture, it indicates that the pulse is being reduced in amplitude by trouble in the set, and the picture would have an irritating tendency to roll every time the refrigerator went on, or when you flipped on the rig.



-THE PICTURE WOULD HAVE AN IRRITATING TENDENCY TO ROLL

Trouble-shooting the sync sections of a television set can be plenty tedious unless you have a good 'scope and know what you're looking for. Again we say, try the tubes first. Even a defective picture tube can cause poor sync operation in some sets, by overloading the video amplifier.

The first worry of just about everyone who calls us, and we don't blame 'em, is that the picture tube may be bad. We find quite a few with open heaters, which respond by heating the pins on the base with a soldering iron. Apparently, oxidation may develop after even a year or so, causing the heater to fail to light. Usually, though, picture tubes gradually get dimmer and dimmer, until finally you have to turn out all the lights to see the picture. And you may notice the picture turns negative when you turn up the contrast or brilliance. A picture tube "booster," costing a few dollars, will often prolong the useful life of these tubes. It's a transformer that steps up the normal 6.3 volts to 7 or 8 volts for the heater. You don't have to make any wiring changes to install it.

As you probably gathered from our discussion of the horizontal sweep circuits, there are a number of tubes and parts which may cause the picture tube to remain dark, so don't go getting heart failure until the set has been checked over.

Another word of caution: Don't turn the i.f. or tuner adjustment screws inside your set. You may think the picture is getting better, but you may at the same time be changing the i.f. response curve of the set so the sync pulses are lost or attenuated, or any of a number of other unhappifying troubles may develop. We get a set like this once in a while, and the only thing to do is follow the factory alignment instructions all the way through. This isn't such a tough job, by any means, but it costs you money!

(Continued on page 136)

Modifications in the Viking II

Notes on Improving the Quality of C.W. Signals

BY CHARLES C. MILLER,* W2RDK

FEW serious objections can be made to the performance of the Johnson Viking II transmitter. One valid criticism, however, is the frequently-heard one about the keying.

'Phone men, and c.w. men who just don't care how many other people are annoyed by their signals, can stop here; the modifications to be described do nothing for the speech and don't add a single watt to the output. Those who have been awakened by *QST* articles during recent years to the difference between barely-acceptable and good keyed signals may find something to interest them, whether or not they own Viking transmitters.

Much of the criticism to be leveled in this article applies equally well to transmitters of other manufacture, and is particularly applicable to most homemade VFO rigs. Reference is made here to the Viking transmitter because a large number of these deservedly-popular machines have been put into amateur service in the past couple of years, and because a great opportunity existed to see what could be done toward improving their signals.

Several owners of Viking transmitters, aware that they caused trouble up to 100 kc. off the transmitted frequency, have tried "key-click filters," vacuum-tube keyers, etc., to no avail. As practically everybody knows by now, it is practically impossible to get good quality signals while keying the oscillator. This is true in the Viking even when keying the crystal oscillator, and the situation is even worse when using the Johnson 122 VFO.

The manufacturer points out in the instruction book on the 122 VFO that performance is improved if the oscillator is not keyed and if the VFO is not made to run on the transmitter's output frequency. Toward this end, key jacks in the 122 VFO and in the Viking transmitter are so wired that (a) the VFO may be keyed alone in its cathode lead, (b) the VFO and the first stage in the Viking may be simultaneously keyed in their combined cathode leads, or (c) the first stage of the Viking may be keyed, allowing the VFO to run continuously during transmission periods. The desire to operate as few switches as possible and the notorious ham proclivity for ignoring instruction books are doubtless responsible for the universal tendency to pass up (c) in favor of (b), or even worse, (a).

For something over a year, I've been exposed to some of the noise generated by a Viking II operated by method (a) above, at about a mile from my place. There are also other Vikings in town, at slightly greater distances. My advice

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• If you're a real ham, we think you will benefit from this article. In the first place, it tells how to make something operate better without too much trouble, and that's something any real ham likes to hear about. And, secondly, we think you will be interested in this account of the diplomatic aspects of keying problems.

was solicited, and a number of "over-the-air" tests were conducted with various waveshaping components and sets of tuning adjustments, without producing any satisfactory solution to the problem of thumps, clicks and chirps. I like to spend time chasing DX on 40 and, unfortunately, so does the owner of the Viking nearest me. I couldn't chop down his antenna, since he is a fellow-member of the Order of Boiled Owls; so I decided to get hold of his machine and see if I couldn't improve the signal quality. He brought over the Viking, the 122 VFO, and the two instruction books, being a tolerant and slightly gullible type. I promised I wouldn't impair the resale value of the equipment too much.

His transmitter (serial No. 6875) was purchased "wired and tested," and the manufacturer had incorporated Modification A (addition of a 6AQ5 clamp tube with positive bias bleed), and had furnished the parts for Modification B. The latter has to do with changing the second 6AU6 speech amplifier to triode connection, removing the inverse feed-back, "building out" the modulation-transformer primary, removing a v.h.f. choke from the screen lead to the 6146s and replacing it with a 56-ohm resistor, replacing a v.h.f. choke in the lead to the VFO heater with a choke wound from heavier wire, and swamping the buffer tank, L_{5A}, with a 10K resistor. The owner had not done this work, so I did it for him, following the instructions of the manufacturer.

Preparation

First, however, before undertaking any work I made a thorough study of the equipment and the two instruction books. I spent three evenings on this. (Owners of Vikings who have already made such a study need not repeat it nor charge the time to the project.) This study brought out several interesting points.

One was that SW_3, the crystal-VFO switch, was a single-pole 11-position affair, connecting the grid of V_6 selectively to any one of 10 crystals or to the RG-59/U VFO line. The other side of the 10 crystals was connected together and to the

screen of V_6, which is fed from the 300-volt line through a 33,000-ohm resistor. The configuration is thus the "electron-coupled" or "modified" Pierce oscillator. Enough capacitance exists from grid and screen to ground to permit dispensing with any additional lumped capacitance. On switching to VFO, when V_6 becomes a first buffer/doubler, the screen of V_6 is left "hot" for r.f. by 33,000 ohms, as there is no provision for switching in a screen by-pass capacitor. I felt that this could be a contributing factor to the instability I thought must exist in the rig and which prevented it from responding to the conventional attacks on keying transients. I also suspected that the arrangement of the crystals could cause pulling of the VFO whenever the VFO frequency approached that of one of the ten crystals, as a finite capacitance exists across the switch on the grid side, and the screen side of the crystals is common, as noted.

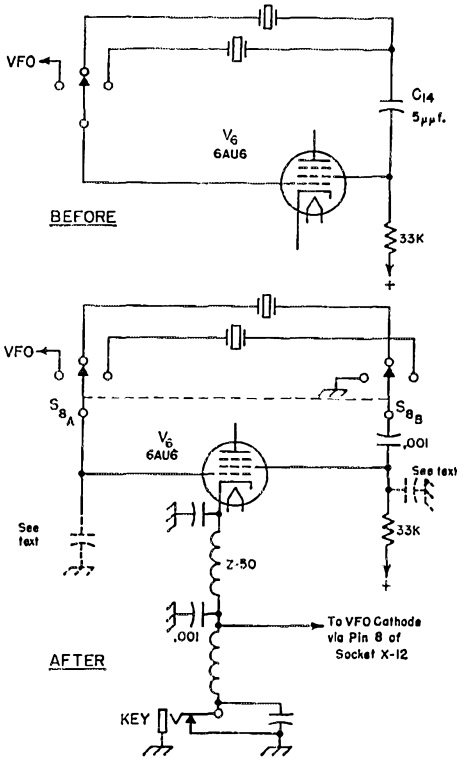


Fig. 1 — The "before" and "after" of the Viking II oscillator/buffer stage.

Examination of the 122 VFO unit showed that its enclosure is not an r.f. shield as we have come to think of shielding since TVI. The lead filtering into the 122 VFO unit also leaves something to be desired. Since the inter-unit wiring is immersed in the strong r.f. field from the antenna, there is the possibility that r.f. can get back into the oscillator circuit, to contribute to instability or perhaps a poor note. Some thought should be given, I felt, to improving the shielding; and certainly something should be done for the lead filtering, particularly in the heater circuit, which is completely unprotected on the VFO end.

Perrine showed a long time ago [1] that variable-frequency oscillators did better with high resistance grid leaks, if the tube was good enough to continue oscillating. I felt that the 47,000 ohms in the 122 VFO was too low and decided to raise it to at least 100,000 ohms.

Goodman reported so long ago I can't give him due credit that B-minus keying is faster in an oscillator than cathode keying [2] and should be used whenever the oscillator is to be turned on and off. Speed is enhanced by a minimum of series resistance and shunt capacitances in the supply leads. I felt there was room for some improvement in this direction in the 122 VFO.

Everyone knows that the series-tuned (Clapp) Colpitts does better with a high-transconductance tube. It is almost automatic to see a 6AG7, 5763, or 6AU6 in published designs, in more or less that order of occurrence. That these may not necessarily be the best of all possible tubes for the purpose seems so far to have occurred to only one serious investigator.[3] Since it was easy to "acquire" a 6AH6, I decided to use one in the VFO. (The socket connections are the same.)

The Work

I therefore sent the lucky owner of this Viking to the local store for a 6AH6, a half dozen 0.001-μf. disk ceramic capacitors, a few Ohmite Z-50 r.f. chokes, and a Centralab PA-2004 miniature two-pole twelve-position shorting selector switch. I offered to furnish the wire, 2 feet of No. 18 enamel, and 6 feet each of green and orange vinyl-covered stranded hook-up wire. I also had available a standard 100-watt soldering iron, one of the "pencil" type with a ⅛-inch tip long-nosed, and diagonal-cutting pliers, a "soldering aid," wire strippers, Allen wrenches, and large and small screwdrivers.

Access was gained to the underside of the Viking II by removing a number of binding-head screws holding the perforated metal cover plate in place, and to the top by removing three knurled-head screws holding the top cover.

Step 2 consumed most of one evening, and consisted of attempts to get good clean keying without modifying anything. The 5R4GYs were removed — to prevent their rectifying stray r.f. and applying it as plate voltage to the final, thus putting a signal on the air even with the plate switch in the off position — and I tried all keying combinations, with and without waveshaping. The keying was unsatisfactory under all combinations of tuning of the 6AU6 and 6AQ5 stages in the Viking. More from curiosity than for any

[1] Perrine, "An Answer to the ECO Problem," *QST*, Sept., 1939.

[2] Not exactly. He said B-minus oscillator keying could be shaped on "break" without regard to the grid-circuit time constant, whereas cathode oscillator keying could not. Either can be keyed fast if the grid-circuit time constant is short, which means a small value of grid condenser. — Ed.

[3] R. A. Egbert, W2QMO, in personal communications to the author during an investigation carried out during the course of a project. I hope he will see fit to publish an account of this soon.

practical value, since crystal and VFO are not simultaneously used, I put a shorted plug in the VFO key jack, put the "crystal-VFO" switch in crystal position, and tried to bring the VFO

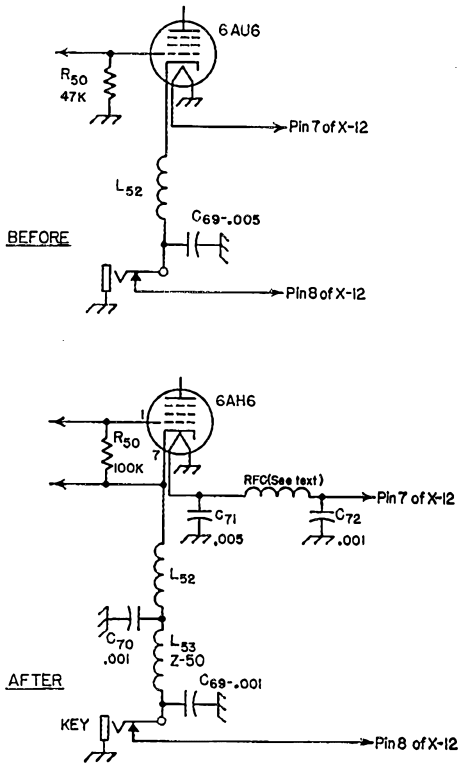


Fig. 2 — Changes in the Model 122 VFO circuit to speed up the keying and also improve the r.f. filtering.

to a low beat note with the crystal oscillator. The pulling of the VFO was plainly audible in the 75A-3 receiver. The VFO abruptly jumped into lock with the crystal as soon as their frequencies were within a few hundred cycles of each other. This occurred with either 3.5- or 7-Mc. crystals and in the first few positions of the crystal switch.

Step 3 is the actual project. If anyone other than my wife bothers to read this far, he's probably fairly serious about wanting to improve the performance of his transmitter. He'll have to spend most of one evening on it, but his locals will thank him for doing the job.

1) The wiring from SW_8 to X_{15} is removed, as is the lead from Pin 1 of the 6AU6 (V_6) to the switch rotor. The RG-59/U VFO input cable is also carefully removed from the switch. C_{14}, a 50-$\mu\mu$f. mica from Pin 6 of V_6 to the common lead of crystal socket assembly X_{15}, is also removed. The coupling on the shaft of SW_8 is loosened and the switch is removed. In its place will be used the Centralab PA-2004 two-pole switch. Put the shaft, cut to 1-inch length, through the bracket, but do not draw up the mounting nut, as wiring is easier with the switch dangling. Cut 11 pieces of green wire 6 inches long and solder one end of 10 of them to one side of each of the crystal sockets. Similarly, cut 11 pieces of orange wire 6 inches long and solder one end of 10 pieces to the other side of each crystal socket. Number the switch points 0, 1, 2 through 10, 11 clockwise around the switch, viewed from the shaft end. Note that the rotor clip is on the opposite side of the wafer from the terminals. Designate the front wafer SW_{8A} and use it for the grid connections (green wires). The rear wafer will be called SW_{8B} and will be used for screen connections (orange wires). Cutting the wires to length at the switch end, solder the leads from the crystal sockets (green wires) to Terminals 1 through 10 of SW_{8A}. Note that the crystal sockets on X_{15} are numbered down the board and back, rather than both rows in the same direction. Run a green wire from Pin 1 of V_6 to the rotor of SW_{8A}. Similarly, bring the orange wires from X_{15} to Terminals 1 through 10 of SW_{8B}, cutting them to length at the switch. Install a 0.001-μf. disk ceramic capacitor from Terminal 11 of SW_{8B} to the rotor terminal. Run an orange lead from Pin 6 of V_6 to Terminal 11 of SW_{8B}, and run a short heavy ground lead from Terminal 0 of SW_{8B} to the nearest chassis ground. Mount the switch and lock it in place, and connect the center conductor of the RG-59/U to Terminal 0 of SW_{8A}. This change, when correctly made, causes both sides of the crystals to be switched, puts 0.001 μf. either in series with the crystals (where it has no effect) when they are in use or shunts it to ground as a screen by-pass for VFO operation, eliminating one possible cause of instability. Some experimenting will have to be done with good/mediocre/poor crystals of both the 3.5- and 7-Mc. variety and an assortment of small (10- to 470-$\mu\mu$f.) capacitors, to determine how much capacity should be added from grid/screen to ground to get the most reliable operation of the stage as a crystal oscillator. In this unit, 22 $\mu\mu$f. was required from screen to ground with nothing between grid and ground, but this will vary with activity of the crystals and possibly from transmitter to transmitter. The pulling of the VFO was cured by this change, as evidenced by the ability now to set the VFO to a low beat note with the crystal oscillator or to tune smoothly through zero beat.

2) The cathode lead of V_6 was opened at a point between the negative lead of meter shunt SH_8 and the connection of the lead from Pin 8 of the VFO power socket, X_{12}. An Ohmite Z-50 v.h.f. choke, by-passed on the cold end by a 0.001-μf. disk ceramic, is installed here. If Modification B has not been made on your Viking, replace the molded-body v.h.f choke, L_{15}, connected to Pin 7 of X_{12}, with a homemade unit of 15 turns of No. 20 or larger enamel wire closewound on ½-inch diameter.

3) In the 122 VFO unit, replace R_{50} with a grid leak of 0.1 megohm or more, connected directly between Pins 1 and 7 of the oscillator tube socket. Put a two-terminal tie point under the hexagonal nut near the end of r.f. choke L_{52}.

(Continued on page 138)

Lightweight 40-Meter Ground Plane

Simple Construction Using Unguyed Aluminum Tubing

BY PHILLIPS SMITH,* W2OTC, EX-W1ENI

• W2OTC is another who has found the ground-plane antenna to be an effective arrangement for 7-Mc. work. This one is easy to build and uses a matching system not often applied to this type of antenna.

THIS ground-plane antenna is described in the thought that it might help some other poor character who might be contemplating erecting a somewhat similar structure.

The writer, being basically lazy like most hams, decided to make the antenna as simple as possible. Several beams had been built since the war, and by drawing on this background as well as KH6IJ's experiences with light-weight structures, the neighborhood eyesore described below resulted.

Electrically, the antenna is per the *Handbook*. Performance over the 40-meter band from 7000 to 7300 kc. is achieved with a v.s.w.r. of 1.6 to 1 or less. Four horizontal radials are used, each radial having a length of 34 feet 2 inches. The vertical element is 33 feet 4 inches in length.

Construction

It was desired that no guy wires be used on the vertical element. This unguyed vertical element consists of three 12-foot sections of aluminum tubing, type 61S-T6, telescoped and bolted together. At the joints, it is best to use bolts and nuts, and not hose clamps. Two ¼-20 bolts spaced at least 6 inches and running through the tubing at right angles to each other are used at each joint. These are tightened just to the point where the tubing begins to flatten. While physically adjusting the over-all length, the top section is left unbolted, and temporarily clamped within the center section by means of a C clamp. The bottom element is 1⅛ inches outside diameter with a wall thickness of 0.058 inch. The center element is 1-inch outside diameter tubing again with a wall thickness of 0.058 inch. The top 12 ft. is ⅞-inch o.d. with a wall thickness of 0.035 inch. These sizes are readily available from warehouse stock, and telescope together nicely. The total weight of the three is just under 6.5 pounds.

The elements are fastened to the top of a 2 by 4 which in the writer's installation is 20 feet in length and attached to the side of a garage. The 2 by 4 need not be guyed if bolted to the side of a building. In fact, guy wires anchored to trees may prove troublesome during storms, while if anchored in the ground they usually present obstructional hazards around most yards. The elements are held to the 2 by 4 by two homemade aluminum clamps spaced 3 feet apart; the bottom section of tubing is insulated from the clamps with sheet teflon. The radials are made of No. 14 wire and are conventional, except that screen door springs are inserted where attached to trees. Needless to say, these springs are insulated from the radials. It was learned from hurricane experience that if the tree swings with particular violence two springs in series should be used.

Feed and Matching

The antenna is fed through RG-11/U 75-ohm coaxial cable with a quarter-wave matching section of RG-8/U 52-ohm coax located at the antenna end. This method of feed was chosen because it presents no weatherproofing problems and eliminates messy coils and matching networks. The length of quarter-wave section was adjusted to give a reasonable v.s.w.r. over the whole band. To do this, it had to be cut to a slightly higher frequency than the antenna itself, the antenna being resonant at approximately 7050 kc.

The antenna resonant frequency is quite broad when measured with a grid-dip oscillator. For

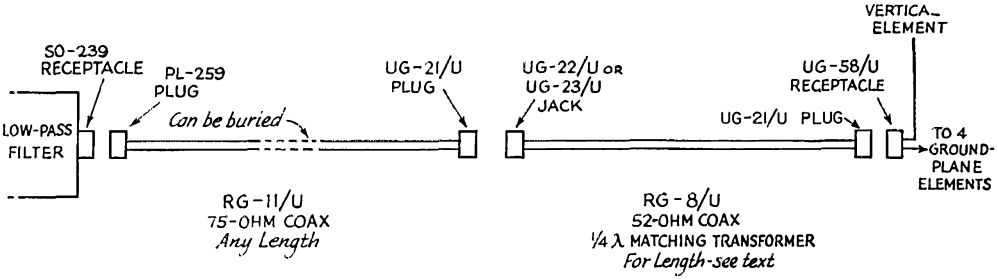
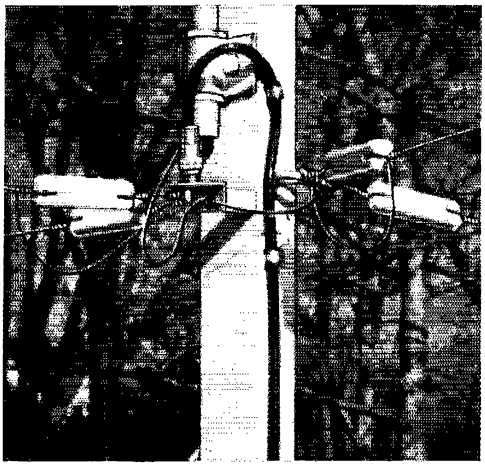


Fig. 1 — Cable arrangement for feeding the 40-meter ground-plane antenna. The construction of the antenna itself is described in the text.

* 70 Woodside Ave., Northport, N. Y.



The four radials are anchored to the post at the bottom of the vertical tubing. This photograph also shows the method of terminating the coax line that serves as a quarter-wave matching section.

the vertical element and radial lengths given above, the matching-section length ended up at 22 feet 11 inches (per formula this should be resonant at 7100 kc.; however, this was not actually measured). Table I shows v.s.w.r. measurements with and without the matching section. The measurements were made with a standard 75-ohm Micromatch.

Fig. 1 shows the various connectors used along the line. Waterproof JAN types are used at all outdoor positions. Sometimes the SO-239 and PL-259 u.h.f. types will act up outdoors in wet weather with a kilowatt. Actually, the UG-21 type is much easier to assemble to cable than the PL-259 type.

General

Electrically, the antenna loads a kilowatt final with a three-turn shielded link, and also works well with a Collins 32V-3. In respect to TVI, no trouble is encountered with neighbors with this mess of tubing when using an unshielded kilowatt final. Interference does exist on the writer's TV receiver, on Channel 2 only, even with the 32V-3 and a good low-pass filter, but is believed due to local ground currents with the unbalanced feed of the ground-plane antenna.

TABLE I

Voltage Standing-Wave Ratio Measurements

Frequency in Kilocycles	*75-Ohm Coax Direct*	*With Quarter-Wave 52-Ohm Matching Transformer*
7000	3.6	1.6
7015	3.6	1.45
7050	Not taken	1.3
7100	3.3	1.1
7150	3.0	1.03
7200	2.9	1.13
7250	2.8	1.35
7300	2.6	1.6

Performance has been compared with that of a horizontal antenna of two half waves in phase. The ground-plane antenna is slightly inferior to the horizontal type in the latter's two favored directions. In other directions and for long-haul work this ground plane is superior and seems to play as it should. It has been noticed in working VKs in the morning that the ground plane offers noticeable attenuation to midwestern U. S. stations on receiving. It is excellent for working mobiles, and also better for daytime short-hop work than the horizontal antenna.

In spite of the writer's elevated location and the dire predictions of several members of the mechanical engineering profession, the darned thing withstood 1954 hurricanes Carol, Edna and Hazel even though the vertical element was at times bent into an approximate 90-degree arc.

Strays

While operating W1AW, Chuck Bender, W1WPR, formerly W3ODU of Pittsburgh, Pa., worked W3ZSP of the same city. During the course of the QSO it was found that they both had lived in the same section of town, had gone to the same high school and had been in the same graduating class — but — they never heard of each other!

—•••—

The CAA has immediate employment opportunities for electronics maintenance technicians to work at points throughout Alaska. Generally, new employees are started as GS-7s ($4205 per annum), plus a twenty-five per cent cost-of-living differential. Selected applicants are given a 12 weeks' course of instruction at the CAA Aeronautical Center in Oklahoma City. While training, employees receive a subsistence allowance. Interested persons should complete Standard Form 57, which may be obtained from any first- or second-class post office, and forward it to the CAA Aeronautical Center, P.O. Box 1082, Oklahoma City, Okla.

—•••—

Hams who like to draw inside straights, or who try for jackpots, might be encouraged by this incident. There are some 40,000 auto tags issued annually in Hamilton Co., Tenn. It's impossible to reserve a number as they are issued on a first come, first served basis. W4PL paid ten bucks at the registration window and out came tag 7373 — a 40,000 to 1 shot!

—•••—

Dr. William A. Koontz of Gas City, Indiana, was recently licensed as WN9*POX!*

Happenings of the Month

NOVICE FILING

In response to League petition, the Federal Communications Commission has proposed the expansion of the 7-Mc. Novice segment so that it would become 7150–7200 kc. In April, ARRL filed comment urging the speedy adoption of the proposal, as follows:

FEDERAL COMMUNICATIONS COMMISSION
Washington, D. C.

In the Matter of
Amendment of Part 12 of the Commission's Rules Concerning Novice Class Operating Privileges } Docket 11263

COMMENTS OF THE
AMERICAN RADIO RELAY LEAGUE, INC.

Pursuant to Paragraph 6 of the Notice of Proposed Rule Making in Docket 11263, the American Radio Relay League files these comments. The League endorses the adoption of the proposed amendment to permit Novice operation, employing A-1 emission in the band segment 7150–7200 kilocycles.

1. The present rule-making grew out of a request filed with the Commission on August 3, 1954, pursuant to a decision of the Board of Directors of the American Radio Relay League, Inc., arrived at at its meeting in May, 1954. As the Commission is aware, the ARRL Board of Directors is composed of sixteen amateurs nominated and elected by more than 45,000 licensed amateurs to represent them in the formulation of League policy.

2. On April 18, 1952, the Commission released a Notice of Proposed Rule Making, Docket 10073, which among other things proposed to make the segment 7175–7200 kilocycles newly available for radiotelegraph operation by Novice Class licensees under the usual equipment and power restrictions. On July 1, 1952, the League filed comment in this matter in considerable detail, endorsing the proposal but requesting that a larger segment, 7150–7200 kilocycles, be made available to Novices. On December 29, 1952, the Commission released its order in Docket 10073, saying with respect to the above matter:

> ". . . consideration of providing a larger segment for Novice operation in the 7 mc amateur frequency band than that proposed preferably should be deferred until such time as experience with Novice operation in the space proposed has indicated the necessity for additional space . . ."

The Commission made final its original proposal for a 7175–7200 kilocycle segment for Novices effective February 20, 1953.

* * *

3. In its earlier comment, the League said:

> "It is, of course, fundamental that adequate privileges must be made available to accommodate the newcomers to amateur radio in the Novice Class. Yet, if the purpose for which the Novice license was created is to be served, 'adequate' privileges must not be so great as to cause such licensees to lose incentive for graduating to a higher and permanent grade of license. It is the League's belief that present low-frequency Novice privileges are not adequate by the above standards."

With more than two years of experience with Novice activity in the abbreviated segment of 7 Mc., the League believes the above comment to be still applicable. The low-frequency Novice bands are crowded, more than comfortably so. The rate of influx of newcomers to amateur radio via the Novice route continues high. The 7-Mc. amateur band has traditionally been a popular one, and accordingly occupancy by Novices in this band has been great. The space available to Novices is simply not sufficient to permit useful training in order to meet the objectives of the Novice license.

4. Aside from mutual interference between Novice amateur stations in the 7175–7200 kc. segment, another major difficulty is disruption of communication by strong signals of high-frequency broadcast stations, mostly in Europe. As the Commission knows, in Europe the frequencies 7100–7300 kc. are available for broadcasting, and indeed considerable such use is made. With high powers, and especially under present propagation conditions, these stations put signals of extreme magnitude throughout the U. S. A. in afternoon and evening hours. It becomes necessary for Novice amateur stations using the 7175–7200 kc. segment to attempt to locate a usable channel in between broadcast carriers. When one considers that only two broadcast stations can thoroughly occupy most of a 25-kc. subband, the present difficulties of the Novice licensee become obvious. Expanding the frequency range available to Novices will permit them more freedom in finding "holes" in the European broadcast band through which to conduct their amateur communication training. The increased spectrum space will alleviate the present congestion to a degree and permit greater training benefits to the Novice class licensees.

The League, therefore, urges the early adoption of the proposed amendment.

AMERICAN RADIO RELAY LEAGUE, INC.
By PAUL M. SEGAL
Its General Counsel

A. L. BUDLONG
General Manager
April 15, 1955.

MINOR RULES CHANGES

FCC has amended the amateur rules to provide that the holding of a commercial radiotelegraph third-class operator permit will, inasmuch as the required code speed is 16 w.p.m.,

(Continued on page 136)

♦

This neat layout is K2CWX at the Albany, N. Y. VA hospital. In street clothes are volunteer instructors KN2JQZ and W2EOM. With them are patients KN2JCM and K2ABX. The VA has shown an interest in encouraging amateur activity in its hospitals; one of its publications currently contains an article, prepared with the coöperation of ARRL, explaining the use of amateur radio in recreational programs. Amateur clubs near VA hospitals should be able to assist by helping to set up stations and by conducting classes in code and theory for patients.

QST for

Guys for Guys Who Have To Guy

Calculating Load of Rotary Beam Supports

BY LEWIS H. ABRAHAM,* W6FHR

• **This article tells how to calculate the wind load on a mast or tower supporting a beam antenna, and the amount of guying required to make the installation safe. In his spare time from ham radio, W6FHR is a structural engineer for one of the major aircraft companies.**

EACH YEAR, as the competition for available amateur space has become keener and keener, antennas have grown steadily higher and higher. Time was when a wire a few feet above ground would cut a healthy swath across the bands. The average ham was usually satisfied with a wire between a 2×4 on the roof and the old oak tree in the yard. If the thing came down, you were off the air for only a few days, and nothing more. Then some enterprising fellow found he could do better if he raised his wire, and the race for height was on. Today, some installations rival the Tower of Babel.

For sticks of 20 or 30 feet, almost any sort of guying usually will be sufficient. But as we start reaching for heights of 50 feet and upward, with beam arrays, the problem becomes magnified, involving the element of danger to life and property. After listening on the air to some descriptions, one can only take comfort in the old adage, "The Lord protects fools and drunks," which, it appears, should also include hams.

Beam Load

In designing a system of guys, the total wind load on the antenna and tower for some safe value of wind pressure must be determined. Contrary to general opinion, the weight placed on the top of the tower is relatively unimportant compared to the wind load. The top load will usually take care of itself when the wind load is compensated. In fact, the vertical components of the tension load of the guys themselves will, in all probability, exceed the top weight of the average amateur installation.

In calculating the wind load for which the guy system should be designed, the requirements of the local building codes should be observed. While the figure will vary from community to community, a general allowance of a unit wind load of 30 lbs. per square foot of exposed area will meet most regulations. For round cross sections, such as beam elements or round poles, two thirds of this value, or 20 lbs. per square foot is permissible.[1] In hurricane belts or localities where abnormal winds or icing can be expected, your local building department should be consulted for recommendations.

The total wind load will be

$$L = PA,$$

where P is the unit load in pounds per square foot, and A is the total *projected* area in square feet.[1] The projected area of members of round cross section section is the length times the diameter; for rectangular cross sections, it is the length times the diagonal of the cross section.[2]

Let us take a typical 20-meter beam, such as sketched in Fig. 1, as an example. The projected area of the elements is calculated first. Since the elements are made up of sections of different dimensions, the areas of each section must be calculated separately, and then added. The area of the three 12-foot center sections is

$$(12)\left(\frac{1\frac{5}{8}}{12}\right)(3) = 4.9 \text{ sq. ft.}$$

The projected area of the outer sections of the elements is

$$(34.8 - 12)\left(\frac{1\frac{1}{2}}{12}\right) = 2.8 \text{ (reflector)}$$

$$(33 - 12)\left(\frac{1\frac{1}{2}}{12}\right) = 2.6 \text{ (driven element)}$$

$$(31.4 - 12)\left(\frac{1\frac{1}{2}}{12}\right) = 2.4 \text{ (director)}$$

$$7.8 \text{ sq. ft. total.}$$

The total projected area of the elements is

$$4.9 + 7.9 = 12.8 \text{ sq. ft.}$$

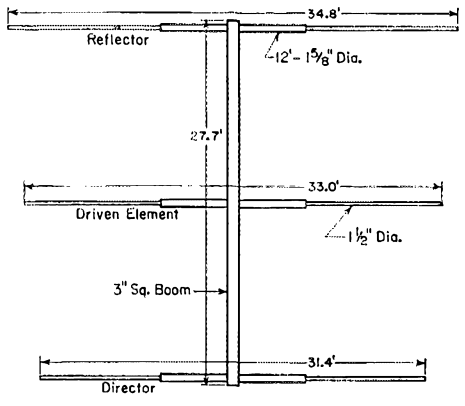
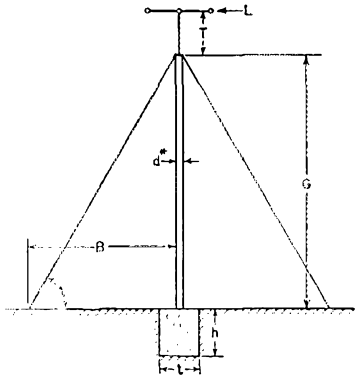


Fig. 1 — Typical 20-meter parasitic beam whose dimensions are used in a sample calculation.

* 11339 Gladwin St., West Los Angeles, Calif.

[1] Wind load on a flat surface is about 50 per cent greater than on an equivalent surface of a member of round cross section.

[2] Although the wind load on a member of square cross section with a corner pointing into the wind is less than on an equivalent flat surface, this fact is neglected in most building codes, and the projected area is treated as though it were flat.



Round Section

$$\text{Guy Load} = KM\left[20\left(\frac{Gd}{2}\right)+L\left(1+\frac{T}{G}\right)\right]$$

$$S = 10Gd - \frac{LT}{G}$$

Square Section

$$\text{Guy Load} = KM\left[30\left(\frac{Gd}{2}\right)+L\left(1+\frac{T}{G}\right)\right]$$

$$S = 15Gd - \frac{LT}{G}$$

Fig. 2 — Diagram and formulas for a system using a single set of guys. *See text for calculating d for lattice masts. All dimensions should be in feet. Dimension T should be held to a minimum.

Using a unit wind load of 20 lbs. per sq. ft. (because the elements are round), the wind load on the elements is

$$(20)\ (12.8) = 256 \text{ lbs.}$$

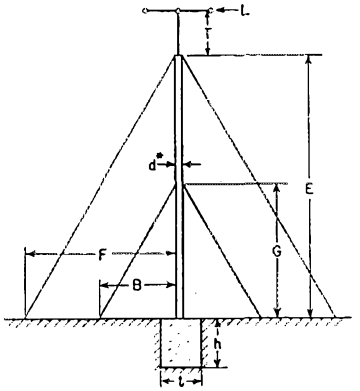
The boom in this example is square, so we must use the diagonal of the cross section in computing the area, and a pressure of 30 lbs. per sq. ft. in calculating the load. The diagonal of a 3-inch square is 4.25 inches, so the projected area is

$$A = \left(\frac{4.25}{12}\right)(27.7) = 9.8 \text{ sq. ft.,}$$

and the boom load is

$$(9.8)\ (30) = 294 \text{ lbs.}$$

Thus the critical load is on the boom, and it is this load that is used for the load L in Figs. 2 and 3.[3]



Round Section,
Upper Set

$$\text{Guy Load} = KM\left[20d\left(\frac{E-G}{2}\right)+L\left(1+\frac{T}{E-G}\right)\right]$$

Lower Set,

$$\text{Guy Load} = KM\left[20\left(\frac{Ed}{2}\right)-\left(\frac{LT}{E-G}\right)\right]$$

$$S = 15Gd$$

Square Section,
Upper Set

$$\text{Guy Load} = KM\left[30d\left(\frac{E-G}{2}\right)+\left(1+\frac{T}{E-G}\right)\right]$$

Lower Set

$$\text{Guy Load} = KM\left[30\left(\frac{Ed}{2}\right)-\left(\frac{LT}{E-G}\right)\right]$$

$$S = 20Gd$$

Fig. 3 — Diagram and formulas for a system using a double set of guys. *See text for calculating d for lattice masts. All dimensions should be in feet.

[3] Under certain circumstances, the total wind load on elements and boom, with winds at angles other than a right angle might be somewhat greater than either of the two calculated loads. However, this design is sufficiently conservative to permit the simplification.

Tower Load

Having obtained the antenna wind load, the load of the tower should now be calculated. The dimension d in Figs. 2 and 3 is the diameter of a pole of round cross section, or the diagonal of a mast of square cross section.

If the tower is of latticed construction, the resulting load will be conservative if the surfaces are considered to be solid. Alternatively, if the actual area is used, it should be increased by 50 per cent. If the latter is used, an effective d must be determined. This is the diagonal cross section of a solid mast having the same total surface area. If, for example, the construction is that shown in Fig. 4, the total area for each bay is

$$(10)\ (12) = 120 \text{ sq. in.}$$

The actual area is the total area minus areas

(*Continued on page 142*)

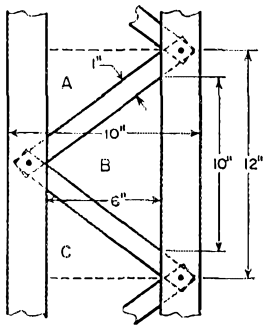


Fig. 4 — Typical section of lattice mast discussed in the text.

TABLE I

Angle A	*B/G or F'/E*	*K*
59°	0.6	1.94
51°	0.8	1.60
45°	1.0	1.41
40°	1.2	1.30
36°	1.4	1.23

TABLE II

Guys in Set	*M*
3	1.150
4	1.000
5	.649
6	.578
7	.457
8	.415

Hints and Kinks For the Experimenter

POWER-CONTROL KINK FOR MOBILE OPERATION

In mobile installations using a dynamotor plate supply, the *carry-over* voltage that lasts for a short interval after the dynamotor primary power has been turned off will frequently prevent real rapid break-in operation. This can easily be prevented in installations that employ a d.p.d.t. relay for antenna and plate-supply control by wiring the relay circuit as shown in Fig. 1. In this arrangement, R_1 (approximately 100 ohms) is

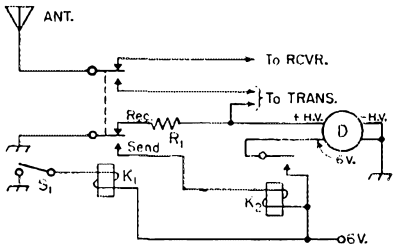


Fig. 1 — A transmit-receive hook-up that prevents holdover of the dynamotor output voltage. K_1 and K^2 are the antenna changeover and dynamotor starting relays, respectively. R_1 is the dynamotor grounding resistor (see text) and S_1 is the push-to-talk switch.

connected between the output terminal of the dynamotor and ground whenever the relay is tripped to the *receive* position. This action bleeds the supply output to ground almost immediately.

— *Fred Nazar, WSRNA*

CONVERTING THE "SIAMESE PADDLE" FOR BUG-TYPE OPERATION

The simple and inexpensive keying mechanism, "The Siamese Paddle," described in *QST* for July, 1952, and again in *Hints and Kinks*, Volume Five, can be converted to a first-class bug with a minimum of additional cost and effort. The simple modification which provides for bug-type operation of the key is shown herewith as Fig. 2.

The vibrating arm for the bug is made from a hack-saw blade or a length of spring steel. A hole drilled in the front end of the arm allows it to be attached to the *dot* lever of the Siamese Paddle by means of the original spacing adjustment screw. A homemade spring contact is soldered to the vibrating arm as shown in the drawing. In a fancier version of the bug, this contact could be made adjustable along the arm. The stationary contact and the contact adjustment for the dot arm may be made from a binding post and a 6-32 machine screw.

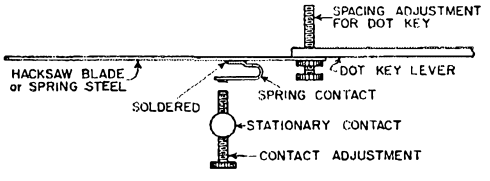


Fig. 2 — A simple system for converting the "Siamese Paddle" to a bug.

The vibrating arm for the key must be weighted down to slow the dot rate down to a reasonable speed. This may be accomplished by wrapping wire-type solder around the arm. An ordinary clothespin will serve the same purpose for some speeds of operation.

Because the two levers of the bug are not mechanically linked, it is possible to strike a dash character before a dot action has been overcome. However, this tendency can easily be avoided after a little practice.

— *Jack Gjovaag, W7UKI*

CONSTRUCTION HINT

The mounting and the wiring of small components can be simplified and made extremely appealing in appearance by employing the hint shown in Fig. 3. The length of No. 16 tinned wire which runs between center posts of each pair of

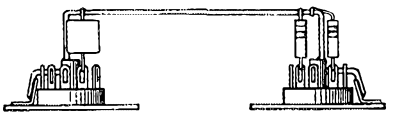


Fig. 3 — The wire bridge between sockets as suggested by W1HXQ.

miniature sockets can be used for both support and connection at the ground ends of resistors, capacitors, etc. Filament and other power wiring follows the chassis as usual. Remember to ground the center post of each socket to the nearest convenient point.

— *Ralph J. Kempton, W1HXQ*

NOVEL VENTILATING SYSTEM FOR MOBILE UNITS

Adequate cooling for some of those compact under-the-dash units can be provided for — without blower — simply by running wiper hose to the wiper line or to the manifold. Frequently, enough air will be drawn in through crevices around the cover, shaft openings, etc., of a unit to make unnecessary the drilling or punching of any special ventilation holes or louvers.

— *Harry E. Adams, W9JX*

A 5-Over-5 for 50 Mc.

A Stacked Array of Unusual Design

BY WILLIAM A. TYNAN,* W3KMV

WHILE a great deal of good work can be and is being done on 50 Mc. with fairly modest antennas, the full capabilities of the band are not being realized by amateurs using single Yagi antennas of four elements or less. Much of the excellent coverage on 144 Mc. and above is the result of the very elaborate arrays in use. One may argue that it is easier to construct multi-element beams for the higher bands than it is for six meters. This is true if you are referring to a particular number of elements, but it is not true when referring to physical size. If anything, an antenna of a fixed

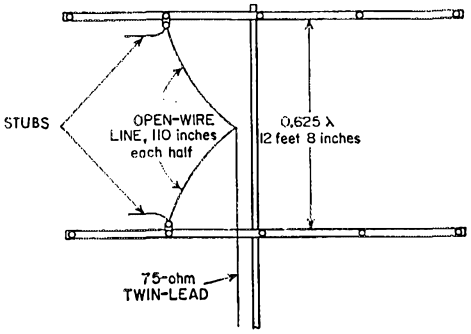


Fig. 1 — Stacking and feed details of the W3KMV array. Closed-end extensions of the phasing lines tune out the reactance of the "T" section on each driven element; see Fig. 2.

physical size is simpler for 6 than for the higher bands. The large 50-Mc. array has fewer elements and is, therefore, easier to feed.

Why all the emphasis on physical size, one might ask? Isn't the important thing the power gain and isn't that dependent on the number of elements? The answer is "Yes," but there is an additional factor which must be considered: the performance of the antenna on receiving.[1] An antenna with a certain gain on transmitting will give the same gain on receiving. This gain figure, however, is in reference to a dipole cut for the frequency in question, and it can be demonstrated that the efficiency of a dipole as a receiving antenna is inversely proportional to frequency. Dipoles for the higher frequencies are smaller and therefore intercept less wave front and consequently deliver less voltage to the antenna terminals of the receiver.

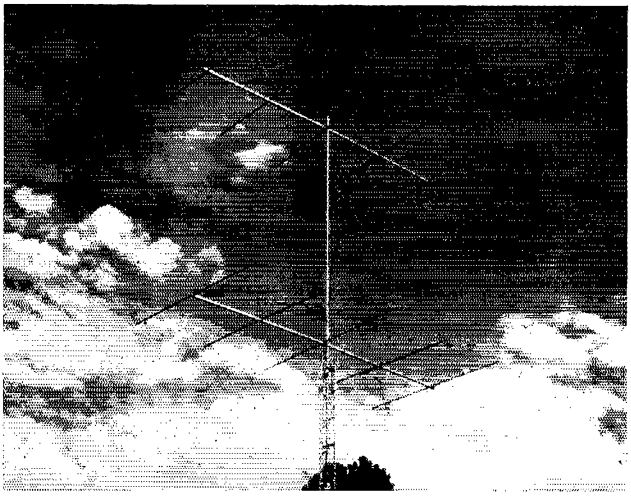
Since the gain of a certain type of antenna is expressed in terms of a dipole for the same frequency, it can be seen that the same inverse frequency relationship holds for any particular configuration of elements, not just for dipoles. Thus, if one uses a 4-element array on ten meters, it would be logical to use an 8- or 10-element array on six meters and a 16- or 32-element array on two meters in order to maintain the same general performance on receiving. It is admitted that these are not necessarily comparable antennas, but this illustration is used only as an example.

From the foregoing, it can be seen that a large antenna on any band is advantageous. Six meters, especially, has suffered from the general use of small antennas. On 28 Mc. and below, antennas have to be rather large in order to resonate. On 144 Mc., the more serious workers have gone to quite large arrays with notable results. It is the writer's opinion that the same procedure on six meters will yield results which would surprise many amateurs. It should be possible for stations using high power and large antennas, such as the one to be described, to communicate on 50 Mc. over distances of 800 to 1000 miles on a regular year-round schedule basis. This might have to depend on c.w. most of the time, but it would be communication nevertheless. The basis for this statement is the work being done on 49.8 Mc. by the National Bureau of Standards on a 775-mile path between Cedar Rapids, Iowa, and Sterling, Virginia. While this work is being conducted with a transmitter output power of about 25 kw. and transmitting and receiving rhombics with gains of 18 db. over a dipole, signals of 10 to 20 db. over one microvolt are common. Amateurs can copy much less than this with low-noise narrow-band receivers; probably enough less to make up for the approximately 30-db difference in power and antenna gains involved.

An antenna for 50 Mc. should have good power gain, and fairly large size, but should not be too complicated electrically or ponderous mechanically. Such an antenna is the one to be described. It consists of two 5-element Yagis vertically stacked with a spacing of ⅝ wavelength between bays. Each Yagi uses 0.2 wavelength spacing between elements. Using this spacing as a starting point the element lengths on a single 5-element array were adjusted for maximum forward gain over a half-wave dipole without regard to front-to-back ratio. Each time element lengths were adjusted, the v.s.w.r. of the transmission line was checked and if necessary, matching adjustments were made. Dimensions worked out as follows: reflector — 115 inches; driven element — 108 inches; first director — 107 inches;

* 9417 Jones Mill Road, Chevy Chase, Md.

[1] Beers, "The Wavelength Factor," *QST*, February and May, 1952.



The 10-element stacked 50-Mc. array at W3KMV, Chevy Chase, Md.

forward directors — 105 inches each; element spacing — 47¼ inches.

Details of the stacked array are given in Fig. 1. The phasing line is 1-inch spaced open-wire TV line, 450 ohms impedance, 21 feet 6 inches overall. Each bay is fed through a "T"-Match, made as shown in Fig. 2. The T sections are connected to the phasing line at points about 110 inches

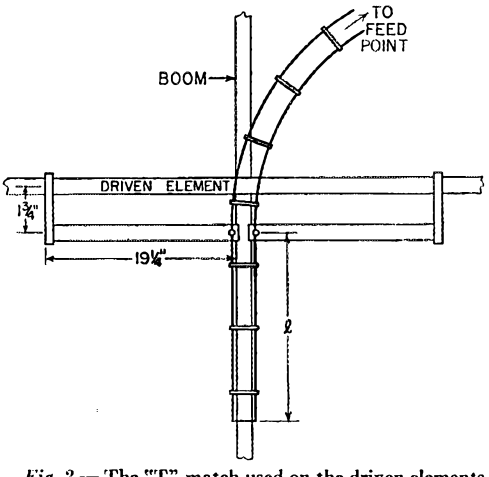


Fig. 2 — The "T"-match used on the driven elements in the 50-Mc. stacked array. Length "*L*" is 19 inches for antenna dimensions given.

each side of the center. This point was found to give the lowest s.w.r. experimentally, but instead of presenting a pure resistance the antennas showed a capacitive reactance. This reactance could have been tuned out with inductors, but a superior method, both mechanically and electrically, was to continue the line beyond the T section, using a shorted line as an inductor.[2] The optimum length was determined experimentally to be about 19 inches. The minimum s.w.r. was found to be 1.35 to 1 at 50.2 Mc. The main feed line is 72-ohm transmitting Twin-Lead.

The mechanical construction of the antenna is quite simple and straightforward. Each array is constructed of ¾-inch aluminum tubing for the elements and 1¼-inch steel tubing for the booms. The elements are fastened to the booms by "U" clamps which are available at any TV wholesaler. Two ¼-inch holes are drilled in the center of each element to receive the "U" clamps. The steel tubing for the booms is also standard TV hardware, while the aluminum tubing was purchased from a wholesale metal distributing concern. The vertical support is 1-inch water pipe, the outside diameter of which is approximately 1¼ inches, so it fits standard TV hardware including the rotator. The booms are fastened to the vertical support by the same type "U" clamps that are used to fasten the elements to the booms. Holes are drilled in the vertical water-pipe support to receive the "U" clamps.

The supporting structure is a Channel Master tower of triangular design, using 1-inch aluminum tubing for the main vertical members. The tower is well cross-braced and is equipped with a climbing ladder. At W3KMV the antenna uses three sections giving a tower height of thirty feet. The bottom of the tower is fitted into three pipes of slightly larger diameter than the tower members, and bolts are run through holes drilled in these pipes and matching holes in the tower legs to support the vertical load. The three pipes are set about one foot into concrete.

No guys are used in this installation. Instead, the tower is located next to the house and a bracket built of 2 by 4s is fastened to the house with 4-inch lag bolts. The tower is in turn held to this bracket with "U" bolts around two legs of the tower. As a precaution against crushing the tower members, small sheets of aluminum were bent to fit between the "U" bolts and the tower legs. The support is at the 22-foot level or about two feet from the bottom of the top section. This seems to give adequate support as the

(*Continued on page 144*)

[2] *The Radio Amateur's Handbook*, page 317 in 1954 edition; page 308 in the 1955 edition.

Six Meters for the Beginner

Part II† — Receiving Equipment; a Simple Converter

BY EDWARD P. TILTON, WIHDQ

IF YOU'RE breaking into the ham game on 80 and 40 meters, as so many newcomers do, you can take care of the receiver problem in several ways. Possibly you'll build your own, though not many do, these days. You may buy one of the new low-priced jobs, or invest the same amount of money in a used receiver that probably cost considerably more when it was new. Unless you're much better fixed financially than most of us, you'll take one of these alternatives to the purchase of a strictly first-class receiver.

And you'll make out all right, whichever way you choose. There'll be moments when you'll yearn for a mechanical filter, and you may get pretty well fed up with that none-too-good dial, but you'll have fun. You will nearly always be able to work someone, and while he may not be the choice DX you'd like to snag, he's a brother ham, and you'll enjoy talking with him.

Things are a little different on 6, however, and on the higher v.h.f. bands, too. Here the best receiver is none too good, and one that is much less than the best is an abomination. The difference lies in the nature of the bands concerned, and in the way we use them. You have to be able to hear the weak ones on 6; if you can't, you'll miss the basic appeal of operation on the band. A small receiving deficiency can easily cut your operating radius in half, and under those conditions there's just not much fun in it. Take the word of any experienced 6-meter man: Be sure that you have good receiving facilities, right from the start.

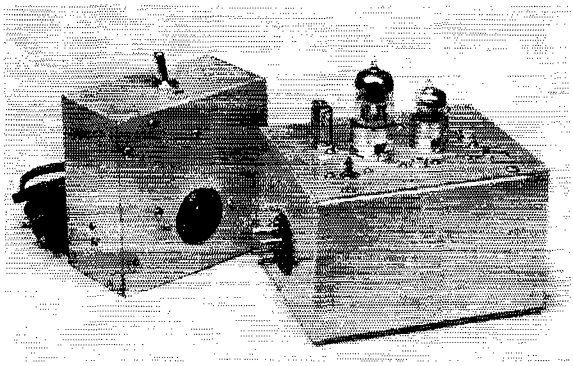
The Manufactured Receiver

"Can I buy a good 6-meter receiver, and if so, who makes it?" This question is asked again and again, but there is no good answer, at least for the fellow who must have coverage from the broadcast band through 50 Mc., in one package, right hot off the production line, ready for use. To be sure, receivers selling all the way from $39.50 to $997.50 have been built with 6-meter coverage, but the sad fact is that not one of them does a completely satisfactory job of receiving on the band. A few, very few, have come close, but every wide-range receiver needs something additional in the way of ham-made gadgets to make it fill the bill on 6.

This is no fault of the receiver manufacturer. To build a receiver that would do a first-class job on 50 Mc., he'd have to put in characteristics that would hamper performance on the pay-off bands lower in frequency. The designer must work to satisfy his largest group of customers, so the high-frequency end of the coverage suffers.

The addition of a low-noise preamplifier will make a satisfactory receiver out of some of the jobs that tune the 50-Mc. band. How then to tell the usable ones from those that are hopeless so far as 6 is concerned? Here are the main considerations: The receiver must have double conversion; otherwise it will suffer from either of two bad failings. It will have a high intermediate frequency, which means inadequate selectivity and poor signal-to-noise ratio. Or, if it has a low (455-kc.) i.f. it will have little or no image rejection, and signals will repeat 910 kc. away from their main tuning point. There is no simple cure for these faults.

Here are some of the double-conversion receivers that tune the 50-Mc. band: SX-73, SX-71, NC-183D, HRO-60 (with extra coil set, optional, at extra cost), SP-600. Any of these, with a low-noise preamp. added, will do a passable job on 6.



The 50-Mc. crystal-controlled converter and its selenium-rectifier power supply. Power may be drawn from the receiver with which the converter is used, if it is convenient to do so.

The Converter Approach

Any decent receiver does quite well on the frequencies below 14 Mc., so the best way to receive 50-Mc. signals is to use a converter ahead of a communications receiver tuned to 14 Mc. or lower. With a 6-meter converter, we can design

† Part I of this article appeared in *QST* for May, 1955.

our tuned circuits and select our tubes for optimum performance at the frequency we're interested in, and this makes a tremendous difference. Fortunately, converter design and construction is a fairly simple matter. You can make a converter for 6 that will work better there than the fanciest communications receiver on the market.

V.h.f. converters fall into two general categories. There is the tunable kind, in which an oscillator is tuned across a frequency band above or below the signal frequency. Output from this oscillator beats with the signal and produces a resultant (or intermediate) frequency, which is then fed into the communications receiver. This i.f. is usually between 7 and 14 Mc., for 50-Mc. converters, though anything down to 2 Mc. can be used. Such a converter must have a good dial, and its oscillator must be highly stable. These factors don't come easily, so the tunable converter is losing favor among v.h.f. men.

The alternative is the use of a crystal-controlled oscillator or multiplier voltage to mix with the signal. The difference frequency (or i.f.) must then be varied across a 4-megacycle range, to cover the 50-Mc. band. This approach introduces some problems, too, but the advantages outweigh the adverse factors. The crystal-controlled converter is rapidly becoming almost standard equipment in v.h.f. work today. Fortunately, it is now possible to build a crystal-controlled job at relatively low cost, and with a minimum amount of complicated adjustment procedure. Here's how:

The "Simplest" Converter

If you've looked over the converter descriptions in the *Handbook* you may be a bit confused about what constitutes a suitable design. If the basic minimum of one tube will do the job, why go to two — or three, or even more? Why i.f. and r.f. amplifiers, if a dual triode working as a combined mixer and oscillator will receive signals? We won't go into these questions at length here, except to say that there are good reasons for the complications you find in the *Handbook*'s chapter on v.h.f. receivers. What we'll consider right now is the minimum that we can build and still do a good job of receiving; a better job than any wide-range communications receiver alone will do on 6.

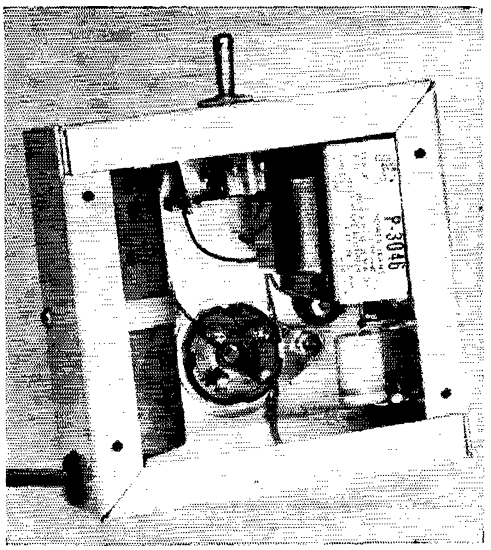
Every converter must have a mixer and an oscillator. These functions are performed in our set-up by a 12AT7 dual triode. Looking at the middle of the schematic diagram, Fig. 1, we see that these portions of the converter could hardly be simpler. The mixer (upper half of the 12AT7) doesn't even have any tuned circuits. A resistor in the plate lead takes the place of the usual plate coil. This makes it necessary to mount the converter close to the receiver antenna connections, but it keeps down the number of parts needed, and simplifies adjustment procedure.

The crystal oscillator makes use of a v.h.f. overtone crystal on 43 Mc. This one was obtained from the International Crystal Mfg. Co., Oklahoma City, and similar crystals are available from most manufacturers. A crystal on the required injection frequency eliminates the necessity for multiplier stages, and makes possible the use of an oscillator circuit of elementary simplicity. The communications receiver is tuned from 7 to 11 Mc. in covering 50 to 54 Mc. with the converter.

• Since the 50-Mc. band was opened to Technician Licensees April 12th, Headquarters mail has contained many letters from newcomers asking about 6-meter gear and antennas. This series of articles for the beginner on 6 was prepared in anticipation of just such requests. Part I (May *QST*) described the nature of the band. This one discusses the 6-meter receiver problem and presents a simple solution. Part III will cover transmitters and antennas, and describe a transmitter especially suited to the beginner's needs.

We could receive signals with only this one tube, but adding an r.f. stage improves the performance in several ways, therefore it is well worth the slight extra complication. Its input and output circuits help to minimize interference from outside the converter's intended tuning range, and the added stage will increase the effective sensitivity many times.

Our r.f. amplifier tube is a 6AK5 pentode. Lower noise, for about the same gain, could be obtained with a cascode-type dual-triode amplifier, but the performance of this pentode stage is satisfactory, and its circuit and parts requirements are considerably simpler than the triode amplifier. Tuning is done by adjusting the slugs in the grid and plate coils; there is no capacitance



Interior of the converter power supply. The transformer is in the upper right corner. Below it is the selenium rectifier. The dual electrolytic filter capacitor is at the left.

across the coils other than that inherent in the tube and associated components and wiring. The slugs may be set so that the converter will work well across the entire band, or its response can be peaked for any part of the band in which the operator may be particularly interested.

It is often possible to draw the small amount of power needed for the converter from the receiver power supply. This is easily done if the receiver has any accessory socket on the rear wall, or inside the cabinet. If there is no such socket on your receiver, you can tie into the receiver directly with little trouble. A plate voltage of about 150, at only a few milliamperes, will do the trick. If you're dubious about digging into the receiver, we have made a little power supply for the converter that can be built in as part of the converter, or made as a separate unit as shown. The latter approach is recommended, as the supply will then be available for other purposes that may arise.

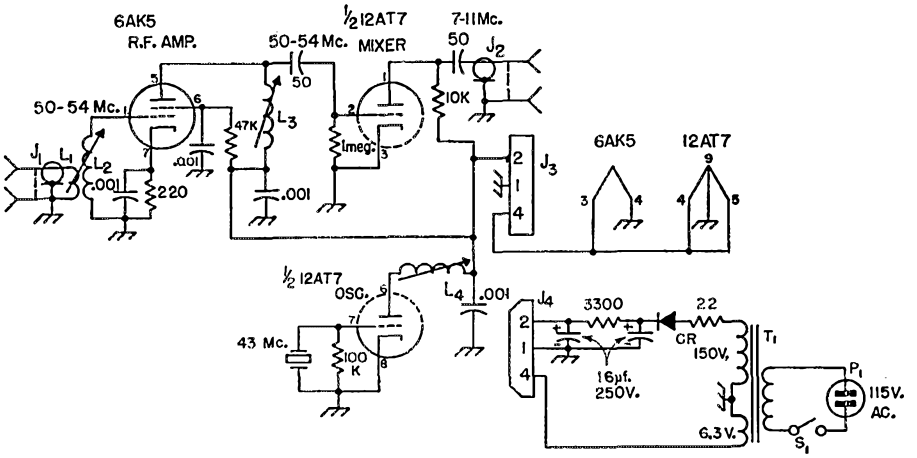


Fig. 1 — Schematic diagram of the 50-Mc. converter and its power supply. All resistors ½ watt. All capacitances less than 0.001 μf. in μμf.

L_1 — 4 turns No. 28 d.s.c., close-wound over ground end of L_2.
L_2 — 12 turns No. 24 enamel, close-wound on ⅜-inch diam. iron slug-tuned form (National XR-91).
L_3 — 8 turns No. 24 enamel, close-wound on XR-91 form.
L_4 — 14 turns No. 24 enamel, close-wound on XR-91 form.
J_1, J_2 — Phono jack.
J_3 — 4-contact male chassis fitting (Amphenol 86RCP4).
J_4 — 4-contact female chassis fitting (Amphenol 78RS4).
P_1 — 115-volt line plug.
SR — 20-ma. selenium rectifier (Federal 1159).
T_1 — Power transformer, 150 volts at 25 ma.; 6.3 volts at 0.5 amp. (Merit P-3046).

Construction

Our converter is assembled on the top cover of a standard aluminum utility box, 3 by 4 by 5 inches in size. The tube sockets and antenna input socket are along the center line of the plate. The antenna socket is one inch in from the edge, the r.f. amplifier socket ⅞ inch farther, and the two tube sockets are 1¼ inches apart. The input circuit slug-tuned coil, the i.f. output connector, J_2, and the oscillator coil, L_4, are mounted along a line one inch in from the long side of the plate, with their centers 1½ inches apart. The r.f. plate coil, L_3, is at the center of the plate lengthwise, and is also one inch in from the edge, on the other side of the tubes. The crystal socket is one inch in from the end, in any position that may make mounting and wiring convenient.

If the converter is to be run from the receiver power, through the accessory socket, the power connector, J_3, may be mounted so as to plug directly into the socket, if space is available. The type and position of the connector will then be determined by the receiver socket. If it is more convenient, the converter may be connected to the accessory socket through a detachable cable.

Fittings of the phonograph connector type are used for the antenna and i.f. output connections. The more expensive and more satisfactory conventional coaxial connectors may be substituted. The antenna input may be a crystal socket, if the antenna system to be used is fed with Twin-Lead or open-wire transmission line. If either of these lines is used, the low side of the antenna pick-up coil, L_1, should be left ungrounded.

With the physical arrangement shown, it may be necessary to file out small notches in the bent-over portion of the case, to make room for parts that are mounted near the edges of the top plate. Leads to the power fitting, J_3, should be made long enough to permit removal of the converter from the case without disconnecting the leads. This will simplify making changes in the main wiring, if this should become necessary.

Neatness and short leads are made possible through the use of two single-lug tie-point strips. One, mounted under the nut that holds the 6AK5 socket in place, supports the junction between the low side of L_3, the 47,000-ohm screen resistor, and the by-pass capacitor. The other, on the opposite side of the 12AT7 socket, supports

the junction of L_4, its by-pass capacitor and the plate load resistor of the mixer.

Power Supply

Use of the receiver power is recommended. No specific connections can be given, as the accessory sockets on the various receivers have no standard terminal arrangement. Check your instruction book or schematic diagram. If the socket is on the rear wall of the receiver, the connector of the converter may be so placed as to plug directly into it. Operation from a regulated source is fine, if the regulated supply in your receiver is brought out to the accessory socket, and if it will stand the extra current. Apply the voltage to the converter and see if the regulator tube continues to glow. If the tube goes out it is loaded too heavily, and you'll have to take the converter voltage from the unregulated terminal.

The small selenium-rectifier power supply shown in the photograph, and in Fig. 1, is adequate for the job, if you want a power supply that is independent of the receiver. It is built in a $2 \times 4 \times 4$-inch aluminum utility box. Parts may be arranged to suit one's own convenience. The power output fitting, J_4, is positioned so that connection can be made to the converter with the unit resting on one of the 2-inch sides. The on-off switch is on the top surface. The a.c. cord is brought out through a rubber grommet in a hole in the main part of the case, near the bottom.

Adjustment & Use

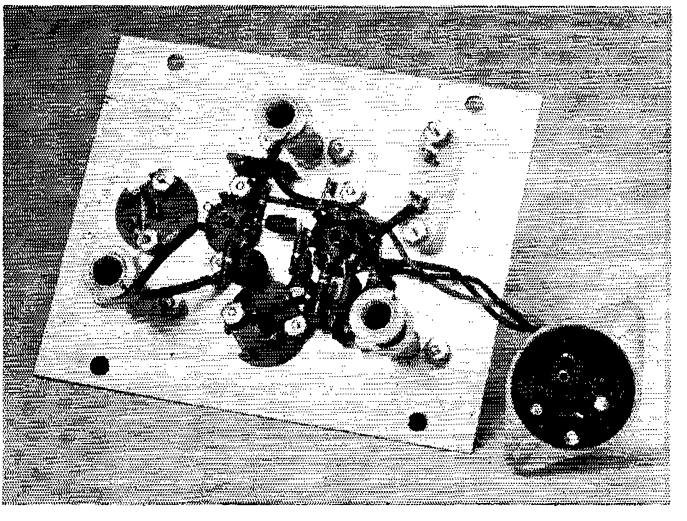
The first step in firing up the converter is to check the operation of the oscillator. This is simplified if plate voltage is applied to that section only. Connect a plate milliammeter (0 to 10 ma. or higher range) to read the oscillator plate current, insert the crystal, and adjust the position of the slug in L_3. There will be a drop in plate current as the coil is tuned to resonance. In the original model the crystal oscillated over the entire tuning range of the plate coil, with the current dropping to 4.5 ma. at resonance.

If the rest of the converter is wired correctly, you should be able to receive signals by connecting an antenna to J_1, and running a short coaxial cable from J_2 to the antenna terminal of the receiver. If your receiver has three terminals on the antenna connection strip, two of these should be connected together to the outer conductor of the coax. The inner conductor goes to the third, which is the terminal intended for the antenna when end feed or single-wire antennas are used.

For the final adjustments you will need signals, a signal generator, or a noise generator, the last being the best of all. If you want fairly uniform reception across the entire band, set the communications receiver at 9 Mc. Peak the slugs in L_2 and L_3 for maximum response at 52 Mc. If response drops off markedly at either end, the slugs may be stagger-tuned slightly to bring up the response as needed. For peaked response over the first megacycle of the band (where most of the activity is currently) set the receiver at 7.5 Mc., and peak for maximum response at 50.5 Mc.

Merely peaking the coils for maximum response will give you somewhat less than optimum signal-to-noise ratio. After they have been peaked in this way, then checking with a noise generator for lowest noise figure will give the best possible reception in terms of signal margin over noise. Adjustment for best signal-to-noise ratio can be made on received signals, but it is somewhat more difficult than the noise generator method. Use a relatively weak signal, and then adjust the slugs in L_2 and L_3 so that the signal shows the greatest rise over the residual noise. This may be at a slightly different setting of the slugs than that which produces the highest S-meter reading or signal volume.

When the converter is working properly there should be a considerable increase in noise when the antenna is connected, even in a location that is remote from man-made noise. This test will show up just about any commercial receiver on the 50-Mc. band, except for a few that were designed especially for v.h.f. use.



All the parts of the 50-Mc. converter are mounted on the utility box cover plate. At the left are the antenna socket and input circuit. Next is the 6AK5 socket, with the i.f. output socket at the lower center, and the r.f. plate coil above. The oscillator coil and crystal socket are at the right side of the 12AT7 socket.

• Recent Equipment —

The Hallicrafters SX-96 Receiver

Although the new SX-96 is a compact receiver (18½ by 8⅞ by 11 inches deep), it can hardly be called a "little" one. Any double-conversion receiver that tunes 0.54 to 34.0 Mc., provides for selectable-sideband reception and has five degrees of selectivity, is not a "little" receiver.

It is an easy matter to visualize the receiver electrically if you look at the block diagram in Fig. 1. The front end, consisting of the 6CB6 r.f. stage, the 6AU6 first mixer (cathode injection) and the 6C4 oscillator, provides for bandset and bandspread tuning through the use of two sets of ganged capacitors. The tuning ranges for the bandset dial, with the bandspread dial set at the minimum capacity end, are 0.538–1.58 Mc., 1.72–4.9 Mc., 4.6–13 Mc., and 12–34 Mc. For the v.h.f. men who use general-coverage tuning of a receiver of this type following a crystal-controlled converter, 7 revolutions of the tuning knob are required to tune 7 to 11 Mc., and 4⅔ revolutions tunes 14 to 18 Mc. On the bandspread dial, the knob revolutions and tuning ranges are: 19 for 3.5 to 4.0 Mc., 9½ for 7.0 to 7.3, 9⅔ for 14.0 to 14.35, 3⅛ for 21.0 to 21.45, and 6½ for 28.0 to 29.7 Mc. The tuning knobs are counterweighted and drive their respective tuning capacitors through gear mechanisms and, on the bandspread tuning, a metal cable.

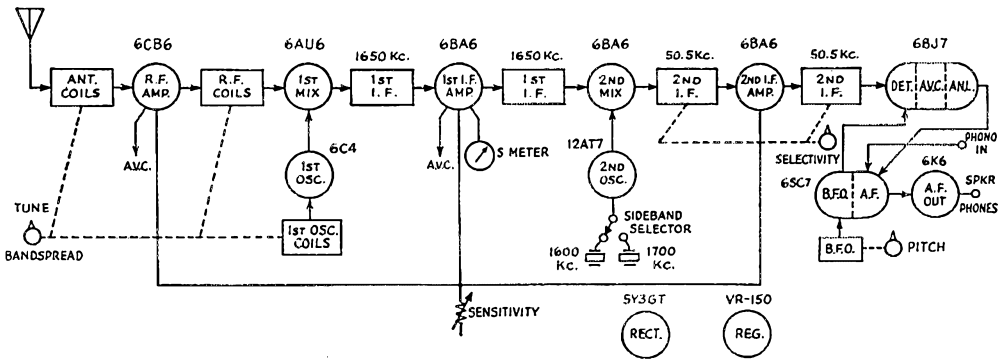
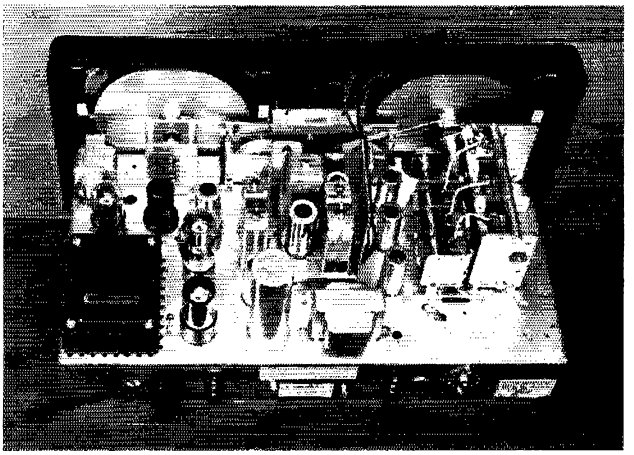


Fig. 1 — Block diagram of the SX-96 receiver.

Following the first mixer, the signal passes to a 1650-kc. i.f. stage and then to a 6BA6 second mixer. Here again, cathode injection is used, but the second oscillator is a 12AT7, of which one section is crystal-controlled at 1600 kc. and the other at 1700 kc. A panel switch



♦

Removing the chassis from the cabinet permits a better look at the SX-96. Here one can see the tuning condensers at the right, with the r.f., mixer and oscillator tubes alongside. The subassembly at the center of the chassis is part of the selective 50-kc. second i.f. amplifier, and the audio and power-supply tubes are at the left. The two large disks against the panel are the gears driven by the band-set and bandspread knobs.

♦

marked "Response" controls the selection of one or the other of these oscillators to give selectable-sideband [1] reception.

The second i.f. amplifier is at 50.5 kc. and uses four high-Q tuned circuits. The selectivity is varied in approximately the same way that it is in the SX-88, by switching in various coupling capacitors and resistors. The ranges are nominally 0.5, 1, 2, 3 and 5 kc. — the manufacturer's curves show the 0.5-kc. position to be 500 cycles wide at 6 db. down and 3800 cycles wide at 60 db. down. In c.w. operation this gives quite good "super-selective c.w." performance and no trace of an audio image on the other side of zero beat. The 3-kc. position is shown as 12-kc. wide at 60 db. down, and the 2-kc. position is 10 kc. wide at that attenuation — these two selectivities are the ones most likely to be used by s.s.b. operators and for a.m. reception under bad QRM conditions. As in the S-76 and SX-88, the bandwidth "grows out" in one direction from the sharpest position mid-frequency, and the operator must understand this condition to explain what will happen to the carrier of an a.m. signal sometimes when switching to a sharper i.f. condition.[2]

A diode detector is used following the 50-kc. i.f. This diode is one of the three diodes in the 6BJ7 tube — the other two diodes are used for a.v.c. and automatic noise-limiter functions. The noise limiter is a modification of the series-type circuit and works on both 'phone and c.w. — its circuit is shown in Fig. 2, along with a simplified diagram of part of the variable selectivity i.f. amplifier.

A 6SC7 dual triode is used for the b.f.o. and first audio stage, and the output tube is a 6K6, providing speaker or headphone output. A "Phone" jack is available at the rear of the receiver for anyone who might want to play a few records through the receiver while waiting for the 10-meter band to open up.

The front-panel controls, other than the band-set and tuning controls already mentioned, are Sensitivity, Volume, and Pitch. The rotary switches include Band Selector, Selectivity (and Phono), Response (upper/lower sideband, treble cut), with toggle switches for AVC, BFO, Noise Limiter and Receive-Standby. The S meter is calibrated in both uv. (across 300-ohm load at receiver terminals, at 14 Mc.) and in S points and db. above S9 (50 uv.).

The receiver is equipped with the usual 3-terminal antenna connection, but the chassis is punched for a coaxial-cable fitting if the owner wants to modify the input connection for coax line. This is desirable if a 6- or 2-meter converter is used ahead of the receiver, as well as in the more obvious case where coaxial line is used throughout the shack and antenna system. A socket at the rear of the receiver permits operating the receiver in an emergency from batteries or a vibrator supply. This socket also provides two leads to the Receive-Standby switch, for remote operation of one's transmitter or other circuit. In the receiver, the Standby position of the switch throws a high bias on the tubes controlled by the Sensitivity control (see Fig. 1). Since this lead is also brought out to the power socket, it becomes an easy matter to provide for silencing of the receiver in voice-controlled break-in operation, without the need for digging into the receiver wiring.

— *B. G.*

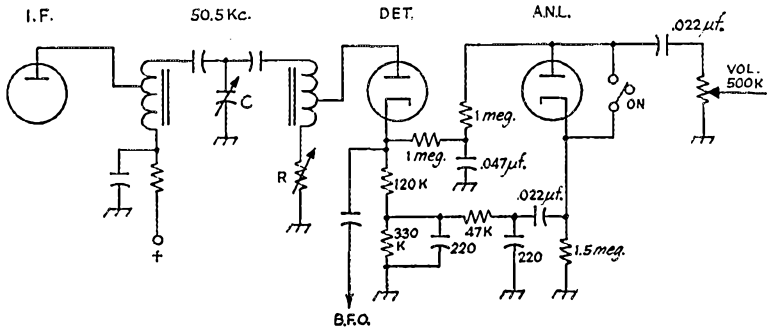


Fig. 2 — Simplified schematic diagram of part of the i.f. amplifier, to show how the selectivity is varied, and the automatic noise-limiter circuit that is used with a.m. and c.w. reception.

In the i.f. tuned circuit, the capacitor C couples the two circuits — lower values of capacitance increase the coupling. The resistance R varies the Q of one tuned circuit. The combination of coupling and Q changes permits the selectivity to be varied over a wide range.

The noise-limiter circuit is a variation of the self-adjusting series-limiter circuit. Its diode conducts as long as the cathode is negative with respect to the anode, and signals can pass. If the cathode is driven positive instantaneously as by a noise peak, the diode is non-conductive during the interval, and that portion of the signal is not passed to the audio amplifier.

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

[2] As explained in "The SX-88 Receiver," *QST*, June, 1954.

Strays

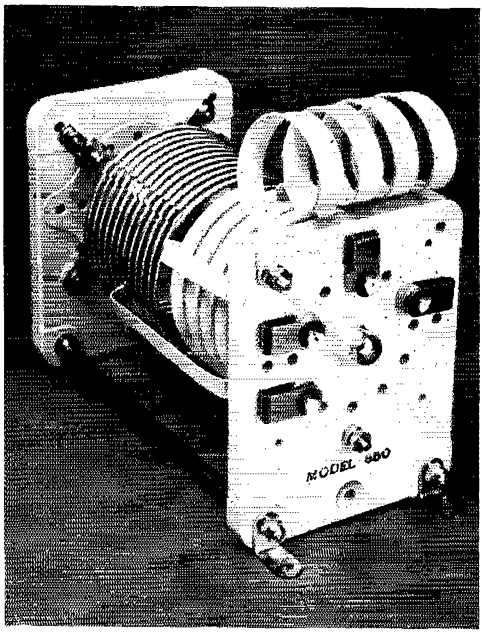
Frank L. Brittin, W9DCX, radio and electronics editor of *Popular Mechanics* magazine for the past 35 years, recently passed away. Licensed since 1915, Mr. Brittin was a real pioneer in amateur radio.

New Apparatus

The B & W Model 850 High-Power Pi-Tank Inductor

THE Barker & Williamson Model 850 is a tapped inductor designed for use in high-power pi-section multiband tank circuits. The taps, one for each of the amateur bands from 80 to 10 meters, are selected by a built-in heavy-duty five-position rotary shorting switch controlled from the front by a ¼-inch shaft.

The inductor is made up in three sections all connected in series. The first section used



alone for 10 meters, is flat-wise wound with ¼-inch silver-plated copper strip. For 15 or 20 meters, the switch adds part or all of a winding of 5/16-inch silver-plated copper tubing. For 40- or 80-meter operation, the switch adds part or all of a third section wound with No. 10 wire and supported on heavy plastic bars. The other two sections are self-supporting. The switch short-circuits all unused portions of the inductor.

The taps are preset (not adjustable) to give inductances that, with appropriate input and output capacitances, will provide a match between tube load resistances of 3000 to 4500 ohms and output loads of 50 to 75 ohms. Over this range, the tank-circuit Q will be between 10 and 15 on the 40- and 80-meter bands. At the higher frequencies the usual tube and stray capacitances limit the minimum tank Q. The tube load resistances correspond to plate-voltage/plate-current ratios of 6 to 9.

The inductances provided are approximately 13.5, 6.5, 1.75, 1 and 0.8 uh., requiring approximately 150, 80, 70, 55 and 50 uuf. (including tube and stray capacitances) respectively, for the 80-, 40-, 20-, 15- and 10-meter bands. The manufacturer recommends a 170-uuf. variable for the input capacitor, and some combination of fixed and variable capacitors that will provide output capacitances up to 1200 uuf. The inductor has a rating of 1 kw., and may be used at plate voltages up to 2500 or 3000.

Except for the 10-meter section, the inductor is mounted between two heavy ceramic end plates 4½ inches wide and 5½ inches high. The 10-meter section is mounted across the rear end plate, at right angles to the other sections. The switch is also mounted on the rear end plate, the control shaft running through the axis of the low-frequency portion of the winding to the front end plate, where a heavy ball-bearing detent is provided. The switch shaft carries wide wiping contactors at both ends and separate terminals at each end. All switch parts are silver plated. The shaft requires a well-insulated coupling.

The over-all length of the unit is 10 inches, and the height, including the 10-meter inductor, is 7¾ inches.

Strays

Here's one for the book. Ken Rasmussen, WN3ZWY, writes that every time he keys his rig, his neighbor's radio-controlled garage door goes up and down. Such a problem could be classified as GDI — garage door interference!

Silent Keys

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

W1CS, William O. Hegvig, Worcester, Mass.
ex-W1IBO, Alfred J. Sette, Stamford, Conn.
W1YWO, Judson L. Chapman, Rockland, Me.
W2CHK, Gilbert E. McDonald, Freeport, L. I., N. Y.
W2FGU, Alvin A. Ferber, Lakewood, N. J.
W2FK, Carl E. Rosen, Rye, N. Y.
W2IZ, Dr. Melville G. Kilborn, West Orange, N. J.
W2MX, Joseph P. Hunter, Maple Shade, N. J.
W2ULT, Frank D. Miller, Buffalo, N. Y.
W2VQY, Felix L. Ghirlando, Williston Park, N. Y.
W3AD, Robert E. Coxey, Lancaster, Pa.
W3UAS, William Caravello, Philadelphia, Pa.
WN4IGU, William P. Elders, Bessemer, Ala.
W5CP, William C. Ellis, Dallas, Texas
W6GHD, George S. Bennett, Orinda, Calif.
W6HH, William H. Craig, Oakland, Calif.
W6LJK, Harlon G. Stoddard, San Francisco, Calif.
W6MWS, Roscoe E. Hoyt, Santa Cruz, Calif.
W6UKN, Warren W. Brooks, San Leandro, Calif.
W8CYN, Arthur M. Shoemaker, Kent, Ohio
W8IOF, William H. Leineke, jr., Flint, Mich.
ex-W8KY, Norman W. Haley, Novato, Calif.
W8RJF, Elroy H. Mace, Cleveland, Ohio
W8VRK, Max C. Kohl, Avon Lake, Ohio
W9DCX, Frank L. Brittin, Chicago, Ill.
W9YVY, James G. Lehmer, Champaign, Ill.
WØIKK, ex-W9YCU, Richard R. Elliott, St. Paul, Minn.
VE2AEE, Omer E. Gautheir, St. Jean, Que.
HI8FG, Dr. Francisco G. Moya, Cuidad Trujillo
LA2SA, Leif Offners, Oslo

The "Wun-Oh-Wun" Code

By O. J. RUSSELL,* G3BHJ

A FEW YEARS ago a number of British amateurs decided to streamline operating procedure in accordance with modern needs. Thus the inevitable preamble "good evening, OM, very pleased to meet you" and its counterparts become condensed into a new signal — "101." By the same streamlining, the long, drawn out "final" is reduced to "102."

Unfortunately, this laudable application of communication procedure (the mostest words in the fewest) has not been accepted to any great extent. This is of course regretful because so many branches of amateur radio still await attention; i.e., working Podunk Hollow with one-watt input, making DXCC on 160 meters in one week, or breaking the 'phone gabfest marathon on 75 meters.

Progress in amateur radio can only come about by neglecting the brick wall of theoretical limitations. Yagi arrays, Schelkeunoff's theorems, Fourier transforms, magnetrons, klystrons, transistors, etc., were all contrived by non-amateur "experts." The true amateur could evolve all this stuff in much less time but for the fact that QSOs are unnecessarily of long duration. It is this crippling deadweight of "airtime" that has been a detriment to advancement. By

"--THIS CRIPPLING DEADWEIGHT OF 'AIRTIME' — A DETRIMENT TO PROGRESS."

the alleviation of this drawback, doors to new developments, inventions, and discoveries will open wide.

Accordingly, the original ideas have been completely modified, streamlined, reorganized, and petrified into a system meeting every and any requirement of amateur communication procedure. The time-wasting drudgery of "radioese" is eliminated by the "Wun-Oh-Wun" code, now proudly offered for the salvation of Hamdom. To ascertain if a station understands the new code, the question "RUA-1?" should be used. Fellow amateurs in the forefront of progress will automatically use this highly effective system in their reply.

Here are the abbreviations and their meanings. No excuse is good enough for not immediately adopting this watt-saving, bug-key-bearing conserving system.

*15 Reepham Rd., Norwich, Norfolk, England

Wun-Oh-Wun Code

101 — Good evening, OM. Thanks for the call. It's a pleasure to work you. Your signal is *pounding* in!

102 — Thanks for the QSO, OM. I enjoyed it very much and can *hardly* wait to work you again.

103 — Okay and 73 to you and yours, OM. Trust your mother-in-law will be in the hospital for some time. So lots of luck and DX. Cheerio!

104 — Sorry, OM, lost most of that because of QRM. Your signal is *really* fine business, especially for a low-power station. Really enjoying this contact, OM. Incidentally, I can find out from your QSL my report, details of your rig, your handle, and QTH. So see you again, — don't bother to come back as I am going to call CQ right away.

105 — Dear OM, your key clicks are easily the best on the band. Thanks a lot for ruining that DX QSO!

106 — Hello stranger! I just love a call from across town to my CQ DX — especially since it just blotted out AC7XX coming back to me. You know, OM, I get a big kick out of reporting on your squelch-tube modulation experiments. Feel free to call me any time. Incidentally, your 'phone is easily the most ghastly I've ever heard!

107 — Okay, OM, bust in now as there is only a low-power lid on the roundtable frequency. Seems like a good time to tell you the really funny one about old Jumbo's latest gag. It's a killer! Pour it on pal — it's all yours!

108 — Yes, OM, perfect copy. It is incredible that you are only running 800 watts and you're only a mile away. The cuckoo clock, barking dog, hollering children, and your grandfather's belching all came through fine business. It's hard to understand how you can't get out with a rig like that.

109 — You have a whale of a signal, OM. I have never worked a station in Jumbololand before, and would certainly appreciate a QSL. I'd like to help you seeing that you are out in the "boondocks." How about an HRO, a case of scotch, or anything you fancy? I'll be overjoyed when I get your QSL. Just pencil your requirements on the back.

For the convenience of those who operate really *rare DX* stations, this special signal is reserved:

000 — Listen you lot of tin-eared lids. This is *my* band. This is *my* party. Anyone calling within 100 kc.

(*Continued on page 160*)

1955 ARRL Field Day Rules

Annual Test for Emergency-Powered Stations, June 25th–26th

ALL set for the 1955 Field Day? Just about every amateur in the ARRL field organization already knows that this annual test of emergency-powered portables packs more enjoyment into one week end than any other event in the operating calendar. On Field Day, clubs and other organized groups function as teams in setting up and operating multi-transmitter stations independently of normal power facilities. But if you aren't able to take part with a group, you can get on with your mobile rig or set up a one- or two-man station afield and enjoy the fun. Hundreds of amateurs will be searching the bands for your signal!

Amateurs with mobile gear are especially urged to test it in the FD. Clubs should get every member-owned mobile unit into *action* and report their aggregate scores to ARRL. Our increased showing by way of individual mobile reports and Club Aggregate Mobile scores is important since such units are considered indispensable in civil defense planning.

The rules and entry classifications are just as usual. Once you're on the air call "CQ FD" on c.w. 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)
× 3 (power below 30 watts)
120
× 3 (*all* radio equipment independent of commercial mains)
360
× 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 SEC or SCM is originated and passed in good form.

65 points (40 QSOs + 25 points for FD message)
× 9 (3 × 3 — power multiplier multiplied by independence-of-mains multiplier)
585
× 1.5 (everything on batteries)
877.5 claimed score

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

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)
× 2 (power input over 30 and under 100 watts)
514
× 3 (all gear independent of mains)
1542 claimed score

(*No battery multiplier for either clubs or groups.*)

1955 Field Day

Starts 4:00 P.M. Local Standard Time,* June 25th
Ends 4:00 P.M. Local Standard Time,* June 26th
* *Not* Daylight Time
(If in Hawaii or Alaska, see Rule 5)

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 23rd to have your results appear in *QST*.

We suggest that you review the December, 1954, *QST* report for hints and kinks relative to the last FD. You may wish to challenge other groups nearby with similar set-ups! Start your preparations now!

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 locations. 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 25th and ends at 4:00 P.M. Local Standard Time (*not* Daylight Time) June 26th. (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 omission of handling data or for defects in form. Copies of all messages originated and relayed must accompany Field Day reports.

Multipliers:

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.

Multipliers 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 23rd. 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 Problem in Higher Mathematics

or "Is Higher Mathematics a Problem?"

BY FRANK H. TOOKER*

The methods of representing mathematical notations in some of our more technically advanced electronics journals can be a little confusing to the Novice, unless he understands certain fundamental principles. For instance, in such notations it is considered neither proper nor rigorous to represent an equation such as $1 + 1 = 2$ in the form:

$$1 + 1 = 2 \qquad (1)$$

Any Ph.D. knows that:

$$1 = \log_{10} 10$$

and that:

$$1 = \frac{Q^m}{Q^n}$$

if: $m = n$

and: $Q \neq 0$

Therefore, Equation (1) may be more clearly expressed in the form:

$$\frac{Q^m}{Q^n} + \log_{10} 10 = N \qquad (2)$$

where $N = 2$

The value of N may be expressed in its expanded form. Thus

since: $\sqrt{R^2} = R$

and: $R^{x+y} = 1$

when: $y = j^2 x$

$j = \sqrt{-1}$

Equation (2) may be rewritten:

$$\frac{Q^m}{Q^n} + \log_{10} 10 = 2\left(\sqrt{R^2}\right)^{x+y} \qquad (3)$$

or:

$$2\left(\sqrt{R^2}\right)^{x+y} - (Q^{m-n} + \log_{10} 10) = 0 \qquad (4)$$

Equation (4) may seem a far cry from Equation (1) but, obviously, Equation (4) is by far the more clearly stated and easily understood notation. Of course, there are numerous other representations for Equation (1), but this brief explanation should give the Novice an inkling of just how it is done.

* P.O. Box T, Lakehurst, N. J.

21st ARRL Sweepstakes Results

Part II — 'Phone and Club Totals

BY PHIL SIMMONS, W1ZDP

While the brasspounders reaped points via their chosen mode, as recounted last month, the 'phone brethren weren't idly twiddling their thumbs. No indeed; they too were roundly jostling the megacycles and running up accumulations of previously unheard-of magnitudes. Altogether, summaries were turned in by 402 voice enthusiasts, 68 of whom will forthwith receive handsome certificates acknowledging their sectional leadership.

Peering momentarily at the tabulation on the facing page, one finds 63 per cent of the triumphant 'phones settling for the low-power multiplier, the others sacrificing it for that extra r.f. "oomph." Average power: 250 watts. As might be suspected, 20–40–75 meters found favor with most; a flat 75 per cent worked these three, or more, bands. But spectral versatility was the keynote as (1) ten and 15 got a big play, (2) three men QSYd to what the Gs call "the top band" and made hay on 160, and (3) two Southern Californians shrewdly tapped the dense v.h.f. population out there, W6AM uncovering almost 200 144-Mc. QSOs. The itemized tube line-ups and transmitter-receiver types, we think, will provide fascinating reading, even for those not contest-minded.

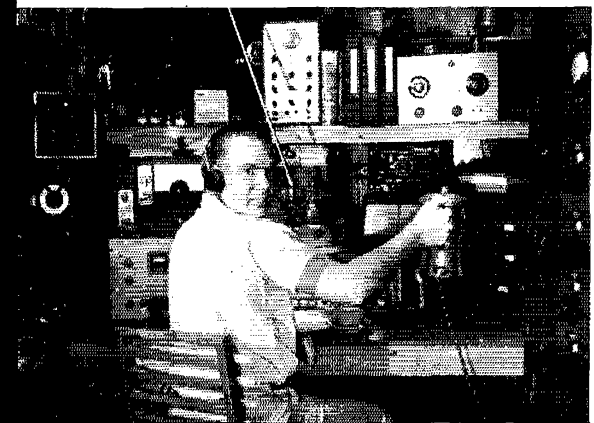
Centrally-located hams vying for DX with coastal stations sometimes find the going slow, but it's a different story in the Sweepstakes! Here ability to work all compass directions often gives mid-U. S. A. residents the nod. Witness that half of the tallies over 50,000 hail from W8, W9 and WØ: W6AM 181,551, W4HQN 141,480, W3JNN 111,362, K2AAA 108,864, WØGDE 94,170, W9WHN [1] 89,460, WØQCX 87,117, W2HJR 86,520, W3VKD 86,140, WØMLY 82,824, WØPRZ 80,519, WØSBE 78,192, W8AJW 76,883, W6CBE 73,982, W6CHV 69,300, WØNPR 66,861, WØQCC 66,030, K4ARU 65,193, W9YWL 64,512, W8DPA [1] 61,008, W1TRE 58,403 WØOMG 58,357, W8MLR 58,328, W9OMM 58,032, W1FZ 57,834, W4SOV 57,216, W9AVJ [1] 56,916, W4YTO 55,296, WØBCF 54,810, W2SKE 54,002, W2SZ [1] 51,832, W5UBN 51,557, W1VYI 50,337. Mirror of the rising activity: 32 scores over fifty grand this time to 17 in 1953.

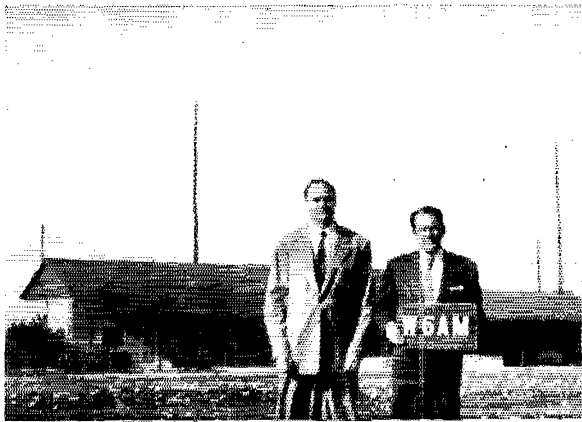
[1] Multioperator station.

Six heard all 73 sections come back. They were W3JNN, W3VKD, W6AM, WØEHF, WØGDE and WØPRZ. Three others, W4HQN, WØSBE and K2AAA, made a grand stab but missed one somewhere along the line. So near and yet so far!

There are other inducements besides the section and Novice awards and the desire to make the "clean sweep." ARRL passes out a lovely silver-banded gavel to the club whose members turn in the highest aggregate score, and certificates to the modal leaders in each club meeting the three entries minimum. The 76 qualifying outfits and the calls of their winners appear in the club box. Forty-nine entries, including 16 over 100,000 points, brought the Potomac Valley victory string to five consecutive SS gavels. Frankford, Ohio Valley and El-Ray broke one million points and likewise rate a doffing of our chapeaux. First participation by the Northern Alberta, Central Utah and Ventura County groups effectively boosted everybody's section multiplier. Now, how about you clubs in Idaho, Hawaii, VE5 and VE8 organizing for 1955!

Meet the fellows who caused two new scoring records to slip into SS archives. On the left, we have c.w. king Don Chesser, W4KVX, Ohio Valley club and Kentucky section winner. Don has traveled quite a piece down SS road since he rolled up 58 QSOs with a TNT rig in 1934. His astounding scoring feat precisely two decades later, a scorching 209,353 points by virtue of 1147 exchanges in 73 sections, offers a rugged target for future challengers. In addition to the coffee pot, Don swears by such operating accouterments as a time stamp, a QSO numbering machine, and a card index system for avoiding duplicates . . . . . On the right, Dawkins Espy, W6FRW (holding sign), and Don Wallace, W6AM, pose at latter's "dream" location. Dawkins whirled the W6AM set-up around five bands and put the Sixes back in the limelight in the 'phone competition with 835 contacts in all sections, 181,551 points. Twelve rhombics and two curtains, most of reversible directivity, enabled him to sew up the Los Angeles certificate and a new single-operator high in the tonsil tussel.





Sidelights

W6QEU's most-QSOs-on-'phone title of 1950 still holds. W6FRW, the talker at W6AM, didn't upset the apple cart but he jiggled it a little. . . . Scribe W2QMO and Wizard W2RDK of the newly-affiliated Order of Boiled Owls, Levittown, N. Y., are delighted with the club's initial contest showing. Though two members are recently-graduated Novices, their seven c.w. entries averaged 75,000 per man. . . . All certificates for SS winnership are scheduled for mailing June 15th. . . W5SQI, who earned 'phone plaudits for New Mexico and Louisiana in the last two SSes, prefers that damp Louisiana ground, has a 33-foot vertical perched on a Coca Cola bottle there. Paul's secretary blistered a finger typing up his log and is glad he did no better. . . . Mississippi voice pace-setter W5WZY recalls that XYL W5WZZ took 1953 section honors. In another switcheroo, Barbara, W1TRE, lead W1 'phones,

'PHONE WINNERS, 21ST A.R.R.L. SWEEPSTAKES CONTEST

Section	*Call*	*Score*	*Transmitter*	*Watts Input*	*Receiver*	*Bands Used*
E. Penna.	W3GHS	38,440	813s p.a.	500	75A2	15, 20, 40, 75
Md.-Del.-D. C.	W3JNN	111,362	VFO-6AC7-6AG7-2E26-813	100	HRO	20, 40, 75
S.N.J.	K2CSC	34,068	VFO-Viking II	100	HQ140X	15, 20, 40, 75
W.N.Y.	W2ICE	40,200	VFO-810-810s	150; 1000	HQ120X, HRO	20, 40, 75
W. Penna.	W3VKD	86,140	KW1	1000	75A3	10, 15, 20, 40, 75, 160
Illinois	W9YWL	64,512	Viking II	90	HQ140X	20, 40, 75
Indiana	W9UTL	32,198	VFO-Viking II	100	NC98, Q5er	40, 75
Wisconsin	W9OMM	58,032	Viking VFO-Viking II	100	SX71	15, 20, 40, 75
No. Dakota	WØNPR	66,861	Viking II	100	S76	15, 20, 40, 75
So. Dakota	WØGDE	94,170	32V3-813s	900	75A2	15, 20, 40, 75, 160
Minnesota	WØTIV	25,137	Viking II	100	RME69, converter	15, 20, 40
Arkansas	W5ZBC	9113	VFO-Viking II	90	SX25	20, 40, 75
Louisiana	W5SQI	41,292	Millen VFO-Viking II	90	HQ129X, NC46, DB20	15, 20, 40, 75
Mississippi	W5WZY	14,362	6AG7-1614-2E26-813	270	HR050	75
Tennessee	W4VFL	44,631	Viking II	90	HQ140X	20, 40, 75
Kentucky	W4CDO	10,920	VFO-6AG7-6L6-807-811s	250	NC173	20, 40, 75
Michigan	W8MLR	58,328	HT20	95	SX71	15, 20, 40, 75
Ohio	W8AJW	76,883	32V1	95	HQ120X	10, 15, 20, 40, 75
E.N.Y.	W2ESE	15,327	Viking II	95	NC183D	15, 20, 40, 75
N.Y.C.-L.I.	K2AAA	108,864	Collins PTO-TR1TV-4-65A	96	75A3	15, 20, 40, 75
N.N.J.	W2HJR	86,520	KW1	800	75A3	15, 20, 40, 75
Iowa	WØMLY	82,824	32V2	90	75A3	15, 20, 40, 75
Kansas	WØLXA	39,930	5100	75	Super Pro	20, 40, 75
Missouri	WØOMG	58,357	Sig. Shifter-6L6s-35Ts	500	HQ129X	20, 40, 75
Nebraska	WØEHF	47,450	6AU6-802-4-250A	1000	HRO60	20, 40
Connecticut	W1YWU	44,973	VFO-Viking I	100	S76	10, 15, 20, 40, 75
Maine	W1GKJ	25,090	Viking VFO-Viking I	100	HRO60	10, 20, 40, 75
E. Mass.	W1TRE	58,403	6AU6-6AG7-6V6-829B	100	HRO60	10, 15, 20, 40, 75
W. Mass.	W1KFV	39,000	VFO-Viking I	100	HQ140X	10, 15, 20, 40, 75
N.H.	W1FZ	57,834	Viking I	96	75A2	15, 20, 40, 75
R.I.	W1TRX	18,928	Globe King	400	HQ140X	15, 20, 40, 75, 160
Vermont	W1SEO	19,926	5100	120	75A2	20, 40, 75
Alaska	KL7BFR	2607	Viking VFO-Viking II	90	Super Pro	20, 40
Idaho	W7NGA	23,486	75GA	94	SX43, 5BR, Super Pro	20, 40, 75
Montana	W7NPV	30,150	32V1	95	SX28	15, 20, 40, 75
Oregon	W7OVA	17,820	Viking I	90	75A1	20, 40, 75
Washington	W7SFA	82,962	32V3	90	75A1	10, 15, 20, 40, 75
Hawaii	KH6CD	1248	32V1	100	75A2	15, 20
Nevada	W7JUO	11,776	VFO-4E27-250THs	1000	75A1	20, 40, 75
Santa Clara V.	W6MKM	27,848	Sig. Shifter-829B	99	NC125	15, 40
East Bay	W6BXE	48,246	4-250As p.a.; 813s p.a.	800-1000	SX28, 75A2	20, 40, 75
San Francisco	W6CBE	73,982	6AG7-2E26-4-125A	500	HRO60	15, 20, 40, 75
Sacramento V.	W6GDO	42,224	Ranger-814s	500	HQ129X, DB22	15, 20, 40, 75
San Joaquin V.	W6NDP	41,580	32V1	100	75A2	20, 40, 75
No. Carolina	W4HUW	35,526	BC696-T40-833A	1000	NC183	20, 75
So. Carolina	W4EZF	1425	BC696-211s	350	SX71	75
Virginia	W4HQN	141,480	VFO-4E27	100	75A1	20, 40, 75
W. Virginia	W8WHR	7128	ARC5-RK36s	450	NC81X, DB22A, BC453	40, 75
Colorado	W9QCX	87,117	5100	100	NC183	15, 20, 40, 75
Utah	W6SLF/7	42,387	KW1	375; 1000	75A3, DB22A	15, 20, 40, 75
Wyoming	W7VBP	5694	VFO-Viking II	125	HRO50T	20, 40, 75
E. Florida	K4ARU	65,193	Viking II	100	SX71, SX43, HQ129X	15, 20, 40, 75
W. Florida	W4SOQ	19,875	Viking II	100	NC183, Q5er	15, 20, 40, 75
Georgia	W4SOV	57,216	32V2	100	SX88	10, 15, 20, 40, 75
Canal Zone	KZ5KA	4320	VFO-807Ws; VFO-4-65As	120; 250	HRO60	15, 20
Los Angeles	W6AM	181,551	Communicator; VFO-4D32	10; 90	Communicator; RME50, 75A3, HF10-20, DB23	2, 15, 20, 40, 75
Arizona	VE1LL/W7	26,586	6AG7 VFO-6AG7-1614-812As	375	HRO60	15, 20, 40, 75
San Diego	W6CHV	69,300	VFO-6V6s-812; VFO-6AU6-813	100	SX28	15, 20, 40, 75
Santa Barbara	K6CKU	3237	5814-5763-6146; Viking II	90	Homebuilt (2 mtrs.), HQ129X	2, 20, 40, 75, 160
No. Texas	W5COF	11,408	Viking II	96	S53A	15, 20, 40
Oklahoma	W5CYQ	19,845	811s p.a.	250	SX71	75
So. Texas	W5UBN	51,557	Viking I	100	75A3	10, 15, 20, 40
New Mexico	W3WFV/5	14,108	VFO-6AG7-6146	40	NC98	15, 40
Maritime	VE1VN	7560	Viking II	120	AR77E	15, 20, 40, 75
Quebec	VE2APC	11,016	Viking VFO-Viking II	100	HRO50T	20, 40, 75
Ontario	VE3BVI	20,592	5763-6C4-5763s-6146-813	100	HQ129X	20, 40, 75
Alberta	VE6MJ	456	6L6-807s-812As	200	HQ129X	20, 75
B.C.	VE7MW	10	807 p.a.	20	Super Pro	20

following in the footsteps of OM W1JEL who did it last time. We'd have a photo of W1TRE with these results but YL Editor W1QON scooped us (see page 54, March *QST*).

. . . ARRL Staffers dispensed a total of 3359 SS contacts. . . . An estimated 95 per cent of the entrants have converted to the 24-hour clock, applying it either to local time or to GMT. The rest stick with the A.M./P.M. system. . . . W1BAN wishes to dispel the notion that 40-meter 'phone is unworkable because of b.c. QRM. Charlie got 51 out of 55 sections there in his first contest in 23 years of hamming. . . . W2SKE is also convinced that 7.2-Mc. 'phone has hypoed SS activity considerably. . . . Thanks to these amateurs who did not "choose to run" but submitted check logs: W1MND, W2GES, *W3s* VKW VRJ, *W4s* TKL VUG, K4ADP, W6TMX, *W7s* QLU/5 WCC, W8LPC/6, W9TAL, *WØs* GWS IYJ, KL7TI, VE1AEE, VE3DJX, VE7RU. . . . Some clubs sponsor their own private competitions to stir up contest interest. Coronado (Calif.) Radio Club offers a trophy annually to its top scorer in the SS. W6JVA got it in the 21st. . . . The program of the Potomac Valley-Frankford gathering January 23rd at Washington, D. C., would warm the cockles of any contester's heart. In a "final exam," guests were to identify the ARRL sections of such long-time Sweepstakers as W1CJH, W4WKQ, W5DEJ, W5KC, W5TFB, W6CIS, W6SUP, W7CCC, W7ZN, W9NDA, WØIC, WØPHR. Without peeking at the scores or the *Call Book*, how many can *you* name? . . . At least five father-and-son teams took part in the festivities on one or the other mode. Age before youth, of course, so pops are first, offspring second: W1FTX and WN1AMZ, W4CVM and KN4ACG, W4YE and W4YZC, W5YXH and W5EDG, W8MNY and W8MNZ.

"My first contest and I had fun and gained experience right up to the last minute," avows W5CYQ. Besides experience, Luther gained the Oklahoma 'phone award.

♦

And so the curtain descends on the 21st ARRL Sweepstakes. As a strenuous test of equipment, skywires and home-station operating prowess, as a rounder-out of WAS totals and an ace promoter of competitive but amicable brasspounding and push-to-talk, this one was tops. May rosy recollections of it long prevail — prevail, anyway, until its *22nd* holding! That one is set for the two weekends preceding Thanksgiving Day, 1955. QRV?

'PHONE SCORES

Twenty-First Sweepstakes Contest

Scores are grouped by Divisions and Sections. . . . The operator of the station first-listed in each Section is award winner for that Section unless otherwise indicated. . . . Likewise the "power factor" used in computing points in each score is indicated by the letter A or B. . . . A indicates power up to and including 100 watts (multiplier of 1.5, 'phone), B over 100 watts (multiplier of 1). . . . The total operating time to the nearest hour, when given for each station, is the last figure following the score. . . . Example of listings: W3GHS 38,440-312-62-B-26, or, final score 38,440, number of stations 312, number of sections 62, power factor of 1, total operating time 26 hours. . . . Multioperator stations, with calls of participants in parentheses, are grouped in order of score following single-operator station listings in each section tabulation.

ATLANTIC DIVISION

Eastern Pennsylvania

W3GHS....38,440-312-62-B-26
W3RSC....28,672-256-56-B-32
W3VST....13,104-112-39-A-16
W3HIX.....9684-135-36-B-18
W3TTW.....8787-101-29-A-10
W3NQB.....5580- 60-31-A-22
W3CLC.....4026- 61-33-B- 3
W3VTR.....2376- 44-18-A-21
W3LAP.....2040- 34-20-A- 8
W3TKB.....561- 19-11-A- 5
W3TDF.....300- 13- 8-A- 3
W3VSQ.....150- 10- 5-A- 5
W3CNO.....108- 18- 2-A- 4
W3MKA (W3s OWK VCE VCY VDN WXC) 12,054-144-28-A-40

Md.-Del.-D. C.

W3JNN...111,362-511-73-A-38
W3VAM....53,985-310-59-A-37
W3JVI....52,500-440-60-B-38
W3YRK....44,516-252-59-A-38
W3TYJ....20,453-154-45-A-29
W3VZZ....15,750-150-35-A-27
W3UKO....11,514-104-38-A-20
W3RAH.....3192- 67-24-B- 9
W3QAZ.....1998- 37-18-A- 9
W3WKB.....1682- 29-18-B- 7
W3RRT.....825- 30-11-A- –
W3MSK.....257- 11- 9-A- –
W3WRH.....240- 12-10-B- 5
W3JZY.....84- 7- 6-B- 1
W3PGA (W3s HXN QLF, WN3ZAQ)..7840-140-28-B- –

Ralph E. Macy, WØGDE, has gear he *hasn't used* — in a Sweepstakes, at any rate! What he *did* use, however, landed him in the driver's seat for South Dakota and all Zero-land. His 94,170-pointer was No. 5 'phone in the country, as well.

Just about as far from Nova Scotia as he can be and still count for U. S. A., VE1LL/W7 becomes the first Canadian to trek southward and pocket an SS certificate in the States. Ken earned his chunk of wallpaper in Arizona by modulating to 26,586 points.

Southern New Jersey

K2CSC....34,068-220-52-A-34
K2BWR....19,228-220-44-B-35
K2WAO[1].....6216- 74-28-A-16
K2BNB.....4761- 70-23-A- 9
W2WE.....988- 26-19-B- –
W2VUM.....882- 23-14-A- 5

Western New York

W2ICE....40,200-300-67-B-20
W2PDB....19,305-166-39-A-34
K2BHP....18,960-198-48-B-22
W2GSS....15,624-124-42-A-14
W2CZT....13,630-145-47-B-20
W2BYJ.....8613-100-29-A-25
W2DRN.....8324- 91-31-A-16
K2DFO.....6080- 94-32-B-18
K2DMA.....5873- 70-29-A-10
W2SNI.....3161- 56-29-B- 9
W2PUN.....504- 14-12-A- 3
W2RLN.....432- 18-12-B-11
W2PFI.....347- 17- 7-A- 2
K2ELK.....220- 11-10-B- –
W2FXA.....6- 2- 1-A- 1

Western Pennsylvania

W3VKD[2]...86,140-590-73-B-37
W3CTN....27,848-236-59-B-28
W3SYW.....60- 5- 4-A- 3

CENTRAL DIVISION

Illinois

W9YWL...64,512-336-64-A-37
W9VOB....29,475-199-50-A-34
W9QXO....20,550-141-50-A-35
W9PBM....15,458-116-45-A-29
W9LQF....14,930-136-27-A-29
VE1VI/W9.13,588-165-43-B- –
W9FVU....12,485-102-41-A-16
W9UXN.....7776- 81-32-A-18
W9DXU.....4230- 71-30-B- 8
W9KLV.....2808- 54-26-B-13
W9NLF.....1728- 36-16-A-11
W9YUN.....1728- 36-24-B- 7
W9DLH.....1647- 31-18-A- 8
W9YTS.....900- 25-12-A- 7
W9FCO.....875- 27-11-A- 6
W9TPA.....798- 19-14-A- 4
W9PCB.....722- 19-13-A- 4
W9KMN.....48- 4- 4-A- 1
W9IDO.....18- 3- 2-A- 1
W9ZSQ.....18- 6- 1-A- 1
W9WHN (W9s DDP KVQ WHN) ...89,460-421-71-A-40
W9AVJ (W9s GVZ NZM PKW) 56,916-429-68-B-20
W9VYD (W9s VYD WBE WDR).....7488- 78-32-A-12

Indiana

W9UTL....32,198-206-53-A-35
W9PQA.....6197- 77-27-A- 9
W9MCN.....4992- 67-39-A-12
W9AQR.....4307- 60-29-A-12
W9FJI.....351- 13- 9-A- 5
W9UWU.....3- 1- 1-A- 1

Wisconsin

W9OMM...58,032-313-62-A-38
W9VBZ....24,975-167-50-A-14
W9LXY....15,708-119-44-A-27
W9NUW...11,915- 88-47-A-15
W9ZDU.....1964- 40-17-A-12
W9RZD.....1560- 33-24-B-15
W9DKH.....782- 23-17-B- 2
W9VWX.....759- 23-11-A- –
W9VOD.....663- 17-13-A- 1
W9FTY.....560- 20-14-B- 4
W9UDK.....429- 13-11-A- 1
W9ZDM.....297- 11- 9-A- 2
W9QGR.....112- 8- 7-B- 1
W9AEM.....27- 3- 3-A- –

DAKOTA DIVISION

North Dakota

WØNPR....66,861-323-69-A-40
WØKZZ....31,241-183-59-A-32
WØNGO.....570- 19-15-B- –

South Dakota

WØGDE....94,170-645-73-B-40
WØPRZ....80,519-558-73-B-30
WØQCC....66,030-357-62-A-40
WØSCT.....4389- 67-33-B-17

Minnesota

WØFIV....25,137-150-52-A-20
WØQJV....3360- 35-32-A-18
WØQZR....1830- 32-20-A-18
WØRGO.....1485- 33-15-A- 7
WØRLI.....234- 13- 9-B- –
WØQDI.....12- 2- 2-A- 1

DELTA DIVISION

Arkansas

W5ZBC.....9113-113-27-A-12

Louisiana

W5SQI....41,292-222-62-A-24
W5ZAK....2700- 38-24-A-14
W5KC.....1344- 28-16-A- 2

Mississippi

W5WZY...14,362-175-43-B-26
W5KNA/5 .12,024- 84-48-A-14
W5OAE....6248- 60-35-A- 6

Tennessee

W4VFL....44,631-263-57-A-38
W4PHW...13,554-252-61-A-40

CLUB SCORES

Club	*Score*	*Entries*	*C.W. Winner*	*'Phone Winner*
Potomac Valley Radio Club	3,698,555	49	W4KFC	W4HQN
Frankford Radio Club	2,529,178	37	W3GHM	.....
Ohio Valley Amateur Radio Assn.	1,739,969	32	W4KVX	W8HQK
El-Ray Amateur Radio Club (Mass.)	1,084,862	28	W1IAP	W1JNX
York Radio Club (Ill.)	721,348	12	W9YFV	.....
Nassau Radio Club (N. Y.)	561,946	12	W2IVS	.....
Hampden County Radio Club (Mass.)	559,543	15	W1JYH	W1KFV
Richmond Amateur Radio Club (Va.)	535,367	40	W4BZE	W4VUF
Order of Boiled Owls (N. Y.)	533,463	7	W2RDK	.....
Chicago Suburban Radio Assn.	479,792	12	W9WFS	W9LQF
Denver Radio Club	400,327	10	WØCYT	WØQCX
Buckeye Short Wave Radio Assn. (Ohio)	378,442	12	W8OYI	.....
Cleveland Brasspounders Assn.	369,641	6	W8VTF	W8OMK
Tri-County Radio Assn. (N. J.)	343,775	15	W2TWC	.....
Milwaukee Radio Amateurs' Club	326,500	15	W9VOD	W9VBZ
Lake Success Radio Club (N. Y.)	325,991	20	W2TUK	K2AED
Sioux City Amateur Radio Club	319,211	8	WØURB	.....
South Jersey Radio Assn.	290,046	11	W2CAG	.....
Connecticut Wireless Assn.	286,685	7	W1BIH	.....
Aero Amateur Radio Club (Md.)	285,115	10	W3QQO	.....
Central Connecticut Contest Club	281,132	13	W1ZDP	.....
Garden State Amateur Radio Assn. (N. J.)	248,182	5	W2TPJ	.....
Detroit Amateur Radio Assn.	248,153	11	W8GB	W8MILR
Central Utah Contest Club	224,572	6	W7QDM	W6SLR/7
Johnson County Radio Amateurs Club (Kans.)	221,607	14	WØBCI	WØMEF
Westpark Radiops (Ohio)	203,195	15	W8DAE	W8AJW
Dayton Amateur Radio Assn.	203,019	5	W8ZJM	.....
Pottstown Amateur Radio Assn.	201,731	7	W3BIP	.....
Philadelphia Wireless Assn.	188,182	6	W3HHK	.....
Mid-Island Radio Club (N. Y.)	185,294	5	W2KTF	.....
Niagara Radio Club (N. Y.)	167,496	11	W2JVO	.....
Wisconsin Valley Radio Assn.	161,818	5	W9RQM	.....
Somerset Hills Radio Club (N. J.)	159,248	4	W2GND	.....
North Suburban Radio Club (Ill.)	159,009	6	W9WJV	.....
South Lyme Beer, Chowder & Propagation Soc. (Conn.)	157,814	4	W1IKE	.....
Hamfesters Radio Club (Ill.)	151,562	18	W9MRQ	W9PBM
Richmond Amateur Radio Club (Calif.)	151,105	4	W6EFD	.....
Ventura County Amateur Radio Club (Calif.)	151,432	4	W6YK	.....
Tri-State Amateur Radio Society (Ind.)	144,664	6	W9UWU	W9MCN
Nortown Amateur Radio Club (Ont.)	140,182	11	VE3DRD	.....
MIT Radio Society	139,080	7	W4YHD/1	.....
Coronado Radio Club (Calif.)	133,021	7	W6JVA	.....
West Seattle Amateur Radio Club	129,897	4	W7AJS	.....
Canton Amateur Radio Club (Ohio)	121,021	14	W8DNC	W8IKM
Raritan Valley Radio Radio Club (N. J.)	114,150	5	W2CWK	.....
Northwest Amateur Radio Club (Ill.)	111,892	5	W9NJZ	.....
Central High Radio Club (Iowa)	103,499	9	WØKYI	.....
Northern Alberta Radio Club	99,590	7	VE6ZR	.....
Hartford County Amateur Radio Assn.	91,155	5	W1UFW	.....
Rochester Amateur Radio Assn.	90,158	10	W2YGW	W2ICE
Queens Radio Amateurs (N. Y.)	89,516	3	W2LPJ	.....
Harmonic Hill Radio League (N. Y.)	89,380	5	K2EIU	.....
Columbus Amateur Radio Assn.	80,913	3	W8DWP	.....
Levittown Amateur Radio Club (N. Y.)	75,266	9	W2AEV	.....
Santa Clara County Amateur Radio Assn. (Calif.)	75,067	6	W6YHM	.....
Northeast Radio Club (Penna.)	69,616	5	W3SOH	.....
York Road Radio Club (Penna.)	67,831	4	W3KFK	.....
Case Institute of Technology Radio Club (Ohio)	66,866	3	.....	.....
Springfield Amateur Radio Club (Ohio)	65,746	5	W8JRG	.....
Clarksville Amateur Radio Club (Tenn.)	63,588	3	W4WQT	.....
Point Radio Amateurs (Wis.)	63,202	9	W9KXK	.....
York Amateur Radio Club (Penna.)	59,788	3	W3RAF/3	.....
Toledo Radio Club	56,575	3	W8MQQ	.....
North Penn Amateur Radio Club	50,491	8	.....	W3RSC
Southern Nevada Amateur Radio Club	49,500	4	.....	.....
Stratford Amateur Radio Club (Conn.)	47,979	3	W1GVK	.....
Swan Amateur Radio Club (Ill.)	46,879	6	W9KMN	W9YUN
Goose Bay Amateur Radio Club (Labrador)	43,958	7	W4KVM/VO6	VO6U
St. Louis University Amateur Radio Club	43,738	6	WØETW	WØTCF
Browning School Amateur Radio Club (Wis.)	42,336	3	W9WAN	.....
Cascade Radio Club (Wash.)	41,664	6	W7EUY	W7KWX
Eagle Rock Teen Age Radio Club (Calif.)	39,908	5	W6UED	.....
Wilson High School Radio Club (D. C.)	37,096	4	W3YIV	.....
Morristown High School Radio Club (N. J.)	20,708	3	K2GLQ	.....
Fall River Amateur Radio Club	13,581	6	W1TXG	.....
Los Angeles Mobilers	2076	3	.....	K6BEQ

W4WIJ.....9177- 82-38-A-16
W4BQG.....8607- 76-38-A-16
W4TDZ.....4480- 70-32-B- 6
W4TYV.....1305- 29-15-A-17

GREAT LAKES DIVISION

Kentucky

W4CDO....10,920-141-39-B-24
W4AUC....10,345-105-33-A-20

Michigan

W8MLR...58,328-360-55-A-37
W8CLR....34,500-250-69-B-25
W8ZXC....12,008-160-38-B-31
W8LOX....8010- 90-30-A-25
W8RGU....2200- 44-25-B-11
W8QGP....1298- 30-22-B- –
W8MNZ (W8s MNY MNZ)
41,412-241-58- -38

Ohio

W8AJW....76,883-384-67-A-37
W8RXM [3]..45,576-318-48-A-35
W8OMK...39,591-250-53-A-34
W8KZH....30,447-205-51-A-38
W8SRF....27,195-185-49-A-18
W8IZT....23,187-198-59-B-39
W8KDJ....19,800-112-60-A-26
W8NOS....16,848-156-36-A- –
W8OMY...16,434-126-44-A-17
W8PIQ....14,934-135-38-A-22
W8HQK...14,550-148-50-B-34
W8OAG....11,472-120-48-B-12
W8JSW.....9126- 78-38-A-13
W8UON....7008- 73-32-A-24
W8IKM....6210- 69-30-A-12
W8RWZ....4920- 60-41-B-11
W8FNX....3538- 62-29-B- 7
W8BTW....3519- 51-23-A- 7
W8IQN....2808- 54-27-B- 4
W8IVE....2700- 50-27-B-12
W88OL....2550- 34-25-A-13
W8BFH....1811- 37-17-A-10
W8PCS....1500- 25-20-A- 2
W8AEU....1134- 21-18-A- 3
W8INW....390- 13-10-A- 3
W8KXP....160- 10- 8-B- 2
W8VUV....60- 5- 4-A- –
W8GHT....33- 11- 1-A- 1
W8DIR....12- 2- 2-A- 1
W8FJP....3- 1- 1-A- 1
W8DPA (W8s DPA JSH JSJ,
WØPUJ) .61,008-334-62-A-37

HUDSON DIVISION

Eastern New York

W2ESE....15,327-135-39-A-24
K2AVY....4092- 63-22-A- 8
K2DQH....3744- 48-26-A- 7
W2SZ (W2s KJG KRL,
W9NFR) .51,832-427-62-B-40

N. Y. C.-L. I.

K2AAA...108,864-504-72-A-37
W2SKE....54,002-436-62-B-19
K2CJN....32,757-181-61-A-22
K2AED....15,855-152-35-A-23
W2EEN....12,054-147-41-B-21
K2AKZ....11,136-116-32-A-36
W2SGK....10,320-130-40-B- 6
K2DZE....4284- 60-24-A-14
W2GJX....4031- 71-29-B- 8
W2DLO....1748- 46-19-B- 4
W2JDN....858- 22-13-A- 5
W2IAW....616- 22-14-B- 3
W2NNH....615- 22-10-A- 8
K2DEM....480- 16-10-A- 2
W2QAN....198- 22- 3-A-11
W2YHP....96- 8- 4-A- 4
W2KTF....48- 4- 4-A- 1
W2DKI....12- 2- 2-A- 1

Northern New Jersey

W2HJR....86,520-623-70-B-38
W2JJI....31,122-274-57-B-36
W2PEV....13,365-135-33-A-33
W2JV.....297- 11- 9-A- 2
K2EHR....48- 4- 4-A- 1
W2LSX....34- 4- 2-A- –

MIDWEST DIVISION

Iowa

WØMLY...82,824-406-68-A-37
WØBX....24,472-220-56-B-34
WØQIJ....12,330-148-45-B-25
WØTLC....300- 10-10-A- 5
WØLNI (WØs MGM NAI)
40,068-330-63-B- –
KØWAD (WØs BVX MHM
STU UHZ)
5814- 80-38-B-17

Kansas

WØLXA....39,930-242-55-A-36
WØMEF....15,606-154-51-B-21
WØLZX....9630-110-45-B-35
WØQMS....3788- 51-25-A-20
WØPB.....520- 20-13-B- 5
WØQYK....273- 13- 7-A- 5
WØYGC....243- 9- 9-A- 2

Missouri

WØOMG...58,357-441-67-B-39
WØBCF...54,810-400-70-B-30
WØJAH...14,586-143-51-B-27
WØFLN....6942- 91-39-B-28
WØTCF....4365- 49-30-A-13
WØPKV....3863- 52-25-A- 6
WØTGI.....6- 2- 1-A- 1
WØIYJ (WØs GEC IYJ)
25,475-167-51-A-31
WØQON (WØs MUM SBO)
10,200-131-40-B-26

Nebraska

WØEHF...47,450-333-73-B-19
WØGYM...22,116-194-57-B-18
WØBTG....10,206- 82-42-A-14
WØQMD....1044- 29-18-B- 6
WØJJK.....24- 4- 2-A- 1

NEW ENGLAND DIVISION

Connecticut

W1YWU....44,973-264-57-A-40
W1BAN....21,945-202-55-B-23
W1YEY....14,766-110-46-A-14
W1YBH....9963-124-27-A-22
W1MRJ....9450-135-35-B-22
W1ULY....4758- 92-26-B-13
W1RDV [4]..3924- 55-24-A- 8
W1ILV....1624- 58-14-B- –
W1QJM....1248- 26-16-A- 2
W1WHL....561- 17-11-A- 4
W1ZDP [4]..324- 12- 9-A- 1
W1ZMB....153- 9- 9-B- 3
W1EOB....50- 5- 5-B- 1
W1ICP [4]....32- 4- 4-B- 1
W1AW [4] (W1s WPR YYM)
26,620-245-55-B-16

Maine

W1GKJ....25,090-195-43-A-29
W1WTG...20,631-150-46-A-24

Eastern Massachusetts

W1TRE....58,403-300-65-A-38
W1VYI....50,337-331-51-A- –
W1LYL....23,186-190-41-A-34
W1JNX....22,140-164-45-A-28
W1PKV....12,099-109-37-A-12
W1MKW....5122-101-26-B-15
W1YHY....180- 10- 6-A- 4
W9VJD/1....162- 9- 6-A- 1
W1WIR....114- 10- 6-B- 5
W1RSR....30- 5- 2-A- 1
W1MX (W1s YSW VK8,
W4YHD, W5ZID)
37,800-343-56-B-38
W1AF (W1s KZN SYV)
3335- 75-23-B-13

Western Massachusetts

W1KFV....39,000-250-52-A-35
W1ZD.....36,603-291-63-B-36
W1MNG....14,840-140-53-B-16
W1UKR....8366- 85-33-A-19
W1CJK....4836- 62-26-A- 5
W1RLQ....1050- 25-14-A- –
W1YK (W1s UBC VAH VVO
WMH YFY, K2CHM)
405- 15- 9-A- 1

New Hampshire

W1FZ.....57,834-307-63-A-30
W1HSC....25,394-149-57-A-26
W1ZCH....9315-104-30-A-16
W1WS.....3498- 53-22-A- 7
W1ZIW....1596- 39-14-A-10

Rhode Island

W1TRX....18,928-182-52-B-18
W1SVQ.....40- 5- 4-B- 1

Vermont

W1SEO....19,926-187-54-B-32
W1NHJ/1....5332- 86-31-B- –

NORTHWESTERN DIVISION

Alaska

KL7BFR....2607- 40-22-A- 6

Idaho

W7NGA....23,486-160-51-A-24
W7IY.....5994- 74-27-A-29

Montana

W7NPV....30,150-169-60-A-29

Oregon

W7OVA....17,820-165-36-A-30
W7AZK....12,880-140-46-B-18
W7SYF.....270- 15-11-A-11

Washington

W7SFA [5]..82,962-419-66-A-39
W7EYD....30,375-205-50-A-20
W7KWX....6816- 71-32-A-16
W7BLX....2064- 66-16-B- 9
W6VUW/7....48- 4- 4-A- 3

PACIFIC DIVISION

Hawaii

KH6CD.....1248- 27-16-A- 5

Nevada

W7JUO....11,776-128-46-B-10
W7RKE.....126- 7- 6-A- 4

Santa Clara Valley

W6MKM...27,848-199-47-A-27
K6BAM....21,866-170-43-A-30
K6BBD.....216- 12- 6-A- 2
W6UW (K6BBD, KN6HCP)
444- 19- 8-A- 2

East Bay

W6BXE....48,246-368-66-B-28
W6VER....47,895-261-62-A-35
W6BSY....18,705-145-43-A-27
W6ITR.....3663- 56-22-A-14
K6DVA....1680- 35-16-A- 7
W6VVZ (W6s JLQ VVZ)
46,592-368-64-B-10

San Francisco

W6CBE....73,982-521-71-B-40
W6ATO....13,550-140-50-B-17
K6ALJ.....1283- 29-15-A-11
W6HQN/6....48- 4- 4-A- 3

Sacramento Valley

W6GDO....42,224-378-56-B-39
W6VBI....32,160-268-60-B-36
W6HIR....1148- 24-17-A- 2

San Joaquin Valley

W6NDP....41,580-227-63-A-31
W6GQZ....12,400-155-40-B-26
W6TZN....11,000-111-50-B-31

ROANOKE DIVISION

North Carolina

W4HUW...35,526-286-62-B-25
W4ZWF....8016- 84-32-A-10
W4CVX....1556- 31-17-A- 4

South Carolina

W4EZF.....1425- 38-19-B- 3

Virginia

W4HQN [6]..141,480-655-72-A-40
W4CBQ....48,100-385-65-B-28
W4SIE....39,846-344-58-B-38
W4UJV....29,988-295-51-B-32
W4KMS....20,520-180-38-A-30

(*Continued on page 140*)

W4VUF....17,982-162-37-A-30
W4PRK....14,256-176-27-A- –
W4AVO....12,771-132-33-A-16
W4IYC....12,700-127-50-A-15
W4IMP.....9632-151-32-B-20
W4ZVE.....7452- 92-27-A- –
W4YTZ.....7250-145-25-B-20
W4BLO.....5772- 83-37-B-10
W4JIJ.....4088- 73-28-B- 8
W4KUJ.....3400- 68-25-B-10
W4ABF.....2363- 38-21-A- 8
W4UIE.....1584- 33-16-A- 8
W4RSB.....1428- 28-17-A- 4
W4OSR.....419- 17- 9-A- 3
W4MZR.....204- 17- 4-A- 3
W4URM.....60- 10- 2-A- 7
W4ZFF.....36- 4- 3-A- 1
W4VPU.....21- 4- 3-B- 1
W4BXI.....10- 2- 2-A- 1
W4ZLH.....9- 3- 1-A- 1
K4WAH.....2- 1- 1-B- 1
W4CA (W4s AYC CBM LNX
OLD SBZ ZZL ZZV)
34,935-348-51-B-29

West Virginia

W8WHR.....7128-108-33-B-13

ROCKY MOUNTAIN DIVISION

Colorado

WØQCX....87,117-409-71-A-40
WØSBE....78,192-362-72-A-35
WØOYS....42,569-243-59-A-34
WØUIF....20,798-148-47-A-24
WØBWJ....18,825-127-50-A-22
WØLO.....13,328-136-49-B-22
WØTWD....4350- 50-29-A-12
WØBON....3892- 70-28-B- 9
WØMYB.....270- 10- 9-A- 3

Utah

W6ELF/7..42,387-300-71-B-36
W7QWH...25,132-207-61-B-19
W7VJJ.....5549- 70-27-A-11
W7QDJ.....819- 20-14-A- 2

Wyoming

W7VBP.....5694- 73-39-B- 6
W7QPP.....297- 12- 9-A- 6
W7PSO.....12- 2- 2-A- –

SOUTHEASTERN DIVISION

Eastern Florida

K4ARU....65,193-352-62-A-39
W4BWR...12,672-132-32-A-31
W4TVN.....147- 8- 7-A- 2
W4NEK (W4s CNC CNI,
K2BQH)
24,898-215-59-B-23

West Florida

W4SOQ....19,875-133-50-A-23
K4AMU.....533- 21-13-B- 6

Georgia

W4SOV....57,216-301-64-A-37
W4YTO....55,296-289-64-A-40

Canal Zone

KZ5KA.....4320- 61-36-B-13

SOUTHWESTERN DIVISION

Los Angeles

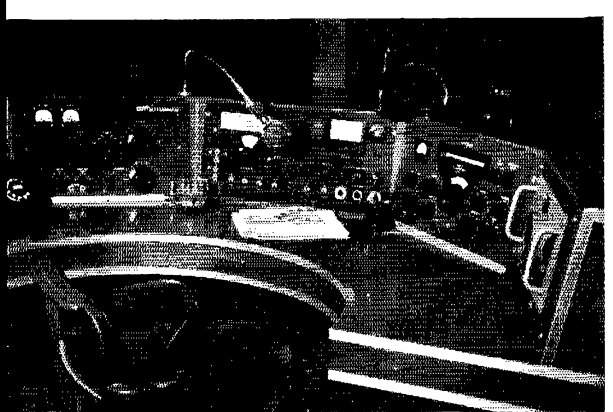
W6AM [7]...181,551-835-73-A-39
W6VBS.....45,548-387-59-B-40
W6NJU....33,900-226-50-A-34
W6OLY.....7301- 78-31-A-22
W6PFE.....2100- 50-14-A-17
K6BEQ.....1680- 35-16-A- 7
W6SQY.....750- 25-10-A- 4
K6GLS.....384- 16- 8-A- 2
KN6HGF....354- 66- 2-A-10
W6LIT.....285- 19- 5-A- 3
W6TRB.....256- 16- 8-B- –
K6AEL.....108- 6- 6-A- 1
K6HNV.....44- 21- 1-A- –
K6DPC.....12- 2- 2-A- 1

Arizona

VE1LL/W7..26,586-213-63-B- –
W7VMP (W7s VMO VMP
VMQ) ...74,621- 532-71-B-40

San Diego

W6CHV....69,300-350-66-A-37



♦

All equipage is within easy reach at the neat, console-type operating position of N.Y.D.-L.I. awarded K2AAA. Don, lucky holdar of a call which doesn't need phoneticizing, was one of the four 100,000-point mike men.

QST for

QST—Volume III

Part III† — Foreword to Sumner B. Young's (WØCO) Index

OF INTEREST to those who wish to follow other legislative incidents covered in Volume III are the following citations: the editorial called "Warning!" at 26, April 1920; the companion editorial entitled "New Legislation" at 27, April 1920 [33]; and the editorial found on pages 24 to 25, in the July (1920) issue, called "Legislative Affairs." [34]

The fraternal and gregarious instincts of the amateurs were asserting themselves; and a large convention, called "The First Annual Third-District Amateur Convention," was held at Philadelphia on May 8, 1920. (For an account of it, see 37 to 38, June 1920.) This gathering evidently was inspired by an earlier meeting staged by the New England Division Amateurs.[35]

"The Philadelphia Idea" was praised in an editorial published at 21 to 22, June 1920:

. . . What we want to direct attention to is the scheme of our Philadelphia and Third District brothers. It is a good one. They say, let us not have a meeting of some club, but instead let us have a convention of amateurs from all over the District. Let all the clubs take part and send as many of their members as they can. And let the unattached come and join hands and get acquainted with the splendid brotherly spirit of amateur radio. In order to make things solid, our Third District brothers organized on the spot the Third District Convention. The Convention elected officers and voted to have a big rousing meeting once a year. They affiliated with our ARRL and did the whole job up in finished style.

We cannot help but point out that this would be a mighty good plan for the other districts to follow. It would be a stepping stone to that one grand ambition we have here at headquarters, which is some day to be strong enough to have a grand National Amateur Radio Convention, at which all the districts would be represented from the entire country, and where we could meet face to face our friends of whom we have heard so much but whom we have never seen. Read the story of the Philadelphia Convention, fellows of other districts and talk the thing over. We will help from Headquarters. . . . (Italics added by S.B.Y.)

Another outstanding feature of Volume III of *QST* is its story of the so-called "fading tests."

There were two kinds of "fading tests" run during the period of time covered by Volume III. Both grew out of an idea first mentioned in an editorial found at 23 to 24, May 1920, entitled "Fighting Fading." After stating that the amateur stations were in a position to organize a systematic study of the problem, the editorial stated (at 24, May 1920):

. . . While we were thinking of all these things, along came the Radio Section of the Bureau of Standards and wanted to know if the ARRL would coöperate with them in the collection of data on transmission phenomenon. . . . We went right down and talked it over with them, and as a result arrangements are now being made whereby a

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† For previous installments see following *QST* references: Part II of "*QST* — Volume III," April, 1955; "*QST* — Volume I," October, 1954; "*QST* — Volume II," February, 1955; Part I of "*QST* — Volume III," March, 1955.

[33] An extract from it reads: ". . . the RCA seems to have fixed it up with our Uncle that if he'll give them transocean business for their own playground they'll boost Sam's aspirations to control all the rest of it. So it looks like there's fun ahead."

[34] Among other things, this recounts the Secretary of Commerce's appointment of a prominent amateur, Charles H. Stewart, of St. David's, Penn., to serve on an advisory committee of "the best technical radio men," engaged in a study of needed radio legislation. This, in part, was to prepare for U. S. A. participation in an International Communications Convention.

[35] See Service's report, at 26, May 1920. ". . . Following the example of the New England amateurs, those in and around Philadelphia are planning to hold a convention and banquet, at which will be represented all the individual amateurs, radio associations, schools and allied-interest within a wide range. Prominent speakers from the ARRL, Department of Commerce, Navy and others will be on hand. . . ."

Also in the August (1921) issue, Glenhurst Research Labs (at Omaha) offered 3 receivers with a bottom tuning limit of 150 meters. See 112, August 1921 (Volume V).

At 55 to 56, December 1920 (Volume IV), a letter from Scott complains that very few amateurs could tune their receivers down low enough to receive 180-meter spark sigs from his station.

The famous Reinartz C.W. Receiver (tuning from 150 to 450 meters) was not described in *QST* until June, 1921. See 6, June 1921 (Volume IV).

The "improved" Reinartz C.W. Receiver, described in the March (1922) issue, had a bottom tuning range of approximately 130 meters. See 9, March 1922 (Volume V).

Jensen's Report (47, July 1922, in Volume V) declares that in the Dakota Division, at that late date, many receivers could not tune below 250 meters.

At 25, March 1922 (Volume V), Phelps complained that lack of stations equipped to receive waves below 200 meters was still hampering the development and use of such waves.

A "Stray" at 50, February 1922 (Volume V), announced that some stations had attempted to operate on 100 meters, but had found that nobody had a receiver capable of picking up their signals.

At 67, April 1922, a letter from McClung served notice that he wanted somebody to work with him, down on 150, 175, and even lower. (This item, too, is in Volume V.)

A letter from Canadian 3GN (see 62, April 1922, in Volume V) declared that very few receivers would get down to 140 to 170 meters; although a few actually would receive down as low as 170.

In the January (1922) *QST*, Kruse (in a letter) declared that manufacturers should produce a tuner having a normal range of 100 to 200 meters, and capable of being loaded to 400 meters. See 63, January 1922 (Volume V).

Of course, many amateurs built their own receivers; but no data are available on such equipment.

At 48, February 1920, in the article entitled "Auto-Modulated C.W. Telegraphy," mention is made of the *possibility* of dropping a v.t. transmitter down on 175 meters, to avoid QRM; but the *accomplishment* was not reported.

In the winter of 1920–1921, S. Kruse (at Washington, D. C.), with 3RP (at Hyattsville, Md.), and 3ABI (also at Washington, D. C., I believe) successfully operated some tube transmitters on wavelengths around 170 meters, for QRM avoidance. See article by Kruse ("Exploring 100 Meters"), at 12, March 1923. This is in Volume VI.

limited number of transmitting and receiving stations are going to make readings for ARRL-Bureau of Standards tests this summer.[36] . . .

The same editorial indicated that a much more extensive set of tests would be run, later, under the supervision of the League; and that *many* amateur stations — not simply a few — would participate. Final arrangements for this ARRL series were to be worked out and announced in *QST*, at a later date.

At 5 to 6, 16, June 1920, it was stated that schedules for the entire country had not yet been finally settled. But complete transmitting schedules were promised for July publication; and a form of "ARRL Fading Report," similar to the one used in the "Bureau of Standards" series, was printed.

In the meantime, the ARRL-Bureau of Standards fading tests commenced, on June 1, 1920, and ran through July 17, 1920.[37]

Evidently many amateurs failed to understand that the fading tests which were being made in June and July of 1920, in coöperation with the Bureau, were *wholly different* from the more widespread tests which were being planned by the League. The Editor, at page 5 of the July (1920) issue, attempted to "set them straight":

> . . . Let us explain again, to clear the air of confusion, that the tests which started June 1st are being conducted for the Bureau of Standards and are participated in by a very limited number of ARRL receiving stations especially chosen on account of their location. These stations are supplied forms and instructions by the Bureau and are reporting their results weekly direct to the Bureau for analysis.
>
> The transmitting stations in this test are using a wavelength of 250 meters by special authority, and their transmitting schedule is at the following hours on Tuesday, Thursday and Saturday of each week.
>
> | | |
> |---|---|
> | 1AW, Hartford, Conn. | 10:10 P.M. EST |
> | 2JU, Woodhaven, L. I. | 10:20 P.M. EST |
> | NSF* Washington, D. C. | 10:30 P.M. EST |
> | 8ZK, Pittsburgh, Pa. | 10:40 P.M. EST |
> | 9ZN, Chicago, Ill. | 9:50 P.M. CST |
> | 9LC, St. Louis, Mo. | 10:00 P.M. CST |
>
> * 3ZW on 250 meters, or WWV on 370 meters, may substitute for NSF.
>
> As announced in June *QST*, the ARRL has enlarged upon the idea originating in the Bureau tests, and schedules are being arranged in each Division whereby all of us may participate in the collection of fading data, and it is this scheme which is holding our interest so closely just now. Independent schedules are arranged in each Division, and everybody is invited to join. . . .

The schedules of the transmitting stations, in the following Divisions, were announced, at pages 6 to 8, July 1920: Central, Midwest, Dakota, East Gulf, Atlantic, New England, Delta, Roanoke, West Gulf, Northwestern, and Pacific.

Most of the transmissions were "slated" (in these schedules) to begin in the middle of July, 1920, and to end anywhere from August 14th to September 14th, 1920 (6 to 8, July 1920). "Special fading analysts" were appointed, in each Division, to receive the reports and to see what information could be derived from them.[38]

In the first number of Volume IV (August, 1920), it was announced that the Bureau tests had ended and that the League tests would begin (as scheduled); but that the first series of League tests would end on August 31, 1920 — conflicting arrangements to be cancelled.[39]

The League series of fading tests were a failure; and no attempt to run a second League series was made on a country-wide basis.[40]

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[36] Mr. S. Kruse (Asst. Elec. Engineer, Bureau of Standards) was one of the originators of the idea of the Bureau of Standards-ARRL fading tests. See 57, June 1921 (Volume IV), and 6, November 1920 (Volume IV).

For details of the first meeting between Maxim and Warner and the Bureau of Standards people, held on April 7, 1920, see 6, November 1920 (Volume IV). Commander A. Hoyt Taylor, U.S.N.R.F., in charge of the radio laboratory, Naval Air Station, Anacostia, D. C., was also present. From the Department of Terrestrial Magnetism, Carnegie Institution, Washington, D. C., Dr. S. J. Manchley and Mr. A. Sterling were in attendance. Maxim offered the use of station 1AW, and Commander Taylor (subject to Navy Department approval) offered the services of station NSF. Dr. J. H. Dellinger, Mr. L. E. Whittimore, and S. Kruse represented the Bureau of Standards.

Earlier in 1920, an editorial in *QST*, called "Swinging Signals" (15 to 16, January 1920) had described the effects of fading, and had asked: "Is there nothing we can do to solve the problem?" J. O. Smith (Traffic Manager of the League) published an article entitled "Variation of Strength of Amateur Station Signals," at 17, April 1920. He mentioned "dead pockets," on land and on sea, along with "fading"; and he asked all amateurs to turn over to the League any information which they might possess, on these things, so that the data could be studied. Some examples of fading, observed on 600-meter ship-to-shore channels, at a British coastal station near Halifax, N. S., were given by Chas. A. Lowry (of Toronto, Canada), in a letter published at 47 to 49, April 1920. He added: "I think the amateurs should get together and try by comparing notes to see if we can't arrive at some definite law that may perhaps cause these strange swinging signals to act as they do."

[37] See 5, November 1920 (Volume IV). For Kruse's analysis of the first "ARRL-Bureau of Standards Fading Tests," see 5 to 12, 37, November 1920; and 13 to 19, 22, December 1920.

A *second* series was run in coöperation with the Bureau of Standards during October, 1920. This series was announced at 11, October 1920 (Volume IV).

On station performance, during the first Bureau series of fading tests, see Kruse's article at 11 to 14, September 1920 (Volume IV).

[38] Again, see 6 to 8, July 1920. The appointees included some very prominent amateurs.

[39] 5, August 1920 (Volume IV).

[40] At 14, September 1920 (Volume IV), it is said: ". . . The ARRL QSS Tests will have been concluded when this appears in print. It is too early to forecast the results, but they seem none too favorable as viewed at this writing. In the southern states QRN has been so terrific as to make them practically a flat failure. They have been run at the very worst time of the year for every locality, and coupled to this is the fact that August is the great vacation month and hundreds of stations have been idle which would otherwise be on the job. All these features are combining to result in a dearth of reports, but it is still expected that information of decided value will be obtained. — Editor."

I have found mention of some "Delta Division ARRL QSS Tests," to be started on November 4, 1920, and to continue during that month. See Clayton's report, 41, December 1920 (Volume IV).

R. H. Pray, at 25, October 1920 (Volume IV), says: ". . . The fading tests in this Division were almost a complete failure, due, I think, to the fact that there was not enough interest. Although the transmitting stations were on nearly as scheduled, there were no recording stations and no reports. . . ."

W. T. Gravely, at 24, October 1920 (Volume IV), states:

By contrast, the Bureau series of fading tests of June and July, 1920, were of such interest that the Bureau of Standards, in cooperation with ARRL, planned three further series for October, 1920; January, 1921 and April, 1921.[41] At least two of them were carried out, in due course;[42] and I believe all three were run off as planned.

Turning now to the magazine itself, it is interesting to note that after World War I, the arrangement with The Radio Club of America was renewed, providing for publication (in *QST*) of papers presented before that organization.[43]

Edwin H. Armstrong's famous paper on the superheterodyne, "A New Method for the Reception of Weak Signals at Short Wave Lengths," was the first one published under this pact. See 5 to 9, 15, February 1920.

An interesting method of grounding an antenna system was disclosed in an article by H. E. Rawson,[44] at 14 to 15, in this same issue (February, 1920). This was "Round's Round Ground" devised by Captain H. W. Round, chief engineer of Marconi, Ltd., London, England. The ground plates were arranged in a vertical position in a circular trench. Insulated leads of identical length were run from a central post to the top of each ground plate. The idea was to deliver all of the r.f. energy to the earth at one and the same instant and to avoid a multiplicity of high-resistance paths to ground of diverse lengths and characteristics.

Readers of the "Index to Volume III" will be interested in the following miscellaneous matters:

(a) *Amateur Regulations:*

At the "reopening," all amateur licenses had expired. So, in all cases, exams for an operator's license were necessary. The code speed requirement was raised from the old 5 w.p.m. standard, to 10 w.p.m. Also, a "clean start" was made, on the issuance of calls. Furthermore, Special-Station licenses became very hard to obtain.[45] Even small transmitting stations which were incapable of sending a radio signal across a state line were required to take out licenses.[46]

Use of initials, as call letters, by unlicensed small stations, became illegal.[47]

Even licensed amateurs who communicated with unlicensed amateur stations faced trouble out on the Pacific Coast.[48]

In England, however, the amateur regulations issued by the Postmaster General were fantastically stringent:

> . . . Aerial not to exceed 100 feet in length for single-wire aerial; or 70 feet for two-wire aerial; operator must be a British national and over 20 years of age; diagram of receiver to be submitted for approval, and valves shall not be used without special authority; power of transmitters not to exceed 10 watts.[49] . . .

(b) *Aurora Borealis (or Similar) Effects:*

A big "blackout" of radio signals, on December 17, 1919, was noted.[50]

In an editorial at 23, May 1920, a period of "wide spread aurora" is mentioned; troubles extending over two-thirds of the month of March, 1920, were recited.

J. O. Smith's report, at 26, May 1920, speaks of widespread auroral disturbances on March 22, 1920. He observed these while on a visit to St. Louis, Missouri.

Service's report, found on 27, May 1920, states:

> . . . How about those Northern Lights on March 22nd? There seems to be a pretty general agreement from all parts of the Division that long distance was knocked unconscious and took three or four days to recover. Some got peculiar kinds of QRN, hissing, sparks, etc. . . .

(c) *Eclipse Effects:*

See the letter by Mr. A. L. Groves, dated from Brooke, Virginia, on May 3, 1920 (page 51, June 1920). The moon was in total eclipse at that location on the night of May 2, 1920. He observed certain phenomena on the 200- and 600-meter bands.

(d) *Emergency Work:*

I have found only one instance recorded in Volume III. This is under "Strays," at 25, December 1919. Unfortunately, there are "gaps" in the account:

> . . . During the tropical storm which swept the

". . . The QSS tests in this division were a complete failure, due, mainly, to the lack of recording stations. The transmitting stations were heard, and their sparks went out on normal radiation, but reports were so few that the data aren't worth reporting. Mr. Groves, fading analyst for the Division, will cover the ground in his report to *QST*, so I shall refrain from making further comments. . . ."

J. O. Smith, Traffic Manager of the League, makes a more optimistic (but completely undocumented) statement, at 26, September 1920 (Volume IV): ". . . The QSS tests of the League have been carried on very successfully . . . aside from the tests made by the League for the Bureau of Standards, this is the first attempt ever made to collect definite data on abnormal and fading signal strength. . . ."

Frank M. Corlett reported receiving only four reports, in the ARRL QSS Tests conducted in the West Gulf Division. See 29, September 1920.

No article analyzing the League fading tests, comparable to Kruse's articles on the Bureau tests of June and July, 1920, ever appeared in *QST*.

[41] See 13 to 14, September 1920 (Volume IV).

[42] On the October (1920) tests, I have found only the announcement, at 11, October 1920 (Volume IV).

On the January (1921) tests, see 25 to 26, April 1921 (Volume IV).

On the April (1921) tests, see 25 to 26, April 1921 (Volume IV), as above; and also see April QSS Schedules, at 23, April 1921 (Volume IV).

[43] 16, January 1920. It was there announced that Armstrong's paper on the *superheterodyne* would be the first one published.

[44] The title was: "Speaking of Grounds."

[45] On all this, see the editorial called "The Lid," at 13 to 14, August 1919.

[46] See J. O. Smith's report, at 16, September 1919.

[47] See the editorial called "Unlawful Transmitting," at 22, June 1920.

It is true, however, that the outstanding amateur station of Louis Falconi, at Roswell, New Mexico, operated under the call "LF," for a while, before receiving his Special-Station License. But he must have had some written authority to do this. See 39, February 1920; and 40, March 1920.

[48] See Seefred Bros.' report, at 40, February 1920.

[49] See "Strays," at 43, July 1920.

[50] See editorial called "A Lesson," at 17, February 1920.

lower Texas coast in middle September resulting in the destruction of Port Aransas and immense loss of life at Corpus Christi, Clifford W. Vick, sometimes CV, of Houston, Texas, rose to sudden fame and overnight became a celebrity in his home city. Vick is a typical American amateur and of course was on the job at his station, and gave the Houston papers the surprise of their lives when he was able to get more real news on the hurricane than any of the national news agencies. In fact he gave to the people of Houston the first authentic information of the storm's location and of the destruction taking place. . . .

This account leaves us completely in the dark as to how, and from whom, Mr. Vick picked up his information. No amateur station within the storm area is mentioned. Did Vick "listen-in" on Government hurricane warnings? Maybe so. But how did he obtain his information concerning the amount of destruction taking place? And why was this information superior to whatever news the national news-agencies were able to gather? Did he "overhear" some 600-meter "gossip" by ship operators? Or What?

This certainly is a "shining example" of how *not* to report an event of this type.

(e) *League Affairs:*

J. O. Smith, Traffic Manager of the ARRL, departed (on October 28, 1919) on a journey which took him to 20 states. He visited many amateur stations during this trip.[51]

An editorial, "Our New Directors," published at 23 to 24, March 1920, contains this interesting passage:

> . . . We've never had a meeting at which all the members of our Board could be present, for it takes considerably longer than the speed of radio waves to get up this way from Texas or Florida or California . . . but we do like to think of all the fun we would have when we can succeed in rounding up all our organization to a convention to be held in some central point, such as Chicago. Think of all our officers and all our operating organization meeting face to face. . . .

Amateurs were urged not to shut down their stations during the Summer of 1920, but to continue operating. See "Don't Give Up the Station!" (8, July 1920).

(f) *Radiophones:*

Robert F. Gowen, radio engineer for DeForest, operated a powerful v.t. 'phone transmitter at his home in Ossining, New York, on 750 meters. His call was HRL. He also operated on c.w. and m.c.w. See "Strays," at 24, December 1919.

Service's Report, at 26, May 1920, speaks of "recent" radiophone tests being conducted by the Western Electric Company, on wavelengths between 450 and 1,800 meters.

Walter S. Lemmon, in an article at 7 to 11, 16, June 1920, described the "Recent Development of Radio Telephones." The apparatus described was mostly W.E. and G.E. gear, furnished to the armed services. At 16, June 1920, Mr. Lemmon described some of the ship-to-shore work conducted between the USS *George Washington* and the big shore station at New Brunswick, New Jersey.

The Alexanderson high-powered long-wave alternator, at New Brunswick, was modulated (by some undisclosed means); and a "telephone patch" connected that station with Washington, D. C. A 3½-kw. v.t. transmitter, rigged for "duplex" operation, was used aboard the *George Washington*. Very good two-way conversations, between this vessel and Washington, D. C., via the 'phone patch, were interchanged up to a distance of 400 miles from New Brunswick.

(g) *Firsts, or Near Firsts:*

At 6 to 7, August 1919, the first published "bid" for the affiliation of radio clubs with the ARRL appears.

A letter from *QST*'s cartoonist, Donald A. Hoffman (ex-8ADU), published at 29, August 1919, gives a suggested *form* of QSL card.

At 29 to 30, August 1919, there appears what I believe to be the first published suggestion that the government appoint amateurs to "police" the air, and thus to minimize QRM. Hubert Woods, of Glendale, California, wrote the letter in which the idea is set forth.

The first regular "calls heard" lists to be published after World War I will be found at 14, December 1919.[52]

A system of installment buying of radio apparatus (called RVA Service) is noted, under "Strays," at 24, December 1919. J. Donald Vandercook, of Lombard, Illinois, conducted it.

The first "transcon" to be sent across the country after World War I is recounted at 13, January 1920. It occurred on the night of December 4th to 5th, 1919.

It is not clear who had the distinction of being the first amateur to handle a message with the famous Navy transatlantic plane, "NC-4," when she was on a recruiting trip which took her to some Gulf ports, and up the Mississippi river. It was either C. W. Vick, of Houston, Texas, or Mr. Crowdus (9BR), of St. Louis, Missouri.[53]

The first instance of the use of amateur field stations, to "time" motor-boat races, is recited at 38 to 39, July 1920. The Radio Club of Burlington (Iowa) set these up, at a regatta held at that city under the auspices of the Mississippi

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[51] See "A Little Journey," 15 to 16, 18, March 1920.

[52] At 22, November 1919, Charles A. Service, jr., had reported reception of 5 local amateurs, at 3QZ, on some unnamed date; but he had not listed the calls themselves.

[53] J. O. Smith's report, at 34, February 1920, says: ". . . The Houston, Texas, newspapers record the fact that one of the League's traffic officers, Mr. C. W. Vick, 1918 Smith St., Houston, had the distinction of working the NC-4 on her recent flight between New Orleans and Galveston. It is stated that Vick was in communication with the plane during the entire flight. . . ." See, also, Autry's report at 39, February 1920.

At 44, February 1920, under "Strays," we find the following: ". . . In late November, the Navy Seaplane NC-4, of transatlantic fame, made a trip up the Mississippi river on a recruiting tour, and the enterprising Mr. Crowdus of 9BR, St. Louis, arranged to establish communication with her operator, Lt. Rodd. From St. Louis to Hannibal, the next stop, uninterrupted communication was maintained . . . *This is the first time we have heard of an amateur station working a plane.* . . ." (Italics added by S.B.Y.)

Valley Power Boat Assn.

In addition to the timing stations, the club operated station 9ACZ, to relay messages, free of charge, for persons attending the regatta, and to broadcast race results.

(h) *Wit and Humor:*

"S.O.L.," by Irving Vermilya, found at 6 to 7, 25, December 1919, reflects his first impressions of life in the U.S.N.R.F., during World War I. It also tells us how "old" WCC (at South Wellfleet, Mass.) was "taken over" by the Navy, and dismantled.[54]

M. Adaire Garmhausen, in "How to Build a Wireless Station," gave us a good record of a lady operator's attitude toward the problems of ham radio. See 55 to 56, July 1920.

(i) *War Service Records:*

In Entwistle's Report, at 17, August 1919, I find this passage:

. . . Radio Inspector Mr. Arthur Batcheller, at a meeting of the New England Amateur Wireless Association, said that out of about 2400 amateurs in the First District about 1100 were in some branch of the service. . . .[55]

(j) *Curiosities:*

Present day collectors of old issues of *QST* will weep over this one: At 36, August 1919, an ad by the League reads as follows:

Back Copies of *QST*

Have your *QST* files complete. Some numbers are already exhausted. December, 1915; January, March, April, and September, 1916, available at 25 cents per copy, postpaid. All issues after September, 1916, 15 cents postpaid. . . .

At 30, September 1919, an item under "Here and There" announced:

. . . Mighty good chances in the commercial game, right now. A good operator can get $125 and up a month, and food, and all the schools are enjoying a huge business. . . .

The "Otter Cliffs," Maine, station of the U. S. Navy was referred to as the busiest coast station in the country." [56]

An item in Entwistle's report, at 17, October 1919, is rather startling:

. . . We have already begun negotiating with British amateurs and amateurs in the Azores for a proposed transatlantic relay. What can you do to help us? . . .[57]

A letter from Henry Klaus, at 29, October 1919, gave "hams" who were located in the country towns something to think about:

. . . I wonder how many radio enthusiasts realize the many possibilities of amateur wireless, particularly in the country districts.

For instance, before the war W. S. Taylor of Minonk, Illinois, and the writer at Eureka, Illinois, exchanged news items by wireless for each edition of the local papers where this "press service" was printed under the pretentious heading "By Radio."

Before the closing of amateur wireless the board of supervisors offered to pay us to keep the courthouse clock set right. On the last presidential election we kept out a bulletin board almost all night. . . . (Italics added by S.B.Y.)

Some items published about F. H. Schnell gave a few of the interesting incidents of his U.S.N.R.F. career, during World War I, and in the months just following it. Schnell certainly was "around" at historic moments:

. . . While in uniform several incidents befell him which any radio man would cherish: While at Belmar he copied the first message from Rome (IDO) to President Wilson; copied the armistice acceptance message from Nauen (POZ) while at Washington; and his was the honor of transmitting to POZ the first message since our entrance into the war.[58] . . .

He also made three trips with the presidential party, on the USS *George Washington.*[59] On one of them (when President Wilson landed at Boston, Massachusetts), the vessel exchanged heavy traffic with WBF (Boston), which was then in charge of E. A. Gisburne, another famous amateur, and the holder of the Congressional Medal of Honor.[60]

Mr. A. H. Wood, jr., at Winchester, Massachusetts, began broadcasting music via radiophone, on 200 meters, from his home. Concerts were scheduled at 3:00 P.M., on Sundays, and also on week-day evenings at some undisclosed time.[61]

C. D. Tuska began playing records, and reading scientific papers, over his radiophone (at Hartford), to entertain local "hams." [62]

During radiophone tests between the USS *George Washington* and the long wave station at New Brunswick, New Jersey, in the summer of 1919, the ship's signals were fed into a transmitter at the shore station, and were reradiated on a wavelength of 13,600 meters. This was also done on 8000 meters.[63]

9ZN and NSF transmitted the "moves" in a championship chess game, on waves below 275 meters, on the night of April 14, 1920. Mr. Norman T. Whitaker, of the Capital City Chess Club, played Mr. Edgar Lasker, of Chicago. The players remained in their respective cities, and battled for 5 hours, via the ether waves.[64]

(*Continued on page 152*)

[54] See, also: 33, February 1920 (letter); and 16 to 17, August 1920 (Volume IV).

[55] The figures don't "sound right" to me.

[56] 3, October 1919, in "Building Your Own C.W. Apparatus."

At 20, January 1920, this same station was said to be "the premier receiving station of the Navy during the war." (Entwistle's report.)

[57] I have been unable to pick up the "thread" of this particular story anywhere else in the first 5 volumes of *QST*. Apparently Mr. DeSoto's "Two Hundred Meters and Down" is silent on the point, also.

[58] 30, November 1919.

[59] 30, November 1919.

[60] See note on 24, February 1920, in the account of the "Boston Conference" (Entwistle). Also, see 20, January 1920, as to how Gisburne won the Congressional Medal, for bravery under fire during the Vera Cruz (Mexico) troubles, prior to World War I. He lost a leg down there. (Entwistle's Report.)

[61] See "Strays," at 44 to 45, February 1920.

[62] See 37, May 1920 (Radio Club of Hartford).

[63] See letter from Theo. A. Gaty, 3CV, at 46, April 1920.

[64] 19 to 20, June 1920. The account concludes with these words: ". . . Chess by wireless is of course not new but this is probably the first time it has been done over these distances and on amateur waves. . . ."

YL NEWS and VIEWS

BY ELEANOR WILSON,* W1QON

KL7 YLs

There are approximately thirty licensed women amateurs in Alaska. To some of these YLs, ham radio is not only an interesting and pleasureful hobby, it is often their only link with the rest of the world.

When one is completely isolated for weeks during "freeze-up" and "thaw-out" periods, as KL7OT, Lydia "Buddy" Clay, has been many times, amateur radio assumes new importance and one appreciates more deeply what fellow Amateurs are able to do.

A book could be written about the experiences of KL7 YLs. We are able to introduce only a few of them at this time, but hope to bring others to the fore later.

KL7ARU — Celia Hunter; licensed in 1952; manager of a Fairbanks travel agency and part owner of a summer camp at Camp Denali, deep in the bush country; has a commercial pilot's license and instructor's permit; lives alone in a veritable "do-it-yourself" log cabin. Her chief interest in amateur radio is local (intra-Alaskan) communication — "this is a big country, and telephone service is virtually nonexistent." She operates mostly on 75 with a Lettine transmitter and an SX-71.

KL7ZR — Rose Cowles; Fairbanks; licensed 1948; OM KL7AN; had the first dog mobile in Fairbanks driven by nine Samoyed dogs using the Alaska Amateur Radio Club call, KL7KC. "While proceeding up Second Avenue calling 'CQ', we were heard in Massachusetts." Rose was president of the Alaska ARC in 1952. She operates 10-meter 'phone with a 45-watt home-built transmitter.

KL7AVO — Virginia Saxon. OM KL7AVK is a doctor in charge of the Alaska Native Service Hospital in Juneau. Virginia's third harmonic was born during a howling blizzard on St. George's Island, one of the seal-famous Pribiloffs in the Bering Sea.

KL7AX — Verna St. Louis; Kodiak; licensed in 1938.

KL7OT — Lydia "Buddy" Clay; licensed 1947. During flood periods Buddy and her OM KL7EM have provided the only communications for the area around Aniak. She writes that "signals have been very poor up in KL7 land for the past several years so activity on any other band except 75 has been curtailed. Even 75 has been poor, but it is opening up and getting back to normal."

KL7BEW — Thelma "Jean" Baker; licensed 1954; lives with her OM, KL7ASQ, at a v.h.f. repeater station in Kaltag. "Our nearest neighbor is 5 miles up river, so if I want to chat with anyone other than our family, it has to be via radio. It is fun to talk to the various YL operators in Alaska, and we can have coffee together, tho' not in the same room. Radio is vital to anyone in this part of the country. We order supplies, fresh produce, etc., via ham radio (to say nothing of hi-fi and radio gear!). I teach our eight-year-old boy, and when signals are good, the teacher lets school out early or declares recess."

KL7RN — Jeanne Collins. Her experiences in the north country could provide a Hollywood script writer with background material for a thrilling movie. KL7ARU writes of her — "She isn't afraid to tackle anything — she can wire a house, fly a plane, or run a diesel snow-go with the same competency." Jeanne is now at Lake Minchumina with OM KL7IS. She is active on 75 and 20 with a home-brewed 500-watt rig, a Collins 75A1, a V antenna and a 3-element rotary. She recalls her five years at a CAA station when her rig was virtually the only contact with the world. Mail arrived there only ten times a year.

KL7ANG — Nancy Walden; Anchorage; licensed 1952, OM KL7BK; operates 75 and 80; is particularly interested in mobiling.

KL7BKA — Bernice Helen Hane; Anchorage; licensed 1955.

KL7BHA — Blanche Drake; Anchorage; licensed 1951, OM KL7BGH; operates 3995 kc.

WL7BKS — Mary Tresidder; Anchorage; licensed 1955; operates 80 and 40 c.w.; OM KL7BES; 2 jr. ops.

WL7BKQ — Patricia Lorentzen; Anchorage; licensed 1955; operates 3706 and 7187 kc.; OM WØKSA/KL7.

KL7AVO and KL7AVK with their harmonics.

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

KL7ARU

KL7BEW

WL7BJD

KL7AZI — June Welling; Anchorage; licensed 1948; operates 80, 40 and 20; OM KL7MS.

KL7AYA — Doris Edwards Staley; Anchorage; licensed 1950; operates 75; OM KL7AXZ, 3 jr. ops.

KL7ALZ — Geraldine LaVonne Nichols; Anchorage; licensed 1951; operates 75; OM KL7MZ; 4 jr. ops.

KL7YG — Marge Sappah; Anchorage; licensed 1949; operates several bands; OM KL7PJ.

KL7CY — Flo Hart; Anchorage; licensed 1938; operates several bands; OM KL7BN.

WL7BJD — Mary Olendorff; Anchorage; licensed 1955; son KL7BCH.

Margie B. Reich; Anchorage; awaiting Novice call; OM KL7AVV.

Mary, WL7BJD, has reported the organization of a YLRL unit at Anchorage during February of this year. Twelve Anchorage YLs attended the first meeting. KL7YG was elected Pres.; KL7AZI, V.P.; and KL7ANG, Secy. Treas. WL7BJD and KL7AYA were appointed Field Day Chairmen. The club's charter will be held open until July 22nd, date of the Anchorage Amateur Radio Club annual Hamfest, in order to give all of the YLs in the territory a chance to become charter members.

Our salute to the YLs of KL7 land. Many of them express a desire to work Ws more frequently. Let's try to get together with them as often as conditions permit.

Pre-YLRL Convention Notes

General information concerning the First International YLRL Convention appeared in this department for February. The following additions and corrections have been received from the Convention committee:

John Reinartz, K6BJ, Director Amateur's Service Bureau of Eitel-McCullough, Inc., will be a guest speaker. Banquet tickets for OMs are $6.00 (not as originally given). YL tickets, to include luncheon and banquet, remain $10.00 each. Plans for the family picnic on June 26th have been discarded. Reservations should be made by June 15th.

YLRL members and interested amateurs wish the Convention Committee every success in sponsoring the First International Convention of the Young Ladies' Radio League.

June, moon,
tune, soon,
Field Day!

It doesn't rhyme, but it is fun and makes sense — to *participate* in one of ARRL's most interesting annual activities.

Past FD records reveal comparatively little YL participation. Take it from those who did meet the challenge — there's nothing like it!

How about it, girls? Whether you join in as a single op or member of a team or club, let's reserve June 25th and 26th for Field Day only.

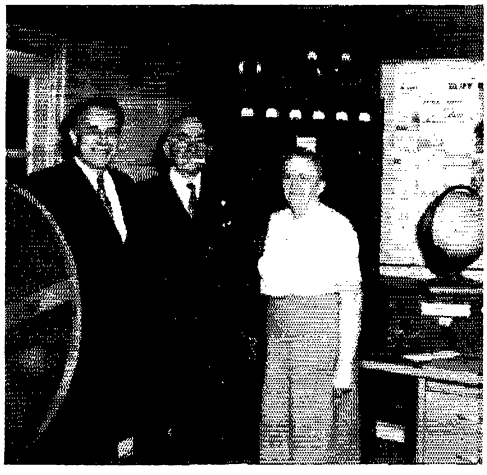
Those YLs who plan to attend the First YLRL International Convention scheduled the same week end are of course excused. Plans for the affair had gone too far before the Convention committee realized that the two events coincided.

See page 46, this issue, for complete FD rules.

Keeping Up with the Girls

The 75-meter YLRL 'Phone Net conducted by W4HLF, Arlie, will have its second annual picnic on July 31st at Big Meadow, Skyline Drive, Va. All licensed YLs and families welcome. . . . Newly-licensed JA6KH, Miss Kazuko Hiraki of Kyushu, Japan, is the sixth JA YL reports K6DV. . . . W5VXK, Delores, was televised by a local TV station from her hospital bed while reporting the arrival of her new daughter to W5YKE on 75 meters. . . . WØQIW is a thirteen-year-old YL in Denver who received her Novice in '53 and her General in '54. Anne works 40 and 20 c.w. Her dad is WØHXX. . . . The *Reporter Dispatch* of White Plains, N. Y., carried an article about exchanging Girl Scout information via radio. From K2DYO, a troop of 12-year-old Valhalla Girl Scouts queried another troop gathered at the QTH of W1BCU, Peg, Foxboro, Mass., about patrols, badge work, and camping activities. . . .

L. to r., C.D. Director Livesley, Gov. Grunning, and Rose Cowles, KL7ZR.



Two highly active KL7 YL operators are (*l. to r.*) KL7CY and KL7RN.

Twenty-two YLs were among the 600 amateurs who attended the mid-winter hamfest in Grand Rapids, Michigan, on March 19th. The YLRL photograph album and scrapbook were reviewed and plans for forthcoming conventions were discussed. Those in the photo are: (*seated, l. to r.*) W8LIV, WN8UVV, W8FPT, W8ATB, W1YLP (ex-KH6TI); and W8MBI; (*standing, l. to r.*) *W8s* SJF, QOQ, ORP, WN8UAU, *W8s* UAP, RIR, W9AQB, *W8s* KLZ, ONI, NDS, QOM, and W9LOY. Four others who were present, but not shown, are W8EIR, *WN8s* QOX, QOY, and QPT.

DL4HO and DL4BS are new calls of ex-W5RFK, Deloris, and OM W5RFJ, formerly of Holloman AFB, N. M., for the past seven years. . . . *WN1s* EEW and EJJ, Laurie and Ada of Wrentham, Mass., and WN9MXI, Helen, of Chicago, are new Novice licensees. . . . WN1CKO is proud to be a YL after "so many years just being an XYL." Helen and sister Vermont YLs *WN1s* CML, CMY and DAP are studying for General Class tickets. . . . Some 300 articles on YLRL members written by YLRL Publicity Chairmen W9YBC, Gloria, and W6LBO, Mary, were released to newspapers throughout the country on May 1st as part of a YLRL program to publicize amateur radio for benefit of the hobby in general and the YLRL Convention in particular. . . . OM G3IDG writes that GM3JGU, Freda, of Glasgow, should be added to the list of YLs in the United Kingdom. . . . The Texas Medical Center News Service publication lauded W5ZPD, Cindy, for the efficient way she and EC, W5SMK, handled traffic for a patient in a Houston hospital. . . . For winning a LARK contest for the third consecutive time, W9LOY, Cris, keeps the club cup she has held temporarily. . . . During the six months she was a Novice, W5ERH worked and confirmed 46 states. Immediately after becoming General Class in Nov. '54, she made up the lacking 2 states for her WAS — all on 40 c.w. using 35 watts and a vertical antenna. Lillian also has WAC. . . . K2AMZ, Alda, is NCS for three sessions weekly of the SRN and IPN. . . . Fourteen-year-old W3UKJ is NCS for the Pennsylvania 'Phone Net on Friday. Mena received her Novice ticket when she was just eleven. . . . W4CZZ, the OM of W4BAV, Catherine, passed away on March 1st. . . . K6DLL/W4STU, Marcia, has joined her OM, W4SWF, in Japan. She recently paid a visit to W4VCB, Ev., who is also residing in JA land. . . . W4TTM, Alice, has been elected Treas. of the Pensacola RC; W4UMM, Sara, is Secy. of the Confederate Signal Corps RC; and VE3ABT, Doreen, is Pres. of the Fredericton RC. . . . K4APF, Ann, has dropped her Novice "N" and is now active on 75 meters. . . . VE3AJR, Dell, has built a preselector which she feels greatly improves the performance of her receiver.

The 5th annual W1 YL luncheon held in Boston on April 23rd marked the largest gathering of YLs in New England to date. Of the 74 who attended, all but 10 were licensed YLs. The 6 New England states, NewYork, and New Jersey were represented. Attending a ham gathering for the first time in her 22 years as an amateur, guest of honor W1HUH, Sister Mary Emiliana, R.S.M., delighted the audience with an account of her activities. See *QST* for December, 1954, for further information about her. Luncheon Secy.-Treas. Barbara, W1TRE, announced that a New England YL club will be organized. All licensed W1 YLs are invited to the initial meeting scheduled for September 24th in Boston. (*Photo by W1UPL*)

• On the TVI Front

TVI IN NEW ENGLAND

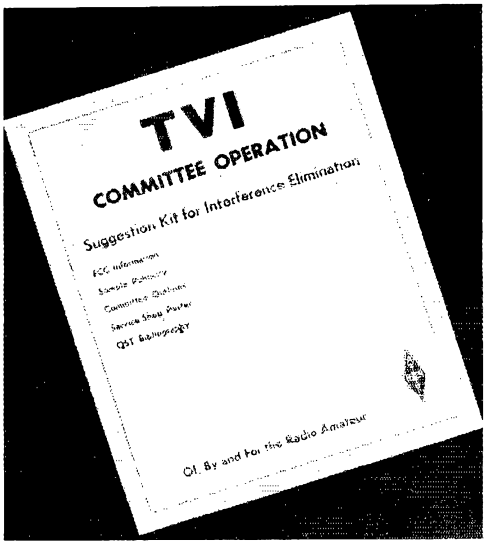
As a result of a survey of New England amateurs conducted by ARRL Director Philip S. Rand, W1DBM, the following information concerning TVI was derived. Figures given are based on data received from approximately 50 per cent of those to whom questionnaires were sent.

59 per cent had no TVI
32 per cent had slight TVI
7 per cent had medium TVI
2 per cent had bad TVI

These findings are a good indication that modern TVI reduction techniques are paying off and that TVI is well on the way to becoming a minor problem.

GUIDANCE MATERIAL FOR TVI COMMITTEES

Prospective interference committees, as well as those currently active, may wish to note the availability of a completely revised assortment of guidance material for interference elimination. This ARRL "suggestion kit," tailored to the



needs of TVI committees, contains FCC information, publicity samples, committee outlines and forms, a service-shop poster, *QST* bibliography, and other material. Your committee's copy of this "TVI Committee Operation" kit is ready for the asking from ARRL headquarters.

TVI BOOK

Phil Rand advises that the stock of the 3rd edition of his TVI book is now running low and no further reprinting is contemplated. If you don't have a copy, you'll probably want to join the thousands who already have it. Simply write Miss Ann Smith, Remington Rand, Inc., 315 Fourth Ave., New York, N. Y. Please include twenty-five cents to cover mailing costs.

INTERFERENCE FROM VFO COIL

After trying to eliminate TVI by using shielded wire, shielding, and other *Handbook* methods, W1YYB discovered that interference was caused by a coil in his VFO resonating around Channel 4. The problem was solved by removing 3½ turns from the inductor, thereby shifting the harmonic of the unwanted resonance point outside of the channel.

HAMFEST CALENDAR

CONNECTICUT — June 19th, at the club grounds at the New Haven Airport. A full day of events and food has been planned for you by the committee of the Fort Hale Mobile Radio Club. Registration begins at 10 A.M., and there will be speakers, displays, and contests throughout the day. XYL activities also. The $3.00 fee includes light lunch and supper. Make checks payable to Fort Hale Mobile Radio Club.

KANSAS — The Central Kansas Radio Club, Inc., is holding its annual Hamfest at Kenwood Park, Salina, Kansas, on June 5th. Bigger and better than ever. Price 75 cents per registration. Licensed hams and XYLs are eligible for registration.

MISSISSIPPI — The second annual ham picnic staged by the Cleveland (Miss.) Amateur Radio Club will be held at the Firemen's Club on Lake Beulah near Beulah, Miss., Sunday, June 5th.

OHIO — The Ohio Valley Amateur Radio Association Picnic will be held at the Cincinnati Police Firing Range, Evendale, Ohio, Sunday, June 12th. Bring the family and enjoy a basket picnic. Special activities for the ladies; games of all kinds. Admission fee $1.00 for adults and 25¢ for children.

PENNSYLVANIA — The Sixth Annual Gabfest of the Uniontown Amateur Radio Club will be held Saturday, June 11th, at the clubhouse on the Old Pittsburgh Road, 2 miles north of Uniontown, Penna. The program will include an auction of radio gear, movies of interest to all, horseshoes, and card games. W3PIE will operate 'phone on 80, 40, and 10 meters. Refreshments at nominal cost. Free coffee, baked beans, potato salad, potato chips and pretzels. The clubhouse will be open at noon, so come early and stay late. Auction will begin at 7 P.M. and will end with movies. This is a stag affair. Registration fee $1.50. For additional information, write Uniontown Amateur Radio Club, P. O. Box 849, Uniontown, Penna., or phone GE 8-8146.

TENNESSEE — The Mid-South Amateur Radio Association will hold its 3rd Annual Hamfest at Ellendale, Tenn., near Memphis, on June 19th. Mobile units will monitor 3980 kc., 29.627 and 145.5 Mc., to offer road guidance. Supervised play for the children, good food and drink. Advance reservations $1.75, at the gate $2.25. For tickets and motel or hotel accommodations contact Melvin Jerkins, W4STI, 2709 Skyline Dr., Memphis, Tenn.

SASKATCHEWAN — The Saskatchewan Hamfest will take place in Saskatoon, July 1st, 2nd, and 3rd. There will be an ARRL meeting, c.w. contest, etc., with banquet on the evening of July 1st. Tours and lectures and general get-together on July 2nd. Field Day, hidden transmitter hunt and sports on July 3rd. Special events are being arranged for the whole family. For reservations and further details contact Mrs. Madolyn Sinclair, Hamfest Mgr., 411–33rd St., W., Saskatoon. Registration $3.00 single, $5.00 a couple.

Correspondence From Members

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

RADICAL RAPP

1161A Irving Avenue
Glendale 1, Calif.

Editor, *QST:*

I have just finished reading Mr. Rapp's article (April *QST*) concerning, "A Radical Approach to Single Sideband." Last April, I read his article about a radical new receiver. Not until I finished this year's article did it become apparent that both articles were feeble attempts at April Fools' Day hoaxes.

Perhaps I am naïve, but I was thoroughly taken in by last year's receiver article. Working for an engineering firm, there is nothing that seems completely impossible to me. A fellow employee read that article and found considerable merit in the idea. We discussed the article at some length. On further investigation, it does not seem as farfetched an idea as you might at first imagine. . . .

Whether or not you intended these articles as complete hoaxes is still not clear to me. One thing, however. You have caused me to wonder if anything appearing in the April issues is ever to be taken seriously. For example, I am very interested in building one of the new two-meter beams, as described on page 23 of the April issue. I am frankly afraid to do this, however, for fear that following my many hours of labor in getting the antenna constructed, I would find that here again was a *QST* fraud, and that the beam would work out about as good as a nonresonant length of sewer pipe.

I would like to stress one thing: that you have in your vast reading audience a number of Novices who hang onto every word in *QST* as though it were a word uttered by the Almighty himself. Many Novices — and obviously, even those who are not Novices — are apt to believe in articles of this type. A Novice is inclined to discuss *QST* articles with older amateurs in an attempt at clarification, and it would certainly be a demoralizing and degrading thing for a youngster if he were to be laughed at and ridiculed for taking seriously something that the older hams promptly regarded as pure fiction. Publishing the articles is fine; I enjoy them. But the manner in which they are presented reflects some rather shallow editorial thinking. Let's label a hoax a hoax. Let's face the fact that while to some it might appear immediately as a gag, others need to be hit over the head with a hammer to know that they are being taken in. And still others will dig more deeply into the project and actually attempt to build the darned thing!

Perhaps, after all, that is your aim. Maybe you understand that there is some technical merit in the article and use it as "food for thought." But, whatever your thinking is, I would appreciate knowing it a little better, and believe that there are others like me who resent the implication (whether true or not) that we are so dull that such an April Fools' joke can be so perpetrated.

I believe that you have, in all other respects, an excellent magazine and that you are rendering a fine service to amateurs.

— *R. F. Van Wickle, W6TKA*

22021 Martinez St.
Woodland Hills, Calif.

Editor, *QST:*

. . . It seems to me that you boys as technical editors should be ashamed to let a thing like this appear. If it were intended as humorous fiction, it should be so labeled, because I believe it is sufficiently misleading to be taken by our more gullible neophytes as the "straight dope."

It is committing intellectual and professional heresy to even remotely associate "old fashioned s.s.b." with Rapp's scheme. To dream that a positively or negatively restored (d.c.) signal on a reactance tube modulator will produce anything resembling a s.s.b. signal is the wildest reasoning I have ever seen — much less to intimate that it has advantages (ouch!) over it. Unless Rapp doesn't believe in the validity of the Fourier expansion theorem (or is ignorant of it), such an arrangement would produce an f.m. signal in which the carrier frequency would wander always higher or lower (depending upon restoration polarity) of the quiescient (no modulation) frequency in proportion to the average value (d.c. component) of the modulating voltage. The a.c. components of the modulating voltage couldn't produce anything other than the normal symmetrical (double) sideband frequencies with spectrum bandwidth depending upon the index and centered about the particular instantaneous carrier frequency which is certainly *not* stable! Contrary to popular belief the carrier frequency remains fixed and varies in amplitude in f.m.; neither the frequency nor amplitude of the carrier varies in a.m. It is basically physically impossible to have an f.m. s.s.b. system with suppressed carrier because the carrier must vary in amplitude with modulation, making reinsertion at the receiver impractical. N.b.f.m. is only a special case where the index is small enough so that the carrier variation (amplitude) is small and the first-order sidebands are roughly proportional to the modulating voltage.

It is indeed difficult to estimate the enormous potentiality Rapp's idea has for producing unnecessary QRM. There are already many so-called n.b.f.m. rigs on our bands at present, and the most obnoxious ones approach operation under this condition. This comes about where the reactance tube is excessively biased, causing a large variation in d.c. plate current as a function of modulation amplitude (akin to plate rectification in amplifiers). These signals give an idea of what should be avoided in modulation systems.

If I'm wrong about this, please straighten me out, but if not please square Rapp away and see if you can prevent anyone from building a mess of this type and thinking it has anything to do with s.s.b.!

— *Dave Mann, W6ILY*

330 N. W. 191 St.
N. Miami, Fla.

Editor, *QST:*

I would like to have Mr. Larson E. Rapp's, WIOU, address. April '54 *QST* (page 37) gave it as Kippering-on-the-Charles. My letter came back — no such P. O. in state named.

— *John H. White*

4525 Beach Ct.
Denver, Colo.

Editor, *QST:*

The Call Book lists W1OU as Robert J. Slagle, Poplar Point, Wickford, R. I. Now who is Larson E. Rapp? . . .

— *Larry Daily, W0VIH*

[EDITOR'S NOTE: OM Daily has an old Call Book.]

129 Ranchitos Road
Albuquerque, N. M.

Editor, *QST:*

ADDITION OF OPPOSITE AND NEGATIVE CLIPPER WILL REMOVE UNWANTED CARRIER ALLOWING 100 PER CENT SUPPRESSION OF CARRIER. REGARDS.

— *Thomas F. Marshall, W5RFF*

1607 Susitna St.
Anchorage, Alaska

Editor, *QST:*

It was with intense interest that I studied the rather technical aspects of Larson E. Rapp's recent article con-

cerning single-sideband f.m. It appears, however, that Mr. Rapp overlooked one feature in his investigation, which should solve a problem which, from the conversations one overhears on the phone bands, is widespread.

How many times have amateurs heard the complaint "your modulation has too much bass!" or "your audio doesn't appear to have any 'highs' in it!" For those hams who desire to hear the higher frequencies, the way to accomplish this is amazingly simple, when one recalls that the second pair of sidebands of an f.m. signal spin around the carrier frequency at twice the frequency of the first pair, the third pair at three times that of the first pair, and so forth. Ergo, if we use wideband f.m. in this process, we end up with all kinds of sideband pairs.

Assume we utilize wide-band f.m. with Mr. Rapp's technique, and an operator is working someone on the first sideband who, in his opinion, has "too much bass." This problem is immediately solved by the operator tuning his receiver not to the first sideband, but the second. The detected signal is now raised an octave. In the event this is insufficient, he can tune up (or down, depending on whether we are utilizing "positive" or "negative" modulation) to the third, fourth, fifth, etc., until the received signal is at the desired pitch. The ultimate, of course, is tuning to the sideband far enough removed from the carrier that will result in the detected frequency being inaudible to the human ear, but will encourage the St. Bernard to move from your favorite easy chair in front of the rig.

There are, admittedly, a few insignificant details which are not quite ironed out at the present time. However, the groundwork for this idea is being sent along to Mr. Rapp, together with permission to use this brief engineering report in any way he sees fit.

— *Jack Wichels, KL7ADQ*

212 N. Maple St.
Mt. Prospect, Ill.

Editor, *QST:*

Mr. Rapp's ideas were so striking I decided to give the system a try. Using a Hewlett-Packard Harmonic Analyzer, Altec-Lansing Intermodulation Analyzer and a Panoramic Analyzer, I set up a phasing system at 450 kc., and to be sure the sideband was suppressed, combined it with a Collins Magnetostriction filter. The results were amazing! Do you suppose this was the first application of a "phasilter?"

In *hock veritas*, indeed! In fact, I don't even know where my next electron is coming from! *S.s.s.c. est omnes in partes duos divisa!*

— *Walter C. Werner, W9RFR*

POOR SPORTS

8301 No. 28 Ave.
Omaha, Nebr.

Editor, *QST:*

Apparently the FCC is still issuing a poor-sport class license. Last evening while listening to a few of the boys on s. s.b., a holder of the poor-sport class license was sitting on the s.s.b. freq., swishing a VFO back and forth for about 10 minutes, keying at times, but of course forgetting to give a call.

Some of the fellows have been complaining loud and long about the way s.s.b. tears up the band for 20 to 50 kc. Perhaps these fellows should reconsider. My receiver is only a little NC-98; however, I don't have this trouble. It would seem that there is a great need for a little practice and information on the art of using a receiver properly, then I doubt if there will be all this talk of incompatibility. My receiver is certainly not the ultimate; however, I find no difficulty in copying a.m. signals within 4–5 kc. from a strong s.s.b. signal, a feat I often find difficult on two a.m. sigs. Of course there are poor a.m. and s.s.b. sigs, though I believe the greatest trouble is poor use of a good receiver.

We are just in a hobby so why all the poor sports? If someone QRMs me I just close shop. I don't sit on the freq swishing a VFO. The boys didn't do this when an a.m. sig QRMed them before; why now? Other poor sports and such are the ones out of the band chasing DX, cussing and a terrific number of both have been heard at this location recently. Novices running over 75 watts and an endless number of others. Poor sports take notice! If you can't participate in a hobby according to the rules, stay off.

— *Alan McMillan, WØJJK*

NEW STANDARD

1238 S.W. 137th
Seattle, Wash.

Editor, *QST:*

It is unfortunate that *QST*, in order to conform to standardization, must forego its own policy. I refer to the new American Standard for graphical symbols in April *QST*. Is one to suppose that the omission of the "hook" where one wire crosses another without making a connection in schematics will result in more errors and confusion in future issues of *QST*?

In the January 1954 issue of *QST* in "Technical Topics" the following appears on pages 43 and 44 under the heading of "Crossovers and Long Leads":

"In the matter of crossovers, there are again two schools of thought. A common practice in industry is to show a connection with a dot and no connection with no dot, as in Fig. 6A. This developed quickly during World War II, since it saved the draftsman's time not to make the crossover loop of Fig. 6B. Admittedly, it is fast, but it is more prone to error than the method of Fig. 6B, because leaving out the dot means no connection at the required point. *QST* uses the second method, as better insurance against errors and for, we think, better readability."

The school of thought to which *QST* formerly belonged will probably die out quite slowly even though a victim of standardization.

— *A. L. Jennings, W7EZJ*

COMPLETE RIG

Nipper's Hr.
Notre Dame Bay, Nfld., Can.

Editor, *QST:*

For two years I have been reading, with interest, the correspondence section of *QST*, and note with dismay that some correspondents would like to acquire a 'phone license, but despise c.w. To me, this doesn't seem logical; for who would want to lose out on the thrills of a good c.w. QSO? Personally, if I had not learned International Morse and acquired my Proficiency Certificate in advance, my A3 license would not be worth two cents in my estimation. If Mr. getter-of-an-easy-license was suddenly requested at any time to handle some urgent traffic by International Morse, would he feel happy in saying "I do not know the code"? I think not. After all, his priceless receiver has built into it a beat-oscillator section, which is mainly for copying c.w. Surely he wouldn't want it to rust out.

To really appreciate ham radio, first be a brass-pounder; for whether your rig be factory or home-built, it would not be complete without a key, an active key.

— *Reg. Lush, VO3H*

EXAM FEED-BACK

230 Harrison St.
Passaic, N. J.

Editor, *QST:*

I never before sent a letter to any editor, but W8EOY's sarcasm (page 150, April *QST*) has prompted this one.

I think there are many, like myself, whose vocations are entirely unrelated to radio; who enjoy QSOing and regard radio as a fascinating hobby, not as a means of demonstrating our superiority. On behalf of these unfortunates, I wish to apologize to those who have a technical education in electronics or television, and feel as the above mentioned gentleman, when we don't appreciatively oh and ah after he spends ¾ of an hour describing how he connected his variable thingamabob to a reverse inverse feed-back circuit and then proceeds to describe his rig to the last bolt.

I, for one, would be delighted to instruct Mr. Davis in one or two of the minor complexities of the legal field just to watch him squirm on an exam in which his background was limited to what he could pick up in hard-to-come-by spare time.

I would also like to thank those hams who give of their time, in the true spirit of fraternalism (which it has been my delight to find in hamming), to help fellows like me to gain experience and get that coveted General even though we don't have the time and experience to build our own rigs.

— *Ron Levine, KN2JXB*

NEW BOOKS

How To Locate and Eliminate Radio and TV Interference, by Fred D. Rowe. Published by John F. Rider Publisher, Inc., 480 Canal St., New York 13, N. Y. 128 pages, including index. 5½ × 8½ inches. Price, $1.80. Paper cover.

This practical handbook outlines the general problem, describes methods of locating interference sources, and discusses means for eliminating or reducing the interference when the source is found. The book covers power-line noises, interference from electrical appliances, fluorescent lamps, and TVI. A model interference ordinance is contained in an appendix. Tracking down interference sources often can be a tedious job, and the amateur who has the noise problem on his hands will find helpful suggestions here.

Ameco Amateur Radio Theory Course, published and distributed by American Electronics Company, 1203–05 Bryant Ave., New York 59, N. Y. 275 pages and appendices and sample examination papers. 6¼ × 8¼, paper cover. Price, $3.95.

Condensed elementary electrical and radio theory arranged in course form. The book is divided into three sections, the first covering direct current, magnetism, and alternating currents; the second, tube fundamentals and amplifier operation; the third, transmitting and receiving principles. Each of the fourteen lessons is followed by questions in the multiple-choice form used by FCC, and each section is followed by an "FCC-type" examination on the material contained in that section. Answers are given in an appendix. The ground covered is that necessary for all of the various classes of amateur operator licenses, plus such additional material as is necessary to round out the picture.

A Dictionary of Electronic Terms, published by Allied Radio Corporation, Chicago 80, Illinois. Edited by Gordon R. Patridge, Ph.D., Purdue University. Over 150 illustrations and diagrams of components, equipment and electronic circuits. 72 pages, 6 × 9, paper cover. Price, 25 cents.

The new edition of this well-known "Dictionary" contains definitions of over 3500 terms used in radio, television and electronics. Over 150 illustrations and diagrams of equipment and electronic circuits are included.

Radio Receiver Servicing, by John T. Frye. Published by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. 5½ × 8½ inches, paper cover, 186 pages. Price, $2.50.

Three main divisions cover the problems of no reception, unsatisfactory reception, and intermittent faults. This book does not go into the theory of radio receivers or servicing, but describes typical symptoms and cures. Full of practical "hints and kinks," and highly readable. Should be very useful as a general trouble-shooting manual to the amateur as well as service technician.

Electronics for Everyone, by Monroe Upton. Published by The Devin-Adair Company, 23 East 26th St., New York 10, N. Y. 370 pages, including index, schematics, 5×¾ × 8½, cloth cover. Price, $6.00.

Written for the layman in easy-to-read style, this is a "popular science" type book introducing the reader to electricity, electronic phenomena, radio and television. Historical development plays an important part in the method of treatment.

Preview — DX Contest High 'Phone Scores

Nineteen Statesiders braved the heterodynes of the 21st ARRL International DX Competition to the tune of over 100,000 points claimed. Note that W1ATE, W2SKE/2 and W2SAI appear to share honors in shattering the latter's all-time 'phone high of 313,200 points registered in 1949. In this listing of leading W/VE scores, multipliers and contacts, an asterisk indicates a multioperator station:

W1ATE	497,182	238	695	W8RLT	89,916	127	236
W2SKE/2	451,130	229	664	W8LKH	88,832	128	232
W2SAI*	314,265	205	514	W3JNN	86,580	117	249
W4KWY	281,957	203	463	W3GHM*	75,864	109	232
W6YY	233,544	148	526	W8NWO*	74,466	126	197
W3DHM	230,640	186	414	W4NHF	68,526	94	243
W4OM	216,594	189	382	W8DUS	67,041	117	191
W2WZ	178,710	161	370	W3CUB	64,842	107	202
W3GHS	155,925	165	318	W5KBP	62,396	112	186
W7ESK	151,200	120	420	W6IDY	59,040	96	205
W9AVJ*	142,242	157	302	W7DL	58,976	76	262
W9EWC	138,600	154	300	VE3RCS*	56,244	86	220
W8BKP*	133,569	153	291	W4CBQ	55,872	97	192
W6AM*	124,526	113	368	VE4RO	49,404	92	178
W3ECR	124,200	150	276	W8ZOK	40,860	90	152
W4DQH	118,224	144	277	W4TWW	38,184	86	148
W3VKD	112,518	141	266	W3KT	37,848	83	152
W8NXF	101,762	146	234	W1DLC	35,076	74	160
W4EEE	100,602	138	243	W8YHO	32,385	85	127
W6VSS	99,231	97	341	W6CHV	31,275	75	139
W8NGO*	91,332	129	236				

Reports from overseas are just beginning to roll in. Here's what we have at press time:

VP7NX	148,665	53	935	ZL1MQ	17,427	37	157
PJ2AF	100,595	55	621	OE13USA	16,527	21	263
KH6PM	90,576	48	629	KZ5DJ	16,302	26	209
EL2X	81,675	45	605	HKØAI	15,594	23	229
HP3FL	69,939	57	429	TI9MHB	14,580	30	162
VP9L	66,223	44	471	EI5I	14,540	20	243
KH6AXH	59,040	40	492	EA9AR	13,524	23	196
KG4AJ	55,044	44	417	CO2BM	13,338	26	171
YN4CB	49,995	45	370	CT3AE	12,716	44	99
VP5AE	47,538	38	421	F8SK	12,012	14	286
CT1SQ	46,080	40	389	G2PU	9774	18	181
KH6MG	35,100	36	325	ZE2KR	9675	25	129
VP4BN	28,630	35	274	DL1KB	8211	17	161
KH6SP	25,248	32	263	ON4OC	7196	14	173
ZB2A*	23,177	43	183	G3DO	5814	17	115
VP1GG	22,904	28	273	CE2GG	5478	22	83
LU7BQ	17,496	36	162				

Final results of the contest will be featured in *QST* the moment the sorting and cross-checking of the entries has been completed. In the meantime, watch for a preview of the c.w. doings next month.

WWV-WWVH SCHEDULES

For the benefit of amateurs and other interested groups, the National Bureau of Standards maintains a service of technical radio broadcasts over WWV, Beltsville, Md., and WWVH, Maui, Territory of Hawaii.

The services from WWV include (1) standard radio frequencies of 2.5, 5, 10, 15, 20 and 25 Mc., (2) time announcements at 5-minute intervals by voice and International Morse code, (3) standard time intervals of 1 second, and 1, 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 recent ARRL *Handbooks* 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.

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

Hoo-oo-oo:

Say, OMs — ever hear tell of the OBO? No? Well, flip off your B-plus for a moment, hitch up your specs, and be briefly briefed on DXdom's somewhat neglected Patron Bird. . . .

'Twas 'way back in the dim dawn of amateur radio when the first DXer began to burn midnight oil. And in those spark days it soon became

obvious that one didn't work much 200-meter DX unless one had the stamina or insomnia to outlast local competition far into the wee wee hours. A browse now through early *QST*s will turn up spontaneous mentions of a curious and informal organization constituted by such nocturnal individuals, rugged birds who could bat their keys from dusk to daybreak with gay electronic abandon. This outfit became famed far and wide as the Order of the Boiled Owl.

Inasmuch as today's crop of DX hounds render stout service in perpetuating principles of Boiled Owlism, Jeeves thought it would be of interest to dig the ancient origin of OBO lore. So we arrayed him in pencil, paper and portfolio and whisked him off to consult with astute *QST* historian Sumner B. Young, WØCO, a logical sage to seek out in such matters. Mr. Young came through with flying colors.

Firstly, WØCO emphasizes the fitness of the term itself: An owl is nocturnal and certainly is tough enough to be called hard-boiled. You've *got* to be tough to ride static from supper till breakfast time! Then he recalls how Boiled Owls really came into their own during the ARRL Transcons and Transatlantics shortly after W.W. I. Many allusions to the Owl constituency appear in *QST*s for that period, one of which puts it quite nicely (p. 51, May 1921):

> Ever suddenly become aware some good radio night that in the last ten minutes all signals have curiously become weaker, and looked over your shoulder to discover that the sun was coming up? If you have you are eligible for admission to the Boiled Owls — fellows who have sat out a "night" until there was nothing left to it. . . .

Ah, but WØCO's deepest delvings turned up the source we should have counted on all along. The Old Man, ARRL's beloved late Hiram Percy Maxim, 1AW-W1AW, doubtless was prime inspirer of all *QST* Boiled Owlishness that trickles down through the years. His typical T.O.M. yarn, "Rotten Hours," pp. 7-8, March 1920 *QST*, goes, in part:

> . . . Now, what I want to know is just this: How do these other night-owls work it? Don't their stomachs ever go back on them? They were still going in like mad when I hit the dust. How much later do they sit up? *Do they never feel like a boiled owl when they get around in the morning?* . . . Take Mrs. 8ER for example. She interests me. Do she and Mr. 8ER bunk at the key? Do they never sleep at all? Do they have a day and a night shift, or does she cook the victuals while he operates and she operate while he feeds his face or how do they work it? . . .

Those italics are ours, and there, by the way, undoubtedly are the first Boiled Owls to be so characterized — Mr. and Mrs. 8ER of 35 years ago. A toast, then, in hottest, blackest, dreggiest coffee to shades of T.O.M. and one most venerable DX-minded group and institution; to the OBO!

* *New Mailing Address:* Effective immediately, please mail all reports of DX activity to DX Editor Newkirk's new address: 4128 North Tripp Ave., Chicago 41, Illinois.

What:

20 c.w. gives the night shift a better break these balmy summer days. K2GMO (ex-VE7ACN-DL4OZ) made hay with improving conditions and scored with **CP3**CA (72) 23, **DU**s 1SCS (79) 14, 7SV (92) 10, **EA**s 6AU (63) 20, 8BC (20) 21, 9DF (72) 15, **EL2**s L (23) 22, X (87) 19, F9YP/**FC** (41) 20, **FB8**BR (12) 19, **FF8**AC (32) 18, **FY7**YE (50) 17, **HK0**AI (80) 19, JA8AQ (47) 13, **KA2**s GE (22) 22, USA (17) 22, **KR6**LJ (42) 23, **MP4**s QAL (60) 16, JO (45) 18 who gets QSLs via W2PCI, **OQ5**GU (25) 19, **OY2**Z (85) 15, **ST2**AR (3) 21, **VQ9** 2RH (19) 19, 4BNU (57) 19, 4FM (35) 19, 4FO (52) 15–19, **2AS** (22) 21, **ZC4**s GF (39) 19, 1P (83) 12–16, **ZD6**EF (50) 19, **ZE5**JL (47) 19, **4X4**s DF (85) 17, FS (65) 21 and **5A4**TX (58) 19, all times here and hereafter in Greenwich. K2GMO, who rooms with W2OHF, runs 1000 watts to a homebrew arrangement plus 3-el. spinner . . . . . W3TYW caught up with **FA8**RJ 22, **PJ2**AR, **TF3**s NA 19, MB (102) 14–21, **TI2**PZ and **3V8**AB (42) 20 . . . . . **EA8**BF (35–100) 14–21, **OE13**USA 12 and **ZE3**JO 19 ran up against W4YZC . . . . . W2ZVS, about to be signed up by Uncle Samuel, reached 173/166 by way of F9QV/**FC** (93) 22, **FM7**WP 17, **HA5**KBA 16, **OD5**s AF 18, AV 19, **SP9**KAS (50) 14–15, **UB5**s KAB (55) 14, KBE (80) 20, **UQ2**AN (60) 20, **VS6**DC 12, **YO5**LC 13, **ZD3**A (60) 20 and a ZD6. Dixie notes more frequent comebacks from U.S.S.R. amateurs lately but most Us still are shy . . . . . **EA8**AI, **ET3**LF, **FR7**ZA, **KC6**ZB of Yap and **KT1**EX hoist HZ1AB's score to 136/121 . . . . . The baseball season and 433-Mc. work cuts into W1QJR's DXing but Vic managed **CN8**HK (28) 20–21, **FG7**XB (100) 21, **FF8**JC (100) 15, **HA5**BL (20) 18, HZ1HZ (30) 18, **LJ2**F (58) 17 just Norway, **LU**s 1ZV 2ZV (70) 22, **OQ5**VD, **OX3**UD (52) 16–17, **SL3**AG (35) 18 just Sweden, **SP5**s AA (50) 17, BQ (50) 23, **VP5**AE (10) 15 of Turks, **ZE6**JB (50) 23, **ZP6**CR (40) 23, **ZS3**K, 4X4FK (82) 21, **9S4**s AZ (40) 18, BE and BN (30) 16 . . . . . **JA**s 1CJ 1CR 4BB, **KA**s 2KS 2OJ 7DM, **KG4**AJ, **KM6**AX (5) 0, **VP**s 7NM 8BD and **VS2**DW (20) 17 swapped 73s with W6UED . . . . . W3VOS used 150 watts and folded dipoles to pick off **CP5**EP, **CS3**AC, **CT3**AB, **EA6**AF (33) 17, **GC2**CNC, HB1MX/**HE** (see Whence), **KT1**UX, **PZ1**QM, **SP2**KAC, **VP3**VN, **YO8**CF, **ZB**s 1JRK (61) 15–16, 2A, **4X4**BR (60) 19 and **3V8**AC . . . . . Spring fever and a king-sized lawn limited K2BZT's 20-meter c.w. activity to jousts with **OY7**ML (80) 13, **SU**IIC (73) 17 **ZP5**GM (30) 1 and a batch of H-22 Test Swiss portables . . . . . W5CAY comes through with **VP7**s NI NJ NS and YV5AE . . . . . 20-meter c.w. luck here and there, at *W1TVJ:* **GT**ICB, one year to the day since their previous QSO. *W2SVC:* a Gambian ZD3. *K2GFQ:* **EA0**AB, **ZD2**FFB. *W4OGI:* PJ2, **VP6**GT, VQ4. *W6ZZ:* JA3LK. *K6ENX:* **HC1**PJ (90) 2, **LU4**XQ (40) 1 of Tierra del Fuego, **VP1**KT (15) 22. *W7EWR:* DU7, **KA2**OJ (38) 3, **TI2**BX (110) 0–1. *W8DLZ:* FY7, **ZD2**DCP (40) 23. *W8YIN:* MP4, HK0. *W9AKJ:* **ZD8**AA (4–80) 23–0. *W9EU:* **JZ0**AG (55–79) 7–13 of Dutch New Guinea. *W0PRM:* **KG6**AFT. *DL4ZC:* **MP4QA**K (30) 13–15, VE8YT . . . . . W7FE, aboard *USNS Marine Serpent* at Saigon, reports such local QRM as **FI8**s BA BG, **KR6**PT, **VS**s 1BJ 2CV, **4S7**s NX and WP working 14-Mc. stuff like **CR7**AD, **FB8**BE and **VQ2**FL around midnight Saigon time. — *W7MO* . . . . . **KJ6AZ** (95) 11–12 answered the hopeful CQ of Hq. YL W1YYM . . . . . W0VFM specifies **CN8**ED 21, an FG7, I1BNU/**Trieste** (85) 19, IT1TAI 20 and **HR1**MC 17 . . . . . The *DX Bulletin* of the West Gulf DX Club mentions 14-Mc. radiotelegraphers **CE7ZJ** (54) 1, **CR6**BP (165) 21, **EA**s 8BK (30) 21, 9AP (25) 21, **FD4**BD, **FF8**s AJ (62) 22–23, GB (89) 19, **FY7**s YB (5) 22, YC (7) 23–0, **HZ1**AB (12) 16–17, **KC6**CG (75) 16, **KS6**AB, **LU**s 1ZT (33) 1, 3ZG (73) 0, 9ZT (15) 1, LZ1KAA (75) 21, **MP4BBS** (110) 16, **ST2**s AR (45) 16–20, GB, **SU1**CN (34) 15, **TA3**US (93) 21, **UA**s 2KAW (98) 14, 9AA (80) 13–14, 0SJ (48) 14, **UR2**AO (76) 14, **VK1**EM (55) 13, **VP8**AQ (40) 0, **VQ**s 2HR (50) 19–20, 2SP (61) 19, 3FN (110) 19, 4FW (37) 19–20, 8AG (12) 16, **VS6**AG (57) 14, **YO3**RD (53) 16, **ZB1**s BJ (13) 21, GBF (70) 22–23, **ZE6**JJ (93) 20, **ZP9**AY (70) 0, **3V8**ES (10) 16, **4S7GE**, **4W1**AB 11–12, **4X4**GY and others.

20 'phone is DXceptional sport if one isn't short on db. in the forward gain department. K2CJN made it 105/90 thanks to **ET2**MZ 18–19. HB1MX/**HE** 14–15, **OD5**AB 19, SV0WM 18–19, **ZB1**CM 20–21, 4X4s BR 19 and DC 19–20 . . . . . A flattened rotary held W4CBQ down to **CP5**EP, **FY7**YE (132) 0, Swan's **KS4**AW (207) 16, **PJ2**MA (PJ2AA) and **VP8**AQ (106) 1 of So. Shetlands fame – 117 on 14-Mc. A3 for Bob . . . . . **VS2**DB calls attention to the availability of Brunei's **VS5**CT (190) and **ZC3**AC, Christmas, (163). QSLs for both stations are handled by the VS2 bureau. VS2DB observes improved 20-meter conditions: "W6 and W7 heard almost daily from 1430 to 1630 GMT." . . . . . **HK0**AI 23 of San Andres, **HI6**EC and 5A1TA worked W3VOS . . . . . 14-Mc. radiotelephones **AC3SQ** 12, **CR**s 4AF (118) 21, 6AL (152) 20, 6CK (180) 20, **EA9**AR (137) 21, **ET2**XX (179) 16, **FF8**s BM (112) 20, FQ (133) 20, **FM7**WN (125) 14, **HC8**HM (317), HZ1TA (195) 10, **JZ0**AG, **KC6**s UZ (214) 14–22, ZB (200) 14–15, **KG6**AA (260) 14, W2SPP/**KG6** (260) 14, **KM6**AX (250) 0–2, **KX6**AF (250) 14, **MP4QA**M, **OD5**AF (220) 18, **SP5**AH (164), **SU1**AS (220) 18, SV0WO (135) 18, **VK9**s RC SP, **VQ**s 3FN (162) 19, 4EU (138) 18–20, 4FG (153) 19, 5DM (100) 19–20, **VS6**CL, **YK1**s AA (260) 8–17, AK (110) 11, **ZD**s 2JDB (147) 23, 8AA, **ZP5**s CF (152) 23, GB (109) 0, **ZS**s 2MI (160) 14 of Marion Isle, 7C, **3V8**s BB (170) 20, BL (310) 19, **4X4**s AS (110) 18 and BC (139) 16 are stalked by WGDXC sharpshooters . . . . . **FK8**KZ (130) and **ZM6**AR (164) 6 show up in So. Calif. DX Club's *Bulletin* . . . . . *Newark News* Radio Club listeners raked in this assortment of 20-meter 'phones: **CP6**YB 22, **CR4**AG, **CR6**s AC 22, AG AJ BH (166) 22, CS, **CT3** 2AG 3AF 12, **EA**s 8AP 20, 8AX 9AW 9BC 21, 9DF, **EL**s 1FI/MM (180) 20, 2X 23, **ET2US**, **FA**s 3JY (135), 8BG (185), **FF8**s AH (105) 20, AP, **FM7WQ**, **FO8**AB, **FP8**AP 19, **FQ8**AK (120) 22, **FY7**s AC 19, YA (115) 20, **GC**s 3EBK 17, 6FQ 18, **HC8GI** (175) 4, **HH2**s G JK LR PR (263) **HH3**DL, I1BNU/**Trieste**, **IS1**BV (190), **JA**s 1ME 4BB, **KA**s 2YM 1, 6EI (400) 15, 7LJ 8RK, **KR6**KS, **KS6**AB (228) 3–4, **KT1**s CH LU RF 22, WX 21, **KV4**s AA AQ (255), BI (260), **KW6**BS 3, **OD5**s AV (117) 15, AY, **OQ5**s AO CC ER FN FO (138) 20, PE, **OX3**GW, **PI1**J (250) of Holland, **PJ2**s AF 0, AG AO AT CE (140), CL (120), CX 21, **TF5**SV 22–23, **TG9**s AI AU KF (165), MB MQ (90), **TI8**RA, **UB5**KBE 13, **VP1**s AE OJF SD ZU, **VP2**s AD DA DL DN KM GW VA (110) 14, **VP3**s HAG LF, **VP5**AE (150) 19, **VP7**s NS NW NX, **VQ**s 2DT (160) 23, 2HJ, 4EZ 4FK 22, 4RF, **VS**s 4HK 0, **9GV** 21, **YI2**AM (170) 19, **YN**s 1RA 4CB, **YS1**MS, **YU1**GM 20, **YV9**BZ (140) 23, **ZB**s 1AJX 20, 1GBF 22, 2A 18, **ZC3**AA 1, **ZD3**BFC 10, **ZE**s 2KI, 6JI (170) 20, **ZP5**s CG CS GP PF (130), **ZS3**s AH 16, E W, **3V8**AS, 4X4s CX BJ DK FS 17, **5A**s 1TA 3TR (125) and 4TK.

40 c.w. is worth a v-e-r-y careful inspection, even in hours of bright daylight. W8GB, with 120 watts to a 33′ vertical, had a nice 35-minute chat with **VK5**KO on the long path around 5 P.M. local time on 7020 kc. Carl, up to 93 countries on 40 since 1953, heard VS1 and VS9 stations sneaking through at the same time . . . . . K6ENX QSOd **CR7**CI (15) 5, **DU**s 1SCS (20) 15, 1VQ (10) 16, F9QP (28) (15) on ship off Indo-China, **LU9**ZE (20) 8, **OQ5**GU (15) 2, **VS1**s BJ (40) 15, GO (35) 15, **ZD6**BX (20) 15 and ZSs galore on the long path including ZS2X whom K6ENX contacted in the '30s while signing W6NHC and XU8MI . . . . . W5CAY, erroneously labeled W4CAY last month, got the goods on **DU**s 7SV (30) 13, 9WX, EA9DF, **JA**s 2LC 9CU, **JZ0**DN of Biak (13) 13–14 and **VP2SE** . . . . . **CE3DZ**. **HK**4s BD DP, **JA**s 1VE 1VX 3BP 4BB 6BO, **KC6**CG (4–12) 13, **KG4**AM. W6TMX/**KG6**, **KR6LJ**, KV4s AA BK and **VS2**EL came back to W6UED

What a spot for Field Day! At left, the cool Greenland pastoral viewed from G3AAT/OX's 1953–1954 back yard. At right, through the window of a Weasel, Lt. Cmdr. R. Brett-Knowles who made many contacts from G3AAT/OX while roughing it with the British North Greenland Expedition which terminated activities late last year. You may recall other G3AAT DX activity as KV4AAT, British Virgin Islands, *circa* 1950.

CR7CI represents Mozambique on several c.w. DX bands and currently is one of the most active of the Laurenco Marques ham gang. Surplus Command gear really gets around! (*Photo via W8YJB*)

♦

. . . . . K6AUD and W6QUV pooled talents to assemble **GR6AC** (25) 4, **FO8AK** (25) 5, **HR1AT** (7) 4, **KM6AX** (25) 15, **KR6KS** (25) 15, **JAØCQ** (10) 16, a **JZØ**, **TG9AZ** (5) 6, **VK9WZ** (12) 15, **VPs** 4LZ (10) 4, 8AZ (20) 6, 8BA (15) 5, **VSs** 1BJ 2CR (17) 16, 6CG (20) 15, Wake Island Novice **WW6BN** (180) 7, **YU3BC** (10) 16 and **ZS7D** (27) 15 . . . . . **CR6AI** 3, **EA9AP** 3, **FG7XB** 2, **FK8AL** 10, an OQ5 and a VQ2 entered W4YZC's collection . . . . . W3VOS worked **CR4AL**, **FP8AP**, **HH3DL**, **ZS3HX** and others . . . . . W4TFB's Viking captured **CR7CN**. IIBNU of Trieste, **KG6GX**, **KR6KS**, **LUs** 8HAM (1), 8ZC and 9ZT . . . . . **CT3AB** (40) 1, **EAs** 6AF (25) 23, 8BK 0, ØAC (6) 2, F9QV/**FC** (18) 23, **FF8AJ** (22) 23, **KT1UX** 1, **OQ5RU** (12) 5, **TF3MB** (15) 1, **VQs** 2GW (18) 19, 2HR (4) 6, **ZD2HAH** (20) 19, **ZEs** 3JO (16) 4, 5JA (30) 4 and 4X4DK (38) 0 clicked with W4YHD . . . . . 7-Mc. c.w. happenings hither and yon, at *W1PWK:* **FA9RJ** (4) 2, **KG4AN** (87) 5, **YU2HV** (5) 1, **9S4BF** (19) 22–23. *W4UWA:* **KH6ARA**. *W3TYW:* sundry VKs ZLs. *W4VE:* **KR6LJ**, DU KC6 OQ 4X4. *W6RZS:* **CP5BS**, DU JZØ. *WØVFM:* **LUs** 5XA 7, 9ZC 8. *DL4ZC:* F9YP/**FC** 7–8, W5 W6 W7. *VP7NM:* **HKØAI**, **LZ1KAA** . . . . . WGDXC adds **VK9s** AU (7) 9–12 and BW (23) 13 to the 40-meter c.w. grab bag.

40 **'phone** features a few DX items here and there among the s.w.b.c. sidebands, splatter and thermal-noise jammers. NNRC browsers logged **EL2s** 1A (195) 9, X, **DU7SV**, **HKs** 4BD ØAI, **HP3FL**, **JAs** 1ACC 1AEA 1AGE 1AGU 1ANR 1GP 1KK 2AF 2CF 3MD 8CT, **KJ6FAA**, **KL7GO**, **KV4AQ**, **LU3AAD**, **OA5G**, **PJ2s**, **TIs** 2BX (190), 5JCH, **VPs** 1PS (265) 7, 2GW (85), 2LN (100), 3HAG, many VKs including 4IC of Willis Islet, **YN4CB** (80), **YVs** 4BT 5BV 5DE (190) and numerous ZL stations . . . . . SWL Ben Adams of New York has logged 62 VKs and 31 ZLs on 40 'phone since January.

15 **'phone** steadily rolls along. W6ZZ accumulated **CE3s** SQ QK, **HC1ER**, **HR3HH**, **KV4BJ**, **OA5G**, **PYs** 2DQ 5DW, **TI2GC**, **VK3YT**, **VP7NK**, **ZL2AJB** and **ZP5AM** . . . . . **CS3AC**, **EA8AX**, **FA8RJ**, **FF8AP**, **OD5AB**, **SVØWO**, **VQ4s** EU EZ RF, **ZS9G**, **4X4CX** and **5A2CL** hooked W4NQM, temporarily a refugee from 28 Mc. . . . . W4WVM needs but 30 watts to flag down stuff like **CN8MT**, **CP5EK**, FA OD5 **SVØ** VQ4 and **ZB1AJX** on 15 . . . . . NNRC 15-meter A3 archives reveal **EA8AI** 20–21, **EL2X**, **ET2XX** 16–17, **HC1FS**, **HKs** 1KC 5AC, **HP3FL**, **JAs** 4BB 9BA, **KA8s** AK AR RK (245), **KG4AR**, **KV4s** AQ BB BD, **OQs** 5VP ØDZ, **PJ2s** AF (190), AP, **SVØWK**, **TI2PP**, **VPs** 5AE 6GT 6WR (250), 7NX **VQ2DT**, **VR2s** CG 20–21, CJ, YN1RA (420), **YU1GM**, **ZB1DK**, **ZC4RX**, **ZE2KR** 20, **ZSs** 3E 3G (175), 3K and 9F (200) 19–20.

15 **c.w.** won't get a huge play until the 21-Mc. 'phone band becomes more saturated. Nevertheless, K6ENX encountered **CE3AB** (60) 18–19, **JA3AB** (90) 23, **KG4AN** (60) 21, **LU8AE** (120) 20 and **ZL1BY** (75) 23 of multiband fame . . . . . W4YZC raised **EL2X** 15 **FA9RW** 15, **FF8AJ** 17, **LU3FX** 16, **KV4s** AA AQ 15–17, **VP7NM** 17, **VP2GW** 17 and **ZS2A** 16 . . . . . W6ZZ's code efforts netted **CEs** 3AG 6AB, **LUs** 2DAW 8ABL 8AE 8EE, **PY1LZ**, VKs 2GW 3XK, **ZLs** 1ADU 1MQ 2GS and **ZP9AY** . . . . . **OQØDZ**, VQs 2HR 4RF, **ZD6BX** and **ZE3JJ** chatted with W3VOS . . . . . W6UED hauled in **CE3DZ**, **DU7SV**, **HK4DP**, **KA2KC**, **KG4AW**, W6TMX/**KG6**, a flock of KP4s and **TI2BX** . . . . . **ZP6CR** and **4X4FQ** raise W1CTW to 66 countries on 21-Mc. c.w., the Israeli being Cal's first Asian in decades of hamming.

80 **c.w.** ails from atmospherics now up our way but DX remains workable. **EA6AU**, **OE3SE** and **9S4AX** made it 64 ARRL DXCC Countries List items on 3.5 Mc. for KP4KD . . . . . W4KFC managed **CX1KB** (1), **EA9DF** (8), F9QV/**FC** (15), **HI8EW** (12), **OQ5GU** (5) and **ZB1BF** (6) to boost his 80-meter score to a healthy 106 . . . . . Dutch weather ship *Cumulus* **PI1LC**, **KV4AA** and numerous Europeans will be receiving K2BZT QSLs . . . . . W3EIS worked **EAs** 8BF 9AP, **FAs** 8DA 9RW 9RZ, **HK4DP**, **OE13USA**, **KT1UX** and **EL2X** . . . . . **FP8AP** 3, **VP7NM** 8 and several ZLs answered W4YZC . . . . . W6UED annexed **JA1CJ**, while DL4ZC worked several W/K customers as far west as Illinois.

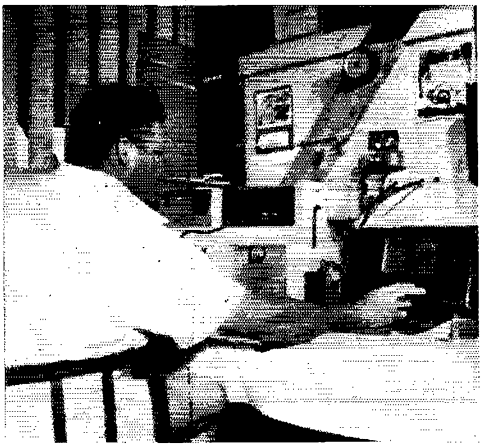
10 **'phone** should be turning *Es* short-skip somersaults around here now. This phenomenon builds up 28-Mc. activity in general which in turn raises chances of intercontinental DX contacts. G3IDG, a ten-meter observer of long standing, notes that **CXs** 2CE 2CF 2CO 4CS 7BA 7BH, **LUs** 3AAT 3CM 5DC 6DJY 7QB 8DDI, **OQ5RU**, **PYs** 4PQ 7DD and 7XQ were heard, heard called, heard worked, or worked by **Gs** 2YZ 3BES 3DZS and 1DG. G3IDG keeps his c.w. 10-watter ready for action on 28,056 kc. . . . . VE3DNE used 100 watts and a 100-foot-high 3-el. spinner to capture **CE2GG**, **HC1EP**, **PJ2AF**, **VP6WR** and others. Buffalo's Channel Two poses quite a problem for Martin, but so far so good . . . . . W9OQI has no trouble working **LU1QG** solidly . . . . . W6ZZ bumped into CEs 4AD and 6AB on, of all places, 10 c.w.

160 **c.w.** finally came through for W6KIP/6 and VS6CQ! W1BB passes the good word that those two persistent chaps accomplished the first U.S.A.-VS6 top-band two-way on April 3rd at 1305–1325 GMT after many months of tedious effort. **VS6CQ**, sometimes accompanied by buddy **VS6CZ**, appears on 2000 kc. with a mere ten watts. Congratulations, gentlemen! . . . . . W1BB reports the 1.8-Mc. range wide open on the capricious north Atlantic path as late as mid-April when **Gs** 3ERN 5JU and **GI3IOS** were worked . . . . . **HB9CM** (30) and **HK4DP** (72) increased W4KFC's 160-meter countries total to 21 . . . . . Climaxed by that W6KIP/6-VS6CQ contact, the 1954–1955 top-band season stands recorded as an unusually outstanding DX session. "How's DX?" thanks all reporters, W1BB in particular, for excellent grapevine co-operation. What will next year bring? In view of accelerating sunspot activity, that's an interesting question!

Where:

Jan Mayen's LB8YB, now intermittently active from Greenland, tells K2CD that all QSLs for his Jan Mayen work will have been forwarded by this September . . . . . Via WØPRM, 9S4AX confirms the Saar QSL bureau address as Box 310, Saarbrücken, and personally offers to QSP QSLs to 9S4s whose QTHs are unavailable . . . . . WØDIB recently obtained a KF3AB Fletcher's Ice Island confirmation and thinks that the address to follow may be beneficial to others so in need. Remember, however, that KF3AB had other operators . . . . . VP7NM, QSL chief down Bahamas way, stresses that legitimate VP7s have the letter "N" after the numeral. Thus VP7s MD and MI are n.g. and the recent VP7s NB and NY are clandestine, too, because the real NB and NY closed stations some time ago. VP7NM adds: "Legitimate calls up to date are VP7s NF NG NH NI NJ NK NL NM NP NR NS NT NU NV NW and NX. VP7s NN and NQ packed up at the end of 1954." VP7NI, ex-ZL1MP, is a late arrival and is setting up a 32V-75A combo at Governors Harbour, Eleuthera Isle . . . . . HZ2AEH (W3MGL) tells W9EU that stamped self-addressed envelopes should accompany all QSL requests via his APO 616, N. Y., N. Y., QTH . . . . . W1s OJR UED WPO YYM ZDP, W2s GND ZVS, W3TYW, W4s HA YHD YZC, W9s CFT EU, WØDIB, HZ1AB, T. Gallagher, NNRC, SCDXC and WGDXC collected these individual items for you:

AP2Q, 121 Gar Wood Road, Quetta, Pakistan . . . . . **AP2U**, 6 Roberts Market, Quetta, Pakistan . . . . . **C3WV**, c/o U. S. Embassy, Formosa . . . . . **CN8IQ**, 8706 E. Forest St., Detroit 14, Mich. . . . . **CO2U**, P. O. Box 250, Havana, Cuba . . . . . **CR6CS**, P. G. de Almeida Lopes, Box 19, Calulo, Angola . . . . . **ET2PA**, Box 379, Asmara, Eritrea . . . . . ex-**F8FW/FC**, (HB9LA) Box 31, Lausanne 19, Switzerland . . . . . **F8WT/FC**, A. Dobak, Airport de Bastia, Corsica . . . . . **FF8BK**, A. Grobliminh, Box 38, Seguela, Ivory Coast, F.W.A. . . . . **FK8AJ**, M. Jerome, Box 104, Noumea, New Caledonia . . . . . **GC3KAV** (QSL via RSGB) . . . . . **HTCI**, F. Lecco, San Marco 2790, Venezia, Italy . . . . . ex-**JY1OG**, G. Stevenson, 320a, AMQ, RAF, Henlow, Bedfordshire, England . . . . . **JZØAG** (QSL via PAØKOP) . . . . . **KC6AI**, R. Kohler, USCG Depot, Box 3, Navy 926, FPO, San Francisco, Calif.



VP1GG's 25-watt rig leaves its mark on all 'phone DX bands as operator G. B. Gregory throws his big British Honduras switch for U. K. leave and probable reassignment to Fiji. A 550-watt a.c. generator powered the transmitter and the Eddystone 680 receiver at right. Three-element rotaries radiated on 15 and 20 meters with a long-wire available for other bands.

♦

K6DV via W1QON we learn that JAs 8AA and 1FA are the first postwar Japanese nationals to be signed up in ARRL's RCC . . . . . Power difficulties, noise troubles and generally poor propagation conditions haunted HZ1AB's early '55 hamming but op W6CRV hears talk of a possible air-conditioned shack with rhombics to match being put at HZ1AB's future disposal. OE13USA donated 300 QSLs to help handle the HZ1AB backlog while a Stateside order for 900 cards dallies en route. W6CRV has about three months left in Saudi Arabia . . . . . WGDXC Asianograms: MP4QAM swaps Trucial Oman for Qatar return. . . . Nepal mountaineering expedition radio LUØMA is reported QSOd by JA stations.

Africa — ET3s GB LF and S join in a petition protesting the poor operating ethics of over-avid W/K countries chasers. Many of the offenders are otherwise competent operators apparently in the throes of a second lidhood. The ET3s maintain a hogpen list, incidentally, and those who would receive rapid Ethiopian confirmations would do well to tread lightly and politely . . . . . Another sad example of overwrought supply and demand is that of ZD8AA. Pp. 60-61 of March, '55 *QST* lists a few appropriate operating don'ts suggested by another Africa twosome, VQ4EI and ZD6BX . . . . . WGDXC notes: EA9AR looks forward to possible Ifni operating with rig courtesy CO2BL. . . . Besides extensive 14-Mc. c.w. fun, FB8BR goes for ham TV and has a 435-Mc. video outfit a-building.

Oceania — KC6s AA AJ ZB and ZC continue active on the island of Yap. KC6AJ is a recent addition to the amateur ranks there and does his hamming with 35-watt c.w. and 125-watt 'phone rigs on 40 and 20 . . . . . W1ZCH, now at 17A Stanley Avenue, Mosman, N.S.W., expects to be operating as VK2ZE before long with his Viking rig, NC-183D receiver and midget 14-Mc. beam. S.s.b. work with the U. S. A. is anticipated . . . . . The WØYDZ/KG6 landscape shot in March *QST* brought nostalgia to WØVIH who designed, built, and used such a 10-element 10-meter beam in 1951 as W7JDB/KG6 and KG6AAE. Strictly speaking, the beam really is an 8-element affair with spread reflector . . . . . DU7SV now concentrates mainly on working eastern U. S. A. stations on 80 c.w. and 15 'phone. His usual spots are 3520, 7020, 7040, 14,080, 14,200, 21,250 and 28,500 kc., the 80-meter frequency around 1000 GMT.

Europe — K6EUV, doing a European tour with the RCAF, attended a Luxembourg radio club meet with LX1s on hand by the roomful. DXers among them expressed desires to work more W5 W6 W7 and VE4-through-VE8 stations. V.h.f. and s.s.b. interest also was rampant . . . . . W1ZDP relays word from HB1MX/HE that the local P. & T. chopped the "/HE" off his call sign. His future Liechtenstein operations may occur as HB1MX period. HE9 calls are reserved for Liechtenstein citizens of whom only HE9LAA is active . . . . . W1OJR finds that LB3OD is a shipboard affair with no Jan Mayen or Svalbard implications . . . . . "Vatican DXpedition cancelled. No possible hope of operating from that country. Reasons given, cold and dry." This from DL4OR to F7ER; so the world's smallest country (108.7 acres) remains a colossal ARRL DXCC Countries List enigma . . . . . PX1YR should have a sturdy A3 signal from now on thanks to a WGDXC-sponsored rotary beam reported en route Andorra.

South America — Add Navassa Island to your WAA award countries list, advises PY1ACY of LABRE (Brazil). Plans for the 4th LABRE DX Contest are under way, an increasingly popular September activity . . . . . W6UED nominates OA5G's QSL as a collector's item. It measures 10 by 13 inches and will go well next to one of those midget Scotland gag QSLs . . . . . CE3AG, ex-CEØAA, embarks on a U. S. A.-Europe summer tour that will cover a good part of this country and many DX spots on the Continent.

(*Continued on page 150*)

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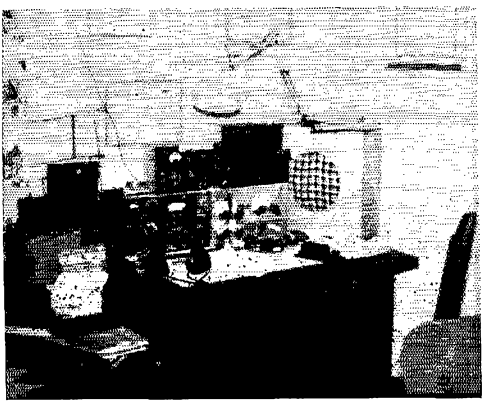
OY7ML's Faeroes c.w. activity makes a big hit with DX hunters world wide. A 15-watt crystal-controlled transmitter, 12-tube home-built superhet, and a few dipoles do the job. (*Photo via W4QCW/KC4AB*)

. . . . **KC6AJ**, D. R. Waldron, Yap Island, Western Carolines . . . . **KC6ZC** (QSL via KC6AJ) . . . . ex-**KF3AB**, M/Sgt. C. L. Hull, 804th Opns. Sqdn., Box A5, Hunter AFB, Savannah, Ga. . . . . ex-**KG6AAE** (QSL to WØVIH) . . . . **KL7BHL**, Cpl. C. W. Wratchford, Det. A, C/R Co., Box 10, 8th Divn., Navy 230, FPO, Seattle, Wash. . . . . **MP4BBS** (QSL via RSGB) . . . . **OD5AF**, Box 150, Tripoli, Lebanon . . . . **OD5AY**, Box 3647, Beiruth, Lebanon . . . . **OQ5VD**, Box 195, Coquilhatville, Belgian Congo . . . . **OY4XX**, Henning, Box 195, Thorshavn, Faeroes Islands . . . . **PY7QU** (QSL via LABRE) . . . . ex-**SVØWC** (QSL to K6DLA) . . . . **TF2WAC**, Box 111, Salem, N. H. . . . . **UB5KBE**, Box 74, Odessa, Ukraine, U. S. S. R. . . . . ex-**VK1AC**, A. C. Hawker, VK3IB, P. O. Box 35, Dimboola, Victoria, Aus. . . . . ex-**VP1GG** (QSL via VR2AS) . . . . **VP1OJF** (QSL via VP1SJC) . . . . **VP7NJ** (QSL via VP7NM) . . . . **VP7NK** (QSL via VP7NM) . . . . ex-**VP8AA** (QSL via G3JFD) . . . . **VQ2KR**, Mrs. K. C. Ritchie, Box 589, Bergenhill, No. Rhodesia . . . . **VQ2RR**, H. Ritchie, Box 589, Bergenhill, No. Rhodesia . . . . **VQ3FN**, % Williamson Diamond Mines, Ltd., Nairobi, Kenya . . . . **VS1AD** (QSL via SARTS) . . . . ex-**W6ODD/CR8/FI8**, Box 776, Camarillo, Calif. . . . . **YK1AL** (QSL via YK1DF) . . . . **YNØYN** (QSL to WØEIB) . . . . **YU2AE**, Box 9, Rijeka, Yugoslavia . . . . **YV9BZ**, L. Alegrett, Box 3208, Caracas, Venezuela . . . . **ZA1B**, Box 60, Tirana, Albania . . . . ex-**ZD1LQ** (QSL to VQ6LQ) . . . . **5A1TA**, Box 372, Tripoli, Libya . . . . **5A5TA**, R. Morgan, Box 372, Tripoli, Libya.

Whence:

Asia — XZ2ST, in lines to NNRC veep Ben Adams, tells of his intended U. S. A. visit this summer. Sway runs 150 watts to an 813 modulated by 805s and employs a 2-element 135°-phased array. "It has been almost three years since we XZs have been able to work consistently with the U. S. A." Vice versa, we might add . . . . . VS1AD, inspired by the March 1952 *QST* article on the subject, has been doing scatter-sounding work and has an interesting collection of echo photos to show for it . . . . . From



I.A.R.U. News

R.S.G.B. SECRETARY HONORED

John Clarricoats, General Secretary of the *Radio Society of Great Britain* for the past 25 years, was appointed to be an Officer of the Most Excellent Order of the British Empire by Her Majesty, Queen Elizabeth II. To our knowledge, G6CL is the only person to have been so honored for service to amateur radio.

John M. Reed, HC2JR

Many of our readers probably noted, with great regret, the listing of John Mark Reed, HC2JR, President of the *Guayaquil Radio Club*, the IARU Member-Society for Ecuador, in the Silent Keys for March. OM Reed died suddenly while traveling in the United States. DX fans will remember him as a member of the HC8GRC expedition[1] to the Galapagos Islands in April, 1950. With XYL HC2TR, he was instrumental in providing emergency communications for a two-week period in August, 1949, when much of Ecuador was rocked by severe earthquakes.[2]

OLYMPIC GAMES

The Victoria Division of the *Wireless Institute of Australia* plans to organize International Hamfests and other events for amateurs attending the Olympic Games at Melbourne in November, 1956. The Olympic Games Committee of WIA, 191 Queen Street, Melbourne, C.1, would like to know, by August 1, 1955, the approximate number of hams and their families planning to attend. Though this may seem to be a very early date, those who have been active in convention planning can appreciate the difficulties in arranging housing for such an event.

QSL BUREAUS OF THE WORLD

For delivery of your QSLs to foreign amateurs, simply mail cards direct to the bureau of the proper country, as listed below. (Bold-face type indicates a recent change from previous listings.) *W, K, and VE amateurs may send foreign cards to A.R.R.L. headquarters for which no bureau is here listed.*

For service on incoming foreign cards, see list of domestic bureaus in most *QST*s (page 43 of May) 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: DVSV, Kierlingerstrasse 10, Klosterneuberg
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 E. Yong, VP3YG, P.O. Box 325, Georgetown
British Honduras: D. Hunter, Box 178, Belize
Bulgaria: Box 830, Sofia
Burma: B.A.R.S., P.O. Box 376, Rangoon
Canton Island: H. B. Johnson, KB6BA, 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 of 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 I.
Denmark: P. Heinemann, OZ4H, Vanlose Alle 100, Copenhagen
Dominica: VP2DA, Box 64 Roseau, Dominica, Windward Islands — *Dominican Republic:* Calle Duarte #76, C. Trujillo
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, I. Morris, EI6U, 9 Shanrath Rd. Whitehall, Dublin
Fiji: S. H. Mayne, VR2AS, Victoria Paraed, Suva
Finland: SRAL, Box 306, Helsinki
France: R.E.F., BP 26, Versailles (S & O); (F7 calls only) F7 QSL Bureau, APO 163, % Postmaster, New York, N. Y.
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
Gold Coast: ZD4BL, Box 47, Accra
Great Britain (and British Empire): A. Milne, 29 Kechill 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, Agana, Guam, Marianas Islands
Guantanamo Bay: William Hamm, KG4AF, NAS, Navy 115, Box S, 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: Box 1, Munnar, Travancore, S. India
Indonesia: P.A.R.I., P.O. Box 222, Surabaja, 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): J.A.R.L., Box 377, Tokyo
Japan (KA): F.E.A.R.L., P.O. Box 111, APO 500, % Postmaster, San Francisco, Calif.
Kuwait: Doug Taylor, MP4KAA, Box 54, Kuwait, Persian Gulf
Lebanon: R.A.L., B.P. 3245, Beyrouth

(*Continued on page 148*)

[1] "A New Country Calls CQ," Reed, July, 1950, *QST*.
[2] "Earthquake in Ecuador," Reed, Oct., 1949, *QST*.

V.H.F. QSO Party

June 11th–12th

ARRL takes pleasure in announcing another of the popular V.H.F. QSO Parties, open to all amateurs who can work any band or bands above 50 Mc. With June one of the best months for v.h.f. DX, here's a great chance to contact some new states and give the equipment and antennas a real work out. The contest will be held during a 33-hour period starting at 2:00 P.M. your Local Standard Time, June 11th, and ending at 11:00 P.M. Local Standard Time, June 12th. Technician licensees can use their new 6-meter privileges during this week end of peak activity. But *every* v.h.f. enthusiast, whether old-timer or newcomer, is urged to get in on the fun!

How To Take Part

Call "CQ Contest" or "CQ V.H.F. QSO Party" to get in touch with other contestants. During contact, operators must exchange names of their ARRL sections for full point credit. It's also a good idea to swap signal-strength and readability reports, although this is not required.

Scoring

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

Certificate Awards

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

Reporting

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

Rules

1) The contest starts at 2:00 P.M. Local Standard Time, Saturday, June 11th, and ends at 11:00 P.M. Local Standard Time, Sunday, June 12th. 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: W2GLV (S.N.J.) works W1DBM (Conn.) on 50, 144 and 220 Mc. for complete exchanges. This gives W2GLV 4 points (1 + 1 + 2) and also 3 section-multiplier credits. (If W2GLV 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 29, 1955, 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.

June 1930

. . . Editor Warner suggests that U. S. amateur clubs take up transmitter hunting, an activity carried out by many British amateur societies. In a second editorial, comments are made about commercial interference in our bands.

. . . "Advanced Transmitter Design," by James J. Lamb, presents a method that will give a rig 3.5-Mc. performance on 10 meters.

. . . Howard F. Anderson tells how to convert the old broadcast receiver to a modern high-frequency superheterodyne in "The Band-Box Superhet."

. . . In keeping with increased interest in 10-meter activity, Clark C. Rodimon, W1SZ, tells of some interesting accomplishments in "More Progress on 28 Mc." Asia works U. S. A., preparation for June tests, and a report on RSGB experiments are highlights of the article. An excellent description is included of active DX station W2JN, operated by C. K. Atwater.

. . . A résumé of the practical aspects of rectifier and filter design is offered by George Grammer, W1DF, in "Getting That D.C. Plate Supply."

. . . Clinton D. DeSoto, W9KL, arrives at League Hq. to assume duties as Assistant to the Secretary. He fills the position formerly held by A. L. Budlong, who is now Assistant Secretary.

. . . W9XAM transmits time signals on 4795 kc. with a crystal-controlled 500-watt rig.

. . . The Experimenters' Section contains some good information on coupling the single-wire feeder antenna to a push-pull transmitter.

. . . A report of the ham phase of the Second Roumanian Arctic Expedition is found in the Communications Department section. H. M. Bassett, W6BSB, was operator for this venture.

. . . The RMA Convention and Trade Show will be held this year in the Municipal Auditorium at Atlantic City. The Convention will be of unusual interest because there will undoubtedly be much discussion of the pentode and its relation to manufactured receivers during the coming year.

The World Above 50 Mc.

CONDUCTED BY EDWARD P. TILTON, W1HDQ

In all the years that no-code and slow-code amateur licenses were under consideration it was said that there were thousands of technically-trained experimenters who would populate our higher frequencies if we made it easy enough for them. They would snap up the idea, if only they didn't have to learn the code. This was the basic idea in back of the "Class D License" argument of the '40s, and it finally took form in the Technician Class ticket, announced along with the Novice license in 1951.

The Technician Class license doesn't quite eliminate the job of learning the code, but developing the ability to send and receive at 5 words per minute should be no serious stumbling block to anyone with the technical know-how needed to pass the rest of the exam. There have been nearly 15,000 Technician tickets issued to date. Where are those u.h.f. and microwave experimenters?

We have a few. Scattered around the country we find honest-to-goodness technicians (small "T") who are doing the best they know how to promote interest in 220, 420 and higher bands. But at least 99 per cent of the "Technicians" are fellows who took the General Class technical exam in their stride, but couldn't quite make the code requirement. The Technician license gave them a foot in the FCC's door; a permanent ticket that could be renewed, if at the end of five years they still found it hard to master 13 w.p.m.

Actually, practically all of today's Technicians are not technically trained at all. They simply latched onto the technical side of ham radio a little faster than they handled the operating side. They are very frankly in a transitional state between the Novice and General Class. Do they have any real interest in v.h.f. or u.h.f. hamming?

So long as using the Technician license meant making use of the frequencies above 220 Mc., there was just about one in a thousand who gave it more than passing thought. "Where can I buy a transmitter and receiver for 220 or 420 Mc.?" was a common inquiry in the months after the Novice licenses began to run out. "Please send me plans for a one-tube transceiver for 220 Mc." "Is there anyone in my area who is working on 220 Mc.?" Much ARRL staff time was spent in developing gear that would appeal to the newcomer who was breaking into the game via the Technician route. This helped some, we hear. Certainly there is appreciably more use of the 220- and 420-Mc. bands today than there would have been without the Technician influence. But it is far from the impressive swing to v.h.f. and u.h.f. experimentation that was supposed to be waiting for this approach to amateur radio.

Will opening the 50-Mc. band to Technician licensees change the picture? Not nearly so much as many wishful thinkers would have us believe, we'll wager. The night of April 12th saw more stations on 50 Mc. in W1 than we've had in quite some time. It was a good night, weatherwise, and everyone was looking for the newcomers. They showed, and they have been popping up since, with perhaps a dozen new calls appearing in W1 before the end of April.

The story around the rest of the country seems about the same. If the Technicians-on-50-Mc. move brings us 200 new 6-meter stations in 1955 we'll be very happy. How many it does net will depend a good deal on what those of us who are already there do about it. For the prospective 50-Mc. Technician is no technician at all. He is a beginner of uncertain age, with the same frustrations, technical and economical, that most of us encountered in getting started. He will need help; over the telephone, in the radio club, or

Six-meter men of Philadelphia and Washington areas get together. Lined up at home of W3OTC, Silver Spring, Md., are (standing): W3MXW, W3CUB, W2ORA, W3GGR, W3YHI W3KMV, W3WOD. Front row: W3CGV, W3UJG, W3OJU, W3RQT, W8NRM/3, W4UMF. Missing when picture was taken, W3JES. (*Photo by W3OTC.*)

over the air, just like any other newcomer. And he'll need activity to keep him interested, once he actually fires up on 6.

In the last analysis, the advent of Technicians on 50 Mc. will be just a steppingstone, at best, to increased utilization of this most interesting 4-megacycle slice of the radio spectrum. It will not end the responsibility that all v.h.f. men have; the selling of their product to the thousands who are primarily interested in lower frequencies.

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

The June V.H.F. Party should be fun this year, if half the expeditions now being planned materialize. As announced last month, W8GUZ and W8JWV will be operating from the highest spot east of the Mississippi River, Mt. Mitchell, North Carolina, during the Party. There is also the possibility that they may hit Sassafrass Mountain, highest point in South Carolina, a day or two before. They will be using a frequency around 144.5 Mc., a 16-element array, and about 75 watts input, operating as W8JWV/4. They will QSL all contacts, but they warn the gang not to be over-eager in that respect. Suitable cards will be made up following their return.

That Sassafrass Mountain location is one that might bear more investigation by expeditions. It is between Routes 178 and 276, just over the line from North Carolina, not far from Greenville, S. C. With 3560 feet of elevation, it might be the spot for some enterprising expedition to make a name for itself in providing a state almost nobody has worked on 144 Mc.

West Virginia will be represented by W3PGA/8, the Aero Amateur Radio Club of Baltimore, who will set up at an elevation of nearly 4000 feet above sea level near Elkins, W. Va. Operation will be on three bands. A 50-watt rig will feed a 5-element beam on 50 Mc. On 144 there will be a 4X150 coax-line amplifier, running 160 watts input, feeding a 16-element array. The 220-Mc. job will have an 832A running 25 watts input, also with a 16-element beam. All arrays will be horizontal. They will also have a 75-meter rig, for use until the v.h.f. contest gets under way.

An expedition that just missed last month's copy was conducted by W6UID, who with several companions operated /7 at Wilson Pass, Nev., March 26th. Many stations in the Los Angeles area thus acquired a new state on 144 Mc., including W6WSQ, who now leads the W6s with 4. W6DNG, who got No. 3, reports that he has worked W7LEE, Parker, Ariz., at least 23 times, most of these with only 100 watts input. He now has 500 watts on c.w., a 32-element horizontal beam, and is building for a kilowatt.

Looking for a simple way to receive signals on 50 Mc.? WØDZM, Minneapolis, says that he's been doing all right with simple mixer-oscillator (1 tube) jobs. An important factor in getting good noise figure, he points out, is keeping the mixer plate voltage down. This is true with either pentode or triode mixers, when no r.f. amplifier stage is used. With a 6J6 push-push mixer the noise rose faster than the signal when the plate voltage was increased above 40. It's really the plate *current* that makes the difference. In a tetrode or pentode mixer this can be controlled by the value of the screen resistor, but in the case of triodes it is best merely to lower the plate voltage. They'll often work well with as little as 8 to 10 volts, and he had one that worked best with only 4 volts on the plate!

Here's a mass-production job on 6-meter gear. W3YHI reports that the club at Andrews Air Force Base recently embarked on the construction of ten 6-meter rigs, complete with modulators. Transmitters have 2E26 finals, running 20 watts, with two 6L6 AB1, driven directly from the carbon microphone transformer. With the pilot model, that's 11 new 6-meter stations due in the Washington area around May 1st.

Displaced Persons Department — W2QED, late of Seabrook, N. J., is now working 2-meter mobile in the Los Angeles area. It will be some time before he has a home station set-up, but meanwhile he's enjoying the 2-meter activity around Glendale. He and W6QKI (ex-W3QKI) promise to infiltrate the predominently vertical Los Angeles gain with a little horizontal antenna propaganda. Reports have it that W8WJC and BFQ are destined for Athens, Tenn. (Third-hand report, not from the Headquarters of High Antennas, Inc.) W2UK, New Brunswick, N. J., will be taking down those big antennas soon and heading for KH6-land. DX on 2 from Hawaii coming up!

Northwest going horizontal? The April issue of *The Oregon Scanner*, edited by W7OAY and W7JIP of Milwaukie and Portland, reports tests going on in Portland and Tigard, Ore., and Seattle and Spannaway, Wash. While the checks are inconclusive so far, results indicate stronger and more consistent signals with horizontal polarization. We understand that the VE7s to the north favor horizontal and would be glad to go along with a shift to that as a standard. Could be that this would do what changing to horizontal has done for the East — step up the consistent operating range of the average 2-meter station. In checks made years ago, your conductor was sold on horizontal by the way it brought up signals over the medium-length paths where the terrain was irregular. Horizontal arrays for 144 Mc. may be seen in the Portland area at W7VS

2-METER STANDINGS

	Call States	Areas	Miles		Call States	Areas	Miles
W1RFU	19	7	1150	W6NLZ	3	2	360
W1HDQ	19	6	1020	W6MMU	2	2	240
W1CCH	17	5	670	W6DNG	3	2	230
W1IZY	16	6	750	W6GCG	2	2	210
W1IEO	16	5	475	W6QAC	2	2	200
W1UIZ	15	6	680	W6EXH	2	2	193
W1KCS	15	5	600				
W1AZK	14	5	650	W7YMP	4	3	417
W1MNF	14	5	600	W7JU	3	2	247
W1BCN	14	5	650	W7LEE	3	2	240
W1DJK	13	5	520	W7YZU	3	2	240
W1MMN	10	5	520	W7JUO	2	2	140
				W7RAP	2	1	165
W2ORI	23	8	1000				
W2UK	23	7	1075	W8BFQ	29	8	850
W2NLY	23	7	1050	W8WXV	28	8	1200
W2AZL	21	7	1050	W8WJC	25	8	775
W2QED	21	7	1020	W8RMH	22	8	690
W2BLV	19	7	910	W8DX	22	7	675
W2OPQ	19	6	—	W8SVI	21	7	725
W2DWJ	17	5	632	W8SRW	20	8	850
W2AOC	17	5	600	W8SVI	20	7	—
W2UTH	16	7	880	W8WRN	20	8	670
W2PAU	16	6	740	W8BAX	20	8	685
W2PCQ	16	5	650	W8JWV	18	8	650
W2LHI	16	5	550	W8EP	18	7	800
W2CFT	15	5	525	W8ZCV	17	7	970
W2DFV	15	5	—	W8RWW	17	7	630
W2AMJ	15	5	550	W8WSE	16	7	800
W2QNZ	14	5	400				
W2BRV	14	5	590				
				W9EHX	23	7	725
W3RUE	23	8	950	W9FVJ	22	8	850
W3NKM	19	7	660	W9EQC	22	8	820
W3IBH	19	7	650	W9KLR	21	7	690
W3BNC	18	7	750	W9UCH	21	7	750
W3FPH	18	7	—	W9ZHL	21	7	—
W3TDF	17	6	720	W9BPV	20	7	1000
W3KWL	16	7	720	W9KPS	19	7	660
W3LNA	16	7	720	W9MUD	19	7	640
W3TDF	16	5	570	W9REM	19	6	—
W3GKP	15	6	800	W9LF	19	—	—
				W9ALU	18	7	800
W4HHK	26	8	1020	W9IGA	18	6	720
W4AO	23	7	950	W9WOK	17	6	600
W4PCT	20	8	—	W9MBI	16	7	660
W4JFV	18	7	830	W9GAB	16	6	750
W4MKJ	16	7	665	W9BOV	15	6	—
W4UMF	15	6	600	W9LEE	15	6	780
W4OXC	14	7	500	W9DSP	15	6	760
W4JHC	14	5	720	W9JNZ	15	6	560
W4WCB	14	5	740	W9DDG	14	6	700
W4TCR	14	5	720	W9FAN	14	7	680
W4UBY	14	5	435	W9QKM	14	6	620
W4IKZ	13	5	720	W9UIA	12	7	540
W4JFU	13	5	720	W9ZAD	11	5	700
W4ZBU	10	5	800	W9GTA	11	5	540
W4UDQ	10	5	850	W9JBF	10	5	760
W4DWU	8	6	625				
W4TLA	7	4	850	WØEMS	26	8	1175
				WØIHD	24	7	870
W5RCI	21	7	925	WØGUD	22	7	1065
W5JTI	19	7	1000	WØONQ	17	6	1090
W5AJG	11	4	1260	WØINI	14	6	830
W5QNL	10	5	1400	WØOAC	14	5	725
W5CVW	10	5	1180	WØTJF	13	4	—
W5MWW	9	4	570	WØZJB	12	7	1097
W5ML	9	3	700	WØWGZ	11	5	760
W5ABN	9	3	780				
W5ERD	8	3	570	VE3AIB	20	8	890
W5VX	7	4	—	VE3DIR	18	7	790
W5VY	7	3	1200	VE3BQN	14	7	790
W5FEK	7	2	580	VE3DER	13	7	800
W5ONS	7	2	950	VE3BPB	12	6	715
				VE2OK	12	5	550
W6WSQ	4	3	1380	VE3AQG	11	7	800
W6ZL	3	3	1400	VE1QY	11	4	900
W6BAZ	3	2	320	VE7FJ	2	1	365

(Twin 6), W7INX (16-element), W7SEZ (Twin 6), W7OKV (32-element), and W7JIP (20-element now replaced by a 24-element job made up from 4 6-element Yagis with ⅝ wave spacing vertically and a full wavelength horizontally).

2-Meter Harmonics Endanger Aircraft Communication

Most 2-meter operators probably never give it a thought, but their second harmonics fall in a military aircraft band. W6RIU reports serious interference from near-by 2-meter stations, as the result of harmonic radiation on the auxiliary military air traffic control frequency of 291.6 Mc.

Even very low-powered rigs can cause trouble, if they are near fields where these frequencies (225 to 400 Mc.) are in use. Landing instructions have been fouled up by such interference, and this is very serious business. Fortunately it is a simple matter to prevent such trouble in most cases. With shielded rigs like the Communicator, for instance, the installation of a simple filter like the one described in *QST* for April, 1953, page 20, and repeated in recent editions of the *Handbook*, will do the trick.

Avoiding TVI is not our only responsibility in connection with harmonics!

TRICKS WITH THE COMMUNICATOR

With the impact the Gonset Communicator has had on the v.h.f. scene, it is only natural that "improvements" for the little green-eyed dragon are a dime a dozen. Seems like everyone has a pet scheme for making the Communicator over into something else than what it was intended to be, a general-purpose transmitter-receiver for 2 or 6 meters. Some of the ideas involve considerable modification of the unit. These we'd prefer to steer clear of, because they tend to ruin the resale value of the rig as it stands. Others can be put on or taken off at will, and it is in this category that we feel the best work can be done.

Two factors seem to strike most modifiers as desirable: use of the Communicator receiver as a converter, and increasing the modulator audio gain to permit talking at lower voice level. Adaptation for c.w., both in transmission and reception, appeals to quite a few owners, too, but either may require some circuit changes. Here are ideas for accomplishing the first two.

More Modulation Without Shouting

The Communicator audio system more or less automatically prevents overmodulation, but it also requires high voice level, particularly when carbon or low-output crystal microphones are used. This is as it should be in portable or mobile operation, but in using the rig at home it is useful to be able to modulate it fully while talking at low level. W2IUI, Linden, N. J., had a bright idea for doing this. Noting that the modulator uses the Heising (choke) system of modulation, in which a transformer with a low-impedance secondary is also used to permit operation of the rig as a p.a. system, he coupled the low-impedance output of a public-address amplifier into the p.a. jack on the Communicator. This allows his amplifier to be used as the modulator, without making wiring changes in the Communicator. The send-receive switch works normally, and the amplifier may be unplugged at any time and the rig used in its original form for portable or mobile work.

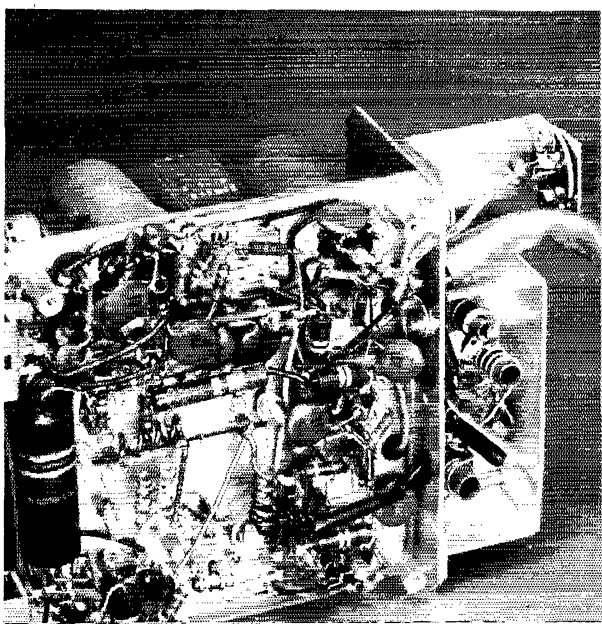
For best results, an amplifier output impedance of 4 to 8 ohms should be presented to the p.a. jack on the Communicator, but impedances as high as 16 ohms will work. The high-frequency attenuation of the Communicator modulation circuit effectively reduces the wide frequency response that is common in high-quality amplifiers. Most such amplifiers also include bass and treble controls. Superior voice quality can be obtained without wideband response, if these controls are adjusted with care. The amplifier should be capable of 20 watts or more of normal output, in order to be most adaptable to this application.

Use as a Converter

The 2-meter Communicator lacks the selectivity needed for satisfactory operation in areas where activity is heavy. The bandwidth is just about right for mobile operation, where frequency instability in the oscillator would be troublesome if a much sharper i.f. were employed. But at the home station improvement in signal-to-noise ratio and better separation of stations can be obtained if the i.f. signal of the Communicator is fed into a communications receiver, converter fashion.

This can be done very simply, and in several ways that will not mar the appearance or operating quality of the Communicator. One extremely simple adaptation is shown in the adjoining photograph. A phono-type coaxial fitting is mounted on a small aluminum bracket attached to the rear of the receiver. Both the mounting screw and the hole for the i.f. lead are already there. A piece of shielded wire long enough to reach to the nearest i.f. transformer is run

(*Continued on page 144*)



Method of taking off the i.f. signal, for using the Communicator as a converter. A coax fitting is mounted on a small bracket on the back of the receiver chassis, and a lead from it is capacitively coupled to the first i.f. tube plate lead.

RECORDS

Two-Way Work

50 Mc.: CE1AH — J9AAO
10,500 Miles — October 17, 1947

144 Mc.: W6ZL — W5QNL
1400 Miles — June 10, 1951

220 Mc.: W8BFQ — W5RCI
700 Miles — October 9, 1954

420 Mc.: W1RFU — W4VVE
410 Miles — June 12, 1954

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
109 Miles — August 8, 1954

21,000 Mc.: W1NVL/2 — W9SAD/2
800 Feet — May 18, 1946

Operating News

F. E. HANDY, W1BDI, Communications Mgr.
R. L. WHITE, W1WPO, Asst. Comm. Mgr., C.W.
PHIL SIMMONS, W1ZDP, Communications Asst.

GEORGE HART, W1NJM, Natl. Emerg. Coördinator
ELLEN WHITE, W1YYM, Asst. Comm. Mgr., 'Phone
LILLIAN M. SALTER, W1ZJE, Administrative Aide

Operation Alert 1955 (June 15th–16th). This civil defense exercise will be based on a hypothetical nuclear attack on 50 to 92 critical target cities of the continental United States with parallel difficulties in outlying territories. The primary FCDA wire facilities and radio back-up provisions for communities and states all will be given a severe test. Analysis of last year's operation revealed the need for flexibility in handling written communications. The pre-attack analysis of what bombings might do to existing communications (expanded-damage concepts in keeping with weapons development!) constitutes a challenge to those planning and testing wire and radio facilities. On the community levels particularly, the actual deployment of units under RACES plans should receive the greatest encouragement and support.

In April *QST* we reported RACES progress as of the end of last year, suggesting that all amateurs not presently identified in RACES or AREC make local inquiry of Radio Officers and ARRL ECs.

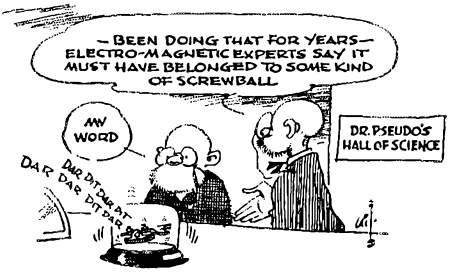
Each *License Manual* contains the full text of the applicable Radio Amateur Civil Emergency Service rules. The RACES series of articles (see April '53 *QST* especially) fully explains the procedures for submitting and getting approval of a RACES plan if none exists in your community. Steps to put forward such arrangements should be urged in every case where an existing RACES plan has *not* been promulgated.

Only thus can our institutional contribution be the fullest credit to amateur radio. So unless you are already lined up for participation, or otherwise already obligated to important duties that would make you unavailable to assist, be sure to make local inquiry into RACES. Contact your EC or SEC for AREC/RACES information. Ask where you *may* serve in connection with this and any future civil defense emergency requirements!

Pse QSL OM. "Some stations send a card only when asked to, others QSL each and every new contact, whether across town or in some foreign land. In return, one is usually received from the other station. . . . To a newcomer in the ranks of amateur radio, a QSO and a card to follow mean a lot.

"You probably have a *lot* of cards on the wall of *your* shack but this new ham, who hasn't been on the air very long, doesn't have many at all. So to keep the ham spirit alive be sure and drop him that all important piece of cardboard, especially the one that confirms the first contact on the air, a never-to-be-forgotten thrill. Send that little card that proves amateur radio really works."—*K6BDI, "Dits and Dahs," Camp Gordon Radio Club, Ga.*

On the Use of CQ. The League's operating booklet frankly recommends never sending a CQ more than five times without interspersing with it one's station identification — reason, so that people who *might reply* as you want, don't just give up and go away! The number of repeated calls must also be definitely limited, too, for the same reason. The most productive procedure is always to intersperse listening periods *at frequent intervals* with one's call. Don't forget also the use of the indication of state, city, direction, etc. with CQ, when you have traffic to move to a given point and have neglected to



get it into your section net that has a tie with National Traffic System routing, or when adding states for WAS, or looking for a particular point. It is then also desirable to use judgment in limiting the length of calls. Some prefer the "three times three" CQ and identification. At any rate, the long-winded CQer is just a laughing stock who is demonstrating his own inadequacies in knowing how to operate, in the opinion of many hams. It is result-getting practice to intersperse ample listening periods with your CQ calls; be sure to cover a goodly slice of band up and down from your frequency after all such calls.

Making ARRL's June 25th–26th Field Day a Success for You. The Field Day rules are printed in this issue. Field Day as ever is dedicated to emergency communications preparedness. Clubs may use *several* transmitter groups on the air simultaneously; the purpose is to give the workability test to as much equipment as possible; also an operating ability test to installers and operators, as only FD can.

The big thing that will make Field Day, or for that matter any other League activity, a success for *you*, is to get in it and give it your best. Field Day benefits are not from the tinsel

of artificial awards but through the sheer operating experience which engenders fraternalism, brings added know-how and a field adventure within your reach, whether you go out with a team or as an individual. Operating participation, as always, will assure your success.

Even one contact can prove your field test a success from the workability standpoint. We stress (by points credit before multiplier) that each station file and send a message to demonstrate bona fide communications and not limit ability entirely to brief contacts. The message, and more contacts, will carry your success farther.

The lessons in a Field Day are numerous; many of them are of a practical nature. Let us stress that the invitation to take part is just as much for individuals as for clubs and groups; scoring plans are flexible giving a choice of ways to enter for all U. S. A. and Canadian amateurs. Compare your results with those similarly set up, or with your own earlier comparable score. Don't forget to start your (one only) FD message to SCM or SEC in this year's field operations. B C N U in the FD! — *F. E. H.*

RTTY NOTES

Under this part of the sunspot cycle we often have superior north-south propagation conditions so that some of those South American teletype commercials in the 80-meter band are consistently heard. After dark signals are often QSA 5. A recent letter from W3PYW mentions that one evening at 1900 EST he logged commercial RTTY signals on 3567, 3587, 3630, 3651, 3657, 3920 and 3992 kc.

W3PYW also mentioned that at least three close friends have asked why amateurs on RTTY don't sign. All RTTY enthusiasts want it made clear that as bona fide licensed amateurs they *do* sign — every ten minutes and at the beginning and end of transmissions as required by FCC! They use RTTY *and* continental *both* as per FCC's Section 12.81. If they don't identify, you can be sure they are not our W/VE amateur friends.

— • • • —

The Amateur Radioteletype Society (New York) and Western Union coöperated in supplying RTTY facilities for a civil defense test held on March 22nd. RTTY facilities were set up in civil defense control centers in Brooklyn, Manhattan, Queens and Westchester County, New York. Among those amateurs furnishing equipment and participating in the drill were *W2s* AKE AWQ BFD DUP EBZ IRT MGN QGH TLY.

— • • • —

A number of prominent RTTY enthusiasts, many of them in town for the IRE convention, turned out for an informal meeting and dinner at RCA Exhibition Hall in New York City on March 21st. Among those present were *W1s* AFN BGW FGL RBF RGU, *W2s* AKE BDI EBZ JAV NSD OOG PAU PBG SPV TBD TKO, *W3s* CRO MHD PYW, W4ZC, W6AEE, *W9s* CNN TCJ, WØBP.

DXCC NOTES

Announcement is hereby made of one addition and one deletion to the ARRL Postwar Countries List. The addition will be that of Wallis and Futuna Islands (FW8). These islands are located approximately 1100 miles NNE of New Caledonia of which they are a dependency. The deletion will be Tannu Tuva.

DXCC credit will be given starting August 1, 1955, for creditable confirmations dated on or after November 15, 1945, for Wallis and Futuna Islands (FW8) contacts. Confirmations received prior to August 1, 1955, will be returned without credit.

In future ARRL DX Competitions, those making contact with amateur stations located in the Wallis and Futuna Islands may claim credit for a separate country in accordance with DXCC rules.

DX CENTURY CLUB AWARDS

HONOR ROLL

W1FH....258	W6SN....247	W3KT....245
W6VFR....254	W8NBK....247	W6SYG....245
W6AM....253	G2PL....247	W2AGW....244
W6ENV....251	W3GHD....246	W6MX....241
W8HGW....251	W6MEK....246	W2BXA....243
W3BES....250	PY2CK....246	W5MIS....243
WØYXO....250	W3JTC....245	W9NDA....243

Radiotelephone

PY2CK....239	W1MCW....215	W3JNN....209
W1FH....230	W1NWO....215	W9NDA....209
VQ4ERR....230	XE1AC....215	SM5KP....207
ZS6BW....224	W8HGW....214	W5BGP....205
W1JCX....216	W9RB1....210	W6DI....205

From March 15, to April 15, 1955 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

W7HQC....110	LA3DB....105	W4VNE....101
W4GCW....108	DM2ADL....103	DL9PX....101
VQ4EI....108	W1WLW....102	HB9EW....101
DL1ME....106	W9RMH....102	W4SOV....100
	VE2OJ....102	

Radiotelephone

VE2GQ....112	G3XC....102	W8NWO....101
EI3S....104	W1WQC....101	W4EEE....100
EA8AX....103		EI2W....100

ENDORSEMENTS

W6RW....233	W3AXT....154	W6MUF....136
G8IG....211	W2AZS....150	W4TP....135
PY4IE....210	W4ML....150	OZ8SS....133
W4LVV....201	W7RT....150	W3HER....131
W3KDP....200	W8EEK....146	W6FUF....131
W1AB....192	WØQVZ....144	W9ALI....130
W2PRN....190	W1JOJ....142	CR6AI....122
W5EFC....188	WØDXE....142	W6SWG....121
W3ALX....180	W9IRV....140	G3AAE....121
W6MFL....164	W8TMA....140	W5HDS....115
W3AFW....161	WØNLY....140	4X4DF....113
W3ECR....161	W1BGA....137	JA1AA....111
W6LVN....160	W2GVP....136	W2FBS....110
ON4FL....157		SM3AKW....110

Radiotelephone

CX2CO....190	W2WZ....150	W3ECR....125
W5EFC....183	W3UIP....143	W8QJR....120
G8IG....180	W1GOU....140	LA5YE....117
CT1PK....171	WØHX....140	W5GXP....110
W9RNX....170	W8VDJ....130	WØEHF....110
PY4CB....170	KT1WX....130	OD5BA....110

W/VE/VO Call Area and Continental Leaders

W4BPD....241	VE4RO....223	VE8AW....160
W7AMX....240	VE5QZ....140	VO6EP....190
VE1HG....150	VE6GD....108	4X4RE....210
VE2WW....181	VE7HC....209	ZS6BW....231
VE3QD....210		ZL2GX....235

Radiotelephone

W2APU....202	VE1CR....120	VE4RO....120
W4HA....180	VE2WW....102	VE7ZM....140
W7HIA....181	VE3KF....163	OD5AB....170
WØAIW....179		ZL1HY....190

A.R.R.L. ACTIVITIES CALENDAR

June 3rd: CP Qualifying Run— W6OWP
June 11th–12th: V.H.F. QSO Party
June 17th: CP Qualifying Run — W1AW
June 25th–26th: ARRL Field Day
July 2nd: CP Qualifying Run — W6OWP
July 11th: CP Qualifying Run — W1AW
July 16th–17th: CD QSO Party (c.w.)
July 23rd–24th: CD QSO Party ('phone)
Aug. 5th: CP Qualifying Run — W6OWP
Aug. 16th: CP Qualifying Run — W1AW
Sept. 3rd: CP Qualifying Run — W6OWP
Sept. 14th: CP Qualifying Run — W1AW
Sept. 15th: Frequency Measuring Test
Sept. 17th–18th: V.H.F. QSO Party
Oct. 8th–9th: Simulated Emergency Test
Oct. 13th: CP Qualifying Run — W1AW
Oct. 15th–16th: CD QSO Party (c.w.)
Oct. 22nd–23rd: CD QSO Party ('phone)

On the fifteenth and sixteenth of June, 1955, the United States is going to get the worst theoretical pasting in its history, bringing about "Operation Alert 1955," a National Civil Defense Test Exercise. The test will start at *1100* EST. Fifty critical target cities will be the recipients of as many hypothetical atomic attacks by bombs ranging in size from 20 kilotons to 5 megatons. In addition, there will be seven atomic attacks directed at any seven of 49 "unknown" targets. Total assumed casualties will be over sixteen millions, of which about half will be assumed killed and half wounded.

Regarding communications, FCDA says: "The exercise will be played communications-wise on the basis of assumed communications channels available after analyzing the damage." Also: "Radio back-up through the use of amateur personnel and equipment should be utilized at all levels to the extent facilities are available at the time of the Exercise. Such amateur participation should be within RACES plans, *approved and pending*. Amateur participation will be encouraged through the American Radio Relay League." The italics are ours.

More details will be included in a forthcoming EC bulletin, which may be in the hands of ECs by the time this appears in print (we hope). This is just a reminder to all and sundry that once again we have to put in a performance to justify RACES. If you are not at present an AREC member, *it is time for you to get signed up with your EC.* If there is no EC, *get one appointed*, or volunteer for the job yourself. Then get in touch with your c.d. director *quick* and get a RACES plan in the works. Only if there is a plan pending can you take part in the June test, so better get going right away!

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We ought to make clear that the RACES subhead on this column is not designed to further split the AREC and RACES. It follows logically along with our philosophy that RACES is one of the jobs of the AREC, and a darned important one. The "RACES" column is part of our "With the AREC" column. We hope you'll read it, whether you're "in RACES" or not. Items about civil defense and RACES which are of general interest, such as the above, will continue to appear in this part of the column.

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On the evening of July 22, 1954, downtown telephone service in Farmington, N. M., was curtailed by flood waters. The police chief asked for and received the help of the amateurs when EC W5CIN stationed one mobile unit at the reservoir, two others at fire and police headquarters, and another on stand-by to be dispatched where needed. Communications were also maintained with Albuquerque when telephone facilities failed. For some time, radio was the only means of communication with the outside world. Amateurs participating: *W5s* GVB (then W7NZB/5) PVB and CIN. — *W6CIN, EC Farmington, N. M.*

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On February 1st, a severe windstorm swept a path across Northern Mississippi, causing considerable damage. EC W4BAQ alerted some of the Memphis AREC members to help Red Cross determine the need for assistance at Commerce Landing, Miss. W4VVQ and W4EPQ were dispatched, one to proceed to the area, the other to provide 2-meter relay. Experiencing difficulty maintaining contact, W4GQQ and W4VZU were dispatched for additional relay points. Memphis fixed stations assisting in contact with these stations included *W4s* BAO BAQ CV DIX IQX and OTJ. The following day the Red Cross asked for a check of the situation at Lewisburg, Miss., where the storm also struck. W4BAQ and W4IQX proceeded to the area and handled some Red Cross traffic via W4UDI, while W4HHK, operating W4UDQ, stood by. Both 2 and ten meters were used in this operation. — *W4BAQ, EC Memphis, Tenn.*

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On February 14th, amateurs in Western and Northern Texas and adjoining states assisted the CAP and CAA in searching for the wreckage of a missing plane piloted by W5DM. W5DM was flying his own plane from Denton to Odessa to visit W5NW (ARRL Veep) when he crashed and was killed within twenty miles of the Odessa airport. The North Texas and the North West Texas nets combined on 3930 to help provide communications for the search, furnishing valuable information for the CAA and CAP. Many amateur mobiles were also out. W5DM's wrecked plane and body were found two days after he was reported missing. Officials of CAA and CAP, and Mrs. W5DM expressed great appreciation for the amateurs' assistance.

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On March 14th K6BJO, a doctor of Dunsmuir, Calif., made an emergency call to a car wreck 5 miles south of Dunsmuir. K6BJO/m called W6ILY and W6WVW, both of Dunsmuir, to call hospital and make arrangements for the patient. All this was done by K6BJO while he was answering the emergency call on the way to the wreck, and enabled the patient to be taken care of promptly.

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Cape Cod's worst blizzard of the year came on April 4th, wiping out all telephone, telegraph and power lines from south of the Cape Cod Canal to Yarmouth. The Cape Cod and Island Amateurs Net was activated by NCS W1NXH at 0845, putting the net immediately on an emergency basis and dispensing with the customary roll call. Weather reports were collected from W3MAC, W1QJA, W2NQK, W2LWA and others to get a general picture of the storm. W1LYV reported in on emergency power at 0927 to say that all power and telephone cables were down, with a strong wind blowing. Twenty minutes later W1YXJ /m came on to report the disaster as they saw it. Stations continued to report in until almost forty were standing by. W1LYV reported being ready on two meters. Inquiries from newspapers started to pour in about noon, but the storm was still in full swing and not much information was available. At 1430, W1CLF took over net control and retained it until 2240, when the net was secured. Fifty-three stations participated in all, including the following not already mentioned: *W1s* AKN AVY AWD AXH BUN DFS DGJ DKS DMI DNI DUN FZO GDT GIX GWL THL LPB LVJ MFI OQT SDT SGL SZU TJA TJU TVS UN OUW ORN/1 VSE VSZ WGP WTZ WUO WWZ YPT/1 YYW ZUR WZ CUA; *W2s* CYT ETS EMV KZ HOS WZ JWM JGV NQK; *K2s* EHI HOS LWA; W3MAC. — *W1CLF, EC Norfolk, Mass.*

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On the morning of February 19th, EC W5UWA was informed of a missing TWA aircraft and asked if the amateurs would be available. He immediately offered the amateurs' services to the state police and put the Caravan Club on a stand-by basis. By 1400, four mobiles were engaged in the search, and at 1500 the Caravan Club was authorized to take part. Unsuccessful before dark on Saturday (19th),

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Members of the Augusta (Maine) Emergency Amateur Radio Unit are conducting classes in radio procedure, with RACES operating standards as a guide, to train operators in the use of civil defense communications equipment. They will man equipment of the Augusta C.D. organization, the Kennebec County Control Station and the State C.D. Headquarters. Standing, left to right, we have Joseph Meriau, Augusta Civil Defense Director; Brian Spaulding, W1ZAK; Ruel Ellis, Augusta Communications Officer. Seated: Harold Chapman, W1WTH; Carleton Miller, W1SIN, Club Secretary and Kennebec County Radio Officer; Theodore Gingrow, W1ZAL; Charles Chapman, W1WTG.

the Caravan Club set up to do the job systematically. An area 30 by 72 miles was laid out in sectors, a member of the Caravan Club covering each sector, according to a plan previously devised by the EC. Five mobiles from Los Alamos also participated. W5ZSL/m operated as control from atop Sandia Crest. One mobile each was assigned to the state police, TWA, and the ground control point for the search aircraft.

Sunday morning while W5ZSL was en route to Sandia Crest, W5UCX controlled the net on 3838 kc. This net was then secured and W5UCX proceeded on his mobile assignment. W5OAI and W5UWA met the mobile group from Los Alamos, gave them maps and their assignments. At 1100 Sunday the wreckage was spotted in the Sandia Mountains and mobiles rendezvoused at the base of the mountain. They were unable to go up, however, because of road conditions, but assisted the Sheriff's Department and the various news agencies on hand. A great deal of help was given the mobiles by members of the New Mexico Emergency 'Phone Net, who helped keep the frequency clear. W5UWA lists the following as having participated in operations: Mobiles *W5s* FVY YDE OAI DAH WBG CTG UWA JAU HZG UAF GGJ ZSL UCX ECN LEF LGS AQQ GWJ RUV FHP TLI FIA SUO VDY ZMN YMA MYQ PDY; fixed stations *W5s* MEW PIZ KWR QPF ZU BXP VNZ K5WCF WØIWN. — *W5UWA, EC Bernalillo Co., N. M.*

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Eighteen SECs reported February activities for their sections, representing 5348 AREC members, for the best February reporting record to date. New sections (SECs) heard from since last month: Los Angeles (W6QJW), Vermont (W1SIO), Montana (W7KUH), Oregon (W7WAT). Twenty-two sections have reported via their SECs already in 1955. This leaves only 51 more SECs to be heard from.

RACES News

FCC has announced that effective May 9th, Form 481 instead of Form 405A will be used when renewing a RACES station authorization. Since the term of such authorization runs concurrent with the regular amateur station license, this means that Form 481 and Form 405A with *both* have to be completed, the difference being that the former has to be signed and submitted by your RACES Radio Officer. This was the subject of an Official ARRL Bulletin dated March 31, 1955, and distributed throughout our Official Bulletin Station system. This is just an extra reminder, in case some of you missed it.

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The Executive Assistant Administrator of FCDA, Mr. Harold L. Aitken, under date of March 22, 1955, has written to all FCDA Regional Communications Officers suggesting that attendance at ARRL Conventions by FCDA representatives is most desirable. This means that recognition is being given to the increased civil defense flavor of ARRL conventions and other amateur gatherings. If you are one of those amateurs who has stayed away from amateur gatherings because of too much emphasis on the purely social and DX aspects, you can step up emphasis on public service aspects by lending the weight of your presence — and chances are good that FCDA will be represented.

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From the *Microvolt*, publication of the Utah Amateur Radio Club, we glean some information concerning RACES preparations in Salt Lake City. The city has seven control stations operating in the Disaster Communications Service. The amateurs are organized into three separate nets on the 75-, 10- and 2-meter bands. Weekly tests are conducted at 1930 MST Wednesday evenings. The present goal is to enroll all local amateurs in civil defense, although any amateur may check into the c.d. drill on 3995, 29,626 and 144,600 kc. C.w. as well as 'phone stations are needed.

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We invite any and all amateurs to submit information on RACES. Naturally, we must insist on editorial prerogative to accept or decline any offering, but we are definitely on the lookout for RACES info, from short one-paragraph blurbs to complete up-front *QST* articles, including pictures and diagrams. If you have a story to tell about your RACES set-up, sit down and write us about it. We're interested.

Horace Luhn (left), W8HSY, and Jack Reith, W8HQK, work W8VVL at the amateur radio communications center in the Red Cross Building in Cincinnati. Members of the Queen City Emergency Net have operated here in the past and have coöperated with the Red Cross in several Ohio River flood emergencies. Equipment shown includes a 50-watt ten-meter rig and an all-band 'phone-c.w. kw. job.

FEBRUARY FMT RESULTS

The ARRL Frequency Measuring Test of February 8th brought entries from 180 participants who made 505 measurements. Each participant has received an individual report comparing the accuracy of his measurements of the special W1AW transmissions with those made by a professional frequency-measuring laboratory. In the standings of the leaders below, decimal fractions are shown only to establish a listing order, since the official readings can only be accredited to 0.4 parts per million. Sharing top honors equally, therefore, are Official Observers W4JUI and W5FMO and non-OOs W8GQ, W4HER, W8CUJ, and W8HB.

Observers	*Parts/ Million*	*Non-Observers*	*Parts/ Million*
W4JUI	0.0	W8GQ	0.0
W5FMO	0.4	W4HER	0.3
W2FE	0.7	W8CUJ	0.3
W5QHK	0.9	W8HB	0.3
W3DVO	1.0	W9CBW	0.5
W1QHS	1.2	W9TCJ	0.6
WØOTR	1.2	W1TWJ	2.8
W6CK	2.0	W8KTM	2.8
W4FJ	2.5	W9CNN	3.0
W6RW	3.3	W6HDP	3.1
W3TFN	3.4	W8CXP	3.3
W8GBF	3.6	W3AHZ	3.4
W3QZP	5.0	TF3CJ	5.2
W4FR	5.7	W4ANK	7.2
W8GZ	5.8	W8JCG	7.2

The following ratings are based on a single measurement: *OOs* — W4IYC 3.0, W7BBK 3.0, W3QCB 3.8, W4VP 4.3; *non-OOs* — VE3BAJ 3.8.

NATIONAL CALLING AND EMERGENCY FREQUENCIES (kc.)

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

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for March traffic:

Call	Orig.	Recd.	Rel.	Del.	Total
W3WIQ	28	621	649	82	1380
WØSCA	16	613	600	1	1230
W6SWP	93	560	482	70	1205
WØBDR	11	572	542	21	1146
WØCPI	15	561	511	50	1137
W4PFC	19	502	495	17	1033
W2KEB	62	454	352	122	990
W9DO	9	447	438	18	912
W4PL	6	462	387	50	905
K5FFB	67	389	402	29	887
W9JUJ	18	430	418	20	886
W7PGY	33	398	364	34	829
W2KFV	16	425	391	84	826
W9YWL	85	393	279	24	781
W7BA	15	368	366	17	766
W3CUL	73	346	251	82	752
K2BJS	35	345	301	31	712
W7FRU	4	352	310	40	706
W6MBW	20	344	319	16	699
W4UHA	140	255	255	6	656
W2LPJ	18	314	293	21	646
W3WV	12	341	254	39	646
W5MN	12	319	267	48	646
W9CSW	5	315	35	280	635
W6YDK	20	297	232	65	614
W7APF	6	286	269	17	578
W9TT	9	334	229	1	573
K7FAE	27	247	260	22	556
W9IDA	115	216	199	10	540
K4WBG	127	222	142	47	538
WØBLI	9	261	253	3	526
W5DTA/5	25	241	254	5	525
W9NZZ	202	161	1	161	525
WØFYO	9	257	188	66	520
W4PJU	5	256	231	25	517
W2RUF	31	272	147	65	515
W4OEZ	116	192	180	12	500
Late Reports:					
K2BJS (Feb.)	22	285	269	25	601
W3WV (Feb.)	19	285	199	36	539

More-Than-One-Operator Stations

W6IAB	43	1996	1887	109	4035
KH6AJF	701	433	333	100	1567
KA2GE	138	628	564	64	1394
K4FDY	40	595	438	36	1109
K6WAY	185	296	455	18	954
K4WAR	96	364	412	48	920
KA2AK	119	369	341	28	857
KØFDL	7	257	0	252	516
Late Reports:					
KC6FAA (Dec.)	1298	5429	5189	240	12156
KH6AJF (Dec.)	2885	1044	895	129	4953
KH6AJF (Feb.)	811	666	575	89	2141
KH6AJF (Jan.)	909	577	496	75	2057
KR6KS (Feb.)	184	307	221	86	778

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

W3CVE	365	WØNIY	132	W4BWR	101
W8DAE	302	VE3NG	129	Late Reports:	
W4TYU	170	W4YIP/6	125	W3CVE (Feb.)	327
K4ASU	162	W4ELS	122	W3RV (Feb.)	111
K6FDG	155	W9AA	115	W3WBJ (Feb.)	100
W6UBY	150	W4DRD	107		
W4DDY	141	VO6N	106		
W4IIB	135	W4KKW	104		

More-Than-One-Operator Stations

VE3BRR/3	425	Late Report:	
W4DFU	351	KA7LJ (Feb.)	169

BPL medallions (see Aug. 1954 *QST*, p. 64) have been awarded to the following amateurs since last month's listing: K2HZR, K5FFB, W7APF, WØGBJ.

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

TRAFFIC TOPICS

There are times when one must bow to the inevitable. After years of plugging a standardized form for handling ARL-text messages, it now appears inevitable that the ARRL way will never be generally adopted. The question then becomes: how far need we unbend to accept common misuse as correct use?

The ARRL way of sending an ARL fixed-text message has been detailed in our booklet *Operating an Amateur Radio Station* (p. 12 in the latest edition). Once in a while we have actually heard ARL-text messages sent that way — but not very often. The chief non-compliance seems to be in insistence on the use of the symbol ARL in the text preceding the text number. Everyone uses the ARL, some both in the check and in the text, others in the text alone.

All right, then, let's make that correct. A message using ARL text number twenty-three will have a check of ARL 3 and the text will read ARL TWENTY THREE. All the other rules pertaining to the use of ARL text messages will still apply. We think it still *makes sense* to spell out the numbers to cut down the incidence of error, and we want to keep it that way.

All this comes about through a revision of our operating booklet, in which the above change is being made. We want you to know that this change was carefully considered and discussed before it was made, minor as it is, and that it is not a misprint in the new operating booklet.

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A lot of you guys are getting awfully careless in your traffic work. We notice it more all the time. Maybe it's a result of trying to run up big totals, or of simply being overloaded, we don't know. Whatever it is, let's tighten up our procedure; because in being careless in haste we not only cause traffic to arrive at its destination badly garbled, but we actually slow down the amount of traffic we can handle. These points will be argued by those who are guilty of them, but we think they are all marks of sloppy traffic handling:

1) Failure to indicate a word count. Any station who passes a message without a word count is marking himself as a sloppy traffic man. If it comes to you without a check, that's no excuse; you should put a check on it before you relay it onward. If the check is incorrect as you receive it, you should indicate a corrected check. The check is *not* an optional part of ARRL message form.

2) Incorrect preamble heading. MARS-originated messages are no different from others — they should have a proper *amateur* heading. Some of the preambles we have seen are corkers. All we want in the *amateur* preamble are number, station of origin, check, place of origin, filing time and date. The rest is extraneous and should be excised.

3) *It is proper* to correct the *form* of a message you are handling, but not its *content*. You don't have to repeat mistakes of the operator who sent you the message, just because "that's the way I got it." But be careful that in correcting form you don't change the content or meaning. For example: (1) If the place of origin reads "Boy Scout Exposition, Junkboro, Pa.," you can eliminate the first three words when you relay it, because they don't belong there; but (2) don't change "Watervliet" to "Waterville" because you never heard of the former and think it's a mistake.

4) Get in the habit of following standard procedure in amateur traffic. Failure to do this is another reason for message garbling. On c.w., use AA between the parts of the address, BT to separate the text from the address and the signature, AR to indicate the end of the message and either B (more to follow) or N (no more). Once not long ago we copied a message that ended up with LOVE TO ALL MARTHA TWO MORE K. It took us a little time to figure out that it should have been LOVE TO ALL BT MARTHA AR B. On 'phone, *say the words.*

5) How about using a little more break-in? Break-in does not mean that you stop for an okay every so often. It means, on c.w. (and it's a c.w. term), that you can hear the other fellow "break" while you are sending to him, so he can interrupt and make you back up if he misses a word. If you are equipped for break-in, send QSK before you start sending traffic to another station; if not, send NO BK, so he won't waste time trying to break you.

6) Improper procedure in sending repeats and getting fills can waste time and cause garbling. When you repeat something on 'phone, say "I repeat." On c.w., send a question mark (?) and repeat the word. If you repeat without the question mark, the receiving operator will naturally think the word is *supposed* to appear twice in the text. In getting fills, use WA (word after), WB (word before), AA (all after) and AB (all before). If you miss several words, use BN (between) followed by the last word received correctly before you missed, a question mark, then the first word you received correctly after the part you missed. On 'phone, of course just use the voice equivalents, not the abbreviations.

In other words, gang, *let's stop being so sloppy in our operating habits!*

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Miscellaneous net reports: (1) The Early Bird Net reports a March total of 791, per W8AMH. (2) The College Net held eight sessions, 66 different stations reporting in, traffic total of 18; a meeting of the College Net was held at Yale University, New Haven, the week end of April 30th.

The American Legion Amateur Net held its annual business meeting recently in Bakersfield, Calif. Left to right, front row: W6QGX, W6UQL, K6ARZ, W6FEA, W6GRO. Rear row: W6PIB, W6KMY, W6OFJ, W6WJF, W6JEJ. ALN meets daily at 1900 PST on 3975 kc. (*Photo by K6CZU*)

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(3) North Texas-Oklahoma Section Net reports 31 sessions, 1088 check-ins, 414 messages. (4) Transcontinental Relay Net reports 31 sessions, five stations, traffic total 1500.

National Traffic System. Usually in the May issue we make some caustic remarks about "Daylight Saving" Time and what it does to our NTS time schedule. This year we neglected to do so, and such remarks in the June issue would be anti-climactic — so we'll skip it, except to remind you that standard NTS procedure is to *remain on standard time*, and most NTS nets, even in the highly-civilized DST areas, customarily do so.

Not that we're prejudiced against DST, mind you. (Not *much*.) It's just that we have to maintain the NTS time schedule, and to do so we ought all to keep our skeds at the same time or *all* move them up an hour. If there is strong sentiment for the latter, let's kick it around a bit.

Summer QRN is the stuff that separates the traffic men from the traffic boys. As the sunspots continue to increase, our recollection is that skip will decrease and QRN during the summer will increase. If we expect the worst, we will be less dismayed if it comes to pass. Lets keep NTS rolling throughout the summer, come what may.

March reports:

Net	*Sessions*	*Traffic*	*Rate*	*Average*	*Representation*
EAN	26	705	0.85	27.0	92.3%
CAN	21	735	0.88	35.0	100
PAN	28	746	0.37	26.0	
1RN	27	315	0.49	11.6	88.0
2RN	54	439	0.36	8.2	96.3
3RN	44	419	0.77	9.5	88.6
4RN	17	117	0.23	7.0	37.0
RN5	50	627	0.87	12.5	60.2
8RN	36	194		5.4	80.6
TRN	31	67		2.1	72
Sections *	492	2845		5.8	
TCC Eastern		215			
TCC Central		225			
TCC Pacific		546			
Summary/ High Net	826	8195	CAN	8.7	CAN
Prior Record	847	8493	1.26	28.6	100%

*Section nets reporting: QKS, QKS-SS & QKN (Kans.); TLCN (Iowa); CN & MCN (Conn.); OLZ (Okla.); NTX (N. Texas); MON-SMN (Mo.); TENN (Tenn.); WVN (W. Va.); AENB & AENP (Ala.); NEB (Nebr.); MSN (Minn.); KYN (Ky.); WSN (Wash.).

Late Reports:

TEN	64	1539		24.0	66.4%
TCC Eastern		139			
TCC Pacific		332			

We regret to see reports falling off, but there have been several changes in net managership recently, and a smooth transition is not always possible. Let's hope we get everybody squared away before the summer doldrums set in.

NTS Net Notes: The new manager of PAN is W7APF, replacing W7NH who put in several years in NTS leadership roles. A total of 41 different stations participated in 1RN during March. W3NRE is the new 3RN manager; 3RN certificates to W3MCG, W3OZV and W3UE. W4AKC has resigned as 4RN manager, and W4BVE is acting until the vacancy is filled. RN5 continues to plug along in good shape, with all sections but Southern Texas and Western Florida now well represented; net certificates have been issued to K4AKP and W4ZJY.

TCC: Things are going well, but there are still some rough spots. The TCC roster as of right now (mid-April) consists of some 33 stations fulfilling 54 of the 60 TCC functions. Transcontinental relaying is tough work and these fellows and gals deserve to be mentioned, so: Eastern Area (W8UPB, Director) — W1EMG W1AW W1NJM W2RUF W3COK W4OCG W4ZFV W8FYO W8DSX W8MQQ VE3GI VE3AJR VE3TM VE3BJV VE3VZ. Central Area (W9JUJ, Director) — W5KRX W9JUJ WØSCA WØBDR. Pacific Area (W6HC, Director) — W4YIP/6 W5RFF W6ATB W6IPW W6ZRJ K6BDF W6YHM W6EFD W7CCL KØWBB KØANZ WØKQD WØBEN VE7QC. At this writing, TCC has six vacancies as regular station, and most of them need alternates. As we said, TCC work is tough, but it's a lot of fun because it's a challenge. Why not try your hand at it once a week?

W1AW OPERATING NOTE

The W1AW Summer Schedule, detailed on page 70 of May *QST*, will be in effect June 1st. See that issue for complete information on when and where to look for W1AW.

CODE-PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW will be made on June 17th at 2130 *EDST*. Identical texts will be sent simultaneously by automatic transmitters on 1885, 3555, 7125, 14,100, 21,010, 52,000 and 145,600 kc. The next qualifying run *from W6OWP only* will be transmitted on June 3rd 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*. Speeds are 15, 20, 25, 30 and 35 w.p.m. on Monday, Wednesday and Friday, and 5, 7½, 10 and 13 w.p.m. on Sunday, Tuesday, Thursday and Saturday. Approximately 10 minutes' practice is given at each speed. References to texts used on several of the transmissions are given below. These make it possible to check your copy. For practice purposes the order of words in each line of *QST* text sometimes is reversed.

Date Subject of Practice Text from April *QST*

June 1st: *The All-Electronic "Ultimatic" Keyer*, p. 11
June 6th: *Graphical Symbols for Radio Diagrams*, p. 16
June 9th: *A Radical Approach . . .*, p. 18
June 14th: *Using the 6860 Dual Tetrode . . .*, p. 20
June 16th: *Director Beams*, p. 23
June 22nd: *The "Tiny Tim" Portable*, p. 25
June 24th: *Emergency Power Distribution*, p. 28
June 27th: *A 6-Band Antenna Coupler*, p. 38
June 30th: *1956 V.H.F. Sweepstakes*, p. 57

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.

Eastern Pennsylvania	Clarence Snyder, W3PYF	June 15, 1955
Iowa	Russell B. Marquis, WØBDR	June 16, 1955

In the Los Angeles Section of the Southwestern Division, Mr. William J. Schuch, W6CMN, and Mr. Robert G. Garner, W6YSK/W6EAJ, were nominated. Mr. Schuch received 484 votes and Mr. Garner received 278 votes. Mr. Schuch's term of office began April 18, 1955.

A.R.R.L. AFFILIATED CLUB HONOR ROLL

In accordance 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 new 1955 Honor Roll of such clubs. The affiliates having 100 per cent ARRL membership are determined from data supplied in the 1955 Annual Report of Club Data. An additional *QST* Honor Roll will be published later this year to include 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 on completing their membership program. Each below-listed club will receive the handsome certificate "100% ARRL Club" previously described in *QST*.

Abington Township Amateur Radio Association, Jenkintown, Pa.
Adirondack Radio Club, Glens Falls, N. Y.
Aeronautical Center Amateur Radio Club, Oklahoma City, Okla.
Batavia Amateur Radio Association, Stafford, N. Y.
Boulder Radio Club, Boulder, Colo.
Connecticut Wireless Association, Inc., West Hartford, Conn.
Detroit Amateur Radio Association, Detroit, Mich.
Door County Amateur Radio Club, Sturgeon Bay, Wis.
Dryden Radio Club, Dryden, Ont., Canada
Haven Radio Club, New Haven, W. Va.
Inglewood Amateur Radio Club, Inc., Inglewood, Calif.
Kingsport Amateur Radio Club, Kingsport, Tenn.
Levittown Amateur Radio Club, Levittown, N. Y.
Lilly Radio Club, Indianapolis, Ind.
Milwaukee Radio Amateurs' Club, Inc., Milwaukee, Wis.
Nanaimo Amateur Radio Association, Nanaimo, B.C., Canada
Norfolk County Radio Association, Norwood, Mass.
North Shore Radio Club, Little Neck, L. I., N. Y.
Northbridge High School Radio Club, Whitinsville, Mass.
Pacific Radio Club, Los Angeles, Calif.
Pickens County Amateur Radio Club, Easley, S. C.
Providence Radio Association, Inc., Providence, R. I.
QSO and QRM Society of Iowa, Iowa City, Iowa
Rappahannock Valley Radio Club, Fredericksburg, Va.
Raritan Bay Radio Amateurs, South Amboy, N. J.
Rome Radio Club, Rome, N. Y.
Scott County Amateur Radio Club, Scott City, Kans.
Sheridan Amateur Radio League, Sheridan, Wyo.
Skagit Amateur Radio Club, Sedro-Woolley, Wash.
South Lyme Beer, Chowder and Propagation Society, West Hartford, Conn.
South St. Louis Radio Club, St. Louis, Mo.
State Line Radio Club of New York and New Jersey, Upper Saddle River, N. J.
Suburban Radio Club, Inc., Kirkwood, Mo.
Sussex County Amateur Radio Association, Sparta, N. J.
Tehama County Amateur Radio Club, Red Bluff, Calif.
Valley Radio Club, Eugene, Ore.
Windblowers V.H.F. Society, Paterson, N. J.

ELECTION NOTICE

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

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

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

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

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

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

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

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

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

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

— *F. E. Handy, Communications Manager*

Section	*Closing Date*	*SCM*	*Present Term Ends*
Yukon*	June 15, 1955	W. R. Williamson	Mar. 17, 1949
West Indies	June 15, 1955	William Werner	Aug. 15, 1952
Utah	June 15, 1955	Floyd L. Hinshaw	Feb. 18, 1954
Colorado	June 15, 1955	Karl Brueggeman	Feb. 16, 1955
San Joaquin Valley	June 15, 1955	Edward L. Bewley	June 15, 1955
Eastern Florida	June 15, 1955	John W. Hollister	Aug. 14, 1955
San Francisco	June 15, 1955	Walter A. Buckley	Aug. 14, 1955
Southern New Jersey	June 15, 1955	Herbert C. Brooks	Aug. 26, 1955
North Dakota	June 15, 1955	Earl Kirkeby	Resigned
Indiana	Aug. 15, 1955	George H. Graue	Oct. 14, 1955
Vermont	Aug. 15, 1955	Robert L. Scott	Oct. 15, 1955
South Carolina	Aug. 15, 1955	T. Hunter Wood	Oct. 15, 1955
San Diego	Aug. 15, 1955	Don Stansifer	Oct. 15, 1955
Northern Texas	Aug. 15, 1955	T. Bruce Craig	Oct. 15, 1955
Western Florida	Aug. 15, 1955	Edward J. Collins	Oct. 15, 1955
Western New York	Sept. 15, 1955	Edward Graf	Nov. 21, 1955

* In Canadian Sections nominating petitions for Section Managers must be addressed to Canadian Director Alex Reid, 109 Logan Ave., St. Lambert, Quebec. To be valid, petitions must be filed with him on or before closing dates named.

CLUB COUNCILS AND FEDERATIONS

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

Central California Radio Council, Edward J. Roussey, W6VCZ, Secy., 1510 Newlands Ave., Burlingame, Calif.

Chicago Area Radio Club Council, George M. Boyd, W9SPT, Secy., 3540 N. Seeley Ave., Chicago 18, Ill.

Cleveland Area Council of Amateur Radio Clubs, Inc., Andrew M. Gent, W8GCP, Secy., 1469 Elbur Ave., Lakewood 7, Ohio.

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

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

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

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

Sacramento Council of Amateur Radio Clubs, Walter H. Wade, W6LLR, Secy., 7014 — 28th St., Rio Linda, Calif.

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

Western Pennsylvania Amateur Radio Club Council, Ernest J. Hlinsky, W3KWL, Secy., 509 Beechwood Ave., Farrell, Penna.

• 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. Pa. Nets: 3610, 3850 kc. Two more Eastern Pennsylvania clubs are now ARRL affiliates, the Tamaqua ARC and the Wyoming Valley ARC of Wilkes-Barre. Another new club in the making is the Levittown ARC of Pennsylvania. QHF, NME, WWG, WUY, and UIL were instrumental in organizing the club. An invitation is extended to anyone in or near Levittown, amateur or non-amateur, to join or attend club meetings. Interested persons should contact Bob Powell, QHF, 65 Mallow Lane, Levittown. The West Philadelphia RA, using its club call, MKA, and under the leadership of OWK, will be shooting for top honors among the Philadelphia clubs on Field Day. RKP reports the Club has had the good fortune to obtain for its Field Day site, a late 18th century mansion located at Valley Forge Park. The Hill Top RTS of Red Lion has undertaken, as a club project, the building of a dozen 6-meter handsets. With the Club furnishing communications for the York County Golf Championship Matches later in the summer, the 6-meter handsets should prove very useful. The Pottstown ARA started a Novice training program several months ago which included "on-the-air" code practice each night and theory classes twice monthly. Along with the program, the Club offers a Novice frequency crystal and an ARRL log book to each Novice passing his exam as a direct result of the training he has received through the efforts of the Club. To date, the following have received their Novice calls: 3ASC, BVA, BVB, BWD, BWG, ZVY, and ZZX. UYH, now with Uncle Sam's Army, is operating portable 7 from Fort Huachuca, Ariz. He's looking for more 20-meter activity from Harrisburg, his home QTH. ZSH, newly-appointed OES, has rebuilt the modulator for his 220-Mc. rig. Congratulations to Mr. and Mrs. YPL; they are the proud parents of twin boys born Feb. 9th. In addition to YPL, Gettysburg has three more active stations: KGN, OLR, and WN3BCQ. WN3-BPT reports a new radio club is being formed at the Pennsylvania Military College, Chester. OZV is now a proud grandpappy. His daughter, SSW, had her first YL, jr. operator. Congratulations. Traffic: W3CUL 752, OK 165, TEJ 128, UKJ 120, DUI 119, AXA 106, OZV 61, BFF 43, PYF 38, YAZ 34, UWP 29, KAG 24, QLZ 21, OML 15, PDJ 10, VPY 10, PVY 9, YGX 2, TYW 1.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA — SCM, J. W. Gore, W3PRL — We are very humble in the honor conferred upon us by election as SCM for the Md.-Del.-D. C. section and will do our utmost to carry out the obligations of the office to serve one and all to the best of our ability. Any member of the Md.-Del.-D. C. section should feel free to contact us on any matters that they feel should be brought to our attention. A review of the activities in the section in the short time we have had reveals the following: WKB now has 120 watts on 2 meters. RE is blasting the ether with a new 6-meter transmitter. VAM is working on a 20-meter beam. OTC is assembling a kw. on 6 meters. VOS is building a cubicle quad for 20 meters. CVE is securing a 2.5-kw. emergency supply. WAF has received his WAS certificate. VOS reports he was the highest scoring W3 in the January CD Party with 74,725 points. NUM has completed his new VFO. FWR will have his new 125/140-watt transmitter on the air after assembly and test. We have been advised that the Woodrow Wilson Radio Club at Washington has just been granted a charter by ARRL. The Andrews Electronics Association has started its first 1955 project, which calls for the building of 13 identical 6-meter transmitters with 2E26 finals. OTC and KMV have been promoting 6-meter activity in their area and their 9-P.M. evening and Sunday morning skeds will usually find quite a number of the following busily chatting away: VHI, WOD, OJU, AHQ, JES, GGR, UJG, PCB, CGV, SL, and RE. The Chesapeake Club scheduled a tour of the WBAL-TV transmitter on March 28th with LZZ conducting. The Mountain Amateur Radio Club of Cumberland held a "Gab Fest" for the Tri-State Area hams on April 1st in the Herman Room of the Old German Brewery in Cumberland. HEC presented 4 reels of movies at the BARCS Club on April 4th, showing the erection of his 20-meter beam and mast, also his 40-meter beam and mast and the final product. Shots of the mast and beams of JNN and LQE were included as well as a number of other well-known DX greats. PRL gave a talk on "Hints & Kinks on TVI Prevention" to the Annapolis Radio Club Feb. 24th, and on March 10th, Prof. Leydorf gave a demonstration of characteristics of transmission lines and antennas at the U. S. Naval Academy Lab. for the Annapolis Club. The Rad-Lab Club of Baltimore held a transmitter hunt on March 20th. The transmitter was 13.25 airline miles from the starting point. LMC was first with 16.5 miles, VLL second with 17 miles, and VAG third with 23 miles. WAG, OBR, TYJ, VBP, NPQ, JQN, WZN, and RU participated in a radio demonstration at the Bethesda Trade Show March 25-26-27. The installation consisted of a 75- and 2-meter transmitter. During the three-day run, 174 messages were directed to 36 different states as well as the Philippines, Hawaii, Puerto Rico, and Canada. Considerable interest was shown by the public in attendance. The booth was decorated with sample certificates, awards, and reprints of articles from various magazines on amateur radio. ARRL supplied material which was used both in decoration and also for distribution. The station operated under the call RCN. HWZ and PRL walked many miles together at the IRE Show inspecting the new equipment just released and getting inside dope on new developments to be released in the near future. WG has been appointed EC for Calvert County. Traffic: (Mar.) W3WV 646, CVE 430, UE 361, WG 62, PQ 59, COK 47, PKC 45, NNX 8, OYX 6, JZY 5. (Feb.) W3WV 539, WBJ 376, CVE 347, RV 135, COK 71, MCG 60.

SOUTHERN NEW JERSEY — SCM, Herbert C. Brooks, K2BG — SEC: ZVW. PAM: ZI. LYL recently joined the Naval Reserve. BAY lost his 10-meter vertical in a storm. It is with regret that we renort the passing of MX. Please note that ZVW now is SEC. We welcome Ed knowing that his experience and ability will be an asset to the section. All ECs are requested to report activities to ZVW. MOM has moved to a new QTH and is busy with tower and antennas. HDW, Laurel Springs, now is ORS. The Delaware Valley Two-Meter Traffic Net meets nightly at 2000. BU now is located at Watchung. ADA has returned to work after a serious illness. SJRA members, please keep SDB posted on your DX activities. The SJRA is making Field Day plans, hoping for a better year than ever. DZU is the newly-elected president of the Southern Counties Amateur Radio Assn., and K2AML is secretary-treasurer. K2BWR, W2CGP, and K2AML handle the TVI complaints for the SCARA. Director Crossley visited the Tri-City Amateur Radio Club at Millville recently. W2BBG, BMC, and K2BET are 2-meter mobile in that area. The Tri-City members are aiding their local c.d. units, providing capable operators for emergency communication. Thanks to RUX for the Tri-City information and to K2CEF for Pleasantville news. K2BHQ, K2EB, K2ETG, W2HIR, NIC, QER, UAE, ZI, and ZQ have earned their Section Net certificates by consistently reporting into the New Jersey 75-Meter Emergency 'Phone Net. Congratulations, fellows, for having done a swell job. Traffic: (Mar.) W2RG 213, K2HZR 72, W2YRW 18, ZVW 18, K2BG 13, CPR 9, W2ASG 8, HBW 3. (Feb.) W2ZVW 112.

WESTERN NEW YORK — SCM, Edward G. Graf, W2SJV — Asst. SCM: Jeanne Walker, 2BTB. SEC: UTH/FRL. RM: RUF. PAMs: NAI and TEP. NYS meets on 3615 kc. at 0630 and 1630, 3925 kc. at 7 P.M. NYSS on 3595 kc. at 1730; NYS C.D. on 3509.5 and 3993 kc. at 9 A.M. Sun., TCPN 2nd Call Area on 3970 kc. at 7 P.M.; SRPN on 3970 kc. at 10 A.M.; ISN on 3980 kc. at 3 P.M. Please note the new time for NYSS as well as the morning session of the NYS C.W. K2BJS is net mgr. of NYSS, with K2DYR asst. mgr. The morning session of NYS C.W. is held at 0630 for those unable to QNI the evening session. K2HVZ is mgr. We regret to announce the passing to Silent Keys of FK and ULT. QLK has been appointed OBS. ECs renewed are QBZ, GHU, ABC, CYD, TIY, QHL, TQ, and VEY. QHH worked T19MHB on 5 bands. K2CEH now has a pair of 826s at 250 watts on 2 meters. K2CUQ graduated 3 more Novices. New OOs are ZCZ, SSC, and K2s EVP and CUQ. ZZG is Montgomery County EC. CZT has a new Viking Ranger to push the 812s. BGO attended a Corning Club meeting with the local c.d. director. KN2LTT is a new ham in Syracuse. FDI had an antenna-raising party. K2GWV is coördinator of the Tri-State Net on 3687 kc. daily at 0700. The Watertown Radio Club purchased a code machine for its Novice training classes. 5ADR/2 now is K2LGN. A joint meeting of the Niagara Frontier Clubs was held

at Lockport with 1RDV, of ARRL; HNH, of General Electric; and 3YA, Atlantic Division Director, as speakers. K2DYC worked crossband 220 to 144 Mc. with QS. The Madison County Wireless Club gives Novice exams. Prospects should contact K2DYH. QBB worked TF3MB, YV1AD, and VP6RG all on 20 meters. RTX, YYI, and FHS are on 2 meters. K2AMZ runs 250 watts to 812s on 75 meters. SJV has a Viking II. K2EVJ is on 144 Mc. The RARA v.h.f. group conducted the RARA meeting with a discussion on receivers, transmitters, and antennas. The "Old Dog Bone" Trophy remains in the possession of QY. The RARA mobile group toured WHAM-TV under the guidance of TWO. TEX and his WYL are in Europe. UPH is discarding s.s.b. and going back to the kw. a.m. rig. We hear that BLP swapped a 32V-3 for a B&W with s.s.b. adapter. QY and ICE are on the program of the Delaware Valley Club to present the RARA OT Show. The ARAT, with OUJ instructing, graduated 26 Novices. Ye SCM's son drew KN2LVF. WS is DXing on 20 but gets on 40 meters in the evening and early A.M. Traffic: (Mar.) W2RUF 515, K2DJN 109, DYB 92, W2OE 63, DSR 60, K2AMZ 54, HVZ 46, W2EMW 44, DSS 42, GBX 28, K2CUQ 19, W2UTH 17, IEP 13, FEB 12, WS 12, QHH 11, K2DG 9, W2RQF 8, COB 7. (Feb.) K2DYB 67.

WESTERN PENNSYLVANIA — SCM, R. M. Heck, W3NCD — SEC: GEG. RMs: UHN, NUG, NRE, and GEG. PAMs: AER and VKD. The WPA Net during March had 248 stations with 134 messages on 3585 kc. Mon. through Fri. at 7 P.M. Thanks to the WPA Net manager and all participating stations for a fine job. NDE reports the Boy's Club of St. Mary's station, KYR, is active on 3620 and 7140 kc. with teletype. The West Able Net meets Sun. at 9 A.M. on 3920 kc. NCS are NRU, WGX, QXF, LKJ, and MPO, with LFS, HUL, VRZ, VKD, and CTN as alternates. UVD is reorganizing the Upper Ohio Valley Emergency Net (URN). If interested report in Sun. at 9:30 A.M. on 3585 kc. The Indiana County ARC had NUG as guest speaker at its last meeting. His subject was "Radio Gadgetry." The club has become affiliated with ARRL and the Western Pennsylvania Amateur Radio Club Council and has received the call BMD. The Beaver Valley ARC is planning to demonstrate its c.d. mobile gear to the County Commissioners. A code machine is available for members and BQB is conducting classes in theory. UJT is seeking 2-meter QSOs. VGR has a '55 Ford with 100-watt all-band mobile. RKX is mobile. QPJ was c.w. winner of the 3rd area in the YL Anniversary Party. NQA reports that the Warren County Emergency Radio System has elected OMK, pres.; UZB, secy.-treas.; WAQ and LFV, directors. The net holds local drills each night on 10 meters at 7 P.M. with WAQ, ZFB, YZR, YKL, UZB, VVJ, SQL, OMK, PHC, KYW, LRE, and NQA active. YUL has received his General Class ticket. The first session of the West Charley RACES Net 29, 490 kc., SVE as NCS, was attended by 34 stations. The Breeze Shooters Net traffic station meets Mon. at 8 P.M. on 29 Mc. The Radio Assn. of Erie YMCA code classes are currently covering theory. BFB and WRK recently attended the RAE meeting. WJA has graduated from the Novices. LKJ demonstrated the use of amateur radio in Red Cross work over one of the local TV stations recently. New calls are WN3BOW and WN3BPB. MED, YKE, TMK, and TLA are participating in surveys being made to find ideal locations for ground wave communications. The Steel City ARC has Field Day plans completed. 9CWL keeps in touch with Pittsburgh on Sun. at 10:30 A.M. on 7280 kc. RIK is using a new Matchbox to put the antenna in the best working condition. MTP is in Philadelphia with the Bell Telephone Co. OKU is s.s.b. on 40 meters. ZDW is on the air from the new QTH with new Collins gear. The South Hills Brass Pounders and Modulators Hamfest Chairman, VKS, has everything going well. Watch for the affair and plan to be there. New calls are WN3AYT and club member WN3AEK. Traffic: W3WIQ 1380, LMM 225, YA 69, KUN 55, UHN 51, SIJ 29, NCD 19, KNQ 14, VKD 14, UTR 8, NMJ 3.

CENTRAL DIVISION

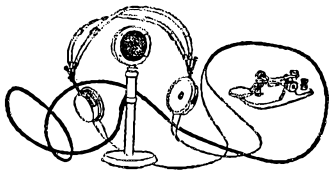
ILLINOIS — SCM, George T. Schreiber, W9YIX — Section Nets: ILN c.w., 3515 kc. Mon. through Sat.; IEN 'phone, 3940 kc. RMs: BUK and MRQ. PAM: UQT. EC: HOA. Cook County EC: HPG. Very little club activity was reported this month, with the exception of the Joliet Amateur Radio Society, which is encouraged by greatly-increased attendance at meetings the last few months. Officers of the Club are REA, HOD, and MHC. New Novice calls heard in the section are PRL, RSY, and RSZ (father and son), JMY, EWU, NPH, and NXY. The nine operators at the state police station KSB 47 in the Chicago Area are kept busy in their spare time giving Novice license exams. The station is, of course, 100 per cent amateur-manned. New General Class calls are EWL, ITV, and MWK. BQC, who has been operating portable zero at Luther College, is home for the summer months. He used his Christmas vacation to round out his WAS. RQR has a new 140-X and loves it. TCX has picked 2 meters as his favorite band, while ATU enjoys 15. ZYP is buying parts for a modulator and threatens to quit c.w., while GDI confesses he has already built "a small modulator" to get on the Tri-Town Club Net. Incidentally, the Tri-Town Club dinner for the XYLs was a great success and the gals are suggesting a repeat performance soon. The dinner committee consisted of OQN, ULB, YGM, CQG, and PFC. FRP enjoyed a trip to Yellowstone Park. BA, St. Clair County EC, has organized an auxiliary police net as part of the c.d. set-up in Belleville. He is brushing up on his c.w. on ILN. ZMJ gives ILN a long-needed outlet in Springfield, the State capital. EVB is the new Wayne County EC. OXS is coroner of Hancock County. Wonder how many public officials in the State also hold amateur licenses? The Kankakee Club gave a c.d. demonstration for the Boy Scouts with mobiles HKA, LCH, WZV, and KLD, and fixed stations QGO, NKR, and FMA participating. IDA plans a kw. on s.s.b. SKR likes morning operation before going to work. HPJ, who has been off the c.w. bands for years, has returned with a super signal because of a transmitter loaned him by your SCM. SXL and PRV really keep things humming on the Central Illinois Amateur operators' net, which emphasizes c.d. Brass Pounders certificates this month go to AA, DO, CSW, IDA, and YWL. Good work, fellows. ICF has been appointed deputy director of the City of Waterloo. CLH has fun with 40 watts on 20 meters. HJS has gone high power in his mobile, and 4VNN/9 has installed an Elmac. 5YUO/9 has been on a building spree; net result one receiver and two transmitters. The St. Clair Amateur Radio Club elected the following officers: DIB, TCX, ATU, ATF, RQR, and UWP. GIJ and ØVPH/9 now have overseas addresses. The Peoria-Area Amateur Radio Club, with IOG, HLF, and FM as officers, has code classes three nights a week; the club has 75 members and gives FCC exams as candidates "arrive." You will note that in the traffic listings at the end of this column there are a number of 'phone stations named. Fellows, the column belongs to you; get in your traffic totals and your news items not later than the fifth of the month. See you at the Starved Rock Picnic. Everyone will be there. Traffic: W9DO 912, YWL 781, CSW 635, IDA 540, AA 336, SME 102, YIX 82, QQG 74, MRQ 73, BUK 56, VHD 44, STZ 27, CEE 24, OR 22, ZMJ 21, CTZ 19, LXJ 18, VER 16, HPG 11, ASK 10, CNF 4, FRP 3, CLH 2, JMG 2, KLD 1.

INDIANA — SCM, George H. Graue, W9BKJ — The Dayton Hamvention bestowed a coveted award to EHU, of Evansville, for outstanding leadership in club and c.d. affairs. The TARS has purchased a DX 100 Heathkit rig. UMS has a weekly sked with DL4CT. KVE and MWM have pi-network finals. New at North Vernon are N9SDS and N9SPA. MARC will hold a joint meeting with the New Albany and Jeffersonville Clubs. AQR is the new EC for Fountain County. High winds took down CBD's 20-meter quad. THC is building an s.s.b. exciter. EHH sports a new HT-9. PUB is mobile with complete Gonset gear. N9SAD is new at St. Stanislaus. EGQ hopes to be DXing on 2 meters. YWE has a new Globe Scout. EHZ reports CAEN activity on 1805 kc. as 23 sessions with a traffic total of 48. OLX, net manager of QIN, reports 62 sessions and a traffic total of 506. WWT reports for RFN with 145 traffic total. YIP, net manager of IFN, reports a traffic total of 243. CEA is a newly-appointed ORS. IMO is the new EC for Kosciusco County. LQE is the most consistent OBS in this area. Richard Elliott, ØIKK, a Silent Key, was buried at Seymour, his home town. JUJ has made BPL 49 times since February 1951. NZZ has made BPL 47 consecutive months. Congratulations to both. OZQ expects to be transferred to Penn. VNV again is planning a long vacation trip. CC is convalescing after an operation. YDA expects an uneventful recovery after major surgery. AZF is building a converter for c.d. work. NH has worked 21 countries on 160-meter c.w. RZS again made a good score in the February Frequency Measuring Test. FHA has dropped the "N." N9IYR is new at Princeton. ZIB is working on 2-meter gear. NZZ, at 6MPY, was QSO with CMT for 3 hours on 20-meter c.w. NTR has the 1-kw. working into a three-element beam 290 feet up on 20 meters. KLR started tower work for the 32-element beam on 2 meters. QZC wants a schedule in his area for 220-Mc. test. Traffic: (Mar.) W9JUJ 886, TT 573, NZZ 525, OZQ 467, TQC 173, WWT 163, TG 151, UQP 132, EHZ 117, STC 94, WRO 73, QYQ 68, CTF 67, PQA 54, SKP 53, BKJ 46, WBA 45, VNV 38, CC 36, WUH 34, CEA 33, ZYK 29, EQO 28, NTA 28, YIP 26, ZRP 25, FGX 20, NH 20, SVL 20, DZC 18, YB 16, ZIB 15, AQR 9, PPS 9, CMT 7, BDP 6, YVS 6, DGA 4, GDL 2.

WISCONSIN — SCM, Reno W. Goetsch, W9RQM — SEC: OVO. PAMs: ESJ and GMY. RMs: IXA, RTP, and UNJ. Nets: BEN, 3950 kc., 6 P.M. daily; WIN, 3685 kc., 6 P.M. daily; WPN, 3950 kc., 1215 Mon.-Sat., 0930 Sun. Wisconsin mobile and c.d. frequency: 29,620 kc. UNJ reports CCO, NQW, and VBZ are NCSs from Wisconsin on 9RN. RTP indicates that the new WIN frequency of 3685 kc. is working out FB with no RTTY to contend with; 340 QNI in 30 net sessions handled 222 messages. VBZ, UNJ, and CCO will graduate from high school in June. FFC is using a Phasemaster Jr. on s.s.b. with 50 watts while working on a p.p. 811A linear final. RQK needs 10 more QSLs for his WAS. SZR is up to 66 countries, with EA6 the latest. RKP rebuilt the final to a pair of

(Continued on page 90)

Something New In Single Side Band



A CHRONOLOGICAL history of ham radio could be summed up in a few words — spark, C.W., A.M., N.B.F.M., R.T.T.Y. and S.S.B. Forty or more years of tremendous technical advances exemplified by a few simple characters. Spark and arc are no longer on the air, and we certainly don't mean to imply that in only a few years more the other forms of radio transmission will also be in limbo. We all should recognize, however, that new forms of radio transmission, having advantages over older forms, are bound to be developed, and the foresighted amateur should take the utmost advantage of them to further the enjoyment of this hobby.

IT is beyond the scope of this page to present a complete economic and engineering analysis of the two basic forms of single side band generation. We at Hallicrafters have spent considerable time and money arriving at the conclusion that the "filter method" is the more stable, rugged and reliable, and of particular advantage when higher powered amplifiers are also used.

AFTER the basic single side band suppressed carrier signal is generated, the second important consideration, for either the home constructor or the development engineer, is to produce a V.F.O. meeting the extremely high order of stability that is required for good S.S.B. operation.

THIS V.F.O. should not only have a high order of mechanical and electrical stability but should also have a tuning dial system which reads directly in kilocycles. We have found that a modified form of series tuned oscillator covering a 500 kc. band is eminently stable. To further improve stability of the oscillator, the basic frequency range of approximately 5.2 to 5.7 Mc. is not switched but heterodyned by crystal oscillators to various frequencies so more than one ham band can be covered by the exciter.

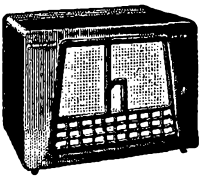
IN our opinion, next in order of importance in a side band exciter is a reliable and simple method of constantly checking its performance. Since a side band exciter deals with unwanted values of energy as much as 60 db. (10,000 times) below the desired energy, there is need for a simple rugged meter which will cover this range on one scale with no multiplying switches to operate. That's a pretty big order but a smart engineer came up with an amazingly simple method. With this circuit you can check your carrier level suppression down to 60 db. below the side band level almost instantaneously. The circuit also provides a constant indication of the output level on A.M., C.W. and S.S.B. Furthermore, it is the best method we have found for tuning up Class A amplifiers wherein a plate meter means practically nothing.

IN summary, then, three main points in S.S.B. are most important: clean, reliable side band generation, a highly stable, accurate V.F.O., and a simple means of tuning and monitoring the emitted signal. Just good basic engineering and amateur operating practices applied to a somewhat new mode of transmission.

—Fritz Franke

Bill Halligan, Jr. W. J. Halligan W9AC

for hallicrafters



New Heathkit VFO KIT

MODEL VF-1

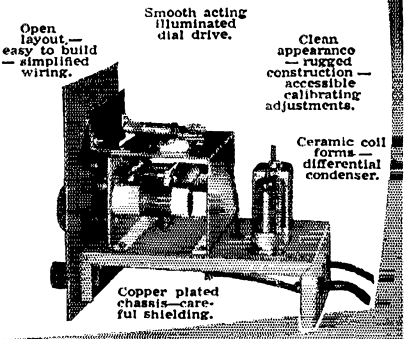
$19.50

Ship. Wt. 7 lbs.

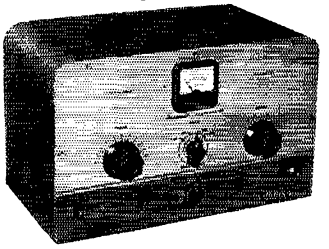
- Smooth acting illuminated and precalibrated dial.
- 6AU6 electron coupled Clapp oscillator and OA2 voltage regulator.
- 10 Volt average output on fundamental frequencies.
- 7 Band calibration, 160 through 10 meters, from 3 basic oscillator frequencies.

Here is the new Heathkit VFO you have been waiting for. The perfect companion to the Heathkit Model AT-1 Transmitter. It has sufficient output to drive any multi-stage transmitter of modern design. A terrific combination of outstanding features at a low kit price. Good mechanical and electrical design insures operating stability. Coils are wound on heavy duty ceramic forms, using Litz or double cellulose wire coated with polystyrene cement. Variable capacitor is of differential type construction, especially designed for maximum bandspread and features ceramic insulation and double bearings.

This kit is furnished with a carefully precalibrated dial which provides well over two feet of calibrated dial scale. Smooth acting vernier reduction drive insures easy tuning and zero beating. Power requirements 6.3 volts AC at .45 amperes and 250 volts DC at 15 mills. Just plug it into the power receptacle provided on the rear of the AT-1 Transmitter Kit. The VFO coaxial output cable terminates in plastic plug to fit standard ½" crystal holder. Construction is simple and wiring is easy.



Heathkit AMATEUR TRANSMITTER KIT



MODEL AT-1

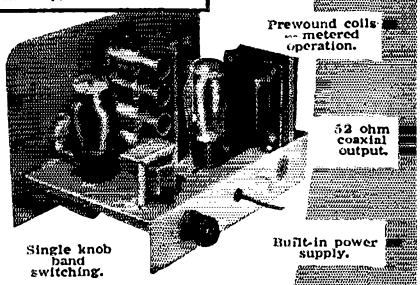
$29.50

Ship. Wt. 16 lbs.

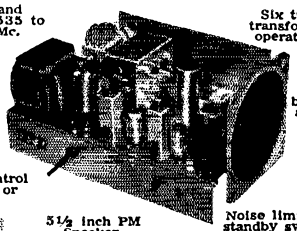
SPECIFICATIONS:

Range 80, 40, 20, 15, 11, 10 meters.
6AG7 .....Oscillator-multiplier.
6L6 .....Amplifier-doubler
5U4G ..... Rectifier.
105-125 Volt A.C. 50-60 cycles 100 watts. Size: 8⅛ inch high x 13⅛ inch wide x 7 inch deep.

Here is a major Heathkit addition to the Ham radio field, the AT-1 Transmitter Kit, incorporaring many desirable design features at the lowest possible dollar-per-watts price. Panel mounted crystal socket, stand-by switch, key click filter, A. C. line filtering, good shielding, etc. VFO or crystal excitation—up to 35 watts input. Built-in power supply provides 425 volts at 100 MA. Amazingly low kit price includes all circuit components, tubes, cabinet, punched chassis, and detailed construction manual.

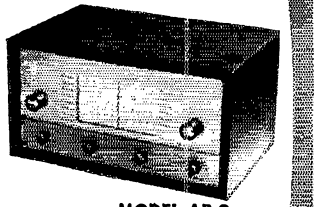


Heathkit COMMUNICATIONS RECEIVER KIT



SPECIFICATIONS:

Range.....535 Kc to 35 Mc
12BE6 .....Mixer-oscillator
12BA6 .....I. F. Amplifier
12AV6 Detector—AVC—audio
12BA6 ....H. F. O. oscillator
12AQ6.....Beam power output
5Y3GT .....Rectifier
105-125 volts A.C. 50-60 cycles, 45 watts.



A new Heathkit AR-2 communications receiver. The ideal companion piece for the AT-1 Transmitter. Electrical bandspread 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.

MODEL AR-2

$25.50

Ship. Wt. 12 lbs.

CABINET:

Proxylin impregnated fabric covered plywood cabinet. Shipg. weight 5 lbs. Number 91-10, $4.50.

HEATH COMPANY

BENTON HARBOR 9, MICHIGAN

New HEATHKIT DX-100 PHONE AND CW TRANSMITTER KIT

MODEL DX-100

Shpg. Wt. 120 lbs.

$189.50

Shipped motor freight unless otherwise specified. $50.00 deposit with C.O.D. orders.

- R.F. output 100 watts Phone, 125 watts CW.
- Built-in VFO, modulator, power supplies. Kit includes all components, tubes, cabinet and detailed construction manual.
- Crystal or VFO operation (crystals not included with kit).
- Pi network output, matches 50-600 ohms non-reactive load. Reduces harmonic output.
- Treated for TVI suppression by extensive shielding and filtering.
- Single knob bandswitching, 160 meters through 10 meters.
- Pre-punched chassis, well illustrated construction manual, high quality components used throughout—sturdy mechanical assembly.

This modern-design Transmitter has its own VFO and plate-modulator built in to provide CW or phone operation from 160 meters through 10 meters. It is TVI suppressed, with all incoming and out-going circuits filtered, plenty of shielding, and strong metal cabinet with interlocking seams. Uses pi network interstage and output coupling. R.F. output 100 watts phone, ... 125 watts CW. Switch-selection of VFO or 4 crystals (crystals not included).

Incorporates high quality features not expected at this price level. Copper plated chassis—wide-spaced tuning capacitors — excellent quality components throughout—illuminated VFO dial and meter face—remote socket for connection of external switch or control of an external antenna relay. Preformed wiring harness—concentric control shafts. Plenty of step-by-step instructions and pictorial diagrams.

All power supplies built-in. Covers 160, 80, 40, 20, 15, 11 and 10 meters with single-knob bandswitching. Panel meter reads Driver I_P Final I_G, I_P, and E_P, and Modulator I_P. Uses 6AU6 VFO, 12BY7 Xtal osc.-buffer, 5763 driver, and parallel 6146 final. 12AX7 speech amp., 12BY7 driver, push-pull 1625 modulators. Power supplies use 5V4 low voltage rect., 6AL5 bias rect., 0A2 VFO voltage reg., (2) 5R4GY hi voltage rect., and 6AQ5 clamp tube. R.F. output to coax. connector. Overall dimensions 20⅞" W x 13¾" H x 16" D.

Heathkit ANTENNA COUPLER KIT

Poor matching allows valuable communications energy to be lost. The Model AC-1 will properly match your low power transmitter to an end-fed long wire antenna. Also attenuates signals above 36 Mc, reducing TVI. 52 ohm coax. input—power up to 75 watts—10 through 80 meters—tapped inductor and variable condenser—neon RF indicator—copper plated chassis and high quality components.

MODEL AC-1

$14.50 Shpg. Wt. 4 lbs.

Heathkit GRID DIP METER KIT

MODEL GD-1B

$19.50 Ship. Wt. 4 lbs.

The invaluable instrument for all Hams. Numerous applications such as pretuning, neutralization, locating parasitics, correcting TVI, adjusting antennas, design procedures, etc. Receiver applications include measuring C, L and Q of components—determining RF circuit resonant frequencies.

Covers 80, 40, 20, 11, 10, 6, 2, and 1¼ meter Ham bands. Complete frequency coverage from 2—250 Mc, using ready-wound plug-in coils provided with the kit. Accessory coil kit, Part 341-A at $3.00 extends low frequency range to 350 Kc. Dial correlation curves furnished.

Compact construction, one hand operation, AC transformer operated, variable sensitivity control, thumb wheel drive, and direct reading calibrations. Precalibrated dial with additional blank dials for individual calibration. You'll like the ready convenience and smart appearance of this kit with its baked enamel panel and crackle finish cabinet.

Heathkit ANTENNA IMPEDANCE METER KIT

MODEL AM-1

$14.50 Shpg. Wt. 2 lbs.

Use the Model AM-1 in conjunction with a signal source for measuring antenna impedance, line matching purposes, adjustment of beam and mobile antennas, and to insure proper impedance match for optimum overall system operation. Will double, also, as a phone monitor or relative field strength indicator.

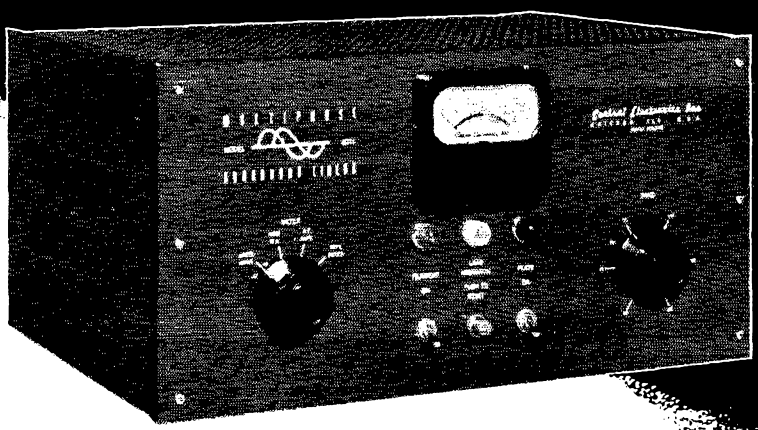
100 ua. meter employed. Covers the range from 0 to to 600 ohms. Cabinet is only 7" long, 2½" wide, and 3¼" deep. An instrument of many uses for the amateur.

HEATH COMPANY

A SUBSIDIARY OF DAYSTROM, INC.

BENTON HARBOR 9, MICHIGAN

NOW a BROAD-BAND* LINEAR

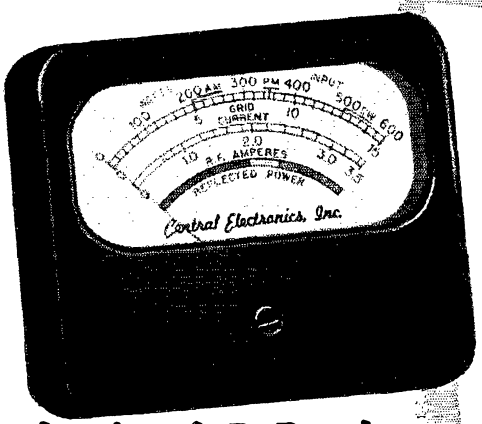


MULTIPHASE
600 L
NO TUNING CONTROLS

SINGLE KNOB
BAND-SWITCHING
10-160

FOR USE ON
SSB, AM, PM & CW

WIRED, WITH TUBES AND BUILT-IN POWER SUPPLY **$349.50**



Another C.E. First!

METER FEATURES NEVER BEFORE FOUND IN A TRANSMITTER

- Reads power input directly in watts
- Reads grid current
- Instantly reads output in RF amperes — no lagging thermocouple
- Indicates reflected power caused by mismatched load
- Calibrated input levels for AM, PM and CW.

. . . and switch the meter to any position while transmitting!

*PATENT PENDING

WRITE FOR LITERATURE

a new concept in linears

CENTRAL ELECTRONICS takes pride in presenting a product of intensive research — the new Multiphase 600L Broadband* Linear. "It is destined to change the entire concept of RF amplifier design in the military, commercial and amateur fields." There are no tuning controls, servos or moving parts other than bandswitch.

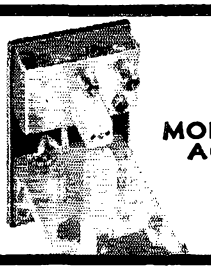
- Single 813 in Class AB_2.
- New band-pass couplers provide high linear efficiency: 60 to 65%.
- Designed for 50 — 70 ohm co-axial input and output.
- Easy to drive — Approx. 2 watts effective or 4 watts peak drive power required for 500 watts DC input.
- Built-in power supply — bias and screen regulation, 45 mfd. oil filled paper output capacitor. Excellent static and dynamic regulation.
- Extremely low intermodulation distortion.
- Automatic relay protects 813 and RF couplers.
- Excellent stability — complete freedom from parasitics.
- Effectively TVI suppressed — RF compartments thoroughly shielded and Hypassed.
- Choice of grey table model, grey or black wrinkle finish rack model.
- Table model cabinet size — 17⅝" W, 8¾" H, 13" D.

MULTIPHASE EQUIPMENT

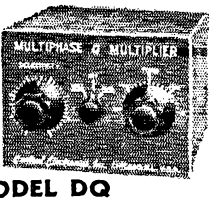
Central Electronics, Inc.

1247 W. Belmont Ave. Chicago 13, Illinois

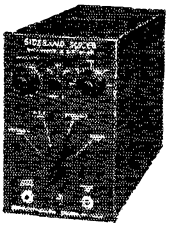
Watch for early announcement of other new CENTRAL ELECTRONICS equipment.



MODEL AQ



MODEL DQ



MODEL B SLICER

NEW MULTIPHASE "Q" MULTIPLIER AVAILABLE THREE WAYS

1. It's built-in the new Model B Sideband Slicer.
2. Plug it into your present Model A Slicer.
3. Attractive Desk Model, for installation directly into receiver.

The new Multiphase "Q" MULTIPLIER is a tunable IF electronic filter that provides tremendous receiver selectivity for peaking or rejecting a signal on AM, CW or SSB. It employs a new two tube circuit* with a special very high "Q" pot core inductor. Continuously variable selectivity *from 60 cps to normal* IF pass-band. Nulls out interfering heterodynes without affecting speech intelligibility. Peak the desired signal; interfering carriers are attenuated up to 50 db.

*PATENT PENDING

MODELS

MODEL AQ

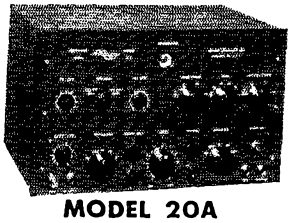
"Q" MULTIPLIER for installation in Model A Slicer. Includes new front panel. Power-IF cable plugs into accessory socket.
Wired . . . $29.50 Kit . . . $22.50

MODEL DQ

Desk Model "Q" MULTIPLIER for use with any receiver having 450 to 500 KC IF. In attractive case 5½" W, 4" H, 5" D, with connecting power-IF cable. Power requirements, 225 to 300 VDC at 12 ma., 6.3 V at .6 amps, can be secured from receiver. Can provide added selectivity and BFO for mobile SSB or CW reception.
Wired . . . $29.50 Kit . . . $22.50

MODEL B

Sideband Slicer, same as Model A Slicer but includes built-in "Q" MULTIPLIER, AP-1 not needed.
Wired $99.50
Kit $69.50



MODEL 20A

- **20 Watts Peak Envelope 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**

458 CONVERSION KIT

Basic 458 Conversion Parts Kit, 15 to 160 meters, with dial, etc. $15.00
458 Deluxe Case and Panel Kit, matches size and appearance of Slicer. . . $10.00

NEW — FOR 10 METERS

MODEL 458-10 xtal controlled converter package to extend 458 VFO into 10 meter band. For use with above 458 Conversion Kits.
Wired $37.50
Kit $27.50

Check These Features NOW IN BOTH MODELS

- **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 tolk 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 sidebond.

SIDEBAND SLICER

MODEL A IMPROVES ANY RECEIVER

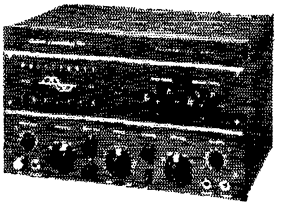
Upper or lower sideband reception of SSB, AM, PM and CW at the flip of a switch. Cuts QRM in half. Exalted carrier method eliminates distortion caused by selective fading. Easily connected into any receiver having 450-500 KC IF. Built-in power supply. Reduces or eliminates interference from 15 KC TV receiver sweep harmonics.
Wired and tested **$74.50**
Complete kit **$49.50**

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**

NEW AP-2 ADAPTER

Combined AP-1 and xtal mixer. Allows Slicer to be used with receivers having 50, 85, 100, 915 KC and other IF systems. One xtal suffices for most receivers. **$17.50**



MODEL 10B

SUCCESSOR TO THE POPULAR MODEL 10A

- **10 Watts Peak Envelope 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**

QT-1 ANTI-TRIP UNIT

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**

WRITE FOR LITERATURE

MULTIPHASE EQUIPMENT

Central Electronics, Inc.

1247 W. Belmont Ave. Chicago 13, Illinois

See Trade Publications on Multiphase "REJUVA-TUBE" — A New CRT REJUVENATOR

New! FO-1

PRINTED CIRCUIT OSCILLATOR

For Generating Spot Frequency Signals with Guaranteed Tolerance between

1000 KC to 15,000 KC

Since the operating tolerance of a crystal is greatly affected by the associated operating circuit, the use of the FO-1 Oscillator in conjunction with the FX-1 Crystal will guarantee close tolerance operation. Tolerances as close as .001 percent can be obtained.

USES

AMATEUR

- *Net Operation*
- *Frequency Standards*
- *Close band-edge operation*

COMMERCIAL

- *Frequency Standards*
- *Signal Generators for alignment purposes*
- *Oscillators in new equipment*

FREQUENCY RANGE: **1000 KC to 15,000 KC fundamental operation**

FO-1 —**Oscillator Kit (less tube and crystal)** **$3.95**

FO-1A —**Oscillator, factory wired and tested with tube (less crystal)** **$6.95**

Order Direct

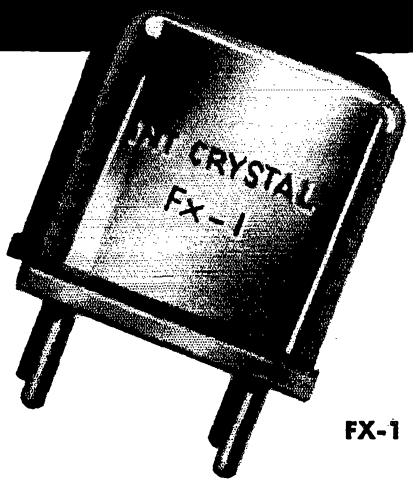
International CRYSTAL Mfg. Co., Inc. 18 N. Lee Phone FO 5-1165 OKLAHOMA CITY, OKLA.

FX-1 CRYSTAL

Companion to the FO-1 Oscillator

The FX-1 Crystal is designed for use only with the FO-1 Oscillator. For tolerances of .01% and .005%, any FX-1 Crystal can be used with any FO-1 Oscillator.

For tolerances closer than .005% the oscillator and crystal must be purchased together. The oscillator is factory wired, and the crystal custom calibrated for the specific oscillator.



FX-1

Tolerance	1000-1499 KC	1500-1999 KC	2000-9999 KC	10,000-15,000 KC
FX-1 .01%	$5.25	$3.75	$2.50	$3.25
FX-1 .005%	$6.00	$4.50	$3.00	$4.00
(.0025% and .001% tolerances are available only by purchasing the FO-1 Oscillator and Crystal together)				
FX-1 .0025%	$6.75*	$5.25*	$3.75*	$4.75*
FX-1 .001%	$8.00*	$6.50*	$6.00*	$6.00*

Prices are for crystal only. To insure this tolerance crystal must be purchased with oscillator factory wired and tested. For total price add $6.95 to price of crystal desired.

HOW TO ORDER: In order to give the fastest possible service, crystals and oscillators are sold direct. Where cash accompanies the order, International will prepay the postage; otherwise, shipment will be made C. O. D.

All International Crystal products are available only by direct order to the factory.

International CRYSTAL Mfg. Co., Inc. 18 N. Lee Phone FO 5-1165 OKLAHOMA CITY, OKLA.

(Continued from page 82)

4E27s at 600 watts. KXK sold his p.p. 813s and added a Matchbox to the Viking II. New officers of the Kenosha Radio Comm. Society are: UCI, pres.; ILR, vice-pres.; and BXB, secy.-treas. Net certificates (WPN) were issued to YFW, UNL, CFO, DVM, IUK, UMJ, and UFW. SAA reports WPN had 1006 QNI and 184 messages handled in 26 sessions during February. FFC has a new three-element 15-meter beam. 1BUD, ARRL's Gen. Mgr., was guest speaker at a special meeting of the FLARC (Madison) April 4th. ZDU has a new SX-96. AEM has a new Globe Scout. A new club of hams at the Milw. U. of W. Extension has been formed. Attending the Extension are EFF, ZLD, YOX, UDK, AEM, and WWN. IMQ has his 30-element 144-Mc. beam back in operation after windstorm trouble. LEE reports 144-Mc. conditions improved. IYF has some 144-Mc. gear. REQ is back on 144 Mc. with DSP's flea-power portable. QGR worked CR7, ZS1, PY4, and CM2 on 7 Mc. YOS reports a pre-Field Day test run of all equipment in Kenosha. WZR uses an AF-1 and an S-38B. WN9KSB uses a Globe Scout at 50 watts. UFX, State RO, indicates RACES drills on 3993 and 3505.5 are being scheduled. Traffic: W9VBZ 413, CXY 356, UNJ 151, SAA 136, IXA 118, RTP 115, CCO 89, UIM 33, KWJ 29, FFC 27, YZA 24, RQK 20, SZR 14, GMY 11, BVG 9, RQM 6, SDK 3, OVO 1.

DAKOTA DIVISION

SOUTH DAKOTA — SCM, J. W. Sikorski, WØRRN — Asst. SCMs: Earl Shirley, ØYQR, and Martha Shirley, ØZWL. SEC: GCP. PAMs: GDE, BNA, NEO, and PRL. RM: SMV. MPQ has accepted a position with Republic Steel at Youngstown, Ohio. GCP is operating a new Ranger, in addition to the s.s.b. rig. New tickets: KNØAOU, Sioux Falls; KØWBW, Mitchell; WCN, Fulton. After several years' absence KØNRU, of the USNR at Sioux Falls, again is licensed, with YWY in charge. 9GEU/Ø has a new Buick and is installing a mobile. DIY is driving a new Ford. Five members were added to the AREC during March, including SDP as EC for Aurora County. Fire in his church destroyed BNA's study and library. CSD erected a downspout vertical on Mar. 27th and exactly one week later wind took it down. Officers of the newly-organized Ellsworth ARC at Ellsworth AFB are WBW, pres.; IK, vice-pres.; ADM, treas.; YRJ, secy. Net reports: NJQ, 18 sessions, 460 QNI, 75 traffic; c.w., 13 sessions, 114 QNI, traffic 44; 75-net, 31 sessions, 1457 QNI, traffic 279; 160-net, 31 sessions, 690 QNI, traffic 78. Traffic: WØGDE 103, ZWL 74, SCT 72, RRN 49, DVB 42, SMV 40, PHR 37, BQH 21, PRL 19, BLZ 17, MPQ 13, TLD 6, GWS 3.

MINNESOTA — SCM, Charles M. Bove, WØMXC — Asst. SCM: Vince Smythe, ØGGQ. MXC is vacationing in Hawaii and visited TQQ, also there. QVR reports XYL Marge now is QVQ. WNØZEL is a new ham at Hutchinson. RLQ bought OMC's receiver. Ex-BOL, Bob Prehm, is now in Seattle with the call 7ZEV. JNC reports inactivity because of family illness. VBD reports a new Viking II to lick TVI. GBF had a nice front-page spread in the *Norwood Times* resulting from overseas traffic delivery. GTX has done a whale of a job as SEC and now has 522 AREC members. Congrats, George! HEO, TUO, and SW are planning an s.s.b. meeting at Willmar for Apr. 24th. Minnesota now has 20 active in s.s.b. on 75 meters. TBS recently was married and is on again from Minneapolis. TJA has another high-power rig under construction. IKJ has junked f.m. in favor of screen modulation with excellent results. ZOB rebuilt and shielded his old rig to eliminate TVI. TUS, while recently hospitalized in Minneapolis, was able to keep in touch with his home while XYL, VPO, operated at the home QTH. PEV, GGI, HEO, and GGQ recently built new high-power linear finals. OET is the proud papa of a new YL born on his XYL's birthday. Traffic: WØMVH 204, KJZ 174, KLG 146, IRJ 108, WMA 104, KFN 84, BQW 70, TUS 64, TJA 58, QDP 55, DQL 49, WVO 49, LUX 47, GTX 44, RVO 44, HIN 42, MBD 34, TKX 34, ALW 26, LIG 26, MVJ 26, SYN 23, BUO 21, OSJ 19, LST 18, KNR 17, VBD 14, UCV 13, OPA 12, QGD 11, GGQ 10, QVR 7, NTV 5, BZG 4, ZTB 4, OJP 3, PUO 3, RQJ 3.

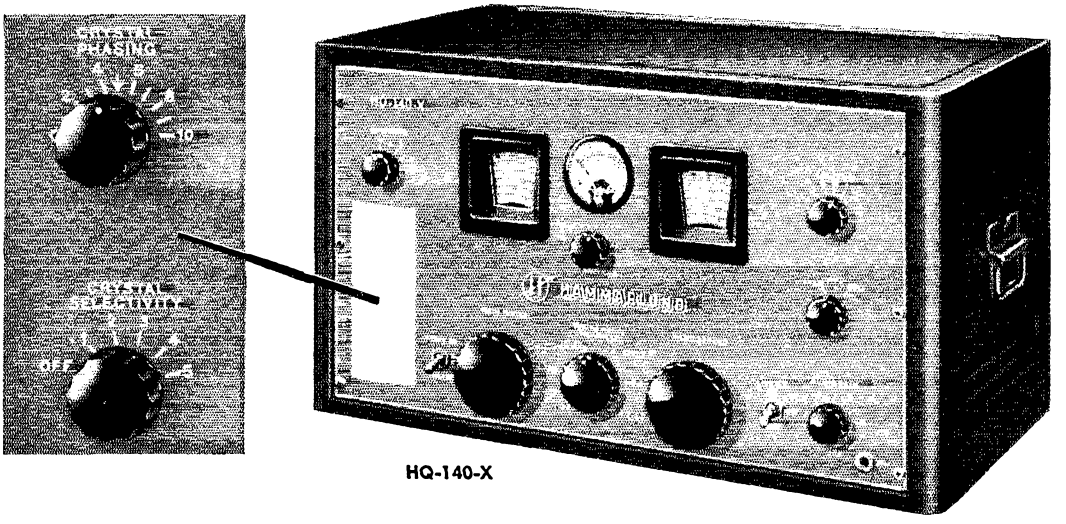
DELTA DIVISION

ARKANSAS — Owen G. Mahaffey, W5FMF — SXM spent two weeks duty with the Navy in New Orleans. WUN is attending a c.d. emergency first aid class two nights a week; he also reports the Little Rock High School Radio Club has a rig on 40-meter c.w. with the call RFS. The Texarkana Amateur Radio Club members provided communications between the scene of a drowning and De Kalb, Tex. Mobiles taking part were RLN, LGH, VAA, ZIT, and NKH. Others participating were DXI, RUS, RLM, VKX, BQJ, MWW, DGG, IQW/5, ILP, JFT, AZO, and HBD. The TARC has been active in two recent c.d. drills. The Club meets the 1st Tue. night of each month. Our PAM, HEE, did a good job in getting the Ozark 'Phone Net started and had 26 stations reporting

(Continued on page 92)

THE HQ-140-X...

SEEMS TO STRETCH THE BANDS



HQ-140-X

In these days, when the amateur bands are more crowded than ever, it's important to make sure the receiver you buy will bring in the desired signal with minimum interference from adjacent channels. That's why more and more 'hams' are turning to the HQ-140-X communications receiver.

The HQ-140-X's outstanding performance under today's difficult operating conditions is achieved because of the Hammarlund patented 455Kc crystal filter and phasing network. This circuit, identical to the one used in the Super Pro-600-JX professional receiver, is controlled by a front panel 6-position Crystal Selectivity switch and provides an OFF position and five increasingly selective bandwidths.

The Crystal Phasing control is a differential-type variable air capacitor which permits precise adjustment of the crystal selectivity for extremely high attenuation of closely adjacent channel interference.

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The HQ-140-X is *the* receiver in the radio shacks of many American Merchantmen. Its dependability and ruggedness make it very popular with seagoing hams.

Get the details on these and other important advantages of the HQ-140-X. Write to The Hammarlund Manufacturing Co., Inc., 460 W. 34th St., New York 1, N. Y. Ask for Bulletin R6.

HAMMARLUND

SINCE 1910

in the first night. Congratulations, Art, and hope we can keep up the good work. LUX reports a new rig on 20 meters. Traffic: W5FMF 44, WUN 26, BUX 10, PX 4.

LOUISIANA — SCM, Thomas J. Morgavi, W5FMO — The crash of a B-47 that was coming for a landing at the Lake Charles AFB sent some of the local mobiles scurrying to supply emergency communications from the scene of the crash. BQH proceeded to the scene and passed traffic and the next day ZDV stationed his mobile at the scene and maintained communications with FEL. 4KJN/5, mobile, was standing by and was immediately available in case he was needed. ZMI, ZJS, and BQH are new mobiles. CCD is starting work on an s.s.b. exciter. GFA, recently of Tulsa, now is at CAA, Lake Charles. FDC is installing mobile in the new car. UGJ is NC for the S.W. La. Emergency Net which meets Sun. at 2 P.M. on 3850 kc. HNS is working hard on his General Class. UGJ is now an OPS. The So. La. Emergency Net meets Sun. at 0800 on 3830 kc. WQX has the rig dismantled because of a change of QTH. EA is looking for traffic. The Ouachita ARC held a picnic in West Monroe on May 15th. Station Net certificates have been issued to most of the net members in Louisiana. If you have not received your certificate, notify the SCM through your NCS. FMO finally got the 20-meter beam repaired and now is back on 20 meters. HUT is a new EC in New Orleans. TRQ is an ORS. UQK, ex-EC for New Orleans, now is living in Houston and expects to be on the air soon to contact New Orleans stations. Prepare now for the coming June emergency test. Contact 1UG, Louisiana SEC, for full details. Traffic: W5MXQ 69, EA 46, VIC 17, FMO 10, HNS 6.

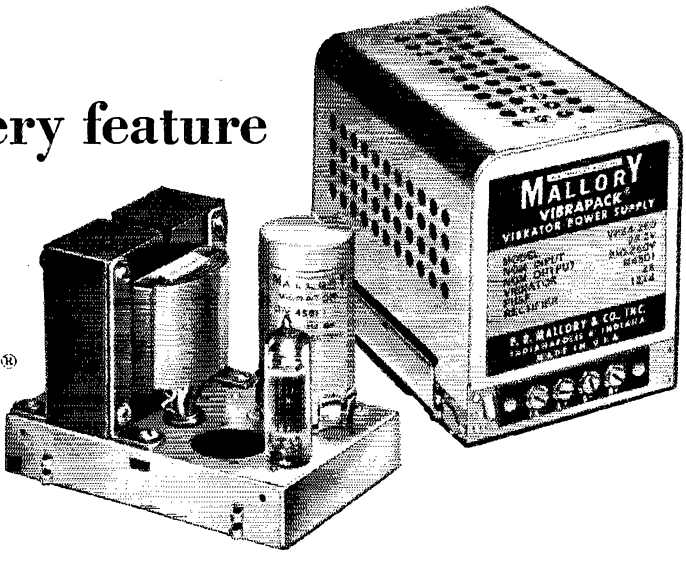
MISSISSIPPI — SCM, Julian G. Blakely, W5WZY — A close race is a good sign. We are grateful to have been elected and thanks. With a little help from each of you we can place Mississippi nearer the top. Congrats to PFC, our new SEC. Our joint goal is an active EC in each county. Appointments are open! A card to the SCM will bring you details and an application form. Even if you can be of service for an adjoining county having no active amateur, drop us a card. Let's have a "Mississippi Night" soon with every county checking into roll call by the SEC. The new Mississippi Rebel Net, NCS IGW, operates 7 days a week (7 P.M.) on 3785 kc. We need coverage on this net; consistent stations will be eligible for the coveted ORS appointment. JHS and his "Hurricaneers" are in there solid; to Norm goes the prize for the best disposition on the air. The Mississippi Magnolia Emergency Net meets Sun., 3870 kc., 1:30 P.M., IHP is NCS. The Cleveland Radio Club is planning a June 5th picnic at Lake Beulah. The Keesler Radio Club schedules s.s.b. lectures. PFC, with emergency gear on Lake Bruen, reports on fishing conditions to VQE. WZ is active on the Mississippi Rebel Net with his VFO. The Capiah Amateur Radio Club is getting lined up for AREC with 2-meter transceivers. ZML will be on 6 meters. All interested in this band drop a card to your SCM for a data sheet to give data on each station to send you. The Riverside Amateur Radio Club of Greenville challenges all clubs to compete in the '55 Field Day Contest. The fair grounds site will be used. GUU has a new Globe King. YAR finally has an antenna. Listen on the Hurricane Net for late hamfest dope. Traffic: W5IGW 105, EWE 93, JHS 64, KYC 39, WZY 18, TIR 13, RIM 12, YBH 12, LPG 11, GUU 10, OTD 8.

TENNESSEE — SCM, Harry Simpson, W4SCF — SEC: RRV. PAM: PFP. RM: WQW. UWA worked another VP7 on 160 meters, bringing his DX total on that band to three. WIJ showed an ionosphere film at the Cookeville Club meeting. FLW raised his 6- and 10-meter beams 15 feet higher. He reports the Tri-County Club is doing fine. A new OPS is K4BKC. After doing a fine organizational job on the Novice Emergency Net CXY has resigned because of the press of other duties. WXL, E.E. student at Tenn. Tech., has a 3-watter built into a coffee can and QNIs KYN regularly. The Bays Mountain Club announces that SWLs are eligible for Hillbilly Net certificates. VUA directed the recent pick-up for the March of Dimes pledges in the Kingsport area, assisted by PID, UIO, TYV, BEV, TYT, and HKU. LNF is now on 75 meters. HKU is on with a kw. VFL has a new Elmac. VUA visited the Watauga Club, in Johnson City, and was much impressed. VZM worked a KH6 on 75 meters using merely 45 watts! ANN operated portable from Florida with 4 watts and worked VDN. VTV has moved to South Carolina. PRY reports the Nashville-Davidson County Area now has 22 mobiles on 10 or 2 meters. OEZ is C.D. RO for the Nashville Area. EAZ, CSO, CSY, and BFS earned Ten-Meter Emergency Net certificates. The Memphis Club will hold its 3rd Annual Hamfest on June 19th. TIE visited W5VAA. WOG and W5CAF visited OGG. SCF and AGC took a fast trip to Tampa and worked mobile from 5 states within 14 hours. Traffic: W4PL 905, OEZ 500, OGG 473, IIB 266, TYU 240, K4FEU 209, W4APC 140, PQP 132, PFP 108, WQW 89, ODR 81, BQG 75, TZD 71, HIH 46, SCF 42, VNE 42, VJ 38, IV 33, YMB 25, SJ 22, TIE 18, UWA 17, RRV 16, HUT 10, FLW 6, HSX 6, PAH 6, YPG 6, ZJY 5, BAO 2, ZBQ 2, CLQ 1, DCH 1, IWV 1, WGJ 1.

(*Continued on page 94*)

MALLORY HAM BULLETIN

You'll like every feature of the New MALLORY VIBRAPACK® Power Supply



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GREAT LAKES DIVISION

KENTUCKY — SCM, Robert E. Fields, W4SBI — SEC: CDA. RM: KKW. Acting PAM: NIZ. OMW informs us that the OVARA picnic will be held at the Cincinnati Police Firing Range, Evendale, Ohio, June 12th. It is a family affair wherein basket picnic lunches will be brought for those attending. There will be plenty of prizes, especially for the ladies, all kind of games, etc. Admission is $1.00 for adults, 25¢ for children. HSI reports that his traffic total is down because of flood conditions along the Ohio River during March. His trailer had to be moved four times. After the flood, high winds blew down his antenna. WNH says the HCARA has a club station now at its club house and is now an ARRL affiliated club. CDA, our SEC, again asks that clubs and communities designate an EC if they don't have one. We do not want to be late with too little. VP, FR, OMW, and JUI took part in the ARRL F.M.T. with JUI coming out with a high score. From reports from NIZ, RPF, and KKW we find that both the KYN (c.w.) and KYP ('phone) nets are growing with a high percentage of net efficiency. Traffic: (Mar.) K4WBG 538, W4KKW 204, RPF 73, NIZ 68, SBI 64, JHU 59, CDA 55, ZDA 37, FGV 31, ZDB 31, JCN 27, SUD 17, SZB 13, JP 10, HSI 4, JUI 4. (Feb.) W4ZLK 39, IAY 8.

MICHIGAN — SCM, Thomas G. Mitchell, W8RAE — Asst. SCMs: ('Phone) Bob Cooper, 8AQA; (C.W.) Joe Beljan, 8SCW. SEC: GJH. New appointees: AMT, Genesee Co., JUQ Allegan Co., MNQ Area 7, NSS Barry Co., PDC Cass Co., QOT Berrien Co. as ECs; MZN as OES. QMN Net certificates for '54-'55 went to DAP, PHM, RTN, SCW, and SJF. The following OOs participated in the February F.M.T.: AYY, CXP, HPR, and SS. All qualified in Class I. Congrats to all. We're all proud of the Grand Rapids fellows for their work in putting on the fine convention. The AREC/RACES theme was in keeping with the latest developments in our SEC's department. Word from him is that the long-awaited approval of the Michigan COMPLAN is nearer at hand. Keep a watch on your newspapers for official announcement and, in the meantime, keep the AREC registrations coming in. HSG/MEX has introduced a rewrite on the license plate law (Senate Bill 1210) which will simplify the original when passed. Thanks for the fine job on our behalf, Cos. QMNer QIX has a new receiver with serial No. "3663." All this and license plates, too? QAH is back to trusty triodes after trouble with tetrodes. DLZ is so pleased with his home-brew two-element VP 15-meter beam that he is scaling one for 20 meters. EGI is QRX while moving so reads QMN mail on the spare receiver at the airport. QQO is working on Field Day plans, which is a good tip for all of us. FX built and is using a "Q-Multiplier" and highly recommends same for others. It even helps his line-noise problem. TIC says the Muskegon gang is covering the county with 10-meter mobiles. Correcting Apr. club news in this column: officers of the GRARC are DLZ, pres.; HIW, vice-pres.; AQA, secy.; ZCH, treas. Lansing Amateur Radio Club officers are OCK, pres.; OPZ, vice-pres.; QOJ, secy.; CKK, treas.; TIJ and CPV, directors. CU on Field Day, gang. Traffic: (Mar.) W8NUL 284, PHA 221, ILP 153, RJC 111, SRK 103, RTN 97, ZLK 62, DAP 60, NTC 58, IUJ 57, JYJ 56, IKX 51, SWG 51, IBB 48, SJF 48, URM 48, OQH 46, QIX 46, SCW 43, IRO 38, NOH 38, QQO 34, IV 31, WVL 31, FX 30, QQK/8 20, ZHB 17, DSE 16, RAE 16, AUD 12, HSG 12, DLZ 8, PHM 7, YDR 7, HKT 6, PDF 4, EGI 3, TIC 2 (Feb.) W8QAH 391, SCW 124, JKX 101, ZLK 100, IKX 50, IBB 36, SJF 26, INF 10, PUV 3.

OHIO — SCM, John E. Siringer, W8AJW — Asst. SCMs: J. C. Erickson, 8DAE; W. B. Davis, 8JNF; and O. V. Bonnet, 8OVG. SEC: IPB. RMs: DAE and FYO. PAMs: EQN and HUX. BPLs were issued to DAE and FYO. MVJ, QHW, and QXH have been appointed ORSs. ILC is now an OPS and CUJ, one of the Dayton F.M.T. wizards, has been made an OO. On April 2nd one of the greatest amateur radio conventions in the nation's history occurred at Dayton. The Dayton Hamvention drew approximately 2000 people. The headline banquet speaker was 1BUD, General Manager of ARRL, while other speakers included 9PFO, HOH, 9WOK, 1OEX, HB, 9EDX, 2KUJ, 2BDS, and SPF. FYW was awarded the trophy for outstanding service to amateur radio and/or the public during 1954, and 9EHU was awarded the honorable mention trophy. VE3AWQ won a 75A-4. Mr. Hamvention, ACE, and his able staff of assistants deserve considerable praise for what they accomplished. We regret to report the death of RJF, an old-time amateur in the Cleveland Area. ZJM has become a father for the third time — a boy again. GDQ made 45 points on 160 meters during the DX Contest. AQ lost his vertical in the recent big wind, while DG lost two masts. Winners in the March hidden transmitter hunt in Toledo with NBD, VLL, and OFG. The Fulton County Amateur Radio Club is the section's most recent ARRL affiliate. Our sensational SEC, UPB, will monitor 3860 kc. at 2:00 P.M. EST and 3580 at 3:00 P.M. the Sunday of Field Day to accept Field Day traffic for QSP. The CACARC has arranged a technical talk to be given in early June in Cleveland. The Dayton *RF Carrier* reports that PQZ and ZOF are doing business with the USAF in the East; LFH

(*Continued on page 96*)

performance . . .

determined his choice

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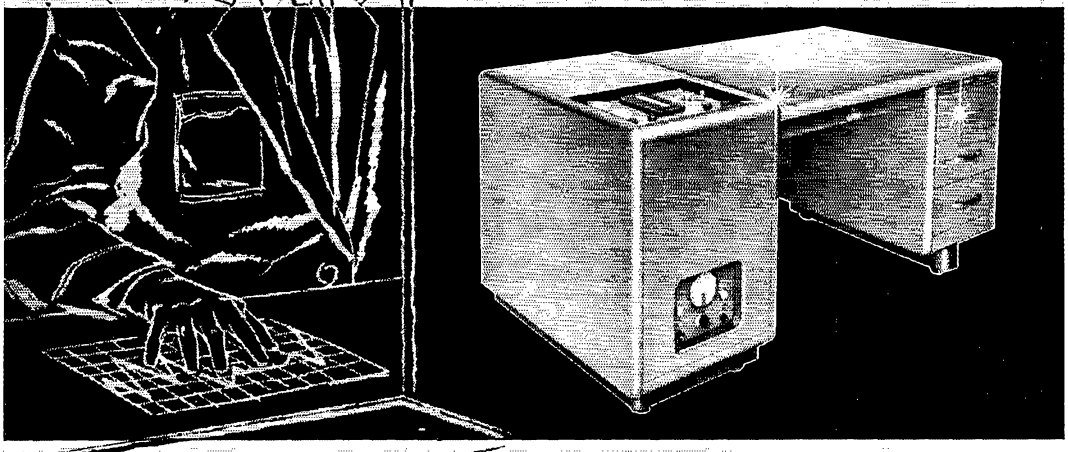

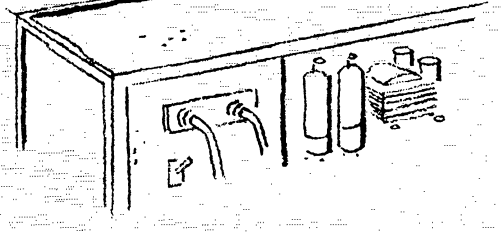

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is on s.s.b.s.c. mobile with 150 watts; RGH's call is being bootlegged on 7 Mc. and PGC is a new arrival on 420 Mc. The Cincy GCARA *Mike and Key* is running a monthly column entitled "About Our Members," with IVE being featured in the March edition. Newly-elected GCARA officers are GCR, pres.; SMQ, vice-pres.; EIB, 2nd vice-pres.; 4VLB, corr. secy.; PLB, rec. secy.; and NCV, treas. The OVARA *Ether Waves* has its own "Who's Who." In March the bulletin featured one of the very, very old-timers, SDJ. The DX column, edited by 4KVX, is truly top-notch. The Springfield *Q-5* lists the following as speakers for the coming months: June, OKB; July, HBJ; August, HOL; Sept., HTE. Active in the Springfield C.D. Net, 3860 kc., 12:30 P.M. on Sun., are EQN, FSU, DCJ, VZE, WAU, HTE, JNU, KJP, GNZ, EBQ, and WXG. The FHARA *Feedline* mentions that new Hamilton Area Novices are WBQ (a YL), VQH, VST, and WCQ; and MWY, OUD, and QJO set up an amateur station at the local Boy Scout Exposition at Fenmont Center. The Columbus *Carascope* informs us that DTL has graduated from the Novice ranks; APF, Franklin Co. EC, has recovered from a long illness and has a new jr. operator, and RVK worked a YU on 7 Mc. Toledo's *Shack Gossip* states that BIQ has worked 84 countries on 15 meters; RZQ has made General Class; new Toledo Novices are VMW, VNR, VBC, VOC, VFH, VBO, and VBT; RYK has upped his power to a husky 30 watts; and KPJ is knocking 'em over with 10 watts on 20 meters. Northeastern Ohio's *Ham Flashes* relates that DXO lost his beam in the recent tornado; LWG, of Alliance, passed away on March 8th; EDS, of Salem, is an ex-W1, having recently forsaken New England; USP graduated from Kent State U. in March; NMP recently was severely injured in an auto accident but is well on the road to recovery; and CUI, DXO, FRY, NXK, and KZS participated in the C.D. Net during the tornado of March 22nd. Traffic: W8FYO 520, DAE 447, LHV 138, MQQ 97, HNP 91, ILC 83, AMH 56, IIR 56, ARO 51, AL 40, AJH 26, AJW 22, LYD 22, LZE 19, HPP 18, GZ 16, RO 16, IFX 15, BEW 11, EQN 11, KDY 10, RN 8, WRL 8, QXH 7, FJV 6, HFE 6, HUX 6, HZJ 6, LMB 6, MGC 6, AQ 5, IAY 5, NZC 5, ET 4, LGR 4, NQQ 4, MEI 3, LER 2. (Feb.) W8REL 308, DL 9.

HUDSON DIVISION

EASTERN NEW YORK — SCM, Stephen J. Neason, W2ILI — SEC: RTE. RMs: K2BJS and W2TYC. PAMs: GDD and IJG. Through the efforts of K2BJS, NYSS has been reorganized. Jack is the new manager and reports that during March 16 sessions were held with 95 QNI and 80 pieces of traffic handled. We sure are proud to have you as our new RM, Jack, and congrats on making BPL again. CFU did a fine job in the recent F.M.T. Warren had an average error of 40.5 parts per million in three measurements. K2BFU is active on 144 Mc. KN2LRE is new in Yonkers. K2EOQ is going full blast on 144 Mc. with a 522 and a sixteen-element beam. AWQ traded his Viking II for a Gonset Communicator which is being used for mobile. K2AVZ has a 522 fired up on 144 Mc. and says the Mount Kisco gang will join him soon. The Armonk Boy Scout Merit Badge Show was a big success. The bouquets go to K2s GJC, GZM, and KN2HRQ. New in Katonah is KN2LPN. The gang is in hopes that Terry will be a contest man and win the Novice Roundup so that the Eastern New York title will remain in South Salem for the third year. If you are interested in knowing the location of a radio club near your home, please drop a postcard to the SCM for information. K2HQJ, manager of the MHT, reports that net members would like to purchase some 3716-kc. crystals from former members who have no further use for them. NZE is general chairman for the SARA Field Day activity. MHE was appointed Field Day chairman for the IBM Radio Club. The Crystal Radio Club held its twenty-fourth annual dinner dance on April 16th, at the Silver Pheasant Inn located in Pearl River. The affair was a huge success. Traffic: (Mar.) K2BJS 712, EOQ 22, EHI 15, W2EFU 11, CFU 6. (Feb.) K2BJS 601.

NEW YORK CITY AND LONG ISLAND — SCM, Carleton L. Coleman, W2YBT — Asst. SCM: Harry J. Dannals, 2TUK. SEC: ZAI. PAM: JZX. RMs: VNJ and LPJ. ZAI reports another successful 10-meter hidden transmitter hunt in Nassau with 23 mobiles and 2 fixed stations participating. The Nassau 2-meter mobiles also enjoy hidden transmitter hunts and plan regular hunts every month. VNJ reminds all of the NLT Net on 3710 kc. Vic also requests amateur in N. Y. C., Brooklyn, and Queens interested in the N. Y. State RACES program to contact him. KEB, KFV, and LPJ once again made BPL. BTL and CRZ are active on 75 meters. AJR is DXing on 14 and 21 Mc. WH returned from W4-Land, where he kept skeds with the local gang. JPB/6 will be heard shortly on 20 and 40 meters. OBE has s.s.b. 75 running. IRY has returned to 2 meters. We regret to report that CHK and VQY have joined the Silent Keys. K2s LUB and LYD are new members on the Lake Success RC. QBS now signs 3BRG from State College, Pa. GG has 10A s.s.b. exciter on 20 meters. NYURC membership has doubled and the traffic total is climbing. K2HID's traffic score is on the rise. IVS is replacing the old automatic key with a new electronic model. GPQ is building a 100-watter for 2 meters. The newly-

(Continued on page 98)

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This indispensable measuring instrument helps you get the most out of your equipment. It will save you time in initial transmitter tuning, neutralizing, antenna loading, and dozens of other jobs. Extremely versatile, the unit will serve you equally well as a sensitive grid dip meter, signal generator, absorption wave meter, or signal monitor from 1.75 to 260 mc. The calibrated, color coded dial is divided in five bands, matching each of the five coils supplied.

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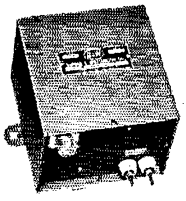

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ALL OF THESE FINE B&W products are available at leading distributors' everywhere.

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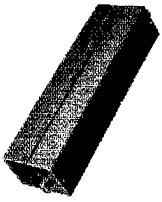
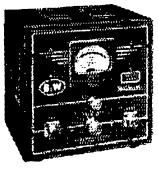


Fight TVI by attenuating undesirable harmonics and spurious radiation by a minimum factor equal to 17,780 to 1 with this new B&W low pass filter. Wave Guide principle and novel multi-sectional construction mean more attenuation in less space at lower cost.

SINGLE SIDEBAND GENERATOR

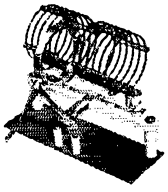
The 51SB generator offers sparkling SSB performance with your present B&W, Collins, or Johnson transmitter, on 80 through 10 meters with the output frequency control presently in your transmitter.

MATCHMASTER



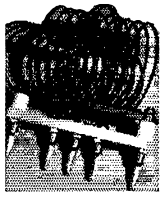
Three valuable instruments in one, the Matchmaster can be used as a dummy load, direct-reading r-f wattmeter, and an integral SWR bridge, for fast measurements on coaxial feed lines, antennas, and transmitting equipment.

FARADAY SHIELDED LINKS



Materially aid in reducing TVI and BCI caused by harmonic or spurious signal radiations, normally transferred by capacity coupling. Adaptable to all conventional link coupled circuits. A perfect fit for B&W variable link air inductors.

TYPE B INDUCTORS



Widely used in buffer and final amplifier stages with input powers up to 150 watts, and voltage up to 1500. Mounting designed for maximum efficiency and flexibility.

Barker & Williamson, Inc.

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formed Fieldstone HSRC has chosen K2GHS, pres.; KN2KVW, secy.; and K2HSZ, trustee. PF reports the Radio Club of Brooklyn is off to a good start in '55. AZS returned to the air after five months without a receiver. K2CMV is now interested in hi-fi but found time to add 8 new countries in the DX Contest. Watch your cycles, fellows and gals. 8 NYC-LI stations made Class I Observer and 3 made Class II in the recent ARRL F.M.T. K2ICU is building a new 813 rig but his 25-watter snagged 45 states and 15 countries before retiring. K2GGG is on the air with 100 watts. LGK would appreciate acknowledgment from those copying his ARRL bulletin transmissions. KN2LAG and OHW are new members of the NYRC. New members of the Fordham RC, which now boasts more than 90 members, are CWI, K2s IFE, IFM, KN2s KPG, LDO, and 1BZH. K2AMP is completing a 13-watt emergency rig. The Eastern Suffolk RC now has more than 30 members with K2EC, pres.; K2EGY, vice-pres.; KDN, treas.; R. Grooms, rec. secy.; K2ASB, corr. secy.; 5SZF/2, act. chairman. K2GXL needs a QSL from one of his many Arizona contacts to complete WAS. KN2KTT, active on 144 Mc. with a Communicator, now has AT-1 for other bands. The Levittown RC school program helped KN2s KMC, KMY, KNC, KNF, KRJ, KSK, and LGP on their way. Looks like lots of Field Day help for that club! Speaking of Field Day, gang, if you can't get out with a club or non-club group, give the boys and gals in the field a contact from your home station or mobile. See you in the Field Day and V.H.F. Contests. Traffic: (Mar.) W2KEB 990, KFV 826, LPJ 646, VNJ 454, DSC 156, JOA 156, OME 140, MUM 124, K2HID 91, AMP 69, ABW 53, W2IVS 29, K2CRH 23, W2OBU 18, GPQ 14, K2GHS 12, W2GP 9, IN 9, AZS 8, PF 8, EC 5, K2CMV 2, W2ENW 2, JGV 1. (Feb.) W2CLG 36, K2HID 33, W2LGK 16, GPQ 12, GP 7, JGV 3.

NORTHERN NEW JERSEY — SCM, Lloyd H. Manamon, W2VQR — SEC: IIN. PAM: CCS. RMs: NKD, CGG, and EAS. OGP is act. mgr. of the State Line Radio Club and chairman of his local civil defense communications committee. Plans are being made by the club for RACES activity in Upper Saddle River. This Club is 100 per cent ARRL and its officers are YVP, pres.; K2GSF, secy.-treas.; OGP, vice-pres. and act. mgr. LQP has made WAS on 3.5 Mc. Although he does not have much time for hamming his DX count is up to 57. The Irvington Radio Amateur Club is forming a YLRL branch. IQP, pres. of the NYC branch of the YLRL, is lending a helping hand in the organization of this important activity. AYP was speaker at the Apr. 4th meeting. His subject was "Operating an Amateur Radio Station." We personally think more of us should review this worthy subject. The Garden State Amateur Radio Assn. had John Van Dayne, eng. sect. mgr. in charge of color TV at Westinghouse, give a lecture on color television followed by an active demonstration where the members viewed a commercial program in color. The Club now meets at McGuires Grove, Rt. 35, Middletown, the 2nd and 4th Wed. A very interesting program is promised on every meeting night so come on over, gang, there is no charge for admission. Thanks to K2GLS and all the others who responded to our appeal for the QTH of KN2JLQ. GTK has a new jr. operator, a boy. K2DOX is working on a new 250-watt final. K2CCI and K2EKU contemplate taking a portable rig on their high school senior class trip to Washington, D. C. K2GRU has started on a new kw. all-band rig. K2ETT is on 40 meters with 80 watts. K2CZX is on 20-, 40-, and 80-meter c.w. with a 250-watt rig. K2EKO is hard at work on a new mobile rig. KN2KLR is a new station in Teaneck. ZYM and his XYL, K2CYU are on a Florida vacation. K2GBP, new president of the Bogota Radio Club, advises the membership now totals 25, and meeting nights are the 2nd and 4th Tue. See GBP for further details. VYP has been discharged from the Navy. We would like to have him back as an OO. Please drop the SCM a line. NIY keeps weekly skeds with 1UYX of Longmeadow, Mass., formerly 2YOB of Teaneck. KN2KHZ is doing fine with his 65 watts on 3.7 Mc.; so far he has 17 states confirmed with a total of 23 worked. Thanks for the note, Dave, and let's hear from you regularly. NLN is a new member of the Windblowers V.H.F. Society. K2CMB is working hard to get his trailer "Windy," in shape for Field Day. K2EQP reports heavy traffic for March. VPL was guest speaker at the April 11th meeting of the Raritan Bay Radio Amateur Club. OGU has his sixteen-element beam up on 144 Mc. ACL, from Perth Amboy, is a new member of the RBRA. K2HXP received his General Class ticket Apr. 1st. JGP is finishing the construction and installation of RACES units in West Orange. K2DSW has just finished building up the Ranger kit, and is getting out FB with it. NIE has a new 2OA s.s.b. exciter. GUM has a new Ranger on the air. LJR is back on the air. Traffic: K2GFX 94, EQP 49, DSW 48, BWQ 38, W2FPM 26, CFB 10, OUS 10, YVQ 4, CJX 2, CVW 2, NIY 2.

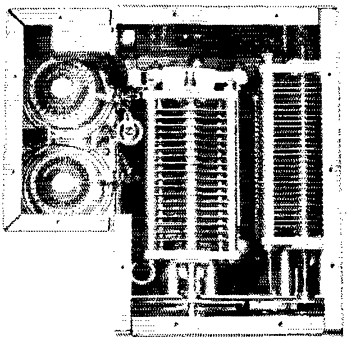
MIDWEST DIVISION

IOWA — SCM, William G. Davis, WØPP — SQE reports that he now is conducting code classes for beginners at the high school radio club. RYT reports that he now is 8VQC at Marlette, Mich. QVA reports that UCE is now at Kellogg. PKT is building a Ranger kit. YKS has moved

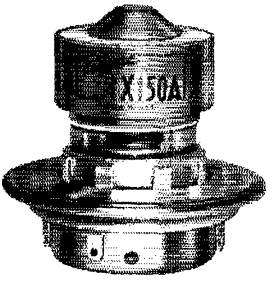
(*Continued on page 100*)

Collins versatile KWS-1 transmitter uses pair of Eimac 4X150A's in power amplifier...

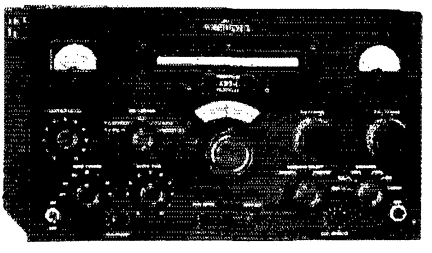
Another success in its history of communication equipment accomplishments has been realized by Collins Radio Company with the new KWS-1, one kilowatt amateur radio transmitter. Designed for versatility as well as reliability and top performance, the KWS-1 has a power input of one kilowatt peak envelope power on SSB, one kilowatt on CW and equivalent to one kilowatt AM when received on narrow-bandwidth receiver. Its frequency range from 3.5 to 30mc covers the 80, 40, 20, 15, 11 and 10 meter amateur bands. The modern engineering approach taken by Collins combines outstanding electrical characteristics with uncrowded physical compactness. The KWS-1 exciter and amplifier are housed in a single receiver-size cabinet suitable for placing on the operating desk or power supply cabinet. A pair of easily driven Eimac 4X150A radial-beam power tetrodes in Eimac 4X150A air system sockets are used in the final amplifier. In the words of Collins, Eimac-developed 4X150A's were selected "because of their superior performance as linear amplifiers, their small size and lower plate voltage requirements."



Top view of one kilowatt linear amplifier section of Collins KWS-1 single sideband, CW and AM transmitter, showing pair of Eimac 4X150A's.



Eimac 4X150A radial-beam power tetrode and air system socket.



The exciter and power amplifier of Collins KWS-1 transmitter are housed in small, compact receiver-size cabinet.

Eimac

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SAN BRUNO • CALIFORNIA

to Des Moines, KVJ has a new SX-96, and LJW has a new HQ-140X on order. He also reports the following Novices in Burlington: KNØAFE, AFN, and AID. CQL is back on TLCN after an 18-month absence. UTD lost his Heathkit transmitter in a fire. PAN reports that he's getting a kick out of the traffic game. A new call in Jessup is KNØAGK. RQA has his General Class license. 9BQC/Ø was elected president and trustee of the Luther College ham station and club. PRF has a class waiting for the RI's next visit and also is winding up another class for Novices. The Iowa 160-meter picnic is scheduled for June 19th at Charles City. New Novices in the Davenport Club are WNØs ZYK, ZYL, YCH, ZYE, ZYC, and KNØs AAK and AAL. These are the result of HMM's classes. Traffic: WØSCA 1230, BDR 1146, CZ 301, EHH 132, LJW 110, SQE 69, QVA 67, BLH 40, KVJ 30, NGS 24, LFZ 21, LGG 21, PAN 21, PUR 9, HWU 8, RMG 8, W9BCQ/Ø 1, WØFDM 1.

KANSAS — SCM, Earl N. Johnston, WØICV, — SEC: PAH. RM: KXL/NIY. PAM: FNS. A new club known as the Kaw-Blue Radio Club has been organized in Manhattan with PAH as pres.; CVB, vice-pres., and treas.; QVO, secy.; and NFX, act. mgr. At the annual banquet of the WARC in February certificates were presented to three outstanding amateurs in Wichita for 1954 — YZB as the outstanding c.w. amateur, BVQ as the outstanding 'phone amateur, and MXB as the outstanding all-around amateur. The Radio Club of Leavenworth High, YVY, has one General Class and four Novice members. The Boot Hill Amateur Radio Club of Dodge City has received its ARRL affiliation charter. The CKRC of Salina will hold its 7th Annual Hamfest June 5th at the usual place in Kenmore Park with prizes and activities as usual. JFE has moved (2 meters and all) to Eldorado. KNØADV, a new station in Eldorado, is on with Heathkit receiver, Q-Multiplier, 1625, and Windom antenna. ADV's father-in-law is SAF and QGB is his brother-in-law. WNØZNO and ZNP are new hams in Linn (Arno's QTH). YTR's YL is now KNØABM. LOW now has the Johnson mobile transmitter kit his XYL gave him for Christmas on the air. Lookee! A new record has been set for traffic reports this month, thanks to you fellows. Traffic: (Mar.) WØBLI 526, KØFDL 516, WØOHJ 380, NIY 294, UAT 223, FEO/Ø 165, MXG 113, LOR 98, ABJ 66, ONF 52, FNS 51, FDJ 42, NFX 41, LOW 36, SVE 34, EOT 33, LBJ 29, LCQ 29, REP 29, VFC 28, NLV 27, ECD 26, SQX 26, ICV 24, LQX 24, LOW 23, SAF 18, KXB 15, UML 15, YJU 15, KØNAB 14, WØKRZ 13, KSY 13, TNA 9, QGG 7, IYF/Ø 6, LIX 6, YFE 5, YVM 5, DEL 4, PAH 4, WWR 1. (Feb.) WØOHJ 385, WXT 46, LCQ 29, LOW 23, ONF 17, SQX 16, UML 15.

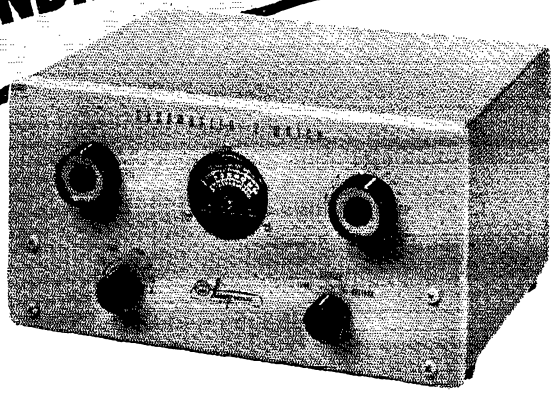
MISSOURI — SCM, James W. Hoover, WØGEP — SEC: VRF. PAM: BVL. RMs: OUD and QXO. The MON evening session is back to 7:00 P.M. again. BUL was retained as net manager of MEN for another year. The Northwest St. Louis Radio Club held an emergency drill on Mar. 2nd in Normandy. Twenty-three participated with 7 mobiles and several fixed stations. GCL is back on the air with an 813 on all bands. SUV has a new speech clipper. WAP was on vacation in Amarillo, Tex. CPI attended a hamfest in Eureka Springs, Ark. HARC, Kansas City, held a Novice meeting with 48 in attendance. KNØAEU organized the meeting. EBE received his 2500 Traffikers Club certificate. SAK will undergo an operation at the Mayo Clinic. VTF received an ORS appointment. GAR's traffic dropped because of severe line noise. VTF is publishing *MONews* for distribution to regular net members. MON members received station location maps from SAK. TSZ is now running 300 watts. QMF is mobile on 2 meters. The Bandhoppers Radio Club is building ten 6-meter transmitter-receivers for 110 and 6-volt operation. ZXX is currently installing radar equipment for CAA in St. Louis. HUQ, EC for Rolla, is moving to the West. WPS is Chief of Communications and Radio Officer for St. Louis County Civil Defense. Traffic: (Mar.) WØCPI 1137, KØFBO 462, WØBVL 223, GAR 208, SAK 147, SUV 132, GBJ 128, VPQ 108, IIR 101, OMM 100, RTO 86, WAP 65, CKQ 64, OUD 63, VTF 59, KIK 49, HUI 44, VTW 38, EBE 25, QXO 18, BUL 17, GEP 13, KA 12, RCV 10, QMF 7, MFB 6, VFP 4. (Feb.) WØQXO 6.

NEBRASKA — SCM, Floyd B. Campbell, WØCBH — Asst. SCM, Tom Boydston, ØVYX. SEC: JDJ. New ECs are DQN Potter, UFZ Alliance, VQR Scottsbluff (replacing JHI who went to Sterling, Colo.), MTI Kimball, UOB Sidney. WPB is on the air with S-38C and HT-17. Western Nebraska ECs are holding rag-chews and general discussions on 3977 kc. on Sun. with hopes of getting an EC Net going. New Novices from Scottsbluff: KNØAKR using a Heathkit HRO-50, KNØARV with Heathkit HQ-140; KNØAKW with Globe Scout Hallicrafters receiver. RHL is using an 807 on 80 and 40 meters. YHN is working a lot of 2-meter DX. YUF is on 2 meters. CSW is on 80-, 40-, and 20-meter 'phone regularly. FLA is holding code practice for Crete Amateur Radio Club prospectives. BEA and AQQ can certainly be heard on 80 meters. BTB is cameraman at KOLN-TV. New officers for the Lincoln Amateur Radio Club are FTR, pres., BXJ, secy. RNH finally got a Nevada QSL but lacks Vermont for WAS. RMO reports a new jr. operator; SZL and LZL each report new YLs. DDP is NCS for the 160-meter Net, operating on 1987 kc. The 75-meter 'Phone Net had 53 QNIs for January, 56 for February, 48

(*Continued on page 102*)

EVERYTHING YOU'VE EVER WANTED IN AN *Antenna* COUPLER

The Harvey-WELLS BANDMASTER Z MATCH



4 INSTRUMENTS IN ONE UNIT

1. A PRECISION ENGINEERED ANTENNA MATCHING UNIT
2. A FORWARD-REFLECTED POWER WATTMETER
3. AN R.F. WATTMETER
4. A DUMMY LOAD

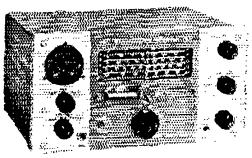
SIZE 12⅜ W x 6¾ H x 10½ D

Only $69.00*
AMATEUR NET

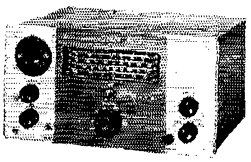
Although originally designed for use with the Harvey-Wells T-90 Bandmaster Transmitter, this antenna coupler may be used with any transmitter for matching into a variety of load impedances ranging from 10 to 2000 ohms. Terminals are provided for line or coaxial antenna feeders. Tuning is continuous from 10 to 80 meters without bandswitching. It will conservatively handle a transmitter input of 500 watts.

In addition to its features as an antenna coupler, the Bandmaster Z-Match has a built-in forward-reflected power wattmeter, an R.F. wattmeter, and a dummy load. Curves are supplied to enable the forward-reflected power readings to be converted to VSWR information. The R.F. Wattmeter is in the circuit at all times, and the dummy load may be used to check your transmitter before going on the air.

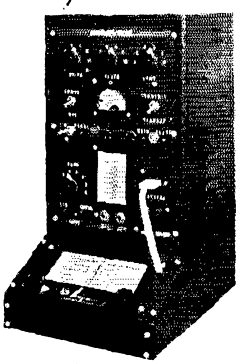
AND OTHER *Harvey*-WELLS EQUIPMENT YOU SHOULD OWN



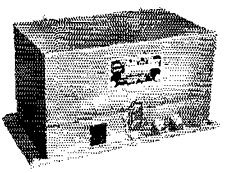
T-90 Bandmaster Transmitter



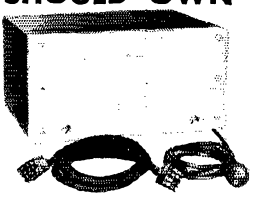
R-9 Receiver



TBS-50 Bandmaster Transmitter



VPS-T90
Mobile Power Supply



APS-90 Power Supply
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for March. RIG is on with a cw. rig, Heathkit VFO, 173 receiver. ODB is on c.w. after a long time. Now is the time to make plans for the Midwest Division Convention to be held in Omaha, Nebr., Oct. 22-23. Traffic: WØRDN 266, RNH 206, ZJF 178, DDT 77, AEM 70, FQB 60, KDW 51, HTA 44, KØWBF 44, WØFTQ 34, RIN 25, VYX 23, QMY 20, ORW 18, MAO 15, FMW 14, FXH 14, DDP 13, BEA 12, CBH 11, EGQ 10, GDZ 10, OOX 10, BOQ 8, KØFBD 8, WØSQA 7, GVA 6, KLB 6, KVM 6, QHG 6, QMZ 6, THX 6, FRS 5, DQN 4, NIK 3, PZH 3, FJV 2, NHS 2, NHT 2, POL 2, PQT 1, PUT 1, RJQ 1. (Feb.) WØDQN 3.

NEW ENGLAND DIVISION

CONNECTICUT — SCM, Milton E. Chaffee, W1EFW — SEC: LKF. PAM: LWW. RM: KYQ, MCN and CN 3640 (0645 and 1845), CPN 3880 (1830), CTN 3640 (Sun. 0900), CEN 29,580 kc. Traffic totaled higher this month on CN when they handled 237 in 26 sessions. QNI leaders: KYQ, RGB, and LV. MCN also had a better month, moving 151 in 26 sessions, with QNI honors to 1BE, RGB, and LV. CTN needs more attention and will welcome more QNI stations. Even so, RFJ reports they handled 10 in 3 sessions. OO reports were made by GIX, RFC, VW, and BVB. WHO has a beam hooked to his Ranger and is scouting DX. ULY reports the HCARA enjoyed Johnson Chief Eng. ØEDX as a speaker March 18th. WHL reports the Hamden Club is active with a facsimile talk by AYC. Cementing their liaison with c.d. a new group, the Bridgeport Radio Amateur Civil Emergency Society (BRACES), has been formed according to EJH, the new EC there. New Novice EIW is the XYL of DML at Bridgeport. ECs note: The new QTH for LKF is 1853 Main, Newington. RFC is the new OO. APA renewed ORS and OPS appointments, while VW renewed OPS and OO. ZKQ received his General Class license. TD continues his OBS schedule on 146 Mc. TYQ is active on CN and MCN. CUH is sporting a new rig and EOB has new p.p. 813 final. JAO and son YUP are building new equipment to maintain schedules. CTB is busy with TV. BFS is ready to quit for TVI. FLQ still is poking at 50 Mc. CJD has a new portable rig. The Middlesex Club has a new call, EDH. BDI presided at the CN/CPN dinner at Cheshire Mar. 26th, where DBM was guest and reported on the c.d. meeting at New York the same day. The meeting was attended by 53, who hashed over traffic and similar topics. Your SCM apologizes for missing it. EVC is the new call of the Southington Club. RQJ has forsaken a.m. and is having fun on s.s.b. DEK is the new Southbury EC. YNC has increased power and activity on CN. Don't forget annual renewal of your appointments. Traffic: (Mar.) W1YBH 146, CUH 143, NJM 137, LV 133, AW 122, KYQ 93, RGB 93, EFW 83, YYM 78, UED 75, HYF 69, LIG 65, ZDX 55, RRE 39, RFJ 34, BDI 29, AYC 26, BVB 26, EDA 24, KV 16, ULY 15, GIX 14, YNC 9, CJD 7, SJ 3. (Feb.) W1WHL 11.

MAINE — SCM election in progress. — SEC: TVB. PAM: WRZ. RM: OHT. The Sea Gull Net is off for the summer. The Barnyard and Pine Tree Nets will continue regular skeds but on DST. We have a new SEC. Chet kindly consented to take over from BYK, who was sadly overloaded with c.d. work. Chet's first mission was a trip to New York and an FCDA meeting. SIN is going to Alaska to work. QIH has been promoted and IOK has his job in the CMP Co. JTH is working for WRDO as an engineer.

Members of the section will be saddened to learn of the death of Bernard Seamon, W1AFT, on April 27th. Sympathy is extended to family and friends in this loss. We present herewith his last report.

TWR and AWN both are home from the hospital after surgery. BOK is recovering from an automobile accident. LHA is back from his cruise in southern waters. AMR is winding up work in Florida and returning to his Edgecomb estate. PS is working at the weather station high atop Mt. Washington and can be heard on 10 meters ground wave. After many years at Houlton, AEK has been transferred to Springfield, Mass. K2HBK, who is the operator at K1FCT, Dow AFB, recently visited WTG in Augusta. As my appointment as SCM expired on April 16, this may be my last report to you. At this time I want to sincerely thank all of you for the privilege of serving you and for your fine coöperation. A low bow to the amateurs who have assisted me in the offices of SEC, BYK and TVB; of PAM, BTY and WRZ; and of RM, LKP and OHT. Well done, gentlemen. Traffic: W1WTG 124, ZME 85, LKP 75, YYW 57, LYR 46, UDD 44, EFR 31, BX 22, AFT 18, BTY 18, NXX 9, UZR 8, WRZ 7, YVN 5, TKE 3.

EASTERN MASSACHUSETTS — SCM, Frank L. Baker, jr., W1ALP — New appointments: BFV Wrentham, KT Georgetown, DPO Chatham, AKN Sandwich, HSN Stoughton as ECs; AVY as OBS. Appointments endorsed: AWO Wenham, DDC Ayer, VIN Carlisle, RUU Easton, MKX Lowell, PAN Billerica, TVD Andover, DWY Beverly, JJY National Guard Emergency Comm. Plan as ECs; JOJ and SPL as OBSs; JOJ as OES; WSN, QLT, and JJY as ORSs; IIM and SCS as OPSs; WK and NF as OOs. ULJ is Sector Radio Officer for Sector 2B. The Hingham Radio Club elected AYG, pres.; WSH, vice-pres.; ONV,

(Continued on page 104)

The Mosley "Vest-Pocket" TRI-BANDER ROTARY BEAM

with *AUTO-LECTRONIC Change-over

- ONE Beam
- ONE Coax Line

*All you do is tune your rig for operation in the band desired. The MOSLEY *TRI-BANDER* **automatically** selects the right combination of elements to give True Beam Performance on that band!

3 BAND OPERATION!

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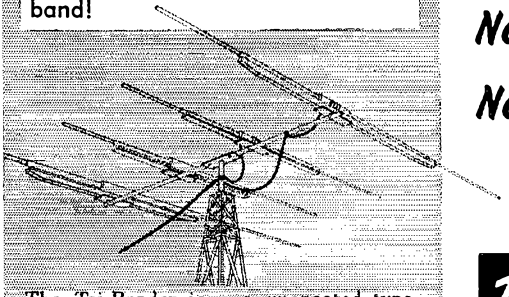

The Tri-Bander is a compensated type beam with four elements mounted on one 15' boom. Two elements function for 20 meter operation and the other two for 15 and 40 meter. Because the latter two bands are not in direct harmonic relation, the beam operates at somewhat reduced efficiency at 21 mcs. but gives maximum performance at 7 mcs. and 14 mcs. Forward gain on these bands is 5 db. and front-to-back is 20 db. SWR is 1.1/1 at resonant frequencies. The Tri-Bander is complete with coils, Auto-Lectronic Coupling Yoke and all necessary hardware. Element sections are pre-drilled and color coded for fast assembly.

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secy.-treas.; VM, DMS, MD, AFR, and 4VXD, planning board. The Satuit Amateur Radio Club elected ZXZ, pres.; LCK, vice-pres.; YTA, secy.-treas. K2CBD is going to Greenland. The following took part in the February F.M.T.; BGW, CLF, MKW, THO, GDJ, JNX, and TF3CJ/1. Heard on 2 meters: ARF, QCC, GYQ, LJN, VKE, KXP, BJT, VXW, IPE, YRD, DYQ, and CHS. On 10 meters: ADD, RKU, RUG, and CZB. Heard on 75 meters: TVC, ASN, TOP, VIW, LAO, and DPV. PIW has Key Jack modulator on 10 meters. QMU has the receiver going again. SXD will be on 2 and 6 meters with an 829. EK will be on 10 meters. RM has a 90-ft. aluminum mast for 2 meters. OOP has the beam pointed at DEO in Maine on 2 meters. LMU is on 10–15 meters with low power. The Scituate gang will be on 2 meters for c.d. work. YTA has an ARC-5 2-meter receiver and is on 40-80-meter c.w. NHH, now in Sharon, is on 40-meter c.w. PVJ is back on the air. AJU will be on 2 meters. Director Keating of Sector 1B called for a test and the following were on: KWD, DW, EKG, FWS, SH, QKY, GNK, VPR, TYN, CLF, HSN, WUW, LOS, MLJ, NGO, ALP, and MME. SCS had 500 contacts in the YL-OM Contest and she and IIM built a Ranger for a driver for the kw. on 20–75 meters. WN1BUR is a new ham in Chestnut Hill. The Brookline Amateur Radio Society and the Seacoast Amateur Radio Club now are affiliated with ARRL. AKN is on 2 meters with a Gonset and has a Viking and TBS-50C. The Wellesley Amateur Radio Assn. held a meeting with SX giving a talk on s.s.b. The South Eastern Mass. ARA has the call AEC in memory of Kenneth Dyer. HPH has a new HQ-140. BMQ has a new Elmac transmitter. AZU is putting up a rhombic antenna. AKC is Radio Officer for Carlisle. WXC has a new rig on 10 meters with a three-element beam on a 63-ft. tower. A new radio club has been formed in Littleton with a net on Wed. at 8 P.M. on 28,800 kc. Members are ODO, BAE, BVJ, QEY, QPU, BDM, WNO, IBY, TRD, CAN, MFY, SPU, KXP, PMZ, VQC YXN, ZXE, ZML, UXK, VZL, SJC, NCO, WNP, ZNE, WME, UYK, DEY, WNR, WXC, ZVJ, BPA, BOI, CAM, 3PRS, K2CBD, 4GBE, 3TMV, BPR, and DEJ. ONK, QNC, and PMZ are working DX on 10 meters. TNO/1, on the summit of Mt. Washington, puts a nice signal into the Boston Area on 2 and 10 meters. WNP has a Viking Ranger. WNR is building an 813 rig for 10 and 75 meters. YYI has 800 watts on 75-meter s.s.b. Winthrop's drill had the following on: TTH, BOX, DQF, BDU, CMW, DEL, DJ, OIR, DLY, DPN, DRP, DUV, HFJ, MQB, ZVO, NMX, QA, TEO, BB, and EAJ. RUU reports that Easton has a TBS-50 and S40-B, 3 Gonsets, and a 500-watt generator. RUU has been on 75-meter s.s.b. and 2 meters. WN1CFF has 39 states on 40 and 80 meters with 30 watts. The South Shore Club had WGM give a talk on mobile rigs. Ed Tilton spoke at the Framingham and South Shore Clubs. MEG has a 75A-2 receiver. TUI is operator at KH6AJF. Area 1 Radio Comm. held a meeting with BL, KTG, DFS, ZYX, TQP, ALP, QQL, DWT, and LN present. DPO is on 2 meters with a twelve-element beam. VFB, in Brockton, is on 10 meters at the new QTH. ABJ is on 20-meter 'phone. Mr. Carroll, the c.d. director, gave a talk at a special meeting of the Braintree Club in the new quarters at the Old Library Bldg. IBE has a new antenna for 75 meters. MX is on 2 meters. UE has a 522 on 2 meters. Radio Amateur Open House held a meeting. BWH, Attleboro EC, sent his certificate in for endorsement. Traffic: (Mar.) W1EMG 404, UKO 288, LM 165, EPE 74, IBE 55, NUP 54, SS 49. UE 40, AVY 32, TY 27, BY 9, ABJ 6, DUO/TYN 4. QLT 4, QJB 2, ZNQ 2. (Feb.) W1QLT 1. (Jan.) W1MX 2. (Dec.) W1IBE 273, MX 18.

WESTERN MASSACHUSETTS — SCM, Osborne B. McKeraghan, W1HRV — SEC: RRX. RM: BVR. PAM: QWJ. The WM C.W. Net meets on 3560 kc. Mon. through Sat. at 1900 EST. WMN continues to roll along very well. RM BVR and Asst. DVW did a splendid job on the net bulletin. Fine comments were received from all who read it. AJX worked portable from the High School Science Fair and won first award. He also is sponsoring an ARRL exhibit. The new EC for Pittsfield is BKG. HRV and MNG enjoyed the fine dinner meeting of the Pittsfield Club April 4th. New England Division Director Rand gave a very interesting talk on his questionnaire. New Novices are DWA and EJA. QFB is back on the air after a long layoff using s.s.b. LHY also resumes activity with a Viking II. The South Hadley C.D. Net has 7 active members on 29,620 kc. Sun. mornings. RLQ and QQO sent in very fine F.M.T. reports. EDV is a new ham in Westfield. ARA has acquired a Johnson Adventurer for summer camp. There is a new 20-meter three-element beam at NPL. COI picked up some new countries in the DX Contest with his rhombics. Trustee BDV, of Northbridge High School Radio Club, reports it is a small club but growing with activity and interest high. The club station is ZPJ; YHU is president. The members appeared on a WWOR-TV program with modern home-built ham equipment and 1920 model rig and receiver owned by BDV, which created much interest. SPF reports c.d. nets are active in Worcester with good attendance. SEC RRX attended the New York meeting on the Area C.D. Test. TVJ is finding time from school work to get back on the traffic nets as well as doing a good job as OO. Traffic: W1HRV 127, BVR 116, MNG 83, ABD 76, DVW 72, AMI 23, AJX 18, YCG 11, TVJ 7.

(*Continued on page 106*)

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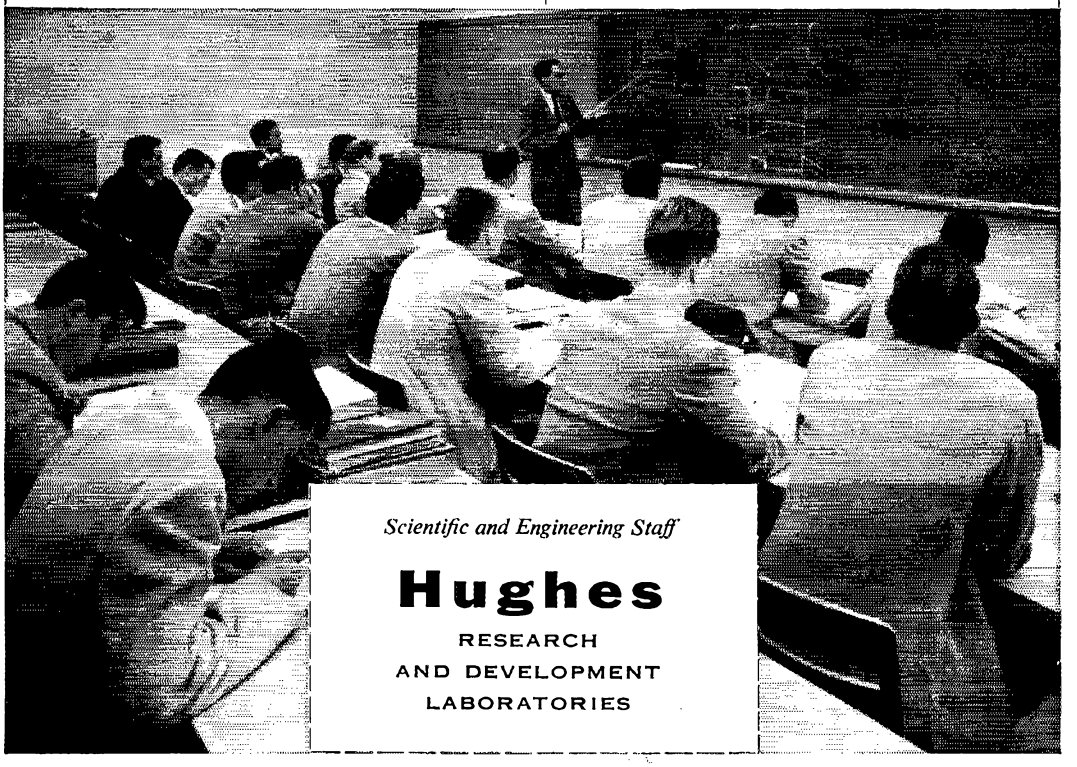

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NEW HAMPSHIRE — SCM, Harold J. Preble, W1HS — SEC: BXU. RM: CRW. PAM: AXL. Officers of the Port City Radio Club are JWJ, pres.; TWP, vice-pres.; YGV, treas.; YSU, secy. ZFP is the proud pop of a new jr. operator born Mar. 28th. QKK now is employed in the engineering dept. of Evans Radio. VE3IG was the first Canadian to earn WNH. WBM is now Strafford Co. EC. Congratulations to FZ's jr. operator Rick, now N1DYZ. YHI is on the air with 600-watt 'phone. TWP is working a terrific amount of rare DX. Applications for membership in the Concord Brasspounders are available from JNC or ZFP. It's good to hear GMH back on the air. YSU had a get-together at his QTH with LMD, CNR, TWP, TDV, TTT, and their XYLs. YGA has completed a new rig for 75 meters which sounds terrific. TDV is busy teaching radio. SSK has a new walkie-talkie on 10 meters. ZYK is on 2 meters. KPD's gallon really snows them on 75 meters. The NHN needs stations in Keene, Manchester, and Nashua. Welcome to Novices DAE, DEN, DFM, DFN, DHZ, DIN, DPP, DYE, and DYJ. BVM now is K4BHB, UCS now is W5IUF, ZNJ now is K2JZH, and ZNX now is K6HZP. PTB is active in c.d. communications. ZIW is a new voice on 10 meters. EAL has a potent signal on 75-meter 'phone. Traffic: W1ARR 160, COC 37, IP 30, GMH 26, YHI 26, CDX 13, HS 11, FZ 5, WBM 4.

RHODE ISLAND — SCM, Walter B. Hanson, jr., W1KKR — SEC: TQW. RM: BTV. PAM: VXC. More than 15 new EC appointments and definite tie-in between AREC and RACES stations were made by TQW for the April 30th RACES test. Over 500 test messages were prepared. All sections of the State were covered and results should be revealing. VXC announces a new net on 29,260 kc. at 7:30 P.M. Mon. through Fri. Here's a chance to qualify for that OPS appointment. Your SCM visited the club at Mount Saint Charles Academy with SEC and BTV and ZXA. UTA is teaching a fine group of hams-to-be there. Also KKR, TQW, BTV, and ZPG visited DDD in Woonsocket and found the boys there making plans to affiliate with ARRL and join in with c.d. work. Your SCM finds that there is some confusion throughout the section with regard to RACES, AREC, and c.d. communications. It is for the best interest of the individual to acquaint himself with the existing set-up in his community. Some cities and towns have not taken initial steps to assure themselves of emergency communications. You can help your local c.d. people. Either KKR, NZR, or TQW will be glad to offer advice. Traffic: W1BXN 107, UTA 78, BTV 46, ZXA 43, VXC 21, CMH 18.

VERMONT — SCM, Robert L. Scott, W1RNA — House bill 285, license plates, still is in the house committee at this writing. Twenty-five hams met with the Committee on Highway Traffic at a public hearing Mar. 30th. At latest report there seems to be a fifty-fifty chance of coming out with a favorable report. The BARC and MARC are co-sponsoring the 4th International Field Day and Vermont Hamfest, Sun. June 12th, at Bayside, Malletts Bay, 7 miles north of Burlington. One of the featured events is a softball game between VEs and Ws. Registration fee is 75c per person 16 years and up. Bring your own picnic lunch. If you are looking for something different in hamfests, try this. One and all are welcome. A *good* time is in store for all. Contact the Vermont boys for the latest dope. Traffic: W1OAK 124, AVP 72, ZEW 41, RNA 39, IT 33, VZE 30, BJP 26, TAN 9, FPS 7, KJG 5.

NORTHWESTERN DIVISION

ALASKA — SCM, Dave A. Fulton, KL7AGU — The Anchorage Amateur Radio Club voted to present an annual award to the amateur in Alaska who contributes the most to amateur radio during the year. This award will be in the form of a cup or plaque and will be awarded annually at the hamfest. Nominations for 1955 should be sent to Box 211, Anchorage, from January through March, 1956. The first award will be made at the 1956 hamfest. A mobile club has been formed in the Anchorage Area, called the Anchorage Mobile Radio Club. The purpose of this club is to provide an emergency mobile radio net for local, territorial, or national use in the event of an emergency. The mobile frequency is 3986 kc. and the club will monitor this frequency for emergency calls. Meetings are held the 2nd Thurs. of each month at the Public Library. Officers of the new club are AGU, pres.; AUV, vice-pres.; and AMS, secy.-treas. Members must have mobiles.

IDAHO — SCM, Alan K. Ross, W7IWU — Movie Springs: VJK checks with RN7 at times and is rebuilding for break-in operation. Lewiston: GMC is applying for EC appointment and checks in with WARTS and American Legion Nets. Emmett: TYG reports that TPC is back in Idaho again. WN7ZEA reports that he is a charter member of the Emmett Valley Radio Club and is working on Conditional Class. Kellogg: RQG reports WHZ, HXN, and RSQ are on 144 Mc. Heyburn: We are very sorry to have to report that FT passed away on April 9th. Boise: NVO reports MARS appointed him contact station for the Governor of Idaho. New stations on 144 Mc. are OHM and RHN. Net frequency is 145.44 Mc. and 8080 crystals for SCR-522 and 6060 for ARC4s are used. We urge all to incorporate this band for local emergency work. IWU is chairman of the

Continued on page 108)

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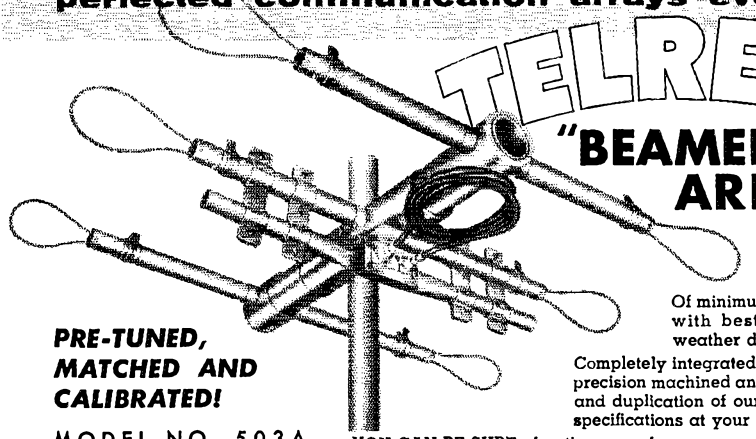

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FIFTEEN METER ARRAYS	#153A	3-Element Array	"T" Transformers and 1/2 wave Coaxial "Baluns" included	110.00	AMATEUR NET
	#155A	5-Element Array		210.00	
	#156A	6-Element Array		235.00	
TEN METER ARRAYS	10M-3	3-Element Array	"T" Transformers and 1/2 wave Coaxial "Baluns" included	67.50	AMATEUR NET
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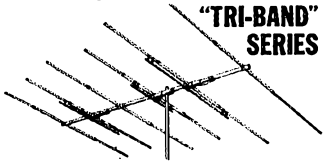

MODEL DB-10/11 Am. Net 118.50 Full Size 10-11 Meter on one boom. 3-el. on 10; 2-el on 11. Wt. 30 lbs. Turning Radius 11½ ft.

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MODEL TB-3 Amat. Net 248.00 Full Size 10-15-20 Meter on one boom. 2-el. on 10; 2-el. on 15; 2-el. on 20. Wt. 86 lbs. Turning Radius 19½ ft.

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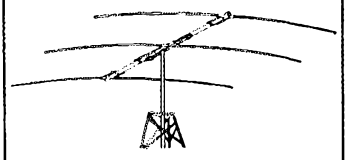

MODEL 403 Amateur Net 330.00 3-element Full Size (100% Aperture). Wt. approx. 92 lbs. Turning Radius 35½ ft.

MODEL 402 Amateur Net 275.00 2-element Full Size (100% Aperture). Wt. approx. 60 lbs. Turning Radius 33 ft.

MODEL 420 Amateur Net 180.00 2-Element "Mini-Beam" (64% Aperture). Wt. approx. 44 lbs. Turning Radius 17½ ft.

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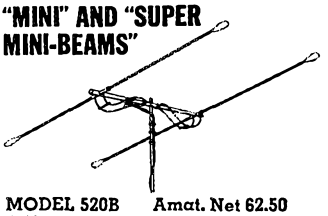

MODEL 520B Amat. Net 62.50 2-Element 20-Meter "Super Mini-Beam" (82% Aperture). Wt. approx. 14 lbs. Turn. Rad. 12½ ft.

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MODEL 1520 Amateur Net 55.50 2-Element 15-Meter "Super Mini-Beam" (86% Aperture). Wt. approx. 12 lbs. Turn. Rad. 9½ ft.

MODEL TBM-3 Amat. Net 190.00 Tri-Band "Super Mini-Beam" 10-15-20 Meter on one boom. 2-el. on 10; 2-el. on 15; 2-el. on 20. Wt. 47 lbs. Turn. Rad. 15½ ft.

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Boise Club TVI Committee. VWS, of Gifford, visited with me while attending the YMCA Youth Legislature. Traffic: W7VJK 16, GMC 11, TYG 10, NVO 5, VWS 3.

MONTANA — SCM, Leslie E. Crouter, W7CT — The new radio club in Livingston, named Old Faithful after the Geyser in neighbouring Yellowstone Park, is showing lively activity. It is coming through in good form under the watchful eyes of KJX and FGB. RZY is cooking up big activities with a contest to see who first contacts HB9BQ, overseas honorary member of the Club. FGB puts out regular code practice on 10 meters for all interested. A dinner is scheduled along with ladies' night when all ham talk will be banned under penalty of a dime a word. LPL is revamping the shack using a rebuilt Navy rig and getting 599 reports from the West Coast. YPN is pleased with his new ticket and his voice has earned him the name, the Montana Grizzley. Billings Emergency Corps officials are planning for more activity in the Emergency Corps and will have drills and activities that should spark up a lot of new interest. OPM is about finished with his new rig. CT is very busy with his new job. Les has to travel the entire State so he plans to visit a lot of hams in person. Don't forget to send in your activities reports early each month. Traffic: (Feb.) W7MQI 28.

OREGON — SCM, Edward F. Conyngham, W7ESJ — WAT, our SEC, is changing QTH in April. APF is hunting Tennessee Valley Indians. PRA has the rig down for a general overhaul. THX and TUW are bringing lots of new life to the Astoria AREC. ADX and TII are working on new BC-669s for emergency rigs. QCL is building a new Viking II. UZU is keeping MARS 2 meters hot. LNG is back on OSN using the club's transmitter. ZGT is not new, he is an old Oregon webfoot; the story in short is ex-3ZGT, 8PWB, F7BS, and W7MIC. BVH is back on after a California vacation. JLU will publish new OBS schedule. KAB is building new home and shack. JRU is helping new operators with building projects. QKX was elected new president of the Tualatin Valley Amateur Radio Club, with HTX as trustee of OTV. The Club is making big plans for Field Day. VBF is very active on MARS from 160 to 2 meters. New appointments issued: VJT, WLL, and UJ as OOs; THX and NFZ as OPs; APF, BDU, TIR, and BLN as ORs; WLL as OBS; NFZ as EC. Results of the February F.M.T.: PQJ top man, BUS second, WN7WKA third. Traffic: W7APF 578, BLN 127, WAT 92, QKU 76 AJN 57, ZGT, 37, WLL 32, BDU 31, ESJ 4.

WASHINGTON — SCM, Victor S. Gish, W7FIX — VAZ is back from W4-Land. PGY lost his beam in a March wind but still had the vertical ground plane for 20 meters. VNZ, chief operator at K7FAE, gave a radio demonstration, to the Boy Scouts Mar. 26th. USO is a new ORS and NCSed WSN. K6BDF/7 is going to night school two nights a week. The Clark County Club is holding twice-weekly code classes with RML and SAP teaching. AIB is pleased with the Viking Ranger, but needs a decent ground system. ULK, now AF MARS, made 90 contacts in the YL-OM Contest and made YLCC by working daughter WN7VWU. EVW is trying to make the WARTS Net when he can get on early. PVF has a 6-foot rack and the kw. is finished — working RTTY. ULL worked KL7 on the first RTTY contact. FZB has a new antenna up. AVM now has a twin-six Gonset 2-meter beam but no time to install it. JEY is building mobile gear. UKI is a new OES on 420 Mc. HVM has twin jr. operators born Mar. 18th. The Tacoma Amateur Radio Society elected GVV, pres.; SGJ, vice-pres.; LIL, secy.-treas. UJA is QRT because of BCI. FM is getting a new mobile rig. OE has a Viking Adventurer for trips and a Ranger for the home rig. SOX still is with the USAF and is planning a visit to Seattle during the next couple of months. RCM, our SEC, mailed in his first report from ten ECs. A joint Washington-Oregon AREC drill will be held the 1st Sun. of each month at 1030 PST on 3585-kc. c.w. and 3900-kc. 'phone. All ECs are invited to send in their reports by radio. LVB is putting out *SARC Relay* for the Skagit Club. The Marysville High School Radio Club elected UKI, pres.; TWQ, secy.; VAN, treas. 6UVP wants the present QTH of MWP, formerly of Renton. CMX is building a new 20-meter beam; he also is on 2 and 15 meters. ILC is back hamming with a new Ranger. HPJ is recovering from a heart attack. JJK is Field Day chairman for the Puyallup Club. TGO is building a Field Day rig to beat them all. WN7WVII, Alice Young, made 168 contacts in 41 sections in the Novice Roundup and also worked a ZL. OIH got his gear in the living room by helping the XYL get her Novice ticket. CZY is playing around with 20 watts s.s.b. WN7YAQ has worked 40 states with parallel 1625s. Washington still needs more ECs. Traffic: (Mar.) W7PGY 829, BA 766, FRU 706, K7FAE 556, W7VAZ 155, FWD 104, OE 87, EHH 63, USO 57, K6BDF/7 52, W7RCM 49, RXH 48, UYL 40, APS 39, HKA 34, FIX 29, AIB 25, PQT 16, GVV 14, ULK 8, AMC 7, LVB 7, AHV 6, EVW 6, TGO 5, FZB 2, PVF 2, WN7YAQ 2, W7AVM 1. (Feb.) W7OE 59, WN7YAQ 2.

PACIFIC DIVISION

HAWAII — SCM, Samuel H. Lewbel, KH6AED — March was one of the busiest months for Hawaii hams. The volcano never did let up and the Hilo gang gave their all

(*Continued on page 110*)

for the c.d. 24-hour operation was the word at the eruption scene with daily traffic from there to the territorial Hq. in Honolulu. The Honolulu Amateur Radio Club adopted a new constitution and has taken a pledge to publicize ham activity in the Islands. AN is chairman of the committee. WØMXC, Minnesota SCM, visited in the Islands and attended a meeting of the Honolulu Mobile Club. This Field Day will have more KH6 clubs competing than ever before so sharpen up your gear and let's see if anyone takes over the HARC this time. Traffic: (Mar.) KH6AJF 1567, KA2GE 1394, KA2AK 857, KH6AVO 15, KH6AUT 8. (Feb.) KH6AJF 2141, KR6KS 778, KA7LJ 462. (Jan.) KH6AJF 2057. (Dec.) KG6FAA 12,156, KH6AJF 4953.

NEVADA — SCM, Ray T. Warner, W7JU — SEC: WVQ. ECs: PEW, PRM, TVF, TJY, and ZT. OPSs: JUO and UPS. ORSs: MVP, PEW, and VIU. OBS: BVZ. Nevada State Frequencies: 'Phone, 3880 and 7268 kc.; c.w., 3660 and 7110 kc. WVQ, Las Vegas, is your new SEC. ECs: Please send your monthly reports direct to WVQ. Senate Bill No. 158 was killed in committee. Had this bill passed there would have been a definite decrease in ham activities. This bill may be rewritten and again presented at the next session of our legislature at which time we will be watching for it. WN7YNF is the YL of YCY. VIQ has moved to Henderson. YKQ is on 80 meters with an Elmac in Las Vegas. K6DAC received "Worked 25 Nevada" certificate No. 25. YAI, of Henderson, is all-band mobile. PC, of Reno, is active in the c.d. on 2 and 6 meters. JLN, of Paradise Valley, has a new 50-foot mast and will be active with an ART-13. ZT, RACES State Radio Officer, and his alternate, HJ, have an approved state plan and are now engaged in actual organizing.

SANTA CLARA VALLEY — SCM, R. Paul Tibbs, W6WGO — The newly-formed West Valley Radio Association held its fourth meeting at Campbell, Mar. 24th. ohn Reinartz gave demonstrations on inductance, capacitance and percentage modulation measurements. HC, Pacific Division Vice-Director, gave information on League activities. WGO outlined coming events for the Santa Clara Valley section. Officers of the Club are K6BYG, pres.; PIY, vice-pres..; GQM, secy.-treas.; EXX has a 150A working on 432 Mc. and informs us that the PAARA plans to give prizes for beating the SCCARA in Field Day this June. YHM, on a business trip to Washington, D. C., will visit West Hartford Headquarters and will listen for the gang from the West Coast at 2CWK. K6BBD is busy working traffic and looking for a 14-Mc. beam to help with signals. 4YIP/6's F.M.T. results were very, very good, within 23 cycles. CBX also was good, within 44 cycles. HC reports nets on the NTS are working quite well. PAN is running smooth considering band conditions. There is need for more stations on NCN. It would help if those of you on A3-band nets would check into RN-6 to pick up traffic for delivery in your area. Stations from your nets could check in on PAN to clear your outgoing traffic east. How about it, gang? Traffic: (Mar.) W6YHM 466, W4Y1P/6 443, W6ZRJ 188, HC 77, K6BBD 60, W6UTV 28, K6BAM 9. (Feb.) W6FON 90.

EAST BAY — SCM, Guy Black, W6RLB — Asst. SCM for V.H.F.: Ollie Nelson, 6MXQ. Asst. SCM for TVI Problems: Harry Cameron, 6RVC. SEC: WGM. Send all AREC applications to him at 199 Harrier Street, Vallejo. ECs: K6ERR, W6CAN, FLT, K6GK, ZZF, QDE. A select group of appointees are the Official Experimental Stations, all of whom are active on 50 Mc. or above. The OES gang consists of WGM, CAN, JZ, NDR, DOU, VSV, OHQ, SXK, MXQ, OJJ, NNS, UHM, RLB, and the newest member, K6DDT. Any other v.h.f. men interested in this fine appointment should contact your SCM at once. SXK reports hearing the 2-meter signals of K6GWE, five hundred miles out to sea on the SS *Hawaiian Rancher*. FZC has been appointed Class 1 Official Observer following his fine performance in the February Frequency Measuring Test. Both HBF and K6CCQ turn in outstanding regular monthly OO reports as prescribed by the conditions of the appointment. AKB has had two bad heart attacks recently. K6BBU is keeping the medics busy too. KEK is active on DX with a three-element beam. CTL is back in business after a long lay-off. ORR is building a high-powered 432-Mc. rig. JHV is now located in Castro Valley. K6GK's XYL has been indisposed of late, but is back home from the hospital now. The fellows at K6FDG have been doing a pretty extensive overhaul job which has cut into their traffic totals. The Richmond Radio Club is running a contest among members to see who can build the best gear during a three-month period. The CCRC's April meeting was at the Richmond Radio Club. 1BUD addressed a hastily-rounded-up bunch from the East Bay section on his way to Guam and the Far East Pacific Division Convention. VSV helped out on the program for the Pacific Division Convention. Traffic: K6WAY 954, W6IPW 187, K6FDG 155, GK 83, W6HBF 42, K6EPC 13, W6EJA 6.

SAN FRANCISCO — SCM, Walter A. Buckley, W6GGC — Asst. SCM: William T. Nakahara, 6GHI. The San Francisco Radio Club held its annual club auction at its March meeting. Club members were guests of the local telephone company, who treated 51 amateurs to dinner and toured them through the new Mission Exchange. The Sonoma County Radio Club elected the following new offi-

(*Continued on page 112*)

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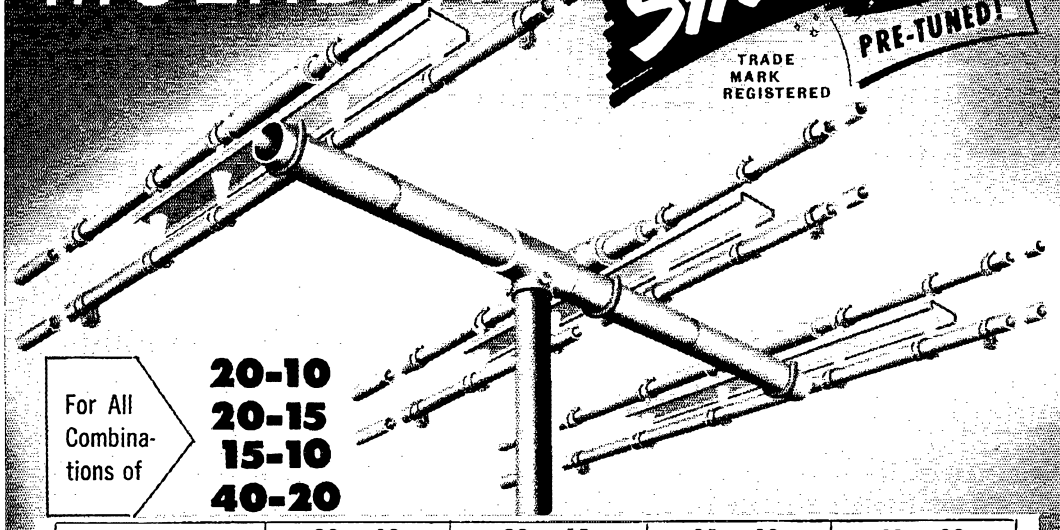

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20-15
15-10
40-20

	20 — 10	20 — 15	15 — 10	40 — 20
No. of Elements	3 El. "Shortbeam" on 20 3 El. Full Size on 10	3 El. "Shortbeam" on 20 3 El. "Shortbeam" on 15	3 El. "Shortbeam" on 15 3 El. Full Size on 10	2 El. "Shortbeam" on 40 2 El. Full Size on 20
Boom Length	16 Feet	16 Feet	12 Feet	12 Feet
Longest Element Length	16 Feet on 20 16 Feet on 10	16 Feet on 20 13 Feet on 15	13 Feet on 15 16 Feet on 10	33 Feet on 40 33 Feet on 20
Forward gain reference to full size dipole	4.8 db on 20 8.8 db on 10	4.8 db on 20 4.8 db on 15	4.8 db on 15 8.8 db on 10	4.4 db on 40 5.6 db on 20
Front to Back Ratio	20 db on 20 25 db on 10	20 db on 20 20 db on 15	20 db on 15 25 db on 10	15 db on 40 20 db on 20
Approx. Weight	30 lbs.	35 lbs.	28 lbs.	48 lbs.
Impedance match	52 ohms on both bands	52 ohms on both bands	52 ohms on both bands.	52 ohms on both bands.
Element Construction	61ST6 7/8"-3/4" dia. Alum. both bands	61ST6 7/8"-3/4" dia. Alum. both bands	61ST6 7/8"-3/4" dia. Alum. both bands	61ST6 1 1/4"-1 1/8" dia. Alum. both bands.
Amateur Net	**$97.50**	**$107.50**	**$94.50**	**$127.50**

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cers: OTW, pres.; K6CLV, vice-pres.; KN6HTC, secy.; KN6HWH, treas. The secretary and treasurer are the only licensed XYLs in Santa Rosa. Congratulations to both. The Mt. Tamalpais Radio Club was host to K6BJ, who gave a talk on his bag of tricks. As usual John drew a big crowd. Both JWF and GGC enjoyed meeting the fellows again. The Cathay Radio Club was extended an invitation to send a representative to the Asst. Directors, SCM, and club representatives meeting in Berkeley. The HAMS is busy working on Field Day schedule and also getting the fellows on the air with 6 meters. The San Francisco Naval Shipyard Club is joining ranks with the HAMS on Field Day. The 29ers held its annual breakfast in April with approximately 40 attending. The Young Ladies Radio Club/SF sent out invitations to YLs and XYLs who have tickets to join the Club as associate members. The invitation was sent to ladies in surrounding counties. The Humboldt Radio Club has a new amateur in the club, KN6KGI. YQZ moved to Eureka from Los Angeles and also joined the club. Congratulations to SLX and his XYL on their new granddaughter. W7UQA won the booby prize at the last 29ers 10-meter transmitter hunt. The fellows were all happy to see K6ALF show up for the 29ers annual breakfast. He was in his new "suit of blue" and will be stationed at Treasure Island Navy Station until future notice. K6EGV is 6-meter mobile. AMH also is a new check-in on the net. URA is net control. SDN offers to help design and build gear at no charge. CTH is the proud owner of a new kw. Viking. FVK keeps daily skeds with his dad, JLV, on 40-meter c.w.; his mom, KN6EEE, is trying for her General Class ticket so she can get in the run. Gordon landed at the radio station at Litchfield Park, Ariz., so has nice gear to work home with. GHI finally has his Gonset beam on 20 meters. Of course K6GPX did all the installation on the beam for Bill. AWT pulled his "super vertical" down and added parasitic elements which are silver plated. GCV is asking for volunteers to help get the beam off the old QTH and on to the new one. SWP came through with a BPL total as usual. YC entered the DX Contest and worked 4 new countries. QMO holds 2 skeds daily with FEA to pick up McCan 4 traffic. Congratulations to GTY on winning the February National Contest Award. The prize was a National NC-88 and Curt now is one of four finalists in line for the grand prize of a $1000 amateur station. Good luck, OM. LJK, who was a friend of many of the old-timers, has joined the Silent Keys. GQY reports that he's been on MARS conducting a math course, etc. PHT says "Cyn's TV" is going along fine. BIP had 250 contacts multi .107 in the DX Contest. Traffic: W6SWP 1205, GQY 206, QMO 173, GGC 53, PHT 40, BIP 4.

SACRAMENTO VALLEY — SCM, Harold L. Lucero, W6JDN — MIW, on 144 Mc., bought a Viking and will be on all bands. PIV is on 40-meter c.w. K6GDS is building a 100-watt rig. DEO is active on MARS. QDT is moving to Modesto. Luck, Tony, we will miss you. CMA, the Field Day chairman, is active on 75 and 160 meters. ASI and FW have new 20A s.s.b. unit. ATN is on s.s.b. 75 and 20 meters. JEQ is active on c.d. nets. KME has a new QTH in North Sacramento. QKJ has a new AR-88. ESZ has a new vertical and is active on MARS. CIS, after exhaustive tests with 30-foot vertical on all bands, declares it is the answer to city dwellers. ZF, active on MARS, says only a few more wires and the kw. amplifier will be ready. HTS-HSB are active in MARS, 75-meter 'phone and 80/40-meter c.w. ILZ is active daily in the Coffee Cup Net at 7 A.M. on 3880 kc. K6FR is buying a Johnson KW. QAC is now active in MARS. EII is active in the Sacramento C.D. Net. VBI is making Field Day preparations. GEC is on mobile, as is LSK. LLR is planning 2-meter operation. VYE is QRL because of business. UAF has a new receiver. K4AQQ/6 is a new ham in Susanville. K6KHZ is the new call of the Tehama County Amateur Club. TMP is on vacation. LJ is taking up golf. K6BHH joined the local guard unit to teach code. PYE is now on 500 watts. OEY is now on the air. KN6EYL and KN6JIG are trying to get on 40 meters. SBH is on 75 and 40 meters. Reports for this month were so large that the balance will follow next month, so bear with me, fellows. Last but not least, the Siskiyou County AREC Net is doing fine.

SAN JOAQUIN VALLEY — SCM, Edward L. Bewley, W6GIW — SEC: EBL. RM: K6EVM. PAM: WJF. You will notice that we have a new RM in the section. K6BGM and W6ZRJ moved to San Jose and had to give up their appointments. Doc and Ann will be missed in this section, as they both did a lot for traffic and club activities here. I hope the gang will give EVM the same support they gave Ann on CVN. Don't forget, gang, your c.w. traffic net is CVN on 3525 kc. at 1900. JZ and FYM drove from the Bay Area to attend the CVARC meeting in Turlock. Ray gave the new council a lot of help and suggestions in getting started. The Turlock gang, with the assistance of some from Modesto, furnished communications for the Junior Economy Run in Stanislaus County. Twenty-two hams participated in the operation, which gave a running account of the progress of the cars, which was broadcast over two b.c. stations. All participants agreed that it was the smoothest operation we have ever had in the County. The Fresno gang is busy with convention preparations. W6ONK reports that the 2-meter repeater for the Fresno Area should be in operation soon. Lots of new Communicators in the area are being

(*Continued on page 114*)

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heard on 2 meters, among them ERE, NSP, GYN, and NTV. FCC engineers from the San Francisco office, along with ATO, gave the Stockton Club a talk on TVI problems. Traffic: W6FEA 229, K6EVM 30, W6EBL 18, WJF 4.

ROANOKE DIVISION

NORTH CAROLINA — SCM, Charles H. Brydges, W4WXZ — SEC: ZG. RM: VHH. PAM: ONM. The Elizabeth City group is working on emergency equipment. Club meetings are held on the 3rd Wed. of each month. JZQ has a new c.d. generator. Everybody will be making plans for the convention to be held in Old Point Comfort, Va., Aug. 12, 13, 14. AH has new p.p. of 4-250s on 20 meters and is working lots of DX. AH has a 15-over-20 about 120 feet up. RHB has licked TVI. WDJ is working s.s.b. in Charlotte. OQQ and BVD also are working s.s.b. in the State. EJP and his XYL EJQ have antennas up and are working 20-, 40-, and 80-meter c.w. KN4AQY, in the eighth grade, is helping six of his schoolmates to get in shape for the Novice exam. PIC has a new mobile rig. Other new mobiles in Greensboro are DCI, MDD, and RPC. The Greensboro Club has an emergency program under way. Please send in reports by the first of the month. DRC is working traffic on all bands. CZR worked HR3HII on 75 meters with his 813. The Confederate Teenage Net meets on 3900 kc. Mon. through Fri. at 4:00 EST. You old-timers can check in also. AGI will be active in Winston-Salem this summer with YZC and YE from Virginia operating on c.w. and 'phone. AGI also qualified for the Old Timers Club. PIC will be on before long. You boys on 2 meters throughout the State can qualify for OES appointment. If interested, drop me a line and I will send the proper forms. RRH is working on 2-meter gear. DSO and RRH are going great guns on MARS. Traffic: W4DRC 185, ZWF 20, BUA 2, WXZ 2.

SOUTH CAROLINA — SCM, T. Hunter Wood, W4ANK — HMG reports that along with his mobile rig he has a complete BC-654 that works out nicely as a combination for emergency use. ZRH devoted 14 hours during March sending code practice and Official Bulletins on 3700 kc. ZRH begins code practice at 6:30 P.M. Mon through Fri. K4ADD works aeronautical mobile up and down the East Coast and reports many contacts. When at home he uses a 350-watter and when in his car it's a Viking transmitter. LXX reports from Florence that LXX and FGX paid a visit to 1AW. AUL, TSU, and LLH are planning high-power mobile rigs. ULH reports some damage to his 20-meter beam from high winds. VAM has a new mobile installation and is completing a kilowatt home rig. SMI is on 20-meter 'phone with 60 watts and is anxiously waiting for 10 meters to open. VOH is installing a mobile rig with the aid of AUL. NJG has moved to North Carolina. A new amateur club has been formed in Sumter with GFP, pres.; K4ANI, vice-pres.; GIT, secy. RPV reports fifty-six charter members. The South Carolina C.W. Net changed frequency to 3795 kc. on Apr. 1st and meets at 7 P.M. Mon. through Fri. Traffic: W4ZIZ 134, ANK 52, FML 52, RPV 40, KYN 14, FM 6, W9JBN/4 5.

VIRGINIA — SCM, John Carl Morgan, W4KX — This month's report must needs be done on a dead run. Ye SCM is still in the throes of breaking in at the new job and getting settled in a new QTH with all that both entail. Please note the new address on page 6, *QST*. Hope to have the rig back together and on the air by the time this appears in print. PFC complains that things are "slack," he handled only 1033 messages. BLR is back with a big total. Kay's been nominated for 4th district chairman at the YLRL. YZC has more than enough QSOs for DXCC, just short a few QSLs. OM YE is working on the kw. rig to keep up with Jr. KN4CAX, the third member of the family, keeps the shack humming. 3DWP says orders were cancelled so he'll continue pushing K4MC, and now is building a rig of his own. IA reports gal-chasing on both A-1 and A-3 in the YL/OM Contest. WYC reports Novice exams were given 16 of a class of 28 run by CVARC. VQZ is concentrating on the 2-meter rig. Cruises are cutting into the operating time of the Navy men, YKB, CGE, and K4BCT, among others. JUJ says he's nearing YLCC, WNH, and WANE certificates. SCM received the fine bulletin of the Alexandria RC. YHD still is boning at M.I.T. and operating 1MX. Newcomers to Virginia include K4BNI and his XYL K4BNG, now in Warrenton. K4BHT (ex-ES3D, ex-K2GWY) now is on the air in Hopewell, but is having trouble with QRM from a nearby factory, and TVI. KFC still is recuperating from 87 hours in the DX Test. Vic worked HK4DP on 7 bands without prearranged skeds. The Emergency Corps Sunday Morning Net meets on 3835 kc. at 0800 EST. Traffic: W4PFC 1033, BLR 307, K4ASU 188, W4YZC 82, K4MC 54, W4AAD 37, IA 32, TVO 24, YKB 20, LW 15, DWP 14, IF 14, WYC 8, CGE 3, VQZ 2, K4BCT 1.

WEST VIRGINIA — SCM, Albert H. Hix, W8PQQ — SEC: YPR. PAMs: FGL and GCZ. RMs: DFC, GBF, JWX, and HZA. Congratulations to GBF on making BPL last month and also on his excellent results in the last Frequency Measuring Test. TMI also participated in the Frequency Measuring Test. BWK has a new B&W 5100 transmitter and is very active now. TGL, in Fairmont, is very

(Continued on page 116)

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active and is well on the way toward his WAS. He is building a 300-watt final and should be on with it soon. HTU is a new OPS. MLX and OIV are new General Class licensees. AFB, AHF, ORT, SFT, IWB, QHG, CLX, BKI, NYH, GGC, LLJ, EOJ, and PQQ attended the Dayton Hamvention. I would like to request the various appointees to send in their appointments for renewal when required. Maybe we can do better next time in getting the special call letter plates for our autos. Thanks to all for trying so hard to get the bill passed. Traffic: W8FMU 223, JWX 153, GEP 90, GBF 75, HZA 65, NYH 34, BWK 24, PZT 23, DFC 14.

ROCKY MOUNTAIN DIVISION

UTAH — SCM, Floyd L. Hinshaw, W7UTM — Good news! The State of Utah now authorizes amateur call auto license plates and thus joins the parade of other states recognizing the amateur fraternity! Hats off to NVY and all the others who helped spark the bill through the legislature. SAZ says the Ogden c.d. boys staged a simulated tornado drill. Participating in the test were GPN, SAZ, RQT, WQC, QNV, OCX, NXC, OSJ, YJK, YDZ, and W8FGO/7. OQD has nearly forsaken a.m. for s.s.b. SP is back on h.f. with his rebuilt gear but still is heard more often on v.h.f. UTM's work schedule is becoming more fouled up, which leaves even less time for hamming. JVU and OKA are planning extensive activities with radio-controlled model boats now that the ice is "out." Traffic: W7UTM 2.

SOUTHEASTERN DIVISION

ALABAMA — SCM, Joe A. Shannon, W4MI — A Novice net is in the making with EJZ as net manager. He would welcome comments from interested Novices as to crystals available and station information. Two Novices, KN4s APF and AOZ, now have General Class tickets and Viking Is. KN4CNA is new in Muscle Shoals. The Anniston Club now has a total membership of 42. The Huntsville Club is trying to raise money for a c.d. trailer. The Tuscaloosa Club was host to a group of mobiles from the Montgomery Club and the Montgomery Club staged a hamburger lunch; followed by a transmitter hunt. Several clubs in the section are making Field Day plans. TKL has a BC-654 and a Communicator on 2 meters for mobile in the new Chevvy. WOG is wracking his brain for an idea for a good DX skywire for 20 meters and ZSQ has a new 20-meter beam all set to go for choice DX. EJZ is busy on the new rig for RYY, while CAH is trying to get on 2 meters. So far he has a converter and a beam but no transmitter. ZWE now has a half-gallon going full blast. HFK has a new Q multiplier and OR finally got the Q5-er and is working on a converter for 2 meters. Traffic: K4FDY 1109, W4UHA 656, COU 372, WOG 66, KIX 56, YRO 56, HKK 46, EJZ 45, YAI 39, TKL 36, ZSQ 28, ZSH 23, CAH 18, RLG 18, PWS 16, ZWE 16, TXO 11, OR 10, BMM 8, HYI 8, OAO 7, CEF 3, KN4BJY 2.

EASTERN FLORIDA — SCM, John W. Hollister, jr., W4FWZ — SEC: IM. Let's head for St. Petersburg and the ARRL Southeastern Division Convention in June. June is also for Field Day — let me have your reports. With over 500 members in the AREC we should have a big Field Day this year. And the hurricane season officially opens in June. Overhaul the emergency gear *now*, be ready and register with your EC. New ECs: BZI, HDU, and BWR. March publicity: The *Miami Herald*'s "Magic Carpet Travelers" featured VYU and VZC stations, with IYT, PBS, and others in the act! The honorary DEN certificate has been received. Daytona: ROD is a new ham. Ft. Lauderdale: IEH's talk on s.s.b. is raising interest and hopes. EUV and BMR are trying to keep beams up regardless of woody woodpecker's proclivity for vertical raw wood. BEN reports excellent mobile attendance at drills. Gainesville: OGI reports the Engineering Fair at Florida U. was a big success and much traffic originated over Gator Club station DFU, which is Collins-equipped. Ye SCM visited TJU and the mobile gang of the AREC under WEM, the EC. Hialeah: UIW reports the GDO built from a TV converter works up to 400 Mc. UIW and KQG are using Techcraft type converters on 2 meters. FLH has 600 watts on 2 meters. The 144-Mc. gang includes KNV, KQG, and UIW. Key West: K4NCN, is using a 75A-3. DRT expects official orders soon. Lake City: Congrats to YNM and his XYL on the jr. operator. YNM has CP endorsement for 20 w.p.m. Miami: PBS reports constructing a transistor F.S. meter that is a sensitive doll. The Dade Club had an interesting talk on beams by Mike Ercolino of Telrex. The new South Miami Club meets at the U. of Miami, according to CUR. Nels also says the prize idea for the Flamingo Net went over big. (His XYL was the lapidary who made the first prize offering won by WYR.) St. Augustine: KN4AHA is using an Adventurer and an S-77. Traffic: (Mar.) W4PJU 517, DFU 353, ELS 257, DRD 191, BWR 147, YJE 123, WEO 121, WS 88, IYT 59, LAP 46, FSS 30, BZI 27, TRN 27, ZIR 26, YOX 25, IM 23, K4ANJ 17, W4AYD 16, WHK 11, SVB 10, FWZ 9, PBS 3. (Feb.) W4DRD 98, SVB 2. (Jan.) W4SVB 11.

WESTERN FLORIDA — SCM, Edward J. Collins, W4MS/RE — SEC: PLE. ECs: MFY and HIZ. AXP lost

(*Continued on page 118*)

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his plate transformer and is rebuilding. RKH is ready to handle emergency work with mobile units. The Hair Net is getting ready for the hurricane season. SMM, MFY, CPE, RKH, and CAJ visited the Pensacola Amateur Club. UXW is acting as hideout for hidden transmitter hunts by the EARS group. The 29,560-kc. monitor signs in the Ft. Walton Area are noted with pleasure. YNA is using cubical quad on 21 Mc. ACB is rebuilding the entire station for 21 Mc. KN4ADY operates from the Sigma-Nu House at Florida State. GMS has an antenna supported by a palm tree and 11-story dormitory. KN4AEP has been getting up the code speed on 75 meters. KN4AGM is studying for the Tech. Class license. BGO is giving 14 Mc. a workout with s.s.b. MS keeps the big rig on 14 Mc. with s.s.b. The Pensacola Hamfest to be held June 5th is getting underway. QK has the VFO working FB. UCY is happy with 10 meters opening up again. CCY is active on all frequencies. UUF holds forth on 144 Mc. ZFL was seen operating mobile from his bicycle (no fooling). ZPN keeps skeds with Tampa. VR keeps 7 Mc. hot. MUX was heard on 21 Mc. SOQ is having antenna trouble, space that is. Traffic: K4AKP 111, KN4AGM 6, W4AXP 4.

GEORGIA — SCM, George W. Parker, W4NS — SEC: OPE. PAMs: ACH and LXE. RMs: MTS and OCG. Nets. The Georgia Cracker Emergency Net meets on 3995 kc: Sun. 0830, Tue. and Thurs. 1830 EST. Georgia State Net (GSN) 3590 kc. Mon., Wed., and Fri. at 1900 EST. FGH, in Quitman has a new little YL. More than 35 charter members were signed up in Columbus when the Columbus Amateur Radio Assn. was reactivated. New officers are CVY, pres.; MNJ, vice-pres.; DDQ, secy.; WXW, treas.; VSW, act. mgr. New appointments: WXW, EC Muscogee County; CFJ, EC Fulton and DeKalb Counties; YTO as ORS and OPS. CFJ is shunt-feeding his tower on 75 meters. OVS is in Beatty Hospital in Rome, Ga. PIM is back on the air after a short absence. ZDP is Fri. night NCS for TCPN, 4th call area. ZDD and VKK are on with BC-699s. BWD is active on 40 meters. PMC now has a VFO on 80 meters. The Augusta-Camp Gordon hamfest will be held in Augusta July 23-24. OKL has his 32V-2 on the air portable from W2-Land. UFE, who writes that he always reads the Georgia report first thing when he gets his *QST* in Germany, has been made 1st lieutenant. PMJ has a new kw. on the air from Reidsville. The Atlanta Club is making preparations for Field Day. NS, ZD, MV, and FBH cleaned out the spring and trimmed the weeds away from the same old site. Reports must reach your SCM by the 5th of the month to be included in the report. Traffic: (Mar.) K4WAR 920, W4DDY 163, CFJ 151, ZDP 125, PIM 120, IMQ 78, OCG 77, YWP 67, MV 28, MTS 24, NS 24, BWD 22, ZD 18, ZUF 18, YTO 6, BXV 4. (Feb.) W4OCG 87, IMQ 51, DDY 44.

WEST INDIES — SCM, William Werner, KP4DJ — WT, new OPS, has an 813 transmitter. DV changed Official Bulletin transmissions from 1810 to 3559 kc. Mon., Wed., Fri. at 7:15 P.M. AST. RC signed up 47 amateurs in the AREC at the hamfest held at Ramey AFB. ZW erected an 80-meter antenna and meets the Early Bird Net at 5:45 A.M. AST. ABE has vertical antenna working on 80/40/20 meters. AAD built 15-meter single-element beam. W4VQN/KP4 put up a V-P 20-meter beam. WW, ZV, and ZW gave "jackpot" contacts on 15-meter 'phone in the DX Contest. WC is rebuilding to high power. New officers of the PRARC are HZ, pres.; MV, vice-pres.; DV, secy.; QA, treas.; DJ, KD, PW, RD, and WR, directors. DJ won a Tel-Rex beam at the hamfest. UT won an Elmac PMR6 receiver. TO now is W2LSB. WD, ill with a nerve condition and unable to move his hands, works 20-meter 'phone. ZN built a 30-foot steel tower for his 20-meter beam. RK is working out fine with three-watt 6L6 mobile on 3925 kc. EE wants 2-meter schedules around the Island. WR is holding code classes for Novices to attain General Class licenses. BV is back on 75 meters. W6CIW/KP4 is heard on 75 meters. W8DBD/KP4 is on 20-meter 'phone. UW, of FCC, is transferring to Idaho. Traffic: KP4WT 48, ZW 38, DJ 1, RC 1.

CANAL ZONE — SCM, Roger M. Howe, KZ5RM — LB has a rotary folded dipole on 15 meters. W6JGY, who grew up here in the Zone, was back for a visit. He and his charming XYL were the guests of honor at a very fine party given by RV and his XYL. The Crossroads Net has been reactivitated on 14,153 kc. at 2100 EST on Mon. NM skeds W5TAF Sun. afternoons on 15 meters. DG has the 100 cards and becomes the first YL in the Zone to make the grade for DXCC. Congratulations, Grace. The Yacht, *Toluca*, was in port with W6FSF on board. He was met by DG, GD, WZ, and WZ's XYL. EP is in the process of erecting a 10-over-15-over-20 array with the help of the washer crew. It is rumored that the witches are going to put out a certificate to holders of the maritime mobile certificate who work the ten charter witches. Traffic: KZ5WA 126, DG 101, CF 54, NM 36, KA 28.

SOUTHWESTERN DIVISION

LOS ANGELES — SCM, Howard C. Bellman, W6YVJ — One of the big items of interest this month was the arrival of Col. Fred J. Elser, of the Signal Corps, on his way from Japan to Fort Monmouth. Nov. 1954 *QST*, page 63, has a

(*Continued on page 120*)

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picture of the Colonel, who worked portable from KA2DX and many other fascinating spots of DX such as TA3GVU. A large number entered the Frequency Measuring Test of Feb. 8-9. Those who made Class II include K6COP, W6NJU, K6HBY, and K6BEQ. Qualifying for Class I Observers are CBO, LIY, MUR, FAI, K6FA, W6YUY, RW (3.3 parts in a million average), and CK (2.0 parts in a million average). Congratulations are in order to the Alhambra District Radio Club on its affiliation with ARRL. About 50 hams attended the traffic breakfast at the Van Nuys affair, with USY officiating. From the *Richon List'ning Post* we learn that MUM while mobile on top of the Montebello Hills was able to work CE3II, VK2AQF, KZ5DG, VP9L, and KL7BBK, all on 15-meter 'phone. HUJ, chief night dispatcher at the U.P. yards, is sporting "The Simplest Modulator" as featured in the ARRL *Handbook*. The air is full of nets. However, we now have a new twist; the 75-meter Freeway crowd meets daily from 7 to 8 A.M. and from 4:30 to 5:30 P.M. at about 3935 to 3950 kc. Included are QVS, HAM, LVQ, MIT, and SOF, with K6CNV, CDX, and CRG. Speaking of clubs, I can now announce with pride that the gang at Pacific Division, Bendix Aviation Corp., finally has gotten a club going at the Development Laboratory in Burbank. Temporary officers are K6CUN, pres.; W6YVJ, vice-pres.; WGY, secy.-treas! and SCR, trustee. Code practice is given each noon lunch hour and the club is pledged to take part in Field Day. K6ELX uses a Viking II rig and a 75A-3 receiver with a vertical on 40 and another on 15 meters. NJU reports that the Pacifico Radio Club officers now are KPM, HII, NJU, and BFD as pres., vice-pres., secy., and treas., respectively. BHG says that 2-meter MARS crystals are available from CK. LVQ has completed a new Ranger transmitter. AM states that his station, with KPC and QMC, made 124,526 points on 'phone and with GFE, KSF, and QMC made 173,000 points on c.w. in the DX Contest. ORS says that on 2 meters, UID/7, at Wilson's Pass, Nev., the week end of Mar. 26th worked W6NLZ, K6CAL, and others. Another new club, the San Bernardino Microwave Society, has been organized and meets the 1st Thurs. of the month at the home of VIX, Ontario. Traffic: (Mar.) W6MBW 699, USY 372, GYH 193, K6DQA 190, W6BHG 127, MLZ 101, HIF 70, KN6HOV 61, W6GJP 56, K6BWD 52, W6ORS 30, CK 27, K6COP 19, W6NTN 13, CBO 9, AM 4, K6BEQ 4, W6BES 4. (Feb.) W6GJP 246, CMN 40, NTN 27, K6ELX 1.

ARIZONA — SCM, Albert H. Steinbrecher, W7LVR — Asst. SCMs: Kenneth P. Cole, 7QZH; Dr. John A. Stewart, 7SX. SEC: VRB. PAM: KOY. Arizona 'Phone Net: Tue. and Thurs., 7 P.M. MST, 3865 kc. Arizona C.W. Net: Tue. and Thurs., 8 P.M. MST, 3690 kc. One outstanding activity in March was the formation of the Yuma County Radio Club with TJT, pres.; ACN vice-pres.; JNY, secy.-treas.; OFA, act. mgr. Meetings are held the 1st and 3rd Sun. Another outstanding activity of the month was the official visit of Walter Joos, 6EKM, Southwestern Division Director and Robert E. Hopper, 6YXU, Vice-Director, who addressed the meetings of the Phoenix and Tucson Clubs. Congratulations go to QWI, who is being sent to Ceylon and India by the Lowell Observatory to view the total eclipse of the sun. RUX advises that there is a newly-organized 10-meter net in the Phoenix Area, at 8 P.M. nightly on 28,700 Mc. and invites all who still have a 10-meter coil to join the ragchew. WUG has been appointed OO, ORS, and OBS. 2ZEP/7 has moved to Utah. UYE now is on 75 meters. LOC is the first Arizonian to receive the Maritime Mobile certificate for working 30 or more M/Ms. Traffic: W7LVR 31, WUG 31, HUV 4.

SAN DIEGO — SCM, Don Stansifer, W6LRU — Asst. SCMs: Tom Wells, 6EWU, Shelley Trotter, 6BAM; Dick Huddleston, 6DLN. SEC: VFT. ECs: BAO, BZC, DLN, HFQ, HIL, HRI, IBS, KSI, KUU, and WYA. RM: ELQ. K6ILO is a new ORS. K6JYI is the call of the Pacific Beach Junior High station. KVB now is a member of MARS. K6BPI is checking into two nets daily and breaking into traffic-handling with a bang. The San Diego County amateur radio directory is nearly ready for distribution, according to the Coronado gang. K6ANV is new treasurer of the Gillespie Club. New members of the Upper Ten Club are AXV and AFO. The Club's annual picnic is set for June 19th at a place to be announced. The San Diego DX Club played host to three Swedish hams recently with a dinner meeting and visits to local ham shacks when the ship visited here on a round-the-world cruise. VAD, in Orange County, now is on 420 Mc. BQP now is on teletype. BZE and CAE are building kw. pi-network finals. FFD is experimenting with quad antennas. More activity was noted in the c.w. portion on the DX Contest this year from this section than any year since World War II. KN6JAF and KGS are new Novices at Silvergate Elementary School. LRU now is at 195 countries with EA9DF, FY7YC, and TI9MHB. K6BEC sports new vacuum-type keying. CHV may be top man in the section for the 'phone contest. The continued lack of information from most clubs and the Imperial Valley keeps the San Diego section news short. If your club has no news in this issue, or pertinent information is missing, get it in the hands of your SCM prior to the 7th for printing. Traffic: (Mar.) W6IAB 4035, YDK 614, K6BPI 373, W6KVB 30, K6DBG 26, W6CHV 5. (Feb.) K6BPI 304.

(Continued on page 122)

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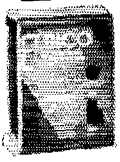

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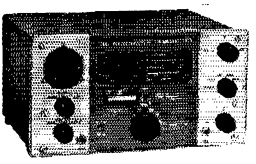

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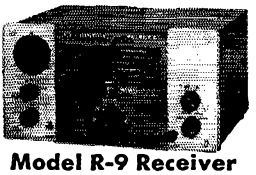

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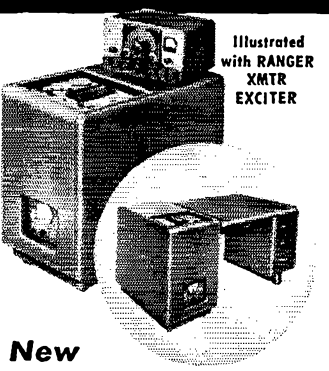

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SANTA BARBARA — SCM, Vincent J. Haggerty, W6IOX — The PAM report from IHD indicates KN6HBH is on 2 meters with an ARC-4, IHD has the s.s.b. rig going with p.p. 813 final, and REF/6 has the mumps! K6NBI came in with the section's largest traffic total ever. QIW was a visitor at the Santa Barbara Amateur Radio Club's March meeting and he is now at the helm as our new SCM. FYW reports KN6INB operated a 2-meter station for the Paso Robles Club at the recent Paso Robles Hobby Show. This is the final report of IOX as SCM so may I thank all who helped me in our section's initial two years. Let's get behind QIW, our new SCM, and help the section develop. Good luck, Bill. Adios and 73. Traffic: K6NBI 365, W6QIW 70, YCF 14, REF/6 6, FYW 3.

WEST GULF DIVISION

NORTHERN TEXAS — SCM, T. Bruce Craig, W5JQD — SEC: RRM. PAMs: PAK and IWQ. RMs: PCN and QHI. Officers of the Kilocycle Club of Fort Worth are KVA, pres.; TDR, 1st vice-pres.; UXY, 2nd vice-pres.; URI, secy.-treas. The Tarrant Co. Disaster Net had a picnic Mar. 13th at Eagle Mtn. Lake. The Irving ARC organized and elected VSH, pres.; GT, vice-pres.; and WN5HHP, secy.-treas. Meetings will be held the 4th Sun. afternoon of each month. SMK, SYL, ICB, and LGY are sending traffic for sick folks. K5AEJ is a new XYL ham in Coleman. SQT and LGY cured LGY's low frequency harmonics and got a better antenna load. UUR, Wichita County EC, has started a 10-meter auxiliary net. MQW is AEC and NCS for this Net which meets Tue. nights. Members are UUR, TTY, PZS, DWS, TLW, MQW, GNE, DNY, GPO, and TFV, supported by AGE, GVA, and AVA. New officers of the Wichita Falls ARC are UUR, pres.; AVA, vice-pres.; DWS, secy.-treas. ZTB works portable with the Boy Scouts. ATR, IRZ, and KRZ report into NTEN from mobile. The Dallas 10-meter Net assisted the Dallas Red Cross in a drive for funds. The Fort Worth 10-meter Net and Dallas 10-meter Net had a joint picnic on Mar. 20th at Arlington City Park. The No. Tex. Emergency Nets report more activity on 2 meters. About 200 attended the Brownfield Swapfest. BPT is trying to get a club started in Palestine. ROTC Signal Corps Unit at Tech, in Lubbock announced a code and theory class for each Tue. and Thurs. nights. KN5AHJ is a new ham in Brownfield. HKF has worked 33 states with 28 confirmed. NOR reports the interest in amateur radio of a group in Muleshoe. The Blue Ridge 160-meter Net reports 92 per cent attendance, with 19 full and active members and 3 supporting members. ACK now works break-in on c.w. FJB is net manager of the Teen-Age Traffic Net. FCX reports he has MARS membership now. Traffic: K5FFB 887, W5DTA/5 525, KPB 299, BAT 229, UBW 226, PAK 190, AHC 149, FJB 86, CF 62, ASA 56, ACK 15, HKF 14, BPT 8, FCX 8.

OKLAHOMA — SCM, Dr. Will G. Crandall, W5RST — Asst. SCM: Ewing Canady, 5GIQ. SEC: KY. RM: GVS. PAMs: PML, SVR, and ROZ. Prospects are mushrooming for one of the biggest and best West Gulf Conventions in recent years. It will be held in Cowtown June 10-11-12 with headquarters at the Hotel Texas. Distinctive markers are being proposed to distinguish Oklahomans from Texans and New Mexicans. C.w. activity is on the increase mostly because of the sparks of RM GVS and JXM with the excellent OLZ bulletin put out by them. All Oklahoma amateurs are cordially invited to meet the OLZ Net on 3682.5 kc. at 1900. A new OO Class IV is CFG in Tulsa, so if you get a card from him it is jut a friendly warning to watch your step so you won't get a QSL from the FCC monitoring station. Much credit is due the Will Rogers H.S. ARC in Tulsa for its activity and for being the only high school ARC in Oklahoma that we know of. The Okeene Annual Rattlesnake Roundup was covered by portables set up by MFX with ZQU and HBL and ROZ with CXM and EJN. Mobiles covering the field were PCQ, GIQ, SVR, AOX, VLV, and BNX. These events are excellent practice in emergency traffic-handling. The more experienced net controls and traffic handlers we can train the better service we can render to the public in case of disaster. Traffic:W5GVS 196, ADC 54, ZZK 52, FEC 47, CBY 38, PML 34, HCG 32, MGK 28, SVR 28, WTC 28, JXM/TC 26, SWJ 26, TNW 22, PNG 20, QAC 20, GXH 19, MQI 19, TKI 16, MFX 15, CXM 13, ITF 12, REC 12, CYQ 10, EHC 2, UCT 2, VAX 2.

SOUTHERN TEXAS — SCM, Dr. Charles Fermaglich, W5FJF — The Houston ARC is starting to put up its new club house. FEK is doing a lot of high-frequency organization work. NOT is working out of town. LSE still is sweating out the stork. OUG is NCS of CERN. Officers of the HARC are RPH, pres.; URU, secy.; FDZ, treas.; PBX, membership chairman; UFG, vice-pres.; VWF, program chairman. ADZ is doing nothing but collecting guns and DXing. IX is busy, to quote ADZ. UFH also is collecting guns. In order to bolster the RACES participation in Houston, Harris County, the local c.d. men turned the entire amateur program over to FJF with a free hand. Classes are coming along and RACES nets are being formed. Amateur spirit is high and participation will be widespread. It is the amateur's duty to work in RACES and it seems to work out better when the amateurs are

(Continued on page 124)

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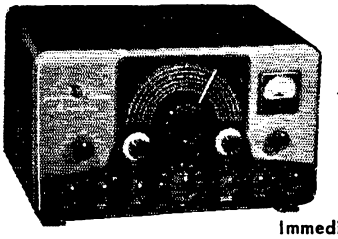

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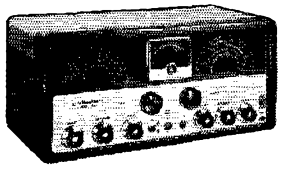

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doing the organization work. Fellow amateurs of Southern Texas, FJF has served as SCM for three two-year terms and declined to be nominated for a fourth term. He feels that it is time for some other amateur to take on the job. QDX was the only qualified nominee so he was declared your new SCM. It has been a great experience serving as your SCM. It has been gratifying to see the growth of ARRL in Southern Texas and the increased participation in club and League affairs. I am looking forward to continuing many friendships and will continue to visit around as I have done in the past. Traffic: W5MN 646.

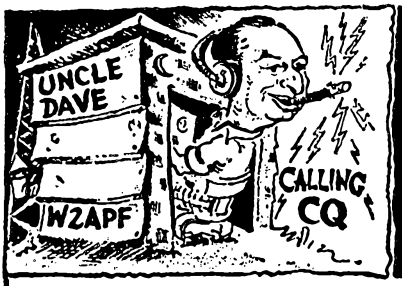
NEW MEXICO — SCM, G. Merton Sayre, W5ZU — SEC: KCW. PAM: BIW. V.H.F. PAM: FPB. RM: JZT. The NMEPN meets on 3838 kc. Tue. and Thurs. at 1700, Sun. at 0730; NM Breakfast Club every morning except Sun. at 0700-0830 on 3838 kc.; NM C.W. Net daily on 3633 kc. at 1900. The New Mexico RACES Plan has been approved, and the Albuquerque and Roswell Areas have forwarded their plans. It should be a matter of pride for all amateurs to sign up in RACES and participate regularly. SGC is C.D. Radio Officer for San Juan Co., and CIN for Farmington. NTN and AAU are establishing a u.h.f. TV station in Farmington. NSV spent a couple of months in Roswell. PBV has the 522 transmitter for sale. FPB reports increased activity on 144 Mc. in Albuquerque. VWU is back in Albuquerque from Florida. FAG has a kw. on 2 meters with a keyer wheel. FPB is NCS of the CAP V.H.F. Net. The Los Alamos organized chapter of the Amateur Radio Caravan Club of N.M. elected VDY, caravan master; BNJ, emergency car. master; YKZ, secy.-treas.; MYQ, prog. dir.; ZMN, asst. prog. dir. Don't forget the State Ham Picnic at Albuquerque June 4-5, the West Gulf Division Convention at Fort Worth June 10-12, and Field Day, June 25-26. Traffic: W5RFF 249, JZT 65, QR 64, CEE 31, ZU 23, HOE 18, BZA 17, WBC 12, BIH 10, ARD 9, CAZ 9, BZB 7, BXP 4.

CANADIAN DIVISION

MARITIME — SCM, Douglas C. Johnson, VE1OM — Asst. SCM, Fritz A. Webb, 1DB. SEC: RR. New ECs in N. B. are JP, EE, BL, VA, VC, and AEB. WB is a new RM appointee. Congrats to PF on winning the 1st Annual VE1 Contest. Runners-up were UT, AAW, and QM. WB reports 23 logs were received. DW is NCS of the newly-formed N.S. C.D. Net which meets Sun. at 10:00 A.M. on 3780 kc. All active N.S. amateurs are urged to report in. PF is building a new 14-Mc. quad beam, plus three rigs for the local AREC. His XYL, ABT, is active on 14-Mc. c.w. BL has a new all-band Elmac AF-67 transmitter. OM is getting good results with a new 14-Mc. ground plane. RR is back on the air with an all-band 30-watter and a Zepp antenna. OC has been giving 160-meter 'phone a whirl and gets out FB. Congrats to BN on the fine showing in the February Frequency Measuring Test. RO, GZ, KU, and YJ are active on 7-Mc. c.w. HG is top Maritime section DXer, with 150 countries confirmed. VO6AH requests all Maritime and Newfoundland stations to clear 3780 kc. daily between 1630 and 1730 AST during Labrador Net time. Traffic: (Mar.) VO6N 210, VE1FQ 136, VO6B 84, VE1AV 53, OC 52, QM 51, VO6S 41, VE1ME 24, OM 23, UT 19, HJ 17, GA 12, BL 11, WB 6, EK 5, DB 2. (Feb.) VE1DW 68.

ONTARIO — SCM, G. Eric Farquhar, VE3IA — With no advice from any net manager, we are assuming all nets are remaining on local standard time. The Gold Belt Net on 3750 kc. has changed its time to 1300 Sun. to accommodate more participants. The Northern Net operates on 3675 kc. Mon. and Fri. at 1900 and 3775 kc. on Wed. at 1915. Congrats are extended to the Nortown Club on making BPL from its station, BRR/3, operating at the Sportsmen's show, and to NG, its pres., for again qualifying for BPL. Thanks to Northbay for the fine bulletin, through which we learn that the annual banquet of the Scarboro Club was very successful! We would remind all of the Eighth Annual Northern Ontario Hamfest June 30th, July 1st and 2nd, again sponsored by the Gateway ARC. CAB reports some two-meter activity, snagging W2SHV some 150 miles airline. NG, DZA, and DTO were seen on TV in connection with amateur radio in emergency work. Also heard but not seen were AJA, ARF, and BUT. Late reports inform us that 150 attended the Marconi Field Day presentation to Nortown, 1954 winners. The Porcupine ARC of Timmins treated the gals to a fine chicken dinner. A joint picnic by the Oshawa, Peterboro, Belleville, and Kingston Clubs is slated for about Aug. 14th at Cobourg Beach. The Belleville Club is making progress on its trailer Field Day project. The Hamilton ARC enjoyed a splendid talk and showing of colored pictures by HI, of London. Because of bad weather KM and IA were unable to attend the c.d. meetings at Hanover. BZB is a new ORS appointee. DSX becomes Timmins Area EC. KM, in Hamilton, Ontario, received a card from a 14-year old SWL in Hamilton, Ohio! The Amateur Emergency Corps of Hamilton attended the Red Cross annual meeting and put on a demonstration. Uranium finds are keeping BUR busy these days. AJR lost his 40-meter antenna and pole for 80 meters in the big blow. The March meeting of the London ARC had six past-presidents present. YJ spoke on civil defense and its prob-

(*Continued on page 126*)



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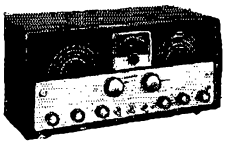

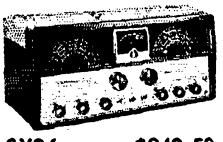

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lems. TO, London EC, discussed activities and invited recruits. Traffic: VE3BRR/3 429, BUR 198, NG 188, VZ 136, BJV 120, AJR 114, NO 44, AUU 37, KM 33, AVS 18, AOE 11, DPO 11, PH 7.

QUEBEC — SCM, Gordon A. Lynn, VE2GL — On March 19th some 115 Canadian hams and their XYLs gathered at Ruby Foo's in Montreal to honor Alex Reid, VE2BE, with a testimonial dinner on the occasion of his silver jubilee as ARRL Canadian Director. The guest speaker was President Dosland, WØTSN. W1BUD also spoke of his long association with VE2BE, and presentation of an s.s.b. 20A exciter was made to Alex on behalf of amateurs from the whole of Canada. LO is trying to work 75-meter 'phone with a 1154 transmitter. WK is active on 75-meter 'phone and has been working some DX on 160 meters. DK, in Scottstown, is experimenting with receivers and beams. II reports into PQN and is handling some traffic. SS is experimenting on 20 meters and working some DX and also is interested in 2 meters and would like to arrange skeds with possible contacts. AFK, in Lennoxville, is active on 80 meters. AOB, ACY, ADU, and EC formed an emergency net for the Red Cross during the recent fire in Nicolet when much of the town was destroyed. CA reports conditions have gone to pot to the north again, making traffic low. AEV is holding a weekly c.w. class in Malartic for the Scouts. BK reports his 20A exciter is on the air, as is BE's. Traffic: VE2DR 101, BB 60, II 54, EC 46, ATQ 24, LM 16, CA 10, CP 7, FL 7, UM 3.

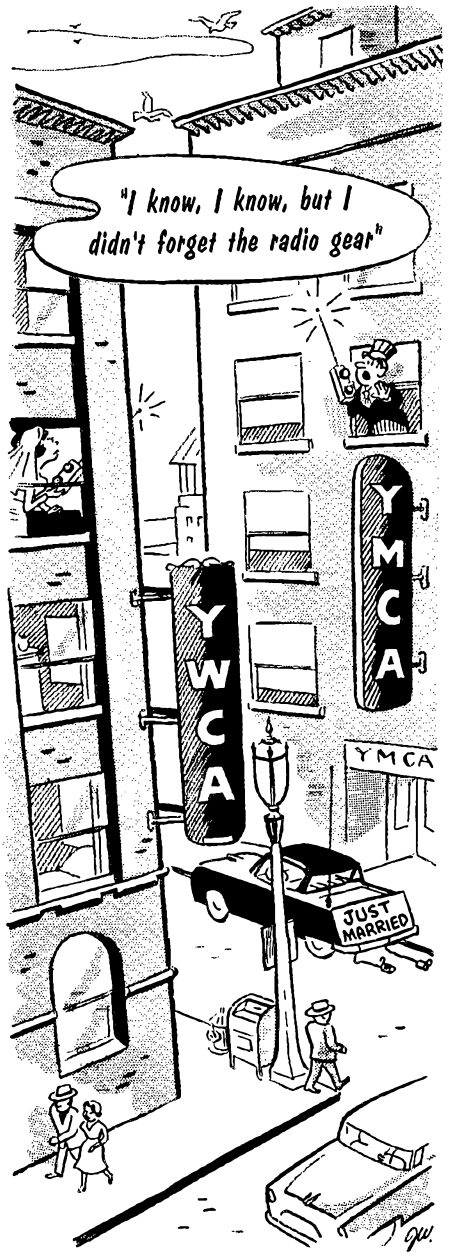
ALBERTA — SCM, Sydney T. Jones, VE6MJ — PAM: OD, RM: XG. TG is the new EC for the Lethbridge Area. WC is having trouble with standing waves. OS is interested in obtaining a printer for RTTY operation. AL is busy moving the rig to another room and experimenting with screen modulation. A new club has been formed in the northern part of Alberta at Beaverlodge. ZDP, YGB, and VGU are operating portable from Beaverlodge. KL is building a new VFO. MJ has the moniscope completed. FF's mobile came in handy recently when one of his trucks was sideswiped on the Calgary Highway. Fortunately no one was injured but a request for assistance was relayed via the mobile by FF to MJ and prompt action was taken. EA is QRL with microwave survey. MM relayed information on the storm at Red Deer. HC was a recent visitor to Edmonton. PV is testing the new modulator. OC is testing the rig from the new Edmonton QTH. The hamfest dates have been confirmed as July 30th and 31st. All roads lead to Lethbridge. Let's go all out this year and support the Lethbridge Club in its efforts. Remember it's *your* Alberta hamfest. Traffic: VE6HM 126, AL 48, OD 23, WC 21, YE 11, MJ 8, IZ 7.

BRITISH COLUMBIA — SCM, Peter M. McIntyre, VE7JT — SEC: DN. AIO now has appointment as ORS and OPS and XY and OBS. During the past few months band conditions on 75-meter 'phone have been rather rugged which has made it difficult for everyone. On 3755 kc. where the BCAREC Net operates is a hot spot whether from design or accident, with QRM both unavoidable and seemingly deliberate, nevertheless the operation goes on. It has grown to a rather large net covering all sections of British Columbia and the western section of Alberta. We are all glad of the interest of all participating in its operation and their continued support of the net operation. In any net operation there is bound to be variances of opinions on how things should be done as far as control of the net is concerned. The number of check-ins, which averages about 70 stations, has a tendency to become unwieldy through no fault of those acting as control station or acting control stations. We would welcome any letters of comment, signed of course, on what you think of the operation of the BCAREC Net. I would appreciate any comments and I know the SEC, the net manager, and those acting as net control stations would accept constructive criticism in the light in which it is given. Traffic: (Mar.) VE7QC 123, ASR 115, AIO 33, ZV 15, ZF 14. (Feb.) VE7AQW 80, ASR 55, AIO 21, QC 17, DH 14, ZV 10, ZF 8, SW 4.

MANITOBA — SCM, John Polmark, VE4HL — Congratulations to Manitoba amateurs HL, NW, AI, JM, LO, JW, WS, GE, PE, MO, ZI, and AS on completing the civil defense communications course. We welcome to the amateur ranks AX, of Flin Flon. New stations on 'phone are JS and CJ. NW portable is moving to Gull Lake soon and will be looking for contacts. RB is sporting a new 24-hour clock. The AREC got off to a good start but more outlets and ECs are required. Application forms may be had from the SCM. Drop us a card or get us on the air. XW did it again with a new modulator which sounds very nice. DI and HS sked twice a week on 20 and 6 meters at 2100 hours and are looking for anyone else interested in trying 6 meters. The total reported traffic was 773, a record for Manitoba. Keep it up, gang. Traffic: VE4AI 179, JM 98, GE 96, IF 69, CB 44, QD 36, VE5DS 34, VE4KG 31, HL 28, JW 22, RB 17, YR 17, JY 14, EF 12, KL 12, NW 11, AY 10, VE5CM 9, VE4LO 4, OB 3, RF 3, AN 2, GB 2, VE5GO 2.

SASKATCHEWAN — SCM, Harold R. Horn VE5HR — KO is active in c.d. at Elrose. DZ has a new jr. YL. QL has a new QTH at Govan. TH and AJ have been doing wonderful work with polio victims in Saskatoon. Because of their efforts Trevor Jones soon will be heard on the airlanes from Saskatoon and Dan Palynchuk hopes to become

(*Continued on page 128*)



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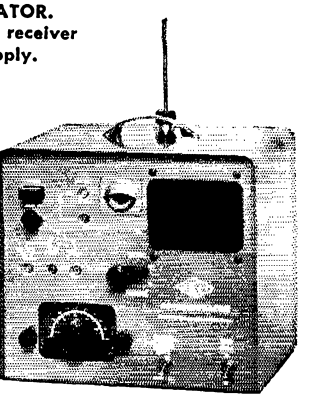

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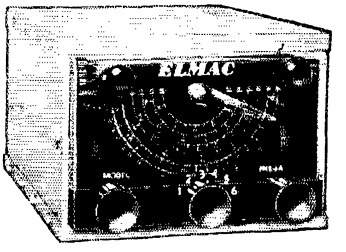

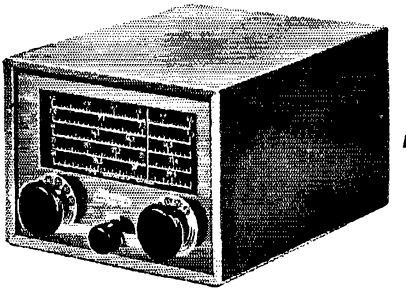

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a VE7. AJ is recovering after a visit to the hospital. YF is pleased to report that two of her prize c.w. pupils are now pounding out signals on the air, to wit: VE5TX and PT. At this writing your SCM is in the hospital recovering from major surgery. This is Madolyn, YF, pinch-hitting for Hal and wishing him a speedy recovery. Don't forget that all roads lead to Saskatoon July 1st, 2nd, and 3rd for the Giant Jubilee Hamfest. Traffic: VE5BZ 22.

Grounded Grid Amplifier

(*Continued from page 22*)

at the center of the subassembly. The lug is mounted beneath a 1-inch stand-off insulator, and a single stud screw holds the choke and stand-off to the subchassis. A feed-through insulator on the subchassis feeds d.c. to the choke and also serves as a tie point for the "hot side" of the by-pass capacitor. The screen grid, grid, and beam plate are grounded to the subchassis as close as possible to each tube socket. The cathodes are connected at the central stand-off insulator, which is also the tie point for the r.f. input lead.

The cabinet is 10 by 14½ by 8¾ inches with a panel to fit. The rotor indicator of the inductor and input capacitor are mounted on the panel and the panel secured by the output rotor switch, meter and toggle switches. The 0.004-μf. d.c. blocking capacitor mounts on the rear of the input-tuning capacitor, C_1.

An r.f. choke was included across the output of the pi-network, so that in the event of a shorted d.c. plate blocking capacitor the power supply fuse would blow. This keeps 1200 volts d.c. off the antenna system.

If plate voltage were applied with no input connection for the cathode return, full plate voltage would appear between cathode and filament. A 1000-ohm resistor is connected from cathode to ground to prevent this from occurring.

Operation

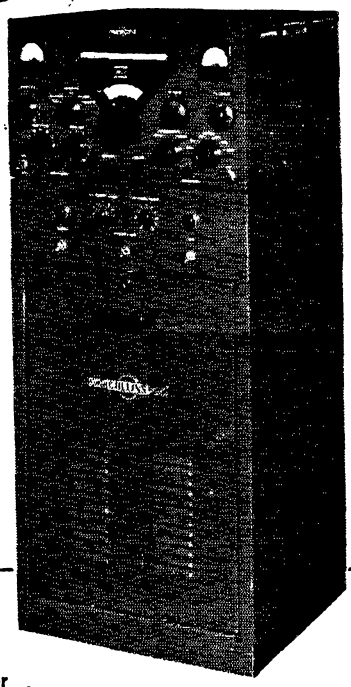
The tune-up procedure is the same as for any pi-network amplifier. The whole coil is used for 75 meters, about half for 40 meters, and one-fourth for 20 meters. Initial tuning adjustments are made with about half the available r.f. drive power. Twenty watts of drive will put a good signal on the air.

The input and output circuits in this design are well shielded by the grounded grid, screen, and beam-forming plates, and no trouble with fundamental or v.h.f. instability has been experienced. Although this amplifier is designed primarily for s.s.b., it may also be used to amplify a low-powered a.m. or c.w. signal.

FEED-BACK

In "A One-Tube Receiver for the Beginner," appearing in last month's issue: the rotor connection of C_1 should go to antenna terminal *2*, instead of to the stator. The parts list should be changed to include a 500-μμf. ceramic capacitor and the 0.01-μf. 250-volt paper capacitor should be 0.1-μf. 200-volt paper.

HARRISON HAS IT!



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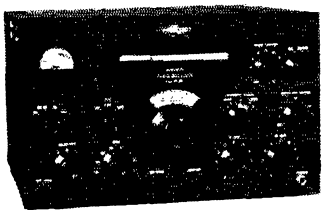

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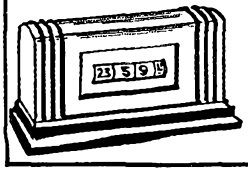

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Parallel 6146s

(Continued from page 17)

for the leads to Terminal B (Fig. 2) and C_6.

The L_8L_9 assembly is also made from a single piece of stock. Allow an extra half turn or so at each end of the winding for leads to Terminals B and C. Free the last ¾ turn of L_9 (the end connected to Terminal C) to make the link adjustable with respect to L_8. In the final construction, the output ends of both L_7 and L_9 are connected to the link tuning capacitor, C_6, by a length of No. 12 tinned wire.

The 47K grid resistor for V_2 is now connected, at the meter end, to the tie point that supported one end of the original R_9. The other end of the resistor is used to support one side of RFC_6. Either Pin 8 or 9 of the socket for V_2 may be used to support the tube end of the choke.

The oscillator plate coil, L_1, is the original inductor, reduced in size. A ½-inch cone insulator supports the inductor as in the previous model.

The new control for C_4 employs a panel-bearing extension shaft. A second bearing, mounted on an aluminum strip spanning the chassis (see bottom view) supports the rear portion of the shaft. A Millen 39003 shaft coupler is attached to the end of the shaft to serve as a pulley. Another shaft coupler of the same type is fastened to the tail shaft of C_6. This provides a smooth surface for the dial cord to travel over on its route through the chassis. Two lengths of cord are used between the drive-shaft pulley and the pulley on the tail shaft of C_6. When installing the cords, first tighten the coupler or pulley on C_4 so that the top end of the setscrew points toward V_2 when C_4 is rotated for minimum capacitance. Now tighten the pulley on the drive shaft with the setscrew pointing toward the right wall of the cabinet (as seen from the front view). In stringing the drive, use the pulley setscrews to anchor the ends of the cords. Allow a full wrap around the pulleys at each end of the cords and make sure that one set of turns travels in a clockwise direction while the other rotates counterclockwise.

As shown in the front view, the oscillator switch knob and the pilot jewel are each 2¼ inches from the amplifier tuning dial. A 2¾-inch dial, E. F. Johnson type 116-262, is used as the amplifier tuning control. Note that the decal marking for C_3 at the top right-hand corner of the panel has been changed from AMP to DRIVER.

Testing

The heater power requirements for the complete r.f. line-up are 6.3 volts at 4 amperes. A supply delivering 300 volts at approximately 50 ma. should be available for the 5763s. Maximum ICAS ratings permit 600 and 750 volts to the 6146s for 'phone and c.w. operation, respectively. The tubes may be loaded to 225 ma. plate current with plate modulation and may be loaded to 240 ma. for c.w. work. In either case, the supply should be capable of delivering an additional 30 ma. or so for the screens.

(Continued on page 132)

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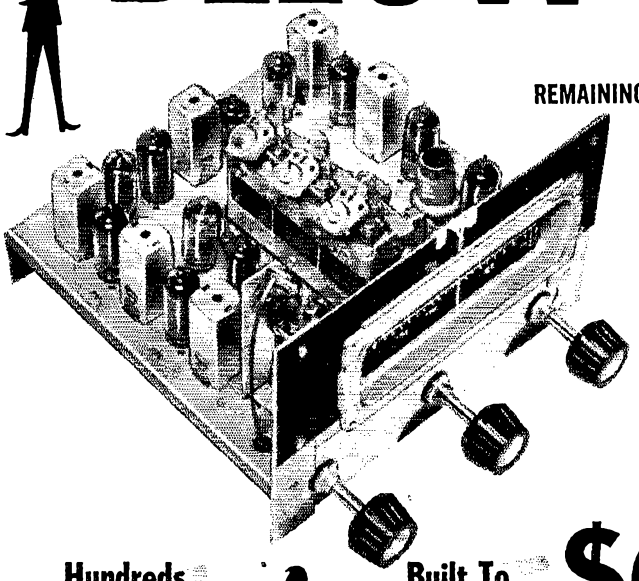

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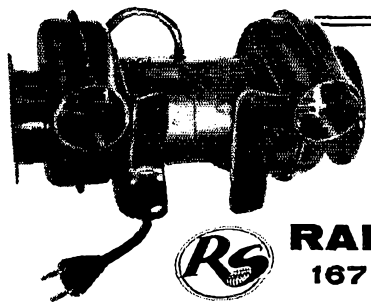

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A 150-watt lamp bulb or a noninductive resistor should be used as a dummy load while testing the transmitter. A 150-watt bulb and a bank of series-parallel connected Ohmite dummy loads were used to obtain the data shown in the accompanying tuning chart.

Plate and screen voltages should be removed from the power amplifier while the exciter is undergoing initial tests. Tuning of the oscillator and the driver stages is completely conventional, and the tuning chart lists typical current readings for V_1 and V_2 as well as settings for C_2, C_3 and S_3. Note that the oscillator plate tuning capacitor, C_2, is to be adjusted for minimum capacitance when the circuit is operated at 3.5 Mc. When using a 7-Mc. crystal and straight-through amplification in the plate circuit, C_2 should be used as an excitation control; increasing the capacitance of C_2 reduces the drive to V_2. In this case, the control may be properly adjusted only with the power amplifier in operation, of course.

If it is noticed that the dial settings for the driver plate circuit do not correspond with those listed in the tuning chart, it will be necessary to experiment with the inductance of L_4. Adjust the inductance by varying the positions of the adjustable turns until the 14-Mc. setting of the dial coincides with that listed. The dial readings for all frequencies above 14 Mc. will fall into line with the 14-Mc. point properly located.

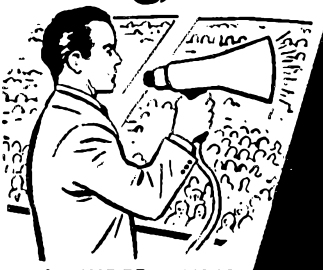
It is intended that the 6146 stage will be operated straight through at all amateur frequencies between 3.5 and 29.7 Mc. However, the circuit may be used as a frequency doubler with the usual decrease in efficiency.

The tuning chart lists tuning-dial and plate-current readings that may be expected when the amplifier is operated at 600 volts. Observe that nearly all readings depend to some degree on the type of dummy load in use. The spacing between L_8 and the adjustable portion of L_9 was approximately $\frac{3}{16}$ inch while the readings were made.

The series-tuned output circuit is perfectly standard and is described in detail in Chapter Six of the '54 and '55 *Radio Amateur's Handbook*. The system is designed to work into a specific impedance — 50 ohms in this case. If the impedance of the antenna deviates from 50 ohms by any appreciable amount, it is necessary to employ a matching circuit immediately following the amplifier. The *Handbook* describes couplers designed for matching 50 ohms to higher values of antenna impedance and also explains how a s.w.r. bridge can be employed during the matching adjustments. Of course, antennas fed with 50-ohm coaxial cable may be coupled directly to the output circuit of the transmitter.

The new circuit may be used without further modification when a 300- or 400-volt plate supply is employed. The 6146s may be loaded to better than 100 ma. at the lower of the two plate voltages and with the 20K screen resistor in the amplifier. If the mobile supply has current to spare, and if R_4 is lowered in value to approximately 7K, the amplifier may be loaded to approximately 150 ma.

NOW HEAR THIS



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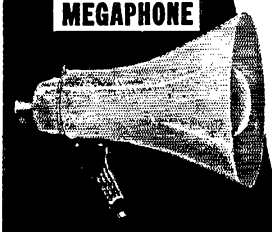
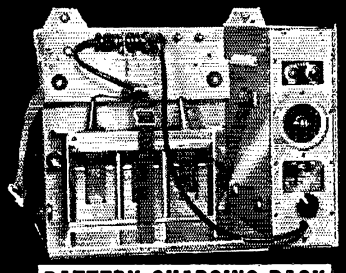


AMPLIFIER



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Here is an ideal system for such applications as fishing boats, yachts, traffic control, sports events, construction crews, surveyors, carnivals, car owners, life-saving stations, or any place where handling of large crowds is necessary, and wherever convenient power line connections are not available, because unit operates from self-contained rechargeable 6-volt storage battery. Can also be used as a stationary or permanent system when used with charging rack, which is designed to hold entire portable amplifier and battery.

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Mobile Reception

(Continued from page 20)

sockets in parallel and the substitution of the 6-volt equivalents.

The b.f.o. switch should be connected between the wire previously labeled "b.f.o." and ground. The wire previously labeled "r.f. gain" may be grounded directly or, if an r.f. gain control is desired, through a 25K potentiometer. If your

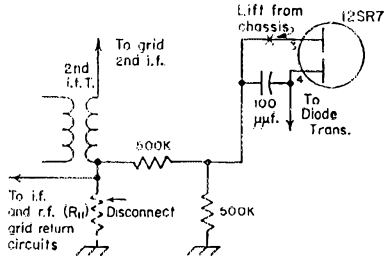

Fig. 4 — Circuit revisions for adding a.v.c. to R23 units not so equipped. Resistors are ½ watt.

particular model of the R23 doesn't have a.v.c., it can be added easily by following Fig. 4.

Fig. 1 shows how the r.f. and mixer coil units are rewired. The oscillator shielded unit is not used; the crystal socket is mounted above the chassis on the oscillator plug-in receptacle. Holes should be drilled in the other two receptacles, and the coils mounted so that the slugs can be adjusted from the top of the chassis.

The vibrator pack is mounted in the space formerly occupied by the dynamotor. The filter components and the new output transformer (Merit 2998) are mounted underneath. The original 12A6 cathode by-pass (C_{30}, previously removed) is replaced with a smaller 10-μf. 25-volt electrolytic. The secondary of the transformer is wired to the phono connector used for plugging in the loudspeaker.

Adjustment

The i.f. transformers in the R23 should be adjusted to the loose-coupling position for high selectivity. This is done by removing the cap on each transformer and pulling the fiber insert out as far as it will go. Adjustment of the slug-tuned antenna and r.f. coils is easily done by tuning in a steady carrier, or by feeding a 1440-kc. signal directly into the R23 and measuring the a.v.c. voltage with a v.t.v.m., and adjusting for maximum voltage. The antenna coil and the output trimmer of the converter should be rechecked on outside signals after all connections between the R23 and the converter have been made. Also, the slider on the VR dropping resistor should be adjusted so that the VR tube glows with the converter connected and operating.

Although no curves were run on the performance of this combination, results seem to compare favorably with those obtained with an HQ-129 with the crystal in the first position.

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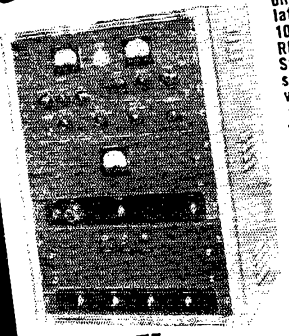

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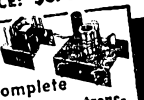

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TV Trouble-Shooting

(Continued from page 86)

There are controls on the back of the set which you might as well learn to adjust. The best time to do this is at test pattern time. The relationship between the top half and the bottom half of the picture is controlled by the "Vertical Linearity" control and somewhat by the "Height" control. These two are interdependent to some degree, so that a change in one may necessitate a change in the other. In addition, changing these two may cause the picture to roll, since the "Vertical Hold" control is in the same circuit. These first two controls are what you adjust when the legs are too long, or when everyone looks like something from Dick Tracy. Weakening of the tubes in the vertical oscillator or vertical amplifier may cause the linearity to change, and may make it impossible to restore things to their proper shape until a tube is replaced.

The "Focus" control is self-explanatory. You should set it so you can see the closely-spaced horizontal lines that cover the screen.

The "Horizontal Drive" control governs the grid drive to the horizontal amplifier tube. If it is misadjusted in one direction there will be vertical white bars on the left side of the screen, and if turned too far the other way the picture will fold over in the middle, or be narrow and dark.

Many sets have an "AGC" control, or "Range Setting." This sets the sensitivity of the receiver for the particular area in which it is installed. If the a.g.c. is advanced too far, the picture will black out, bend, or tear. If it is set too far counter-clockwise the picture will lack contrast.

That finishes up our discussion of TV troubles. It doesn't make any difference, apparently, what brand of set you buy, or what you pay for it. Some folks have troubles, others with the same make and model don't. Even though our business is television servicing, we wish you good luck!

Happenings

(Continued from page 82)

grant credit for the code-speed requirement to any applicant for amateur license except Extra Class. The Commission has also amended the rules to provide that Form 481-1 will be used for renewal applications for RACES authorizations; until such time as a revised form becomes available, applicants should use the present form by entering the word "renewal" at line 3.

OHIO AMATEUR RADIO WEEK

Again this year Governor Lausche, in response to representations by the Ohio Council of Amateur Radio Clubs, has proclaimed an Amateur Radio Week in that state. It is, of course, June 19th–25th, the week culminating in ARRL Field Day. The proclamation praises the amateur record in terms almost identical with last year's language (p. 45, September 1954 *QST*).

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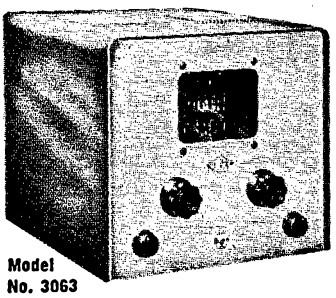

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Model No. 500W Here is a complete, ready-to operate RF linear Amplifier with single control bandswitching for six amateur bands. This extremely stable output stage, operating in Class AB_2, provides very substantial power output with low grid drive. Excellent linearity and extremely low harmonic content in the pi network output circuit are other important features.

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Complete with tubes—now reduced to only $339.00

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And Many Others **Write W2BUS for complete details**

CARTER GENERATOR

DS-400

This 6 Volt DC power supply utilizes the Carter 420A Generator, which delivers 400VDC at 200 ma., continuous duty rating. The base contains the filter, a starting relay, another relay for receiver disabling (N.C. Contact-N.O. Contact available but not wired in) as well as the Terminal Board, heavy duty 6 volt input posts and is fused for both input and output.

Don't be confused. This power supply is not war surplus.

These brand new units were built as the companion power supplies for a de luxe Mobile Transmitter. Base measure 7¼ x 5 x 5¾ overall height. **Limited supply. Order now.**

Only $39.50 each

BRUSH MICROPHONE

Model BA 16 Brand new, attractively designed, quality crystal microphone with shielded 8 ft. rubber cord. Stands on flat base or can be mounted on any standard mike stand. Size 2⅛" square x 3" high.

Special $4.95

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HERMETICALLY SEALED METERS

Ruggedly built 2½" meters precision engineered for accurate performance. Vacuum sealed, dustproof and moisture proof, unaffected by heat, cold, humidity. Made to JAN specifications by one of the best known names in meters. Attractive black finish steel case.

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ST-203-A

MOBILE TRANSMITTER KIT

Only a few of these superbly engineered 10 meter mobile transmitter kits now left. (See previous QST ads) They are priced to move fast.

ST-203A Kit including all construction components. Less mike, tubes and crystal .....**Only $29.50**

Order now while they last!

9 SECTION JEEP WHIP ANTENNA

Extends to 82" • Closes to 14"

This U. S. Government antenna is highly versatile for mobile use on 2-6-10 or 11 meters. Mast is removable so you can base load the antenna for 20-40-75 meters. Solid brass construction. Used originally for bumper mounting with removable base clamps. So constructed that 6 of these Whips can be used to make a 3 element Beam Antenna.

Type AN75D **Each $1.89**

Shipping Weight 4 lbs. **3 for $5.00**

Terminal Radio CORP.

85 CORTLANDT ST., NEW YORK 7, N.Y. • WOrth 4-3311

Viking II Modifications

(Continued from page 29)

Dress L_{52} from its previous position on the key jack to the nearer terminal on the new tie point. By-pass the cold end of L_{52} to a shakeproof solder lug attached to chassis ground. From the cold end of L_{52} to the key jack, install an Ohmite Z-50 v.h.f. choke. Remove C_{29}, a 0.005-μf. disk ceramic, from the terminals of the key jack and replace it with a 0.001-μf. disk ceramic from the hot terminals of the jack to the solder-lug chassis ground just installed. The 0.005-μf. disk ceramic just removed may now be wired with short leads between Pins 3 and 4 of the oscillator tube socket, by-passing the heater. Another two-terminal tie point is located in a convenient spot (I used the hexagonal nut just forward of L_{51}) and on this tie point is to be mounted a home-made heater choke. This was wound on the body of a 2-watt carbon resistor and consisted of about 18 turns of No. 18 enameled wire, close-wound. The heater wiring was opened to insert this new choke. Another 0.001-μf. disk was used to by-pass the cold end of this choke. C_{68} was changed from 0.005 to 0.001 μf. Lastly, a 6AH6 high-g_m pentode was substituted for the 6AU6 previously used as an oscillator.

The unit was allowed to warm up and was then recalibrated. The project was then complete, except for determining the constants of the waveshaping network.

Results

Attempts to key the VFO alone produced clicks that were slightly colossal. Keying the first stage of the Viking through a suitable filter, allowing the VFO to run continuously, produced good keying; but there was an audible backwave in the receiver, and one thing the owner of the machine said he wouldn't tolerate was any sound when the key is open. Now, with the wiring of the key jacks, this combination is a real-gone natural for a differential keying system.[4,5] I got the man over at my place, showed him how small the backwave was, explained how differential keying would make it sound like real fine break-in, and demonstrated the sound of the keying of the Viking through the filter I had cooked up. He agreed to take home the transmitter and the filter, and to use it as I had instructed him, pending his constructing (or more likely, persuading me to build for him) a differential keyer.

Everyone knows by now how you check keying, so I'll go through it very fast and lightly: Receiver antenna off, receiver input shorted, b.f.o. off, a.v.c. off, limiters (if any) off, crystal filter out, audio well up, and r.f. gain up just far enough to hear a little "shooshing" when tuned to the signal. Tuned just off the signal, you manipulate the constants of the waveshaping filter

(Continued on page 140)

[4] Goodman, "Chirp-Free Break-In Keying," *QST*, Oct., 1953.

[5] Puckett, "'De Luxe' Keying Without Relays," *QST* Sept., 1953.

Gateway to Amateur Radio!

- ★ HOW TO BECOME A RADIO AMATEUR
- ★ THE RADIO AMATEUR'S LICENSE MANUAL
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- ★ OPERATING AN AMATEUR RADIO STATION

Anyone starting out in amateur radio will find these publications a necessary part of his reading and studying for the coveted amateur radio operator's ticket. Written in clear, concise language, they help point the way for the beginner. Tried and proven by thousands upon thousands of amateurs, these ARRL publications are truly the "Gateway to Amateur Radio."

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or vacuum-tube keyer until you hear *nothing at all* on opening the key, and the very slightest of clicks, if anything, on closing the key. Then, just to make sure you haven't introduced a chirp or a bad terminal yoop (which you'll find, if you're keying an oscillator and know what to listen for), you tune in a harmonic of the signal — 14, 21, or 28 Mc. — beating against your frequency standard or some steady source, adjust the VFO for a low beat note (pitch, not volume) and send long slow dashes. If all is still well, quit; you're ahead of the game.

This particular rig took 0.01 μf. right across the key, in series with the key a big old Thordarson choke heavy enough to have lots of henrys at quite a number of milliamperes, and 2 μf. across the key leads on the transmitter side of the choke. W2—— thought the signal was too soft as he listened to it on his own receiver, but after coming over here and listening, he was more than somewhat enthusiastic about the sound of his signals.

If your rig doesn't need this kind of treatment . . . if your locals can work DX through the edges of your signals . . . if all the problems of keying that plague the rest of us are simple to you, and if you *know* this from having swapped stations with one of your locals — well, congratulations; but would you *please* pass on the dope to some of the guys responsible for those *%$# signals on the low end of 40?

Sweepstakes

(Continued from page 58)

W6SHY....29,106-201-49-A-32
K6BPL....24,192-168-48-A-28
K6CAH....7632- 80-32-A- —
K6AZW....4865- 71-35-B- —
K6CED....2322- 43-18-A- 9
W6WSS....825- 25-11-A- 5

Santa Barbara

K6CKU....3237- 83-13-A- 9

WEST GULF DIVISION

Northern Texas

W5COF....11,408-100-39-A-26
W5ESR....7079- 72-33-A- 9

Oklahoma

W5CYQ....19,845-210-49-B-31

Southern Texas

W5UBN....51,557-261-67-A-35
W5HQR....36,462-206-59-A-30
W5RSN....30,857-272-59-B-32

New Mexico

W3WFV/5..14,108-110-45-A-23
W5BTB....7685- 70-37-A-17

CANADIAN DIVISION

Maritime

VE1VN....7560- 84-45-B-24
VO6U....3333- 51-22-A-11
W4KVM/VO6..90- 6- 6-A- 1
VO6AH....2- 1- 1-A- 1

Quebec

VE2APC...11,016-102-36-A-20
VE2CB....10,919-130-29-A-17

Ontario

VE3BVI....20,592-156-44-A-31
VE3H8J....528- 22- 8-A- 8
VE3DLS....135- 9- 6-A- 3

Alberta

VE6MJ....456- 19-12-B- 7
VE6HM....3- 1- 1-A- 1

British Columbia

VE7MW....10- 2- 2-A- 1

[1] K2IKS, opr. [2] W3WPY, opr. [3] W8ILC, opr. [4] Hq. staff, not eligible for award. [5] W4JLW, opr. [6] W4NTZ, opr. [7] W6FRW, opr.

Strays

At a state prison in Georgia, a boner was pulled and some call-letter license plates came out with inverted Ms in about half the places Ws should have been. Particularly unhappy about the situation were hams who received tags on which both an inverted M and W appear.

Let's be Honest

Everyone has the same equipment to sell ... equipment made by National, Hallicrafters, Elmac, Johnson, Collins, and many others. Why then do so many radio amateurs say, "You'll be far better satisfied if you buy from Stan Burghardt"?

Because

At BURGHARDT'S -- you'll do better on trade-ins ! You'll receive top dollar, and in most cases your trade-in serves as the down payment on new gear.

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At BURGHARDT'S -- no order is too large or small for my personal attention. We'll acknowledge all your inquiries and process all orders the day received.

At BURGHARDT'S -- I personally stand behind every sale, and your satisfaction is guaranteed or your money refunded after a 10 day trial. "At Burghardt's your confidence is our most valuable asset."

Sincerely, 73

Stan

Stan Burghardt - WØBJV

P.S. Write for our latest bulletins. We have hundreds of standard brand pieces of equipment in our trade-in department and prices are realistic !

P. O. Box 41, Watertown, South Dakota

Guys

(Continued from page 84)

A, B and C. $B = A + C$, so the area to be subtracted is $2B$. The area of B is

$$(6)\ (5) = 30, \text{ and } 2B = 60 \text{ sq. in.}$$

$120 - 60 = 60$ sq. in. actual area per bay. Increasing this by 50 per cent, as mentioned above, gives a figure of 90 sq. in.

A solid section 12 inches long, having an area of 90 sq. in., would have a width of

$$\frac{90}{12} = 7.5 \text{ inches} = 0.625 \text{ ft.}$$

Multiplying by 1.4 to obtain the diagonal gives

$$d = (0.625)\ (1.4) = 0.875 \text{ ft.}$$

This is the d that should be used in Figs. 2 and 3. Tables I and II give the values of K and M.

Guy Wires

Guy wires are usually set at an angle of 45 to 60 degrees with the horizontal, and unless absolutely necessary, this angle should never exceed 60 degrees. Table III gives the breaking strength of 6×7 galvanized sash cord which makes excellent guy wire. Other types of cable will work equally well. However, regardless of the type selected, the guy should have a breaking strength of 4 times the calculated load. The loads calculated by means of Figs. 2 and 3 are, of course, the load on each guy.

TABLE III
6×7 Galvanized Sash Cord

Diam. (in.)	*Breaking Strength (lbs.)*
5/16	126
3/32	283
1/8	504
5/32	756
3/16	1035
7/32	1413
1/4	1836

Base

The cross section of the base supporting the tower may be calculated by the use of the following, referring to Figs. 2 and 3.

$$t = \sqrt{\frac{W}{100}},$$

where t is the side of a square base in feet, and W is the combined weight of the tower, beam and base in pounds. (Concrete weighs about 144 lbs. per cubic foot.)

The depth of the base is determined by

$$h = 1 + \frac{S}{200t},$$

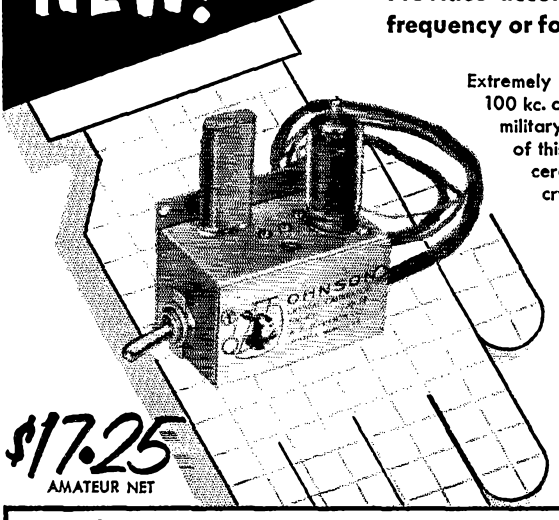
where h is in feet and t and S are given in Figs. 2 and 3.

One last word of caution: Guys should have only sufficient tension to take up any obvious slack.

If the design principles outlined here are followed, your tower should withstand any of the elements with a minimum of maintenance.

NEW! 100 KC CRYSTAL CALIBRATOR

Provides accurate check points for transmitting frequency or for calibrating receivers and VFO's!



Extremely compact, this tiny crystal calibrator provides accurate 100 kc. check points to 55 mc. High quality, hermetically sealed military type crystal is superior to those usually found in a unit of this type. Circuit uses a 6BH6 tube and has an adjustable ceramic trimmer condenser for exact zero beating of the crystal to WWV or other standard.

Measuring only 1⅝" x 2½" x 1½", the chassis may be mounted inside receiver cabinet or in any convenient spot. (Overall height to top of tube is 3⅜".) Power may be taken from your receiver or other source—requires only 6.3 volts at .15 amps. and 150 to 300 volts at 2 ma. Special clips are provided for tube prongs of equipment furnishing power take-off. Power cable and extension leads are included to permit remote mounting of switch. Furnished completely wired and tested with tube.

Cat. No. 250-28 CRYSTAL CALIBRATOR

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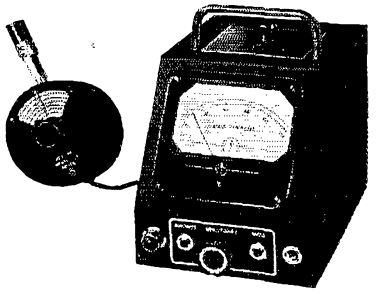

MEASUREMENTS' MEGACYCLE METER

Available in the Following Frequencies:

Model 59 —2.2 Mc to 400 Mc
Model 59 UHF—430 Mc to 940 Mc
Model 59 LF —0.1 to 4.5 Mc

A versatile "grid-dip" meter widely used by engineers, servicemen and amateurs in television, FM, and for many other applications.

MEASUREMENTS CORPORATION
BOONTON NEW JERSEY

5-Over-5

(*Continued from page 37*)

structure has withstood two storms with winds up to 70 m.p.h.

Hurricane Hazel proved, however, that water pipe does not have all the strength needed in an installation of this type. The 95-m.p.h. winds of this storm bent the water pipe about fifteen degrees, but the antenna stayed up. Other materials are now being considered as a replacement for the water pipe. As storms of the intensity of Hurricane Hazel are relatively uncommon in most areas, it is expected that water pipe would be satisfactory for most installations.

The rotator, a Leader Superroter, is located about seven feet below the top of the tower. The 1¼-inch o.d. water pipe fits into the sleeve of the rotator which has a built-in thrust bearing. A second bearing, consisting of a short section of 1⅜-inch i.d. water pipe, is installed at the top of the tower to take care of the side loads. The rotator is designed to withstand thrust loads of 150 pounds, which is about three times the weight of the antenna.

So far, the results with this antenna have been very gratifying. No long-distance schedules have been attempted as yet because of the low power in use (about 50 watts), but during the last *Es* season five new states were added to the total which is fairly good when one is beyond the thirty-state mark. Ground-wave results have been good, with signal reports from stations in the 60- to 120-mile region usually equaling or slightly surpassing reports given fellows in this area who are running higher power in superior locations. Plans are under way to increase the transmitter power to somewhere near one kilowatt. When this is done, some DX schedules will be attempted. It is hoped that others will also build high-power transmitters and large antennas which will make consistent long-distance coverage possible.

A single-bay version of the basic 5-element yagi fed with 300-ohm Twin-Lead is in use at W3OTC. The matching system used for the fed portion. It and the unbroken portion of the dipole are ¾ inch apart, center to center. Results from this installation have been good and indicate that a worthwhile advantage is realized by using an antenna of this type instead of one with fewer elements.

World Above 50 Mc.

(*Continued from page 73*)

from the jack into the receiver, the shield being removed from the wire for the last inch or so. An insulated wire about 1 inch long is then soldered to the plate terminal of the i.f. transformer. (T_2 on the Communicator schematic. The terminal has a short bare lead running to Pin 5 on the first 6BH6.) These two insulated wires are then laid alongside one another for a length of about one half inch, and fastened together with Household Cement. There should

(*Continued on page 146*)

be no electrical connection, of course; merely a small capacitance.

A coaxial lead fitted with a male phono-type connector carries the i.f. output to the antenna terminals of a communications receiver. The receiver is tuned to about 6 Mc. The Communicator can then be operated either as a converter or as a complete receiver at will, merely by turning up its audio gain or that of the communications receiver, whichever type of operation is wanted at the moment.

The oscillator stability of the Communicator does not permit T9 c.w. reception ordinarily, but its front-end noise figure is good and the signal-to-noise ratio on voice is considerably improved when it is used in this way. Signals that can be detected but not copied readily on the Communicator's own i.f. and audio system may come up to solid readability when the communications receiver's selectivity comes into play.

A slight retuning of the Communicator i.f. transformers may be necessary, but this is done readily enough. Just tune the i.f. screws for maximum eye closure on a medium-strength signal. Whether the receiver cable is plugged into the Communicator or not makes no difference in reception. Addition of the small jack on the back of the rig requires only drilling out a couple of the holes in the protective screen cover, so there is no disfiguration that would affect resale value involved.

W2IUI, who suggested the audio-amplifier stunt above, has a hint for a converter-type connection that requires no retuning of the i.f.s. He solders a short lead to the input terminal of the noise-clipper switch, bringing this out the back of the receiver through a 10-$\mu\mu$f. coupling capacitor and an alligator clip, to which may be attached a lead to the communications receiver antenna terminal. The ground return for this circuit is through the receiver antenna coil, and separation of up to several feet is possible as long as there is a common ground for the two units. When the system is not in use the clip should be grounded to the Communicator case.

One more hint from W2IUI. To use a French handset or other combination unit, a lead may be soldered to the speaker connection on the send-receive switch and brought to the unused terminal on the microphone jack, for feeding the earphone unit of the handset.

All these ideas apply to either the 6- or 2-meter Communicator, except that the intermediate frequency is different for the two units. In the 6-meter model the i.f. take-off method shown in the photograph would involve working into the communications receiver at 11 Mc. Coupling in the Communicator should be at the first i.f. plate. If the noise-clipper method of W2IUI is followed, the i.f. will be 1500 kc. in the 6-meter model.

OES News

The OES file is getting fatter by the month. Without much promotion by the Headquarters Staff, the Official Experimental Station appointment is gaining stature steadily. Quite a bit of material for these pages is drawn regularly from the monthly reports of OES appointees. This month we're turning the file over to Ellen White, W1YYM, who gets out an OES Bulletin at intervals when she can find the time. Instead of using the reports in this issue of *QST*, they'll go into the miscellaneous news she has for the Bulletin.

If you're working on the v.h.f. bands regularly you should be enrolled in the ARRL OES program. You report activities regularly to your SCM, and you receive any news or ARRL bulletin mailings that have v.h.f. angles. For more detailed information, write your SCM, or ARRL headquarters.

add POWER to S.S.B. with A.E.C.

W2GG, W9ARK, KV4BB, W1BE, W1CPI, W2GJX, K2DW and W4MT are a few of the KW SSB signals using AEC 1010's. Compare these specs:

A.E.C. 1010:

Tube: One 4-400A
The low-power driving requirements of the 4-400A tube class AB1 lends itself admirably for use with exciters of 4 to 5 watts output.
The series 1010 is a front panel band-switching amplifier with a pi-network tank circuit incorporating a variable vacuum capacitor, forced-air cooling, and complete shielding.
Grid circuit: High efficiency band-switching turret.
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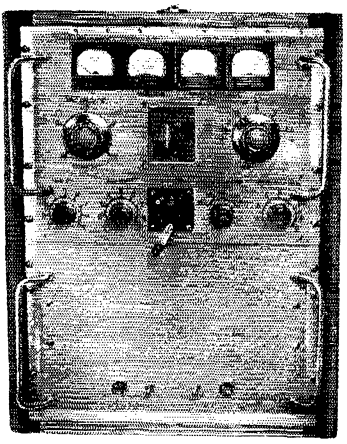

Metering: Four large 3 in. illuminated square meters provides simultaneous Reading of Grid Screen plate and plate voltage. The 1-KW amplifier with its bias and screen supplied is contained in a completely shielded compartment 19" W x 14" H x 13" D. Price complete with tubes $650.00.

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A.E.C.-410:

Tubes: Two 811A Push-Pull
The low driving requirements of the 811A (used in a push-pull plug-in swinging link type final) lend themselves admirably to use with the large number of existing exciters of 4 to 5 watts output.
Size: Table-top cabinet 22" W x 14" x 14¾" D with hinged top. Panel is standard rack size 19" W x 12¼" H.
Price: 410 - 400 Watt Linear amplifier $295.00
Price: 420 - 400 Watt Linear amplifier $335.00

Amateur and Commercial Equipment custom built to your specifications.

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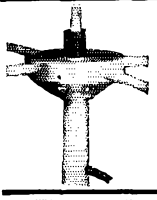
217 MERRICK ROAD, AMITYVILLE, L. I., N. Y.



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. . . for 20, 15, 10, 6, or 2 meters. Hole in bottom threaded for 1" pipe. Holes for antenna and four horizontal or drooping radials will be drilled to fit tubing sizes specified by purchaser.

Postpaid anywhere in U. S. **$6.95**

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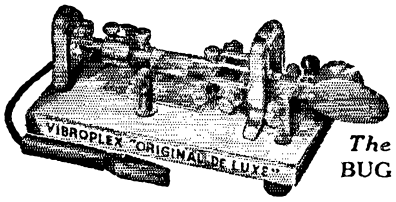

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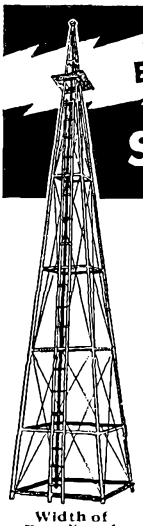

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IARU News

(Continued from page 69)

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Macao: Via Hong Kong
Madeira: Via Portugal
Malaya: QSL Manager, P.O. Box 600, Penang
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Mauritius: V. de Robillard, Box 155, Port Louis
Mexico: L.M.R.E., Liverpool 195-A, Mexico, D.F.
Montserrat: VP2MY, Plymouth
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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: YN1RA, Apartado #926, Managua
Northern Rhodesia: N.R.A.R.S., P.O. Box 332, Kitwe
Norway: N.R.R.L., P.O. Box 898, Oslo
Okinawa: O.A.R.C., APO 331, % Postmaster, San Francisco, Calif.
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
Papua: P.O. Box 107, Port Moresby
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, 34-1, Lisbon
Roumania: A.R.E.R., P.O. Box 95, Bucharest
Salvador: YS1O, 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: P.O. Box 301, Trieste, F.T.T.
Trinidad: John A. Hoford, VP4TT, P.O. Box 554, Port-of-Spain
Tripolitania: 5A2TZ, Box 372, Tripoli
Uganda: P.O. Box 1803, Kampala
Uruguay: R.C.U., P.O. Box 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: S.R.J., Postbox 48, Belgrade

Strays

While operating on 20 meters, W3ZJG heard G3DV, worked G8DV, and then worked none other than PAØDV.

How's DX?

(*Continued from page 68*)

Luis looks forward to meeting many amateurs he has communicated with regularly over the past three decades . . . . . WGDXC items *del Sur:* PY2CK speaks of renewed Trinidad Island DXpeditionary interest. . . . PZ1RM's recent multiband resurgence makes one rare area somewhat less rare. . . . South Shetlands mailboats show up but twice a year, in March and December.

Hereabouts — VP1GG takes stock of the British Honduras ham situation before heading home to England and declares it copacetic: "Several prospective amateurs here. VP1VR newly licensed, VP1s EK and PS soon to be, so B. H. will still be well represented." . . . . . KL7BHL now boards with the Navy on Adak where he's rebuilding and furbishing a cozy hamshack . . . . . DXCCer KL7AFR hit the Alaskan news headlines when his digging for a water well turned into a natural gas strike. Friend KL7AI visualizes a new set of kilowatts and rhombics at the Seaton Service Station, Mile 1235, Alaskan Highway, but KL7AFR is uncuthusiastic about the whole thing. All Bill wanted was a little H_2O . . . . . Other complaints to the contrary, TI2BX reports excellent cooperation from multiplier-hungry on-frequency folk during the A3 periods of the last ARRL DX Test. While W4GTH kept a schedule circuit open for word from TI2BX's son, a Fort Bragg paratrooper, you could have heard a pin drop. But at schedule's end a terse TI2BX "QRZ Contest" brought the roof down . . . . . W0PRM and 9S4AX note that W4TED worked 53 new countries in the aforementioned Test — must have started near scratch! . . . . . W6s ENV and QD dropped in at W4KFC during the Test homestretch to find Vic hovering wild-eyed over a stack of 75A receivers searching vainly for something he hadn't already worked . . . . . W1FTX looks for a new Connecticut QTH to enlarge his DXCC tally while W9ABS, a 40-meter specialist, seeks to clinch his diploma at a new Rock Island, Ill., location . . . . . W4ML would appreciate hints on how to catch up QSLwise with ZC6WF, '47; YA2AB, ZCs 1AZ and 6PR, '48 . . . . . DXers will find a flock of brother owls at the Ohio Valley Amateur Radio Association Picnic at Cincinnati on June 12th. For details check immediately with W4OMW . . . . . Unless your receiver broke down you don't need to be told that YN0YN, operated by W0AIW & Co., made good a determined effort to put a rare Nicaraguan prefix on amateur bands from Corn Island in late April. The chain-reaction ruckus they stirred up kicked off the warm-season DXpeditionary programme with a capital "dah-di-dah." Many of the gang also logged QSOs with YN0YN/MM and YN0YN/KS4.

"Wun-Oh-Wun"

(*Continued from page 45*)

of *my* frequency is automatically blacklisted. When I assign a calling frequency, don't deviate by more than ten parts in a thousand million. I gotta work all the guys who financed this expedition — or else! Wataya think this is anyway, a hobby or something? All needing a QSL card mail ten bucks to DXPEDITIONS, INC., Capone Memorial Building, 7373 Liddy St., Illgokosha. And you boys back at the club if you are listening, I fixed the first day's log like what we agreed, so the cards I left with you are OK. Don't mail them in for DXCC right away as the mail outta these parts is supposed to be slow.

Well, fellows, now you've got it. The "Wun-Oh-Wun" code is as modern as a Mulligan transcription and as keen as Kenton — streamlined to eliminate the sheer drudgery from QSOs and enable you to enjoy other aspects of your hobby. Start using it today and see ham radio as it really ought to be!

POWER

Power Output: Single Side-Band 400 Watts Peak Envelope
C.W.—350 Watts

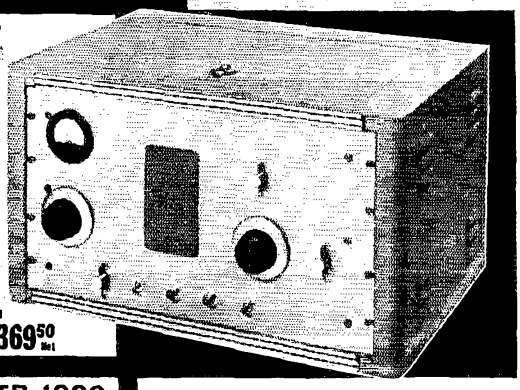
TRANSITRON "500" LINEAR AMPLIFIER

Designed By Hams—To Serve Hams Better

HERE is an "honest to goodness" power-laden linear amplifier that comes right out of the design facilities of Transitron, Inc. So easy to operate, the Transitron 500 is a compact, fully shielded unit, *ideally suited for single side-band operation.*

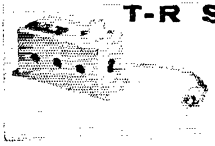
IT HAS *no plug-in coils*, and features a minimum number of tuning adjustments. Field tests have proven the "500" to be of *low harmonic output*, free from parasitics, and with excellent stability on all bands.

- **Single Side-Band Operation**
- **No Plug-In Coils**
- **Low Harmonic Output**
- **Continuous tuning from 3.5 to 30 MC**
- **Driving Power Required: 5 watts**



T-11 **$369.50** Net

T-R SWITCH Model TR-1000



The most practical and efficient answer to operation of amateur and commercial transmitters and receivers from a common antenna. Requires no tuning adjustments of any kind and has a power handling capacity of 1000 watts. **$9.95**

See the Transitron Line at your local parts distributor, or for more complete technical information write

TRANSITRON, INC.
154 Spring Street New York 12, N.Y.

PROFESSIONAL KEY AT A LOW PRICE!

Combining the best features of many amateur and professional models, this semi-automatic key operates with a smooth, easy action. Heavy cast metal base 6¼"x3"x½", attractively finished in black wrinkle enamel. Adjustable from lowest to highest speeds—all hardware and vibrator heavily chrome plated. ⅛" coin silver contacts—rubber mounting feet—circuit closing switch.

Cat. No. 114-520 **$11.50** *Amateur Net*

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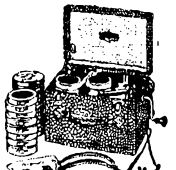
WASECA, MINNESOTA

EASY TO LEARN CODE

It is easy and pleasant to learn or increase speed the modern way — with an **Instructograph Code Teacher.** Excellent for the beginner or advanced student. A quick, practical and dependable method. Available tapes from beginner's alphabet to typical messages on all subjects. Speed range 5 to 40 WPM. Always ready, no QRM, beats having someone send to you.



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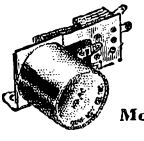
MIDGET ALL-PURPOSE POWER RELAYS BY DOW

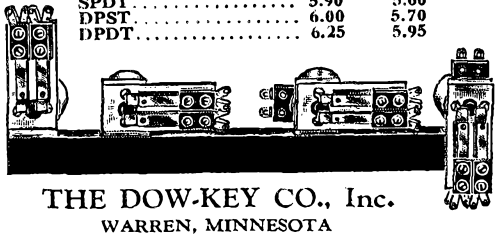


. . . a new class of relay for Radio and Industry

Model DKP **DKP**

SILENT as a DC relay, rated at 25 amps non-inductive load at 110 V . . . mounts easily under a 1½" chassis . . . carefully engineered for control circuits, motor starting . . . quiet, rugged . . . linkage and lost motion eliminated by direct magnet thrust . . . this versatile relay solves mounting problems: easily changed mounting foot allows combinations for chassis, bank or rack mountings . . . heavy leaf springs and 3/16" coin silver contacts with operate time of 2 to 5 milliseconds put the DOW Midget All-Purpose Power Relay in a class by itself.

Contacts	Amateur Net AC	DC
SPST	$5.85	$5.50
SPDT	5.90	5.60
DPST	6.00	5.70
DPDT	6.25	5.95



THE DOW-KEY CO., Inc.
WARREN, MINNESOTA

QST — Volume III

(Continued from page 57)

A "Stray," at 43, June 1920, reads as follows: "5AO, Houston, Texas, sends time signals at 7 P.M. daily and Sunday, followed by a QST weather report; 200 meters, 1-kw."

An item at 44 to 45, June, 1920, announced that commencing June 4th, 1920, and for about 10 days thereafter, the stations of the Inter-City Radio Co. at Chicago, Detroit, and New York, would broadcast "free" I.N.S. PX-reports of the Republican National Convention at Chicago: and that these broadcasts would commence at 6:00 P.M., each day, and continue intermittently all evening. Amateurs were urged to copy these "dot-and-dash" news items, and to supply the same to their local newspapers.

On May 6th, 1920, the First Annual Aviators' Ball was held, at the Morrison Hotel, in Chicago; and between 10:30 and 11:15 P.M., the guests danced to music transmitted by radiophone, from Indianapolis. The Ravenswood Radio Association (of Chicago) set up the technical arrangements.[65]

General Summary:

Volume III figuratively "dumped" a lot of facts into the laps of its readers: but too many of the important tales which it tried to tell lacked accuracy, completeness, and coherence.

Perhaps too many things were happening (and happening too fast) to be handled by the available staff.

The need for saving money must have been constantly felt; because there were ARRL bonds to pay off, League members to be gotten back onto the membership rolls, and some salaries to be paid — including that of the new Editor.

But whatever difficulties the lack of proper editing or reporting caused (both at that time, and in later years), the magazine found high favor with the amateurs of its day; and in consequence, it prospered. — *S.B.Y., WØCO*

R. R. 3, Box 94,
Wayzata, Minnesota,
February 25, 1954.

—···—

Part I of WØCO's index to Volume IV of *QST* will appear in a subsequent issue. — ED.

[65] 43 to 44, July 1920. Apparently, this included the transmitter.

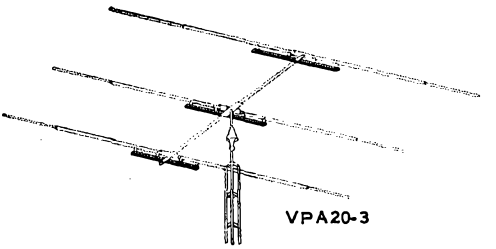
HAM FEATURE!

MOSLEY "Vest Pocket" Rotary Beam Arrays – acclaimed by Hams on every DX band for *True Beam Performance* and heavy duty construction. Up to 7½ Db. forward gain ... puts your signal on top of QRM – makes your DX calls pay off! "V–P" Beams are pre-tuned, easy to assemble. Complete with all parts including factory made matched loading coils.

IN STOCK – FOR IMMEDIATE DELIVERY!

Model VPA1015-2. 2 Element, 10, 11 & 15 Meter V-P Beam. **Amateur Net $39.89**

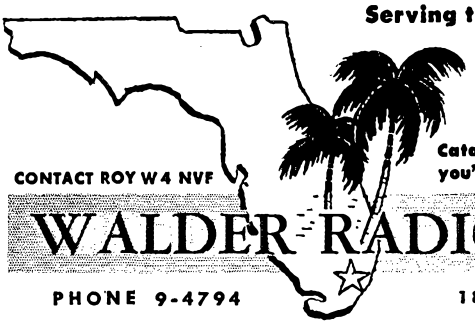
Model VPA1015-3. 3 Element, 10, 11 & 15 Meter V-P Beam. **Amateur Net $59.68**



Model VPA40-2. 2 Element, 40 Meter V-P Beam. **Amateur Net $74.95**

Model VPA20-2. 2 Element, 20 Meter V-P Beam. **Amateur Net $44.73**

Model VPA20-3. 3 Element, 20 Meter V-P Beam. **Amateur Net $66.37**



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RCA INSTITUTES, INC.

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350 West 4th St., New York 14, N. Y.

OFFERS COURSES IN ALL TECHNICAL PHASES OF RADIO, TELEVISION, ELECTRONICS

Approved for Veterans

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NOW AVAILABLE

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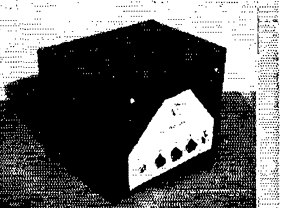
NEW – net 74.50



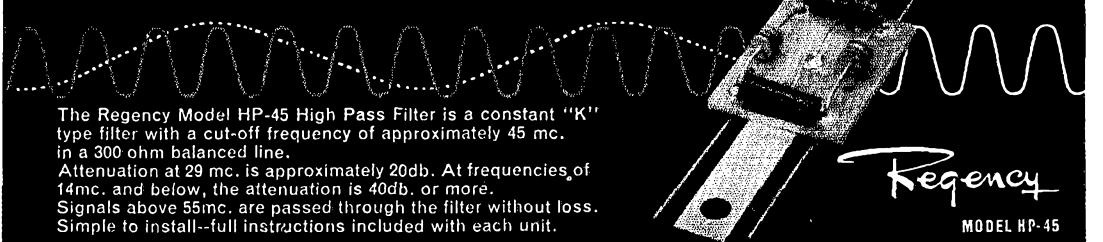
"THE ELECTRONIC FUNNEL"

an improved audio volume compressor with low pass filter

SOONER ELECTRONICS CO.

6239 EAST KING PLACE TULSA, OKLA.

HERE IS AN EFFECTIVE HIGH PASS FILTER TO SUPPRESS TELEVISION INTERFERENCE!



The Regency Model HP-45 High Pass Filter is a constant "K" type filter with a cut-off frequency of approximately 45 mc. in a 300 ohm balanced line.
Attenuation at 29 mc. is approximately 20db. At frequencies of 14mc. and below, the attenuation is 40db. or more.
Signals above 55mc. are passed through the filter without loss.
Simple to install--full instructions included with each unit.

Regency

MODEL HP-45

REGENCY Division of I.D.E.A., Inc., Indianapolis 26, Ind.

AMATEUR NET, ONLY 99c

HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others. No Box Reply Service can be maintained in these columns.

(3) The Ham-Ad rate is 30¢ per word, except as noted in paragraph (6) below.

(4) Remittance in full must accompany copy. No cash or contract discount or agency commission will be allowed.

(5) Closing date for Ham-Ads is the 20th of the second month preceding publication date.

(6) A special rate of 7¢ per word will apply to advertising which, in our judgment, is obviously non-commercial in nature, and is placed and signed by a member of the American Radio Relay League. Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, if by a member of the American Radio Relay League take the 7¢ rate. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising by him takes the 30¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply. To expedite handling of your copy please state whether you are member of ARRL.

(7) Because error is more easily avoided, it is requested signature and address be printed plainly. Typewritten copy preferred, but handwritten signature must accompany all authorized insertions.

(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

Having made no investigation of the advertisers in the classified columns, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

QUARTZ — Direct importers from Brazil of best quality pure quartz suitable for making piezo-electric crystals. Diamond Drill Carbon Co., 248 Madison Ave., New York City 16.

MOTOROLA used communication equipment bought and sold. W5BCO, Ralph Hicks, 204 E. Fairview, Tulsa, Okla.

WANTED: Cash or trade, fixed frequency receivers 28/42 Mc. W9VIY, Troy, Ill.

WANTED: Early wireless gear, books, magazines and catalogs. Send description and prices. W6GH, 1010 Monte Drive, Santa Barbara, Calif.

CODE slow? Try new method. Free particulars. Donald H. Rogers, Ivyland, Penna.

SUBSCRIPTIONS. Radio publications. Latest Call Books, $4.00. Mrs. Earl Mead, Huntley, Montana.

URGENTLY need AN/APR-4 items particularly tuning units for important defense contracts. New high prices. Engineering Associates, 434 Patterson Rd., Dayton 9, Ohio.

OUTSTANDING ham list always. Our prices on trade-ins of all amateur brands are realistic and down to earth. We feature Johnson National, Collins, Hallicrafters, Gonset, Elmac, Harvey-Wells, Morrow, Central Electronics and other leaders. We trade easy and offer our own time-payment plan tailored to fit you. All leading brands of new equipment always in stock. Write today for latest bulletin, Stan Burghardt, WØBJV, Burghardt Radio Supply, Inc., Box 41, Watertown, S. Dak.

DON'T Fail! Check yourself with an up-to-date, time-tested "Sure-check Test." Novice $1.50; General, $1.75; Amateur Extra, $2.00. Amateur Radio, 1013 Seventh Ave., Worthington, Minn.

ANTENNA for bandswitching transmitters up to 300 watts input, approx. 120 feet long, centerfed with 75-ohm line, 70 feet included, low SWR, tunes 80-40-20-10 meter bands. U. S. Patent 2,535,298. Each one tested for resonance on all bands. Send stamp for details. $18.95 each. Lattin Radio Laboratories, 1431 Sweeney St., Owensboro, Ky.

CALL SIGNS — Three color, reflectorized (glass-beaded), aluminum. 4" x 12", $1.50 postpaid, includes mounting frame for car, rig or shack. Lackner, W9WFT, 2029 Bradley, Chicago 18, Ill.

MICHIGAN HAMS! Amateur supplies, standard brands. Store hours 0800 to 1800 Monday through Saturday. Roy J. Purchase, W8RP, Purchase Radio Supply, 605 Church St., Ann Arbor, Michigan. Tel. 8-8696, No. 8-8262.

2-METER aluminum Brownie beams, $22 and up. Write to H. W. Snyder, W3LMC, 4330 Glenmore Ave., Baltimore 6, Md.

WANTED: All types aircraft & ground transmitters, receivers, ART-13, RT18/ARC1, R5/ARN7, BC610E, BC221 mounts and parts wanted. Fairest prices possible paid. Dames, W2KUW, 308 Hickory St., Arlington, N. J.

WANTED: Bargains in transmitters, receivers, laboratory and test equipment, also miscellaneous and unusual gear, etc. What have you? Please state price desired. Especially interested in husky power supplies, large filter chokes and condensers, etc. Also need plate transformers putting out about 4,000 V or more each side center. Harold Schonwald, W5ZZ, 718 North Broadway, Oklahoma City 2, Oklahoma.

BC-348L modified 110 volt, $65, with speaker LS-3: $85. SCR-522 complete $50. K. Horton, 26 Sherwood Road, Stamford, Conn.

FOR Sale: Complete station, Collins 30KI transmitter, 375 phone 500 c.w.; 310E exciter, bandswitching 80 through 10; Astatic D104 mike, NC-183D recvr, relays, spare parts, guaranteed perfect condition: $995 takes all. Not sold separately. W5HEJ, F.o.b. West Monroe, La. 205 Circle Drive.

WILL Pay $150 for good clean AN/ARC-1 20-channel preferred. Also BC-610E, BC-614E, BC-939, BC-729, BC-221, TCS and others. Cash for Sig. Corps, Navy, Air Force stock catalogs; maint. and instr. TM's for war surplus equipment. Amber Co., 393 Greenwich St., N. Y. 13, N. Y.

QSLS? QSLS? Get America's finest and largest variety super-gloss QSL samples 25¢ (refunded). Sakkers, Holland, Michigan.

QSLS. Samples dime. Printer, Corwith, Iowa.

QSLS-SWLS. Meade WØKXL, 1507 Central Avenue, Kansas City, Kans.

QSLS-SWLS. Samples free. Bartinoski, W1YHD, Williamstone, N. J.

QSLS-SWLS. Cartoons, Rainbow, others. Reasonable. Samples 10¢ (refunded). Joe Harms, 225 Maple Ave., North Plainfield, N. J.

QSLS of distinction! Three colors and up. 10¢ brings you samples of distinction. Uncle Fred, Box 86, Lynn, Penna.

QSLS, SWLS. America's Finest!!! Samples 10¢. C. Fritz, 1213 Briargate, Joliet, Ill.

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.

QSLS "Brownie," W3CJI, 3110 Lehigh, Allentown, Penna. Samples 10¢; with catalogue, 25¢.

QSLS! Taprint, Union, Mississippi.

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 10¢. QSL Press, Box 71, Passaic, N. J.

QSL samples. Dime, refunded. Roy Gale, WIBD, Waterford, Conn.

QSLS. Postcard brings samples. Fred Leyden, W1NZJ, 454 Proctor Ave., Revere 51, Mass.

QSLS-SWLS. Samples 10¢. Malgo Press, 1937 Glendale Ave., Toledo 14, Ohio.

QSLS. Nice designs. Samples. Bescsparis, W3QCC, 207 S. Balliet St., Frackville, Pa.

QSLS. Distinctively different. Postpaid. Samples free. Dauphinee, K6JCN, Box 66009, Mar Vista 66, Calif.

QSLS! Modern designs and craftsmanship. Samples 10¢. Tooker Press, Lakehurst, New Jersey.

BEAUTIFUL QSLs. Samples 10¢, catalog 25¢. World Printing, 166 Barclay Ave., Clifton, N. J.

QSLS 2-color 150 $2.00. Guaranteed. Samples 10¢. Bob Garra, Lehighton, Penna.

QSLS. Attractive, reasonable, samples free. Jones, W3EHA, 840 Terrace, North, Hagerstown, Md.

QSLS-SWLS. Samples free. Backus, 5318 Walker Ave., Richmond, Va.

QSLS-SWLS. Varicolored, specialist, 10¢ samples. Snyder, W9HIU, 113 Harrison, Jeffersonville, Ind.

QSLS in the West. Save time, money. Star Printing, 130 S. Glenoaks, Burbank, Calif.

DELUXE QSLS. M. Vincek, W2LNT, 117 Center St., Clifton, N. J.

QSLS — The kind you want. Samples 10¢. Graphic Crafts, Route 12, Ft. Wayne, Ind.

UNUSUAL! Vivacious! Illustrated QSLS, typolithographed. Free samples. WAT, Box 128, Brecksville, Ohio.

ENGINEERING Degrees, E.E. major electronics, earned through home study. American College of Engineering, Box 27724 (D), Hollywood 27, Calif.

WANTED: SX-28A receiver. State price and condition. W8AKY, Kelch, 2857 Ambler Ave., Cleveland, Ohio.

NEW and used Motorola, Link, RCA, G-E, etc., FM commercial communications equipment bought & sold. Allan M. Klein, W2FOU, 95-33 225th St., Bellerose, L. I., N. Y. Phone FL 4-3394.

GIVEAWAY Prices! Army surplus, new radio gear: Dual rotary switch, 16 pole, 15¢; grab bag assortment, $4, 88¢; output transformer and low pass filter, PRI 10,000 ohm, Sec. 4 ohm, pass frequency from 410 to 2000 cycles, 50¢; copper antenna wire, single strand, outdoor covering, 100 Ft. 50¢. Cash with order or C.o.d. Army Surplus Outlet, 91 N. Second, Memphis 3, Tenn.

QSLS. Something new — Different — All printed in 3 colors or more on glossy stock, $3.85 per 100. Preference when ordering such humorous, plain or modern. Be surprised. Satisfaction guaranteed. 2-day service. Constantine Press, Bladensburg, Md.

SELL: Triplett Mod. 650 VTVM. Practically new. In perf. condx. Will take $50. Also: 25-watt mod. xfrmr, Stancor A3845, $6; two filament xfrmrs, 5V, ct, 6A, 2500V insul., $3.00 each; one filament xfrmr, 5V, ct, 3A, 2500V insul. $3.00; two 6mfd, 1500V filter condensers, $2.00 each. All in perf. condx. I will pay shipping. All inquiries ans'd. Wallace L. Cook, W5LPR, 1614 Morson Rd., Jackson 9, Miss.

FOR Sale: Audion dated nineteen four. Price high. W1QZO, Harry Warner, 11 Berlin St., Quincy, Mass.

COMPLETE Station: Viking 1, TVI suppressed, S-40B, Viking VFO, all accessories: $350. K2DQH, Chris Lane, North St., Harrison, N. Y.

TECHNICIANS: Get on six meters fast with Tecraft xtal control mini-converter, 3 tubes. Only $24.95. Mail for details. N.R.M. Wholesale Radio, Inc. 280 Teaneck Rd., Ridgefield Park, N. J.

TELETYPE equipment: Sell Type 12 AH, 60 w.p.m. receiving distributor. W8EB. Aker, 717 No. Ninth St., Cambridge, Ohio.

TELETYPE: Microwave and Servo parts, Wilcox CW-3 receivers and much more for sale or trade for G/R, HP, Ferris, Etc. test gear 1940 or later, any repairable condition, if complete. Standards, Decades, Servo equipment, split and two-phase motors, selsyns and polar coordinate recording milliammeter. Tom Dale, W1TWP, Box 868, Portsmouth, N. H.

LETTINE Mod. 240, with mike, key, xtal, 10 and 40 coils; low-pass filter: $50. Fred S. Eggert, 11833 Wisconsin Ave., Detroit 4, Michigan.

SELL: Collins 75A3, like new, $375.00. Speaker, $14.00; crystal calibrator, $17.00; 32V2, $400. All perfect. W4AHG, Byron, 1226 Wisconsin Ave., Washington 7, D. C.

MILLEN 90881 500 watt R.F. amplifier, improved. TVI-Suppressed. I worked 153 countries with it. $65.00, with coils for 40, 20, 10, pair of 812A tubes. Without power supply. Kenneth Caswell, K2BU, 10 Cunningham, Glens Falls, N. Y.

FOR Sale: HRO60, speaker and coils A, B, C, D, F; Viking II with VFO and Johnson Matchbox, all factory-wired. Also for sale cheap: portable mills, surplus communications receiver, code machine, 25 watt xmtter, office typewriter. K2GGR: Call days GR 7-1959, New York City.

FOR Sale: Collins 30-K transmitter, complete with exciter. Asking $900. Elmer A. Capwell, W1JND, Anthony, R. I.

HALLICRAFTERS S-77A, late model, like new, $80; Viking Mobile with V.F.O., 75, 40, 20, 15, 10 meters; never been installed in auto: $120.00. Shure 101C carbon mike, with coil cable: $12.00. WØKXU, 1579 Milwaukee, Denver, Colorado.

HRO-5A1 (1947 model) wanted. Ed Preston, W5JNO, 6714 Gaston Ave., Dallas 14, Texas.

VIKING Mobile and V.F.O. Wired by professional. Cost $185.00 six months ago. Sell complete for $115.00. Langdon Thaxter, W1MSU, Cumberland Foreside, Portland, Maine.

SURPLUS Navy walkie-talkies with tubes, crystal, complete: *$15.00. Meter bargains from $1.50. Free bargain list. Meshna Enterprises*, 580 Lynn, Malden 48, Mass.

PITTSBURGH Hamfest: Sunday, August 7, 1955, at Totem Pole Lodge in South Park. Save 25% by registering in advance. Send check for $1.50 to William E. Guthrie, 4949 Roberta Drive, Pittsburgh 36, Pennsylvania. Tickets are $2.00 after July 22nd. This is the 17th annual Hamfest of the South Hills Brass Pounders and Modulators.

TRADE or sell: One Stancor *#P8029 1500V*, one *#P8033 2000V* power transformers, two Stancor #C1405 chokes and two Stancor #C1415 chokes. All are 500 Ma., F.o.b. Belvidere. One B & W CX70B Butterfly with disk neutralizers. One B & W 10HDVL coil. Six never used 810s. Want: UTC S-49 power transformer, S-33, S-34 UTC 300 Ma. chokes, Triplett 3256 absorption frequency meter, Viking II transmitter or new Heathkit 125 watt transmitter. Milliammeters. Good communication receiver. Larry Kleber, Belvidere, Ill.

RECEIVERS: Transmitters, repaired and aligned by competent engineers, using factory standard instruments. Collins, Hallicrafters, Hammarlund, National. Our nineteenth year. Douglas Instrument Laboratory, 176 Norfolk Avenue, Boston 19, Mass.

GOING SSB! Selling Viking II with Johnson LPF, Viking VFO factory built, T-3 mike, Vibroplex bug, all less than six months old, for $275.00 Cash. No shipping. W2IPA, 226 Clifton Ave., Staten Island, N. Y.

COMPLETE Station I-A, TVI-suppressed; S40B. K2DQH, Chris Lane, North St., Harrison, N. Y.

FOR Sale: Globe Champion transmitter, fone/c.w. TVI-suppressed, *$150.* B. J. Parisi, Box 1005, Onset, Mass.

SELL: S40B receiver, in excellent condition: $85.00. W9FJH, Molls, Jr., 3419 W. 112th Pl., Chicago, Ill. Phone: Hilltop 5-1164.

SELL Model 240 Lettine transmitter (improved link or Pi-net output, TVI-suppressed; coils for 20, 40, 80); $55.00; Lettine VFO (improved single calibrated dial); $35.00 — both: $85. Guaranteed! N. L. Rowe, K2DFW, 85 Huron Rd., Bellerose, L. I., N. Y.

RECEIVER: NC183D, less speaker, like new! $250.00. F.o.b. New Haven, Conn. Roy Riley, 103 Atwater St., New Haven, Conn.

WANTED to buy or rent: the book "Two Hundred Meters and Down" by Clinton de Soto. Emmons, W9FWD, 1125 Pierce Ave., Marinette, Wis.

COLLINS 32V3, $595.00; 75A2, $325.00. Both: $875.00. Two years old. In perfect condition. Pickup deal only. Write Al Bein, K2BWQ, 26 Lenox Ave., Clifton, N. J.

FOR Sale: Hallicrafters Echophone EC-3 ham receiver, R. F. stage, xtal filter, S meter, noise limiter, monitor, bandspread with original instruction booklet: $40.00. Dom Garofano, W3VMJ, 4332 Germantown Ave., Phila. Penna. Tel: DA 4-3036.

CANADIANS! Selling out! Large assortment of electronic parts and equipment. Write for free list and prices to W. J. Ford, 36 Deloraine Ave., Toronto 12, Ont., Can.

WYOMING Hamfest July 23–24. Ham vacation in beautiful Big Horn Mountains. Information from W7QPP.

FOR Sale: Heathkit AT-1 transmitter, AR-2 receiver, AC-1 antenna coupler, $55.00 takes all. Manikowski, W9JGV, 8235 Strong St., Chicago 31, Ill.

FOR Sale: Concord turntable-amplifier with 2 extension speakers; Dynamic D7T clipper microphone with floor stand; Pr. 810s; ICA code course, 5 records; RCA kw modulation transformer, will match 1:1, 5:1, 25:1; wavemeter. Wanted: *GDO, VTVOM;* Pr. 4-250A; *heavy duty modulation transformer capable of 1.8:1 match;* RG 8/U; RG 11/U; preselector, black ripple 5¼" enclosed rack. Will sell or buy separately or trade for any of the wanted items. W9PWV, Landfield, 821 Waveland Rd., Lake Forest, Ill.

GONSET Bantam 20 Beam. Can be seen operating. Terrific results: $42.00. Want: Gonset Commander, used. Earl Burtman, W1VAN, 18 Earle St., Norwood, Mass.

TRADE: PE-101C dynamotor (converted) for BC-453 (any condition); BC454 or wide-spaced tuning condenser. Byron E. Fortner, W9FYM, RFD #6, Box 370, Indianapolis 27, Ind.

FOR Sale: Brand new condition, Model 2A Marshall 2 meter converter and 12-element Gonset 2 meter beam. Lewis (Rudy) Simmonds, W5CZW, Box 1149, Brownfield, Texas.

RECEIVERS for sale: BC-453, $9.00; BC-454, converted for 110 VAC, $11.00; SX-25, $50.00. RCA ACR-136, $13.00. W1IKW, Birnbaum.

SALE: Motorola Airboy receiver, port., 200 Kc to 400 Kc, $8.00; Dynamotor Eicor 5.6V, 420 volt, 280 Ma., $20.00; commercial power supply 110 AC, 420 volt 200 Ma.; also 6VDC, 6VAC, 13 x 8", $29.00; ARB-1 receiver, converted, power supply, 200 Kc to 9 Mc, $25.00; Ranger surplus recvr 200 Kc, 550 Kc, $5.00; Bud cabinet CR1742, 14" x 19", $7.00. Gifford, W5SVB, 1412 No. Manhattan, Amarillo, Texas.

FOR Sale: Super Pro 400 SX, in excellent condx, new set of tubes, clean as new, $250.00. F.o.b. Albuquerque, N. Mex. R. J. DeLorenzo, W5BJQ, 3242B "A" St., Sandia Base, Albuquerque, N. Mex.

BARGAINS: With new guaranteed: R-9-er, $12.50; S-72, $59.50; SW-54, $32.50; S-83C, $35.00; S-40B, $79.00; Lysco 600S $129.00; S-27, $99.00; SX-43, $129.00; S-76, $149.00; SX-71, $169.00; SX-42: $189.00; HRO-50, $275.00; Eldico TR75TV $49.50; Heath AT-1, $25.00; HT-17, $32.50; EX Shifter, $49.00; Globe Trotter, $49.50; Harvey-Wells DeLuxe, $69.00; Viking I, $209.50; Viking II, $259.00; New SS-75, $189.00; early HT-9, $139.00; Globe King, 400B, $359.00; 32V1, $395.00; 32V2, $450.00; 32V3, $550.00. Free trial. Terms financed by Leo, WØGFQ. Write for catalog and best deals to World Radio Laboratories, Inc., 3415 West Broadway, Council Bluffs, Iowa.

WANTED: Instruction manual and wiring diagram for National NC-100XA receiver. V. L. Kline, 73 Rhodes Ave., Akron 2, Ohio.

IRE Proceedings: March 1944 to December 1954, one issue missing; QST 220 issues beginning 1932. Take any reasonable offer. W6FXL, 665 Cliff, Pasadena 8, California.

SELL or trade: L W 2-meter transmitter with tubes and crystal, 2-meter converter with tubes. Need wire or tape recorder or 10-meter phone rig. W5BSX, Burleson, Texas.

SELL: PP 813 CW transmitter in 66" enclosed rack, Heath VFO, 3 element 20-meter and 4 element 10-meter beams: $250.00. Dixie Kieler, W2ZVS, 266 Midland Ave., Montclair, N. J.

SELL: 75A3, just factory realigned and modified including 6DC6, 1st RF for radically improved signal noise ratio, complete with Collins speaker, 3 and 6 Kc mechanical filters, NBFM adapter, xtal calibrator, Panadapter coax connection, $597.50 value. Sold separately, $435.00. 32V2 with internally shielded cabinet plus prefabricated 32V3 final internal shield, 35C2 low pass filter, NBFM adapter, complete set spare tubes including two spare 4D32s: $706.75 value; sold separately, $485.00. Complete package deal: $870.00. Used approximately *30 days* a year during annual vacations from shipboard R/O job. Write to W2MZF, Ed Astfalk, 14 Beekman Place, Glen Rock, N. J. Phone GIlbert 4-4727.

FREQUENCY change kit: 6 Johnson pressure condensers type 750-FVSP-250, w/758 max. 226.8 min.; also variable broadcast xmitting hi-voltage capacitors and other parts for kit. All in original cases. Everything for $400.00. H. J. Abrams, 124 L St., N.W., Washington, D. C.

SELL: Globe King 400B, push-to-talk, like new. All coils 80 thru 10; BC696, BC457 and BC459; WRL 500 watt ant. tuner. $450.00 cash takes all. W5UQK, Collins, 5512 Crawford St., Houston, Texas.

FOR Sale or trade: Viking Adventurer; Bandmaster; LM10 freq. meter; *Heathkit VFO, NC-88* and other gear. Cash or high power transmitter wanted. No reasonable offer refused. K2KKS, Colston, Box 212, Patchogue, N. Y. Tel. PAtchogue 3-0186.

HARVEY-WELLS TBS50C: $65.00 and Morrow 5BR converter, $40.00. In good condx. Wally Ruda, W2MTT, 56 Barbara Pl., Buffalo 25, N. Y.

FOR Sale: Gonset 2-meter converter. In new condx. Used only about five hours: $40.00. Larry Cohen, K2KGB, 100 Brook Ave., Passaic, N. J.

COLLINS 75A2, late model, in excellent condx: $285; 6 ft. enclosed relay rack, with dolly: $30.00. WIQKP, Vigoda, 25 Lafayette Rd., Newton 62, Mass. Tel. BIgalow 4-6340.

COLLINS 32V3, L/p filter, spare 4D32, perfect, $595; also 75A-2A, 3 & 6 Kc xtal cal., latest modifications, speaker, $425. Both for $995 F.o.b. Cincinnati. Write: Mel Aichholz, W8LLX, 727 Floral Ave., Terrace Park, Ohio.

RECENTLY factory overhauled 75A-2, $325.00; 32V-3, $550.00. Eight (8) Raycon 3½ ft. horns, $50. George Sperry, 108 Oak Hill, Portsmouth, Va.

4-125As, removed from commercial equipment, in gud condx, all tested 10 meters, $10.00 each. Edward Fraser, W1IMD, 17 Ridge Hill Ave., Malden, Mass.

HRO-60, late model, unused and in original carton: $400; two Eimac 4-250As, new, unused: $60 pair; 4-65As, $25 pair; Jennings vacuum variable 40 *μμf*, $30; BC-453 QS'er, converted with power supply in *dynamotor space*, $30; Thordarson CHT plate *xfrmer* 15P21, 1500/2000/2500/3000 VDC 650 Ma, $75; Jennings UCS variable vacuum 10-200 *μμf*, $50; 4X150A, new, with Eimac air socket, $30; open frame plate xfrmr 600 VDC 600 Ma., $10; Motorola mobile transmitter, unmodified 40 watts with modulator, $20; Motorola 6913 receiver, modified for Gonset triband, $15; 872As $3 pair. John Huey, W9AMU, 390 Hill, Elmhurst, Ill.

HRO50T, with matching speaker; A, B, C & D coils, Select-O-Ject *xtal calibrator, NBFM* in gud condx: *$300 or best offer*; also 10A exciter SSB with a 482 VFO for $115.00. Would like to contact another ham to share expenses for a housetrailer trip around the United States, visiting places of interest. Rogers, W3MER, 1424 Burton St., Whitestone, L. I., N. Y.

SELL: SX-43 with R-42 speaker. In excellent condition: $140. Converted ARC-4 with power supply: $35. W9VIP, Edwards, 477 Robinson St., West Lafayette, Ind.

FOR Sale: Sams Photofact, Vols. 1 thru 18, complete and like new: $180; Stancor battery eliminator, 6 volts, 12.5 amps., $15; three VT127A, $2 each; 5 each 1625 and 1626 at 45¢; one 100TH, $9.00; two 5514, $4.00 each; Babcock mobile power supply, Mod. #PS-4A, like new, $30.00; new JK3910 Kc. xtal, $2.50; new Sola constant voltage transformer, Mod. #7201, $25.00; quantity of old type receiving tubes, unused and cheap. Calvin J. Evans, LaGrange, Ind., W9LTR.

VIKING Mobile xmitter, like new, and complete: $85.00 pp. C. Svoboda, WØLQK, Chapman, Kans.

SELL: SX-25, $85; National NC-120, $130; National FB-7, $35. W1AGE, 44 Seaview, Marblehead, Mass.

2 Meter beams: 6-element, horizontal or vertical, all seamless aluminum. $6.95 prepaid. Wholesale Supply Co., Lunenburg, Mass.

20–15–10 DX bands coming back. The VS baby mobile antenna, beautifully chromed, only 4 ft. high, is a DX natural. Weatherproof High Q plug-in loading coils, with chrome fittings available 75 thru 10. Trim appearance. Changes bands instantly. Adjustable to exact frequency. Perfect for 50-watt bandswitching transmitters. Effective on all bands. Replaces cowl or fender whip. Simple installation. Antenna with one coil and mounting hardware, $12.95. Specify band. Additional plug-in coils, $2.75 each. DX 3 coils, special, $17.45. W6VS, Bill Davis, 225 Cambridge Ave., Berkeley, Calif.

LIKE new trade-ins: Collins 75A-3, $450; RME-45, $95; Collins 75A-1, $275; BC-221, $99.50; Collins 30K-1, $950; "A" Slicer, — never used — $60; Mallory VP-552, $19.95; Viking II, $279.95. More! Write for list. Curle Radio Supply, 439 Broad St., Chattanooga, Tenn. 406 Meridian, Huntsville, Ala.

NC-183, extras, $190; Eldico bug, extras, $25; excellent home-brew all-band 6146 VFO c.w. transmitter with complete station control system in grey cabinet, $100. Large 24-hour clock, $5.00. Will ship anything collect on 50% deposit. Money-back guarantee for 10 days. Inquiries promptly answered. S. Baxter, 635 So. Brainard, La-Grange, Ill.

PRINTED circuits made from your drawings. Etched circuit supplies. Rowe Engravers, 492 East 39th St., Paterson, N. J.

FOR Sale: 130 watt, bandswitching, TVI-suppressed, phone/c.w. rig. Parallel 6146 output, 807 modulators. Rig is in 67" Par-Metal Deluxe cabinet. Heathkit VFO included. Best offer takes it. Nick Quackenbush, W3VEJ, 39 Butler St., Kingston, Penna.

WE will be looking for you at the ARRL Central Division Convention at South Bend, Indiana. October 15-16 are the dates. This will be the Big One for 1955! Advance registration $3.50. Write to Box 551. Make checks payable to Central Division Convention. Do it now!

WANTED: 187V English make rectifier tubes, new. Will pay $10 each for two to four such tubes. Captain James Faye, C.A.P., Ottoman, Virginia.

FOR Sale: Central Electronics 20-A exciter with QT-1 anti-trip unit. Practically new, factory-wired, and also matching 458 VFO. Both for $250. Two Hy-Lite Antennae beams, 3-element 10-meter, $25.00; 3-element 15-meter, $30; Radiart TR-2 rotator, complete, $20. W. S. Thomas, 374 Mancha Place, Monterey Park, Calif. Phone ATlantic 2-7797.

WANTED: Complete mobile set-up in perfect condx. First cash deal, late model equipment. State details in your first letter. Write J. H. Field, Box 112, Brownsville Sta., Brooklyn 12, N. Y.

FOR Sale: HRO-60 with coils for A, B, C, D. New condx; no reasonable cash offer refused. No speaker. R. E. Ridenour, 839 Wildwood Pkwy, Balto. 29, Md.

HALLICRAFTERS S-40A, in gud condx: $50 or will trade for 35 mm camera. Dick Keast, W3IDR, 145 Rambling Way, Springfield, Penna.

FOR Sale: One Premad vertical aluminum antenna; adjustable to 35 ft; Model No. 535, with base insulator. New. Price, $40.00. Write to Galen Yust, Box 83, Owatonna, Minnesota.

VIKING II goes to best offer over $225.00. 135-watts not needed for driving new final. K2AHH, Curtis, Jr., 24 North Country Club Drive, Rochester 18, N. Y.

SELL: S-85 Hallicrafters rcvr, brand new, perfect, $97. 1 will ship. Herb Sweet, K2GBH, 2649 Locust Ave., Oceanside, N. Y.

WANTED: NC101X or pre-war HRO in gud condx. State price. W7JFU, Britton, St. Helens, Oregon.

BARGAINS galore! MD-7/ARC-5, $6.95; split stator 200/200 $\mu\mu f$ variable, 6KV, .138" spacing: $12.75; xfrmrs, 24V, 3 amp, $1.79; ASB-5 rcvr (500 Mc.). Uses lighthouse tubes, 60 Mc. IF; FB for amateur TV, new, less tubes, $7.50; Filter chokes: 12H/250 Ma., $2.75; 8.5 H/350 Ma., $4.50; 2.5H/700 Ma., $4.65. Send money order or check. Shipping charges c.o.d. Communications, 131 Liberty St., Dept. Q, NYC, N. Y.

BARGAINS! With new guarantee and completely reconditioned: S38, -$29.00; S40A, $69.00; S40B, $85.00; S-76, $139.00; SX71, $179.-00; SX62, $199.00; NC98, $119.00; HQ140X, $299.00; VHF152A, $49.00; TBS50D, $69.00; Meissner EX, $39.00; Viking Ranger $199.00; Viking II $239.00; Viking VFO, $39.00; Viking Mobile $89.00; HQ129X, SP400X, NC125, NC183D, NC240D, HRO60, AR88, 75A1, 75A2, 75A3, 32V1, 32V2, 32V3, KW1, PMR6A, AF-67, Super 6, Commander, B & W 5100; many others cheap. Shipped on approval. Easy terms. Satisfaction guaranteed. List free. Henry Radio, Butler, Mo.

SELL: Central Electronics signal slicer Model "A", $45.00; SX25 receiver, $40.00; RME MC53 converter, $40.00; an air can demonstrate. Cash deal only; will ship exprrss collect. Also untouched 522, $35.00; 522 receiver, $7.50; BC454 receiver $7.00; W2WEY, Hunt, 20 Midway Drive, Livingston, N. J.

TELETYPE Mod. 12, less keyboard. Also 21-A. Heathkit VFO with FSK, AT-1 transmitter, AC-1 antenna coupler, 300 ft. Amphenol KW twin lead. W4ZPZ, Sheffield, Jr., 1805 Madison Ave., Greensboro, N. C.

SELL: Millen grid dip meter, $40.00; Precision model 85 volt-ohm meter, $20.00; RME100 speech clipper, $27.50; Viking Ranger kit, in factory sealed carton, $160. Woolfries, WØDSP, Box 1264, Sioux City, Iowa.

COLLINS 75A2 factory installed 3 Kc mechanical filter, also latest modification with 6DC6 and has crystal 100 Kc. calibrator; used very little, in original carton in new condx: $350.00 f.o.b. Atlantic City, 2427 Boardwalk, Irv Fishelberg, W2ZLD.

FOR Sale: Elmac A54H and AC power supply: $130.00. Gonset Tri-Band, $25.00. All good as new. Dick Shamis, WØOFL, Valentine, Nebr.

SELL: 125 watt modulator (AM) with speech amplifier, complete with tubes, less high voltage supply. WØDMA, Smith, Caledonia, Minn.

QSLS needed for QSOs with AC2MA, VR2AZ/VRI, VQ1RK, VP2SG, KH6QV/KC6. Anyone having information please write Lt. Col. Lloyd Colvin, 4th Sig Grp, APO #403, NYC, N.Y.

FOR Sale: Three oil-filled transformers, primary 115 volt, secondary 14000/1000/0/1000/14000, $75 each. Original cost over $300.00. F.o.b. point of shipment. W8NFD.

SELL Elmac mobile transmitter AF67 and rcvr. PMR6A. Never used. Best offer. Need VHF152A. Popelarski, W3HDL, 6029 67th Place, Riverdale, Md.

FOR Sale: New and used Gonset mobile equipment. Also two and six-meter Communicators, etc. I buy, sell, exchange mobile gear. Will trade for new and used Polaroid cameras and accessories. R. T. Graham, W1KTJ, Box 23, Stoneham, Mass. Tel. ST 6-1966.

SELL: 250W 'phone-c.w. rig, 812s final, custom transformers and chokes, meters, rack, coils, spare tubes, $125.00; BC-454 rcvr, new, $15; BC-456E modulator, new, $3.00; BC-457 with 80 meter coils, new, $15.00; BC-459, new, $15.00; BC-654A 80-meter 'phone/c.w. recvr/xmittr, complete: $30.00; SCR522 xmittr/recvr, $40.00. Information on request. S. C. Reed, W1NWY/2, 28 Cheshire Road, Bethpage, L. I., N. Y.

FREE LIST: Amateur components, transformers, capacitors, tubes, 274N equipments. New pair 833As, $50.00; transformer 3600 center tapped, 450 Ma., weighs 60#, $25.00. Want: VHF gear. I. Seidman, W2GNZ, 1535 Longfellow, Bronx, N. Y.

VE HAMS! For sale, NC98 with spkr; TA12 transmitter, 500 volt 300 Ma. pwr supply. All for $250.00. Will sell separately. F.o.b. Weymouth, N. S. VE1ML, A. M. Lawley, P. O. Box 139, Weymouth, N. S., Can.

NATIONAL receivers SW-54, NC-88, NC-98, NC-125, NC-183, HRO-60 in stock. Attractive swaps or trades for used ham receivers and surplus equipment. Dynamotors — 6 VDC/420 VDC 280 Ma., good used, $12.95; 12 VDC/400 VDC 500 Ma. including filter base, starting contactor, excellent, $16.95; surplus RG-8/U cable, 100 ft., $5.95; 250 ft., $13.25, 500 ft., $25.00. Free Bargain Bulletin. Visit store for our unadvertised bargains. Lectronic Research, 719 Arch St., Philadelphia 6, Penna.

SELL: Variac, 45 amp, $40.00; new BC-457A, $5.00; new ARC4 RX, TX, $10.00; HQ-129X with speaker, $120; Fil. trans. 11 volt 65 amp, $10.00. W6WYR.

SWAP 3-color QSL printing for small used electric tools, etc. Oscar Craig, Newark, Arkansas.

BC348M, built-in AC supply, $85; T21/ARC5 transmitter converted to 160 M, no power supply, $10; Hickok 214 battery operated VTVM, $20; Gonset noise limiter for auto radio, $5.00; Supreme 589 tube-tester with roll chart, $15; Hallicrafters S41G receiver, $15. Leo Liebl, W9NVS, Medford, Wis.

MUST Sell: Hallicrafters HT-20, TVI suppressed transmitter and Viking 122 VFO, both used less than 10 hours, in perfect condx, all manuals, complete. First $300 takes both. G. Brady, W2NDP, 910 Smith St., Uniondale, L. I., N. Y. Phone IV 6-0680.

COLLINS 32V-3 and 75A-2A with factory installed mechanical filter, FM adapter and xtal calibrator, including 800 cycle and 3 Kc filters. Matching speaker in original carton. Factory tested and hardly used at all. Submit best offer. Charles W. Boegel, Jr., WØCVU, 1500 Center Point Road, N. E., Cedar Rapids, Iowa.

CRESCENT tape-recorder, $50.00; Gonset Commander with VFO, $85; Elmac PMR-6A, 2 pwr supplies, $115; BC-946, 110 VAC, $15; BC-455, 110 VAC, $20; VFO, 40 & 80 meters, $20. Looking for an Ecophone EC-4, S-22R, S-38. W4YN.

SELL: Eldico TR75-TV in good condx: $50.00. Peter Hansen, R.R. #1, Olivet, Mich.

FOR Sale or trade: Crestwood tape recorder, $100. Williamson type amplifier, two chokes, two chassis, KT-66 tubes, $75; Shure 55S multi-impedance unidirectional dynamic microphone $17.50; portable mill, $35; 10-station intercom Master, $15; Crosley 5-tube table radio, $10; Turner BX microphone, $5. All in excellent condx. Satisfaction guaranteed. Priced F.o.b. Rockford, Ill. V. R. Hein, 418 Gregory St.

SELL: 75A3, in excellent condx, used very little. Highest bidder over $475. Manuel Castro, K6AMB, 87 El Vanada Road, Redwood City, Calif.

FD Month Fellows, do you have portable pwr? We have 6VDC Vibrapacks, 400VDC, 100 Ma. output, like new, $12.50; painted, $9.00. All are fully guaranteed perfect, 6#. PE101-C dynamotors, $6.10, brand new, in original boxes, 13#; xtals for 2 meters 8060–8150 Kc, 95¢ ea. Ant. tap switch 11PST, $1.35. John, W2VAQ, Gallagher's Service, Boiceville, N. Y.

COLLINS 32V3 transmitter, like new condx, $525; PE-103 dynamotor, like new, $25; Hallicrafters TW-1000 receiver, $65; S-38C receiver, $25; Don DeShazo, Jr., W9BVC, 529 Blackstone Ave., LaGrange, Ill.

COLLINS 32V2 transmitter, excellent condition, $475. Will consider lower priced transmitter or receiver as part payment. Meissner EX Signal Shifter, $50; Revere T-700 deluxe push-button tape recorder, $145; Solar CC1-60 capacitor analyzer, $25; RCA WV-97A Volt-ohmyst with H.V. probe, $50; Eico 1040 D.C. supply, $17.50. All F.o.b. Baltimore, Md. Robert Wolfe, W3HDT, 2506 East Hoffman, Balto 13, Md.

QUICK sale: Eldico TR-1-TV bandswitched xmttr, pi-net output, with Meissner EX Signal Shifter VFO, 300 watts AM, FM, CW, TVI suppressed. Xmttr used under 100 hours. First $285 steals it. Pick up; will crate only at your expense. G.E. VRS-1 single sideband selector, perfect, $45. Robert Lewin, W2PIE, 28 Fenimore Drive, Harrison, N. Y. Phone Rye 7-3733.

FOR Sale: SX71 Hallicrafters receiver, like new condx, in original carton, instruction manual: $165.00. No speaker. Charles R. Brinton, W1QVL, 1180 Narragansett Boulevard, Cranston, R. I. Phone Williams 1-5285.

SELL: Meisner EX Signal Shifter, with pwr supply and FMX modulator. In excellent condx, $49. WØZHJ, 2444 Dee, Lincoln, Nebr.

WANTED: Viking II, TVI suppressed and VFO. Want to sell BC221AJ frequency meter, 400 cycle modulation, internal VR supply. W2JJY, 3311 Halsey Rd., Fairlawn, N. J.

STOLEN! Hammarlund HQ-140X receiver Sterial No. 3850. Reward for information leading to recovery. Sell: Dumont #241 'scope, $175; Collins 32V-3, $525 and 75A-3 with two filters and calibrator $445, both like new. Want: ARC-1, ART-13, ARN-7, TDQ, APR-4 and tuning units. Tom Howard, W1AFN, 46 Mt. Vernon St., Boston 8, Mass. Tel. RIchmond 2-0916.

FOR Sale: Single Sideband SS75 crystal exciter having upper and lower sideband PA400 linear amplifier to match (450 watt) bandswitching mixer operation 20-40-80 meter. Sacrifice. Like new, in perfect operating condx. W3ALE, Richard M. Krauss, 1220 Wheatsheaf Lane, Abington, Penna.

NEW Hallicrafters SX-96; make offer. S-20R professionally realigned, new tubes: $49.50. New Heathkit VF-1 $19.50. MS-710 code practice oscillator with speaker, $5.50. John Bradley, 41 Cedar Ave., Montclair, New Jersey.

FOR Sale: National NC-183D double-conversion receiver, complete with speaker. In new condition, perfect in every way. No modifications. $100 off amateur net. Will ship. W7TKB, care of Sta. KATL, Miles City, Montana.

GONSET 3-30 $24.95, 6 meter $19.95, 10–11 $24.95, Tri-band $29.95, Super-six $39.95, Signal-slicer $29.95, Commander $99.95; Hallicrafters SX-18 $69.95, SX-24 $74.95, S-38 $34.95, S-38A/B/C $39.95, S-40 $59.95, S-40A $69.95, S-40B $79.95, S-41 $24.95, SX-42 $179.95, SX-43 $129.95, SX-62 $250.00, SX-71 $159.95, HT-17 $39.95, HT-18 $59.95; National HFS $99.95, HRO $99.95, NC-125 $125.00, SW-54 $34.95; Collins 32V1 $375.00, 32V2 $450.00, 32V3 $550.00; Sonar AMP-50 $19.95, CFC $24.95, MB-26 $34.95, MB-611 $14.95, SRT-120P $149.95, V-120 $14.95, VFX-680 $24.95, XE-10 $4.95, MR-3 $29.95, SR-9 $29.95; Meissner 8-C $29.95, EX $44.95, FMX $4.95; other used items available. Free list from W1BFT, Evans Radio, Concord, N. H.

FOR Sale: Heathkit DX-100s, wired and tested: $290.00. We also wire and test any kits. Prompt service. Write Zarfos, W3GES, Red Lion, Penna.

MOBILEERS! Send for your free copy of Mobile Antenna Design. We cater exclusively to supplying the needs and solving the problems of the mobile ham operator. Skyline Electronics — Ham Division, 5835 W. Chicago, Chicago 51, Ill. Tom Kosti, Pres., W9OPU, and W. Vogel, W9BVX.

SELL: Viking II, $240; Matchbox $40, in excellent condition. Only six months old. W9DXS, Embach, 7140 Longacre Rd., Milwaukee, Wis.

10, 15 and 20 meter beams. Aluminum tubing, etc. Perforated Aluminum sheet for shielding. "Radcliff's", Fostoria, Ohio.

300 Watt 813 transmitter, $125; mobile transmitter with dynamotor, $25; VFO, misc. gear, very reasonable. D. P. Tracy, 2233 Michael Dr., Youngstown 11, Ohio.

FOR Sale: 300-watt, 813 final, with pwr supply, built-in bias supply, grid and plate metered, coils 80 and 40 meters. Very nice rig. $50 cash and carry. Write or see WØANK, Nemel Kimberlin, Diagonal, Iowa.

PASS amateur theory exams. Check yourself with sample FCC-type questions and Novice and General Class examinations. All for only 50¢. Ameco Electronics, 1203 Bryant Ave., New York 59, N. Y.

VERTICAL antenna for 20-40-80M. All material and information included. $59.50. No C.o.d. El Cajon Electronic Engineering, 720 S. Joynson Ave., El Cajon, Calif.

WANTED: 20 meter, 10 meter and 6 meter coils for Millen R9'er. W1CUT, de ARRL, 38 LaSalle Rd., West Hartford 7, Conn.

UFO data compiled. W5CA.

SJ6A Hallicrafters receiver, $100; NC183D, $300. All equipment in perfect condition. Clement Gouveia, 3310 63rd St., Sacramento, Calif.

SELL or trade: Collins 32V3. Want 8 mm movie equipment. W9BHV, 857 Burlington Ave., Frankfort, Ind.

PIONEER 6 volt mobile dynamotors, small and efficient, 400 volt at 300 mill int. with base containing A, B, and RF filters: $19.94; G-E relay control containing sensitive 8000 Ohm 1.5 mill relay and other parts, $1.24; G-E 10 μfd 1400 volt oil condenser, $1.44. Send for new Bargain Bulletin. Post Electronics Company, 98 Park Place, New York 7, N. Y.

WANTED: Amateur or govt surplus receivers, transmitters, test equipment, teletype, technical manuals. Cash, or trade for new Johnson Viking, Ranger, Barker Williamson, Hallicrafters, Hammarlund, Harvey Wells, National, Central Electronics, Gonset, Elmac, Morrow, RME, Telrex, Fisher Hi-Fi, Pentron, Bell, etc. Need: ARC-1, ART-13, ARN-7, APR-4, TN-19, TN-54, BC-221, BC-610-E, BC-614-E, BC-939, APN-9, APQ-13, TDQ, APA-11, RA-20, BC-312, BC-312, BC-342, LM, DY-12. New & Used equipment at 44 Canal St., Boston; 60 Spring St., Newport, R. I. Write to Alltronics, Box 19, Boston 1, Mass. (Richmond 2-0048)

BOTTLE Sale or swap: In pairs 813s, $7.50; 803s, $3.00; 805s, $5.00; 8005s, $7.50; Eimac 35Ts, $5.00; HK-54s, $5.00; 24Gs, $2.00; 826s, $3.00; TZ20s, $5.00; 872As, $6.00; T203Zs, $7.50, with fil xfrmer and sockets extra. Need KW final and power supply components. Art, W1MNG, 1702 Main St., Agawam, Mass.

TRADE large HO railroad layout, many unopened kits, for ham gear or what have you. Shelton Morgan, Box 274, Brookhaven, Miss.

ATLANTIC City vacation! Commodore Hotel, Kilowatt accommodations at low power prices. Luxury rooms with bath and radio. Budget special rooms with running water. Write for information and reservations. Ben Robin, W2BIG, Manager, Commodore Hotel, 715 Pacific Ave., Atlantic City, N. J.

ROTARY inductors from BC-375E, in excellent condx. Price: $7.50 postpaid. Mod. xfrmers 811-As to 813, $3.00. C.o.d. Phil Garver, W5ZBI, 2136 E. Newton Pl., Tulsa, Okla.

QRT-TR1 and S76 complete, $210. Separate bids considered. Dr. Guertin, WØUHX, Perry Point, Md.

CASH for your gear. We buy as well as sell. Write for cash offer or trade. We stock Elmac, Gonset, Hallicrafters, Hammarlund, Johnson, Lysco, Master Mobile, Morrow, National and other ham gear. H & H Electronic Supply, Inc., 506 Kishwaukee St., Rockford, Ill.

WANTED: Modulation and driver transformer for BC610E; also tuning units for 7 and 19 Mc. range. Ray Snider, 3008 So. 27th, La Crosse, Wis.

NEW Crystals for all commercial services at economical prices; also regrinding or replacement crystals for broadcast, Link, Motorola, G-E and other such types. 20 years of satisfaction and fast service. Send for L-7 catalog. Eidson Electronic Co., Temple, Texas.

BC-221 AE frequency meter for sale. In flawless condx. Complete with original calibration book and built-in selenium pwr supply: $90.00. Also sell Millen 90800 xmtter with 20 meter coils: $25.00 prepaid. Sonar XE-10 NFM exciter: $20.00 prepaid. Trade almost new Ikoflex IIA reflex camera with Tessar f3.5 lens, leather case and $30.00 cash for HQ-129X with spkr. W9EVI, Reynolds, 1640 Sheridan Rd., Evanston, Ill.

LONG ISLAND Hams! Come to Hams' Heaven. Real bargains in xmitters, recvrs, verticals, mounts, dynamotors, tubes, xfrmers, chokes, condensers and many other parts. Trade-ins taken. Meters repaired and calibrated. Special scales and shunts. Algeradio Electronics Co., 236 N. Franklin St., Hempstead, L. I., N. Y.

TRADE good 5820 Orthicon for gud 5527 Icon. Cleaning house. Send for list. Jeppesen, WØQFZ, 2318 Second Ave., Council Bluffs, Iowa.

SELL Heathkit receiver with cab. New $22.50. James Gaskill, KN6HEW, 125 Estates Street, Livermore, Calif.

LEECE-NEVILLE 6 volt system. 100 amp. alternator, regulator & rectifier, $60.00. Also Leece-Neville 12-volt system 100 amp. alternator, regulator & rectifier, $85.00. Good condition. H. A. Zimmermann, 570 Jamaica Ave., Brooklyn 8, N. Y. Ulster 2-3472.

DIAGRAMS: Ham gear, timers, counters, intercoms, organs, etc. $1.00 each and up. List free. Parks, 104Q SE 57th, Portland 15, Oregon.

WANTED and for sale: Want to buy 10 to 20 2-meter mobile installations, particularly commercial units like those from taxicabs, police, etc. Give complete details and best cash price. For sale: BC-221 frequency meter, Meissner signal shifter, SX-24 receiver, 750 volt 300 Ma. AC power supply. Bruington, W4NJE, Box 246, Lewisburg, Tenn.

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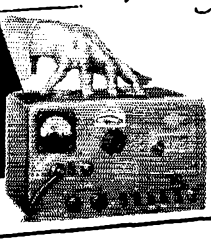
unlimited performance in limited space



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160 THROUGH *6 meters* . . .

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FREQ. RANGE: 1.7-54,mc continuous coverage. ....

TUBES: RF-6AG7, 6146. AF-12AT7, two 7C5's.

POWER REQUIREMENTS: 300-500 V at 200-225 ma., (phone) and 6.3V, AC or DC at 3.15A. Up to 60 watts input, phone or CW.

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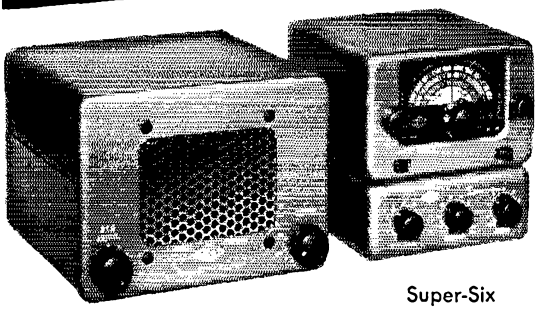
Complete with tubes, less power supply, xtal and microphone. **Net 124.50**

A stable, rugged, tubeless VFO designed expressly for the Commander. Patches to the latter's panel receptacle with flexible cable provided. Calibrated, covers 75-80, 40, 20, 15, 10 meters

Net 29.95

AND WHEN IT COMES TO MOBILE RECEPTION... IT'S



SUPER-SIX AND SUPER-CEIVER

Super-ceiver in conjunction with any good quality amateur converter, such as Gonset Super-Six, provides a complete mobile receiver capable of outstanding performance on phone and CW.

The unit is crystal controlled for maximum stability and utilizes eight tuned circuits at 262 kilocycles for high selectivity. Self contained vibrator power supply furnishes voltage regulated power to converter and to BFO. Latter is highly stable with adjustable pitch control. Separate RF and AF Gain controls, adjustable squelch, effective noise clipper. Built-in speaker with connections for external speaker if desired. Pertinent controls are on a small control head which mounts near the converter for "fingertip" operation. Connecting cables and plugs are supplied. Power pack is designed for quick conversion to 12V DC.

Super-ceiver **Net 119.50**

Super-Six **Net 52.50**

GONSET CO. 801 SOUTH MAIN ST., BURBANK, CALIF.

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Super-Value Knight Push-Button Tape Recorder

A best buy in recorders! Five push-buttons select all operating functions: fast forward, playback, stop, record and fast reverse. Takes up to 7" reels. Two-speed dual-track for wide range of recording times. At 3.75" per second, 7" reel records for 1 hour—and additional hour on second half of tape; at 7.5" per second, records ½ hour continuously, 1 hour overall. 7" reel rewinds in 3 minutes. Response: ± 3 db from 75-8500 cps at 7.5" speed; 80-6000 cps at 3.75" speed. Efficient erase system; "lock" prevents accidental erase. Features: two neon recording level indicators, 2-watt built-in amplifier; 5 x 7" oval speaker. Records from mike, radio, tuner or phono. Handsome 2-tone portable case, 14 x 12 x 9". Complete with mike, take-up reel and 600-ft. roll of tape. For 110-120 v., 60 cycles AC. U.L. Approved. Shpg. wt., 29 lbs. **96 RX 675.** *Only*..... **$89.95**

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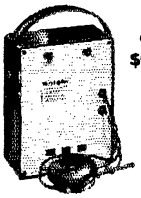

New Low-Cost Knight Geiger Counter Kit

ONLY **$15.95** Get started in uranium prospecting now with this extremely sensitive instrument—comparable to costly equipment, yet easy to build at only a fraction of the price. Just turn it on, flip the high-voltage switch and listen to the clicks in the headphone when you hit a radioactive source. Uses low-cost long-life batteries. Kit includes all parts, tubes, carrying case with handle, 22½ and 1½ volt batteries, radioactive sample and headphone. Complete instructions for quick assembly. 1½ lbs.
83 S 242. *Only* **$15.95**

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ONLY **$29.50** Easy to construct. Complete with built-in voltage regulated power supply. Calibrated for 80, 40, 20, 15, 11 and 10 meters; output on 80 and 40 meters. Features: very high stability; good oscillator keying characteristic for fast break-in; TVI suppression; plenty of bandspread; vernier drive; only 8½ x 6 x 5". Includes all parts, tubes, case and full instructions. Shpg. wt., 8 lbs.
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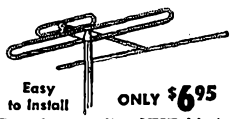
Knight In-Line Antenna Kit



Easy to Install

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Complete quality VHF kit includes: efficient in-line antenna; 5-ft. mast; base mount; 75 feet of 300-ohm train line; five 3½" standoff insulators. Antenna has separate folded dipole for low and high bands, reflectors for high gain on all channels. Elements are ½" seamless aluminum tubing. 10 lbs.
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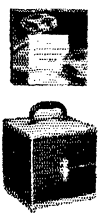
FREE! Tape Carrying Case Worth $5.95 with Purchase of 10 Reels of Quality Knight Tape



$24.85 VALUE ONLY **$18.90**

Buy ten 1200-ft. reels of this top quality recording tape and get the carrying case FREE! Knight tape meets the most critical professional requirements, yet costs far less. Noted for noise-free reproduction and uniform response. ¼" wide, acetate plastic base with red oxide coating mirror-polished for high frequency response and minimum wear on recording heads. Splice-free type "A" (inside coated) tape on 7" plastic reel. Ten reels with carrying case. 13¼ lbs. **96 RX 836.** *Only*.. **$18.90**

Famous Multitester Value

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Reduced from $17.95. Famous name 22-range volt-ohm-milliammeter. Tops for radio servicing. DC ranges: 0-5, 50, 250, 500 and 2500 volts. AC and output voltage: 0-10, 100, 500 and 1000 volts. DC current: 0-1, 10, 100 ma; 0-1 and 10 amps. Resistance: 0-500, 100,000 ohms; 0-1 meg. Decibels, −8 to +55. Large 3" D'Arsonval meter, 2% accuracy. 4½" x 8" x 3". With battery and instructions. Shpg. wt., 3½ lbs.
84 F 393. *Only*..... **$14.95**

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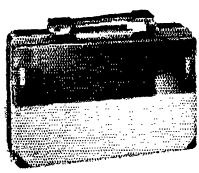
Terrific value 34 piece kit for shop or home use. Polishes, grinds, drills, sands. Includes: ⅛" drill with 3-jaw hand chuck (full load speed, 900 rpm), rubber backing pad, paint mixer, 7 carbon steel bits, lamb's wool polishing bonnet, buffing disc, bench stand, 12 abrasive discs, side handle, 6-piece adapter set, 3" grinding wheel; all in heavy steel kit box; with rack for drills. For 110-120 v. AC or DC. Wt., 6 lbs.
46 N 289. *Only* **$14.95**



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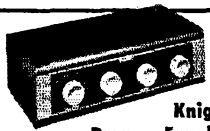

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ONLY **$32.95** Reduced from $36.95. Control unit for any basic Hi-Fi amplifier. Response, ± 1 db, 30-30,000 cps; 3-position record compensator; 4 inputs: magnetic phono, tuner or crystal phono, tape, microphone; output, 2.5 volts, hum, −65 db. 3½ x 11½ x 5½". 7 lbs.
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ONLY **99¢** Brand-new, famous name JAN-surplus transmitting tube. 5 prong base; 6.3v. fil.; max. plate v. (CW) 750; max. plate curr. (CW) 100 mc.
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ONLY **$5.95** Famous Swiss-style knife with 8 blades of finest Solingen steel. Includes: 2¾" blade; 2" blade; screwdriver-bottle opener-wire scraper; Phillips screwdriver; reamer; can opener; 3" saw; scissors with spring-return handles. Highly polished blades; with belt loop; army-type red molded sides. A great value.
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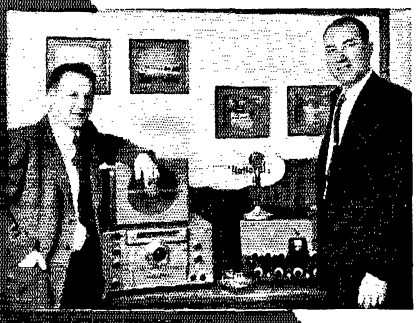
dream receiver contest!



ENTRY BY CURT OLAFSSON, SAN FRANCISCO IS BEST SUBMITTED BY THOUSANDS OF HAMS

National *knows* what features amateur operators seek most in a receiver! For months we've conducted our "Dream Receiver" contest to find out. Thousands of hams around the world submitted suggestions for the receiver they considered to be ideal.

Judged best of all by National's panel of experts were the suggestions submitted by Curt Olafsson, WOGTY, of San Francisco. Congratulations to him, and to the other contest winners named here. And thanks to the thousands of other amateurs we heard from, too.

Actually, *every ham operator everywhere* is a "winner" in National's contest—for its purpose was to enable us to be sure that National products have all the features hams themselves consider to be most desirable.

Watch for the announcement of National's new "Dream Receiver"—the result of this world-wide search for the features ham's want most in a receiver.

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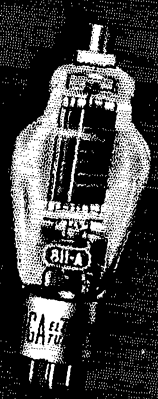


RCA-811A. Little giant of the power triodes. 260 watts input, class CW; 175 watts, phone; 235 watts, rf linear single-sideband. All inputs are ICAS.

Take Hallicrafters' new "high talk power" linear, for example.

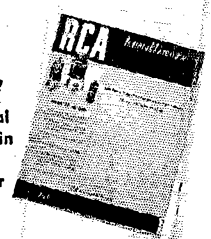
Capable of delivering a real S-meter kick from "10" to "80", this versatile single-sideband final—*operates with two RCA-811-A power triodes.*

The RCA-811-A appeals to the designer and operator for these reasons: it is a high-perveance type—delivers high power at moderate plate voltages—has an extremely high mu—operates virtually at zero bias. RCA-811-A is a true radio-frequency type—takes full plate input *up to 30 Mc!* RCA-811-A is economical—handles more watts input for your dollar.

Preferred for years by amateur and commercial designers, RCA high-perveance triodes and beam power tubes are available in a wide choice of ratings. Your RCA Tube Distributor handles the complete line. For technical data on the RCA-811-A, write RCA, Commercial Engineering, Section F37M, Harrison, N. J.

WHICH RCA TUBE FOR SINGLE-SIDEBAND?

See listing—with typical operating conditions—in new RCA Headliners for Hams. Free—from your RCA Tube Distributor.



Close-up view of the Hallicrafters HT-31 Linear Power Amplifier—using two RCA-811A's.

RCA® RADIO CORPORATION of AMERICA
ELECTRON TUBES
HARRISON, N.J.

BOARD MEETING HIGHLIGHTS

The Board of Directors of the American Radio Relay League, Inc., sat in annual meeting at Hartford, Connecticut, on May 13th and 14th. In sessions running well into the second day, the Board carefully examined the progress of the League during the year previous and reached policy decisions charting a course for the future.

An ARRL National Convention was authorized for 1956 to be held in the San Francisco area, subject to completion of plans; the sponsor is expected to be the Central California Radio Council.

So that the views of the Pacific Division could come before the Meeting, the Board invited former director Ray H. Cornell, W6JZ, to participate in the discussions, but necessarily without vote (Mr. Cornell, by recently accepting employment in the radio industry, had rendered himself ineligible to continue as Director but there was insufficient notice to permit the new director, Harry M. Engwicht, W6HC, to reach Hartford for the Meeting).

The Board re-designated Percy C. Noble, W1BVR, ARRL Vice-President, to serve on the Executive Committee, and to that Committee also reappointed Vice-President F. E. Handy, W1BDI, Treasurer David H. Houghton, and Northwestern Division Director R. Rex Roberts, W7CPY, for one-year terms. The Board continued its appropriations for field organization travel for SCMs, SECs and QSL Managers, including provisions for SCM and SEC travel in the territories and possessions. The salary of the ARRL's General Manager was increased to $18,000 per year.

Regulationwise there is to be a study of the desirability of permitting frequency shifts of less than 850 cycles in F.S.K. emission; if the results are favorable, the Commission will be asked to amend our rules accordingly. Studies are also to be made of the desirability of upgrading the level of the written examination for the Novice Class licenses, and of using WT as the prefix to identify Technician Class licensees. The General Manager was instructed to continue efforts to seek a relaxation of the power limitation on the 420-Mc. amateur band, to the extent it is feasible.

As indicated by a number of commendatory actions, the Board in its examination of our affairs found the League and amateur radio in a most satisfactory status. Bouquets were tossed to the Headquarters for its performance during the year, and additionally to the *QST* staff; to the field Engineering and Monitoring Bureau of the Federal Communications Commission for its continued fine coöperation with the amateur radio Service; and to volunteer League field organization workers (SCMs, SECs, QSL Managers, ECs, etc.) for their outstanding achievements during the year.

By a rising vote of applause, the Board of Directors took note of the attainment by Canadian Director Alex Reid, VE2BE, on January 1st, of 25 years of continuous service on the League's governing body. Congratulations were also expressed to three Headquarters' staff members upon completion, during the past year, of 25 years service: Technical Director George Grammer, W1DF; *QST* Technical Assistant, C. Vernon Chambers, W1JEQ; and Communications Department Administrative Aide Lillian M. Salter, W1ZJE. The Board registered its deep regret over the passing of Karl W. Weingarten, W7BG, Northwestern Division Vice-Director and for many years its Director, and Hugh L. Caveness, W4DW, for many years Director of the Roanoke Division.

Minutes of the meeting will appear in July *QST*.