

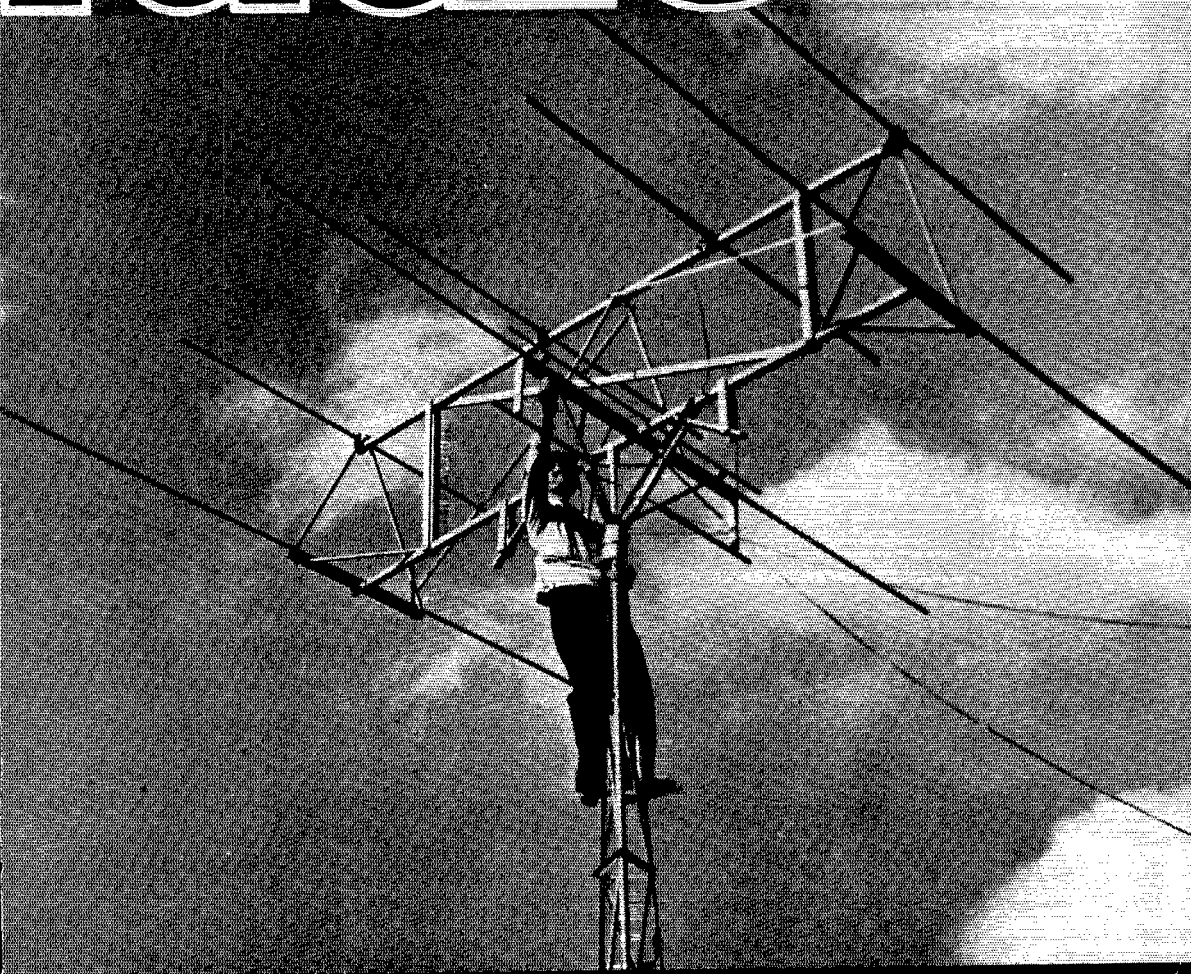
QST

January, 1947

35 Cents

devoted entirely to

amateur radio



PUBLISHED BY THE AMERICAN RADIO RELAY LEAGUE

FOR HIPERM ALLOY TRANSFORMERS

The UTC Hiper alloy audio transformers are specifically designed for portable and compact service. While light in weight and small in dimensions, neither dependability nor fidelity has been sacrificed. The frequency characteristic of the Hiper alloy audio units is uniform from 30 to 20,000 cycles. These units are similar in general design and characteristics to the famous Linear Standard audio Series.

UTC Hiper Alloy Transformers Feature

- True Hum Balancing Coil Structure
- Balanced Variable Impedance Line
- Reversible Mounting
- Alloy Shields
- Multiple Coil, Semi-Toroidal Coil Structure
- High Fidelity



FOR IMMEDIATE DELIVERY

From Your Distributor

Type No.	Application	Primary Impedance	Secondary Impedance	\pm 1 db from	Max. Level	Max Unbal. DC in primary	List Price
HA-100	Low impedance mike, pickup, or multiple line to grid.	50, 125, 200, 250, 333, 500 ohms	80,000 ohms in two sections	30-20,000	+22 DB	5 MA	18.60
HA-100X	Same as above but with tri-alloy internal shield to effect very low hum pickup.	50, 125, 200, 250, 333, 500 ohms	120,000 ohms over all, in two sections	30-20,000	+22 DB	5 MA	23.95
HA-101	Low impedance mike, pickup, or multiple line to push-pull grids.	50, 125, 200, 250, 333, 500 ohms	135,000 ohms 1.5:1 ratio, each side	30-20,000	+22 DB	5 MA	21.25
HA-101X	Same as above but with tri-alloy internal shield to effect very low hum pickup.	50, 125, 200, 250, 333, 500 ohms	50, 125, 200, 250, 333, 500 ohms	30-20,000	+22 DB	5 MA	26.60
HA-108	Mixing, low impedance mike, pickup or multiple line.	8,000 to 15,000 ohms	50, 125, 200, 250, 300, 500 ohms	30-20,000	+22 DB	0	18.60
HA-106	Single plate to push-pull grids	8,000 to 15,000 ohms	50, 125, 200, 250, 333, 500 ohms	30-20,000	+22 DB	1 MA	15.95
HA-113	Single plate to multiple line.	8,000 to 15,000 ohms	50, 125, 200, 250, 300, 500 ohms	30-20,000	+32 DB	5 MA	17.95
HA-134	Push-pull 89's or 2A3's to line.	5,000 to 10,000 ohms	30, 20, 15, 10, 7.5, 5, 2.5, 1.2	30-20,000	+32 DB	5 MA	19.95
HA-135	Push-pull 2A3's to voice coil.	3,000 to 5,000 ohms	30, 20, 15, 10, 7.5, 5, 2.5, 1.2	30-20,000	+32 DB	5 MA	18.60

The above listing includes only a few of the many Hiper alloy Transformers available... write for catalog.

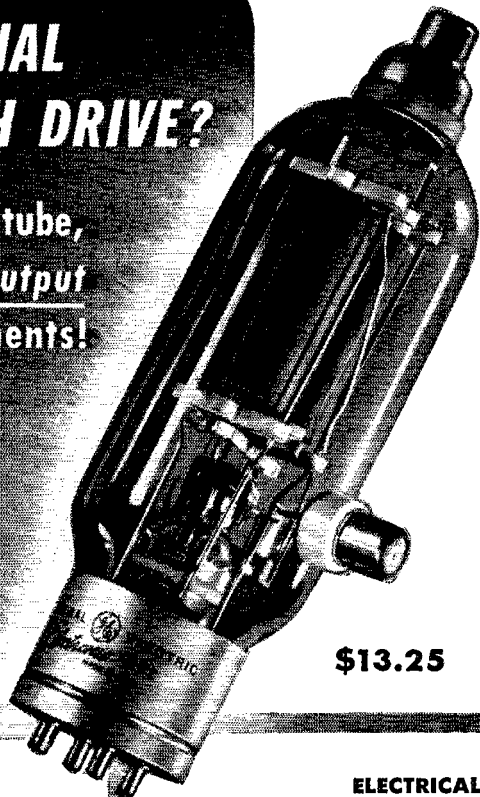
United Transformer Corp.
 NEW YORK 13, N. Y.
 150 VARICK STREET
 EXPORT DIVISION: 13 EAST 40th STREET, NEW YORK 16, N. Y.
 CABLES: "ARLAB"

DOES YOUR FINAL CALL FOR TOO MUCH DRIVE?

... then plug in this G-E tube,
and have high power output
with low drive requirements!



"DRAGS IN THE DX"
GL-8000 TRIODE



\$13.25

JUST because your final hasn't the drive you'd like, don't give up on reaching hams overseas! A GL-8000's husky 500 watts of input only requires 8 watts' driving power.

Two of these power tubes in your *new* rig, will save cost because they demand less drive—perhaps direct from your V.F.O.!

All of which underscores the GL-8000's desirability for your final. With this efficient triode, you'll be following the smart modern trend toward bigger output from smaller tubes needing less driving power.

Frequency at max ratings ranges up to 30 mc, to include 10-meter work. At reduced ratings, Type GL-8000 will operate up to 100 mc, or well beyond the 6-meter band.

Sturdiness is a feature of the GL-8000—triodes being characteristically straightforward in design. Also you get *ease of installation*. Hams know by experience that triodes usually "perk" the first time they're plugged in.

Your nearest G-E tube distributor will tell you more about Type GL-8000, as well as the G-E amateur tubes listed, rated, and priced in Bulletin ETX-19. He has your copy of this handy summary waiting for you. Or write *Electronics Department, General Electric Company, Schenectady 5, N. Y.*

ELECTRICAL CHARACTERISTICS

Filament voltage	10 v
Filament current	4.5 amp
Amplification factor	16.5
Capacitances:	
grid-plate	6.4
input	5.0
output	3.3

RATINGS FOR TYPICAL OPERATION (CCS)

	Class C Telephony	Class C Telephony (plate-modulated)
Plate voltage	2000 v	1,600 v
current	250 ma	210 ma
input	500 w	335 w
dissipation	125 w	85 w
Driving power (approx)	8 w	8.5 w

NOTE—Extreme driving economy, and long life, result from operating the GL-8000 at CCS ratings. However, if maximum "punch" is desired, ICAS ratings allow 1-kw input on phone, or 1½-kw input on CW, for a pair of these tubes.

SO YOU CAN HEAR DX BETTER

The R-9'er, a 1-tube wide-band pre-amplifier, is described in Nov.—Dec. issue of G.E.'s "Ham News". Study this low-cost device which turns small receiver signals into B-I-G Your G-E distributor has "Ham News" for you.

ELECTRONIC TUBES OF ALL TYPES FOR THE RADIO AMATEUR

GENERAL ELECTRIC

161-P2-8850

how **AMPHENOL** eases television's growing pains

A glance at the new Duodecal socket shown below will demonstrate the complete fulfillment of television's demand for a socket of full flexibility and highest quality for the new series Duodecal base television viewing tubes.

This is typical of the pioneering which has established Amphenol leadership in the design and manufacture of TV and FM components.

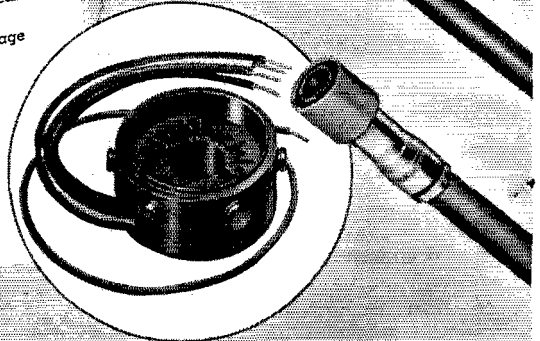
The activity of Amphenol engineers in the higher frequencies enables them to sense in advance the needs in these fields. The new Duodecal socket is but one of many such Amphenol firsts which include efficient Hi-Q tube sockets, octal angle sockets for cathode-ray and other tubes, Twin Lead parallel transmission line, FM and television receiving antennas, solid dielectric coaxial cables, and special-use cables for television color cameras and for facsimile.

Write for Data Sheets on these new products.

AMERICAN PHENOLIC CORPORATION
CHICAGO 50, ILLINOIS

FEATURES OF THE DUODECAL SOCKET

- Six locations for bringing leads out radially in one bundle assure a neat wiring harness, and minimum space requirement.
- Rear socket cap totally encloses connections, eliminating breakage at solder terminals due to flexing. Electrical shock hazard is minimized.
- An extra opening is provided for bringing high-voltage grid lead out separately when this is desirable.
- Latest wrap-around type cadmium-plated phosphor-bronze contacts provide four lines of contact on each tube pin.
- Cap and body of socket are molded black electrical bakelite.
- Spring-ring assembly eliminates screws and drive pins.



COAXIAL CABLES AND CONNECTORS • INDUSTRIAL CONNECTORS, FITTINGS AND CONDUIT • ANTENNAS • RADIO COMPONENTS • PLASTICS FOR ELECTRONICS

JANUARY 1947

VOLUME XXXI

NUMBER 1



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QST

devoted entirely to

AMATEUR RADIO

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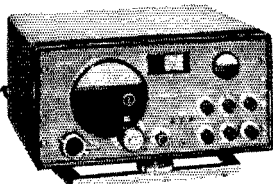
A "third hand" to help you

reach for new horizons . . .

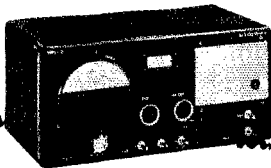
THE *New* hallicrafters SKYRIDER PANORAMIC

Hallicrafters Sky rider Panoramic, Model SP-44 is actually a "third hand" to help you reach for new horizons in ham radio. The Panoramic shows not only the received signal but every signal 100 kc on either side of the received signal... provided visual sweepwidth is set at maximum. By making a wide range of radio signals visible a new dimension is added to the field of radio operating. Listed at right are a few of the things Panoramic enables you to do:

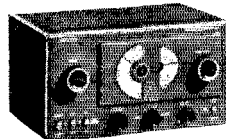
1. Spot frequency modulation or parasitics on an amplitude modulated signal.
2. Measure percentage of modulation and the quality of the signal being transmitted under all conditions.
3. Read signal strength instantaneously, aiding in quickly adjusting the output stages of the transmitter or the field strength of directional antennas.
4. Check other frequencies against known standards or the receiver calibrations. Any frequency drift can be spotted immediately.
5. Show where and how much to shift frequency to avoid interference once a QSO is under way.



MODEL SX-42. Described by hams who have operated it as "the first real post war receiver." One of the finest CW receivers yet developed. Greatest continuous frequency coverage of any communications receiver—from 540 kc to 110 Mc, in six bands. FM-AM-CW, 15 tubes. Matching speakers available.



MODEL S-40. Function, beauty, unusual radio performance and reasonable price are all combined in this fine receiver. Overall frequency range from 540 kc to 43 Mc in four bands. Nine tubes. Built-in dynamic speaker. Many circuit refinements never before available in medium price class.



MODEL S-38. Overall frequency range from 540 kc to 32 Mc in four bands. Self contained speaker. Compact and rugged, high performance at a low price. Makes an ideal standby receiver for hams. CW pitch control is adjustable from front panel. Automatic noise limiter.

SEE THESE THREE GREAT NEW HALLICRAFTERS RECEIVERS



Photo above shows Hallicrafters SP-44 Panoramic in use with Hallicrafters receiver, the Model S-40.

TEN TUBES INCLUDING CATHODE RAY TUBE **\$99⁵⁰**

No modifications are necessary in your receiver in order to connect the Model SP-44. It does not interfere in any way with normal receiver operation. The Skyrider Panoramic may be used with new and old Hallicrafters models or any receiver having an IF frequency range between 450 and 470 kc. The Panoramic picture which is presented on the scope screen

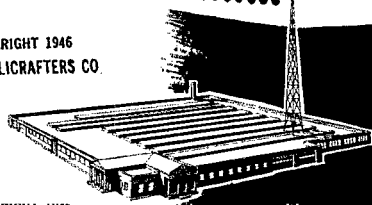
through a specially processed green filter appears bright and sharp. Easy to read in a normally lighted room. Just four simple operating controls make it easy to handle. Get the help of this valuable "third hand" in opening new ham horizons. Order from your local distributor today. Specify: Hallicrafters Model SP-44 Panoramic.

BUILDERS OF

Skyfone

AVIATION RADIOTELEPHONE

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THE HALLICTRAFTERS CO.



hallicrafters RADIO

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Sole Hallicrafters Representatives in Canada:
Rogers Majestic Limited, Toronto-Montreal

Section Communications Managers of the ARRL Communications Department

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

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NOW THE 4X500A POWER TETRODE

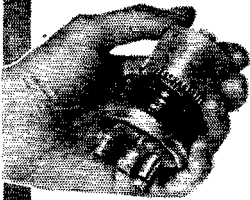
Now, with the new 4X500A, the advantages of the Eimac-designed tetrode are brought to the 500-watt class.

The 4X500A includes the outstanding VHF performance, stability, ruggedness, and freedom from undesirable primary and secondary grid emission that have made the Eimac 4-125A and 4-250A the obvious choice of transmitter engineers for important sockets in both low-frequency and VHF applications.

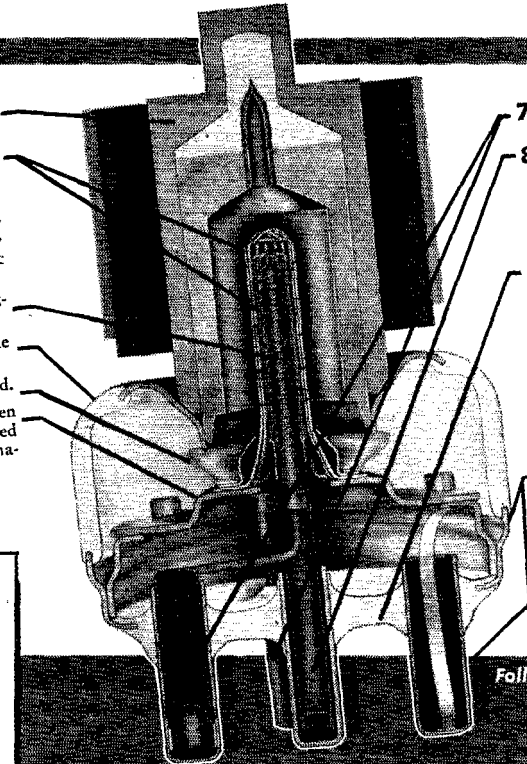
Here is a transmitter-man's tube intended to make life more simple for the transmitter engineer. The 4X500A is designed for functional application; note the nearly perfect shielding between grid and plate circuits made possible by the low-inductance

screen mounting disc which terminates in a contact ring on the envelope. The large low-inductance tubular control-grid lead within the envelope terminates at the center of the base. This design makes it easy to build coaxial tank circuits around the 4X500A. These are only two of its many features. Among others are the rugged 500-watt air-cooled anode, Eimac-processed grids, and silver-plated terminals pointed out below.

It isn't necessary to design your transmitter around promises. Eimac 4X500A tetrodes are available NOW. They'll deliver as much as 1750 watts useful output at 110 Mc. with but 25 watts driving power (two tubes). They'll deliver 3500 watts at the same frequency with 50 watts driving power (four tubes, push-pull-parallel). Complete operating information and ratings are in the technical data sheet for the 4X500A—now available on request.



- 1 External Anode, 500 watts dissipation, forced air cooled.
- 2 Control and screen grids precisely aligned—assures maximum plate efficiency and low control and screen grid currents. (Primary and secondary grid emission is positively controlled by exclusive Eimac grid processing.)
- 3 Double spiral filament—rugged, stable emission.
- 4 Hard glass envelope—ample r-f insulation.
- 5 Electron bombardment shield.
- 6 Rigid, low-inductance screen grid mount assures improved VHF operation and permanent alignment.



- 7 Filament terminals—heavy duty, large contact areas.
- 8 Control grid terminal—low inductance, logically placed for maximum isolation between input and output circuits. Centered for use in coaxial cavities.
- 9 Molded glass base—maintains precise alignment of all terminals for ease and simplicity of insertion in sockets. Makes possible compact design, and low inductance lead engineering. (All base terminals plus concentric screen grid terminals are silver plated for minimum r-f resistance.)
- 10 Concentric ring and pin type screen grid terminals for VHF and cavity circuits or pin sockets.

CROSS SECTION
EIMAC 4X500A
POWER TETRODE

ELECTRICAL CHARACTERISTICS

4X500A POWER TETRODE

Filament: Thoriated Tungsten
Voltage . . . 5.0 volts
Current . . . 13.5 amperes

Direct Interelectrode Capacitances (Average)
Grid-Plate . . 0.05 *μ*fd
Input 12.8 *μ*fd
Output 5.7 *μ*fd

Maximum D-C Plate Voltage . 4000 volts
Maximum D-C Plate Current . 350 ma.
Maximum Plate Dissipation . . 500 watts

THE COUNTERSIGN OF DEPENDABILITY
IN ANY ELECTRONIC EQUIPMENT

EITEL-McCULLOUGH, INC 1313M San Mateo Ave., San Bruno, Calif.
Export Agents: Frazar and Hansen, 301 Clay Street, San Francisco 11, California, U. S. A.

Follow the leaders to

Eimac
TUBES

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 Secretary at the administrative headquarters at West Hartford, Connecticut.



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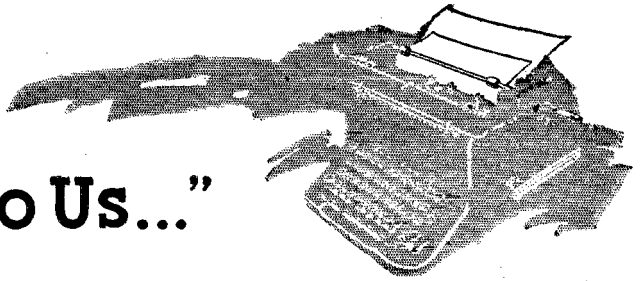
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"It Seems to Us..."



ACCOMPLISHMENTS OLD AND NEW

In these days when Young Squirts with a dollar-and-a-half bottle work all over the world their first week on the air, it is hard to realize that there ever was a time when such things were unknown and only dreamed about. Yet December marks the twenty-fifth anniversary of the Second ARRL Trans-Atlantic Tests, the first time that amateur signals ever spanned an ocean on schedule. The difficulties were so immense and the accomplishment so great that they are worth thinking about now, to keep a perspective on our progress.

While an occasional American ship operator had reported an American amateur signal in European waters, amateurs on land had never heard them and the first trans-Atlantic tests with British amateurs, a year before, had been a complete failure. This time, to supplement the efforts of the European amateur listeners, the ARRL Board of Directors determined to send overseas a crack American amateur with the best available amateur receiving apparatus. They invited Paul Forman Godley, 2ZE, to undertake the mission, considering him "America's most expert operator in the practical reception of short-wave signals." Godley, known as "Paragon Paul" because he was the designer of the excellent Paragon receivers of those days, had been the first man to adapt the Armstrong circuits to the higher frequencies used by amateurs and had originated the famous variometer regenerators; he could build a better receiver for this job than anybody else. He accepted the task and went to work on his apparatus. Meanwhile ARRL Traffic Manager Schnell was busy with arrangements, including qualifying tests for entrants. While there were to be free-for-all periods during which any station could transmit, those who qualified by covering 1,000 miles over land in the preliminaries were assigned a secret identifying cypher group and allotted a special transmitting schedule for the tests themselves. Twenty-seven stations qualified.

It is difficult today to imagine the feelings of the pioneer group who saw Godley off on his mission. He himself, in his official report to the League, spoke of his worries as his ship bore him eastward "toward an unknown professional fate." Yet at a farewell dinner in New York the night before, *QST* reports, "While the trial was to be a severe one and no man could with surety predict the outcome, optimism was distinctly the keynote and everybody was certain that if it could be done at all, Paul would get signals." Godley carried the sealed cypher identifications for Philip Coursey, the organizer of the tests on the European end, and bore sealed instructions from the Traffic Manager. The State and Commerce Departments made special arrangements with the British government for the entry of his apparatus and his permission to erect a receiving station. While amateurs at home tuned their rigs for the last watt and British hams polished up their receivers, Godley sought a location in the British Isles. Driven out of London by interference and noise, he eventually set up on the coast of Scotland near Glasgow, his antenna a Beverage Wire and his shack a tent, lighted only by an oil lantern and heated only by an oil stove. He was barely ready when the tests began.

There followed what has been called "the greatest scientific sporting event in all history." For ten nights from December 7th to the 16th, six hours a night, Yanks and Canadians transmitted while Godley and the Europeans listened. The first part of each evening was the free period, with a rotating schedule by call areas, while the second part held the rotating schedules of the stations that had qualified for an identifying cypher, not more than three of them on the air at once. Godley's lot in his cold tent was a most uncomfortable one, for throughout the tests Scotland rocked in the worst weather on record, wild gales and terrific downpours. The pole line blew down repeatedly. It was necessary to traverse its many hundreds of feet frequently to adjust the resistance at the far end. He had a heavy cold.

Yet finally there came the magic moment when he and his checking operator hugged each other in glee, for they had signals and we had got across! The Atlantic had been bridged at amateur powers on the despised 200-meter band and history was being written!

And can you imagine us back home, waiting for the news? Each night Godley got off a commercial radiogram reporting his results, sending it via Coursey in London to verify the cyphers and file. By the special courtesy of the Marconi Co. and R.C.A., this daily message was sent slowly by hand by MUU and repeated back by WII, at a scheduled hour, so American amateurs could copy it. Most of us had long-wave sets in those days and in most American shacks there would be an excited group awaiting the returns on the previous night. Promptly at 2 A.M., Eastern Time, WII would slow down and say, "Give me Godley's message." And over she would come, sometimes to let us down with a report of nothing heard, sometimes to electrify us with a list of stations that had made the roll of fame. Static was frequently bad and in any event Godley's apparatus took a long time to adjust, so some nights he heard nothing. There was a hurricane over the Atlantic and the best signals were heard when the storm was on the path; after it moved to one side, nothing more was heard. One night the message had a check of 94 and we knew the moment we heard it that there was good news. When the tests were all over and the final score tallied, Godley had heard twenty-seven stations—eight spark and nineteen tube transmitters. Eight British amateurs had heard a total of ten Yanks, all c.w., one of them receiving eight of our stations. At least one amateur each in France and the Netherlands had also heard some of us.

Godley returned a conquering hero, to be fêted and honored for his accomplishment. The scientific world marveled at our feat and set about rewriting its absorption formulas and speculating anew about the Kennelly-Heaviside Layer. For ourselves it was a golden milestone in the course of amateur radio. On both sides of the water we amateurs now knew that it was only a question of time until we should succeed in that dream of two-way transoceanic communication. The success of the tests gave amateur work such an impetus as nothing else could give, and great days were seen to lie smilingly ahead for us.

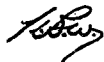
Let us remember today what we all owe Paul Godley for his part in making present-day amateur radio what it is!

It seems to us peculiarly fitting that it should be on this anniversary that we can hail the first 50-megacycle amateur communication along this same trans-Atlantic path. As

reported elsewhere in this issue, QST's Edward Tilton, W1HDQ, on November 24th was in contact for over an hour with G6DH and G5BY on 50 Mc., the English amateurs necessarily using the ten-meter band because their comparable assignment, 58.5 Mc., did not "open up." While there were reports that one-way 5-meter signals were heard in both directions across the Atlantic before the war, this is the first time that amateur frequencies above 50 Mc. have been used for transoceanic communication. Another band of the amateur family has made the Great Circle!

What a contrast with the apparatus and procedures of 1921! If a radio Rip Van Winkle of those days, with his expert knowledge of cage aerials, plate-glass condensers and synchronous rotaries, could find his way into a modern v.h.f. station there would scarcely be a piece of equipment whose function he could even guess. A more impressive contrast is to be found in the certainty with which this latest accomplishment could be forecast. Predictions some time back indicated that the maximum usable frequency would climb high enough this winter to sustain a contact. The word was spread to experimenters on both sides of the ocean and preparations made. It has scarcely taken us twenty-five years to multiply Godley's frequencies by 40; of course, good apparatus is required but it is probable that we were ready for contacts some years ago if only the path had "opened" and we had had enough knowledge of probable openings to man both ends of the path simultaneously. This time, with better knowledge, the m.u.f. has been observed daily and the result was inevitable when the "moo" went high enough. It is, nonetheless, a grand accomplishment that represented plenty of hard work and skill by the amateurs at both ends, and we congratulate them warmly.

There have been estimates that F_2 -layer transmission may become briefly possible on frequencies as high as 70 or 80 Mc. before this sunspot cycle ends. If anything like this occurs, we shall of course realize two-way long-distance communication on the 50-60 band and over far longer paths than the English-American one. It is something our v.h.f. pioneers confidently expect and illustrates the fascination which this field offers the experimenter. And who knows but that, as our knowledge increases, we'll some day discover ways to make these frequencies perform at goodly distances over longer and longer parts of the solar cycle? Does it not seem quite likely that some day this newest accomplishment will be as much a commonplace as DX on lower frequencies has become since Godley's day?



A New Phase-Modulation Circuit for Narrow-Band F.M. Transmission

Modulator-Exciter Unit for Either Crystal or VFO Control

BY JACK J. BABKES,* W2GDG

THE advantages of f.m. over a.m. have been listed so many times in the literature in the past decade that they should be a familiar story to most amateurs. However, in view of the rapidly-increasing interest in the narrow-band variety of f.m. at the present time it is not out of place to review them once more. Accent is usually placed on the noise-reducing qualities of f.m. reception, and it is true that, for the same bandwidth as is occupied by an a.m. transmission, an improvement in signal-to-noise ratio over a.m. is possible on weak signals; that is, for equal readability, a weaker carrier will suffice with narrow-band f.m. and a good f.m. receiver than with a.m. and a correspondingly-good a.m. receiver.

Now many of us have good narrow-band f.m. receivers. But inasmuch as it is possible to receive narrow-band f.m. transmissions on the ordinary communications receiver, at little if any disadvantage as compared to a.m. reception on the same receiver, it is not necessary for the receiver problem to be solved before the transmitter advantages can be realized. These are impressive: (1) F.m. costs less initially than a.m., since the speech equipment operates at no more than receiver power level and no expensive high-power audio or power-supply equipment is needed for the modulating system. (2) Power consumption is reduced — i.e., the over-all efficiency is higher — because the audio power required for f.m. is negligible. Furthermore, the same modulator is

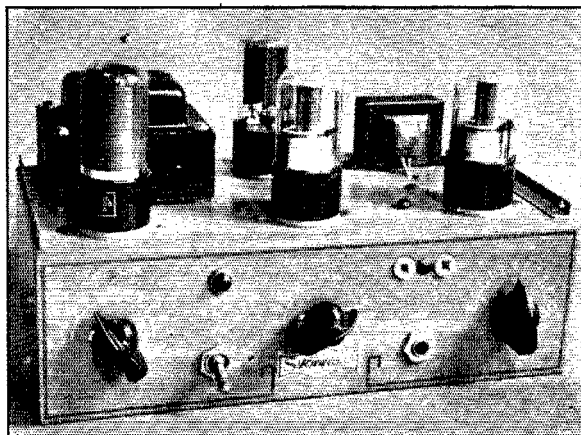
• Here's a new f.m. modulator circuit, one that gives adequate frequency deviation for amateur narrow-band f.m. from a crystal-controlled source, while requiring only a relatively small amount of frequency multiplication. It's the circuit used in a commercially-built f.m. exciter that has helped solve the BCI problems of the city-dwelling 10-meter 'phone man.

equally effective with a transmitter of any power-output level. (3) More carrier power output can be obtained from a given tube or tubes in the final r.f. stage because the tubes can be operated at c.w.-telegraph rather than 'phone ratings. (4) Excitation requirements for the final stage are less severe, since there are no amplitude peaks to care for and the quality of the modulation is unaffected by the amount of drive available for the output stage. (5) Tank and auxiliary components in the final stage need only be adequate for c.w. operation, since there are no high-amplitude modulation peaks with f.m.

There are two additional advantages to f.m. transmission that do not exactly fit into the transmitter list. Both are of definite benefit to the "other fellow," and one is invaluable to the operator of the transmitter. The first is the fact that excessive frequency swing with f.m., although creating additional sidebands outside the channel normally required, does not have the

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The chassis layout of the f.m. exciter unit is simple. Power-supply components and rectifier are along the rear edge. Along the front, from left to right, are the 6V6GT doubler, 6SL7GT oscillator-modulator, and 6SL7GT speech amplifier. Controls along the front are the doubler tuning, modulator tuning, and audio gain. The crystal socket and microphone jack are between the two latter controls.



same effect as overmodulation with an a.m. transmitter. In the overmodulated a.m. case, the sudden carrier cut-off when the down-peaks exceed 100 per cent is similar to a key click in c.w. transmission, and overmodulation splatter can and does cause had interference of an especially irritating nature over a frequency spectrum all out of proportion to the bandwidth actually required for a.m. transmission. Like key clicks, splatter causes plenty of trouble with nearby broadcast receivers as well. The same percentage of excess deviation in an f.m. transmitter simply causes the channel occupied to expand in proportion to the deviation, but does not produce the spurious frequencies associated with a.m. overmodulation.

The second advantage has been mentioned a number of times in *QST* recently: F.m. practically eliminates broadcast interference of the type associated with r.f. pick-up in the audio systems of b.c. receivers — a type of pick-up that is only too common, especially in the h.f. and v.h.f. region, and probably accounts for the major part of BCL troubles on all frequencies. As for the tunable types of BCI, narrow-band f.m. is certainly no worse than a.m.

Producing Narrow-Band F.M.

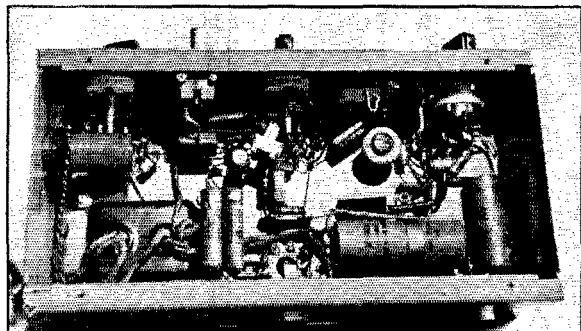
Methods for the production of frequency-modulated signals can be divided into two general groups, those in which the frequency of a self-controlled oscillator is varied by some such device as the reactance modulator, and those in which the frequency-stabilized output of a crystal-controlled oscillator is shifted in phase at an audio-frequency rate. Since a change in phase is equivalent to an instantaneous change in frequency, phase modulation produces effects that are identical with frequency modulation except that with phase modulation the frequency deviation is proportional to the rate at which the phase is shifted — in other words, is proportional to the modulating frequency. To produce true frequency modulation from phase modulation, it is only necessary to shape the frequency-response curve of the a.f. system so that the output amplitude is inversely proportional to frequency.

The advantage of phase modulation over direct frequency modulation lies in the fact that the carrier frequency is as stable as the crystal oscillator that generates it. The self-controlled oscillator, even when well designed and properly built, is ordinarily more sensitive to voltage fluctuations, temperature changes, mechanical vibration, and so on than the simplest crystal oscillator. These effects are magnified when such an oscillator is modulated by a reactance tube not only because the modulator tube must be connected across the tank circuit and thereby adds new sources of instability, but also because the oscillator tank circuit cannot be made very high-*C* without restricting the frequency deviation obtainable. To provide a high order of carrier stability, commercial f.m. transmitters using reactance-tube modulators employ auxiliary circuits that provide a means for comparing the carrier frequency with that of a stable crystal-controlled oscillator, and for bringing the carrier back to the proper frequency whenever it has a tendency to wander. Since such circuits are practically as complicated as an f.m. receiver, they are not too attractive for amateur transmitters.

A number of types of phase modulators have been developed in the past several years for various different services, but none has been capable of producing a frequency swing comparable to that obtainable from a reactance modulator in conjunction with a self-controlled oscillator. The result has been that a large amount of frequency multiplication has been required for a deviation of even a few kilocycles. In the circuit to be described, the frequency deviation is comparable to that obtainable from the reactance-type system when the latter is used with a reasonably high-*C* self-controlled oscillator.

The operation of the new circuit, shown in Fig. 1, can be visualized best in terms of a simpler circuit used in some f.m. transmitting equipment built for military use.¹ A triode tube is used as a

¹ This circuit was developed by the Link Radio Corporation and used in a number of military and commercial applications.



◆
Power-supply equipment is along the lower edge in this bottom view. The audio and r.f. components occupy the upper section, grouped near the tubes with which they are associated.
◆

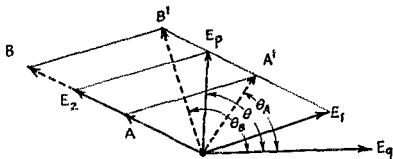
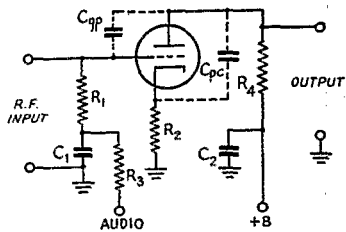


Fig. 1 — A simple form of phase modulator, with vector diagram showing how the phase of the r.f. output voltage varies when the amplitude of component E_2 is varied at an audio-frequency rate. E_2 is the amplified grid voltage and E_1 is the component that reaches the output circuit through the grid-plate capacitance of the tube.

resistance-coupled r.f. amplifier and, since there is no shielding between the grid and plate, the r.f. grid voltage will cause an r.f. current to flow through the grid-plate capacitance and the load circuit. This is in addition to the normal r.f. plate current caused by ordinary amplifier action in the tube. The voltage components developed across the plate resistor, R_4 , by these two currents are not in phase, since the voltage drop caused by current flow through C_{gp} is more or less in phase with the grid voltage while the voltage drop caused by amplifier action is essentially 180 degrees out of phase with the grid voltage. The exact phase relationship depends on the impedance of the load circuit and is affected by the plate-to-cathode capacitance, C_{pc} , of the tube. The vector diagram in Fig. 1 is reasonably typical; E_1 , the component of plate voltage caused by C_{gp} , leads the applied grid voltage by a small angle, and E_2 , the component resulting from amplification, is slightly less than 180 degrees out of phase with the grid voltage. E_1 and E_2 combine to give the resultant r.f. plate voltage, E_p .

When an audio-frequency voltage is applied to the grid of the tube the mutual conductance — and consequently the amplification — is varied at an audio rate. The variation in amplification causes the voltage E_2 to vary likewise; with a steady audio signal it might swing between the limits A and B in Fig. 1. Since E_2 combines with the unvarying component E_1 vectorially, the resultant voltage, E_p , is varied in phase with respect to the grid voltage between the limits A' and B' . Larger or smaller audio signals will cause correspondingly larger or smaller shifts in the phase of E_p with respect to E_g .

In order for the phase shift to be linear with

respect to the audio swing, the two voltage components E_1 , and E_2 , should be of approximately the same magnitude. E_2 would ordinarily be much larger than E_1 because it represents the amplified output of the tube. To reduce the amplification, negative feed-back is introduced by means of the cathode resistor, R_2 . C_1 is an r.f. by-pass in the grid circuit, and in conjunction with R_3 also provides the necessary audio compensation to convert the phase modulation into frequency modulation. It will be observed that the output is amplitude-modulated as well as phase-modulated, as indicated by the change in length of the vector E_p , when swinging between A' and B' . Amplitude modulation is not serious when E_2 is about equal to E_1 , and is easily washed off in the following frequency-multiplier stages.

So much for the basic idea. The new circuit² is shown in fundamental form in Fig. 2. Instead of a simple resistor in the plate circuit there is a tuned tank, L_1C_3 . L_2 is a continuation of L_1 , the turns ratio between L_1 and L_2 being approximately 2.4 to 1. L_2 with C_4 resembles the familiar neutralizing circuit used with a straight-through triode amplifier, but its purpose in this case is not to neutralize the amplifier but to provide an adjustment for the phase and amplitude of the voltage acting between the grid and the plate. Similarly, C_3 offers a means for varying the magnitude and phase angle of the impedance in the plate circuit. By these two means alone it is

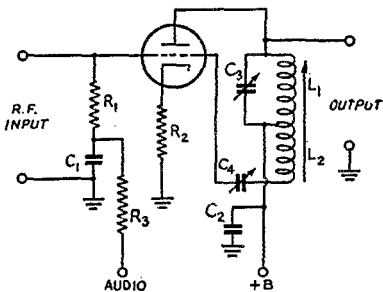


Fig. 2 — The modulator circuit discussed in the text. A tuned plate circuit and feed-back connection (L_2C_4) provides means for increasing the phase swing. Further improvement is secured by using an iron-core coil.

possible to increase considerably the phase shift obtainable, and thereby increase the frequency deviation. However, still greater deviation is secured by inserting a powdered-iron slug in the coil, the characteristics of the iron being such that an additional phase shift is introduced when the d.c. plate current of the tube is varied by the audio-frequency signal. In total, the frequency deviation obtainable with this circuit is nearly 1.5 kc. at a crystal frequency of 4 megacycles, as compared to about 250 cycles for the circuit of Fig. 1.

² Patent applied for.

A Practical Exciter Circuit

A complete circuit for a modulator-exciter using this method of phase modulation is shown in Fig. 3. Intended for narrow-band f.m. in the 29-29.7-Mc. band, it uses crystals lying in the frequency range 3625-3712 kc. and, after the necessary multiplication of 8 times to reach the 29-Mc. region, will easily produce a frequency swing of 10 to 12 kc. at 29 Mc.³ As indicated in the circuit diagram it uses one section of a dual-triode 6SL7GT as a Pierce-type crystal oscillator and the other triode section as the phase modulator. The crystal and modulator operate on 80 meters, and the output of the modulator is fed to a 6V6GT doubler so that the final output of the unit is on 7 Mc. Such amplitude modulation as is introduced by the modulator is eliminated in the doubler stage. With a normally-active crystal, the power output is approximately 3.5 watts — sufficient as a substitute for the crystal oscillator in many transmitters, or for driving a following frequency multiplier.

The proper r.f. and a.f. voltages are secured in the modulator circuit by means of the degenera-

³ It can obviously also be used on the 11-meter band with proper crystal selection, and the deviation is large enough for successful wider-band operation at 50 and 144 Mc. The deviation at 14 Mc. is sufficient for that frequency in the event that use of narrow-band frequency modulation should be authorized there.

tive cathode resistor, R_{10} , and the grid voltage divider, $R_7R_8R_9$. R_8 and C_8 form a correcting network having an a.f. attenuation of 6 db. per octave, above 2000 cycles, to convert the phase modulation to frequency modulation.

A second 6SL7GT is used as a two-stage resistance-coupled audio amplifier for driving the modulator. The input circuit of the amplifier is suited to high-impedance microphones of either the crystal or dynamic variety. A level of -48 to -55 db. — easily supplied by a communications-type microphone — at the input jack is ample for full modulation. The gain control, R_{11} , sets the amount of frequency swing for a given voice level, and is appropriately named the "deviation control."

The construction of the unit is not difficult, as shown by the photographs of the Sonar Model KE-10 F.M. Exciter in which this circuit is used. The parts layout follows the circuit diagram approximately, with the speech amplifier at one end of the chassis, the oscillator and modulator in the center, and the output tube at the other end. Reasonable care should be used to keep the components associated with a particular tube grouped so that leads will be fairly short.

The method of coupling the unit to the transmitter will depend primarily on the transmitter itself, and any of the methods that are successful with a VFO having 7-Mc. output may be used

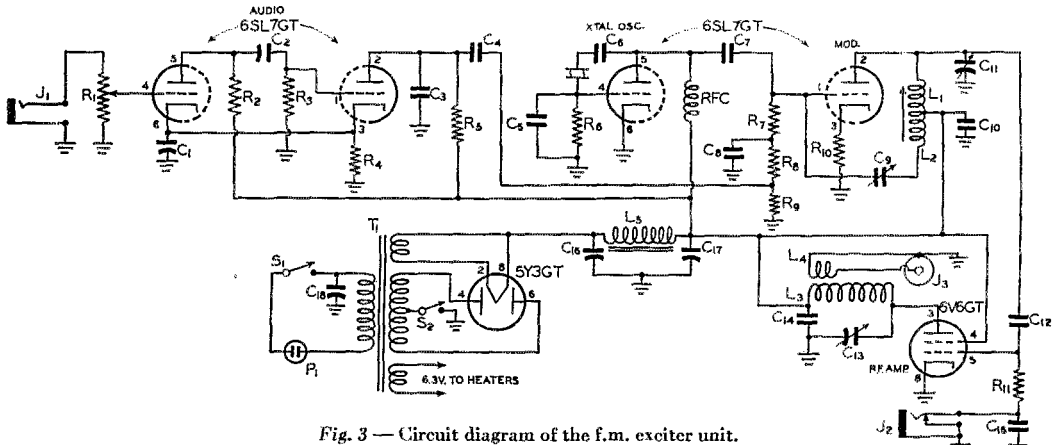


Fig. 3 — Circuit diagram of the f.m. exciter unit.

- C_1 — 25- μ fd. 25-volt electrolytic.
- C_2, C_4 — 0.01- μ fd. paper.
- C_3 — 400- μ fd. mica.
- C_5 — 50- μ fd. mica.
- $C_6, C_8, C_{10}, C_{14}, C_{15}$ — 0.005- μ fd. mica.
- C_7, C_{12} — 250- μ fd. mica.
- C_9 — 2- μ fd. variable.
- C_{11}, C_{13} — 75- μ fd. variable.
- C_{16}, C_{17} — 8- μ fd. electrolytic. 450 volts.
- C_{18} — 0.1- μ fd. paper.
- R_1 — 0.5-megohm volume control.
- R_2, R_3, R_5, R_9 — 0.25 megohm, $\frac{1}{2}$ watt.
- R_4 — 1000 ohms, $\frac{1}{2}$ watt.
- R_6 — 30,000 ohms, $\frac{1}{2}$ watt.
- R_7 — 50,000 ohms, $\frac{1}{2}$ watt.
- R_8, R_{10} — 25,000 ohms, $\frac{1}{2}$ watt.

- R_{11} — 0.1 megohm, $\frac{1}{2}$ watt.
- L_1, L_2 — L_1 36 t. No. 36 enam., L_2 15 t. No. 36 enam. spaced $\frac{1}{4}$ inch from L_1 . $\frac{1}{2}$ -inch diam. form. Powdered-iron core.
- L_3 — 37 t. No. 20 enam., close spaced, $\frac{3}{4}$ -inch diam.
- L_4 — 2 t. of hook-up wire on cold end of L_3 .
- L_5 — 20 henrys, 70 ma.
- J_1 — Open-circuit jack.
- J_2 — Closed-circuit jack.
- J_3 — R.f. output receptacle.
- P_1 — 115-volt plug.
- RFC — 10-mh. r.f. choke.
- S_1 — S.p.s.t. switch (mounted on R_1).
- S_2 — S.p.s.t. toggle.
- T_1 — Power transformer, 250 to 300 volts d.c. at 70 ma., with 6.3- and 5-volt windings.

with this exciter. In cases where there is a 7-Mc. crystal oscillator or doubler operating at a power level of three watts or so, the simplest scheme is to wind a coil of a few turns around the 7-Mc. tank, connect it through a length of twisted pair, coax or Twin-Lead to the output link in the exciter, and remove the tube associated with the 7-Mc. tank in the transmitter from its socket.

To set the unit in operation, plug in a crystal of appropriate frequency, connect a 0-1 milliammeter in the doubler grid return through J_2 , and tune C_{11} for maximum grid current. The current should be at least 0.3 ma. and probably will run considerably higher. Then tune the doubler tank circuit to resonance by varying C_{13} until a neon bulb brought near the hot end of L_3 shows maximum glow. The various stages in the transmitter with which the exciter is used should be tuned in the normal way.

Next, listen to the 29-Mc. signal in a receiver, adjusting the gain for a signal level about the same as that of incoming signals. It may be desirable to cut off the final amplifier in the transmitter to avoid overloading — and it is usually possible, in fact, to get sufficient signal from the 29-Mc. harmonic from the exciter alone, the rest of the transmitter being off completely. Set R_1 at about half scale and have someone talk into the microphone in a normal tone. While listening, vary C_{11} to find the setting that gives maximum modulation. The audio level will come up tremendously with slight detuning from exact resonance, and the 6V6GT grid current usually will drop off by about 0.2 ma. at the correct setting of C_{11} . That is all there is to getting on the air with narrow-band f.m., but it is advisable to check the sidebands, using the receiver crystal filter in the sharp position, to see that they do not extend beyond the limits of the channel occupied by an a.m. station. The deviation or gain-control setting that gives full modulation without excessive channel width is the best one to use, since any wider swing will not be accepted by the i.f. channel in the ordinary communications receiver.

If desired, a VFO may be used instead of the crystal oscillator. The output of the VFO (which should incorporate the usual buffers for good carrier stability) can be fed into the crystal socket prong that connects to the grid of the first section of the 6SL7GT, the other side of the line from the VFO being connected to ground. The VFO output should be in the 3.5-Mc. band, since it replaces a 3.5-Mc. crystal, and should have sufficient output to give a minimum of 0.3-ma. grid current in the 6V6GT.

For receiving narrow-band f.m., any a.m. receiver having a 4- to 6-kc. pass-band can be used with good results simply by detuning so that the carrier is placed on the slope of the i.f. selectivity curve. However, this is far from the ideal method of f.m. reception because it gives none of the discrimination against amplitude noise that is char-

acteristic of a true f.m. receiver. But there is no reason why a couple of limiters and a discriminator having a bandwidth of approximately 6 kc. cannot be hooked to a communications receiver and thereby make the full benefits of improved signal-to-noise ratio with f.m. possible.⁴

⁴ For constructional details of such a unit, see Grammer, "Some Thoughts on Amateur F.M. Reception," *QST* March, 1941.

Silent Keys

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

- W1BCB, ex-1QAS, Harold W. Waugh, Hingham, Mass.
- W1HSX, Andrew Nelson, New Haven, Conn.
- W1KOU, Harold H. Wish, Portland, Maine
- W2QGY, Theodore Mourgues, Mt. Vernon, N. Y.
- W2SBV, ex-W8SBV, Joseph P. Berry, Elmira, N. Y.
- W3BRZ, Elmer K. Denlinger, Lancaster, Pa.
- W3CLH, James N. Bagwell, Lancaster, Pa.
- W3FVQ, David J. Schell, Myerstown, Pa.
- W4AMD, Roy Holloway, Johnson City, Tenn.
- K4DDH, Dr. Gleason W. Kenrick, Rio Piedras, P. R.
- W5JFN, Frank Dodd, Russellville, Ark.
- W6PHH, Louis Zweighaft, Glendale, Calif.
- W7HJZ, Hunter A. Onstine, Bellingham, Wash.
- W7JOC, ex-W6PHC, Sidney R. Turner, Tucson, Ariz.
- W8AF, William Fletcher, Detroit, Mich.
- W8AHD, S. T. Bortz, Wayne, Mich.
- W8ALN, K. J. Whise, Wayne, Mich.
- W8QCJ, Joseph H. Dean, Shadyside, Ohio
- W8TWG, Gilbert J. Howie, RT2c, USNR, Painesville, Ohio
- W9AZ, Dr. John R. Wilkinson, Kankakee, Ill.
- W9BKZ, Ivan Alm, Oakland, Nebr.
- W9DKI, Joseph R. Evans, Great Bend, Kans.
- W0DKK, ex-W9DKK, Noble E. Brewer, Boulder, Colo.

ARRL's 13th International DX Competition

Contest Periods: C.W., Feb. 14th-17th, Mar. 14th-17th;
'Phone, Feb. 21st-24th, Mar. 21st-24th

BY F. E. HANDY,* WIBDI

FOR the first time since 1940 world conditions permit announcement of this annual operating feature. Entries may be made in one or both contests. All bands may be used at will, but not frequencies out of the bands. 'Phone sub-bands must be observed. The same rules apply to both contests. The quota plan for mainland W/VE stations, 3 per country, applies only in the c.w. contest. Entries are welcome for one or both contests. C.w. scores are independent of voice scores. All claimed points in the radiotelephone section of the contest must be made voice-to-voice. In the telegraph contest only c.w.-c.w. QSOs count.

Disqualifications

League Official Observers will be asked to report all violations to the Contest Committee. Disqualifications will be made as in former years for off-frequency operation, improperly-modulated notes, and the like. Enforcement of sportsmanship in addition to the vital duty of ARRL in protecting the rights of all amateurs requires this. Two accredited OO reports will disqualify. Monitoring cooperation is requested of the FCC. Any stations known to have been logged in violations by the FCC during the contest will be disqualified automatically. A single citation or advisory notice will disqualify in this case. W1AW will likewise engage in monitoring for the Committee.

All nationals must work on frequencies made available to amateurs by international treaty provisions and limit operations to such of those frequencies or sub-bands as made available, where frequencies are set apart for amateurs by edict of their government. Regardless of nationality, operators will be disqualified if reported from any source for off-frequency or other violations in the contest period, with sufficient evidence to prove such deviations to the satisfaction of the Contest Committee. The interest of all amateurs in frequency allocations is too precious to permit any selfish or illegal operation jeopardizing the reputation of all amateurs. A high degree of responsibility and frequency observance is necessary! ARRL will not permit scoring by unfair means where this can be checked and will not tolerate practices which might constitute grounds for complaint against the amateur service at the coming 1947 International Telecommunications Conference.

* Communications Manager, ARRL.

Contest Plan

Operators with the prefixes W (or other continental U. S. prefix) and VE will be taking part in a QSO party with amateur stations in all other parts of the world. When they effect DX contacts, they will exchange self-assigned serial numbers (two-¹ or three-figure signal reports² plus three self-assigned numbers that stay the same for all stations). These complete exchanges are recorded in the contest log as shown in the example. From such a record each operator's score will be determined. From the scores (which the Contest Committee will verify by cross-examination of logs) the winners will be determined for each locality and medallions awarded. Three points can result from each contact with a full serial-number exchange in any band, but no more can be obtained from the same station unless both stations connect in another band for additional exchanges. Contacts with nonparticipants can count. Refer to this announcement if necessary to explain the plan of operations.

Those amateurs outside³ the U. S. and Canada will try to work as many W/VE (continental) stations as possible to exchange serial numbers. Stations in all localities need only take part on the dates announced and report results at the end of the test to receive credit and be eligible for awards, unless evidence requiring disqualification is submitted.

Medallion Awards

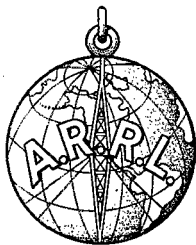
Each operator's competition derives from the operation of amateurs in his immediate ARRL Section⁴ of W/VE. Awards are for the operator running up the best record for each Section under the rules. Comparison of scores between remote sections and countries is not indicative because of the differ-

¹ In 'phone exchanges only two numerals will be given, the first the "readability" and the second the "strength." Telegraph entrants will send and receive six-figure groups, and 'phone entrants five-figure groups. (By giving the five numbers reports may be noted without the necessity of using the words "readability" and "strength" which are normally desirable words to use in exchanging 'phone reports. 'Phone operators do not need to use HM, ML, etc. They can "say it with words" indicating where they will be listening first.

² For RST definitions of "readability, strength and tone," in that order, see 1946 ARRL Handbook, page 464, or Operating an Amateur Radio Station, page 15.

³ Alaska, Hawaii, Philippine Islands, Cuba, Puerto Rico, Newfoundland, and all localities outside the continental United States and Canada will receive QST mention and awards based on their work with W/VE stations.

⁴ Page 6 of this issue carries a complete list of Sections of the ARRL field organization.



Front and back views of the medallion to be awarded the c.w. and 'phone winners for each country, and each continental U.S.A. and Canadian ARRL Section.

ent conditions under which stations work. Medallions will be awarded the c.w. winner and the 'phone-contest winner for each country, and likewise for each continental U.S.A. and Canadian ARRL Section.

All hams in the one territory (ARRL Section⁴ in continental U.S.A. and Canada or ARRL country list) will compete two week-ends, February 14th-17th and March 14th-17th for a C.W. Medallion award, and/or the two week-ends February 21st-24th and March 21st-24th for a 'Phone Medallion award. Since the DX transmission characteristics for the different bands will be most nearly the same for all operators in any award area, the chances are as equally fair to all as can be arranged. Winning will depend on both station and *operating ability!*

Contest Periods

The local starting and ending times for our two DX Competitions are best shown in tabular form. Times outside the Americas should be computed from "Greenwich."

C. W. Contest:

Time	Starts	Ends
Greenwich	Feb. 15th 0001 (12:01 A.M.)	Feb. 16th 2359 (11:59 A.M.)
AST (60th meridian)	Feb. 14th 8:01 P.M.	Feb. 16th 7:59 P.M.
EST (75th meridian)	Feb. 14th 7:01 P.M.	Feb. 16th 6:59 P.M.
CST (90th meridian)	Feb. 14th 6:01 P.M.	Feb. 16th 5:59 P.M.
MST (105th meridian)	Feb. 14th 5:01 P.M.	Feb. 16th 4:59 P.M.
PST (120th meridian)	Feb. 14th 4:01 P.M.	Feb. 16th 3:59 P.M.

The second period of this contest starts at these same hours, Mar. 15th and Mar. 14th respectively, in a table like the above.

The second period of this contest ends at these same hours Mar. 16th in a table like the above.

'Phone Contest:

Greenwich	Feb. 22nd 0001 (12:01 A.M.)	Feb. 23rd 2359 (11:59 A.M.)
AST (60th meridian)	Feb. 21st 8:01 P.M.	Feb. 23rd 7:59 P.M.
EST (75th meridian)	Feb. 21st 7:01 P.M.	Feb. 23rd 6:59 P.M.
CST (90th meridian)	Feb. 21st 6:01 P.M.	Feb. 23rd 5:59 P.M.
MST (105th meridian)	Feb. 21st 5:01 P.M.	Feb. 23rd 4:59 P.M.
PST (120th meridian)	Feb. 21st 4:01 P.M.	Feb. 23rd 3:59 P.M.

The second period of this contest starts at these same hours, Mar. 22nd and Mar. 21st respectively, in a table like the above.

The second period of this contest ends at these same hours Mar. 23rd in a table like the above.

Operate all times available in the two week-ends of the C.W. Competition and/or two week-ends of the 'Phone Competition. Indicate your total time on the air in logs.

Operating Procedure

Crowding the band-edges is an invitation to be disqualified! W/VE hams not wanting to waste operating time will avoid any use of "CQ DX." Stations "outside" will not waste time answering such, when one of their calls will bring hundreds of answers from more efficient operators. *Listening* is a first essential. "You have to hear them before you can work them." All operators should try to work *break-in* for best operating efficiency. Hams outside W/VE urge contestants not to waste time discussing RST. Transmit the full serial number for exchange . . . then any "extra" time needed will be available if fills are necessary. U.S. and Canadian amateurs ask for continued use of CQ by stations in remote localities . . . but make such CQs short! *Sign often* in CQs or calls.

- Scores are the sum of DX contact points times official countries worked (or the number of W/VE districts). Swap number groups (signal reports and self-assigned serial number) in DX QSOs — separate medallions to C.W. and 'Phone DX Competition winners — gavel trophy to leading club!

Use the following after a CQ so the receiving operator will know from which part of the band your tuning will start.

HM — Will start to listen at *high*-frequency end of band and tune toward *middle* of band.

MH — Will start to listen in the *middle* of the band and tune toward the *high*-frequency end.

LM — Will start to listen at *low*-frequency end of band and tune toward *middle* of band.

ML — Will start to listen in the *middle* of the band and tune toward the *low*-frequency end.

VFO use in calling on the *exact* frequency of the DX stations is out! Many remote stations will *not answer* any such calls. It encourages QRM to pile up so *no* stations get exchanges through. The same station can be worked additional times in *additional bands* provided the c.w. quota, per band, per country, is not exceeded.

Serial Numbers

Participants assign themselves a distinctive three-numeral group which is used throughout the contest as the last part of each number exchanged (sent). The first digits of the serial number sent constitute the Readability, Strength, and Tone reports of the station to which the number is sent. Try to send and receive one complete serial number with each DX station.

Club Participation

Certificate awards will be made through each club (in addition to ARRL Section awards) in the continental United States and Canada to a member where three or more individual club members, or local hams invited by such a club, take part. For a club member to rate a *c.w.-winner certificate*, at least three acceptable entries from c.w. club workers must be sent to Headquarters. A club *'phone-winner certificate* likewise will be issued to one member only when three 'phone entries mentioning the club have been received. Reports must be made direct to ARRL, West Hartford, mentioning the name of the club, to be eligible for the affiliated-club award. Entrants who mention their club will be eligible for both club and section awards.

The sum of the scores of *all* club participants ('phone and c.w.) may be added, and reported by the club's secretary to count for the club itself. A gavel, with engraved sterling-silver band, is offered as an award to that club whose officers or activities manager submits the greatest collective score in ARRL's 13th International DX Competition.

LOG, 13TH A.R.R.L. INTERNATIONAL DX COMPETITION

(Example: W6ZAA Serial No. 543)

C. W. Entry **Feb. 14th-17th** *(Logs from W or VE show, for each band)*

Call

Name.....

Address.....

Transmitter Tubes.....

Plate Watts (input last stage).....

Nr. Hours Station Operation (17 h.
28 min.)

ARRL Section (for W/VEs)

Bands	3.5 Mc.	7 Mc.	14 Mc.	28 Mc.	Total	Different Stations & Countries
<i>Nr. DX Stations QSOed</i>		3	5	1	9	9
<i>Nr. Countries QSOed</i>		2	4	1	7	6

(Logs from remote points indicate, for each band, in this part of the log: "Nr. W/VE stations QSOed . . ." and "Nr. U.S.A.-Canada licensing areas worked . . .," in a similar tabulation.)

Date & Time	Station Worked	Country ⁵	Worked Record of New Countries ⁵ for Each Freq. Band				Serial Numbers		Points
			3.5	7	14	28	Sent	Received	
Feb. 14th 4:02 P.M. PST (or 0002 GT)	G6NF	England			1		568,543	478,001	3
Feb. 15th 7:15 P.M. PST	G2MI	England			1			578,988	2
9:40 P.M. PST	PAOAZ	Netherlands			2		488,543	488,111	3
Mar. 14th 7:38 P.M.	VK2TI	Aust.		1			579,543	579,287	3
8:50 P.M.	ZLIMR	N.Z.		2			487,543	398,657	3
11:50 P.M.	VP9X	Bermuda			3		349,543	588,984	3
Mar. 15th 12:05 A.M. PST	VK2RA	Aust.		2			586,543	577,000	3
3:10 A.M. PST	VK5FM	Aust.				1	499,543		1
2:00 P.M. PST	PY2AC	Brazil			4		487,543	486,852	3
									24

Multiplier = 2 + 4 + 1

24 × 7 (countries) = 168 score

I hereby state that in this contest, to the best of my knowledge and belief, I have not operated my transmitter outside any of the frequency bands specified in, or in any manner contrary to, the regulations my country has established for amateur radio stations; also that the scoring points and facts as set forth in the above log and summary of my contest work are correct and true.

.....
Signature of Operator(s)

Additional Rules

- I) Contest work must all take place in the contest period.
 - II) Logs must include date, time of QSO, call of station worked, serial numbers exchanged and data shown on sample log, with the claimed score.
 - III) Scoring: Both the W/VE station, and the station in the remote locality, receive one point when the W or VE serial number is acknowledged by the station in the remote locality. Each operator similarly, may add two points further when a serial number (to U.S.A./Canada) is acknowledged by the W/VE.
- Total "points" multiplied by the number of (1) countries or localities for all bands, or (2) U.S. and Canadian licensing areas for all bands, equals the score.

(Concluded on page 108)

Converting the BC-348-Q

Modifications of Another Popular Surplus Receiver

BY PAUL M. KERSTEN,* WØWIT

• The two most popular surplus receivers at the present time appear to be the BC-342 and the BC-348-Q. This story tells of the minor modifications necessary to a BC-348-Q to fit it more closely to the requirements of amateur operation, such as breaking down the gain-control circuit into separate controls for r.f. and audio, adding a simple noise limiter, and putting in an S-meter.

AMONG the items of surplus gear available to the amateur at the present time is the BC-348-Q, a receiver which has attained widespread use and acclaim by the amateur radio fraternity. This receiver lends itself well to changes which make it more efficient from the amateur's standpoint. It is the purpose of this article to describe some of the simple changes made in a receiver of the "Q" series (110-volt a.c. adaptation) and to point out other more difficult changes which can be made if the owner so desires.

In order to change the circuit the physical layout of the set had to be altered slightly. One making these changes can suit his own preference and station requirements in the location of switches, jacks and plugs. The accompanying photographs clearly delineate the changes which were found to be most satisfactory at this station. All changes can be made with the tools and parts usually available in the ham shack.

Antenna Terminals

Beginning with the antenna terminals and

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◆
A view of the panel of the revamped BC-348-Q. An S-meter has been installed at the upper right. Of the three toggle switches in the lower left-hand corner, the left-hand one is for send-receive, the upper right controls the a.v.c., and the lower one turns on the noise limiter.
◆

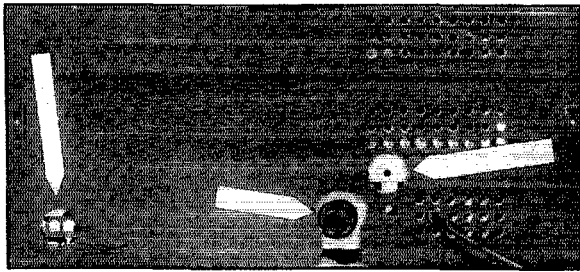


working through the set to the output transformer, the first addition was an auxiliary set of "Ant.-Gnd." terminals placed at the rear of the chassis. A terminal strip was bolted to the frame of the set at the rear, as shown in one of the photographs, and a wire was brought from the "Ant." terminal on the panel along the lateral side of the antenna unit (190) to it. The ground connection was made directly to the chassis via a small lug under the bolt holding the terminal strip. A $1\frac{3}{16}$ -inch hole was cut in the cabinet to allow access to the new terminals.

At this point it might be mentioned that if one desires to use balanced input on any band with this receiver he can isolate the antenna-coil ground return and bring it out to a third terminal at the rear. It is also necessary to clip condenser 41. This change necessitates removing antenna unit 190, a difficult task in itself, and subsequently realigning the r.f. end.

First R.F. Stage

In the original circuit the first r.f. stage is connected to operate as a triode. Increased r.f. gain can be obtained by changing this stage to pentode operation. At the installation being described, the first r.f. stage was also removed from the r.f. gain-control circuit. The circuit for these changes appears in Fig. 1. As seen in the diagram, G_2 is connected via the shield to ground as in the original. The jumper between G_2 and the plate is removed and a 0.01- μ fd. by-pass condenser is placed between G_2 and ground. A 70,000-ohm resistor is inserted between G_2 and a point on the lug side of the 15,000-ohm resistor, 99-3. It is important this plus lead connects to the B+ bus below resistor 99-3. Condenser 65 is shunted



A rear view of the BC-348-Q with the case replaced, showing clearance holes cut in the case.

to ground by a 250-ohm $\frac{1}{4}$ -watt resistor. The lead between the cathode of the first r.f. stage and G_3 of the second r.f. stage was removed, allowing the first r.f. stage to operate "wide open."

Gain Controls

Continuing through the circuit, the next change was the incorporation of separate r.f. and a.f. gain controls. The "AVC-OFF-MVC" switch, 169, was removed and in its place was inserted a s.p.s.t. switch (S_1 in Fig. 4) to control the a.v.c. network to be considered later. Circuits for r.f. gain, a.f. gain, and a.v.c. are given in Figs. 2, 3 and 4.

The dual potentiometer, 110, was removed and in its place was substituted a 0.35-megohm potentiometer with switch. This unit controls the a.f. gain and the 110-volt supply to the primary winding of the power transformer. The leads to the former volume control were not disturbed

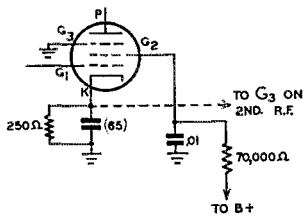


Fig. 1 — The modified first r.f. stage. The lead represented by the dotted line is removed, and the cathode returned to ground through the 250-ohm resistor. Other modifications are described in the text.

other than to attach them to the new potentiometer-switch unit. The two potentiometers in the dual control can be separated readily, allowing the 20,000-ohm section to be used as a separate r.f. gain control. This particular control has a special taper so it is advisable to use it. It was mounted on the panel just to the left of the crystal switch. Leads were carried below through holes drilled in terminal board 198, located below crystal unit 160. It is important that the 100-ohm resistor, 107-3, be removed from the r.f. gain-control circuit and utilized in the a.v.c. circuit alone.

The a.v.c. circuit is connected with a switch placed between ground and resistor 107-3. This

switch was mounted in the hole previously occupied by switch 169 and acts as the a.v.c. on-off switch. The circuit for the a.v.c. control is given in Fig. 4.

Noise Limiter

A noise-limiting circuit similar to that which has appeared in past issues of *QST* was inserted. The circuit for this is given in Fig. 3. Switching the network into the circuit produces very little reduction of volume. A switch was placed in a

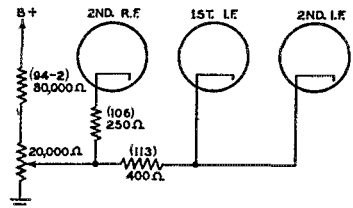


Fig. 2 — The gain-control circuit is revised by separating the tapered 20,000-ohm potentiometer from the combination control and connecting it as shown.

hole drilled in the panel just below what is now the a.v.c. on-off switch. The noise-limiter network could be permanently connected into the circuit without diminishing the efficiency of the receiver, if one doesn't want to bother with the switch.

When the crystal-filter network is switched into the circuit, the selectivity of the receiver is markedly increased but the gain of the receiver is diminished. Because of this some users might like an additional stage of audio. This was not added at this station, however.

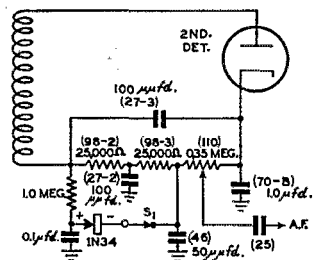


Fig. 3 — A shunt-type noise silencer is added to the second detector by revising the circuit slightly and adding a 1N34 crystal diode, a 1-megohm resistor, a switch and a 0.1- μ fd. condenser.

Output Jack and Coupling

The output transformer 155a has two output taps designated "high" and "low." The "high" tap has an impedance of approximately 4500 ohms to match a headset and the "low" tap has an impedance of 500 ohms to match a line. Some

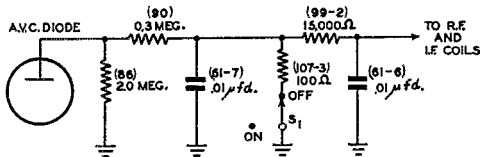


Fig. 4—The circuit location of the a.v.c. on-off switch.

users who have not discovered that the resistance values given in the *Instruction Handbook* accompanying the receiver refer to d.c. resistance instead of impedance, will be pleasantly surprised at the increased gain which follows the incorporation of a 500-ohm-to-voice-coil transformer at the speaker end of the line. As shown in the photographs, a jack was mounted on the chassis at the rear adjacent to connector *SO 104* and a corresponding $1\frac{3}{16}$ -inch hole was cut in the cabinet. Condenser 61-8 was moved slightly toward the output transformer. This jack is used for speaker output and the "low" tap is connected to it. Another lead was run from the "high" tap to one of the jacks on the front panel and is reserved for headphone use. The upper headphone jack was removed and in its place a s.p.s.t. switch was inserted in the power-transformer high-voltage center-tap for send-receive. There are provisions for a send-receive relay through Pins 2 and 6 in *SO 104*, but the screen circuit controlled by 2 and 6 was used for an S-meter, and as a result other provisions for send-receive relaying and switching are necessary.

S-Meter

The S-meter circuit is given in Fig. 5. The meter used was a 0-150 microammeter, although a higher-range one can be used, and it was mounted in the upper right-hand corner of the panel, as shown in the photographs. The circuit constants for the meter were found to be critical, but if those given are used one should experience no difficulty. It might be mentioned that in order to obtain a greater swing of the meter it is necessary to decrease the 0.15-megohm resistor and to decrease the swing this resistor is increased. When the r.f. gain is decreased the meter tends to go off scale to the right and when the c.w. oscillator is turned on it tends to go to the left. Because of this a separate switch could be placed at point X on the diagram.

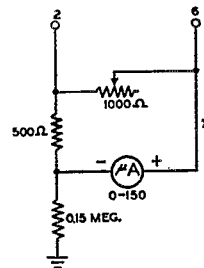
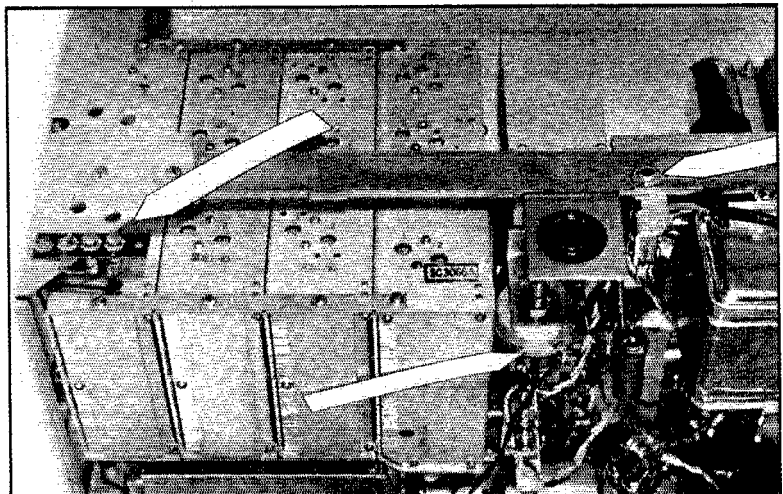


Fig. 5—The S-meter circuit requires a 0-150 microammeter and three resistors. For greater meter swing, the 0.15-megohm resistor should be replaced by one of a lower value. If a higher-range meter is used, such as a 0-1 milliammeter, the 0.15-megohm resistor should be replaced by a resistor of lower value.

The plug connector *SO 104* was removed from the set, and in its place a 6-prong socket was used. This was mounted in the end of an old i.f. can. The shield can was cut down to fit the available space and it made a very rigid support for the

(Continued on page 108)

This view of the rear of the chassis shows how the antenna binding posts, the S-meter zero-set potentiometer, the output speaker jack and the 6-prong socket for connecting to an external send-receive switch are installed.



A Simple Rotatable Antenna for Two Bands

Dual Two-Element Array for 14 and 28 Mc.

BY ROWLAND J. LONG,* W9NLP

WHEN we hear the term "rotary beam" most of us visualize a three- or four-element job sixty or seventy feet in the air driven by an expensive remotely-controlled rotating head—something beyond the reach of the ordinary ham who doesn't often have much left over after paying for the pork chops. There are probably many who would like to work DX who do not realize that a much simpler and cheaper structure can be quite effective. The dual 14- and 28-Mc. two-element array shown in the photographs was put up at a cost of less than fifty dollars, support included. It is elevated only 35 feet and yet with it we have worked 127 countries on 'phone. An antenna of this type is the answer for the ham who hasn't the space for

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long-wire antennas, which constitute the only other form of cheap DX antenna, if convenient trees can be used for support.

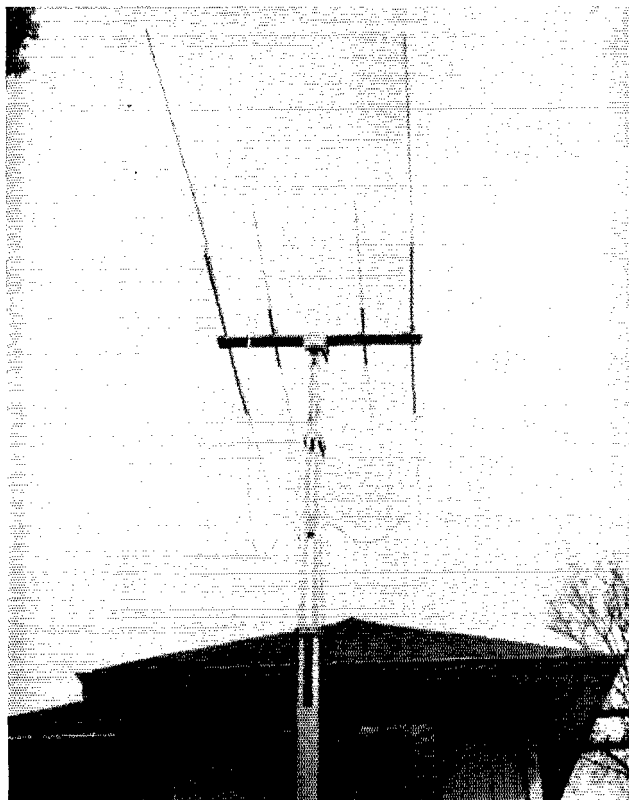
14-Mc. Array

The framework supporting the elements is a simple structure. As shown in the sketch of Fig. 1, it consists simply of a 7½-foot two-by-ten with two-by-four crossarms. Those supporting the 14-Mc. elements are six feet long, while the shorter ones for the 28-Mc. elements are four feet long. The elements are made up of sections of thin-wall conduit. The 14-Mc. antenna is split to provide for the insertion of a coupling coil consisting of eight turns of ¼-inch copper tubing 2 inches in diameter, spaced ¾ inch apart. In the grooves between turns, five turns of ignition cable

are wound, the ends connecting to the RG-8U concentric transmission line. This coupling helps to maintain balance with a concentric line. Each half of the antenna is made up of a 10-foot section of ¾-inch conduit and a 7-foot extension of ½-inch conduit. This extension is adjusted to expose a length of 5½ feet making the total length of each half of the antenna 15½ feet. The director is a single 20-foot length of ¾-inch conduit with 8-foot extensions at each end adjusted to expose 6½ feet. This makes the over-all length of the director 33 feet. Two 10-foot lengths may be joined together if a 20-foot length cannot be obtained. The ½-inch extensions are fitted into the ¾-inch portions of the 14-Mc. elements by splitting the ends of the ¾-inch sections with two blades in a hacksaw to produce a wide slot. A brass garden-hose clamp is used to bind the joint securely. The spacing between antenna and director is 7 feet, 3 inches.



Looking up at the simple dual two-element array at W9NLP. The 28-Mc. elements are mounted between the 14-Mc. antenna and director. Slack in the flexible coax feed lines permits almost 360-degree rotation.



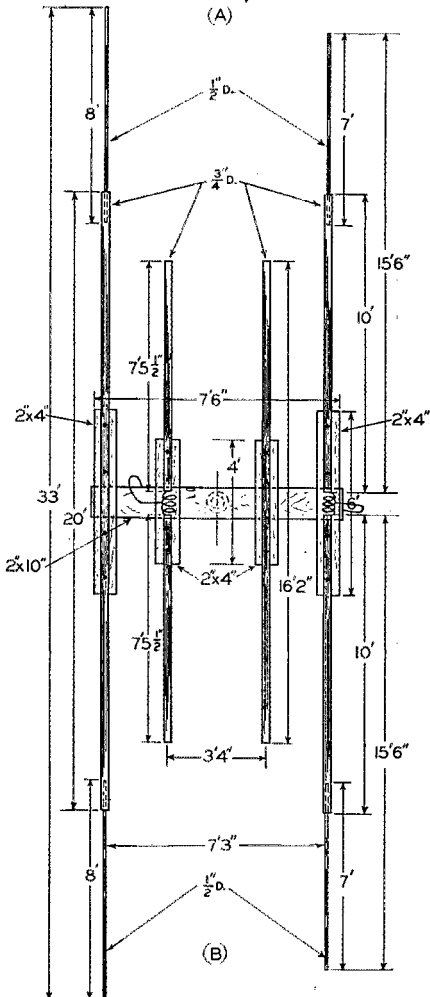
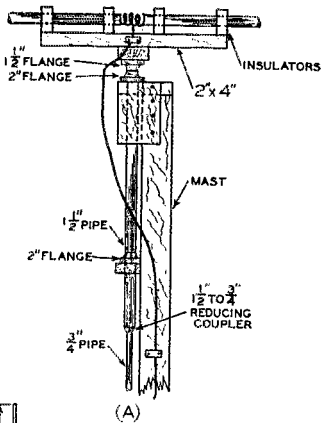


Fig. 1 — Sketch showing (A) details of the rotating shaft suspension, and (B) the construction of the simple dual two-element rotatable antenna.

• In this article, W9NLP describes a simple dual two-element array for 14 and 28 Mc. which has proved to be very effective. The theoretical gain is 4 to 5 db. above a half-wave doublet, but perhaps even more important is the reduction in QRM and noise. The article includes the description of a simple mast of the type with which this antenna has been used.

28-Mc. Elements

The 28-Mc. antenna is made up of two 7-foot $5\frac{1}{2}$ -inch sections, $\frac{3}{4}$ inch in diameter, while the director is 16 feet, 2 inches long. The two are spaced 3 feet, 4 inches. The 28-Mc. coil is similar to the one used in the 14-Mc. antenna except that it has only five turns of copper tubing and three turns of ignition cable. Heavy stand-offs should be used to insulate the elements from the framework.

The dimensions shown in Fig. 1 were determined experimentally. They are those which show resonance in the antenna and director at 14.2 Mc. and 29 Mc. and the arrays show a maximum forward gain at these frequencies of about 5 db., in contrast to the adjustment for maximum front-to-back ratio. The dimensions are not critical. If they are followed to an accuracy of plus or minus an inch, no difficulty will be encountered. Both beams take power over the entire band with very slight drop-off at the extreme edges.

Mast Construction

The support for the array is inexpensive and simple to construct. It also has the advantage that it may be lowered easily for antenna adjustments. It starts out at the base with a nine-foot railroad tie, of the type used at switches, sunk five or six feet in the ground leaving three or four feet protruding above ground. Next, four two-by-sixes 16 feet long are placed end to end in pairs, making two two-by-sixes 32 feet long. These are spliced and bolted together using two short pieces of two-by-six as splicing spacers, as shown in Fig. 2. The bottom ends are fanned out to

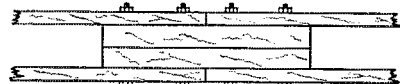
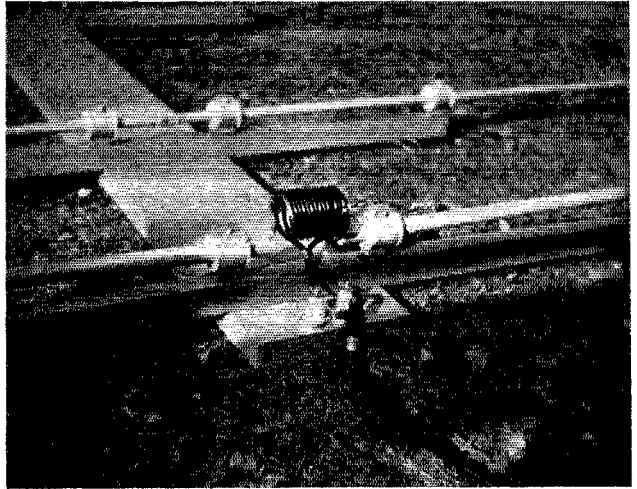


Fig. 2 — Sketch showing the method of splicing the two sections of the mast.

straddle the railroad tie while additional two-by-six spacers are used above, reducing the spacer to a single piece of two-by-six near the top to taper the mast. At the top of the mast a block-braced shelf protruding to one side is made of three pieces of two-by-ten, as shown in Fig. 1. A two-inch pipe flange is then fastened to the shelf and a two-inch hole to match it is cut in the shelf.

◆
 The coupling coil at the center of the 20-meter driven element. The one for the 28-Mc. antenna is similar but smaller.

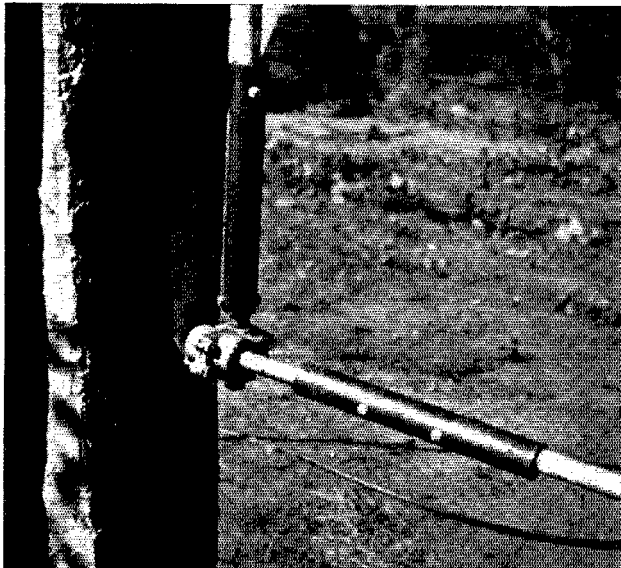


◆
 This forms the upper bearing for the rotating drive shaft. Another shelf with a pipe-flange bearing is fastened to the mast about four feet below the first. At the center of the 2-by-10 in the framework a 1½-inch pipe flange is fastened into which a 5-foot length of 1½-inch pipe is screwed. This forms the upper part of the rotating shaft which is dropped through the two upper bearings already provided. A reducing coupling, 1½ inches to ¾ inch, is fastened to the bottom end of the 1½-inch pipe. Three-quarter-inch pipe is then used for the remainder of the drive shaft. At the bottom a metal bracket holds an awning gear box which provides a right angle for bringing the rotation control into the shack. These gear boxes have a reduction ratio of about 8 to 1 and are self-locking. Three-eighths-inch rod or pipe can be used between the base of the shaft and the station control. If it is impossible to run the control shaft in a straight line between the mast and the shack, any number of turns can be made using these gear boxes. A control wheel or crank may be placed at the station end. All joints in the rotating system should be pinned to keep them from twisting loose.

A cheap but effective direction indicator consists of several turns of string around the control shaft and a plumb bob. A vertical scale may be placed behind the bob.

Before the mast is raised, guy wires should be fastened on about four feet from the top. Two matching holes for half-inch or larger bolts should be drilled in both the railroad tie and the bottom ends of the two-by-sixes. The bottom end of the mast is then raised to the top of the railroad tie and the top bolt slipped into place. If the mast is placed close to the shack, it can be swung up into place with block and tackle fastened as far up on the building as possible. Otherwise, it can be pushed up into position with gin poles, using the guy wires to steady it. When it is in the vertical position, the second base bolt can be pushed into place. In coupling the concentric line to a receiver whose input impedance is approximately 300 ohms, a coil consisting of 45 turns of No. 18 wire, 1 inch in diameter, is connected across the receiver input terminals, the coax line tapping on the coil at 5 turns each side of center.

Similar dual two-element arrays have been used by a number of hams in this vicinity, as well as by DX stations abroad, with excellent results.



◆
 Awning gear boxes provide right-angle turns in rotating mechanism. Sections of pipe are used as couplings.

Moscow

A Report on the Five-Power Conference by ARRL's Representative

FOR three weeks this past fall, from the opening plenary session on September 30th to the final plenary on October 21st, telecommunications representatives of China, France, the U.S.S.R., the United Kingdom and the U.S.A. met in session in Moscow at what will probably be known as the Moscow Five-Power Telecommunications Conference. Headed by Francis Colt de Wolf, chief of the Telecommunications Division of the Department of State, the United States delegation of nineteen members (plus a secretary, fiscal officer, interpreter and four stenographers) included five advisers from American nongovernment operating groups, one of whom was ARRL's Assistant Secretary A. L. Builong.

The conference is, perhaps, unique in that it resulted in no signed documents, no formal agreements and no commitments. The reason for the absence of such customary features is apparent when the purpose of the conference is understood: This was, essentially, a meeting of the five powers in advance of the world telecommunications conference (which presumably will be held sometime in 1947 and which will result in binding agreements) for the purpose of examining their respective proposals and their thinking for that conference, learning something of each other's philosophy with respect to such proposals, and determining how far they were in agreement on basic principles with regard to the revision of the Convention and Regulations.

From the amateur point of view the conference is of interest because it gave us a chance to learn what the other powers are thinking when it comes to amateur frequencies for the next world conference, and this brief account will be confined to this aspect of the meeting. Consideration of the frequency picture at Moscow breaks down into two parts: first, the initial proposals which each country brought to the meeting; and, second, the extent to which they found they either were in agreement or thought they could come to agreement by mutually-acceptable compromises. With respect to the first, China had no frequency proposals, so a summary reduces to the proposals of France, U. K., U. S. A. and the Soviet Union. By bands, these were as follows:

1.7 Mc.: The United States, as has been reported in *QST*, proposes loran in our band here, currently makes no international proposal for amateurs. The French proposal was found also to eliminate amateurs from the band, allocating it to maritime mobile and low- and medium-power services. The United Kingdom continued the band more or less on the Cairo basis: shared

between maritime mobile and amateur between 1715-1950 kc. and between maritime mobile, amateur and navigation aids from 1950-2000 kc. The U.S.S.R. continued the Cairo allocation "as is," sharing the band between amateur, fixed and mobile services.

3.5 Mc.: U.S. proposes 3500-4000 kc. exclusively for amateurs. The U.K. proposal cut down the band to 400 kc. and shared it with a variety of other services: 3500-3530 kc. shared between fixed, maritime, amateur, aeronautical and (provisionally) tropical broadcasting; 3530-3700 shared between fixed, maritime, amateur and "off-route" aeronautical; and 3700-3900 shared between fixed, amateur and aeronautical; no provision for amateurs above 3900. France restricted amateurs to the 250 kc. between 3650-3900 and shared this with "medium-power services." U.S.S.R. eliminated amateurs entirely in this band, giving it to fixed, maritime and aeronautical.

7 Mc.: U.S. proposes 7000-7300 exclusively for amateurs. U.K. proposed only half the band exclusively for amateurs, 7000-7150 kc., and shared the other half between amateurs and high-frequency broadcasting. France also cut the exclusive amateur section to 7000-7150 but gave the other half of the band exclusively to broadcasting. U.S.S.R. gave broadcasting exclusive rights to 7200-7300 kc., permitting amateur in 7000-7200 but shared with the fixed service.

14 Mc.: The U.S. proposal is 14,000-14,400 kc., exclusive for amateurs. The French proposal was found to be the same! The U. K. proposal showed an invasion of our band here by broadcasting; U. K. proposed only 14,000-14,350 exclusively for amateurs and proposed that the remaining 50 kc. be shared between amateur and broadcasting. U.S.S.R. proposed sharing the whole band between fixed and amateur.

21 Mc.: This is the band we've never had but which the U. S. is proposing as a new amateur band, for the next world conference, the U. S. proposal currently being 21,000-21,500 kc. It is encouraging to note that the idea is catching on, even though nobody else at Moscow went the whole way with us: the U.S.S.R. proposal was for a 400-kc. band exclusively for amateurs, 21,100-21,500, and the French proposed a 250-kc. band for amateurs from 21,200 to 21,450. Only U.K. failed to include at least a small amateur band here.

28 Mc.: The U.S. proposal is 28,000-29,700 kc. U.S.S.R., France and U.S. all agreed on 28,000-29,700 kc. exclusively for amateurs and U. K., while labeling all its proposals above 23 Mc.

"provisional" for the time being, continued the full Cairo assignment of 28,000-30,000 in its proposal.

So much for our DX bands. Above 28 Mc., the U.S.S.R. showed itself closest to U. S. thinking with a family of bands patterned after earlier American proposals which would allocate amateur bands at 40-44 Mc., 144-148, 1145-1245, 2500-2700, 5250-5650, 10,000-10,500 and 21,000-22,000 Mc. The U.K. went along fairly closely with current U.S. thinking above 1000 Mc., with amateur bands at 1345-1425, 2300-2450, 3400-3600 (shared with marine navigation aids), 5650-5850 and 10,000-10,500 Mc., but below that differed with proposals of 66.4-67.4 Mc. on a provisional basis, 166-170 Mc. shared with aeronautical and marine beacons, and 420-450 Mc. shared temporarily between amateurs and altimeters, later to be shared between amateurs and aeronautical ranges. France proposed an amateur band at 58.5-60 Mc. and had no other amateur proposals between this and 132 Mc., at which figure the French terminated the allocation table they had brought with them to Moscow.

These were the *initial* proposals, the proposals which each nation brought to Moscow as part of its complete current allocations table to examine in the light of the proposals of the other four powers. Following presentation of the proposals, meetings were held to see to what extent the plans could be brought into agreement. This was possible only to an extent, and in the case of the amateur bands resolved only into the following:

3.5 Mc.: This being a so-called regional part of

the spectrum, U.S.S.R., U. K., and France were willing to let the United States propose 3500-4000 kc. for amateurs outside the European region (China concurring), but for Europe agreed on indicating 3500-3900 shared between fixed, mobile and amateur (as Cairo does now); in addition, they agreed the power of amateurs should be limited in the European region. As a matter of fact, U. K. and France went further and indicated they could agree on an exclusive European amateur band of 3500-3600, but U.S.S.R. was unable to agree to this up to the time the Moscow sessions terminated. The U.S.S.R., U. K., and France were in agreement in excluding amateurs from 3900-4000 kc., designating this for aeronautical (primarily mobile) only, in Europe.

38 Mc.: U.S.S.R., France, U. S. and China were in agreement in recommending this band for amateurs, exclusively, and U. K. agreed to make every endeavor to adjust its views to such an allocation when it finally settles on its plan above 23 Mc.

Above 28 Mc. negotiation resulted in agreement on 1215-1295 Mc., 2300-2450 Mc. (subject to U.S.S.R. concurrence), 5650-5850 Mc. and 10,000-10,500 Mc., all to be exclusively for amateurs.

On our other bands, no basis of agreement could be developed during the Moscow sessions. With respect to all our DX bands, the United States indicated it could not agree to any reduction whatsoever from its proposals, and even among the others it was not possible to find a basis for common understanding. At 7 Mc., for instance, U. K., France and China appeared willing to agree on at least 7000-7200 exclusively for amateurs, but U.S.S.R. could not agree to cur-



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This sizeable group constituted the American delegation to the Preliminary Five-Power Telecommunications Conference held at Moscow in September and October last.

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tailing fixed services here; at 14 Mc., the U. K. indicated it might see its way to washing out its proposal for sharing amateur and broadcasting in the top 50 kc., which would bring everybody but U.S.S.R. together, but U.S.S.R. regarded this part of the spectrum as too valuable for the fixed service to turn it all over exclusively to amateurs. In an effort to agree on at least a part of the band, U.S.S.R. suggested 14,000-14,300 exclusively for amateurs provided it was agreed 14,300-14,400 would be allocated exclusively for fixed, but the others not agreeing on this proviso the U.S.S.R. withdrew its proposal as a possible compromise and the outcome was "no agreement" at 14 Mc. At 21 Mc. (the U. S. holding out for the 500 kc. for amateurs in its proposal), the Soviet and French eventually found themselves in agreement on at least a 350-kc. band from 21,100 to 21,450 kc.; the U. K. representatives, unable to agree to such a proposal at the time, nevertheless expressed a willingness to study this when they went home with the idea of finding some amateur assignment within these limits, although coupling this with the necessity for some compromises by the others on broadcasting in this part of the spectrum.

That about sums up Moscow, from the standpoint of the amateur. To those new to the game (as well as many old-timers) the aggregate of the proposals of the other countries at Moscow must seem to paint a pretty black picture for the future of amateur radio, particularly as concerns our DX bands, at the next world conference. With no desire to minimize the seriousness of our situation, it must be pointed out that such a prospect is not new; we faced almost as gloomy a prospect at Cairo, in 1938. It is not encouraging, however, to note from a study of the complete tables of the U. K., France and U.S.S.R. that these countries all appear determined to plug for materially wider bands for high-frequency broadcasting, at the expense of the amateur and fixed services; we, in common with many others, had hoped that saner points of view would prevail with respect to the peace-time function and value of this service. In any event, let it be clearly understood that the proposals and "agreements" here represent the thinking of the respective countries only as of Moscow; they may change their thinking (either for better or worse) by the time they come to the world conference.

In conclusion, it would appear that the Moscow meeting was successful and well worth while. It enabled us, informally and without commitment, to obtain advance knowledge of the thinking of the other powers represented, to learn the reasons for their proposals and to explain the reasons for ours.* All are still free to propose what they wish, but there can be no doubt that much was accomplished by the exchange of views which took place. These exchanges, incidentally, took place under the most friendly circumstances, with a sincere desire apparent on the part of all to

arrive at some basis of agreement. In large measure this was due to the example set by the chairman of the conference, Mr. A. D. Fortushenko, Soviet Deputy Minister of Communications, who proved to be not only a most capable representative of his own country but typified the attitude of the rest of his delegation in being willing to meet the others half-way whenever differences of viewpoint were involved. Such an attitude, coupled with an unusually efficient secretariat, excellent hotel accommodations and a thoughtfully-planned series of entertainments which included several receptions, concerts, and evenings at the incomparable Soviet ballet and opera, made our brief stay in Moscow pleasant as well as profitable.

—A.L.B.

*The United States philosophy with respect to amateurs was given excellent presentation by Captain Paul D. Miles, USN (Rtd.), chief of FCC's Frequency Service, Allocation Division, who acted as U. S. spokesman in the Frequency Allocation Committee, and subsequently was designated chairman of the special subcommittee of that Committee which completed the major portion of the frequency study.

FEED-BACK

In W3BXE's "A Three-Band Utility Transmitter," described in November *QST*, the following corrections should be made in the parts list of Fig. 1: L_{1B} should be 11 turns instead of 40; T_1 should read "7.5 v." instead of "6.3 v." — otherwise the dropping resistor, R_{12} , is unnecessary.

W0JH, coauthor of November's "Let's Not Overmodulate — It Isn't Necessary!," says production testing of the 30K transmitter reveals that in the clipper-filter of Fig. 3, reducing the value of R_0 to 50,000 ohms will make the circuit more foolproof.

W9DED, author of "A Deluxe Electronic Key," which appeared in September *QST*, regretfully has notified us of the following errors in his original manuscript: In Fig. 2, R_3 should be 0.22 megohm, 1 watt; R_{15} , 5600 ohms, 2 watts; and R_{16} , 3300 ohms, 2 watts. Mr. DeHart thanks W7HID for bringing these discrepancies to his attention.

Our apologies to W2ICJ, W3HDZ, W7IUY, and a host of others, who built "The Most Inexpensive Transmitter" described in December *QST* and then were unable to complete the tune-up and put the little rig on the air — all because we had broken faith with the continued line and omitted the balance of the article. We'll try to redeem ourselves this month. If you'll go along with us just this once more and turn to page 134, this issue, we promise you'll find the remainder of Byron Goodman's story. See you on the air . . . soon!

A 15-Watt Modulator for Low-Power Work

Making Use of the Cathode-Follower Driver in Small Audio Amplifiers

BY BERNARD H. GEYER, JR.,* W8WGF/1

THERE have been few innovations in speech amplifier-modulator circuits since the introduction of Class B modulators almost 15 years ago. Modulators of this type made it possible for the first time to obtain large amounts of audio power at relatively low cost but a suitable driving arrangement has always been somewhat of a problem. Since the load upon the driver of a Class B stage varies widely over the audio cycle this means that the output impedance of the driver must be low so that the change in Class B input impedance will represent a small percentage change across the driver output. Otherwise, as in the case of a power supply with poor voltage regulation, the output voltage of the

A pair of 6F6s was chosen for the modulator. In order to modulate the output of the 807 fully, the 6F6s had to be operated as Class AB₂ amplifiers which, of course, meant a low-impedance driver. Since space and weight were definitely at a premium in the portable, a Class B driver transformer was out of the question. The problem was solved by the use of the cathode-follower type of driver with resistance coupling, as shown in Fig. 1. The theory behind this coupling system has been described in a previous issue of *QST*.¹ An arrangement of this type not only eliminates the need for a driver transformer but, at the same time, provides a lower-impedance source than can normally be obtained with conventional trans-

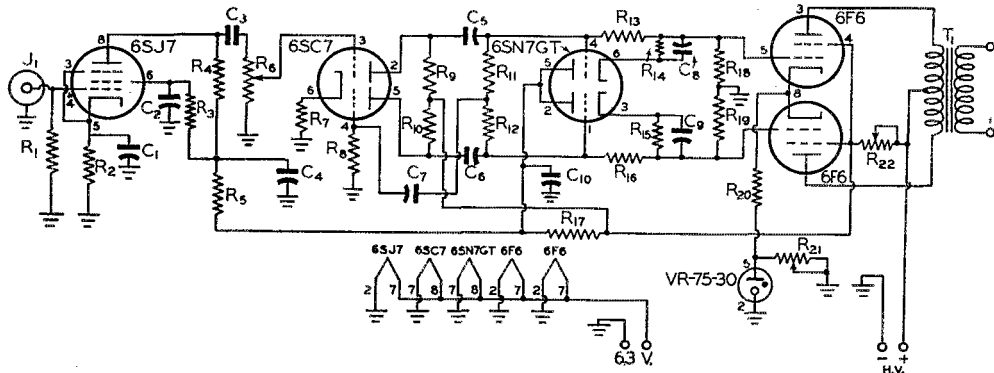


Fig. 1 — Circuit diagram of the low-power modulator using a cathode-follower driver.

- C₁, C₈, C₉ — 25- μ fd. 50-volt electrolytic.
- C₂, C₄ — 0.5- μ fd. paper.
- C₃ — 0.0022- μ fd. mica
- C₅, C₆, C₇ — 0.01- μ fd. paper.
- C₁₀ — 8- μ fd. 450-volt electrolytic.
- R₁ — 1 megohm, $\frac{1}{2}$ watt.
- R₂ — 1500 ohms, 1 watt.
- R₃, R₈ — 2.2 megohms, 1 watt.
- R₄, R₉, R₁₀ — 0.47 megohm, 1 watt.
- R₅ — 47,000 ohms, 1 watt.
- R₆ — 2-megohm potentiometer.

- R₇ — 3300 ohms, 1 watt.
- R₁₁ — 4.7 megohms, $\frac{1}{2}$ watt.
- R₁₂ — 6.8 megohms, $\frac{1}{2}$ watt.
- R₁₃, R₁₆ — 0.22 megohm, $\frac{1}{2}$ watt.
- R₁₄, R₁₅ — 1000 ohms, 1 watt.
- R₁₇ — 5000 ohms, 10 watts.
- R₁₈, R₁₉ — 10,000 ohms, 1 watt.
- R₂₀ — 400 ohms, 10 watts.
- R₂₁ — 1500 ohms, 50 watts (adjustable).
- R₂₂ — 10,000 ohms, 10 watts (adjustable).
- T₁ — Output transformer.

driver will soar over that part of the cycle where the load is light and correspondingly droop over that portion when the load is heavy, causing distortion. For this reason driver tubes of low plate resistance and also a driver transformer of low resistance are requirements in the usual form of Class B driver.

In designing a 'phone rig with an 807 in the final for portable work, several factors had to be considered when it came to the audio end.

former coupling from the plate circuit. The frequency response, of course, is as good or better than would be obtained with a conventional circuit using a high-grade driver transformer.

To compensate for the voltage drop through the load resistors in the cathodes of the 6SN7, the voltage of the biasing source must be higher than that required for biasing purposes. Plenty of plate voltage was available for the 6F6s since they are operated from the same plate supply as the 807. For this reason cathode biasing was considered, but the varying plate current of the

* 905 Boylston St., Boston 15, Mass.
¹ Greenwood, "Cathode-Follower Circuits," *QST*, June, 1945, p. 11.

(Concluded on page 104)

Happenings of the Month



ELECTION RESULTS

There are numerous changes in the ARRL Board of Directors, and in the alternate directors, as a result of the 1946 autumn elections, the results of which are reported below for your information.

In the Central Division (now consisting only of the states of Illinois, Indiana and Wisconsin) three candidates for director fought it out in a very tight race:

Clyde C. Richelieu, W9ARE.....	510 votes
George E. Keith, W9QLZ.....	504 "
G. Lane Eldred, W9SG.....	470 "

Mr. Richelieu, the new director, is the acting SCM for Wisconsin and was Iowa SCM in 1938-39. By profession a communications engineer, with six years of service as an airway radio engineer with CAA, he is presently the district manager of the Simplex Time Recorder Company at Milwaukee. He has been a leader in club work in both Wisconsin and Iowa and is of course ORS, and OBS and OO as well.

As has already been reported, Harold H. Jansen, W9DJG, of Alton, is the new alternate of the Central Division.

Kentucky, Michigan and Ohio now constitute our new Great Lakes Division and they have elected a director and an alternate for an initial term of one year. The new director is Harold C. Bird, WSDPE, of Pontiac, our SCM for Michigan since 1938. Active in amateur radio since 1909, Mr. Bird is a senior operator with Western Union. He too is very active in club work in his territory. The balloting:

Mr. Bird.....	635 votes
John A. Kiener, W8AVH.....	571 "
Robert L. Stewart, W8OXG.....	111 "
James M. Boles, W4ERV.....	98 "

For its alternate, the Great Lakes elected John H. Brabb, W8SPF of Grosse Pointe Park, a practicing attorney, in balloting as follows:

Mr. Brabb.....	699 votes
Earl S. Nelson, W8DS.....	483 "
Chester W. Bolg, W8JXY.....	223 "

The Hudson Division also has a new director in the person of Joseph M. Johnston, W3ABI, of Avon, N. J., staff engineer at the Evans Signal Laboratory at Belmar and prominent in the affairs of the Monmouth County Amateur Radio Association:

Mr. Johnston.....	906 votes
George Rulffs, jr., W2CJY.....	720 "

Robert A. Kirkman, W2DSY, the retiring director who recently turned over division affairs to his alternate, Mr. Rulffs, as acting director, himself ran for alternate director of his division and won very handsily over his only opponent, Maurice R. Gutman, W2VL:

Mr. Kirkman.....	1,117 votes
Mr. Gutman.....	508 "

Percy C. Noble, W1BVR, had been declared elected the director of the New England Division but there was balloting for alternate and a change in the office, the new alternate being Frank L. Baker, W1ALP, of North Quincy, engineering aide at the AAF Watson Laboratory:

Mr. Baker.....	828 votes
Clayton C. Gordon, W1HRC.....	333 "

The Northwestern Division chose Harold W. Johnston, W7DXF, for its new director, in a close contest with Karl W. Weingarten, W7BG, the incumbent. Mr. Johnston received 358 votes, Mr. Weingarten 310. Mr. Johnston is a radio and teletype maintenance inspector for CAA and resides in Seattle. He has been active since 1923 and was our Oregon SCM in 1939-40. As previously reported, R. Rex Roberts, W7CPY, remains the alternate director.

The Roanoke Division again returned Professor Colonel Hugh L. Caveness, W4DW, over his only opponent, C. S. Hoffmann, jr., W8HD, 363 votes to 190. J. Frank Key, W3ZA, remains the alternate director.

The small Rocky Mountain Division had several candidates for each office and fought it out in good style. For director:

Franklin K. Matejka, W0DD.....	123 votes
Howard R. Markwell, W0TFP.....	76 "
Willis A. Finchum, W7JQU.....	36 "

and for alternate:

P. Arthur Smoll, W0KVD.....	139 votes
Artie D. Davis, W0BJN.....	101 "

Mr. Matejka, with an active career in amateur radio since 1921, is a construction engineer on the Colorado-Big Thompson project of the U. S. Bureau of Reclamation, in charge of the construction of tunnels, canals, dams and power plants. He lives in Estes Park, Colo. Mr. Smoll is a retired educator, residing in Colorado Springs, and is chairman of the Pikes Peak Amateur Radio Club.

In the Southwestern Division we have previously reported that Arthur Schifferman,

W6RBH, was declared elected as alternate without balloting, being the only candidate, but there was a close race for director to succeed John E. Bickel, W6BKY, who is retiring, resulting as follows:

Hans R. Jepsen, W6KEI.....	653	votes
Dwight B. Williams, W6RO.....	513	" "

Rudy Jepsen, the new director, is a PAX repairman for the Southern California Telephone Company in North Hollywood. He has been particularly interested in plans for emergency communication and is AEC Emergency Coördinator for the San Fernando Valley.

In the West Gulf Division, Wayland M. Groves, W5NW, was comfortably reflected over his only opponent:

Mr. Groves.....	554	votes
James A. Smith, W5ECE.....	258	" "

Jack T. Moore, W5ALA, assistant director and the president of the Dallas Amateur Radio Club as well as the recent SCM for Northern Texas, was chosen for the new alternate:

Mr. Moore.....	476	votes
Gordon G. Ash, W5CY.....	330	" "

Reports on the imminent election for Canadian General Manager and alternate will appear in *QST* soon.

80 OPENED IN HAWAII

Following their release by the military services, the frequencies 3625 to 4000 kc. were opened to the use of amateurs in the Territory of Hawaii at 4 p.m. on November 20th. The Class A 'phone assignment 3900-4000 kc. is included. The release was made by means of FCC Order No. 130-K which, for convenience, recapitulated all authorized amateur bands and types of emission. The only change in the "ordering paragraphs" is in the one assigning us the 3500-4000 band, which now reads as follows:

3500 to 4000 kc. Use of this band is restricted to amateur stations as follows: 3500-4000 kc., using Type A1 emission, to those stations located within the continental limits of the United States, the Territory of Alaska, Puerto Rico, and the Virgin Islands; 3625 to 4000 kc., using Type A1 emission, to those stations located within the Territory of Hawaii; 3850 to 4000 kc., using Type A3 emission, to those stations located within the continental limits of the United States, the Territory of Alaska, Puerto Rico, the Virgin Islands, and the Territory of Hawaii, and subject to the further restriction that A3 emission may be used only by an amateur station which is licensed to an amateur operator holding Class A privileges and then only when operated and controlled by an amateur operator holding Class A privileges.

The frequencies 3500-3625 are still in use in the Islands for local airways, it is reported, but the League hopes to effectuate their similar return very soon. No frequencies in the band 3500-4000 are as yet released for amateur use in the regions to the west of the Territory of Hawaii.

HAS YOUR LICENSE EXPIRED?

The several extensions of amateur licenses during the war years have produced unparalleled confusion in determining the expiration date, particularly as concerns some December dates. We have checked and cross-checked with Washington. We don't care what anybody else says. We know we are right:

If yours is the usual "extended" amateur case, your station license expires with your operator license, and operator licenses began expiring December 8th. If your operator license was issued on a December 8th to a December 31st, from 1938 to 1943, it is not extended until December, 1947. Instead, it expired in December, 1946. Even if you have a letter from the Government saying that your licenses are valid until December, 1947, they still expired in December, 1946! In such a case there is nothing for you to do but to apply immediately for renewal, attaching whatever official advice you have previously received to explain your slowness, and request that your new license be back-dated to show continuity of your licensed status. FCC will do this in such cases.

If the date of issuance on your operator license is a January 1st to a December 7th, from 1939 to 1944, it expires on the corresponding date in 1947. Keep a reminder of that date before you. Two or three months in advance (not more than 120 days) write your district FCC Engineer-in-Charge for an amateur application form and file it direct with FCC at Washington, with your old licenses attached.

Operator licenses issued since December 8, 1944, run their stated terms.

COUNTERPART CALLS

When FCC changed our call areas it undertook to give each affected amateur, wherever possible, the counterpart of his previous call. But when an amateur of his own initiative moved from one call area to another, FCC felt no such obligation. We are pleased to report that now the policy has changed and that, *in future*, when an amateur moves from one call area to another and is due to suffer a change in call, FCC will assign the counterpart suffix upon request where it is possible.

F.C.C. AMATEUR EXAMINATIONS FOR 1947

The Federal Communications Commission will give amateur examinations during 1947 on the following schedule. Remember this list when you need to know when and where examinations will occur. Where exact dates or places are not shown below, information may be obtained, as the date approaches, from the Engineer-in-Charge of the district. *Even stated dates are tentative and should be verified from the Engineer as the*

date approaches. No examinations are given on legal holidays. All examinations begin promptly at 9 A.M. except as noted.

Albuquerque: Mar. 23, Sept. 24.
 Amarillo, Tex.: Apr. 1, Sept. 19.
 Anchorage, Alaska, 39 U. S. P. O. and Courthouse: By appointment.
 Atlanta, 411 Federal Annex: Tuesday and Friday at 8:30 A.M.
 Bakersfield, Calif.: Some time in February and August.
 Baltimore, 508 Old Town Bank Bldg.: Monday through Friday. When code test required, 8:30 A.M.
 Bangor, Me.: Some time in April and October.
 Beaumont, Tex., 329 P. O. Bldg.: By appointment.
 Birmingham: Jan. 8, Apr. 9, July 9, Oct. 8.
 Billings, Mont.: May 6, Sept. 30.
 Bismarck, N. D.: Some time in April and October.
 Boise: Some time in April and October.
 Boston, 7th floor Customhouse: Monday through Friday.
 Buffalo, 328 Federal Bldg.: First and third Thursdays each month.
 Butte, Mont.: Apr. 30, Oct. 4.
 Charleston, W. Va.: Some time in March, June, September and December.
 Chicago, 246 U. S. Courthouse: Friday.
 Cincinnati: Some time in February, May, August and November.
 Cleveland, 541 Federal Bldg.: First and third Fridays each month, also by appointment.
 Columbus, Ohio: Some time in January, April, July and October.
 Corpus Christi: Mar. 13, June 12, Sept. 11, Dec. 11.
 Cumberland, Md.: Apr. 10, Oct. 9.
 Dallas, 500 U. S. Terminal Annex: Monday through Friday.
 Davenport: Some time in January, April, July and October.
 Denver, 504 New Customhouse: First and second Thursdays each month.
 Des Moines: Jan. 10, Apr. 4, July 11, Oct. 17.
 Detroit, 1029 New Federal Bldg.: Wednesday and Friday.
 El Paso: Mar. 24, Sept. 29.
 Ft. Wayne: Some time in February, May, August and November.
 Fresno: Mar. 19, June 18, Sept. 17, Dec. 17.
 Galveston, 404 Federal Bldg.: Tuesday and Friday.
 Grand Rapids: Some time in January, April, July and October.
 Hartford, Conn.: Some time in March and September.
 Hilo, T. H.: Apr. 8, Oct. 28.
 Honolulu, 609 Stangenwald Bldg.: Monday at 8:30 A.M.
 Houston, Tex., 216 U. S. Appraisers Stores Bldg.: Tuesday and Friday.
 Indianapolis: Some time in February, May, August and November.
 Jacksonville: Apr. 19, Nov. 1.
 Juneau, Alaska, 6 Shattuck Bldg.: Monday through Friday and by appointment.
 Kansas City, 838 U. S. Courthouse: Friday and by appointment.
 Kaunakakai, T. H.: Oct. 17.
 Klamuth Falls, Ore.: Some time in May and November.
 Lanai City, T. H.: Oct. 14.
 Las Vegas, Nev.: Some time in April and October.
 Lihue, T. H.: Apr. 22, Oct. 8.
 Little Rock: Jan. 15, Apr. 16, July 16, Oct. 15.
 Los Angeles, 539 U. S. P. O. and Courthouse Bldg.: Wednesday at 9 A.M. and 1 P.M.
 Memphis: Mar. 12, June 11, Sept. 10, Dec. 10.
 Miami, 312 Federal Bldg.: Monday and Thursday.
 Milwaukee: Some time in January, April, July and October.
 Mobile: May 21, Nov. 12.

Nashville: Feb. 12, May 14, Aug. 13, Nov. 12.
 New Orleans, 400 Audubon Bldg.: Monday at 8:30 A.M. and by appointment.
 New York, 748 Federal Bldg., 641 Washington St.: Monday through Friday.
 Norfolk, 402 Federal Bldg.: Monday through Friday, 8:30 A.M. to 5 P.M.
 Oklahoma City: Jan. 23-24, Apr. 29-30, July 24-25, Oct. 29-30.
 Omaha: Jan. 17, Apr. 11, July 18, Oct. 10.
 Philadelphia, 1200 Customhouse: Class A, Monday, Tuesday, Thursday, Friday, 9 A.M. to 2 P.M. Class B, Wednesday at 9 A.M. and 1 P.M.
 Phoenix, Ariz.: Some time in April and October.
 Pittsburgh: Feb. 4-5-6, May 6-7-8, Aug. 12-13-14, Nov. 12-13-14.
 Portland, Me.: Some time in April and October.
 Portland, Ore., 805 Terminal Sales Bldg.: Friday at 8:30 A.M.
 Reno: Apr. 16, Oct. 15.
 Roanoke: Apr. 5, Oct. 4.
 St. Louis: Feb. 7, May 9, Aug. 8, Nov. 7.
 St. Paul, 208 Uptown P. O. Bldg.: Friday.
 Salisbury, Md.: Mar. 13, Sept. 11.
 Salt Lake City: Mar. 22, June 21, Sept. 20, Dec. 20.
 San Antonio: Feb. 13, May 15, Aug. 14, Nov. 13.
 San Diego, 307 U. S. Courthouse: By appointment.
 San Francisco, 328 Customhouse: Monday and Friday.
 San Juan, P. R., 323 Federal Bldg.: By appointment.
 Savannah, 214 P. O. Bldg.: By appointment.
 Schenectady: Mar. 12-13, June 11-12, Sept. 10-11, Dec. 10-11.
 Seattle, 808 Federal Office Bldg.: Friday.
 Sioux Falls, S. D.: Some time in March, June, September and December.
 Spokane: Apr. 23, Oct. 8.
 Syracuse, N. Y.: Jan. 8, Apr. 9, July 9, Oct. 8.
 Tampa, 410 Main P. O. Bldg.: By appointment.
 Tucson, Ariz.: Some time in April and October.
 Tulsa: Jan. 27-28, Apr. 25-26, July 28-29, Oct. 24-25.
 Wailuku, T. H.: Oct. 15.
 Washington, D. C., 316 F St., N. E.: Monday through Friday, 8:30 A.M. to 5 P.M.
 Wichita: Mar. 7, Sept. 12.
 Williamsport, Pa.: Mar. 12, June 10, Sept. 10, Dec. 10.
 Wilmington, N. C.: June 7, Dec. 6.
 Winston-Salem: Feb. 1, May 3, Aug. 2, Nov. 1.

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.

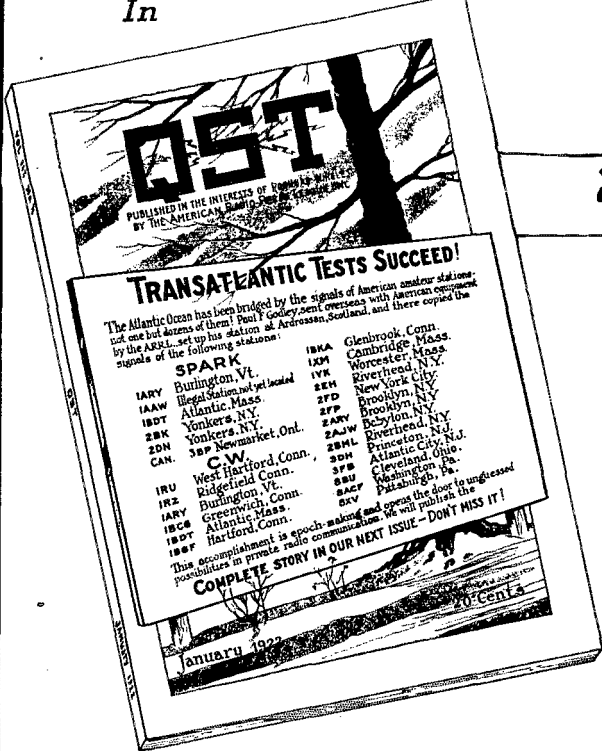
OUR OLD 2 1/2-METER BAND

It will be remembered that one reason for shifting our 2 1/2-meter band to 2 meters was to be able to provide a solid block of channels from 108 to 132 Mc. for various civil aviation uses. After long study, FCC has recently announced the subdivision of this block, and if you still have

(Concluded on page 108)

25 Years Ago

this month



"Oh, Mr. Printer, how many exclamation points have you got? Trot 'em all out, as we're going to need them badly, because WE GOT ACROSS!!!!!!"

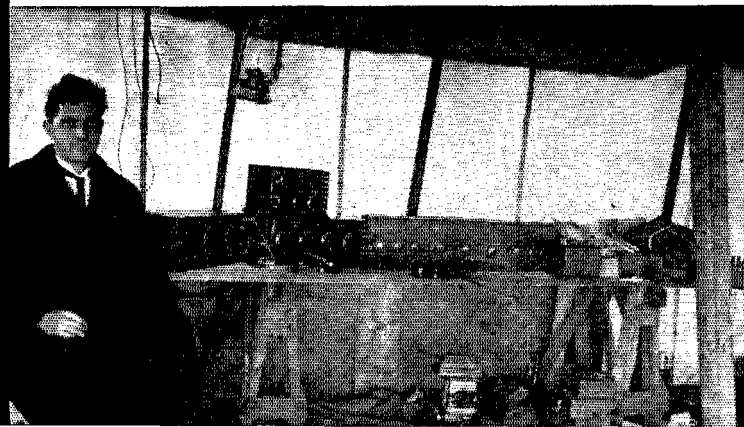
WE HAVE confirmation of the history-making news — January 1922 *QST*'s joyful telling of the good word which has been crackling through nightly from Marconi's MUU and Radio Corporation's WIL. "It can't be done on 200 meters with low-power amateur equipment." Well, we did it . . . and on schedule! Let the skeptics study the imposing list of Transatlanticers on this month's cover. And say, Matty, better retire 9ZN's spark, because toddler c.w. is a striding grownup today!

Paul Forman Godley, 2ZE, ARRL's special representative, outfitted with the finest American regenerative and superheterodyne receivers, has been copying our "Test" transmissions from a specially-selected site at Ardrossan on the bleak, dismal Scotch coast. Since December 8th he has reported twenty-six of our stations crashing across the North Atlantic to find his Beverage Wire and feed warmth to a wind-buffed static-riddled tent. The score to date: spark 6, c.w. 22!

In his early messages "Paragon Paul" names IBCG, Greenwich, Conn., a station built especially for the Tests by Messrs. Armstrong, Cronk-hite, Burghard, Grinan, Amy and Inman, as the outstanding signal coming out of the States. Not only did IBCG get across handily, its operators also were successful in transmitting the first private message overseas via amateur radio. Some of the country's best stations are on the roster of the accomplished. There is an ironical note in the evidence that "1AAW," first station logged by Mr. Godley, is a call bootlegger. The list of Atlantic-spanners should grow, however, because Mr. Philip R. Coursey, our British friend who has been handling the arrangements at that end for Traffic Manager Schnell, has radioed ARRL headquarters, "Many your stations heard by British amateurs. Details later." Further vindication of our faith in our receivers and transmitters, and our Board of Direction's selection of Mr. Godley!

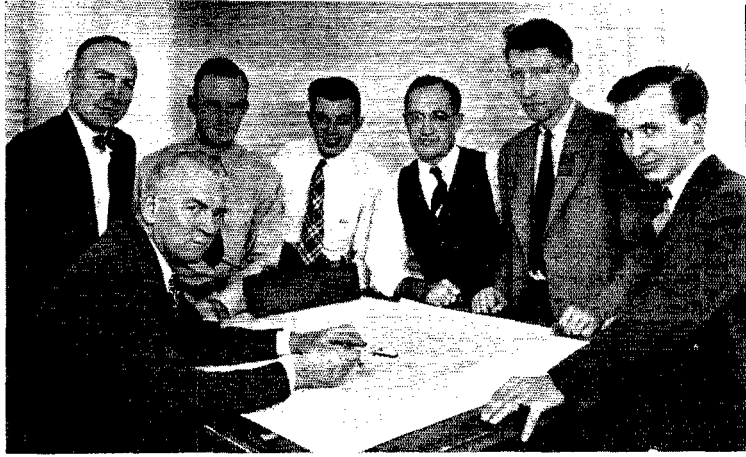
K.B.W. has been collecting on his pre-Transatlantic wagers and is now richer by one English spring topper, bill to Mr. W. W. Burnham, manufacturer of the British Ultra III receiver. *QST* has a new two-year subscriber, too, with 9HM paying off. In the flush of our triumph *QST*'s editor writes, "We got over, as we said we would, and our ARRL did it. It opens the door to big things and the scientists of the world are of course gasping and marveling that such small powers on such short wavelengths could cover such distances. . . . They're [the commercials] wondering today why they put in 200-kilowatt machines and miles of 500-foot towers and use wavelengths of many thousands of meters when a private citizen in his home in Podunk, Penn., with less than 50 watts of c.w. power can do the same thing."

To clear the air at this time the Committee on Transatlantic Communication of the Radio Club of America, consisting of Messrs. Armstrong, Hebert and Pacent, has disapproved 2QR's claim to



Interior of the tent "ham shack" used by Mr. Godley. Inspector D. E. Pearson, checking operator, is shown seated alongside the makeshift receiving position, the lantern and oil stove.

Paul Forman Godley today, in his offices at the Paul Godley Co., consulting radio engineers. Surrounding Mr. Godley, ex-2ZE, are, left to right, his partner, Murray G. Crosby, W2CSY, and staff members Paul F. Godley, jr., Barton C. Coffman, Charles Evans, Archer S. Taylor and Carson W. Kauffman.



being the first station to span the Atlantic, as reported last year. The Committee supported their decision with 42 exhibits and a letter from Hugh and Harold Robinson, operators of 2QR, acknowledging that they were in error in believing they had been heard in Scotland by Messrs. Benzie and Miller.

The leading technical article this month is A. L. Groves' "Some Ideas on Short-Wave C.W. Reception." The merit of using condensers and coils instead of variometers, with resultant improved selectivity and stability for receiving sharp c.w. signals, is presented. "Improving the Relay Spark Transmitter," by Sumner B. Young, 1AE, completes an enlightening series. In "The Antenna System at 3DH," D. W. Richardson broaches new ideas on reducing antenna losses. Improvements in the popular 1DH circuit are presented in "Comments on the Sure-Fire C.W. Circuit," by H. S. Shaw, jr., 1JK. Recommended are the rearrangement of grounds, a change to parallel plate feed and removal of the plate meter from high-current r.f. circuits. Lieut. E. W. "A-P" Stone is back in *QST*'s pages with excerpts from his recent lecture on the relationship between light, heat and radio waves.

We are honored by Secretary Hoover's announcement of the Department of Commerce Cup, to be awarded to "America's best all-around amateur station, the major portion of which is homemade." The award is to be made annually under the auspices of ARRL. Complete rules are published, and entries for the 1921 award invited. WJZ, Newark, is pictured in the "With the Radiophone Folks" department. "Boy Scout Radio," by John F. Gray, 6MZ, together with S.P.W.'s "And It Came to Pass —," round out

the lighter side of this issue.

Traffic Manager Schnell's prophecy that before the year-end c.w. signals would span the continent has come true, with 1ES copying GALE and 2BAK being heard in Mexico. Plans are being completed for a "President-Governor's Relay," to be held in March. In the station descriptions department we find the deluxe c.w. layout of 1AFV, Salem, Mass., 9HM, St. Paul, 3SM, Philadelphia, 9AGP, Chicago and 9ABL, Kankakee, Ill. Strays report that Robert C. Higgy, 8IB, has joined the *QST* staff. . . . Vermilya of 1ZE has forsaken his spark for a 100-watt tube set and is active in the Transatlantics. . . . Wouldn't it be wonderful if 1TS reported calls not heard to save valuable space in *QST*?

If our climate is un-Godley,
 If the weather seem to Paul,
 If our static strikes you oddly,
 If you hear no sigs at all,
 If you get harmonics down the scale,
 As far as tuners go,
 If the dialect in Scotland,
 Doesn't sound like Ohio,
 If twenty thousand hard-boiled hams
 Are waiting on your word,
 If but the thought of hearing them,
 Seems very near absurd,
 If — in the chilly morning hours —
 The faintest sigs come thru,
 We'd like to hear about it,
 If it's all the same to you! !

—Tribute to Mr. Godley by Editor
 Harris of Britain's *Conquest*,
 From *QST* for February, 1922.

The tent and site at Ardrossan on the Scotch coast, where "Paragon Paul" and Inspector Pearson spent their ten-day vigil during the Second ARRL Transatlantics.

• Technical Topics —

Flat Lines and Loading

THERE seems to be a common notion that the way a line couples to the transmitter gives an indication of whether or not the line is flat. To be specific, the case we have in mind is the one where the line is connected to a swinging link coupled to the final tank coil, no auxiliary feed-tuning apparatus being used. The assumption is that if the transmitter can be loaded to normal input with fairly loose coupling, the line is matched to the antenna and everything is lovely, but if the amplifier won't load then those malicious standing waves are getting in their underhand work.

The facts of the matter may be — and usually are — just the opposite. A line that is really flat looks like a pure resistance to the transmitter, a resistance having a value that — depending on the type of line — may be between 50 and 600 ohms. It is not so easy to put power into a resistance in that range of values with just a loosely-coupled coil, particularly if that coil has only two or three turns and the tank coil itself has a great many. Loose coupling is possible only between two circuits having relatively high Q . In the swinging-link case, the Q of the secondary or load circuit is practically negligible, and the power is transferred by simple transformer action. To get anywhere on that basis, the coupling between the two coils has to be tight, and in many cases the number of turns on the link is not sufficient to couple into the line even though the two coils are as close together as possible.

The doubting Thomases can prove this to themselves by a simple test with a dummy antenna. The Ohmite dummies provide a means for getting reasonably close to a purely resistive load of known value, and the two sizes — 70 and 600 ohms — will simulate two popular line impedances. Two of the 600-ohm units can be connected in parallel to provide a 300-ohm load. If the transmitter power output is too great for the capacity of the dummy antenna, the final-amplifier plate voltage should be reduced to a value that will keep the output under the 100-watt rating of the dummy when the plate current is reduced in the same proportion. For example, suppose the amplifier normally operates at 1500 volts and 300 ma. and the power output is 300 watts. Dropping the plate voltage to 750 and the plate current to 150 (thereby maintaining the same ratio of plate voltage to plate current) will keep the output below 100 watts for testing — and, if the amplifier is actually operating Class C, the same load that draws 150 ma. at 750 volts will draw 300 ma. at 1500 volts with no

change in coupling.

Our experience has been that with the ordinary commercially-built tank coils and links it may be possible to load the amplifier properly with a 70-ohm dummy at 28 Mc. and perhaps also at 14 Mc., but at the tightest possible coupling it is not possible to make the amplifier draw enough plate current at 7 and 3.5 Mc. It is usually impossible to get sufficient coupling with a 600-ohm dummy at any frequency. Conditions are most favorable when the tube or tubes used in the amplifier operate at high plate voltage and relatively low plate current. This is because manufactured tank coils generally have inductance values that will give a good tank Q only when the plate-voltage plate-current ratio is high; the coils are too large for tubes that operate at relatively low voltage and high current. Insufficient Q in the tank circuit makes it difficult to couple to a load, particularly when the load is not a resonant circuit.

To get sufficient coupling at the lower frequencies in a test of this sort, it is almost invariably necessary to forget about the swinging link and do one of two things: either wind a new link right over the tank coil, adjusting the number of turns until the proper loading is obtained, or tap the dummy directly on the tank, adjusting the spread between taps until the loading is right. It is not uncommon to find that a great many more coupling turns are needed than the link provides; in fact, the 600-ohm load often requires just about half as many turns as there are in the tank coil itself. The experience of trying to make a dummy antenna "load up" the transmitter should be quite illuminating to those who take it for granted that a swinging link should couple into any "flat" line.

If a dummy antenna won't load the transmitter, how can a line of the same resistance be expected to do it? The answer is, of course, that it can't. If the line does load the amplifier and the dummy doesn't, it is certain evidence that the line is not flat. Before using loading as a criterion of line performance, find out *first* what sort of coupling is required to get full loading with a dummy antenna of the same resistance as the line impedance. Then if the line loads the transmitter in the same way as the dummy, there is at least a chance that the line is flat. It is by no means a certainty, because it is readily possible that the line length and termination are such as to present a good load at the transmitter with a far-from-negligible standing-wave ratio. Lacking a good means for measuring standing waves,

perhaps the best stunt for checking is the old one: Add about an eighth wavelength of line and see if the loading changes; if it does not, add another eighth wavelength and check again. If the loading is still the same, your worries about standing waves are over. But if either test causes the loading to change or makes it necessary to retune the final amplifier for resonance, the line is not flat even if the amplifier can be fully loaded with the swinging link in the next county.

It is an unfortunate fact that one swinging link cannot serve for coupling to a nonresonant

line on all bands from 3.5 to 28 Mc. If it has enough turns to do the job at 3.5 Mc. it has far too much inductance to be useful at 28 Mc., and if the turns are kept down so the link reactance will be small at 28 Mc. it is impossible to get sufficient coupling at the low-frequency end of the scale. The solution for all-band work — and for any single band where coupling via the link alone is insufficient — is to use an antenna coupler that provides a means for matching to the line.

— G.G.

V.H.F. Antennas — Horizontal or Vertical?

EVEN in the earliest days of organized activity on 56 Mc., the question of antenna polarization rated wide discussion, and it has been the subject of heated argument ever since, with both sides sticking by their guns with more tenacity than logic. Most of us are inclined to be allergic to new ideas, and even in a group as progressive as hams are reputed to be there are not a few who bristle at the mere suggestion of a change from long-established practice, even when it can be shown that such a move will result in improved operating effectiveness. As recently as the spring of 1946 a furor reminiscent of the famous Tea Party was set off in the Boston area by the recommendation in the pages of *QST* of horizontal antennas for 50-Mc. work.¹

New England, like the rest of the East, had done all right with vertical antennas, and the gang, which included veterans of as much as 15 years of v.h.f. work, did not take kindly to the idea of changing to horizontal polarization, simply because a few upstarts in the Middle West had done so. The activity of the early '30s started with vertical antennas, as the first tests showed that the verticals produced the strongest signals over the purely-local paths then covered. It was quite definite that vertical antennas produced stronger signals than horizontals in working across town, which was the "DX" of 1931. Much of the early work was done with mobile and portable rigs, with which vertical polarization is a natural, and high-gain antennas (which are the particular field where horizontals are most effective) were unknown.

After a few years the 5-meter band began to break out with a rash of sporadic-E DX, and we suddenly realized that the horizon need not necessarily be confined to the distance one could see from a high hill. How about horizontals for the DX work? They were tried, first in the Middle West and later in other sections, and found to be very useful. The more advanced workers also began to use multielement arrays by this time, and horizontal beams replaced verticals in many

leading stations. When enough of them were up they came into general use for extended-local work as well as for DX, and the long pre-eminence of the East in five-meter work began to be threatened.

The trend to horizontal polarization was under way, and the v.h.f. bands became the scene of nightly arguments on the merits of one or the other. Many tests were made in attempts to find the answer, and even today the bewildered v.h.f. worker, who owes no allegiance to either side, is subjected to a cross-fire of "evidence" in support of both sides. Commercial studies, on the outcome of which the whole thing was decided, showed that horizontal polarization had a slight edge, when all angles were considered, and television and f.m. went horizontal on the strength of the evidence so gathered. The margin was very slight, indeed, and it can be shown that there is very little in favor of one or the other, provided the *most effective* type of antenna is used and the same polarization is used at both ends of the circuit. How, then, does a fellow choose?

Since the most effective antenna system for v.h.f. work is one which concentrates radiation at useful angles, designs which lower the radiation angle and yet are simple in construction are the most applicable to amateur use, and here is where the horizontal systems shine. The directive antenna in its simplest form is the multielement parasitic array, wherein a director or reflector is used in conjunction with a driven element a half-wave long. The addition of one or more such parasitic elements sharpens the radiation pattern in the plane of the elements. Thus it may be seen that such an array will have a concentration of power at useful angles when it is used in a horizontal position: i.e., it will be sharp in a vertical plane (desirable, because it lowers radiation angle) and broad in a horizontal plane (desirable, to make it unnecessary to rotate the antenna for every station heard). If one uses the same array in a vertical position conditions are reversed. The pattern in a vertical plane is

¹ "The World Above 50 Mc." *QST*, June, 1946.

(Continued on page 108)

A Tuned-Line Matching Transformer

Simplified Matching for Close-Spaced Beams

BY DR. T. A. GADWA,* W2JO, EX-W2KHM

MATCHING an untuned transmission line to an antenna is always a problem for the radio amateur. Various schemes have been proposed, all having desirable and undesirable features. The matching stub is unwieldy if the antenna is to be rotated. The condenser-coil scheme suggested by the author¹ permits rotation but the coil must be protected from the weather and the adjustments of the coil may be difficult. Since tuned parallel conductors act like parallel resonant circuits, it is possible to use them as an impedance transformer. The physical length then becomes less than the usual quarter wavelength. For a three-element close-spaced beam at 28 Mc., when matched to a 575-ohm untuned line, a quarter-wavelength stub of 8 feet is shortened to about 14 to 28 inches when using a tuned line for

• Here is a straightforward method of matching an open-wire line to a close-spaced beam, or other low impedance, which occupies considerably less space than the usual quarter-wavelength matching section. Complete information on the adjustment procedure is included, as well as how to go about the initial calculations for approximating the constants.

* 214 Hillcrest Road, Mt. Vernon, N. Y.
¹ Gadwa, "An Impedance-Matching Transformer," *QST*, Feb., 1943.

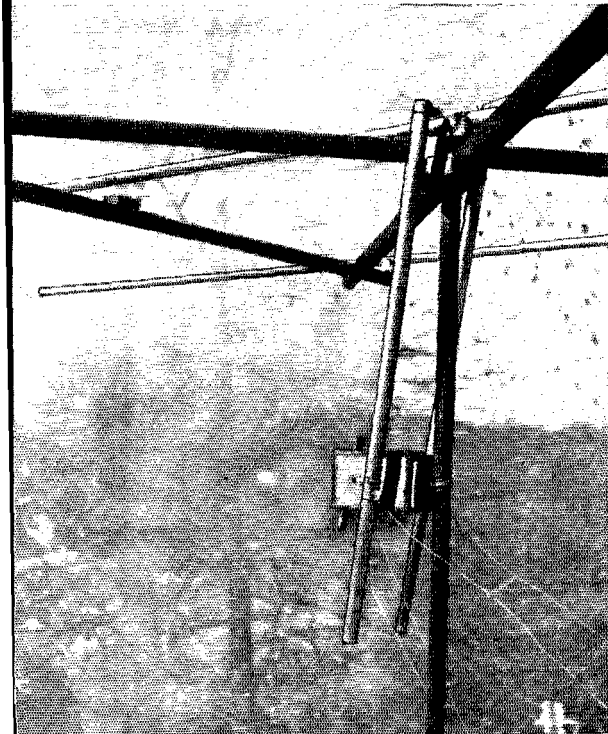
The variable condenser used in the matching system is housed in a weatherproof box clamped to the mast that supports the beam. The weatherproof box also serves as a support for one end of the short tubing used as the inductance elements in this method of matching. By loosening the clamp supporting the box and the two clamps that make connection to the tubings, the effective length of the inductance elements can be varied. The condenser is adjustable from the ground, through strings and a crossarm on the condenser shaft.

matching, and definitely has some interesting possibilities.

For a beam antenna of low radiation resistance, the matching transformer should be of low-loss construction, since the circulating currents are high. The maximum voltage developed on the tuned line appears at the condenser, and is equal to that on the untuned line, so the insulation may be the same for both. Tubing the same as used for the antenna elements is satisfactory for the tuned line, since it is rigid enough to maintain its spacing.

To adjust such a system, a simple trial-and-error procedure as outlined by the author² can be employed. For those interested in a specific application, the description and operation of a tuned line as an impedance-matching transformer will first be described. To those that have other or similar requirements and wish to design their own, mathematical equations will also be presented. The system can be adjusted without recourse to a separately-excited antenna if some means is provided to indicate standing waves on the transmission line. A simple indicator is a pilot bulb shunted across a few inches of feeder and antenna. Place one on the transmission line at the junction with the transformer, another $\frac{1}{8}$ wavelength from the junction, and a third $\frac{1}{4}$ wavelength from the junction or $\frac{1}{8}$ wavelength from the second bulb. Another bulb on the radiator at the junction with the transformer will indicate antenna current. Fig. 1 shows the necessary set-up. Set the length of the antenna elements at the usual values and connect the untuned line and tuning condenser to the tuned line. For 29 Mc., make the length of the tuned line about 28 inches to start. Set the transmitter tuning condenser at the capacity for resonance, couple the untuned

² Gadwa, "Standing Waves on Transmission Lines," *QST*, Dec., 1942.



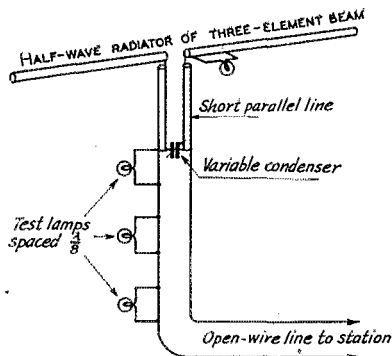


Fig. 1 — A simplified matching system for feeding close-spaced arrays with open-wire lines, using parallel tubing for the inductance elements. The tune-up procedure is simplified by tapping three small lamps on the line as shown.

The beam in use at W2JO uses a director element 15 feet long, a radiator 7 feet 10 inches each side of center and a reflector 16 feet 11 inches long, all of 1-inch diameter tubing. The spacing between elements is 41 inches. The parallel line, of 1-inch diameter tubing spaced 6 inches, is 28 inches long. The open-wire line is No. 14 spaced 4 inches — nominal impedance, 575 ohms — and the test lamps are spaced 48 inches along the line.

line to the rig and turn on the power. Vary the tuning condenser until maximum antenna current is indicated. Vary the coupling to keep the power input at reasonable values. If the length of the antenna and tuned line are correct for the frequency, no standing waves will appear on the untuned feeders — otherwise adjustments are in order. First adjust the length of the radiator element to resonance and lastly the length of the tuned line to eliminate standing waves. From the shape of the standing waves, the condition of antenna resonance can be established as outlined by the author,¹ as in Fig. 2. It is not necessary to shift frequency to determine the frequency of maximum loading.

A nonresonant antenna will present a reactive

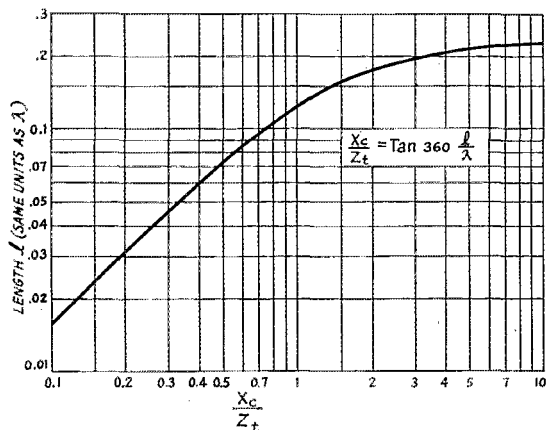


Fig. 3 — A plot of Equation 5, showing the length of the tuned line for various values of $\frac{X_c}{Z_t}$.

load to the transmission line and cause standing waves. An antenna that is too long for an operating frequency will act like an inductance and resistance in series and the transformer will present a similar type of load to the transmission line. The standing waves will look like that of Fig. 2-A. A minimum current point will occur somewhere within $\frac{1}{4}$ wavelength of the end of the transmission line. Similarly, an antenna that is short will act like a capacitive load to the untuned line and standing waves will look like Fig. 2-B. No adjustment of the L/C ratio of the transformer can produce a flat line if the antenna is nonresonant. When the antenna is resonant, a flat line is possible if the L/C ratio is correct. Otherwise, standing waves will occur with maximum and minimum currents at one-quarter wavelengths from the end, depending upon the L/C ratio. If the L/C ratio is low, the standing

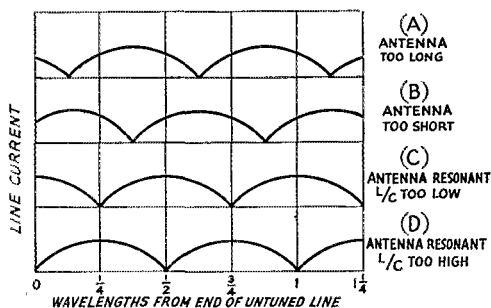


Fig. 2 — The variation in line current along the open line for nonresonant antenna and incorrect L/C ratio in the matching transformer.

waves will look like Fig. 2-C. If the L/C ratio is high, the standing waves will look like Fig. 2-D. Lengthen the tuned line by moving the tuning condenser and untuned line connection away from the antenna for the case of Fig. 2-C. Shorten the tuned line by moving them toward the antenna for the case of Fig. 2-D. Allow extra length

for the tuned lines to permit such an adjustment. The excess stub can be removed after the correct length has been found, although it appears to have negligible effect on matching, provided it is not excessive.

The tuned lines do not have to be in a straight line. They may be curved but not folded. Neither do they have to be parallel but may converge or diverge. The only requirement is that the necessary inductance be provided. The system has performed for the author and the photograph shows how it

is assembled. The tuning condenser must be waterproofed, but the insulation need not be any better than for typical untuned lines. The tuned lines can be exposed to the weather which is an advantage over the coil scheme. The device has the decided advantage that it allows adjustments for matching the antenna and transmission line. This is impossible with quarter-wavelength matching transformers where the spacing and length are fixed. It permits matching of low-impedance beam antennas to untuned lines with reasonable line spacings. For example, a 28-Mc. three-element antenna of 8-ohm impedance, if matched to a 600-ohm line, would require a quarter-wavelength matching transformer of

$$\sqrt{8 \times 600} \text{ or } 70 \text{ ohms.}$$

About 5 feet of 70-ohm coaxial line would be required, but there is no provision for adjustments since its impedance and length are fixed. Parallel elements would have to be 8 feet long, large diameter and abnormally close-spaced.

It is desirable to have the condenser variable. A suitable control to operate it while in position can be developed by the individual. The condenser should preferably be a double stator with the rotor floating, to eliminate contact losses.

To design an impedance-matching transformer for any other conditions, the equations to use are presented again here:

$$X_L = R_1 \sqrt{\frac{R_2}{R_1} - 1} \quad (1)$$

$$X_C = \frac{R_2}{\sqrt{\frac{R_2}{R_1} - 1}} \quad (2)$$

$$X_L = 2\pi fL \quad (3)$$

$$X_C = \frac{1}{2\pi fC} \quad (4)$$

The length of the tuned line is obtained from the formula

$$\frac{X_C}{Z_t} = \tan 360 \frac{l}{\lambda} \quad (5)$$

- where R_1 = antenna impedance in ohms
 R_2 = untuned line impedance in ohms
 X_L = inductive reactance of tuned line in ohms
 X_C = capacitive reactance of condenser in ohms
 L = inductance of tuned line in henries
 C = capacitance of condenser in farads
 f = frequency in cycles per second
 l = length of tuned line in any units
 λ = wavelength in same units as l
 Z_t = impedance of tuned line in ohms

Equation 5 is plotted in Fig. 3 and is more convenient than the equation to solve for the length of the tuned line, as it eliminates the use of trigonometric tables. The values obtained from

these equations are approximate and serve as a start for further adjustments. The capacity of the condenser is obtained from Equations 2 and 4 and the length of the tuned line from Fig. 3.

The author's set-up gave a calculated value of 14 inches as the length of the tuned line and 81 $\mu\text{fd.}$ of capacity, but 28 inches length and less than 50 $\mu\text{fd.}$ of capacity proved to give the best results. The antenna impedance may be the least-accurate assumption. A calculated antenna impedance of 26 ohms for the best impedance match of the author's set-up indicates that assuming 8 ohms for the impedance of the 3-element close-spaced antenna is a serious error.³

The design calculations for the author's antenna follow:

$R_1 = 8$ ohms, assumed antenna impedance of three-element beam

$R_2 = 575$ ohms, impedance of open line of No. 14 wire spaced 4 inches

$$X_C = \frac{R_2}{\sqrt{\frac{R_2}{R_1} - 1}} = \frac{575}{\sqrt{\frac{575}{8} - 1}} = \frac{575}{\sqrt{72 - 1}}$$

$$= \frac{575}{\sqrt{71}} = \frac{575}{8.43} = 68.2 \text{ ohms}$$

$Z_t = 298$ ohms, impedance of open line of 1-inch diameter tubing spaced 6 inches

$$\frac{X_C}{Z_t} = \frac{68.2}{298} = 0.229$$

$$\frac{l}{\lambda} = 0.0355 \text{ from Fig. 3.}$$

$$\lambda = \frac{468 \times 2 \times 12}{28.8} = 390 \text{ inches at } 23.8 \text{ Mc.}$$

$l = 0.0355 \times 390 = 13.84$ inches, length of tuned line

$$C = \frac{1}{2\pi \times 28,800,000 \times 68.2} = 80.9 \times 10^{-12}$$

farads = 80.9 $\mu\text{fd.}$

The formulas apply for all cases where the line impedance is greater than the antenna (load) impedance. Where they are equal, the capacity C will be zero and the length $l = 0.25$ wavelength. In other words, an untuned quarter-wave matching section will result and could be omitted with the same results.

³ Many factors difficult of prediction enter into the resultant impedance of the driven element in a close-spaced array. The tuning of the parasitic elements, the height above ground and, at high frequencies, the ratio of element length-to-diameter all influence the antenna impedance. For these reasons, close-spaced arrays should be adjusted in position for best results. The big advantage of Dr. Gadwa's matching system is that the antenna can be tuned near the ground, if necessary, and the matching can be done conveniently after the array is in place, since it is only necessary to be able to reach the tuning condenser box and where it is tapped across the line. This does not imply that tuning the antenna near the ground will give the optimum adjustment — it probably won't — but at least it will be approximate, and the feeder-line match will be exact. — Ed.

Put 'Em Push Push!

A Low-Cost Way to Get Started on 6

BY LOUIS J. FRENKEL, JR., * W9GUP

WHEN the 50-Mc. band was released we began to look over the ways by which we could get a signal on that band without a complete rebuilding job on the existing 10-meter rig. We didn't want to use a conventional doubler, as we knew that modulating such a stage would be sure to bring in QSLs of the wrong kind. The push-push doubler idea looked better, but changing the existing 10-meter final from push-pull to push-push was not easy. The simplest solution seemed to be an outboard push-push doubler, to be driven by our regular 10-meter rig.

Excitation for this stage could be supplied by the present 10-meter rig, with no greater trouble than a change of crystals and a slight retuning. Our line-up is similar to many ten-meter jobs now in use: 6L6 crystal oscillator-doubler, 807 doubler, and push-pull 807s in the final. The oscillator uses 7-Mc. crystals. Substituting 6.25-Mc. rocks

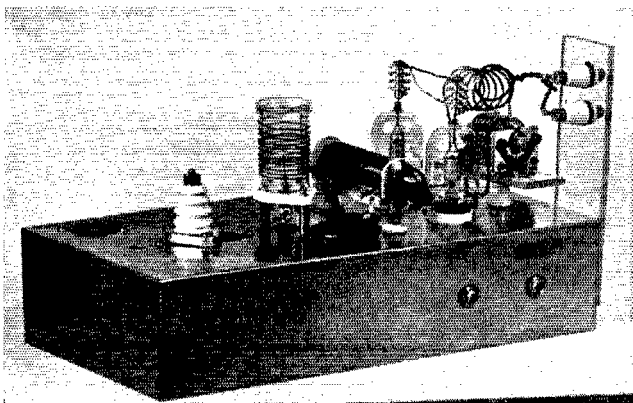
and retuning the circuits slightly gave us 25-Mc. output from the 807s without any pruning. As most hams design their tank circuits so that they tune "all out," almost any rig will have enough tuning range to take care of 25 as well as 28 Mc. without alteration. The push-pull 807s provide more than enough drive for a push-push doubler using any of the low-*C* triodes.

A glance at the schematic, Fig. 1, will show the simplicity of such an arrangement. Since neutralization is not required, a compact layout is possible, and the unit described has room to spare on a 7 × 13-inch chassis. The tubes employed are 3C24s, or 24Gs, but any low-*C* triodes may be used. The grid circuit is similar to any push-pull amplifier, but the two plates are connected together and a single-ended circuit which

resonates at 50 Mc. is used here. Excitation, which is on 25 Mc., is fed to the grids by means of a twisted-pair link not shown in the photograph. The porcelain stand-off near the grid coil serves as a support for the link. Two turns of insulated wire around the center of the grid coil will provide more than enough coupling to the driver stage. Output is taken from the 50-Mc. plate circuit by means of a two-turn link, which is inserted between the turns of the tank coil at its cold end. This link is connected to two feed-through bushings which are mounted on a polystyrene plate at

the end of the chassis. The filament transformer, tube sockets, two r.f. chokes, and a small bias battery are mounted below the chassis. The bias battery is a good precaution, to save the tubes in case of excitation failure, and it permits use of the rig on c.w. by means of keying a preceding stage.

Two closed-circuit jacks are mounted on the front of the chassis, one for measuring the grid current and one for plate current. The latter also serves as a means of applying modulation. A patch cord is connected to the secondary of the modulation transformer, and this is plugged into the plate-meter jack when the rig has been tuned up and is ready for modulation.



The 50-Mc. outboard amplifier has room to spare on a 7 × 13-inch chassis. The stand-off at the left serves as a mounting for the link from the driver stage. The single-ended plate circuit and antenna coupling are at the right. Jacks on the front of the chassis provide for insertion of grid and plate milliammeters.

• Operation in the 6-meter band offers many interesting possibilities, yet many refrain from using this band because they think that it entails the construction of a new rig, or a rebuilding of the existing one. Here W9GUP shows a simple outboard unit which should make it possible for anyone now having a 10-meter rig to put a signal on 6.

* 3330 Lake Shore Drive, Chicago, Ill.

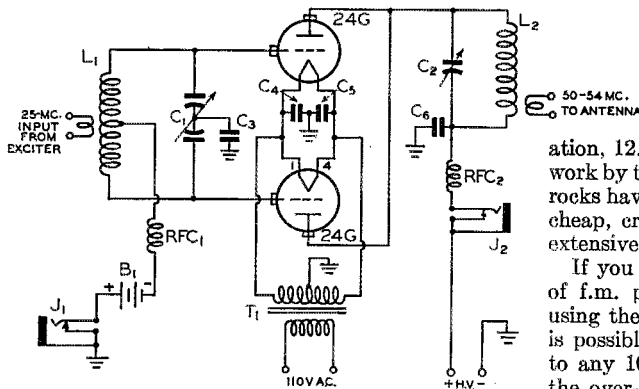


Fig. 1 — Schematic diagram of the 50-Mc. outboard push-push doubler.

- C₁ — 35- μ fd. per-section split stator.
- C₂ — 35 μ fd., double spaced.
- C₃ — 0.008- μ fd. mica.
- C₄, C₅ — 0.0022- μ fd. mica.
- C₆ — 0.002- μ fd. mica, 2000-volt test.
- L₁ — 12 turns center-tapped, No. 20 enameled wire, spaced 1½ inches on a 1½-inch diameter polystyrene plug-in coil form. Coupling link (not shown in photograph) is 2 turns of insulated wire around center of L₁.
- L₂ — 5 turns No. 14, 1-inch diameter, spaced 1½ inches; self-supporting and mounted directly on the plate condenser. The antenna pick-up coil is two turns No. 18 push-back wire, 1-inch diameter, at cold end of L₂.
- B₁ — 45-volt battery.
- J₁, J₂ — Closed-circuit jack.
- RFC₁ — 2.5-mh. r.f. choke.
- RFC₂ — Six-meter v.h.f. radio-frequency choke.
- T — Filament transformer, 6.3 volts a.c. at 6 amperes, for 24Gs.

Tuning Up

With excitation applied to the grids and a 100-ma. meter inserted in J₁, tune the grid condenser, C₁, for maximum grid current. This should be at least 50 ma. Plate voltage may then be applied, starting with 400 volts or so. Tune the plate condenser, C₂, for minimum plate current. It is well to remember that, as this stage is operating as a doubler, the dip will not be as pronounced as with a straight amplifier. A calibrated absorption-type wavemeter should be used at this point, to be certain that the output is on the desired frequency.

I wanted to use the same modulator for 6 as for 10, hence it was necessary to run about the same input on both bands. With 400 volts on the plates, input to the 3C24s runs about 180 ma., with the antenna coupled. Much higher voltages may be used on the final if the audio power is available to modulate the increased input. With higher plate voltages it would be advisable to insert a resistor of about 2000 ohms in series with the bias battery, to bring the bias up to the 125 volts recommended for the 3C24s. Somewhat more grid drive will be required, but higher efficiency will result than is obtainable with the low voltage on the plates.

Other Possibilities

This set-up is designed for crystals in the range between 6.25 and 6.75 Mc., but if your rig uses 14-Mc. crystals for 10-meter operation, 12.5-Mc. crystals can be used for 50-Mc. work by the process outlined above. The 6.25-Mc. rocks have the advantage of being plentiful and cheap, crystals in this range having been used extensively in war-time applications.

If you want to go "whole-hog" on 6, the use of f.m. presents an interesting possibility. By using the same outboard amplifier technique, it is possible to add a high-powered 6-meter final to any 10-meter rig, and the use of f.m. keeps the over-all cost low. Such a rig would also be useful for DX c.w. work when band conditions are hot.

So there you are — it's not so tough to get started on 6. A cheap crystal, and an outboard amplifier made up from parts most of us have kicking around, will do the trick. Warm up the old soldering iron and put 'em in push-push — I'll be seeing you on 6, neighbor!

• Louis J. Frenkel, jr., became interested in radio in 1938, at the tender age of 17, and was licensed as W4GDB in Atlanta, Georgia, in 1939. Later he held W2MWI, in New York City, and received W9GUP in August of last year. His principal interest in amateur radio is v.h.f. circuit and antenna experimentation. He is a member of the Amateur Emergency Corps.

Prior to the war he was employed by the Western Electric Company, working on carrier-current telephone equipment in the Kearny, N. J., plant, leaving this concern during the war to take a position in the Applied Physics Lab of John Hopkins University, working on the development of the proximity fuse. He recently returned to the Western Electric Company, and is now in Chicago, at the Hawthorne works.

Strays

"Had a very interesting QSO today (Sunday) on 28-Mc. 'phone, with W7ERA in Oregon. At the start he was using an input of 1.35 watts, 75 volts at 18 mils. He reduced power in steps to 0.14 watt, or 35 volts at 4 mils, and was still perfectly readable and S4½ on the meter!" — W9JFB, Nappanee, Ind.

Well, all right, but we'll bet W7ERA had his modulator turned on!

1947 V.H.F. Marathon

Jan. 16th to Dec. 15th — Medallion and Certificate Awards to W/VE Leaders — Separate WAS Contest

BY F. E. HANDY, * WIBDI

MARATHON standings appear month-by-month in *QST*. The awards for 1946 will be announced soon. The new Marathon will be based on cumulative operating results in the amateur bands above 50 Mc. The rules are set forth below. Changes from last year include extension of the Marathon dates to cover 11 months instead of eight, reporting periods from midmonth to midmonth, rewritten rules on claiming credits for work when in "portable" or "mobile" status, and emphasis on the fact that regular-activity credits can be claimed on new as well as repeat contacts.

1) Bronze-medallion awards will be engraved with the calls of the winners for each of *three* frequency groupings (50-54 Mc., 144-148 Mc., and above 235 Mc.) for their leading standings, Jan. 16, '47 through Dec. 15, '47.

2) The high scorer for each of the 11 reporting periods will receive Marathon Certificate recognition for the period covered by his operations.

3) Additional certificates will go to the leading participants in each ARRL Section for Jan. 16, '47-Dec. 15, '47.

All awards will be made on the evidence submitted. The V.H.F. Editor, ARRL Technical Director and ARRL Communications Manager constitute the Award Committee. The Committee may declare "no award" if there are fewer than three entries in any classification. Duplicate awards will be made if circumstances warrant. Decisions of the Committee shall be final. ARRL staff members may take part but are ineligible for awards. An amateur need not be a League member to be eligible. All W/VE licensed amateurs are invited to report progress for each period with point claims. V.H.F. Marathon forms to simplify reporting are available on request.

Rules for W/VE 1947 Marathon

1) *Contact points:* Contacts are scored for completed QSOs permitting exchange of intelligence besides call identity. Only contacts from transmissions on government-assigned amateur-band frequencies may be counted in scores. *One contact only, per band, per year, per different station,* counts in the claims. The points claimed depend on Great Circle distances between stations:

Under 25 miles	1 point
25 to 75 miles	2 points
75 to 250 miles	5 points

* Communications Manager, ARRL.

250 to 500 miles	25 points
500 to 1500 miles	10 points
Over 1500 miles	50 points

2) Multipliers:

50-54-Mc. contacts	1
144-148-Mc. contacts	2
Contacts at or above 235 Mc.	10
Contacts initiated on f. m.	2

The frequency band of one's *transmitter* shall determine the multiplier. This permits cross-band work to count. Contacts resulting from a call on f.m. (not switch-over after a.m. contact) earn a separate multiplier of 2. Given claims cannot include both f.m. and a.m. credit for contacting a particular station, for the same band.

3) *Credit for portable or mobile work:* Stations using a portable designator only because of fixed operation at a new residence address (not actually operating portable or mobile) may not be counted for any extra credit. They may be counted once in the contest as a fixed (home) station. To facilitate checking, all portable or mobile work will be reported on separate sheets, or grouped separately from regular fixed-station work. The same station may be worked for credit either at home or in field status.

A) When operating in fixed status (home station) one may work another home station for one point.

B) When operating in fixed status (home station) one may work this same station afield for an additional point.

C) When operating afield one may work the same home station for an additional point.

D) When operating afield one may work the "home station" mentioned in (C) *when it is afield*, for an additional point. Examples:

- a) W1HDQ works W1XYZ . . . 1 point
- b) W1HDQ works W1XYZ/1 . . . 1 additional point
- c) W1HDQ/1 works W1XYZ . . . 1 additional point
- d) W1HDQ/1 works W1XYZ/1 . . . 1 additional point

If more than one contact is made with a station afield, only the contact for the greatest distance may be counted for score. Locations of portables and mobiles must be well defined to permit the award committee to validate point claims.

4) *Special credit for regular activity:* As a bonus for regular activity, points (never exceeding three per day or fifty per month) may be additionally claimed, *one for each contact* with a dif-

Most States in 1947? — Separate V.H.F. Contest

• Amateurs not in the Marathon may compete for the separate *Most-States-Worked ARRL bronze-medallion awards* by reporting their QSOs representing "states" to ARRL monthly by postal card or other means. The record of states worked on 50- and 144-Mc. will appear in *QST* monthly with the Marathon scores. Initial *QST* listing for the Most-States V.H.F. Competition is automatic for Marathoners. In all cases, to be considered for medallions, the top contestants must supply written confirmations (proof of QSO for each state claimed) at the year-end.

1) Two bronze medallions will be inscribed with the call of the winner and number of states worked in '47: one for the operator working most states exclusively on 50-54 Mc. — one for the operator working most states exclusively on 144-148 Mc.

2) Eligible: All W or VE licensed amateur operators.

3) Period of work: Jan. 1-Dec. 31, 1947, inclusive.

4) All work credited must be from one location, i.e., from points of operation no two of which are more than 25 miles apart. The District of Columbia counts for Maryland.

5) Report new states at once. Hold confirmation cards and letters until the end of the year.

6) Leading operators must then submit one written confirmation to the Award Committee for each state claimed. Such presentations must be postmarked on or before Jan. 15, 1948.

7) Duplicate awards will be authorized if warranted or the "earlier date" of completing the maximum result may determine a single winner. In the absence of three entries the Committee may declare "no award." Staff members are ineligible. Committee decisions are final.

ferent station. In this scoring department the same station may be worked on different days. Activity credits may cover new as well as repeat contacts. To achieve the daily quota of three, different bands may be used as necessary. Contacts for regular activity may be added only "after multiplier." QSOs for regular-activity credits need *not* be listed in interim Marathon reports. Logs showing such QSOs in support of claims must be kept available for call if and when requested by the Award Committee.

5) *Reporting*: Claims must be made in the form of "stations-worked" lists. *Station calls, locations (city and state), distances, and points for each QSO*

must be shown, with the total credits claimed for reporting periods, 16th of one month to the 15th of the following month, inclusive.

Reports must be sent *at once* after each reporting period for claims to be allowed, i.e. reports for a particular period must bear a postmark not later than the 22nd of the month. Special V.H.F. Marathon forms are available from ARRL, and these or a reasonable facsimile must be used in making reports.

6) *Proof of contact* in writing may be required from any stations as prerequisite to final review or interim credits, if requested by the Award Committee. FCC logs may be submitted as necessary evidence to straighten out points in doubt, and leading participants especially must be prepared to support claims, as required.

Each competing score shall be that obtained by one operator, using equipment under his individual control. Club stations may take part. The highest one-operator score shall then be submitted in addition to any data of performance of others for incidental mention. Mail all reports to ARRL Communications Department, West Hartford, Conn.

Strays

Don't say we didn't warn you! W1OMJ ran across this ad in the *New York Daily News*: "Radio Antennas . . . order now . . . quality limited."

W1JEQ has a good way of eliminating the messy stains on soldered joints. As soon as the solder has "set," but while the joint is still hot enough for the rosin to be in a semiliquid state, he brushes the surplus rosin away with a small fairly-stiff brush. This leaves the joint shining and clean. The rosin hardens on the brush and is easily removed by flexing the bristles with the fingers.

G.E. has devised an extremely-sensitive electronic leak detector which can detect a hole so tiny that 15,000 years would be required for the contents of a quart bottle of air — at atmospheric pressure — to leak through. The unit is used in improving methods of obtaining high vacua in electronic tubes.

Ground your transmitter racks and chassis before they ground you.

SWITCH TO SAFETY!





How's DX?



How:

Enough time hasn't elapsed to get any widespread reaction on the "Pig Pen" suggestion of W4JV's last month, but a card did come in from W1DUK with this rather sage observation: "Why put them in the Pig Pen? Have you no respect for pigs?" However, that doesn't worry us too much. Pigs are intelligent animals and they will understand. It would be nice if the same could be said of the DX hogs.

Speaking of intelligence, let's take a look at the RST system. It is supposed to convey to the other fellow what his signals are like, and if used properly it can do a fair job. But the S and T portions have been abused so much that they are almost meaningless. If a guy gets a T8 report he thinks it means his signal is rough a.c. and he is insulted. No fooling — you all know it's true. How's for everyone taking about 2 minutes time to read the definitions of the T scale — they're in the front of your ARRL logbook — and then start giving *honest* reports for a change? In other words, instead of guessing at what the scale means, use the definitions as given. If a guy squawks when you give him a T7, tell him to look up the meaning and he will know what his signal sounds like, which is what the scale is for. And when someone is T4, don't give him T8, give him T4! Who knows, it may help to clean up the bands a little.

On the other hand, the c.w. gang is considerably handicapped in their strength, or "S," reports, compared with the 'phone gang. The best

one can do on c.w. is S9, which every 'phone man knows isn't much of a report, even though the definition is "Extremely strong signals." To correct this terrible situation and in an attempt to bring the c.w. man up to the same high technical level as the 'phone gang, we propose a system of "+" reports above S9 somewhat related to the highly-developed "db. above S9" of the more scientific 'phone men. Because there is no c.w. signal for "+," we suggest it be sent "DB," to avoid confusion. Thus an "S9 ++" report would be sent "di-di-dit dah-dah-dah-dit dah-di-di-dah-di-di-dit dah-di-di-dah-di-di-dit," etc. The proposed additions to the present inadequate scale run like this:

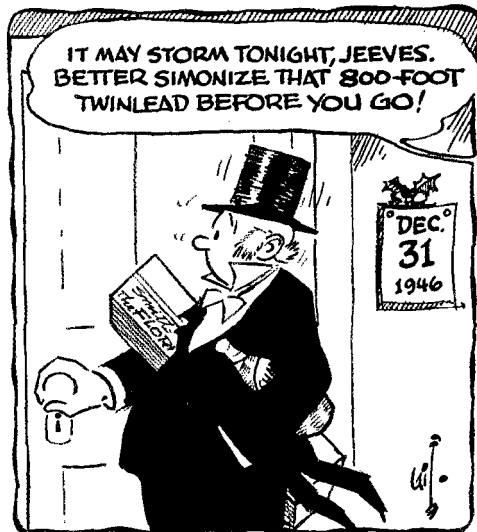
- S9 Extremely strong signal
 - S9+ Very extremely strong signal!
 - S9++ Terrifically strong signal!!
 - S9+++ Goshawful strong signal!!!
 - S9++++ Unbelievably strong signal!!!!
 - S9+++++ Absolutely out of this world.
- Solid copy, except in QRM.

What:

The boys who get a boot out of working their DX on 80 pulled a good one last month, when W1OUD and W2CGG worked VK2LC (3630) for over an hour. W1OUD is ex-W8AQE W1ZL worked PAØIN (3510) and VE7ALP (3510) and heard G8TK (3520) Via W1DQ, G6BY sends in a large list of 3.9-Mc. 'phone signals heard, from W1, W2, W3, W4 and W8. The Englishman works many of them cross-band on both 7 and 14 Mc.

Not too many reports on 7-Mc. stuff this month, although the few reports indicate the DX is there. W3KNM worked HB9CS (7140), HH2FE (7110) and HC1PC (7300), and W3HVD used 15 watts to a 6L6 to get F7AA (7295) W1JLL raised NY4AB (7145), G3PZ (7080), SM5LF (7140), F9AM (7130), F3NB (7140), F8LA (7125) and HB9FR (7140) But W9MUX has the best list and, from his part of the country, the best DX: GM6RV (7140), LA7Y (7140), HC2CV (7145), GI6TK (7135), G6ZO (7145), F8QL (7120), HH2JB (7120), PY1FW (7115), PAØNG (7140), NY4CM (7270) and various VKs, ZLs and KH6s.

It's a toss-up as to whether 20 or 10 had the best DX this month, so we'll present the evidence and let you choose for yourself. At G6RH, Bob garnered VP9D (14,070), VP5EM (14,190), HE1CE (14,090), VP4TR (14,160), KZ5AB (14,150), ET1JJ (14,060 T6), I7AA/I6 (14,040 T6), ZP6AB (14,060), VP4TB (14,105), VP8AD (14,075) in South Georgia Islands, UQ2AB



(14,055 T6) in Riga and CR9AG (14,080) Gems from a long list of W4BPD include LX1AX (14,090), XU1YR (14,085), J3AAD (14,085), VS7ES (14,065), HI8X (14,060), W6VKV/I6 (14,120), HZ1AB (14,075), ZB1AB (14,100), EPIAL (14,085), and FN8C (14,050 T5). Gus heard VP8AI (14,065 T7), VS9AN (14,140) and HP2CA (14,365) W6ONZ knocked off a lot of Europeans and other stuff, like OH3KO (14,080), YR5V (14,070), ZK1AB (14,220), OY3G (14,080), LA4R (14,060) and TF3A (14,055) The very consistent W2HHF showed up with HZ2YY (14,060), UB5AB (14,080), OE3WD (14,100), VQ3HJP (14,095), OX1C (14,060), FA3F (14,105), OH2PK (14,085), VP3JM (14,070), Y16C (14,120 T5), EK1AA (14,050), and VU2DB (14,100) worked, and PK5JN (14,150), ZE1JS (14,100), EA5BR (14,090), VQ6GH (14,085) and UD6BC (14,100) heard W1KFFV has been hard at work, as evidenced by ZD8A (14,065), FA8BX (14,100), OX1BC (14,000), TA6ST (14,065), CN8MI (14,060), and somebody signing YP1AA (14,055), wherever he might be! Running 45 watts, W8KPL got EL5B (14,100), TG9FG (14,000), VP5AA (14,170), OQ5CE (14,125) and W2OUB/C7 (14,100). One antenna is a four-element job folded around in the attic At W2ITD, it's CP1PA (14,080 T8), Y1X(?) (14,095), W5KGL/C7 (14,095), OA4BG (14,000), HK1AD (14,080), PK6HA (14,070), EL3A (14,085), OX1Z (14,090), CR9AN (14,085) and OQ5LL (14,090) W6AM added UA9CP (14,085) and CR7VAL (14,100) W6GAL

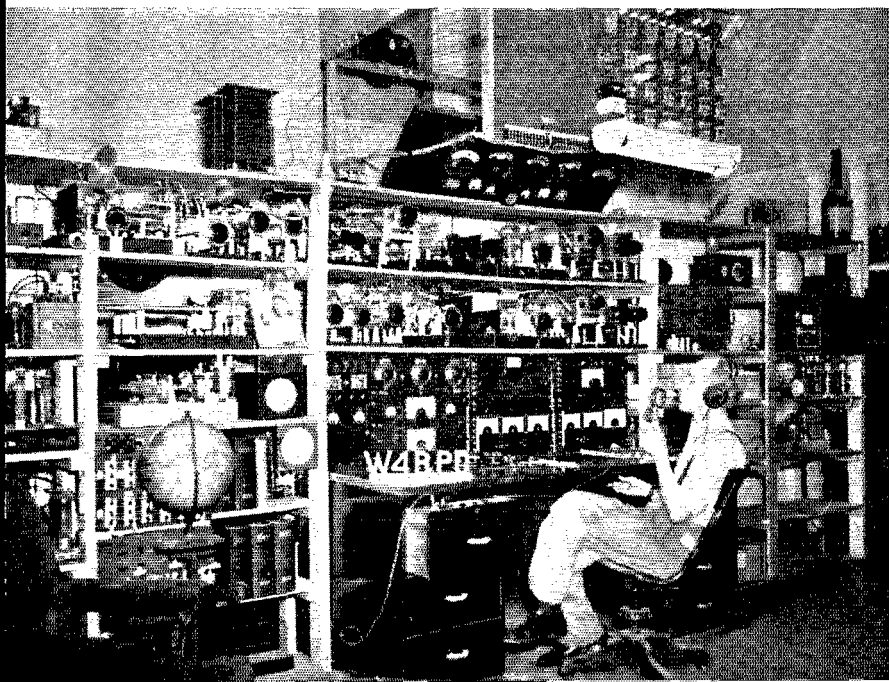
is happy this month, having worked a flock of good ones which bring his postwar total to 78 and his all-time to 145. Among those not credited elsewhere: UAØKAA (14,100), OQ5AU (14,180), VQ2GW (14,070), SUIUS (14,250) and LA2H (14,080). His pal, W6GHU, came up with 16 new "all-timers," including XZ2KM (14,070), OQ5BT (14,170), and OX3BC (14,110).

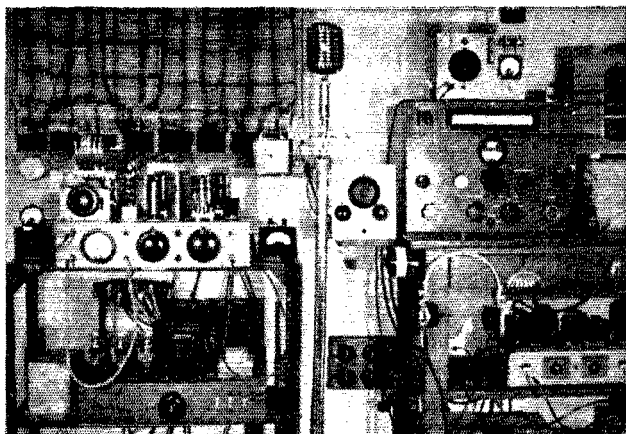
The 'phone fellows found slightly better pickings on 10, but on 20 there were a few. W2MPA worked F7AE (14,360) in Casablanca, FG3FP (14,350), J5ABA (14,180), KA1SS (14,180), PK3MB (14,370), PZ1UD (14,305), YV3AT (14,070), ZB1L (14,120), VP4TE (14,320), and SM7SU (14,210) for his 98th postwar W6IDY got ZS1CZ (14,180) and ZE2JA (14,140), and W1GKK has a long list which includes CE1AR (14,125), HC2OA (14,205), J2AAS (14,260), PZ1W (14,400), VP2MY (14,360), VP9L (14,300), and WØMCF/C1 (14,265).

The brass pounders on 10 snagged a few, although the cream seems to have been on 'phone. For instance, W3BKP made six 1-day WACs during the month, with stuff like VU2DJ (28,070), VU2AG (28,080), VP8LK (28,040), W2QVJ/KP6 (28,080), CR7AD (28,050) and YR5G (28,060), while on 'phone it was VP1AP (28,225), XU1RP (28,850), VQ3EDD (28,200), VS9AB (28,300), YI2CA (28,380) and VU2CQ (28,300) W9RBI, charter member of the PLL Club (Postwar Lousy Location), may lose his membership if he keeps up with c.w. like JØACS (28,600), GC8NO (28,100) and UA3KBC (28,100), and ZB2A (28,090), W6RMC/KJ6 (29,100), SUIHF

☞ This photograph will give you a rough idea of the stations at W4BPD. Yes, Gus Browning, down in Orangeburg, S. C., has practically a complete station for each and every band. He has separate final amplifiers for 80, 40, 20, 11 and 10, each consisting of a pair of 813s driving a pair of 304TLs. Any one of these is driven by a VFO exciter using a string of 807s. The modulator ends up with a pair of 250THs, with negative-peak clipper and splatter choke, and the audio driver unit includes a "clipper" circuit. The receiver system uses a common i.f. amplifier which includes a Lamb noise silencer, crystal filter, amplified a.v.c., heterotone, three kinds of detection, series noise limiter, peaked audio, heterofil, 1N34 noise limiter, and a built-in monitor. Separate miniature-tube converters for each band can be switched into the i.f. system. Antennas include an N-S rhombic, an E-W rhombic, a terminated rhombic on AC4YN, a 14-Mc. Sterba for Europe and New Zealand, another 14-Mc. Sterba for South Africa and Western Australia, a rotatable 28-Mc. 4-element beam, and a 14-Mc. vertical extended Zepp.

Other gear around the shack includes 50- and 144-Mc. transmitters ending up with p.p. VT127As, a 5-inch 'scope for modulation checking, antenna tuners for the receivers, frequency standards, a globe with S.C. as the axis and the beam patterns drawn in, and a log with something over 100 countries worked postwar. The bare space at the lower right is probably reserved for the kitchen sink!





And this station is the well-known VU2CQ of Bombay, India. The call VU2AC is used for f.m. and television experiments.

(28,270) and VU2AQ (28,290) on 'phone W6ITH got a few new ones on 'phone: EA1D (28,400), VR2AB (28,330); ZB1AB (28,140), VQ2WP (28,460), VP4TF (28,340), and OQ5AR (28,100), and G6RH spoke with KA1ABA (28,400), XE1H (28,400), HC1FG (28,490), VS7FF (28,300), PK1AW (28,420) and VP6YB (28,250) W8TOB glommed on to VP9F (28,460), I1BX (28,465), VQ3TOM (28,498), YV5AB (28,190), YR5B (28,180), OQ5AE (28,380) and VQ4ASC (28,335) via the chin route, while W5KUC worked W8WHW/KG6 (28,600), HR1MB (28,520), and W4BOW/Iwo Jima (28,510) the same way.

Where:

W6VFR says VS8AA and F1SCC are one and the same, aboard ship, so the fellows can relax -- and subtract. W6GAL adds that J2CC, VS9AC and SU1UQ were also signed by this same fellow, who was near the countries indicated by the prefixes but mobile marine W4MS, QSL Manager in W4, passes along the dope on FASDX. Don't try to send any cards direct, but if you work "Sid" send your card to W5KPI, and if you work "Al" send your QSL to W2DXF. Oh, sure, you can send your card direct, but it probably won't get there PK1OKL QSLs 100 per cent, if you send the card to his home address, W6OKL, says W2BXA TA1AF and OD2AC were phonies, according to G2PL A charming spectacle indeed is the nightly show of DX hogs fighting over a crack at XU6GRL, Doc Stuart of W6GRL, now in China. A few addresses, kindly donated by the gang. From W4BPD: CR4BQ, Sea Cable Station, Port Grande, Cape Verde Islands; Y12CA, RAF Station, Habbaniya, Iraq; ZB1AB, Port Radar Centre, H. M. Dock Yard, Malta. From W2AJR: HZ1AB, Bob Thanisch, c/o TWA, Dhahran, Saudi Arabia, 1264 AAFBU, A.P.O. 788, N.Y.C. From W8HYC: ZB2B, Bert Glass, Rock Radio Station, Gibraltar; XU1YY, 1212 Ethel Street, Glendale, Calif.

HK3AB is P.O. Box 1728, Bogota, not Box 1128 as we had it. Sorry We have the address of HA4EA and also can forward other cards for HA. They are still not licensed there, at the present time G8UA worked a honey, and got a card to prove it: OY3IGO (14,175), Ingvar Olsen, c/o Ingenieur F. Wellejus, Thorshavn, Faroe Islands. You may have to dig -- he's only running 12 watts and is VFO-controlled W3WJF worked PR5AB (3630) who said 'he

was in Brazil and gave his address. Can't account for the prefix, although it's part of the Brazilian block.

When:

Here are some of those times that may help you decide what part of the day not to listen. The times are GCT.

From W5ACL of Houston, worked on 14-Mc. c.w.: VU2KP (1325), VQ3HJP (0350), UA3KBC (1330), KL7AD (0415), HC1JW (0330), ZK1AB (0415), VR2AA (0500) and ZP6AB (0250) W5HFO, also of Houston, on 10 'phone: VQ2PL (1740), OZ5TZ (1750) and G2PU (1810) W2RDK in N. J. finds Europeans good on 7 Mc. at 2230 to 0030 and again from 0430 to 0800. 7-Mc. South Americans start about 0015, and the VKs and ZLs reach a peak just before sunrise W0OUH in North Dakota, on 14 Mc.: UA9CB (1500), UA3AW (0600), TF3A (2215) and VU2FM (1740) W4JV in Florida clocks them on 10 thisaway: CN8HM (1400), ZS6GO (1800), SM7IA (1730), YR2A (1645) and FASDX (1800) At W7EYS in Washington, on 14 Mc.: ON4UT (1800), KP6AB (0400), SM3HC (2330) and ZS6J (1800) G2AO says W6s come through on 14 Mc. practically around the clock, but the QRM from Europe is toughest 0900 to 1500.

Who:

You all know the controversy that has been raging about the correct length of a folded dipole made of Twin-Lead. Well, W6WP went at it the scientific way, measuring field strength as he lopped off the dipole an inch at a time. On 14 Mc. he ended up with the thing 93.7 per cent of a half wavelength, which would make the formula for the length 459 divided by the frequency in Mc. W3QFL and some of the others around Pittsburgh picked up some surplus Air Corps "telescoping" vans and use them for ham shacks. They are 6 wide by 9 high by 12 long, are

made of plywood, and have wiring, heaters and a lot of other stuff in them W7VY made WAC in 55 minutes on 20, working UA1NP, ZS1BF, CX1DZ, VK4DO, W5KGI/C7 and W8FZJ. Gene complains because DX is pretty hot in the mornings and he has to drive like mad through town to get to work after finishing up on some choice DX. He admits to getting a few traffic tickets but says it's worth it. So now they're going to blame the traffic violations on ham radio! What next? W5NW rose to the bait about ARRL Directors not working DX, and admits to a few like GM3RL, XADC, VU2FM, HB9EB, UA3KBC, VP4TD, VQ3HJP and CX1DZ on 20, with J2AAF and YV5AP on 40. Golly, we didn't mean to start a feud! ZC1AR never was in Transjordania but was near Jerusalem in Palestine. He is now officially JXJC on 28 Mc., and can be reached via R.S.G.B. He says ZC6FQ was legit but is now QRT This is one we'd like to keep quiet about, but it is our bounden duty to pass along the tip from W1AH that ZM6AC and possibly ZM6AA will be active from Western Samoa. From what W1AH has been able to gather through his grapevine, there never has been any amateur activity in ZM, which doesn't make us feel any better about that prewar ZM contact We had to look twice at the dateline on his letter, but W2BSR told us about LZ1XX, EL3A, OX1BC and a VQ2 he worked, among other recent DX, and then went on to describe the rig. Artie uses a 203A in a high-C Hartley circuit, a detector and one audio using Type 30s, and a pair of Murdock 'phones bought in 1920! He plans to try 28 Mc. soon, with an 852 in a concentric-line controlled oscillator. That 90-percent-operator 10-percent-station estimate will have to be revised! W3BES, who is as well-qualified as anyone in the country to comment on operating, sends the following: "A rather rare DX station listening for answers to his five-minute CQ heard so many W stations answering all on the same frequency that he couldn't distinguish any of them. But he was a brilliant lad and came back with, 'Attention all stations calling, please to avoid QRM answer one at a time. GA.' Nothing like using one's head, is there?" Yes, Jeeves, I'll explain it to you later D4ANB is now back in the U.S.A. and can be reached at 117½ Military Ave., Salisbury, N.C. GW2FUD also dropped in on Pitcairn and confirms the story that ZL2FR and Andrew Young are getting nowhere fast in being reactivated on the ham bands, but they're still trying. The ham rig is all set to go at any time Bill Fells, KP6AB, says he expects to be on Palmyra about two years, with KP6AA. He will be up to 400 watts very soon and can be reached via Navy 309, F.P.O., San Francisco. Bill has heard MX3KP (14,080), among a lot of stuff heard and worked W2EKK/J2 sends in

a list of the J QTHs, and mentions in passing that there are commercial stations over there on 14,000, 14,008, 14,025, 14,050, 14,070, and 14,320, just in case you have been wondering why you don't raise everyone you call over there. Bernie runs a kilowatt on 14,040 and 14,080, and requests that cards for him be sent to 2162 North 8th Street, Philadelphia 22, Pa. VQ4MNS is returning to England, where he will resume as G2CKM. In Kenya he made some 400-odd contacts with his 5 watts on 28,128. He expects to go to ZE1 in about a year VO4J got into a round table on 80-meter 'phone the other evening which consisted of G3IF, EI7M and D2KW. Several W1s were heard, but apparently they weren't listening up around 3600 kc. at the time W6NIH doesn't think too highly of W5CXs and his bid to fame on working 9 Gs and "other locals" on 125 watts. We quote, "Phooey. If you want, I'll send a copy of my log for Oct. 16th which shows QSOs with not only 9 Gs but also I1BN, HE1CE, F8AT, PA0AAT, GM2ADT, ON4HB and OH1W. All this with 15 watts and from San Diego yet. Better W5CXs should use his five-element beam for a rotary clothes line." Now, fellows, please. We don't want to start anything between Texas and California, especially when both states enjoy such a unique reputation for veracity Quite a few fellows have commented on the new call of Jeeves' boss, and all sorts of wild rumors have been kicked around as to how he was able to finagle it. Several have accused me of blackmailing FCC via the BuStan because I caught WWV off frequency one time. One sharpie, remembering my early work on the 88, suggested that I had been showing an influential gentleman in Washington some new chord changes in "The Missouri Waltz" and was rewarded by the call. A few just don't believe it and want to see the license. A prominent DX man, who is also a member of the Society of American Magicians, claims it was done with mirrors and is an old trick. Seven ARRL directors threatened an investigation. My boss at the radar development lab where I worked during the war says it was undoubtedly a reward for my outstanding contributions during the war — to the scrap drive! Jeeves and I prefer the last explanation. But, gee — ain't it a beauty?

— W1DX

[Edron's Note: No magician — among BG's lesser-known talents is a flair for amateur magic — ever tells the audience just how the rabbit got into the hat to be pulled out. To relieve the suspicion of skulduggery, therefore, we hasten to say that the perpetrator of "How's DX?" once went under the cognomen of W6QV and was entitled to apply for a two-letter call under the new rules even as you and I. But why he drew that particular combination is something else again — we can only speculate that some DX man at FCC must have hoped it would prod him into working some of the stuff that he writes about so authoritatively . . . or maybe as consolation for not being able to work it . . . we don't know.]

A World-Time Slide Rule

Converting Local Time to Foreign

BY W. J. CHRISTIAN,* KL7BP

A TIME indicator is a useful and interesting gadget to have around the shack, especially when working DX. With it you can tell what time it is at the station you are contacting or at any other point on the globe. It also provides a rapid means of converting local time into some common reference time, such as GCT. There are several good calculators on the market, but the one shown in the sketch is simple enough so that any ham can make one. The few materials required are easy to obtain and the work involved takes only a matter of an hour or so.

Scales, such as the set shown in Fig. 1, are glued over the regular scales of an ordinary cheap slide rule of the type selling for a quarter or half a dollar. As an alternative, a reasonable substitute can be made from strips of cardboard. Use a wide strip for the back. Then glue on the narrower strips carrying the upper and lower scales. This will leave a path for the sliding strip between the upper and lower scales. A substitute for the glass slide can be made by cementing a piece of celluloid to a couple of small pieces of wood or bakelite.

The scales may be drawn up with India ink by hand or perhaps more conveniently with a typewriter. If the carriage of the typewriter is not long enough for the complete length, each scale may be typed in halves and the sections glued together. The calibration marks are made with the apostrophe mark, the typewriter providing automatic equal spacing. The time marks represent 15-minute intervals, while the meridian marks represent 15-degree time zones. The top and bottom scales are the same except that the upper one is calibrated in city locations while the lower one is calibrated in degrees east and west of Greenwich. The city marks are made opposite their corresponding time meridians, which can be taken from a globe or map.

Operation of the time slide rule is quite simple.

* c/o National Bureau of Standards, CRPL, NOB, Navy No. 230, Adak Id., Alaska.

If you wish to determine the time at some DX station you may be working, set the slide so that your clock reading is opposite your location on the top scale or your time meridian on the bottom scale, reading the time at the DX station under the name of the town on the upper scale or over the time meridian of the DX station on the lower scale. Referring to Fig. 1, with the slide set as shown, when it is 6 A.M. in New York, it is 3 A.M. in San Francisco, 1 P.M. in Moscow and 7 P.M. in Manila. To convert to GCT use the same procedure, reading GCT on the upper slide scale above 0 degrees on the bottom scale. Thus, as Fig. 1 shows, 6 A.M. New York time is 1100 GCT; 7 P.M. Manila time also is 1100 GCT.

In setting the slide to your local time, the slide usually will extend either to right or left so that part of the fixed scales will not be covered. For instance, with the slide set as shown in Fig. 1, the time in the Aleutians is not shown. In cases like this, slide the glass indicator over the "00" mark on the slide after it has been set to your local time. Then slide the other "00" mark at the opposite end of the slide under the hairline, thus covering the desired DX point. The changing of "00s" results in the slide extending to the left, times indicated are in the day preceding the local day; in other words, "yesterday." When it results in the slide extending to the right, the times indicated are in the day following the local day, or "tomorrow." Whenever it is not necessary to change "00s" to cover the desired DX point, the day at the DX point is the same as the local day.

As an example, suppose it is 2 A.M. in New York and we want to find out what time it is in Hawaii. When the slide is set with 2 A.M. under the "New York" mark (or over the 75-degree mark), the left-hand "00" will come over the 105-degree W. mark. The glass slide is set at this point to hold the place while the slide is reset with the right-hand "00" over 105 degrees W. The time of 8:30 P.M. now will be found under

(Concluded on page 110)

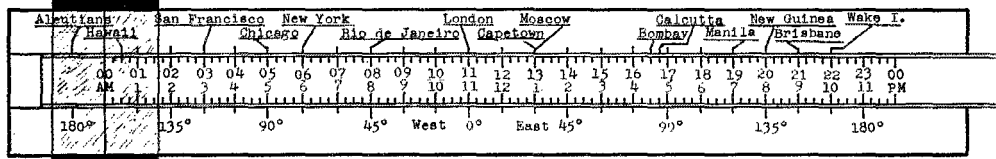


Fig. 1 — World-time calculator made from an inexpensive slide rule.



Foreign Notes



HUNGARY

To replace the old M.R.A.O.E., dissolved during the war by their government, Hungarian amateurs are forming the *Magyar Rövidhullámu Rádióamatörök Egyesülete*, or M.R.R.E. Temporary president is Ervin Kereszti, and temporary secretary, Dr. Ladislav Radnai, HA4EA.

Hungarians have been unusually hard hit by the effects of the war. Of course, most amateurs lost all their equipment, and a great many their homes and other living essentials. Inflation is fantastic: Dr. Radnai says that one hundred QSL cards cost 10,000,000,000,000,000 *pengos* — the equivalent of \$5.00. His salary per month, although in the thousands of *pengos*, is equivalent to about half a dollar of U. S. money.

At present, amateurs are not licensed — the matter is before the Allied Control Commission.

Our thanks to Dr. Radnai, Dr. Frigyes, HA7P, I. Antalfy, HA4H, and Peter Somssich, HA8S, for the above data.

CZECHOSLOVAKIA

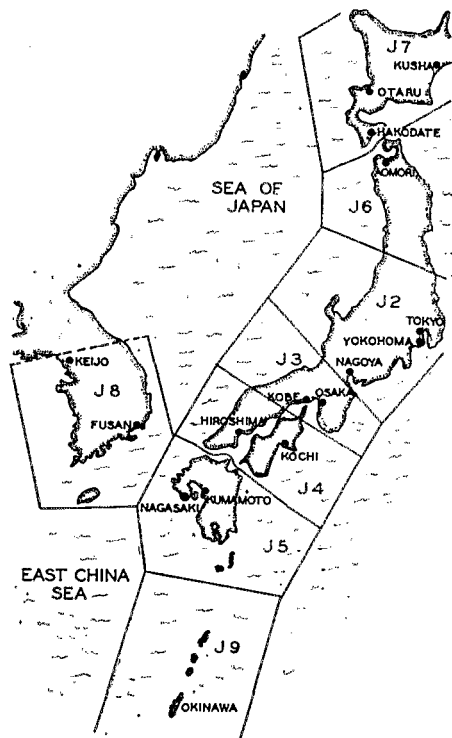
The Ministry of Posts has set up new regulations for OK hams, almost exactly as requested by C.A.V. Only members of the Society can get licenses. Beginners are in Class C with a 5-watt limit; after six months they may obtain Class B licenses with permission to use 50 watts and radio-telephony on part of 80 meters. After three years they can graduate to Class A licenses, with permission for 100 watts power and complete 'phone privileges. The bands now available are:

1.75-2.0 Mc.	112.0-118.0 Mc.
3.5-3.635	224-230
3.685-3.95	408-420
7.0-7.3	2300-2450
14.0-14.3	5250-5650
28.0-30.0	10,000-10,500
56.0-60.0	21,000-22,000

Most of the regulations are similar to FCC rules governing American amateurs.

RUMANIA

Through the Department of State, we learn that the Rumanian administration "no longer has any objection with regard to the use of 28-29- and 58-60-Mc. frequency bands by amateurs." However, it is pointed out that licenses cannot be issued until peace is concluded, at which time approval of the Allied Control Commission must be secured. YR5X confirms with the brief note, "Rumanian ham transmissions will be resumed as soon as the peace is signed."



A map of the call districts in occupied Japan, courtesy of Major Hines, W5GAB-J2AAF. Call assignments are made by Headquarters, Eighth Army, only to Allied personnel. Those with operator licenses and calls may use them signing the portable indicator J; those without tickets have to pass the standard Class C examination before being given military authority to operate.

QSL BUREAUS

The following are additions to the list of QSL bureaus of the world as published in October *QST*. Complete lists will, as is customary, appear regularly in the May and October issues.

- Belgian Congo*: Box 77, Kalina, Leopoldville.
- Bermuda*: J. A. Marr, R.N. W/T Station, Daniel's Head, Somerset.
- Colombia*: L.C.R.A., P. O. Box 584, Bogota.
- Haiti*: Roger Lanoix, c/o RCA, P. O. Box A-153.
- Hawaii*: A. H. Fuchikami, 2543 Namaau Dr., Honolulu.
- Hungary*: Peter Somssich, XII Nemetvolgyi-ut 12, Budapest.
- South Africa*: S.A.R.R.L., P. O. Box 3037, Capetown.
- U.S.S.R.*: Central Radio Club, Postbox N-88, Moscow.

Fifth Annual ARRL-Member Party

Saturday-Sunday, January 11th-12th — Call-Pin Awards

BY F. E. HANDY,* WIBDI

ALL ARRL members are invited to *take part* and send in the list of calls of members worked. Participants will report claimed scores with the information on exchanges. Name of section¹ and the date membership expires, month and year, will be swapped in QSOs.

Log forms (not necessary) will be sent free on request to Hq., or rule your own, just three columns listing *calls, section, dates*. In radiotelephone contacts the section, membership month and year will be named. No special order is required. It's a "one-operator" activity, or separate scores for each operator may be sent in.

Radiotelegraph members will abbreviate section names and use four numerals to show membership dates. "Conn 0348" will mean "Connecticut Section, my membership good through March, 1948," for example. Information to be exchanged in every case comes right off your own *League membership certificate or pocket card*. On logs tell which frequency bands you used indicating if 'phone, c.w., or both.

It is a family party for all members. To get contacts send "ARRL de. . . ." Work members anywhere. The leading member in each section will receive an ARRL Call-Pin award. Advance entry is not necessary. Scores can be all by one mode — or part telegraph and part voice — and any combination of frequencies you like.

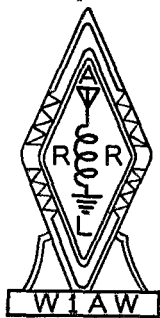
Ending Time: Monday, January 13th, 12:01 A.M. PST; 1:01 A.M. MST; 2:01 A.M. CST; 3:01 A.M. EST or equivalent.

Operate *any* 20 hours of the 33-hour party. State contest hours you did *not* operate if your score is over 10,000.

Scoring: One point for each complete set of information sent; 1 point for each set of data received and logged. No member can be worked to get more than one complete exchange for 2 points. A fixed credit of 50 points may be added before multiplier, for those who have received an ARRL Code Proficiency award. The sum of all points will be multiplied by the number of *different sections*² in which at least one member has been worked and exchange effected. A convenient way to keep record of new sections as you work them is to circle and number the name of the section in your list or mark the list in *QST*.

Fun and new member contacts are assured. See how many members *you* can work on these dates. This activity is one of the big annual events. Try your luck!

² An example: The multiplier is that number of field-organization sections in which at least one ARRL member is contacted. Assume W5XXX has completed exchanges with 60 different stations, located in 30 different ARRL sections. His multiplier is 30.



One of these attractive combination ARRL-membership-and-call-letter pins (gold border and lettering, with black enamel background) will be awarded in each of the 70 ARRL sections, with call of the winner engraved thereon.

Starting Time: Saturday, January 11th, 3 P.M. PST; 4 P.M. MST; 5 P.M. CST; 6 P.M. EST, or the equivalent time at any point.

* Communications Manager, ARRL

¹ See complete list of ARRL field-organization sections, page 6, this *QST*.

Strays

WIMGP finds it convenient to keep his smaller ARRL publications together in a *QST* binder.

— . . . —

The proud magnetron, top-notch wartime performer, which traveled in the most exclusive circles during hostilities, is now doing KP duty as the r.f. generator in the Radarange, Raytheon's new electronic stove that grills a frankfurter in eight to ten seconds.

— . . . —

A mammoth tube tester which checks bottles with ratings up to 500 kw. has been developed by G.E.

**SWITCH
TO SAFETY!**





The World Above 50 Mc.

CONDUCTED BY E. P. TILTON, * WHDQ

RECORDS

Two-Way Work

- 50 Mc.: W6NAW — W8CIR/1
2590 Miles — July 5, 1946
- 144 Mc.: W3HWN — WIMNF
390 Miles — September 29, 1946
- 420 Mc.: W6FZA/6 — W6UID/6
170 Miles — September 28, 1946
- 2300 Mc.: W1JSM/1 — W1LS/1
1.6 Miles — June 23, 1946
- 5250 Mc.: W2LGF/2 — W7FOF/2
31 Miles — December 2, 1945
- 10,000 Mc.: W4HPJ/3 — W6IFE/3
7.65 Miles — July 11, 1946
- 21,000 Mc.: W1NVL/2 — W9SAD/2
800 Feet — May 18, 1946

I'm hearing you on fifty megacycles — I'm hearing you on fifty megacycles!" This frenzied shout by G6DH, Clacton on Sea, England, on 28 Mc. completed the first contact wherein a v.h.f. band was used for trans-Atlantic communication. It was followed a few minutes later by a similar cross-band contact with G5BY, South Devonshire, and international DX on 50 Mc. was at last an accomplished fact, instead of an intriguing possibility. Amateurs in England and the United States had been watching conditions carefully all during the fall period, and numerous test transmissions had been made on 50 Mc. by American stations, and on 58.5 Mc. by the English, in the hope of breaking down the North Atlantic path. G5BY, in particular, had been running automatic transmissions, followed by listening periods, for months.

Prospects for international work by means of F_2 skip began to appear in late September, when a sunspot peak sent the m.u.f. up to the point where stations operating in the range between 30 and 40 Mc. began to get "heard" reports. Late October showed another peak, on the well-known 27-day recurrence cycle, and American f.m. stations near 45 Mc. were heard in England for a few days around October 25th. When these same stations began to be heard regularly at long distances in mid-November, it was obviously time to be on the watch for the chance to make that first trans-Atlantic v.h.f. contact.

Anticipating that the peak for the year would

* V.H.F. Editor, QST.

arrive sometime between November 20th and 25th, G6DH suggested a series of daily schedules with the writer on 28 Mc. Starting on the 13th, these contacts were made each morning at 8:15 EST, at which time observations were made at each end as to the maximum frequency of DX reception in the range just below 50 Mc. WGTR, Paxton, Mass., could be heard daily on 44.3 by G6DH, and numerous commercial harmonics (mostly frequency-shift keying) were in evidence at WHDQ on the better days. For several days prior to the 24th, signals were heard at both ends of the path on frequencies as high as 48 Mc. — a tantalizing experience when one is all set to go on 50,002.3! Test after test was made on this frequency with no result.

Sunday morning, November 24th, looked about the same as the previous mornings had, except that G6DH reported that his observations to the south and east, earlier in the day, had indicated that the m.u.f. might be a trifle higher. By 9:45 A.M. EST, WGTR had shown up at G6DH, and several DX carriers were logged, up to 47.35 Mc., before 10 A.M. at this end. Things were getting interesting!

Around 10 A.M. there was a slight recession, the m.u.f. and signal strength dropping slightly at both ends of the path, and optimism sagged correspondingly, though the checking continued on schedule. Comparing notes again between 11 and 11:15 indicated that things were really warming up. At WHDQ the 47.35-Mc. signal (continuous carrier with occasional f.s.k.) had picked up to S9, a weaker f.s.k. sig was heard on 48.82, and several signals higher than WGTR at 44.3 were coming in at G6DH. It looked like time to go to work on 6!

Arrangements were made whereby WHDQ would transmit for five-minute periods each fifteen minutes, listening on 28 Mc. for replies from G6DH. The first such transmission was made at 11:15, in the form of a QST on voice to all 50-Mc. stations, to the effect that an opening across the North Atlantic was imminent, and urging all stations to get on and transmit. The QST was continued for four minutes, followed by a one-minute c.w. call to G6DH. That did it — and the first trans-Atlantic v.h.f. QSO was on!

In an attempt to hear other 50-Mc. stations, several of whom were now transmitting, G6DH began tuning the band, while the writer continued

shouting the glad news on 50 Mc. While this was going on a telephone message was received from WIBEQ, Coventry, Conn., who had been in 28-Mc. contact with G5BY, relaying the information that W1HDQ was being heard at South Devonshire. A v.h.f. two-way was attempted, but the m.u.f. didn't go quite high enough to permit G5BY to make it on 58,632 kc., so contact was re-established with his rig on 10. The rig at W1HDQ was kept on the air practically continuously, to establish the duration of the reflection period. The 50-Mc. signal faded out at G6DH at noon, 43 minutes after the first faint sign of a carrier had appeared at 11:17. At G5BY the signal remained in until 12:25, a total of 68 minutes. The peak signal reported by G6DH was S7, while G5BY heard it well over S9 at times.

Honors in connection with this famous first are split equally between Denis Heightman, G6DH,



V.h.f. work is a family affair at G6DH, Clacton on Sea, Essex, England. At the right are Denis, Eileen, Clive and Nicholas Heightman. Eileen is a licensed operator, and has kept many of the daily schedules on 28 Mc. with W1HDQ, which resulted in the first trans-Atlantic 50-Mc. QSO. The lower photo shows Denis at the operating position, with the receiver used in the trans-Atlantic v.h.f. work. At his left are the 75-watt 28-Mc. and 25-watt 58-Mc. rigs.



and Hilton O'Heffernan, G5BY, for though the contact was made first with G6DH it was established beyond all doubt that G5BY actually heard and identified the signal a minute or more before G6DH, who logged the carrier at 11:17 during the QST, as an unidentified 'phone, and did not get the call until the first c.w. signature at 11:19. G5BY heard almost the entire voice QST, his reception beginning at 11:16.

Tip-off that something was in the wind came for G5BY at 10:17 a.m. EST, when WEDI, presumably a ship, was heard on 52.9-Mc. c.w. calling WOO. The signal built up steadily to far over S9, starting its fade-out at 10:44, but continuing at readable level until 11:00. At times the carrier was left on without keying, and with a live modulator circuit. Sounds of typewriters, signals from



receivers running in the operating room, and voices of personnel could be heard plainly. The fading characteristics were similar to those of the signal from W1HDQ, and quite unlike the rapid swinging fade commonly noted on 28-Mc. signals.

The receiver used by G6DH employs a 954 as a regenerative mixer, followed by a 3-Mc. i.f. stage and a regenerative second detector. The antenna is a 50-foot long wire at present, but a 50-Mc. beam is in prospect. G5BY used a 4-element horizontal array cut for 51 Mc., and a rhombic which is 240 feet on a leg. The 4-element array turned out to be far superior in reception. At W1HDQ we used the 6- and 10-meter stacked array pictured on this month's cover, which will be described in detail in *QST* for February.

Numerous other Gs are interested in the possibility of cross-band work with W stations operating on 50 Mc. The 10-meter band is an excellent medium for the promotion of such effort. The same applies to the hams of many other countries, and it seems likely that there should be a considerable amount of international v.h.f. work before the sunspot peak runs out in a couple of years. LU1EP, OA4BG, VP4TF, KP4KD, KP4CF, KP4AJ, ZS1T, SU1CX (G5KW), CN8BA, PA0UN, CE3FV, and numerous others have promised to cooperate and interest is spreading daily.

To exploit the possibility of work with VKs and ZLs, arrangements have been made with the Wireless Institute of Australia and the New Zealand Association of Radio Transmitters to conduct tests on a regular schedule, details of which were run on W1AW nightly for a week during November. At the suggestion of N. Z. A. R. T., W stations should transmit hourly during the first ten minutes, after which they should listen for stations in Australia and New Zealand for the following ten-minute period. Time for the schedules was set tentatively as 2100, 2200, 2300 and 0000 GCT, but this time should be modified, where necessary, to coincide with the middle of the period when ten-meter signals are at their best for the path in question, or roughly mid-day at the midpoint of the hop. ZL1AO, ZL1PD, and ZL2CX are known to be on with beam antennas and good rigs, and ready to work out on the above schedule. The N. Z. A. R. T. *Break-In* also lists ZL2LD, ZL3KR and ZL3LL. A batch of VK frequencies forwarded by KH6AR appears in the "Who's Where on Six?" box.

W4GJO and W6QG Make First 50-Mc. F₂ Two-Way!

While we are beating the drum for activity in other countries we should look to our own. There has been a lamentable lack of 50-Mc. effort in this country this season. With their first opportunity for genuine DX on 50 Mc. staring them in

Who's Where on Six?

W1AKQ Quincy, Mass.	50.7 Mc.
W1ELP Cambridge, Mass.	50.01
W4ANN Johnson City, Tenn.	52.0
W5HHT New Orleans, La.	51.05
W8AKR Breedsville, Mich.	50.4
W8AAF Bloomingdale, Mich.	50.5
W8KHY Battle Creek, Mich.	51.6
W8NZ Grand Rapids, Mich.	50.2
W8VIB Three Rivers, Mich.	50.45
W9GUP Chicago, Ill.	51.4
W0PKD Salina, Kans.	50.4
VE2KH Montreal, Que.	50.53
VK2NO	50.3
VK3GG	51.9
VK3HK	51.4
VK3MJ	51.0
VK3BW	50.01
VK3YF	50.45
VK3YJ	52.0
VK3LS	50.7

the face, not a few of the gang have forsaken the band to join the QRM battle on lower frequencies. Work on the other bands is fun, of course, and we like our share of it as well as the next fellow, but this is no time to be leaving 6 without occupancy! Evidence of this is the QSO between W4GJO, Orlando, Florida, and W6QG, Santa Ana, California, which took place at 12:12 p.m. on the 24th, at the same time that the G contacts were in progress. This is a notable "first" in at least two categories: it is undoubtedly the first instance of two-way v.h.f. work by means of F_2 reflection, and it represents the first time that a W6 has been worked by a Florida W4 on a v.h.f. band. That 50-Mc. DX work was going on simultaneously over such a wide area would seem to indicate that many contacts should have been made, if more of the gang had been on the job at the right time. W6QG reports that W4GJO was in with a very good signal, and that W4IUJ, West Palm Beach, was heard working W6FPV at the same time. Your conductor and W1LLL both heard commercial harmonics in the low end of the 50-Mc. band, following the G QSOs, but frequent CQs brought no other results.

During the time that the above DX work was going on, W9ALU, Metamora, Ill., heard commercial harmonics as high as 53 Mc., and heard W2BYM, Lakehurst, N. J. calling G6DH on c.w. A commercial harmonic carrying Spanish speech and Latin-American music was heard on 50.4 Mc.

Another spot where 50-Mc. activity is badly needed is in the Hawaiian Islands. Our Island Paradise should be an ideal spot for the DX-minded v.h.f. enthusiast. The m.u.f. between the Islands and the Philippines, Australia, and New Zealand is certainly far higher than across the North Atlantic, and all these places have the 50-Mc. assignment, so that two-way work should have been done long ago. All that is needed is some intensive effort in the right places. The boys "down under" are on — how about some KH6 cooperation?

There are a few fellows in countries where the

V.H.F. MARATHON

Call	Contacts Through October		States Worked	
	50 Mc.	144 Mc. 235 Mc.	50 Mc.	144 Mc.
W1AEP	65		539	21
W1BGT*	237	2	1031	6
W1CGY	38		315	15
W1DEH†		52	241	4
W1HDQ†	108	126	1992	25
W1KLR		108	634	5
W1LLL	103		1192	27
W1LMU		160	652	4
W1MBS*		131	432	2
W1PFJ	126		1244	25
W2AMJ	101		929	24
W2AUF*		189	587	4
W2BQM	66		609	18
W2BYM	121		1144	25
W2COT	32	31	213	7
W2DZA		225	1007	8
W2JWO		269	1832	10
W2QVH		294	1359	8
W2RPO	6	65	542	3
W3BKB		74	498	5
W3BTP*		91	538	4
W3CGY	36	55	553	8
W3GKP*		128	952	6
W3HWN		179	1800	9
W3RUE	30	18	538	16
W4CDG/3*	9	161	1138	6
W4HVV	32		574	15
W6BWG	48		171	2
W6IBS		60	294	1
W6NJJ*		265	1322	1
W6OVK	10	77	545	6
W6QG	54		532	8
W6RVL*	130	173	928	5
W6TGY*		54	158	1
W6WNN	38		240	3
W7KAD	65		1322	19
W7QAP	37		643	11
W9AB	15		98	6
W9ALU	16		154	6
W9PK	73		940	19
W9ZHB				25
WØYUQ*	76		1169	22
WØZJB	112		1520	27

* Includes portable or mobile work.
 † Not eligible for award.
 ‡ October winner: WØYUQ, with 295 points.

50-Mc. assignment has not yet been adopted who are straining at the leash when they think of that m.u.f. bouncing up over 50 Mc. at frequent intervals. A few (not Gs, incidentally) have suggested that we might do well to watch the region just inside the low edge of our band for possible DX from other countries when things look good on 6. We're not listing their frequencies or calls, but rest assured they exist, and in some mighty attractive DX spots.

When Do We Look for F₂ DX?

Unlike sporadic-E DX, which is largely unpredictable and therefore requires eternal vigilance on the part of v.h.f. workers, F₂ opportunities occur on a fairly well-defined schedule, at times which can be predicted well in advance. It is thus not necessary to camp on the band day and night in order to avoid missing that one chance to

knock off a choice bit of DX. If one has a sensitive receiver which is capable of covering the frequencies between 40 and 50 Mc., he will not have to spend much time listening before he will have a fair idea of best time of day to attempt 50-Mc. DX contacts. In general, it will be the middle of the period when 10 is open for the path in question. The highest m.u.f. will be prevalent at the peak of the 27-day recurrence cycle of solar activity, and if this is not known, the m.u.f. can be established quite readily by listening for the highest frequency at which fading signals are coming through. If the frequencies between 40 and 50 Mc. are checked for a few days it will be learned whether the trend is up or down, and one can act accordingly. *Basic Radio Propagation Predictions*, issued monthly, three months in advance, by our Bureau of Standards Central Radio Propagation Laboratory, is an excellent guide. This publication may be obtained from the Superintendent of Documents, Washington 25, D. C., for 15 cents per copy, or \$1.50 per year on subscription. These predictions show the month of November as the peak month for 1946, with a decline of about 4 Mc. in m.u.f. for most paths in December, January, and February. Regions around 20 degrees north latitude will continue to have an m.u.f. well above 50 Mc. throughout the winter, and the prospects for F₂ DX are still good enough to bear watching in the United States. Stations in the Central Pacific, Southern Asia, and Northern Africa should work 50-Mc. DX almost daily, if only a few of them would get on the band and try!

Here and There on 6

We've heard of some strange DX reports in our time, but this one tops them all. W9AB, Mishawaka, Indiana, recently received a reception report from HB9U, who says he heard W9AB RST 568 on Sept. 2, 1946 — on 66 Mc.! Harry sent us the QSL, but we still find it hard to explain.

A two-band antenna is a handy thing to have, but 10 and 6 are a tough pair to work with. W6QG suggests that a good compromise "V" could be made by making the legs 68½ feet long. This would be 2 wavelengths at 28.3 Mc., and 3½ wavelengths at 50.05 Mc. The compromise angle would be 62 degrees. If more room is available the legs could be made longer, so long as the 4-to-7 ratio is used. The same idea could, of course, be applied to rhombics.

Do you find the listings of 50-Mc. frequencies helpful? Jack Woodruff, W9PK, says that he made a list of all the stations so listed as being active within a radius of 350 miles. He puts his beam toward the locations given, and makes calls when the band seems to be dead, and sooner or later a good many of them have shown up.

Remember W5DNN, Austin, Texas, who, with W5VV, helped to put that city on the 5-meter map? Steve is now in the process of moving to

Venezuela, where he insists he is going to go to town on 50 Mc. Another migrant is W1JCT, of 2-meter fame, who is on the way to a tour of duty in San Juan, Puerto Rico. Johnny is taking along gear for 50 Mc., and we think he can be depended upon to make the right use of it. Nice spots, both places, right in line for some good high m.u.f., the year 'round.

What constitutes a "contact"? The generally-accepted standard is that at least one transmission be made each way, and that some information (at least the correct call, preferably location and signal report) be exchanged. As many of our DX QSOs are made when conditions are changing rapidly, it is a sharp operator who can get even this bare minimum through at times. Such a contact was the one between W6NAW, Los Angeles, Calif., and W8CIR/1, Boston, Mass., on July 5, 1946. Though two transmissions were made each way, signals were fading so rapidly that little in the way of positive information was conveyed. Examination of evidence offered by both sides indicates that a QSO certainly did take place, and therefore it is recognized, belatedly, as a new record for 50-Mc. two-way work. The confusion surrounding it serves to demonstrate the value of exchanging some concrete information under such conditions, in order to provide positive verification for the record. In cases where voice is doubtful, both sides should shift to c.w., which is almost certain to be faster and more reliable in the end. The practice of making such contacts with c.w. and then shifting to voice later if conditions permit is highly recommended.

Probably the oldest v.h.f. net in existence is the Minutemen, who have been doing business in Eastern New England since 1932. This group gets together each Sunday morning on 51 Mc., at 9 o'clock. Membership includes W1IN, president, W1AJW, secretary, and W1s HUV, DA, EHT, EKT, MJ, HSV, ELP, VT, and W1IIQ and W2KH as honorary members. More such organizations would help to keep things going on our v.h.f. bands.

Another net is that of the Mike and Key Club of the Los Angeles Area, which operates on 51,840 and 53,080 kc., according to W6OHM, who says that there is unprecedented activity, with nearly 200 stations active on 6, many using the modified MBF rigs, running very low power. W6OHM had 712 QSOs on 6 during September and October. No activity on 6?

Some new states should start showing up before long. Tennessee, never known for its v.h.f. activity, has W4ANN at Johnson City. Kentucky is represented by W4AWN, W4JBF, and W4JBW, who are just across the river from Cincinnati, where they have company in the presence of W8s ODF, NDN, AKW and W9ICF/8. These stations are working Dayton regularly, and W4JBF, who has 800 watts, has been heard in Ft. Wayne, Ind., 150 miles distant.

A few of the gang are staying with 6 out in the Northwest corner. From Yakima, Washington, W7JPA reports that W7CTY, Grandview, W7BOC, Zillah, W7HEA, Toppenish, and W7JPA, Yakima, are on nightly at 7 P.M. PST. They are known as the Megacycle Manglers, and they concentrate on 50.4 Mc. Others in that area known to have 6-meter gear completed or in the works, include W7CAM (500 watts, 4-element array), W7GMC (working on mobile rig), W7JVB (3-element rotary, but transmitter not on 6 yet), W7GR (f.m. rig on 6 and 10), and W7AWX (mobile rig with 832 in final). W7JPA has an 829 in the final and a 4-element rotary. W7CTY runs 300 watts to a pair of 812s, with a 3-element beam. The rig at W7BOC is an 815 final at 75 watts, with a hot converter employing 6AK5s for receiving.

Not all the extended-local work is done in the United States. G5BY recently passed the 200 mark in his record of QSOs at distances beyond 200 miles. He has worked G6LK, 156 miles, more than 100 times. In work with stations in the London area, 164 to 184 miles, sharp increases in the strength of weak signals are often noticed. This effect, undoubtedly the result of the passing of meteors across the signal path, is most pronounced at this range, and is noticed less on stations at greater distances.

A good v.h.f. receiver bet is reported by W6YBP, Isleton, Calif., who says that the AN/ARR-5 can be converted to amateur use with a minimum of trouble. It is a version of the well-known S-36, revised for airborne use in detecting radar equipments operating in the range between 27 and 146 Mc. It is being sold by some West Coast surplus outlets at what appears to be a reasonable figure.

1500 Miles on 144 Mc.?

Periodically we hear phenomenal reports of DX reception on 144 Mc. Mind you we don't say it can't happen, for we remember what happened to the fellows who said it couldn't happen on 5 not so many years ago, but that doesn't make it any easier to believe. One night in mid-October (11th), W1JQA, Randolph, Mass., reported hearing the call, W5KL, and the location, Dallas, Texas, on 2 meters. We reported these facts to W5KL, who replies that on the evening in question he was operating on 144 Mc., and that he called W5AJG, in Dallas, several times. The report by W1JQA is not sufficiently complete as to details of the transmission to provide positive confirmation, but it does appear probable that the signal heard actually was that of W5KL — but how it happened to get 1500 miles from home is one thing we have not yet figured out! Of course, if it happened to us that would be a different story!

Having trouble getting activity started on 2,

(Continued on page 118)

Power Increases and Their Effects

Db. Rears Its Ugly Head

BY LAURENCE SMITH, * W7FOM

• If you are considering an increase in power in the near future, this common-sense article on the merits of power increases is right down your alley. Or if you have already booted the input up above what it used to be and have been slightly disappointed in the results, here's why.

Now that most of the amateur bands have been returned to us and a lot of fellows have that old (or new) rig tuned up and on the air, we can sit back and take it a little easier and make plans for the future. Perhaps a lot of you fellows are already burning the midnight oil planning a new rig or a new final stage that will handle two or three times the power you are now running. Or perhaps you are scheming and figuring as to how you can squeeze just a little more power out of that already-overloaded final tube.

How many of you fellows have dreamed of a rig with maybe double, triple or even four times the power of your present rig and thought, "Boy, would I burn holes in the ether and would I go places with that much power!" Later on perhaps you acquired the increase in power, after a considerable outlay of money, and then were disappointed when you didn't shove the S-meter up several points on the other fellow's receiver. What was wrong? Or perhaps you have been in contact with some fellow who asked you to stand by while he raised his input 5 per cent. Why weren't you able to tell the difference in the strength of his signals?

Before you take that roll of lettuce (money to you) which the XYL was probably figuring on using for a new outfit and spend it on some higher-powered equipment, let's take a look at this business of power increases and what one can expect from them.

The Decibel

To do this we are going to have to take a look at that somewhat unpopular fellow the "decibel." Now hold on! — don't throw down your copy of *QST* and go out and blow that cabbage just yet. I'm not going into a long-winded explanation and discussion of the decibel — I'm not well enough acquainted with the fellow for that — but I do hope to give a simple idea of what the decibel is with respect to this business of power increases, so that it will mean a little more to a lot of you

* Route No. 2 East, Missoula, Montana.

fellows than just the top row of figures on the receiver S-meter.

What is the decibel, or "db." as it is commonly called? Basically it can be said to be a measure of the minimum variation in the intensity of sound that the average human ear can detect. The response of the human ear is not linear but it is logarithmic. If we have an amplifier delivering 5 watts of energy to a loudspeaker and then increase that energy to 10 watts, the sound won't be twice as loud. The increase in level will amount to about 3 db. and should be around 50 per cent louder to the human ear. To make the sound appear twice as loud to the ear, we have to increase the level

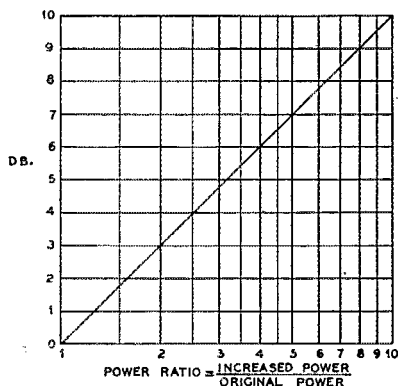


Fig. 1—A plot of power ratio vs. db.

about 6 db., which represents an increase in power of 4 times. If you wish to get an idea of how different variations in db. level sound to the ear, make a visit to your local broadcast station and have the operator give you a demonstration on the monitor amplifier. This is a simple matter, as practically all audio controls used in broadcasting are calibrated in db. loss.

Now how can we figure how many db. a certain power increase will give? If one wants to be fancy he can get it from a table of logarithms and the knowledge that

$$db. = 10 \log \frac{P_2}{P_1}$$

where P_1 = original power
 P_2 = power after increase

But this involves a knowledge of logarithms and all we want to know is how much good our contemplated power increase will do. So the lazy man's approach is the best in this case, and Fig. 1

About the Author

• Laurence Smith, W7FOM, ex-W9EIZ, is one of those busy all-round radio folk whose hobby interest led him into occupation in the b.c. field. He has been an engineer at KGVO for the past 4 years, more recently having been promoted to chief engineer. His first call was received back in 1930. When not busy rebuilding or experimenting, W7FOM can usually be heard rag-chewing on 'phone. His wartime hobby of amateur photography has been relegated to the background, now that the ham bands are open again . . . and he must give time, he says, to his XYL and their three potential OMs.

shows db. plotted against power ratio. It is an easy matter to read off the necessary db. once the power ratio is calculated.

Suppose you plan to increase your power threefold. Then, from Fig. 1, the increase equals 4.8 db. Simple enough, isn't it? Now that we have found that our power increase of threefold corresponds to a gain of 4.8 db., let's see what this means on the S-meter of our communications receiver. The one here is an older-model RME-69. The meter on this receiver is calibrated in R units, instead of S units as in the later models. However, the meaning is the same. The meter is also calibrated in db., zero db. corresponding to R1 and each increase of 6 db. representing an increase of one R unit. Thus our power increase of threefold represents 4.8/6.0 or 0.8 of an R unit. This is what you can expect the other fellow to report to you on your signals, assuming identical receiving conditions for the two powers. It doesn't sound very impressive, does it? However, the signal will sound about 80 per cent louder which in many cases may mean quite a difference between copying the signal and not copying it.

Now that we have a true picture of what an increase in power means to you, stop and think: Is it worth the extra cash to shove your signal report up less than one S- or R-point? This is not an argument against high power, because to the fellow who has the money to put into high-powered equipment I say, "Go to it," provided you know how to handle high power and use it with discretion. Of course it is up to you to decide whether that double or triple power increase is worth it, but don't be disappointed when the fellow on the other end reports you only a fraction of an S-point louder than you were with the lower power. Also, before you screw up the plate voltage another notch on the final tube (which probably puts the plate on the verge of dripping), stop and figure out what those few extra watts are going to mean to the fellow on the other end. Remember it takes an increase of approximately 26 per cent in power

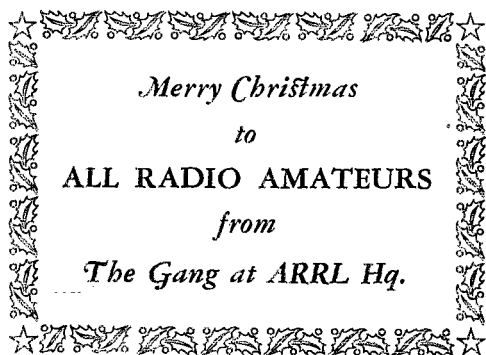
to raise that signal 1 db., which difference is barely perceptible to the human ear.

During the war all broadcast stations were required to reduce their power output 1 db. This represented a power reduction of slightly over 20 per cent. A 5-kw. broadcast station actually put a little under 4 kw. into the antenna during the war. It was conceded that the average listener could not tell the difference between the two powers. This rule has of course since been rescinded, and all broadcast stations are now running their full licensed power.

It seems to me that a lot of us might get more for our money if we change our plans about that increase in power until we can really afford an increase in power that will mean something. Instead of spending that moola now for some higher-powered equipment (and being relegated to the dog house by the XYL), it might be better if we were to concentrate on the old rig for the present and try to get it to operate a little more efficiently and smoothly. Perhaps a few bucks spent for an antenna ammeter, a field-strength meter, a better transmission line or a new beam antenna, might give us just as much increase in results as would the contemplated power increase, and at less expense.

Remember if you can get an increase of $\frac{1}{2}$ of an S-point, or 3 db., at the receiving end with the same power input to the rig, you have accomplished the same goal as doubling your power into the antenna, and if a new beam antenna should give you an increase of 6 db. at the receiving end, brother, pat yourself on the back. You have really done something. That's just the same as increasing your power 4 times. Also Ye Olde Lighte Bill will be smaller and you can pass most of the folding stuff over to the XYL for that new outfit (she would probably have snagged it away from you anyway before you got down to the radio store).

Personally I think I'll give that ham in the next county a buzz and see if I can figure some way of raising the S-meter on his receiver a fraction of a point farther with my 807 and the 35 watts input.



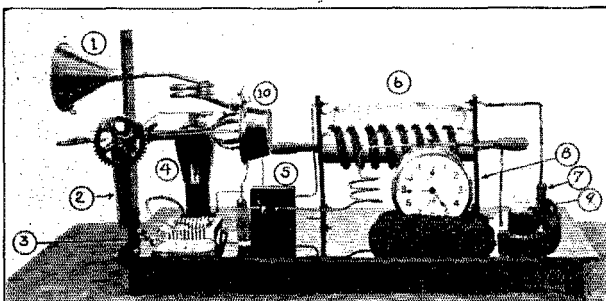
The Repenter

For People Who Think They Think

BY BURT L. ZIMET,* W2JUX

PLAGIARISM is a nasty word — especially when it is applied to a usually staid magazine like *QST*. Yet such things can and do happen. I refer specifically to an article written by A. H. Sharbaugh and R. L. Watters titled "Our Best DX — 800 Feet!" This article, as you know, appeared in the August issue. Specifically, permit me to quote Line 3, Paragraph 2: "As may be seen from the photographs, this equipment resembles nothing ever before seen in a ham shack." This is a particularly vicious piece of plagiarism and a definite attack upon the integrity of hamdom. To quote further, "It is not the intention of the authors to describe it so that it might be duplicated . . . as microwave technique is still rather involved for the average ham." This statement brings tears of frustration to these bleary, myopic orifices. I cannot permit it to pass into documented history via *QST* without raising my lonely voice in protest. I shall take up my plumed helmet and gird my loins in defense of the memory of J. O. Otis, W3EXC, Inventor Extraordinary, and at the same time vindicate hamdom for all time. Like a knight errant of old, I shall hold down the shack until you gentlemen quickly review the contents of April 1936 *QST*, page 58. Yes, gentlemen, I said April, 1936. Imagine, dear reader, Messrs. Sharbaugh and Watters were anticipated a full decade ago! The shame of it! I call upon every red-blooded QRM-infested ham to look for himself. Can Sharbaugh and Watters deny the striking similarity? Remember, dear reader, photographs do not lie. The writer is willing to admit that the Flugelhorn used by Otis the Great is of rounded periphery, and the one used by the infamous rascals in question is of pyramidal form. He is even prepared to admit that the pyramidal form has many advantages; however, the relative merits of the various Flugelhorns are beyond the scope of this paper.

Once more quoting these alleged authors. "We decided to make a single tube serve as both oscillator and transmitter." A single tube! Look at the Otis "Puckering Tooka" and what do you see? A single tube! Refute this, Messrs. Sharbaugh and Watters, if you dare. Again quoting them: "The line stretcher . . ." Who are they kidding? Do they take us for rank amateurs? Who ever heard of a "line stretcher"?

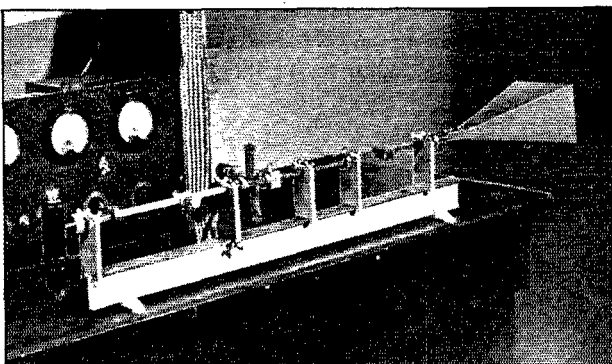


ALL-BAND "STANDING-BY" TRANSMITTER AT W3DQ, OTHERWISE KNOWN AS THE WILSON "PUCKERING TOOKA"

- | | |
|--|---|
| 1—Hi-funclity talk into-er. | (Set hands for report you wish to get—QSA5 R9 etc.)—will also record the number of snapshots you haven't taken of Aunt Lila.) |
| 2—Stuffing box (for holding cotton from pill boxes, rusty aeroplane wing struts, etc.) | 9—Super-oscillating gimmick (with mud valving). |
| 3—Main switch—master control. | 10—Speech chopper-offer (removes harsh irritants from heavy-duty voices and stuff). |
| 4—Tube here (just for looks). | |
| 5—Peachy Heavy-Duty stuff. | |
| 6—Filters out QRM. | |
| 7—Feeder. | |
| 8—Shock-proof report giver. | |

Inventor's note: My "puckering tooka" incorporates circuit design of tomorrow; however, tomorrow never comes, so skip it. Dynamic in personality, lavish in generosity, my "puckering tooka" is a peachy wireless sender. J. O. Otis, W3EXC, inventor.

[Reprinted from *QST* for April, 1936]



The equipment under challenge, described in August 1946 *QST* by WINVL/2 and W9SAD/2.

* Research Laboratory, 2017 East 24th St., Brooklyn 29, N. Y.

I ask you, dear reader — line stretcher indeed! Such ambiguity must never again soil the fair pages of our beloved *QST*. Get this one too, dear reader: “. . . the guide by a ‘T’ joint.” Who ever heard of needing a guide to find a joint? Besides, dear reader, they make no attempt to tell us where this mysterious “T” joint is! Why I ask, why? Because there is no such joint or, friends, I would know about it!

In summation, this final quote will no less chagrin you than it did me. Think of this: “This negative potential exerts a repelling action on the negatively-charged electrons and causes them to slow down, stop and reverse their direction of travel back through the holes in the resonator.” This statement, dear reader, is directly and in verbatim lifted from the photograph by Otis. Where Sharbaugh and Watters use thirty-three words to make this statement, Otis the Master uses only six words, quote “Super-oscillating gimmick (with mud valving).” Get that, dear reader — with mud valving! Written a decade ago — MUD VALVING! No other author can make that statement! Otis the Great could and did. How, now, Messrs. Sharbaugh and Watters, do you still think microwave technique is too involved for the average ham?

When the original paper describing the Puckering Tooka appeared I became so enthusiastic and engrossed with its possibilities that I decided to investigate it further and make such modifications as I found necessary toward its final commercial form. Having spent some four hundred and eighty weeks (0.0002+ light years) in cloistered seclusion in my cellar, ahem, basement laboratory, I am now prepared, together with all technical data and graphs, to release to the palpitating world my startling discoveries. These far exceed even the fondest expectations of Otis the Great. His reserved statement was made a decade ago: “My Puckering Tooka incorporates circuit design of tomorrow; however, tomorrow never comes, so skip it.” Get that, dear reader. (I’ll listen on 20 while you’re doing it.)

I intend to show, armed with my notes, that the above statements made by Otis a decade ago are absolutely and irrevocably true. Further, my notes will show that the Puckering Tooka has a definite use in this vale of tears. However, the last revision of my notes decided me to name this startling apparatus a *Repenter* for obvious reasons, especially the one of deep and profound remorse for this article. For reasons beyond the scope of this paper, the following description is divided into parts.

General

The *Repenter* is a lightweight, compact unit (see Fig. 1) and is intended for use by people whose capacities for repentance are below normal (for example, hams who buy surplus war equipment they’ll never be able to use) or by those who, have more to be sorry about than can be conveniently handled without artificial aid. By use of

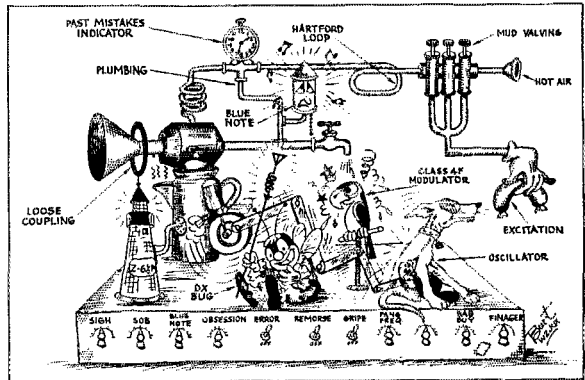


Fig. 1 — Parts layout for complete *Repenter*.

this device the operator may have his bad moments repented for him, thus permitting him to engage in activities which he may later “repent at leisure.” The *Repenter* is absolutely guaranteed (except in March) faithfully to repent in exact accordance with the desires of even the most talented of bunglers.

The *Repenter* produces tone-modulated sighs in the frequency range 10.3 to 70.1 pangs per second (10.3-70.1 p.p.s.) and the modulation frequency is one thousand sobs per second (1000 s.p.s.). The device may be adjusted to produce racking pangs of remorse when such extremes are indicated. A simple adjustment of the Remorse potentiometer will create an atmosphere of complete dejection and thus enable the operator to quickly repent hasty words or purchases. Complete and absolute penitence is accomplished at 60 p.p.s. However, the operator is cautioned that this adjustment must be made with extreme care (kid gloves — if available) (if not — use spats), since the *Repenter* will be operating in the Black Despair end of its Gripecurrent Plight-voltage curve. (NOTE: A Gray Gloom may be obtained from the output jacks when the Grief control is turned to the extreme counterclockwise position. Should this control be in the Off position, only a lingering doubt will be present.) When gloomy (the surplus wasn’t what you thought it was), the operator should turn the dial labeled KICK ME to On position and immediate relief will be realized.

It is, of course, reasonable to assume that in accordance with Moe’s Law (Hey, Moe — watta

ya know?) the Repenter can be made to rue. To rue the day, adjust the device in accordance with the simple nine hundred page instruction manual furnished with each Repenter. When the urge to say "You'll be sorry" comes upon the operator, the Azuzza-type Expectation Preselector should be attached to the Repenter. Combining these two devices will produce in the Repenter a negative Drift current which biases the Volstead Valve excessively.²The net effect

note to as much as a complete nervous breakdown. Thus, for 2 moods off resonance the response is only 40 db. down and the bandwidth at 10 times down is ± 17 kilopangs (two moods off resonance being equal to a front-to-back ratio of 22,222 db.).

Power Output

The Repenter is designed to efficiently deliver a maximum output power of 60 Whats RMS (Room for More Stations), this being greatly in excess of the power normally required for ordinary ham use. In fact, 60 Whats would cause the operator to "buy in haste and repent at leisure." Therefore, the operator is cautioned not to utilize the full power output unless he belongs to the group called problem people.

Circuit Design Considerations

Spurious or parasitic remorse is prevented by the use of Pang suppressors in the Mud Valving circuits. The Repenter must always be operated at the highest possible sobbing point. Sobbing-point measurements can be made from readings of the Flow and Ebb meter on the front panel. This meter is of the Past Mistakes type, having 1000-Ohs-per-volt sensitivity, and will indicate how lousy things are going. Where conditions require a "filled-with-remorse" state, as in the range 14 Kilowracks (14 KW.), the operator should carefully adjust the Racking Trilks, since the device has an inherent tendency toward self-oscillation at these frequencies. Careless adjustment would cause the Repenter to break into a violent state of sobbing which could build up in amplitude to a peak power of over 150 qts. This would, of course, instantly swing the Worry current sinusoidally and a state of mental exhaustion would prevail. The author has carefully investigated this phenomenon and recommends the use of several antilament chokes connected in series with the screens of the No-Nox tubes. Such chokes will effectively damp out all but the racking type of sob. The dampness is controlled

(Continued on page 118)

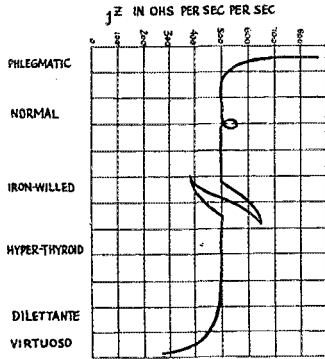


Fig. 2 — Output impedance vs. various types.

on the operator is essentially a surge of linear expectation which causes a hasty revisit to every surplus store within a hundred-mile radius to purchase everything in sight, including such useful items as air brakes for rotary-beam antennas.

Characteristics

The Repenter differs from most conventional ham gear in that it satisfactorily matches a wide range of emotional impedance. These impedance values depend in large measure, of course, upon the temperament coefficient of the operator. When this factor is substantially flat the instrument may be relied upon to adequately supply remorse for long periods of time without recalibration. However, where the emotional impedance varies in accordance with the season, the weather, or what's for supper, the Repenter must be recalibrated. It is necessary to return the Repenter to the manufacturer for recalibration since the exact standards of human nature are as yet unknown. A plot of the output impedance is shown in Fig. 2. The response of the Repenter is essentially flat over the entire sad gamut of emotional range, being less than 3 db. down at the Remorse end, and only 2 db. down at the Indifferent Compunction end. Where a flatter characteristic is desired, the Repenter may be flattened with any convenient pile driver.

Selectivity

The Repenter is provided with a vernier dial (Mergenthwiker Type DTs) which enables the operator to discriminate between recurring cycles of despair differing by as little as a single blue



Fig. 3 — Simplicity of operation of Repenter illustrated.



Hints and Kinks

For the Experimenter



STANDING-WAVE INDICATORS

WITH the continued popularity of 300-ohm ribbon in antennas, feeders, and matching systems, there is a real need for some simple means of observing the changing amplitude of standing waves on the feed line as tuning adjustments are made. The gadgets shown in Fig. 1 serve to give a pretty fair idea of what is taking place on the line, and are of great assistance in determining when the optimum impedance match is reached.

The indicators are made by soldering a small pilot lamp to one end of a six-inch length of 300-ohm ribbon, the other end of which is shorted, forming a pick-up loop. Two indicators are usually required, although in some applications one may be enough. The two indicators should be as nearly identical in construction as possible. For use where the power applied to the antenna is substantially under 100 watts, a longer length than that shown in the sketch may be needed.

In use, one of the indicators is moved along the transmission line until a point of maximum brilliance is found. It is then taped in position on the line as shown in the sketch. The second indicator is then moved along the line, starting at the point where the first one is now taped, until a point of *minimum* brilliance is found. These two points will be about a quarter wavelength apart. In instances where the standing-wave ratio is low to begin with, it will be impos-

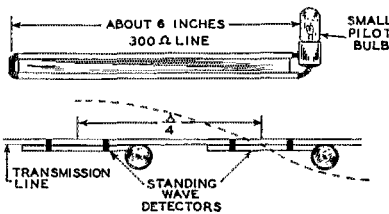


Fig. 1 — A simple standing-wave indicator for use with 300-ohm line. In use the indicator is taped to the line as shown in the lower sketch.

sible to find maximum and minimum points. In these cases it is safe to assume that a satisfactory impedance match has already been achieved. In most cases however, substantial standing waves will exist on the line before matching adjustments are made. Once the points of maximum and minimum brilliance are found, the matching device should be adjusted while the relative intensity of the two indicators is being observed.

When the two bulbs are of equal brilliance, the s.w.r. is low, and a fairly good match can be assumed. The indicators are not sensitive enough to permit detection of very small changes, such as when the s.w.r. is low to begin with, but for the sort of work normally encountered with ham antennas, they do a good job, and do it cheaply.

— Ray Brandt, W9T.IJ

— — —

TWO-WIRE CONNECTION FOR BIAS PACK

TWO wires can be connected to the power plug of the transformerless bias pack shown in the ARRL *Handbook* without fear of a short-circuit if a s.p.d.t. switch and 115-volt lamp are connected in the circuit as shown in Fig. 2.

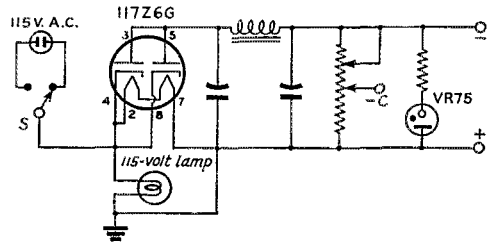


Fig. 2 — By the addition of a switch and an ordinary lamp bulb, the possibility of short-circuiting the 115-volt line in the *Handbook* transformerless bias supply is eliminated.

The switch should be thrown to the lamp position for "on" operation and the lamp will light unless the plug is incorrectly placed in the socket.

— Walter Zuckerman, W2LBF

— — —

EXTENDING THE RANGE OF THE C-R-L BRIDGE TO 10 MEGOHMS

THE usefulness of the impedance bridge described in the July, 1944, issue of *QST*¹ can be increased by extending its range to 10 megohms. All that is required is the addition of another position to the multiplier switch and a simple wiring change as shown in Fig. 3. Although a 7-position switch was specified in the parts list in this article, in most instances a standard 11-po-

(Concluded on page 180)

¹"An Inexpensive Impedance Bridge," Cosmas, *QST*, July, 1944.



Correspondence From Members -

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

25 YEARS AGO

Radio Division, WAKC, Freehold, N. J.

Editor, *QST*:

Forty years in "wireless" and radio and am still reading *QST*. I still look through its pages for ideas, proving an old saying, "once a ham, always a ham."

My interest is all pepped up because this month, 25 years ago, brings back fond memories — "The Trans-Atlantic Tests." Believe me, I will be following it in each issue and you will know the reason why as you open up the old pages and see the dope on W2AWL, and also pictures. The call letters are still in the family, being held by my oldest son. The picture of the rig in 1909 still is my favorite.

Do an old timer a favor — stretch that "25 Years Ago" out a little so the young squirts can see what happened back in yonder days. And off the record, I like to read it.

— Robert S. Johnson

[EDITOR'S NOTE: See page 32.]

THE BIRTH OF F.M.

1221 Kemble St., Utica 3, N. Y.

Editor, *QST*:

Narrow-band f.m. is nothing new. It was used by Utica hams about 20 years ago.

Transmitters in those days used single-tube low-*C* self-excited circuits. The tubes were extremely microphonic. If a fellow stuck his nose as close to the tube as possible without burning the tip of his bugle, and yelled like the devil, he would cause the tube electrodes to shiver in their glass boots at voice frequency. Since the circuit was low *C*, the changing interelectrode capacities varied the frequency. You really could work 'phone that way.

Wasn't that narrow-band f.m.?

— Edwin F. Ehlinger, W2BBP

POLLS

920 Alpha St., Inglewood, Calif.

Editor, *QST*:

Since the amateur bands have been reopened several questions have been voted upon by the Board of Directors which have been at variance with what I think are the wishes of the majority of us and have aroused much criticism of Headquarters. Such talk was frequently heard on ten meters from all parts of the country. I believe this points to a fundamental weakness in having a small group of men vote changes which affect the hobby of thousands. The obvious solution is to submit such questions to the general membership of ARRL in a referendum poll, when changes are contemplated.

Under such a system the directors would still perform a valuable service in meeting and deciding what questions should appear on the ballot. Such controversial subjects as Class D licenses, power limitation, 'phone on forty meters, division of bands between c.w. and 'phone, may then be decided by majority rule and it will behoove every amateur to join the ARRL and have an actual vote in matters governing his welfare.

— George Dery, W6HG

[EDITOR'S NOTE: If the League's system of self-government indeed has a fundamental weakness, then so does the American Congress, after which it is basically patterned.

It has been past practice of the Headquarters, either on

its own initiative or at the instructions of the Board, to collect statistics of amateur opinion on these various subjects. Polls have been used in numerous instances, although they comprise but one of several methods. Necessarily discontinued during the war period and until most of the amateur bands were returned, the system has now been revived — for example, the 10-meter band proposal appearing in December *QST* and the occupancy survey in the current issue.]

MORE ON METEORS

Electrical Engineering Dept.,
Stanford University, Calif.

Editor, *QST*:

I should like to comment on W2IXK's letter to the editor published in November *QST*. Mr. Abell reports noticing bursts of signal in the 144-Mc. band which coincided with meteor whistles and "grunts" heard on a short-wave broadcasting station during the Perseid Meteor shower.

Tests carried out at Stanford University during the Giacobini-Zinner meteor shower of October 9th have demonstrated that it is possible to receive both bursts of signal and Doppler whistles on transmissions from a 700-watt amateur station operating in the 29-Mc. band. At a lower frequency, such as 15 Mc., a large percentage of the bursts which are heard are accompanied by whistles. However, on 29 Mc. it was found that this percentage is very much less. It appears that as the frequency is raised, the number of bursts with whistles gradually decreases, until at the very high frequencies only the bursts are noticed. By listening to two stations simultaneously, it was also established that a burst *without* a whistle at the higher frequency was invariably accompanied by a burst *with* a whistle at the lower frequency.

The bursts, moreover, appear to be strong enough to support momentary amateur transmission at the higher frequencies at ranges beyond the normal maximum. It seems to be entirely possible that Mr. Abell was actually picking up snatches of 144-Mc. QSOs being carried on between amateur stations so far away from Poughkeepsie that they would not normally be heard at all. The trick in picking up these signals is, of course, the matter of having one's receiver tuned to the exact frequency being used by an amateur in another city at the instant a meteor comes along!

It would be very interesting to know how many other amateurs have noticed momentary transmission of this sort on the frequency bands from 28 megacycles and up.

— O. G. Villard, jr., W6QYT

Box 20, Yermo, Calif.

Editor, *QST*:

It was with great interest that I read the letter of W2IXK. Until reading his letter, I had no plausible explanation for a similar experience. Here is my story: In tuning over the 28-Mc. band at night hoping for a short-skip opening, I noticed that short bursts of 'phone and c.w. signals would come through, the intensity of which would be anywhere from S4 to S9 at the beginning and tapering off to inaudibility in about three to four seconds. It was never determined from what distance or which direction these signals came.

At the present, my free time is limited, but at the first

opportunity I am going to make an investigation similar to that conducted by W2IXK to determine if these 28-Mc. bursts are due to meteors or some other cause.

— Bruce Henke, W6TFJ

SWL CARDS

120-11 Beh. Channel Dr., Rockaway Park,
L. I., N. Y.

Editor, QST:

I have been an SWL for the past twenty years and wish to state that the boys on the ham bands will 100 per cent QSL when you have something to give them in return. I have gone to the expense of getting a cut made and have my local printer make me a special card. Since last March I have received over 250 cards from all W districts and numerous foreigners.

— Jack Altman

'PHONE REPORTS

581 Center St., Wallingford, Conn.

Editor, QST:

... In reference to the readability scale of 1 to 5 with 'phone signals, it seems to me that the report should refer to the quality of the signal rather than the ability to understand. This is the meaning that I put into my reports.

I agree that if "I can't understand a word you say" is the way I receive your sigs, I cannot in any way see fit to give a report of Q5. It is possible that your signal is perfectly readable on the Super-Pro next door, though. After all, I won't give an unreadable report to a Russian 'phone who is in the clear just because "I don't understand a word you say." I just don't understand Russian! . . .

— Tom Cullen, W1MXZ

130 Martense St., Brooklyn 26, N. Y.

Editor, QST:

... It appears appropriate at this time to review our methods of reporting signals and, possibly, to consider some changes or even a different system of reporting. For many years, "Circuit Merit" numbers have been used for ship-shore and overseas radiotelephone circuits to give the operators a simple measure of transmission performance. It is a method of judging radio-circuit characteristics in terms of a five-step scale as outlined below. While this method of rating is necessarily inexact like the RST scale, it is believed that, because of its simplicity, it would be just as useful in amateur radio practices as for commercial radiotelephone services. The enclosed table which shows the approximate relations between Circuit Merit figures and the signal- or speech-to-noise ratio and the speech intelligibility is suggested for use in all amateur 'phone communications in place of the existing R (readability) and S (signal strength) reports. The Circuit Merit rating is really a combination of both.

Circuit Merit	Per Cent Speech Intelligibility	Relative Speech-to-Noise Ratio	Grade of Circuit, or Circuit Performance
1	0-20	Below 8 db.	Hopeless
2	20-40	8 to 16 db.	Poor (Uncommercial)
3	40-60	12 to 22 db.	Fair (Commercial)
4	60-80	20 to 32 db.	Good
5	80-100	Above 30 db.	Excellent

It is apparent from the above table that Circuit Merit 3 represents the lowest grade of condition considered commercial. The distance at which Circuit-Merit-3 conditions prevail may be considered to represent the practical service range of a station. It is conceded that the same factors may not be exactly applicable to amateur 'phone operations but it is felt that the use of these Circuit Merit ratings will provide a relative standard, simple to use by everyone.

The spread of the signal- or speech-to-noise ratio for a given grade of the radio circuit results largely from different

interfering effects of various types of noise. The performance of the particular receiver, the judgment of the operator, the accuracy of measurement, etc., all are factors which tend to make the relationship approximate. In some commercial applications, such as mobile radiotelephone service, the signal-to-noise ratio, as used above, may be obtained from two measurements as follows:

a) The magnitude of the received signal is measured with the transmitter fully modulated with a 1000-cycle tone.

b) The 1000-cycle tone is removed and the noise on the transmitter carrier is measured.

The noise measurements described above are made with a Western Electric Type 2-B noise-measuring set using line weighting. The noise measurement is taken as the average of the peak deflections on the meter of the measuring set. The signal measurement in db, minus the average noise reading in db, is the signal-to-noise ratio in db. Therefore, the "Circuit-Merit-3" circuit, which is considered just commercial, corresponds to an average signal-to-noise ratio of about 17 db. In general, the minimum signal-to-noise ratio for a good 'phone QSO should be at least about 12 db., which is equivalent to the average voice signals, being about 11 times stronger than the radio circuit noise or QRM. . . .

— David Talley, W2PF

748 Glenview Rd., Glendale, Calif.

Editor, QST:

Seeing the talk in QST about giving accurate signal reports made me think that you would probably be interested in an idea that I have used successfully. QST published a while back a comparison of the S-meters of numerous commercial receivers. It showed what each receiver called a signal of a certain number of microvolts, and the amazing thing was the discrepancy in reports. An S6 signal on one might be anywhere from S4 to S9 on others. This indicates that reading a report from an S-meter is absolutely useless.

Therefore, I graphically took the average S reports of all the receivers and made a chart. That is to say, I found out what signal in microvolts the average of all the receivers would call a S1, S2, etc. I forget what decibel base was used, but these are the figures I arrived at: S1, 2 db.; S2, 6 db.; S3, 12 db.; S4, 15 db.; S5, 18 db.; S6, 22 db.; S7, 28 db.; S8, 35 db.; S9, 48 db. Then, over this scale I superimposed a scale of what my own receiver gave for signal reports: S1, ½ db.; S2, 4 db.; S3, 7 db.; etc. Now, when my S-meter shows a certain reading I can merely glance at my chart and translate it into what the average of all these commercial receivers would read. I can't think of a fairer way of giving a fellow a report. If everyone did this, reports would be almost exact; an S5 report from one fellow would invariably mean the same strength as an S5 report from another fellow, even though they had very different-reading S-meters.

— Frank B. Williams, W6ULE

[Editor's Note: We still believe the RS system as good as any for amateur 'phone reports. Past difficulty has not been with inherent inadequacy of the system itself, but rather with our own looseness or abuse in using it.]

SMOOTH SENDING

Rt. 3, Box 491 Lem Turner Rd., Jacksonville, Fla.

Editor, QST:

... Many amateurs seem to try and impress listeners that they can transmit code at high speed, thus informing said listeners that they are tops. Well, they remind me of the tobacco auctioneer. Who can understand them?

One of the most beautiful compositions I ever listened to was some bird transmitting and using a key like a machine transmitter. Nothing is more pleasant to listen to, or to copy. Tonight I listened to a W2 call CQ 20 times and sign his call one time, so jerky and so fast that I only got the W2 and a bunch of dots. He didn't even know how to make a dah.

When W1AW was covered by QRM I tried copying amateurs and all I ever got was "CQ de Blah, CQ de Blah."

(Concluded on page 180)



Operating News



F. E. HANDY, WIBDI, Communications Mgr.

E. L. BATTEY, WIUE, Asst. Comm. Mgr.

GEORGE HART, WINJM, Communications Asst.

J. A. MOSKEY, WIMY, Communications Asst.

LILLIAN M. SALTER, Communications Asst.

New Year's Thought. A challenging 1947 lies before us. A year ago many of our amateur frequencies were still under wartime loan to the Government. Today we enjoy the fullness of almost every prewar operating activity. We can make of '47 what we will!

Amateur radio has the collective strength of the number of amateurs who will work for common objectives. ARRL is the institution of amateur radio in the sense that it is the only organization that has represented the amateur consistently in U.S.A. and international councils. Unity for the common preservation of our privileges is essential. To face the challenge of another international treaty-making meeting we should devote our energies to strengthening the organization we have . . . supporting sound programs for the long-term amateur interest . . . extending our abilities to render useful public service while we restudy our needs, minimize potential frictions with those outside our institution, and build our positive values.

Respect for all that amateur radio means is the first essential in a program that calls for public support. Each individual amateur, each operator at his key or mike, each incident and conversation, large or small, contributes to or detracts from the standing of amateur radio as an institution. So let us engage in a little self-analysis of *everything we do* in amateur radio in 1947. Let us keep this one aim in mind. If what we do contributes to a good record for the amateur let's do more of it. If what we do has the opposite effect let us dispense with such practices or correct them. Each of us should spend at least some time in a constructive amateur program which adds to the public-service record of the amateur, and makes our amateur-radio service fully live up to The Amateur's Code.

Spacing. Continental code is thought of as consisting of dots and dashes — but it is the third element, *spacing*, that creates both the dits and dahs, and sets off *words* by additional spacing in between them.

Sometimes it takes a battle with a laggard relay spring to produce dots and dashes that don't run together. Adjustment of straight and bug keys is important in contributing to perfection or defects. The youngster in our ranks is likely to think that a racing fast style is good to cultivate,

and while under such a misapprehension he sets his straight-key contacts too close, his bug weights far forward, and the dot contact too light, resulting in too-short dots, sent too fast for the corresponding dashes!

But it is more often than not the lack of an essential sense of rhythm that results in lack of necessary extra spacing between words. Lack of adequate spacing may make calls run together and become unreadable, or make words something to be guessed at, which is *not* good. Insufficient spacing may often cause furrowed brows and muttered curses by the receiving fraternity — not the pleasure of communication with us and recognition of our know-how. Shall we look at our own spacing of characters and words and see what we can do about this?

DX Competition. Announcement of this annual activity elsewhere in this issue gives us pleasure. Early announcement was necessary in order to permit amateurs of other nations to be apprised of the dates and the rules. It takes weeks for *QST* to cross the oceans to many far-off places. The "SS" was an epic second to none. We cannot promise what DX will be in store, but we've spread the word and hope for the best. 'Tis a real sporting event, if every entrant will only work it that way. The DX classic, 1947 brand, is coming right up in February! Choose your poison, 'phone or c.w. Careful of those VFOs, now!

Be Vocal. Irresponsibility of the few, unfortunately, always reflects against the many. It is all to the good for amateur radio that there is a growing spirit of intolerance toward inconsiderate and careless amateurs who value their transmitting privilege (our common property) lightly.

A vocal amateur radio — honest and critical in signal reporting and outspoken in complaint — can do much to control and curtail the "crummy" signal, the inconsiderate tester, the off-frequency DX chiseler, the VFO zero-beat practitioner and others short on sense and sportsmanship. Let an outraged amateur opinion curtail our discourtesies to each other. But use your influence first, last and constantly on the side of perpetuating amateur radio by nailing off-frequency operators and any careless, inconsiderate or deliberate operating trespass on *other people's* frequencies and rights. Here is where an outraged amateur-

radio opinion can do the most good. All undesirable and spurious emissions *outside* our amateur circle, affecting the many individuals and groups *outside* the amateur bands, must be controlled and prevented for the good of amateur radio itself.

In this constant battle to promote the understanding and support of all citizens for amateur radio, good amateurs also should be especially intolerant of the transmission on the air of dubious "parties" and remarks trashy, suggestive, or in bad taste.

Casual day-to-day impressions of amateur radio are probably more important influences on public opinion than the exceptionally fine work of amateurs with expeditions, contact set up for GLs overseas with their families in the U. S. A., or our work as key people supplying engineering, communications and executive talent for the war effort or civilian emergency. Let's be vocal also to our public in telling the story of the fine things amateurs are constantly doing. Let's not use words (phonetics or others) over the mike that paint us as morons or in other *poor* light.

Each amateur, whether he knows it or not, continually acts as an ambassador of the whole fraternity to the public. This is so when he talks (off the air) about his amateur radio. It is so when one talks on the air, likewise! Again it is so when a ham checks his transmitter for spurious radiations, and for minimum harmonic content. Likewise when satisfactory cooperation is arranged in personal contact with neighboring broadcast listeners. In these latter instances we avoid interference to point-to-point and public-service broadcast transmissions, when interference might injure the whole amateur cause.

Why Not Use the High End of Ten? Why not use it and spread out in this band? At this writing KH6AR is receiving signals well all the way to 29.7 Mc. In fact he avoids QSOs below 29 Mc. to minimize QRM on contacts. The frequencies good for east-coast to west-coast work are open *all the way up to 47 Mc.* at this mid-November writing. (The six-meter gang in fact are looking for a transocean opening for some world-beating records!) The S.A.R.O. gang demonstrated the efficacy of 4-watt coast-to-coast work on 29.4-Mc. f.m. to us personally as long ago as Labor Day. So let's spread out our occupancy properly through this band.

On Frequency Observance. Try your hand at F.M.T. Elsewhere in these pages ARRL also announces the first postwar Frequency-Measuring Test. OOAs as well as all members are invited to take part and awards have been arranged for the highest demonstrated proficiency.

FCC rules governing the amateur service (§12.113) say that *the licensee of an amateur station shall establish procedure for making such measurement regularly.* It is required that the means for measurement be independent of the

transmitter frequency control and adequate to insure operation within the amateur frequency band. If one operates near the edge of a band it follows that he must arrange measurement facilities superior in accuracy to those adequate for work in a center band portion. With WWV available constantly for calibration checks and a wealth of published information available in past issues of *QST* and elsewhere, compliance with FCC specifications should be easy.

Official Observers send cooperative notices to invite attention to all sorts of deviations from FCC requirements. When it comes to frequency deviations, some of the responses to cooperative notices indicate too much reliance on "crystal markings." Be it known that circuit and holder capacity and adjustment, plus temperature, may cause considerable variation from a "marked" crystal frequency. Frequency markings should *not* be relied upon for *high* accuracy in the first place.

Ever get a citation for work with your carrier 1.8 kc. inside the band? A voice-operating ham writes to suggest that we call attention to the FCC Rules (§12.113) where it is stated that "*Sideband frequencies resulting from keying or modulating a carrier wave shall be confined within the authorized amateur band.*" The international treaty to which the U. S. A. is signatory specifies "voice telephony," as permitted, a total bandwidth of 6 kc., sideband 3000 cycles, so that under the quoted rule, a 'phone carrier must be kept at least 3 kc. within the 'phone sub-band. Numerous FCC citations have been issued to amateurs in past years for noncompliance with §12.113.

On Proving Public Interest. The list of constructive responsibilities that an amateur can assume is a long one. We shall not repeat here the material from the League's operating booklet (sent free on request to any ARRL member) or from our "Operating News" of previous issues. Enjoyment of amateur operating is lessened not a whit by the fact that it may play a constructive rôle. We recommend that every ham accumulate a list of activities in which he might prove "public interest, convenience and necessity" in his operations, if individual proof was called for. Membership in the ARRL Emergency Corps would be a "must" on our list. Selective "station" appointments that offer services "of, by and for" the amateur, to fellow amateurs, appeal to many. Participation in club work, state and national communications-reserve activities, in radio training-aid programs, acquiring of proficiency awards, study of technique, progressive improvement of station and personal ability, adherence in it all to The Amateur's Code, these are the traditional things that make for a sound amateur radio. We commend them to every new (and old) amateur.

— P. E. II.

FREQUENCY-MEASURING TEST

January 10th and 24th, February 4th

WIAW will transmit signals for purposes of frequency measurement starting at 9:30 P.M. EST (6:30 P.M. PST), Friday evening, January 10th. The signals for measurement will be sent simultaneously on four frequency bands, consisting of dashes interspersed with station identification. These will follow a general message sent by tape to enable listeners with frequency meters to locate the signals before the measurement transmission starts. The *approximate* frequencies used will be 3785, 7205, 14,105 and 28,015 kc. About 4½ minutes will be allowed for measuring each frequency, starting about 9:36 P.M. on long dashes. It is suggested that frequencies be measured in the order listed. Transmissions should be found within 5 or 10 kc. of the suggested frequencies.

January 24th (Friday) WIAW will transmit a second series of signals for the Frequency-Measuring Test, and on February 4th (Tuesday) a third series of signals to be measured will be sent. The identifying procedure and recommended order of measurement will be the same as for the first Test, the frequencies (approx.) as follows:

Starting 11:00 P.M. EST (8:00 P.M. PST)
Jan. 24th — 3560, 7255, 14,010 and 28,480
Feb. 4th — 3710, 7055, 14,025 and 28,070

Individual reports on results will be sent ARRL members who take part. Copies of this report are sent SCMs so eligibility for OO appointment is known to the SCM. When the average accuracy reported shows errors less than 71.43 parts per million, or falling between limits of 71.43 and 357.15 parts per million, the participants will become eligible for appointment by SCMs as Class-I or Class-II Official Observers, respectively. It is only necessary that the individual amateurs have the interest and other qualifications for carrying forward in such League organization posts.

This first postwar ARRL Frequency-Measuring Test will be used to aid qualification of Class-I and Class-II Observers. Observers not demonstrating the requisite average accuracy will lose their appointments until they demonstrate the above-stated minimum required accuracy for these classes of the appointment. It is required that all Class-I and Class-II OOs participate in at least two of the four Frequency-Measuring Tests to be announced during 1947, to hold their posts.

All participants may submit frequency measurements on one or all frequencies and dates shown above, all awards depending on the overall average accuracy, as compared with readings submitted by an independent professional frequency-measuring organization. An award committee will examine results to insure fairness to all, and its decisions shall be final.

All League members (and only members) who take part, who are not connected with the Official Observing system, and not attached to the ARRL staff at Hq., will compete for an *electric-clock award* by submitting their best measurements on the F.M.T. It will be presented to the Member whose readings show the highest average accuracy, when compared with the official report from the frequency-measuring bureau. A second *electric-clock award* will be presented to the leading Class-I Official Observer who has had his certificate completed by postwar endorsement. To be considered for the clock award it is necessary to attach a statement that you alone, as operator, handled your equipment in making the readings submitted to the Communications Department of the League.

HAM CALLS FOR NAVAL RESERVE

The FCC has reserved some 300 special calls for use by amateur stations of Naval Reserve units. W7USN is assigned to the Naval Reserve Armory, Seattle, Washington, and K6NRA has been issued for use by the Electronic Warfare Company at Santa Barbara, California. This is the first instance of a K call being issued for amateur use on the mainland. Additional USN calls and suffixes in the NRA to NRZ series will be assigned as the Naval Reserve program progresses. Regular drills will be carried out under Navy calls on Government frequencies, but after hours the stations will also be available to licensed amateur members of the units for operation in amateur status in the amateur bands.

CODE PRACTICE ON 28 MC.

The following amateurs are transmitting code lessons in the ARRL Code-Practice Program on 28 Mc.

W2NZH, Arthur E. Mack, 100 Alsace Ave., Buffalo, N. Y., 28,200 kc., Tuesdays, 9 to 10 P.M. EST.

W2RXL, Karl S. Morris, 367 Bates St., Phillipsburg, N.J., 29,015 kc., Monday, Wednesday and Friday, 9 to 9:30 P.M. EST.

W3LTM, Joseph D. Curtice, 1630 Park Rd., NW, Washington 10, D.C., 28,017 kc., Monday through Friday, 7 to 7:30 P.M. EST.

W6VJQ, J. L. Fredenburgh, 4154 "C" Street, San Diego 2, California, 28,800 kc., Monday, Wednesday, and Friday, 7:00 P.M. PST (5 to 13 w.p.m.).

W8FMU, R. L. Wardle, 501 Pythian St., Morgantown, W. Va. Write for schedule.

W9FIF, William Ash, Route 6, Jacksonville, Illinois, 28,525 kc., Monday, Wednesday, Thursday and Saturday, 8 to 9 P.M. CST.

Additional volunteers are needed to send code practice by radio. Schedules may be arranged to suit your convenience. Hints on how to conduct code lessons are available from the Communications Department. A combination of voice and

code transmissions is most effective. If you are operating on 28 Mc. and would like to help in the ARRL Code-Practice Program, drop us a postal and we will send further details.

Those using the available practice are urged to correspond with the amateurs making the transmissions so that those who give this useful service may plan their lessons to best aid their listeners.

OCTOBER CD QSO PARTY

Listed below are the highest claimed scores for the October CD QSO Party. Grouping by c.w. or 'phone depends on the amount of operating time spent on each. If over 50 per cent of total operating was by voice, listing is 'phone, if over 50 per cent was by c.w., listing is c.w.

For the January party the rules will permit operation by c.w. or 'phone, or both, with a separate score required for all work accomplished using each mode. 'Phone-only participants will compete with others in that category, and c.w.-only contestants will compete with all other c.w. operators. Two entries may be made, if desired, one c.w., one 'phone.

The scores for the October party show what a success the affair was. W3BES and W4EOP are in the same positions they were in July, first and second respectively. Most of those listed are immediately recognized by their calls as prewar CD contest "regulars." We might refresh you on a few, however, such as W1OUD (ex-W8AQE), W1OJM (ex-W5HQN), W1ORP (ex-W3EHW), and W3KWA (ex-W8KWA).

See you January 25th-26th, the dates of the next CD QSO Party.

CLAIMED SCORES (C.W.)

Station	Score	Contacts	Different Stations	Sections
W3BES	535,680	372	238	50
W4EOP	488,880	330	236	55
W4JIZ	418,910	320	208	49
W1TS	322,150	275	184	46
W3GHHM	319,325	259	193	48
W2IOP	311,610	276	179	42
W2OXX	298,820	262	178	45
W9DIR	295,680	250	185	46
W3BXE	274,680	246	176	42
W6RBQ	247,800	150	133	44
W1LLX	245,100	222	174	41
W3HUM	240,240	225	166	42
W1UE	234,300	207	177	43
W1EOB	230,625	219	162	43
W3GJY	215,270	203	167	39
W1BIH	208,845	215	149	40
W1FTX	201,505	205	154	37
W4FXU	194,000	200	156	38
W8ROX	193,000	194	156	37
W9WFS	186,000	194	148	38
W0EHR/3	182,700	203	140	40
W0YCR	167,320	182	137	41
W8SCW	162,900	174	142	39
W9NUF	162,000	180	137	43
W2AYJ	159,300	174	136	41
W1OJM	150,510	167	135	39
W3NF/9	147,050	173	130	40
VE3EF	144,375	169	126	39
W0JNC	141,900	165	125	40

Others with scores of over 90,000: W9BGC 131,750, W1KQY 123,250, W0MPW 119,720, W4DQW 117,360, W1OUD 113,985, W1ORP 113,250, W3ADE 110,250, W8ZFA 108,780, W0VEE 107,965, W1BDI 107,310, W4BYF 103,505, W9NZZ 100,080, W3KWA 99,360, W4DXI 98,670, W2GVZ 93,267, W1DX 92,355, W3LVY 91,790, W0NCS 91,105.

CLAIMED SCORES ('Phone)

Station	Score	Contacts	Different Stations	Sections
W4BIW	4375	13 (voice) 12 (c.w.)	23	12
W4DCQ	3465	21 (voice)	21	12

CHESS BY RADIO

Revival of interest in chess matches by radio is indicated by correspondence from P. W. Morrell, W0JOJ (now W0SO), Kansas City, Kansas. A match between a player in Kansas City and one in St. Louis was handled by W0JOJ on September 11th. The 7-Mc. band was used to exchange the various moves. On September 21st a tournament between five-man teams was also handled by radio between the two cities. W0LLN was the St. Louis station.

W0SO suggests that amateurs contact their local chess clubs and offer radio facilities for inter-city matches. It is an interesting activity and the exchange of data accurately is a good test of operating ability. W0SO would be interested in hearing from any amateur interested in chess by radio, as would Mr. and Mrs. Warren Newcombe, W6WYC and W6WSG respectively, 2177 Mandeville Canyon Road, Los Angeles 24, Calif.

A.R.R.L. ACTIVITIES CALENDAR

Jan. 10th: Frequency-Measuring Test
 Jan. 11th-12th: ARRL-Member Party
 Jan. 14th: CP Qualifying Run
 Jan. 24th: Frequency-Measuring Test
 Jan. 25th-26th: CD QSO Party
 Feb. 4th: Frequency-Measuring Test
 Feb. 13th: CP Qualifying Run
 Feb. 14th-17th: DX Competition (c.w.)
 Feb. 21st-24th: DX Competition ('phone)
 Mar. 5th: Frequency-Measuring Test
 Mar. 7th: Frequency-Measuring Test
 Mar. 14th-17th: DX Competition (c.w.)
 Mar. 17th: CP Qualifying Run
 Mar. 21st-24th: DX Competition ('phone)

 Jan. 16th-Dec. 15th: 1947 V.H.F. Marathon
 Jan. 1st-Dec. 31st: Most-States V.H.F. Contest
 First Saturday Night Each Month:
 A.R.R.L. OFFICIALS NITE (Get-together for SCMs, RMs, SECs, ECs, PAMs, Hq. Staff, Directors, Alt. and Asst. Dirs.)

MEET THE SCMs

Since mid-June the Idaho Section has been led by Alan K. Ross, W7IWU, who was elected to the SCM post by the members of that Section.

Born in Omaha, Nebraska, October 2, 1915, he attended the University of Wisconsin, from which institution he received his B.S. degree in electrical engineering.

An employee of the Western Union Telegraph Company since 1938 (he now is manager and chief operator of the Traffic Department) he possesses a 2nd-class telegraph license to operate Western Union portable emergency transmitters.



His enthusiasm for amateur radio, dating from 1931, led him to lose no time in obtaining his first license. In addition to his present call he has held W9BOP, W4BSY and W6REP. He is able to receive at an estimated speed of 35 w.p.m., and can copy on a typewriter at 30 w.p.m. Besides the SCM job, he holds

office as president of the Gem State Radio Club of Boise.

W7IWU is located on one side of the "utility" room, along with two wash tubs and a washing machine, and the layout includes a 6L6 crystal oscillator, ECO, 6L6 buffer, p.p. T-40s modulated by a pair of 46s, covering 80, 40, 20 and 10 meters, an HQ-120-X receiver, and a 40-meter center-fed Zepp antenna. The 80-meter c.w. and 75-meter 'phone bands are used mainly, but W7IWU tries to operate a bit on all bands down to 10 meters. There is a portable rig consisting of a Howard 430 receiver, in addition to a complete transmitter and receiver operated from a Vibrapak. Transmitter is a 6C5 Pierce oscillator, 6V6G final modulated by a 6C5 speech amplifier and 6V6 Class A modulator. IWU takes portable gear along on camping trips to contact the boys back home and says, "They seem to enjoy it all as much as I do, and it sometimes is amazing what low power will do." His extreme interest in emergency work is attested to by the fact that he is a member of the AEC and has participated in all Field Days.

Photography is a secondary hobby and for diversion he hunts and fishes in season, and swims and plays tennis as time allows.

An all-around SCM, Alan should contribute much to the upbuilding of the Idaho Section.

BRIEFS

The Communications Department would welcome more entries in its Article Contest. The

author of each article published is awarded a \$10 prize, consisting of \$5 in Victory Stamps and \$5 in ARRL supplies (except QST). Contributions may be on any subject in the field of amateur operating or organization. Entries should be not over 500 words long. Send as many articles as you wish, marking them "For the CD Contest."

WIAW OPERATING SCHEDULE

Operating-Visiting Hours

Monday through Friday, 8:30 A.M.-1:00 A.M.

Saturday, 7:00 P.M.-2:30 A.M.

Sunday, 3:00 P.M.-9:00 P.M.

Official ARRL Bulletins containing latest FCC information relating to amateur operation and reactivation, and other bulletins on matters of general amateur interest, are transmitted on regular schedules, as follows:

Frequencies: 3555, 7145, 14,150, 28,060, and 52,000 kc. (Voice — 3950, 14,280, 52,000 kc.)

Times: Monday through Friday, 8:00 and 11:30 P.M. EST. (0100 and 0430 GCT, Tuesday through Saturday)

Sunday, 1:00 A.M. and 8:00 P.M. EST (0600 Sun. and 0100 Mon., GCT)

Starting at the times indicated, bulletins are transmitted by telegraph simultaneously on all frequencies. Bulletins are sent at 25 w.p.m. and repeated at 15 w.p.m. on the early schedule to facilitate code practice. Telegraph bulletins are followed in turn, by voice transmissions on 3950 kc. and 52,000 kc. simultaneously and then on 14,280 kc. Changes from this schedule will be announced by the operator.

Code-Proficiency Program: Practice transmissions at five speeds, 15 through 35 w.p.m., are made Monday through Friday on the above-listed frequencies, starting at 10:00 P.M. EST (0300 GCT, Tuesday through Saturday). Approximately ten minutes practice is given at each speed. Next certificate qualification run is scheduled for Tuesday, January 14th.

General Operation: WIAW engages in two-way work with amateurs as follows:

Monday through Friday, all times EST —

11:00 A.M.-11:30 A.M.	28,060-kc. c.w.
11:30 A.M.-12 noon	29,150-kc. voice
3:00 P.M.-3:30 P.M.	14,280-kc. voice
3:30 P.M.-4:00 P.M.	14,150-kc. c.w.
6:00 P.M.-7:00 P.M.	7250-kc. c.w.
7:00 P.M.-7:30 P.M.	3950-kc. voice
7:30 P.M.-8:00 P.M.	3555-kc. c.w.
9:30 P.M.-10:00 P.M.	3555-kc. c.w.
12:15 A.M.-1:00 A.M. (Tues. through Sat.)	7250-kc. c.w.

Saturday and Sunday (excepting dates of official ARRL activities)

Saturday: Midnight-1:00 A.M. (Sun.)	3555-kc. c.w.
Sunday: 1:45 A.M.-2:30 A.M.	7250-kc. c.w.
6:00 P.M.-7:00 P.M.	3950-kc. voice
7:00 P.M.-8:00 P.M.	7250-kc. c.w.

The station staff:

John T. Rameika, W1JJR, "JR"
Wm. H. Matchett, W1KKS, "BM"
James E. White, W1PEW, "JE"

WIAW is not open on national holidays.

CERTIFIED CODE SPEED

ARRL offers all amateurs official certification of their code receiving speed. Do you *know* how fast you can copy? Have you something on paper to prove your proficiency to those with raised eyebrows? ARRL's Code-Proficiency Program provides the means for you to determine your receiving speed, and receive a certificate to prove it. Here's how . . .

Once each month a special WIAW transmission is made to enable you to qualify for a Code-Proficiency Certificate, at a speed of 15, 20, 25, 30, or 35 w.p.m. If your initial certificate is for a speed below 35 w.p.m., you may later try for endorsement stickers indicating progress above your first certified speed. See WIAW schedule for details on frequencies used for Code Proficiency transmissions.

The next qualifying run will be on January 14th. The text on that date, received successfully by ear at the highest speed you can copy, should be sent to ARRL for checking. To avoid errors in recopying, send your original copy. *Attach a statement certifying over your signature that the copy submitted is direct copy, made from reception of WIAW by ear, without any kind of assistance, personal or mechanical.* If you qualify, you will receive your certificate, or appropriate endorsement sticker for certificate you already hold. Those who qualified in the past should submit copy only if speed is higher than indicated on certificate or endorsement sticker.

Do you need practice? If you want to "brush up" before trying the official "qualifying run" use the WIAW practice transmissions nightly, Monday through Friday, 10:00 p.m. EST, at speeds of 15, 20, 25, 30, and 35 w.p.m. When you feel qualified for at least 15 w.p.m., make copy of the monthly official run and submit copy. Then work for the endorsement stickers, right up through 35 w.p.m.

QST lists in advance the text to be used on several of the CP schedules. This makes it possible to check your own copy. It also provides a means of obtaining sending practice since it permits direct comparison of one's fist and tape sending. To get sending help hook up your own key and buzzer and attempt to send right in step with the tape transmissions. Adjust your spacing in the manner indicated as necessary for self-improvement.

Date	Subject of Practice Text from November QST
Jan. 3rd:	<i>Keeping Your Harmonics at Home</i> , p. 13
Jan. 6th:	<i>A Three-Band Utility Transmitter</i> , p. 20
Jan. 9th:	<i>Let's Not Overmodulate</i> . . . , p. 23
Jan. 14th:	Qualifying Run, 10:00 P.M. EST
Jan. 17th:	<i>Narrow-Band F.M. with Crystal Control</i> , p. 27
Jan. 21st:	<i>The VT-127-A in Amateur Transmitters</i> , p. 33
Jan. 23rd:	<i>Postwar DX, Where Is Thy Ring?</i> p. 42
Jan. 27th:	<i>A High-Gain Two-Meter Rotary Beam</i> , p. 45
Jan. 29th:	<i>An Unusual Rectifier Circuit</i> , p. 56

RE 7-MC. BRITISH BROADCASTERS

Encouraging news for 7-Mc. operators is contained in *London Calling*, journal of the British Broadcasting Company:

" . . . the BBC . . . does not wish to interfere with the activities of amateurs, and will always seek to avoid such interference by choosing frequencies in other broadcasting bands when these are suitable and available.

"As solar activity is now increasing, the BBC expects to be able to maintain its services to the Americas during the next few years without recourse to the 41-metre band, thus reducing to a minimum interference with amateur activity."

November observations of the 7-Mc. band indicate that the BBC already has moved most of its stations, if not all, from the 7200-7300-kc. region.

AMATEUR STATIONS ON ARMY POSTS

To encourage training, create interest in radio communications, and for morale purposes, use of Army-owned radio equipment in the amateur bands is authorized on posts, camps, or stations, provided the commanding officer approves (WD Circular No. 279, September 14, 1946).

Stations must be operated in accordance with FCC rules, or regulations of a theater of operations. Only personnel with amateur operator licenses may operate such stations, subject to local limitations as necessary. As far as practicable, stress is placed on group use in order that maximum benefit may be obtained with minimum equipment.

BRASS POUNDERS' LEAGUE

(October Traffic)

• W7FST leads the BPL with a traffic total of 814 (113 orig., 42 del., 659 rel.). This is the third consecutive month in top place for W7FST, who pushes his traffic on both c.w. and 'phone.

The following make the BPL with over 100 "deliveries plus extra delivery credits": W2LTP 326, W4FU 263, W1UE 145.

A message total of 500 or more, or 100 "deliveries plus extra delivery credits" will put you in line for a place in the BPL. The Brass Pounders' League listing is open to all operators who qualify for this monthly "honor roll."

In counting traffic for your monthly report to the SCM, count one point each time a message is handled by radio. That is, one point if you originate the message and forward by radio; one if received by radio and delivered; two points if received by radio and forwarded by radio. In addition, an extra point may be claimed for each delivery made by mail, telephone, in person, by messenger or external means other than radio. This extra credit is not allowed for a message received for yourself or a party on the immediate premises.

FLORIDA HURRICANE EMERGENCY

The Florida Emergency 'Phone Nets, operating on 3910 kc., with Anthon Litschauer, W4ACZ, as Master Control, put on a commendable performance during the hurricane which passed through that state on October 6, 7 and 8, 1946.

Net operations started early on the morning of the seventh and continued until 11:00 A.M. on the eighth. Weather reports were handled to a central clearing point, enabling the various U.S. Weather Bureau stations to keep currently posted on barometric pressures and wind data in the South Florida areas where the storm first hit. Certain Weather Bureau stations had lost contact with each other due to teletype failures. Amateur radio was the sole means of communications. Weather information was disseminated several times each hour, and supplied to Red Cross committees as well as Weather Bureau stations.

Another important service rendered was the relaying of news stories to the United Press in Atlanta and to the Associated Press in Jacksonville. At one time a press release from New York reported considerable damage at Sarasota. The rumor was quickly spiked by a correct report being sent to Atlanta by amateur radio for immediate release.

Among those acting as Net Controls and Alternate Net Controls for the various districts into which the Florida emergency organization is divided were W4FWZ, W4DPD, W4DQW, and

W4CQZ. The following additional Florida stations are known to have participated: W4AFO, W4AKI, W4ASR, W4BMR, W4BN, W4CFC, W4CPG, W4CPW, W4CUZ, W4DAA, W4DAH, W4DBA, W4DUW, W4EEZ, W4EVB, W4FJU, W4GWH, W4GZY, W4HAW, W4HHX, W4HRN, W4IEZ, W4IK, W4IMJ, W4IPM, W4IVX, W4IWN, W4JAL, W4JAS, W4JEN, W4LT, W4NN, W4PB, W4PT, and W8WRW. The Florida net received help from amateurs in other states, among them, in Georgia, W4AAY, W4BB, W4BIW, W4BPT, and W4GMA, in South Carolina, W4FNC and W4MJ, and in Virginia, W4HKJ.

Several Florida stations lost commercial power and were forced to use emergency sources. Among these were W4AFO, W4CQZ, and W4JAL. W4JEN also was using emergency equipment, and many others had stand-by gear ready to go should commercial power fail.

Numerous amateurs along the entire Atlantic seaboard and in states within interference range of Florida assisted by "standing by" and in clearing the 3910-kc. channel. "Tony," W4ACZ, writes, "The Florida Emergency 'Phone Nets wish to thank all those who kept our frequency open on 3910 kc. This cooperation made possible the successful operation of our nets."

The following c.w. stations were emergency-powered and constantly on the alert: W4BYF, W4CFC, W4DUW, W4FCL, W4FVW, W4IKI, W4IMI, W4IML, and W4NB. Route Manager W4BYF had emergency operators lined up for the police and Red Cross in the event they were needed.

GENERAL TRAFFIC PERIOD

6:30-8:30 P.M., Your Local Time

— — — —

GENERAL TRAFFIC CHANNELS

3575 to 3600 kc. 7150 to 7175 kc.

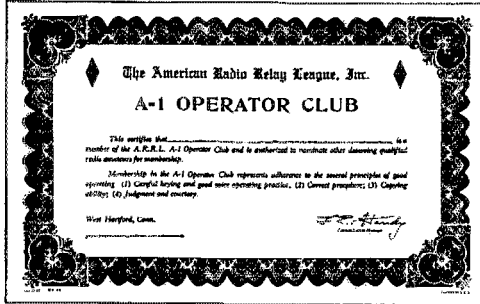
ARRL recommends the above-mentioned hours and frequencies for use by those amateurs who have an occasional message to send but are unable to keep regular schedules or participate in organized networks. ORS and other active traffic handlers will monitor the General Traffic Channels, particularly during the General Traffic Period. They will be watching for your directional CQ to the state your message is addressed (for example: CQ Illinois, CQ Oregon, etc.). If you wish to break into message handling, it should be possible for you to use the general period and channels to pick up traffic from fellows like yourself for relay or delivery. No ARRL nets will be registered in the General Traffic Channels. Those frequencies have been purposely kept free to aid the casual message handler. Use the facilities provided and let us hear of your results.

235 MC. USED AT BOAT RACES

Southern Nevada members of the ARRL Emergency Corps, assisted by other amateurs, furnished communications for two days of speedboat racing on Lake Mead, seven miles from Boulder City. These races, in which 127 power boats competed for national outboard and inboard hydroplane records, were conducted by the Associated Speedboat Clubs on October 26-27, 1946. Four 235-Mc. battery-powered 5-watt transceivers were stationed at the boat pit, the judges' stand, and aboard two boats stationed along the one-and-two-third mile course. W7CDM, W6IAJ, W7JU, W7JUO, W7OPP, W7PGD, and W7TKV received well-deserved credit for the operation and maintenance of the network during the regatta. W6PZY and A. M. Aden also contributed to the success of the operation. Commodore Walter Olson, W6CFI, of Los Angeles, Race Committee chairman, expressed his appreciation for the assistance given by the Emergency Corps. Chet Tyree, chairman of the Boulder City Chamber of Commerce Race Committee, also formally thanked the participating amateurs for their help.

A-1 OPERATOR CLUB

The ARRL A-1 Operator Club is designed to promote a high caliber of operating in the amateur bands. To become a member, one must be nominated by at least two operators who already "belong." The attractive membership certificate is shown below.



July *QST* (page 78) requested all active amateurs holding A-1 certificates to advise the Communications Department by postal or radiogram. Based on responses to this request and on new nominations received, we have compiled the following list of currently-active A-1 Operator Club members:

W1AJ BB BDI BFT BHM BUD BVR DF DX EH EZR
FPP FTJ JMY JTD LLX LVQ NJM ORP TS UE ZK
ZL W2AEY AIQ DRV ESO GVV GWE HCO IOP
KTR LBI LR MO NIY NNK ORS QHH QOK ZL W3BES
BXE DUK ETM EU GGX HZS JW KDP KEW KQD
LVY MUE NCJ NF OFO. W4EOP JIZ MR. W5BFA
CVQ DWV. W6CIS FII HG LUJ PGB RBQ SGX UO.
W7AFZ. W8BMK DPE DWB JIN JM KWL LZK ONK
PAF PQQ PSF QV SFD SLH VOY WE. W9AND BKK
CDA CYU DBO EBX ERU HUV LLN LUC NS NUF
VES. W0NVF. KP4BJ KD. VE2DR 6AO HM LQ. G5BY
RI 8FF. HB9AT LU7AZ OK1AW XE1AM ZE1JJ ZL3CC.

Many members have not notified us of their activity. It is again requested that all "A-1 Operators" now active on the air so advise us in order that our postwar roster may be brought up to date.

In choosing candidates for the A-1 Operator Club, members consider the following points:

1) General Keying. Well-formed characters and good spacing are considered above "speed." In nominating 'phone operators, good voice-operating technique, clearness, brevity, cooperation with other operators, careful choice of words, etc., may be used as criteria.

2) Procedure. Use of correct procedure is a natural qualification. Long CQs, unnecessary testing, long calls without signing, too much repetition when not requested, and all other poor practices are grounds for disqualification.

3) Copying Ability. This is to be judged by proficiency in copying through QRM, QRN, and other difficulties, and accuracy of copy as well as speed.

4) Judgment and Courtesy. The "CUL 73" type of operator can never make the grade. An operator should be courteous and willing to consider the other fellow's viewpoint. He should QRS or QSZ when requested. He should embrace every opportunity to assist beginners. The matters of "good notes," "sharp" signals, lack of frequency "wobulation," good quality ('phone), use of sound technical arrangement and proper adjustment while not directly points of operat-

ing ability are certainly to be considered under Judgment and Courtesy.

In weighing candidates, A-1 Operators consider each of the four required qualifications. Each counts a possible 25 points (of 100 total). No operator nominated should have a rating of less than 15 on any qualification. The total must be 80 or over to warrant a recommendation.

Regarding Disqualification: After an operator has been nominated, if exception shall be taken, or complaint made of faults in his operating work, copy of such complaint shall be sent to him in order that he may profit from constructive suggestions or explain the circumstances. In the event of a number of objections to a nomination, or lacking a satisfactory explanation, the call may be added to a "disqualified" list on record at Headquarters.

The A-1 Operator Club should number in its ranks every good amateur operator who follows standard practice on the air. All amateurs should strive to make their operating merit nomination to this select group. Present members should nominate any deserving operator after careful observation of his operating habits and ability.

YOUNGEST YL OPERATOR

In December *QST* we reported that W5LVZ (now eleven years old) is believed to be the youngest active radio amateur. We are now able to announce a young lady who may be the youngest YL operator — Miss Georgette Ottney, VE3AMC, 13 years of age. Georgette is active on c.w. with 35 watts to an 807.

AMATEUR RADIO AIDS RESCUE OF SNOWBOUND MOTORISTS

Amateur radio was responsible for getting aid to 300 motorists caught in a traffic jam on a New Mexico highway, during a blinding snowstorm on November 3, 1946. One of the motorists was Dale Hauck, W8VAX, of Battle Creek, Michigan, who had a portable 28-Mc. 'phone rig in his car. His call for help was answered by W8UIL, Paul L. Hughes, president of the Canton (Ohio) Amateur Radio Club.

This was the substance of W8VAX's transmission to W8UIL: "Trapped in a terrific snowstorm. There are almost 300 cars in a traffic tie-up on U.S. Route 66, about 65 miles west of Albuquerque. It is snowing heavily and very cold. Many drivers have left their motors running to keep heaters going and are running out of gas. Please call the New Mexico state police for help."

W8UIL immediately proceeded to call a directional CQ to Albuquerque, which was answered by W5HGV, F. A. Rogers in Albuquerque (there was one directional CQ that worked!). W5HGV notified the New Mexico state police and within 26 minutes of the initial contact between W8VAX and W8UIL, tow trucks, blankets, gasoline and other supplies were being rushed to the stranded cars.

This is another example of public service that makes us proud of amateur radio and the people in it! Orchids to W8VAX, W8UIL, and W5HGV!

• 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, Jerry Mathis, W3BES — A welcome letter from an old ORS, 3IKW, tells us that he is living in Arlington, Va., and is with the Navy Bureau of Personnel. 3JPK passed the Class A exam and is on 28-Mc. 'phone working DX with his BC-610 and Super Pro. 3BS is none other than ex-3FIL, who received the new two-letter call by virtue of once being W2BR. 3JOP, of Northampton, is interested in becoming a traffic net member. 3FHD, a new papa, rejoined the Beacon Radio Amateurs after five years' absence. 3HTM is working 3.5-Mc. c.w. and 3IKP has a new 813 final on 7 Mc. with 175 watts. 3FLY is active on 7 and 14 Mc. 3ATR and 3DYL annexed XYLS over the summer and 3CNP is QRL with a new baby. 3HTF bought an NC-120 from War Surplus and is building a 7" television receiver. 3KVQ, a new Philadelphia call, works 3.5-7 and 14 Mc. with an HQ-129X and a TZ40 running at 125 watts. 3MAL is ex-8LAU and will be looking for his old pals on 7198 kc. The Schuylkill Radio Amateur Club is organizing and has thirty-five members to date. 3OML is eager to get the traffic nets going. 3EU reports being on a hot traffic net and enjoying same very much. 3QP states that his VE8MR schedule has folded up but he now schedules 7DCO/KL7 on the Pribilof Islands. 3KMW's receiver quit after a few minutes in the CD Party. 3GHM and 3BXE ran a fine race in the CD Party. 3DGM is spending a lot of time in VE2. He missed the CD Party and the SS. He is taking along a little Echo-phone to listen and weep. 31XN has a new 14-Mc. beam which is working out fine. 3ENX is bowling the DX over on 14 Mc. with his 810s. 3EHR/3 now is 3MFM. 3CTA went out for blood in the SS using 'phone. 3AOJ and 3BXE contacted 3EKK/J, who is from Philadelphia. 3HXA writes a rather pessimistic letter from Manila telling us that his chances of becoming a KA are remote indeed. When the Philippines became independent they cancelled all non-citizen licenses. Members of the Drexel Electronic Society are operating their own station, 3MGF, under a newly-obtained FCC license. Members who are not licensed operators are permitted to transmit by voice when a licensed amateur operator is present. Any licensed operator who is a member of the club may use the club's equipment at any time. About six of the club's members are licensed. Traffic: W3QP 73 3EU 17 3QEW 5 3ID 5. 73. Jerry.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA — SCM, Hermann E. Hobbs, W3CIZ — LVY reports that the following now are members of the AEC: IDW, EIM, KKH, EZV, FBB, KQZ, and IBP. These men were contacted either at Bendix Radio, or at the recent meeting of the Baltimore Amateur Radio Communications Society which LVY addressed on behalf of the AEC. LVY's new OBS schedule is 9:45 p.m. Monday through Friday on 3705 kc. and his new equipment includes a National I-10 receiver, 10-watt c.c. 144-Mc. transmitter, 10-tube 144-Mc. superhet receiver, an Abbott TR-4, and an Abbott MRT-3. DVO has a BC-375E and is going to rebuild for 300

watts. His XYL is up to 6 w.p.m. now. KOU now is on 144 Mc. 3ECP maintains a nightly schedule at 11:00 p.m. EST with LVY and reports the following: KBE expects to have a new 10-meter, three-element rotary beam working soon. 4GQT, on 3.9 and 14-Mc. 'phone with a Meissner 150-B transmitter, is having antenna and BCI trouble. KAU is on 14-Mc. 'phone with a pair of 304TLs in final, and is building a 144-Mc. crystal-control rig. The Washington Radio Club held an auction on Oct. 26th and over twenty dollars was added to the club treasury. At the same meeting twenty-five new members were initiated. KBE celebrated his birthday on Oct. 12th by giving a Hot Shoppe treat to the Washington Radio Club members. ECP is building secondary frequency standard, but progress is slow. JJD says that the November report stating he is a new call is incorrect. He reports good DX on 28 Mc. EQK is back on the air on 14 Mc. exclusively using a Variarm made by Millen and a Millen exciter unit. His present antenna is a Twin X folded dipole vertical. The Delaware Amateur Radio Club elected the following new officers: GL, pres.; DPA, vice-pres.; HGA, secy-treas.; IYE, rec. secy. The club meets the first Tuesday of each month at 8:30 p.m. in the Chamber of Commerce Building. J. E. Deavenport, secy-treas., reports ADQ, the Amateur Radio Club of the U. S. Naval Academy station's frequency is 3991 kc. and the boys are on from about 4:45 to 6:15 p.m. every day and Saturday and Sunday afternoons. The members are working on a 750-watt c.w. rig for 14 and 7 Mc. and various other projects of lesser importance. The present rig is a Collins job, about 60 watts. Members holding Class A tickets are 9LCI, 1NWW, and 3KCF; 6WGR is Class B, and 3LEZ is Class C. Traffic: W3LVY 223, ECP 100, IYE 28, KIV 8, DVO 5, JJD 3.

SOUTHERN NEW JERSEY — SCM, Ray Tomlinson, W2GCU — SEC: 2BAQ. ECs: 2SAK, 2PSZ, and 2ASQ. The code classes sponsored and conducted by the HTRC are nearing a close. The code classes of the DVRA have an average weekly attendance of nineteen. 2PAU is new editor-in-chief of the *SJRA News*. 2FXN, RM, has accepted the job of reorganizing the SNJ ORS Net. 2SFT has 600 watts on 3.9-Mc. 'phone. 2SVV sponsored a blowout for members of the HTRC at the October meeting. New OBS schedule submitted by 2ORS is Mon., Wed., Fri., 12:00 midnight on 3700 kc. and Tues., Thurs., Sat. 12:00 midnight on 7251 kc. He would like the gang to listen for him after 11:30 p.m. on 3535, 3620, 3700, 3769, and 7251 kc. 3HJE, of Philadelphia, now is 2QCL, of Camden. 2RXL will send code practice on 29,915 kc. Mon., Wed., and Fri. from 9:00 to 9:30 p.m. EST from Nov. 1, 1946 to Mar. 31, 1947. 2ACC is building rig for 144 Mc. 2PIN is proud possessor of brand-new SX-28. 2SIP is on 144 Mc. 2IMA is Assistant EC for Hunterdon County. 2IMA, 2OFW, and 2PKE are new AEC members. 2BEI maintains daily schedule with G6BY. The U. S. Coast Guard Auxiliary had a very successful workout in field tests on 2780 and 3410 kc. Oct. 13th. SV1EK visited 2ASQ recently. LU8DR was a guest of 2PRG. 2PRG has had sixty-four successful unscheduled QSOs with LU2DM. Under the direction of 2EKU, Asst. EC, a simulated emergency drill was called on Oct. 26th. This AEC group plans to work in close cooperation with other agencies in all communications emergencies. Members include: 2SAK, 2EKU, 2IMA, 2OFW, 2FWP, 2QKI, and 2PKE. 31OK now is signing 10NY. 2ISZ is working out nicely with Millen exciter. 2SHM is building for high power on 14 Mc. New calls are: 3GNU/2SFT, 3EGE/2EGE, 3HYC/2RMC, ex-3BZX/4JYG, new/2SUX, new/2SVV, new/2TAM, new/2OOG, new/2SIP, 3ACC/2ACC, 3JBU/2RXL. Traffic: W2QUH 41, 2ORS 7, 2CFB 5, 2SAK 3, 2OXX 3, 2BEI 1. 73. Ray.

WESTERN NEW YORK — SCM, Charles I. Otero, W2UPIH — The following Rochester amateurs are on 144

Mc. every night between 7 and 9 p.m.: OVE, TXB, RTB, DJW, OWF, OTW, PHT, and RSL. The organizer of the gang, RSL, pres. of RARA, stated the boys want schedules with Buffalo and Syracuse. The RARA held "Ladies Night" and 8MHU, "Dr. Cardevo," amazing magician, entertained. In addition, there were movies and prizes for the ladies. 8OAL now is 2RMH. MRO is working for Syracuse Police Department as radio operator. RUT is on 3.5-Mc. c.w. with 100 watts, 3550.6 kc. UPH, on 3.9 Mc., worked COTCX on 14 Mc. through VTR, also on 14 Mc., with excellent results. Organization of WNY traffic net is taking shape. Meanwhile RIZ will act as net control on 3720 kc. until we get organized. SZK is ready to get in with 200 watts. Stations ready, please drop a card to the SCM. RWH put back up his 7- and 3.5-Mc. Zepps after a recent freak storm knocked them down. RWH is at Clarkson Tech. with WRC, QXO, and SDI. The latter is trustee of the college radio club. WKE, formerly of Rochester, now is 2WKE/3, of State College, Pa. WKE is building up interest on 144 Mc. in his new location. Schedules will be attempted when equipment is ready, with stations in Philadelphia, York, Mechanicsburg, Erie, and others. QLI is EC for Steuben County, RTW is EC for Chemung County, RME is EC for Chenango County, CLO is EC for Erie County. PJF, EC for Allegheny County, has appointed RJK as one of his assistants. New officers of the KBT Radio Club are IIE, pres.; PZJ, vice-pres.; 8QLK, secy.; SUI, treas. KBT had an auction at the club meeting. New officers of the Niagara Falls Radio Club are: RCK, pres.; SEF, vice-pres.; OWQ, secy.; IFW, treas. PTH is moving to California. 8LFQ has a new "harmonic." QHF and RUC are experimenting with converters on 144 Mc. On 28 Mc. regularly are ROQ, RUC, PZJ, PNN, PFC, FEY, QWS, NZH, BQR, VTU, SSC, OSR, UXH, and PPE. RGO has his 28-Mc. beam on top of a 70-foot steel tower. RCK entertained the Falls Club with movies taken in Italy and Switzerland. QNA is in Alabama and Tennessee on a business trip. QAA put up a new 14-Mc. beam. AFQ put up a new six-element beam for 28 and 14 Mc. The Binghamton Amateur Radio Association is going stronger with more members returning from the armed forces. FCG reports that all through the war the club kept the same officers. Postwar activities are going strong. Their new project is setting up an emergency communication system for public service. Much good work and goodwill was accomplished during the war working closely with the State Guard, Civil Air Patrol and Civilian Defense. SJV, the 8EC, would like to get in touch with Binghamton for EC organization. 73. *Charlie.*

WESTERN PENNSYLVANIA — SCM, R. R. Rosenberg, W3NCJ — SEC: AVY. New appointments: ECs — UST, Allegheny County; QOD, Armstrong County; KQD, Blair County. ORS: OFO, 9EXW/3, TWI, YA. OPS: LYC. OO: 9EXW/3. 3YA, Pennsylvania State College, again is on the air with MOD, KXS, 2WKE/3, SHY, RYB, 8WVN, SFK, and Bob Wallace (OPLA) responding to first roll call of postwar operators. LOD, formerly 8HKU, has completely rebuilt his transmitter to eliminate trouble from harmonics. KWO is new Mercer County amateur. OFO has new HQ-129-X and is rebuilding transmitter with T-200 final. 8SFG worked 4FLH in Miami, Fla., on 50 Mc. f.m., and schedules Pittsburgh stations OMY, RUE, and OKU. OAJ/3 and KXI are operating on 50 Mc. HLA is an old-timer on 3.5 Mc. BVP works out consistently on 14-Mc. 'phone. Active 144 Mc. stations in Sharon area include KY, KWL, GEG, KQA, KWO, QCN, and KIL. Consistent contacts with Youngstown, Ohio, now are possible. The Mercer County Radio Assn. elected officers: GEG, pres.; VUR, vice-pres.; KWL, secy-treas. KWL has new p.p. 813s final. KXI contacted amateurs in New Jersey and Michigan on 50 Mc. LBZ has kw. 'phone rig, while TXS has 1 kw. on c.w. LNA, ex-8FXK, is back on 7 Mc. QOD is looking for 144 Mc. contacts from Kittanning. TWI has new HQ-129-X and is putting finishing touches on 400-watt rig. LYC is operating on the 14- and 28-Mc. bands. LOF maintains daily schedules with SHY and 8TKZ. KWA worked NY4CM and KEIA on 3.5 Mc. and heard two PA9 stations near 3515 kc. BWP is a member of the Old Timers Club. 9EXW/3 is active on 3.5-, 7- and 14-Mc. c.w. with 810 final, and on 144-Mc. band with HY-75 transmitter. AVY has rebuilt transmitter, but only has coils for

7 and 14 Mc. KQD worked twenty-five countries on 14 Mc. in a month and a half, and contacted forty-two states with 150 watts input. CB and UVM have built new oscillators. KEW schedules 8ACL. NBV worked 8UKS in Cleveland on 144 Mc. LTN and QKI are experimenting with 144-Mc. antennas. GV operates occasionally on 7 Mc. with 3 watts. 8NMJ and 8UKS presented interesting talks on antennas at recent Radio Assn. of Erie meetings. AAQ is operating 28-Mc. 'phone from Phoenix, Ariz. TOJ, our RM, submits Western Pennsylvania ORS net report for October: fourteen net sessions held and fifty-two messages handled, with the following stations participating: KWL, LOD, LQQ, KWA, KQD, MJK, NCJ, TWI/4, VYU, and TOJ. Traffic: W3KWL 175, 3TOJ 65, 3MJK 54, 3BWP 37, 3KWA 20, 3NCJ 15, 3KQD 8, 9EXW/3 8, 3YA 5, 3LOD 3, 3TWI/4 2, 2WKE/3 2, 3LQQ 1. 73. *Ray.*

CENTRAL DIVISION

ILLINOIS — SCM, Wesley E. Marriner, W9AND — FXB, EC, appointed RT coordinator for Red Cross Disaster Relief Corps emergency communications. RT is organizing emergency net on 144 Mc. During the Boy Scout Trail Week Exposition at Soldier Field, Chicago, OIG, ZDK, ATV, EDK, and RT comprised the communications team. While recovering from a throat operation EDW rebuilt the rig. GFF is busy with college work, but took time to get married. New ORS are: SXL, JTX, WFS, YTV, EBX, JMG, NUF, MUX, DXL, YBY, QLZ, NGG, TZQ, MKS, W3NF/9. OBS: EDW, JMG, and QLZ. OPS: FIN and IAW. OO: IBC, GMV, NUF, BPU, ADN, and BRX. MUX is having good luck with 7-Mc. European DX. Illinois Net, 3765 kc., includes AND, BEN, CZB, DXL, EMN, FKI, FLQ, JMG, JTX, MRQ, OWT, PEK, QLZ, SXL, TLC, YTV, PTQ, and BGC. Get a crystal or tune the e.c.o. to 3765 kc. and join the boys. PEK reports HQV is new in Clinton. AND worked VO6F on 3.7 Mc. with 25 watts. RCJ, on an enforced rest with leg fractures, is operating the rig from bed. AHV reports OSS Net operating on 3540 kc. GNU traded receivers with 8UUS. CKM is building new final. AWA has a new antenna every week. Welcoming new additions to their families were: HOC, a boy, and AUU, a girl. GNU was the doctor. ERU has opened a radio supply house in Rockford at 511 Kishwaukee and has some swell bargains. DWQ is at college and operates YB there. WFS worked eighteen DX stations in five hours on 28-Mc. c.w. BRX has a new kw. on 28 and 14 Mc. The following ECs have renewed appointments: ODT and QLZ. Your SCM is sporting a new HT-9 rig and Panadaptor. VJN never gets through experimenting. ZRB and EIU visited AND. SXL sends in the following news from Kiekapoo Radio Operators Club: AMP is activities manager. Bill Moulis is theory teacher. BPU, president, has new frequency meter. PRV has an FB 8JK antenna on 14 Mc. while CEO could use help to get antenna up. EXV is back on the air and has acquired an XYL. CFV stocked up on surplus equipment. LJM has new receiver. YQP is theater sound equipment serviceman. YBY is on 28-Mc. 'phone. QQ is ex-9AYB and is on 3606 kc. The Tower Radio Club, Wheaton College, ZXR, reorganized with FHN, pres., KJZ, vice-pres., IHT, secy-treas. W3NF/9 has sixty crystals. Who has more? He was prewar WLML in AARS. FKI is ex-K4HER. JMG is doing FB work on 3.5 Mc. QLZ is working on 'phone net. EVJ should be given a rousing cheer for his work in organizing the ILN Net. BGC had to reduce power because of blinking lights. FIN runs 40-watt 'phone/c.w. on 3.5 Mc. JTX is busy with traffic schedules. New OO is KA. KMN is ORS and OPS. BGC handled a total of 222 the past year. ACU worked WAC plus thirty-five countries since the war. YBY sends photo of swell operating position. TZQ works ICN and says that Carrie, ILH, was at the key. IAW runs 800 watts. QWM is back with FCC. UBW and NGG are next-door neighbors but work different shifts so no QRM. NIU attended APO convention in Buffalo, N. Y. 41IF/9 is on at Pontiac. YYE is at WQQP. Traffic: EVJ 338, DXL 151, JTX 113, AND 107, FKI 63, MRQ 53, SXL 52, JMG 40, YTV 13, WFS 4, BGC 2.

INDIANA — SCM, Ted K. Clifton, W9SWH — Indi-

ana c.w. net is active on 3656 kc. Mon., Wed., and Fri. at 6:30 P.M. CST. DHJ, of Crown Point, is net control. Crystals can be obtained from your SCM. If you are not receiving the *Bison* by this date, send your name and address, with 40¢, to the SCM. Our new ORS, RCB, went to the head of the list in traffic handled this month. YWE can't get home in time for the net. LBE and PMT checked into the net along with QLW. Some of the Valpo gang now check into the net on 144 Mc. EHT can't work AB. ENH is off on another trip. DGA, of Evansville, is after the DX and has a new three-element half-wave antenna on 14 Mc. DGA, QLW, and EHU are the "Unholy Three." UIA is doing well on 50 Mc. FJI has a four-element beam for 50 Mc. and three-element for 28 Mc. GCR is new ham at Evansville. DFD, formerly of Chicago, is now in Evansville teaching at Evansville College. BBC has 450 watts on 28 Mc. into a close-spaced three-element plumber's delight. GZB has been heard on 14 Mc. recently. JLT built a new 3.5-Mc. rig to use at Purdue. ELP is a new Fort Wayne call. PMT's first real DX was with a CM and a G. CXJ had his seventh delivery, a jr. operator. IDZ has a new BC-342. FMJ and his XYL bagged a nice flock of birds on a recent hunting trip in the Dakotas. GOX bought the XYL, EFW, a new Crosley car and has offered to buy her a new deep freeze unit if she will give her consent to buy an airplane. LGG has loaned his receiver to his ex-GI brother, who is convalescing from injuries received in action. IPY now is Class A. EGQ has a pair of 24Gs on 144 Mc. with 50 watts input. PQL, Valparaiso, has 75 watts to pair of 24Gs. SNF is putting 100 watts into above tubes. There are twelve to fourteen stations on 144 Mc. in Valpo. DUT has a 14-Mc. vertical which works well. ABB is on 14 Mc. in Hobart working DX. UKV is busy putting up antenna for 7 and 144 Mc.; he has portable and home station on 144 Mc. Fellows, if you are interested further in what Indiana is doing, send for the *Bison*, as mentioned above. Traffic: W9RCB 82, DHJ 18, MKM 13, ENH 10, HUV 9, DGA 7, QLW 4, SWH 4. 73. *Ted*.

WISCONSIN — SCM, C. C. Richelieu, W9ARE — IQW is rebuilding Army surplus receivers. HHK is a new ham on 28 Mc. ZRX has new three-element beam on 28 Mc. He reports QHR is heard consistently on 28 Mc. at Benton. Ground-wave work is catching on fast in the State with DKH, EWC, OVE, GAJ, BTE, DDG, HNX, and NVJ in the Sheboygan area all going to town. Your SCM met EWC through mobile operation one dark stormy night and had an FB QSO en route to Milwaukee. EWC has a new three-element beam that really works the DX. RBI WACED in six hours Oct. 19th. ARE enjoyed meeting the Madison gang at Four Lakes Club meeting Oct. 28th. The Ground Hog Net members held a hamfest Nov. 10th at Rockford with GPI as master of ceremonies and LIP as sergeant at arms. QFL has new 28-Mc. beam and new 28-Mc. mobile rig. J2AAT answered an NVJ CQ recently on 28 Mc. and Chris still is groggy. HNX lights up the neighborhood house lights with his new beam. OJI, HWZ, and UIT are using narrow-band f.m. with good results. EWC has double detection 28-Mc. receiver using SX-36 into SR-20. QZO and QIX have new BC-610s. BTA is back on the air. The Sheboygan and Manitowoc gangs have worked STIC and NZU across Lake Michigan ground wave 10. QFL worked Kansas City, Mo., ground wave 10 for what appears to be a record for this area. SZL, HJU, UFX, DIR, and LFK are Wisconsin Net (3775 kc. Mon. through Fri. 6 p.m. CST) mainstays. HJU and NWM are ORS. AWO has 28-Mc. "V" beam 19½ wavelengths long and is working DX with 19 watts. LNM made WAC with new three-element beam. NWM is traffic manager of Four Lakes Club at Madison. See Chuck with your U. of Wis. traffic. It is with profound regret that we announce the passing of HRM. As a life member of MRAC he served as secretary par excellence for many years. We'll miss you, Erv. SK and 30. Traffic: W9SZL 25, ARE 19, HUU 3. 73. *Rich*.

DAKOTA DIVISION

NORTH DAKOTA — SCM, Raymond V. Bennett, W0EVP — KZL, who had been appointed RM, has accepted a transfer to the Maintenance Division of CAA and left for Cincinnati to take up his new duties. An RM

to take his place soon will be selected. Organization of the North Dakota Net is under way and your SCM would like to have your application for ORS or OPS by post card. GZD bought a new house and moved the "shack." In spite of moving he still finds time to handle traffic. PJT had the misfortune to lose his modulation transformer. Well, he loves c.w. anyway. OUH, boasting a new HQ-129X, has been working DX and worked nineteen countries during October. Best DX was UA9KAA at Dionon Island. GJJ walked off with prizes including a Hammarlund MC35DM condenser and BW BVL 10 coil at the hamfest at La Jolla, Calif., while on vacation. EVP is QRL his new job as chief at KGCU. OEG is new call received by Bob Manson. Traffic: W0GZD 8, SSW 7, EVP 5. 73. *Ray*.

SOUTH DAKOTA — SCM, P. H. Schultz, W0QVY — 0BJV has accepted OPS appointment on 3.9-Mc. 'phone. HB9AW is looking for a South Dakota contact on 28- or 14-Mc. c.w. He is very near the low-frequency end of the band. GCP has returned from Oregon and expects to locate in Mitchell. HDO is in Mitchell. YOB finally worked South Carolina for WAS. Rapid City hams are active. WUU is interested in lining up hams in the southeastern section of the State for an emergency net. He has contacts in Akron, Iowa, and Sioux City for emergency outlets. BLK declined the job as RM so the position is open. OLB, at Glenham, is looking for anyone along the MIL line to help complete an emergency net. A two-page copy of the minutes of the BHARC has been received. The Sioux Falls Amateur Radio Club elected JLI, pres.; HON, secy.; and CRY, treas. Meetings are held at the All Saints School. Your SCM visited the club on the night of Oct. 23rd. 73. *Phil*.

MINNESOTA — Acting SCM, Vernon G. Pribyl, W0OMC — RJF worked KL7AD and the next day the KL7 stopped in to see him. Ken said he had a lot of fun in the CD Party but his activity was limited because of his work. LOI has a "V" beam for 14 Mc. EPJ, ex-SCM, is active on 3.5-Mc. c.w. The Minneapolis Radio Club now has a membership of 150 and has succeeded in obtaining a permanent meeting place at 2205 Park Ave., So. Election of officers will take place in January. JNC has thirty countries and reports he spends about 60 per cent of his time trying for more. CGK, an old brasspounder, finally took time out and got his Class A ticket. NCS, net control of the MSN, schedules VE4AM two nights a week. He has been doing some hard work maintaining and expanding the MSN. RPT schedules the Missouri Net. HEN is working on reorganization of TL "A." HEO is vacationing in Texas. PNQ sends in TYN's traffic report. They are brothers! GKC is doing FB on 3.5-Mc. c.w. FAJ has been active on 3.5 Mc. c.w. and is considering joining the MSN. GBZ says his 15 watts have been working out so well he hasn't found time to work on his big rig. BHY and JIE have been alternating as net control stations of the 3.9-Mc. 'phone net. Membership continues to increase. Get in on the fun, fellows. Obtain membership in one of the nets that are operating day and night. A card to the Acting SCM will get you started. MPW, JRI, and CZO are new ORS. QCP has been transferred to Hawaii, where he is monitor officer, and has moved his family there. BHY is on narrow-band f.m. on approximately 29,120 kc. and reports good results using a 3-section 8JK beam. BMX keeps a regular schedule with a ZS on 28-Mc. f.m. IRM says f.m. is great to cut out BCI when living in an apartment house. ICU, who still is with Ft. Monmouth Signal Corps Labs, got married. He has acquired the call 2RRX and is on 28 Mc. TEF, now living in Memphis, has a jr. operator. "Uncle FUZ" by tradition only now, was issued his old call W0EA and is on 7, 14, and 28 Mc. looking for contacts in the Minnesota section. Thanks for all the nice reports this month. Traffic: W0NCS 96, TYN 26, EPJ 16, RJF 10, HKF 9, GBZ 8, JNC 5. 73. *Vern*.

DELTA DIVISION

ARKANSAS — SCM, Marshall Riggs, W5JIC — LUY is fourteen years old, the youngest member of the Little Rock Club. IGM and DFY have new e.c.o.s. LCO is on 28 Mc. with p.p. TZ40s. KGU has Lazy H antenna on 28 Mc. FWF has folded dipole on 28 Mc. DVI and LQZ have

mobile rigs on 28 Mc. IRY has new modulator and p.p. 807 final. ENH is on 28 Mc. DFY has three-element beam on 28 Mc. LVB has p.p. 813s 500 watts on 28 Mc. AYH is gunning for high voltage transformer. Ex-3DEA now is LQN on 3.9-Mc. 'phone. Ex-8MIH now is LSH on 14-Mc. 'phone. LLO is on 7-Mc. c.w. when the crystal works. HAT has p.p. 813s 400 watts on 28 Mc. with four-element beam. FPD is on 14 Mc. LCZ is on 28 Mc. with 50-watt rig and an antenna farm. 2NCR and XYL, 2NWZ, visited in Hot Springs and Fort Smith. AQF will be director of Delta Convention in '47. LVT has cornered all 28-Mc. DX. KKM has three-element beam. HPL now is in double harness. EA is on Rebel Net handling traffic in good shape. KJB is new-comer from Texas and is on 28 Mc. with private power plant. LLM is new ticket in town. Traffic: W5LSH 56, EA 50, LVB 15, LQN 7, HAT 3. 73. *Marshall*.

LOUISIANA — SCM, W. J. Wilkinson, jr., W5VT — RM KTE has the Pelican Net (LSN) operating on 3550 kc. and wants members in Baton Rouge, Alexandria, and other points. KUG is keeping schedules on several nets. JET has new Class B ticket. MAV is new ham in Monroe. IIG is acting president of OVARC. DAQ is active on 3.9- and 14-Mc. 'phone. BEK has been building new rig. FJW has new S-40 which JUY transported from Lake Providence. IDK has been "burning up 28 Mc." DXL has been building for EGK. FPJ is making new 3.5-Mc. matching net for rig. CNG has about 600 watts on 3.9 and 14-Mc. 'phone. LUU is on 7 Mc. LXU is new operator with HT-9 in Rayville. KMR is on 28 Mc. JEY, DRF, IDK, HOS, KRY, and KMR have round tables on 28 Mc. IVF has raised antenna pole. OVARC had a booth at the Ouachita Valley Fair. CEW is back on 28 Mc. for DX. KMD has forty countries. KEK is building kw. rig. LLB has new rig. JTT worked his first ZL. FPZ and FUS have 'phone on 28 Mc. JFF worked Tokyo. KJE is after WAS. GCS has a new beam. ML builds antennas. AEN is having beam trouble. CGC is working 14- and 3.5-Mc. c.w. LES is active. IOP has WAC twice on 28-Mc. 'phone with forty-one countries. HOU is active on LSN. GND can put up a good rag-chew on 7-Mc. c.w. LQV is battling the breeze with c.w. BMI visited with the SCM, who has a new call, W5VT. KHC is on 28- and 7-Mc. c.w. IBL is on 14-Mc. c.w. GAD is a new ham in LaPlace. GUK is active. Traffic: W5VT 38, KTE 16, JET 9, KUG 7, BSR 5, GUK 5. 73. *Dub*.

TENNESSEE — SCM, James W. Watkins, W4FLS — Reports still are slow in coming in. We have yet to hear from you fellows in Memphis, Jackson, and Knoxville. Reports from other sections of the state are just as slow. Let's try and improve this condition. Drop me a card about the first of each month. All current ORS, OPS, OBS, EC, etc., please advise of your continued interest for renewal or appointment. Those interested in new appointments should write at once. DTI reports he now has Class A and his old call back. His new location is Martin and he will be on 3.9- and 14-Mc. 'phone and 3.5, 7, and 14-Mc. with 150 watts as soon as he can finish building the rig. CVM, also at Martin, is active on 20 Mc. and busy working VKs and ZLs. Both are interested in 50 and 144 Mc. and would like to hear from anyone near them who also is interested. AAW reports Nashville amateurs held a meeting in October to reactivate the Nashville club. Let's have more information when reorganization is complete. EDC is active on 3.9 and 7 Mc. AYQ is on 7 Mc. with 150 watts. FLW now is located at Dresden and is active on 3.9 Mc. MP reports he is active on 144 Mc. EVX is on 14 Mc., and HRS, EBQ, and GXX have daily contacts on 28-Mc. 'phone. ERJ has converted a 375E into a portable-mobile. KPR is new call in Chattanooga. DLK is rebuilding. When not handling traffic PL is busy converting surplus BC348P from d.c. to a.c. HHQ is active on 3.9 Mc. with low power. EAL is back on 3.9 Mc. Traffic: W4PL 63. 73. *Jim*.

GREAT LAKES DIVISION

KENTUCKY — SCM, Joseph P. Colvin, W5IEZ/4 — 9FZL sold his LITTLE 80-meter rig and may be getting on 50 Mc. Nothing But the Truth Society has made NY4AD and 5HUU honorary members. Ex-9DFW is 4KGM. Ex-9DNJ is 4JXF. 4DML is on 14-Mc. 'phone.

7IIS/4 is on 28-Mc. 'phone. 4KKG finally got some QSL cards. Ex-9FS is 4FU. 4BEW is on 14 and 3.9 Mc. and reports 4GAQ active in Ashland. 2MLM reports a pair of 28-Mc. contacts from Fort Knox with 9YZS, London (Ky.) and 9KRY, Somerset. 4KKG QSPed traffic to Hollywood via Honolulu and got reply in fifteen minutes. He has a kw. and two-element beam. 4JLE, on 7 Mc., would like to QSO Georgetown. 4UXH, ex-8SED, is active ORS in Dayton. 4TXC is on planning narrow-band f.m. 4MO, ex-9VBN, has HT-9 on 28-, 14-, and 3.5 Mc. 'phone and c.w. 4AHL is on 3905 kc., 40 watts 807, and wants to hear from 9JON/8. 8MEU has two full waves on 3.9 Mc. 4JTO, ex-9GNV, sent me dope on several hams: 4MSE is active on 28-Mc.; 4TFG, 4WYW, and 4YIN took portables to college; 4JTO is active on 14 and 3.9 Mc. with a portable-mobile 28-Mc. rig to use on Pine Mountain; 9EHU is firing up on c.w.; Lexington and Louisville Clubs both had John Reinartz with them in October demonstrating his "Duo-Inductors." 4KAM is ex-9FWT. Notes from Princeton: 4KAQ is ex-9FXA; 4JAG is ex-9EIS; 4JGU runs 90 on 14-Mc. 'phone; 4KBL moved to Los Angeles; 4JJE has 250 on 14 Mc.; 4GDK runs 25 to 829 on 28-Mc. 'phone. 4KWO is on 3.9- and 14-Mc. 'phone. 4FBJ reports working GB3, ZS, YR, and EK1 on 14 Mc. with 300 watts. Traffic: 4FU 426, TXC 21, KKG 6, MO 3. 73. *Joe*.

OHIO — Wm. D. Montgomery, W8PNQ — Anyone with prewar appointments which have not been endorsed should send in certificates for renewal. All ORS/OPS monthly reports should be mailed so as to reach me not later than the 5th of each month. PUN has been appointed as PAM and EC for Chillicothe and vicinity. Other appointments include FNX and THJ as OPS, UZJ and ZAU as ORS, THJ and THJ as OBS, EQ and ATK as OO, THJ as EC for Piqua, and FQY as EC for Mansfield. There are no ECs, OPS, or ORS in Youngstown, Marion, Newark, Lima, Defiance, Hamilton, Ashtabula, Wilmington, or Washington Court House. There are no active OPS or ORS in Cincinnati, Columbus, Akron, and Canton. Contact the SCM for details on appointments if interested. RN, Ohio RM, reports the formation of the Buckeye Net, which meets at 7:30 p.m. Monday through Friday on 3730 kc. Stations interested in bang-up traffic handling are invited to attend. Sign "CQ BN." Net certificates have been issued to the following regular stations in this net: MPG, ZAU, QIE, LWG, BUM, WE, CJL, VWX, RN, and WWG. ZFA reports the acquisition of a new BC-342N receiver, new sky poles, and two new antennas to go with his 1/2-kw. rig. PUN, Ohio PAM, reports that thirty-four Dog House Net members attended the picnic on Oct. 27th at Serpent Mound Park. WEV brought his rig along and the boys spent the afternoon working out with it. New net officers were elected as follows: STZ, pres.; TRX, vice-pres.; DZO, secy.; PUN, treas. EQ reports that the Ohio 8 a.m. Net is working on 3965 kc. and that anyone is invited. IBNL now is 8ZLU. PNJ reports working twenty-eight countries, including ZBZA, since Aug. 20th on 28-Mc. 'phone. From the Columbus Amateur Radio Assn. we hear that new officers are: PSE, pres.; SYY, vice-pres.; HXQ, secy.; IVS, treas.; MDX, WRN, and MQG, directors. EFW reports that DGP now is 3LMZ in Maryland and is on 14-Mc. c.w., that HFE made 120 crossings of the Atlantic during war as flight operator with ATC and now is radio operator at Cleveland Airport for AMA, that SEBY/6 is on 14-Mc. c.w. from Berkeley, Calif., that FZN has an FB 28-Mc. f.m. transmitter on the air, and that JRS and AKA are radio engineers with the Ohio Bell Telephone Co. WRN states that the 144-Mc. gang in Columbus works regularly at 7:00 p.m. EST each evening and will welcome any DX, and that TJD, SFR, YAU, and UZ are regulars on 144 Mc. JFC has a JK and a Sterba curtain working on 28 Mc. 8OZH is looking for some Ohio contacts on 3.9-Mc. 'phone from his portable N.Y.C. location. VMJ reports a new YL operator at his house. GNP reports that the 3rd annual clambake of the Lorain Amateur Club was well attended, and that MWF and ALB walked home with the door prizes. THJ says that the following Piqua boys now have their Class A tickets: SYC, AMR, ALZ, and EGP. Of the eighteen hams in Piqua, ten belong to the Piqua Radio Club. APC writes a column entitled "Calling CQ" which appears frequently in the *Columbus Star*. *Drips* from the *Grid Pan* says that Dr. Meyers has consented to run off one more batch

of his Megacycle Mixer for ailing fists. Place your orders now. The Cincinnati 50 Mc. Club is growing. Present members include AKW, NDN, ODF, and several Kentucky boys. Nightly contacts with Dayton, QYD, and DAL, are made. TAJ requests information on how to get the XYL to give permission to put up a tower in the yard. LYQ has made his 100 countries postwar, most of them on 14-Mc. 'phone. YML is struggling with a BC-375 for 7-Mc. c.w. TQS has a new jr. operator. Traffic: WERN 47, CBI 43, EQ 40, ZAU 38, UZJ 27, WE 27, ROX 19, QIE 12, PUN 7, LCY 2, PNQ 2. Very 73. Bill.

MICHIGAN — SCM, Harold C. Bird, W8DPE — SCLL is running QMN Tues. at 7 P.M. The NCS requests that all stations give him their schedules. 8UGR reports new transmitter 807 oscillator, 811 p.p. about 200 watts input. 8FX is getting out a directory of all QMN stations reporting into the net since its opening. 8KOS is working DX on 7 Mc. and reports working CM2BM and VO6F on 3566 kc. 8WWL has new BC-221 frequency meter and works BR Net and CAA Net. 8PVB is ORS and reports 8BMF running parallel 807s with v.f.o. and 100 watts on 3.5 Mc. 8YBR is on with single 807. 8GQZ had to give up 3.9-Mc. 'phone because of too much line noise. He will be on 7-Mc. c.w. and 14-Mc. 'phone using $\frac{1}{2}$ vertical on 14 Mc. 8YCB is working 3.5-Mc. c.w. 8PUF is on with 45 watts input. 8YKS is ORS. 8MRL and NWU are working 'phone after years of c.w. 8DYH wants reports for SWL column in *News*. SOCE has three-element beam working on 28 Mc. and reports working 88AN and G6AY. 8NQ has received his Old Timers Club certificate. SURV is trying to work QMN. Ex-8HSK now is 3MSK in Washington and reports he has worked sixty stations on 28 Mc. with only ten watts input on c.w. for a total of sixteen countries. 8SWF has new four-element beam and is going to step up power to 900 watts for 28 Mc. 8ABH, now 4PJO, schedules ex-8EWH nightly. 8URM has renewed his ORS appointment. 8RJC has been fishing for DX on 14 Mc. 8BIU got on the air with a nice-sounding rig. 8YDR reports the passing of 8ALN, who was lost when the yacht in which he was riding capsized. 8DED is carrying on his QSL business and selling RME-45 receivers. 8RYP is back on QMN. 8MGQ is running down bugs in his rig and handling traffic for club work. 8DNM is new reporter from Muskegon. 8SCW reports that 8RMH is with the armed forces at Camp Lee, Va. 8UTC is a new reporter in Ann Arbor. 8GXJ sent in a nice traffic report. 8TRN schedules 8NW, in Baffin Island, nightly and handles traffic for him to his wife. 8TMN has a new antenna and is working in QMN regularly. Ex-8JKO writes from Seattle, Wash., that his new call is 7HCC and he would like to hear from the old QMN gang. 8KNP is working with low power because of BCL trouble. Traffic: W8SCW 293, 8SAY 288, 8CLL 109, 8ABH 71, 8TBP 33, 8DPE 26, 8FX 25, 8WWL 25, 8PVB 21, 8RJC 20, 8QKK 16, 8URM 14, 8TYE 13, 8GP 12, 8UGR 10, 8RYP 6, 8KOS 4, 8BIU 3, 8MGQ 3, 8OCE 2, 8DNM 1, 8UVK 1. 73. Hal.

HUDSON DIVISION

EASTERN NEW YORK — SCM, Ernest E. George, W2HZL — Congratulations to the Westchester Amateur Radio Association on becoming affiliated with ARRL! We welcome a fine gang into our official midst as a recognized club. The club's official publication, the *WARA Band Spread*, is worthy of your reading time. From the Cohoes gang we learn of 144-Mc. operation by JHQ, NHS, and ODC from North Troy. LXX, from Poughkeepsie, reports, "There hasn't been enough u.h.f. activity around here for the past month to wad a gun." The reason is the work done to organize the big blowout on the 29th which was a big success. Dead spots on his dial were found to be a bum condenser bearing, and all this after two months of hunting parasitic resonant wires and chokes! RCR reports 114 contacts using 15 watts on 3541 kc. WARA reports record turnout at annual hamfest. HEV took home first prize, 2KOW jr. operator took second, and BEQ third. DCO has worked thirty-six countries on 28-Mc. 'phone, including GSTB, a station he hadn't contacted in eight years. While QSOing, SU1HF and DRH discovered they were former high school buddies. 8I/O/2 holds county record of eighty

countries. HFS is noted for helping GIs with contacts. POY is the youngest ham in the County. JAM worked all continents in four hours recently. PEO is using 132-ft. inverted U antenna. BAV is working with 1BBM on 425 Mc. ISO is mobile with five-element beam on 144 Mc. and is active on Mt. Graylock DX. Traffic: 2ITX 26.

NEW YORK CITY & LONG ISLAND — SCM, Charles Ham, jr., W2KDC — The simulated emergency drill held in October brought a good turnout in all Long Island counties. Brooklyn had fifteen stations in all categories. Nassau had nineteen with emergency power used at four fixed stations; Suffolk had five mobiles and two fixed, but did a good job at covering a large area. Queens used emergency power on half of its twelve stations. Messages of progress were sent via radio to the SCM. Other phases of Emergency Corps activity moved apace. In Brooklyn fifteen stations report regularly even though OHE is ill. 4GLP/2 will verify NQQ's story of the "Hypo Kid." BPV and HQT now sport crystal-control on 144 Mc. OHE gives sincere praise to those who stand by while the Monday night drill is in session. ALH solicits low-frequency Emergency Corps information and will forward it to OHE. BPV has been commended for his job as control during the October test. In Suffolk, the gang is ready for anything, with interest increasing for the Monday night event. ADW has 144-Mc. beam. OQI deserted 144 Mc. for 28 Mc. EBT finished his vacation and found more activity near home than anywhere he had traveled. FCH replaced the HY75 with a 127A. OEO is recuperating from appendectomy. BFA, formerly of 160, is heard on 144 Mc. UX is more active since the end of the fishing season. LCK is on 144 Mc. from E. Moriches. BSR, the RST man, is back on 14-Mc. c.w., DX only. From Queens, BSP calls in to report SNS as a new EC recruit and OTZ as Asst. EC in charge of one of Queens' three nets on 144 Mc. Even though there are twenty-five regular Emergency Corps members, BSP solicits more, so you 144-Mc. men should give Bill a call Monday nights. From Nassau County, FI says his group is an outgrowth of the WERS and is showing excellent spirit and cooperation. Some QRM bothers the net Monday nights. CET is co-ordinator. BO, LNO, BON, and BGO are heard each Sunday at 3 P.M. on 3600 kc. They would like to have a call from DOG, CET, BSP, and KDC. "CQ AEC" is the call. PRE does very well with 15 watts to a 6L6 having thirty-six states on 3.5-Mc. c.w. Mike seeks ORS appointment. SKV, of Brooklyn, was 1BBJ. Bill alternates between transatlantic flights as communication officer and working ART-13 transmitter on 14 and 7 Mc. HXC, who is with CBS television crew, says QZ, AVC, ECB, KJO, and RFG are always hamfesting when televising field set-ups. QZ just WACed by catching VU2AJ on 23-Mc. 'phone. SYA/2, at West Point, visited NAZ after Army-Duke game. SYA also has great fun recording 3.9-Mc. 'phone gang. JZX is using a BC-610. NRS is on 7208 kc. and is looking for schedules or net operation. The Trylon Radio Club was recently brought to life, with OG as vice-pres.; DXL, chairman; PGZ, secy.; and QDE, treas. Meetings are held the 1st and 3rd Wednesdays of the month at 69-11 Yellowstones Blvd. For dope contact QDE, Wellbrook, at 98-120 Queens Blvd., Forest Hills. 9TWS now is SMX. 8UUW is PZE, Sam Seml, of WERS, now is SHE. 2WL, ex-9YBS, and 7GCO, member of Old Timers Club, now is living near Flushing. JBP is working DX on 14 Mc. RDE is new ham at Locust Valley. AIZ's transmitter is reportedly a beautiful piece of furniture (besides being a good transmitter). LGK is using 832 on 144 Mc. Joe finds 6 watts adequate for good relay work. OBU is going very strong on NYC-LI Net on 3710 kc. at 9 P.M. 2EC says "T.L.A.P." will accept traffic to any part of the U.S.A. Call "CQ TLAP" near 3630 kc. before 9:30 P.M. when the schedule starts. RQJ rebuilt a ham-to-be's BC-342N. NAZ had 69 QSOs in CD Party. PZE worked a little DX and will join NYC-LI Net soon. HXT still is putting up antenna. Traffic: W2BO 113, EC 64, OBU 39, NAZ 25, JBP 6, LGK 4, RQJ 3, HXC 2, KJD 1.

NORTHERN NEW JERSEY — SCM, John J. Vitale, W2LIN — Asst. SCM, 2NKD; Section EC: GMN. NCY is going strong in Dumont with an HT-4. Hank has been re-appointed ORS. FXN, who has been working with NNN Net, is reorganizing SNJ Net on 3700 kc. Tues., Thurs., and Sat. at 8:00 P.M. EST. GVN has a four-element beam on

28 Mc. in Plainfield. FTL is using a.c.o. on 28-Mc. 'phone, built by LCR. DAC is experimenting with 1½ watts on 28 Mc. using a 6AK5. HLX is QRT while at school. CWK has been reappointed ORS. He is the proud possessor of one of the large certificates issued in the '30s. APL is ORS and is on 3.5, 7, and 235 Mc. GVZ had a nice time in the CD Party. Pat comes into the NNJ Net regularly. PQC, in Irvington, is a new-comer to NNJ Net. There are many grateful parents and sweethearts in this country, thanks to LTP. Hank has been doing a marvelous job handling traffic from EL4A and EL5B. He qualified for Brass Pounders League with his extraordinary total for this month. The schedules are held nightly on 14 Mc. ANG is signing W2KCG/VP2 from Antigua Is., B.W.I. He would like to hear from someone with a Signal Shifter for sale. Thanks to NZC for the following information: OFM, BYK, KZW, NZC, HHW, and KXK are members of T9 Society. NZC is secretary. The club meets at the QTH of HHW in Little Silver every other Friday night. BYK's new QTH is 81 Mt. Hermon Way, Ocean Grove. OFM is scouting for DX. KXX has a new beam. SLW/KL7, in the Aleutians, would like to hear from some of the gang. His QTH is: S/Sgt. Edward Rich, jr., WXLB, W2SLW/KL7, Adak, Aleutian Is., Alaska. Please send the SCM the following data on all clubs in this section: Name of club, total membership, whether or not it is an ARRL affiliate, name and address of secretary, meeting QTH and dates. QLF and RIG can really bat the breeze on 3.5 Mc. They meet every evening at 11:30 on 3725 ko. PRW/1, in Maine, completed WAC for XZ2YT in Burma on 28 Mc. After 14 months in E.T.O. for Mackay, AMT is back on 7 and 3.5 Mc. NIY met old buddies in the CD Party. Code and theory classes are being conducted by KSR and Dennis Tommarazzo at Radio Wire and Television, 24 Central Av., Newark. BRC is pounding away on 7 Mc. with three new crystals. APL, with 12-ft. vertical rod and 35 watts, worked the Coast on 7 Mc. Newly elected officers of the Jersey Shore Amateur Radio Association are: CQB, pres.; FZY, vice-pres.; LMB, secy.; FC, treas. They issue a semi-monthly bulletin to all members. CYS has ninety-eight countries worked postwar. GAK is vacationing in G-Land. The newly-formed Hudson County Amateur Radio Association held its Dec. 11th meeting at the Polish Home, 22 Liberty Ave., Jersey City. Temporary officers are: JSX, pres., and RBN, secy. NNI has received his old call, LX. PQC is trustee of MTZ, Irvington High School Radio Club. LFR received appointment to Atlantic-Pacific Trunk Line. NWA is a new ORS appointee. Many thanks, fellows, for your nice reports and cooperation. Traffic: W2LTP 458, CGG 175, LFR 109, NKD 71, OCC 22, BRC 19, BJZ 19, GVZ 19, MLW 15, QLF 13, IIN 9, APL 8, CJX 6, NNI/LX 6, NWA 5, NIY 4, MIG 3. 73. John.

MIDWEST DIVISION

IOWA — SCM, Leslie B. Vennard, W9PJR — @DVP, now at Fort Dodge, Kans., is working both coasts with 7 watts on 7 Mc. @AHP reports Iowa 75 Net still is hot at 12:30 p.m. @NMA has new QTH but will be going soon. He is operating @TNI at present. @EKM (LSPH) is on at Anamosa. @CCE is ready for that emergency. NMA attended hamfest at Slater. @GKS is working plenty of DX and has thirty-three countries so far on 14 Mc. @CVU didn't like our report in October QST. Our apologies, but I still don't like rotten signals. @PKA, a new ham at Ottumwa, has bandswitching on all bands. @FP, ex-AHP, had license No. 14 in '19. AEP now is @PP and is net control of Iowa 75 Net. @SXS is going to radio school in Kansas City for that commercial 1st-class license. His QTH is Red Oak, and he is interested in emergency net. @VIQ/@ is back at New Hampton and hopes to get in the Iowa 75 Net soon. @SEF wants an All-Iowa Party soon. What say? @YOQ was killed while working on his rig. @ATN/@ reports that a new radio club has been organized at Soo City with @POY, pres.; FNF, vice-pres.; ATN, secy.; and GWT, treas. Traffic: W@EPI 16, GKS 8, YBV 3, NXW 2.

KANSAS — SCM, Alvin B. Unruh, W@AWP — W. G. Schrenk, @PAH, 1528 Pierre St., Manhattan, has agreed to assume the duties of Section EC. All former ECs and members of AEC, as well as those interested in taking part in

the emergency program, are urged to write him at once. Plans are also being made for a section traffic net on 3610 kc. and a 75-meter 'phone net. If interested in net operation, write the SCM. We need more ORS and OPS. OZN has been appointed OBS. BPL is OO, Class II-III-IV. GSW has band-switching exciter, and p.p. TZ40 final. He reports the following additions to local ham ranks: TTF, OZA, BLR, CVX, COP, YFE, and 5JXT. In Coffeyville, PSE is back at Field Kindley H. S. and has the club station. VWT, back on the air. Thirty-five are enrolled in the school's amateur radio class. KKK is new call there. YLY has kw. on 3.9, 7, and 14 Mc. CPY is active at Newton. OAQ has returned from Europe and is on 14 Mc. DAC is on 7 Mc. and VDH, ZAT, CHE, and VVV are on 28 Mc. GHR is a new call. EPX, Kansas City, has 200 watts on 3.9- and 28-Mc. 'phone, 7- and 14-Mc. c.w. KEI is trying to erect an antenna that looks harmless to BCLs. YOS, back at Seneca, is using p.p. T40 final. At Manhattan, YUQ keeps daily 50-Mc. schedule with Kansas City. JCH is building a four-element 28-Mc. beam. MKU is back from Japan, where he operated at W9WBM/J3, Kobe. @BLY reports the house in which she lives formerly belonged to YPM, and the fixtures and antenna pole were still there. She operates on 7190 kc. mostly, and is looking for other YLs. Traffic: W@KEI 3.

MISSOURI — SCM, Mrs. Letha A. Dangerfield, W@UD — ZJB has been made v.h.f. editor of CQ. JCG is planning a 50-Mc. test when he arrives in D4-Land. ZIS has accumulated enough gear for some real v.h.f. experiments. OVY has an 829 final on 7 Mc. and is building a modulator for 28 Mc. JAP is back in Missouri and is eager for ORS renewal and traffic. QXO is very busy with work, but piled up our largest traffic total of 12 by contacting the Hit and Bounce Net and the Missouri Net. YHZ heard another station on 11.9 Mc. third harmonic from 3.9-Mc. 'phone band, and is installing parabolic reflectors for use on 420 and 1215 Mc. KIK is booming through with an a.c.o. into a 15-watt Stancor transmitter. NNH was first to send in a report on 28 Mc. to the Bureau of Standards and is reporting on the Missouri Net. RNK is on 28 Mc. GCL bought a 348C receiver and still is rebuilding. ARH has 28-Mc. rotary beam and worked forty-eight QSOs with twenty-three countries with 60 watts, and had his first 'phone QSO after holding Class A for twelve years. DEA haywired an 811 for 7 Mc. and made a score of 15,325 in last CD Party. OUD's old Stancor P-60 is aging — a blown filter, rectifier and screen bypass, — each at a most inopportune moment. The Missouri Net now works regularly at 7 p.m. daily on 3755 ko. Regular stations are QXO, OUD, KIK, NNH, and YSM. We need more stations and more traffic. Traffic: W@QXO 12, DEA 6, OUD 3, DID 2.

NEBRASKA — SCM, Arthur R. Gaeth, sr., W@FQB — TQD put in some new B & W coils in final, and is very busy on the TLAP net. He reports that ex-90NL now is 6VLX/3 in Washington, D. C. MLB is SEC for Nebraska and is looking for a good second-hand receiver. Ex-W5ABI, former SCM of Arkansas, now @TJU, has a pair of 807s fired up. EKK has been appointed EC for District 1, and endorsed as OBS for same district. QUA likes new NC-240D. FRQ is with FCC in Philadelphia. We extend condolences to the family of JVL, who died of a heart attack on November 5th while preparing to leave for work. UFD took over two schedules that JVL had for that day. VHR built a modulation indicator and monitor à la QST. FUV built three-element plumber's delight for 28 Mc. and hoisted it up thirty-six feet. RUH built three-element beam for 28 Mc. SSH rebuilt transmitter and can now be heard in North Omaha on 28 Mc. FQB is active on 14- and 7-Mc. c.w., as well as 23-Mc. 'phone. The Ak-Sar-Ben Radio Club signed up eight new members last meeting and will hold annual election in November. Well, gang, this is my last report. I want to thank each of you for your contributions toward keeping the Nebraska section on the map, and ask that you give your new SCM, W@POB, the same consideration. Thanks very much and Holiday Greetings to all. Traffic: W@TQD 256, FQB 4. 73. Art.

NEW ENGLAND DIVISION

CONNECTICUT — SCM, Edmund R. Fraser, W1KQY — VB, our RM, has the Nutmeg and New England Nets working smoothly. Nutmeg Net Control stations are: ITI, Mon.; EFW, Tues.; CTI, Wed.; KQY, Thurs.; and VB, Fri. New England Net Control stations are: BVR, Mon.; OUD, Tues.; CTI, Wed.; BIG, Thurs.; and VB, Fri. Nutmeg Net meets 7 p.m.; New England Net meets 7:45 p.m. Mon. through Fri., both on 3640 kc. VV, SEC, wants all ECs to report. H SX, of New Haven, passed away in October. He was RM, ORS, OPS, BPLR, A1 Operator, and RCC, WAS, and WAC certificate holder and an outstanding traffic and DX man, 'phone and c.w. Club News: ACV reports temporary BARA officers are KAB, chairman; ACV, secy.; OPG, treas.; MQM, GRU, and KUH, activity committee. GRU worked KL7. MGS has new QTH. ACV has applied for two-letter call. OPG has HRO, 3.5-Mc. Zepp 90 ft. high and Gamatron 254 final. MQM is running 40 watts looking for space to put kw. rig. LGN has new HRO. Joe Dietz reports the SARA participated in state-wide field tests. EC OGQ was in charge of ten mobile units. Messages were flashed from points in Stratford, Bridgeport, and Devon. FSY, HYF, and Ernest Hugh attended Boston Hamfest. The latter took Class B exam. OS, ex-8HCO/1, BRAS member, reports that RY, now in Bridgeport, is working plenty of DX and building p.p. 250TH final. EHI is using 40 watts and three-element beam on 28 Mc. MWN is on 3.9-Mc. 'phone with 500 watts and is constructing 144-Mc. rig. ERL is on 144 Mc. JBK is on 3.5 Mc. OGS, Bridgeport EC, participated in state-wide field tests. JVM has HRO-W on 7 and 14 Mc. OS, on all bands above 50 Mc., has worked twenty-two countries on 3.5 and 7 Mc. DXT, secretary of Newington Amateur Radio League, reports the club has reorganized. News in general: EFW has daily traffic schedule at 9 p.m. with 20BU and reports CJD replacing blown transformer. BGJ, GTH, BTU, GSP, and FPM are active on all bands. IKX is using TR-4 on 144 Mc. ORP has VE2 daily schedule. BIH relayed message direct from XU1YR. KKS has thirty-two countries on 28 Mc. ON reports PEY, ex-DEN, is active on 7 Mc. DWP is building new rig for 3.5, 7, and 14 Mc. 5IA now is IIC, SWTS is PJJ, PFU and EFW visited KQY. APA reports that KKY and LEP operate on 28 Mc. BHM is piling up DX using BC-610 and HQ-129X and has weekly schedule with 9ZB, former 1YU operator. NJM works rig remote control from upstairs. BDI is overhauling 144-Mc. gear. WR is Litchfield EC. ORS: AMQ, DAV, GB, JTD, AFB, PJJ, GC, IC, NJM, CJA, and LKF. OPS: MEM. OBS: GB. Traffic: W1VB 423, UE 367, CTI 108, JMY 93, NJM 90, EFW 76, WAW 75, LOP 60, KQY 59, DAV 52, BHM 23, OS/8HCO 20, ORP 12, TD 7, FTX 6, DWP 3, BIH 2, APA 2, GC 1, HYF 1, 73. *Ed.*

MAINE — SCM, G. C. Brown, W1AQL — J. L. Rennett, Aberdeen, Scotland, writes that AQM and AGK are pounding in over there on 28 Mc. FV sent in his ORS ticket for endorsement and reports that GE attended the hamfest in Boston. LNI reports the following new stations around Portland: OHY, ODP, ODA, OIS, OIL, and OGZ. He also reports that the Portland Amateur Wireless Assn. is being reorganized. NXX is building a 100-watt rig. GKJ is rebuilding. NKM has commercial power now and has a 40-watt rig going; he also has a new HQ-129X. AWT is building crystal-control for 144 Mc. FBJ says that GKJ has offered to organize Cumberland County for EC work. 4HRN, ex-1LHA, sends his regards to the Maine boys. He is moving to Port au Prince and will be on 3597.5-, 7050-, and 14,010-kc. c.w. and 3960-, 14,845-, and 28,690-kc. 'phone from HH after Jan. 1st. LKP wants schedules on 7 and 3.5 Mc. in the late afternoon. He met ARV and a lot of the gang from southern Maine at the Manchester Hamfest. BWB is trying to contact EBY at Farmington Falls. OHT sends in his first report and says that BIG is trying to reorganize the Pine Tree Net. FNL and CBV attended the Boston Hamfest and report a record-breaking crowd. At the recent CAP AAF air show in Auburn-Lewiston five mobile 144-Mc. units were manned by OHY, OKU, OIS, OIL, FXA, AUC, DAS, LYK, PNB, IGW, FBJ, AFT, GXY, and LOA to furnish communication from point to point on the field. KJJ is building a new beam for 14 and 28 Mc. IYP has a

Class A ticket. 2PRW/1 is working from Pine Point with 175 watts on 28 Mc. HWP is a dispatcher for Portland Police Radio. LDC was D4AKG while in Munich, Germany. Ex-ART now is KP4DC. CBV and ALZ called on HOM in Malden, Mass., recently. Traffic: W1FBJ 8, KOB 3, LKP 2, 73. "GC."

EASTERN MASSACHUSETTS — SCM, Frank I. Baker, jr., W1ALP — KTE renewed OPS appointment and will carry on as PAM for 3.9-Mc. 'phone. Several OPS want to get a net going on this band. If interested, write to KTE. AAL and AAR renewed OPS appointments. KZT and AAL renewed ORS appointments. MEG and JDP are new ORS. OHR is new OO Class 3 and 4. 4DGS is active on 3.9 Mc. CTW is OES. Sorry to have to report the death of BCH of Hingham. Ex-1WV is 6ZZ and would like to QSO the gang in this section. Ex-3HCE is 1PJG. 7IGY won an HQ-129X at the Boston Hamfest. Ex-2CLK is PIM in Danvers. MOJ and LZW are Class A. The R.L.D. net is on 3775 kc. at 7:30 p.m. each week-day night. These hams get on now: NYH, OUD, EPE, DWO, TH, and FPS. ESN won an RME-45 at the hamfest. KCP's new XYL won an S-40 at the hamfest, and LIO and NC240-D. 9IRK is on 144 Mc. Ex-1FZX is 2SPB in Neptune, N. J. Ex-8DMW is 1PFD in Pittsfield. PFA is on 28 Mc. OAJ is operating on 3.9-Mc. 'phone from Beckley, W. Va. K6LBY is on 14 Mc. OOP is on 144 Mc. V06K, now in Battle Harbor, Labrador, is on 14,310-kc. 'phone at 6 p.m. EST nightly and on 14,100-kc. c.w. daily. PGN is a new ham in Melrose. AYD won an HQ-129X at the hamfest. The Brockton Amateur Radio Club meets at the YMCA on the 1st and 3rd Monday nights. The 56 Mc. Minutemen held a meeting at EHT's. New officers: IN, pres.; AJW, secy. Sunday meetings are held at 9 a.m. on 50 Mc. OHR is Concord EC. The T9 Club met at 8BBQ's house in Marblehead. OEK has a pair of 24Gs on 144 Mc. MEG has 200 watts on 7 and 14 Mc. JDS is building a new shack and outfit. HSV and PFJ, ex-8CLS, spoke at Eastern Massachusetts Club meetings. 6ZZ is looking for a QSO with Vermont. OUD made over 25,000 points in the CD Party and won a Vibroplex at the hamfest. NXY has a coaxial tank 144-Mc. receiver. BB has schedule with G2PL and D9AAB, MRQ has schedule with DXV and his XYL won a multimeter at the hamfest. AAL has five frequencies each on 3.5, 7, 14, and 28 Mc. ONV has worked thirty-eight countries and took two messages from 6VKV/16 in Asmara, Eritrea. BDU is in the Hit and Bounce Net at 6 a.m. daily. The following are on Eastern Mass. Net on 3745 kc.: KZT, EPE, FGT, EMG, OUD, JYJ, KTU, JCK, and BDU. JSM worked 2HWX in Little Silver, N. J., on 147 Mc. from QTH in his car, 15 watts HY75, six-element beam, his seventh state. OMM QSOed VS9AB on 28 Mc. LQQ QSOed YR5X and ZS1CN. JNE has thirty countries on 28 Mc. LQO QSOed Nevada after eight years. LMT is building with a pair of 812s for modulators. BPH has new beam on 14 Mc. PCC, ex-8UGH, is on 14 and 3.9 Mc. MVG has new HQ-129X. OBF is working on v.h.f. BKR has a rotary on 144 Mc. BB held FB emergency test with these hams on: DJ, OIR, BDU, MEV, and OOK. MX has new location at M.I.T., Bldg. 20, Room 20E-201. Officers of N. U. Radio Club KBN are: LJW, pres.; NYA, secy.; PFK, treas. OKB is on 28 mc. The Suburban Net has decided on 28 Mc. for reopening. BHD is on 14. CTW worked nine W2s in a row on 144 Mc. LDD has new NC 1-10-A. DNL has 300 watts on 28 Mc. Traffic: W1BDU 157, OUD 122, FGT 90, EMG 84, LM 36, BB 23, AAL 17, OHR 9, 4DGS 6, MEG 4, NXY 4, ONV 4, ALP 3, MD 3, MRQ 3, OEK 3, AAR 2, JDS 1.

WESTERN MASSACHUSETTS — SCM, Prentiss M. Bailey, W1AZW — SEC: BSJ. RM: BVR. IHI is new ORS. NKN and ODU are taking flight instructions. BIV reports JXE is back with us and soon will be on Western Massachusetts Net. LUA has a BC-324 receiver and says it's 'PB. He also has a BC375 transmitter on order. A new on-the-air club in the Springfield area is the 144 Club. Members are 8EJA/1, 3ROC/1, 10BQ, OLS, MSN, OJV, NLE, KUE, BSJ, and NY. They meet each Wednesday night on 144 Mc. and plan monthly social meetings. W1FOI is no more. He obtained his original call, WINY, from the FCC. COI is new OPS. He is also playing with 2300-Mc. equipment. GKK has new 14-Mc. three-element rotary and it really works, with J and XU for his newest DX. JXY has

new 28-Mc. three-element rotary. PHZ is new ham in Adams. BVR attended 30th anniversary of the founding of the New Haven Amateur Radio Club and also the Boston Hamfest. BVV is spending some time on 'phone and has applied for OPS appointment. LUD, HNE, and yours truly attended the Manchester Hamfest. The Pittsfield Radio Club elected new officers recently. OMJ is pres.; 7EZT/1, vice-pres.; IZN, secy.; JGY, treas.; and LKO, activities manager. HAZ has had great success with f.m. on 28 Mc. The Worcester County Radio Assn. held a very successful Halloween Party. The Pittsfield Radio Club's Halloween Party was held at the Stanley Club. Everybody had a swell time. Traffic: W1NY 84, BVR 66, IHI 33, JAH 33, AZW 13, JGY 8, BIV 4, NKN 1. 73. *Prent.*

NEW HAMPSHIRE—SCM, John H. Stoughton, W1AXL—On behalf of the amateurs in New Hampshire I would, at this time, like to thank the Manchester Radio Club for its efforts in making our State Convention a huge success this year. We all feel proud to know that we have such a fine up-and-coming radio club in this section. Following is a list of the ECs: AXI, Exeter; AXL, Claremont; BST, Laconia; GDE, Manchester; KPL, East Jaffrey; LYA, Gorham; LVG, Concord; MRN, Wolfeboro. Contact the EC in your vicinity and join the AEC. 4HMS/1 has been attending several hamfests. OCY is a new ham in Charlestown. He has a 500-watt rig on 7.2 Mc. and will be on 3.9 Mc. 'phone as soon as he can get a modulation transformer. ATJ is our new RM. He has been working across the pond on 3.5 Mc. AXL and ATJ are running tests on 144 Mc. We would be interested in hearing from any of the gang who are working the new 50-Mc. band. It is expected that there will be some activity on that band on the western side of the state in the near future. Traffic: W1ATJ 32, AXL 4, 30, #4.

RHODE ISLAND—SCM, Clayton C. Gordon, W1HRC—MWK is at U. of Chicago working on bachelor's degree in English and is engaged to an XYL out there. He would like schedules on 7- and/or 14-Mc. c.w. with R. I. gang after the first of the year. His QTH is 5639 University Ave., Chicago 37. (MEK-NCD, take special note.) EZ says QR9AN on 14,050 kc. needs Rhode Island, Connecticut, and New Hampshire for WAS. He is on every day at about 1430 GMT. QR has converted TR-4 for 144 Mc.; also he has acquired an NC-1-10A receiver and would like some help on the N. E. Net schedules. DWO is working on electronic bug which is giving him plenty of headaches (more than one bug in the bug). LWA has worked thirty-one countries on 7 Mc., including PK1VHN, UA3AW, KH6DI, OK2MA, XAGY, and HK3CX. INU is working on auto-keying unit using photo cell and awaiting arrival of his Connecticut Net crystal which, by the time this comes out, probably will be the relief you are looking for. QR. Traffic: W1DWO 29, QR 21, LWA 8, HRC 2.

VERMONT—SCM, Gerald Benedict, W1NDL—NWW, a new ham in Rutland, is on 14 and 3.9 Mc. AVP is putting up new Johnson Q 28-Mc. antenna. MMU now is ORS. MMU is trying to get Vermont Net going on 3740 kc. Give the net a call at 6:30 p.m. JMO, GQJ, and NDL attended PCN meeting at Millbury, Mass. GQJ has his nice shack in the basement nearly completed. OKH is building 28-Mc. rig. BJP has new NC-240D. BD now is operator at WCAX. Traffic: W1AVP 6, 73. *Jerry.*

NORTHWESTERN DIVISION

ALASKA—SCM, August G. Hiebert, K7CBF—The Fairbanks Arctic Amateur Radio Club now is in possession of an all-band transmitter, using 75Ts in the final donated by AI, who will spend the winter at Goodpaster using flea power. The transmitter is located at Fairbanks Public Schools in a new club room. There's a nightly 3940 kc. Alaska net going strong at 6:30 p.m. Alaska time, including CA, CX, EU, BH, 9HRK/KL7, ES, DB, DE, ED, CI, 5LEF/KL7, VE8AJ, FH, FC, DY, ISQ, and FR. DX hounds will be glad to know AD is back at Tanacross after a stateside junket. CF has rebuilt and now handles traffic from the States and Canada on 7 Mc. with only 25 watts. Traffic: KL7CF 11, 73. *Augie.*

IDAHO—SCM, Alan K. Ross, W7IWU—Reports are coming in faster now. Thanks a lot and keep them coming.

EEY and KEK report Magic Valley Radio Club was host to Southern Idaho Radio Club in Rupert Oct. 26-27. KEK won a Vibroplex in code contest with 53 w.p.m. and says "I'll have to put a rig on c.w. again. HI." DLA was official operator. IOA won a portable-mobile DX prize. HKJ also has a mobile rig. KBU was beer champ. ACD flew down from Shelley. HST was drafted as taxi driver. BMY was busy with entertainment. A venison dinner was served, one deer each by IEY and JHY. The club voted to become affiliated with ARRL, and to hold next year's hamfest at Yellowstone. BAW has new HT-9. JPP is building work bench, then the rig. Ex-BKK has FB location for future operating. Spirit Lake reports three actives: HXN, HIQ, and IGU. IYG schedules J9AAK for traffic and sports new DB-20 and Panadapter. BAA checks in on Gem Net. Traffic: W7JMH 62, IWU 46, IYG 22, 73. *Alan.*

MONTANA—SCM, Albert Beck, W7EQM—Section EC: BWH. KGJ is a new ham in Billings. CT is doing a splendid job as OO. Keep your carriers clean, fellows, New officers of Southern Montana Radio Association are: FIN, pres.; CT, vice-pres.; HVB, treas.; IWW, secy.; GFV, sgt. at arms. IWW runs a kw. on 14 Mc. CT has 300 watts on 3.9 Mc. #KET/7, a new ham in Missoula on 3.9 and 28 Mc., likes Montana. Your SCM's new QTH is 2326 Amherst Ave., Butte. KHG and KWA are new in Butte Club. EMF, JFR, and CJN are continuously active on 144 Mc. Traffic: W7CT 5, 73. *Al.*

OREGON—Acting SCM, Cliff Tice, W7BEE—QP sends news of Klamath Falls. While there are eighteen hams there they seem to be too busy to cause much QRM. The list follows, as it may give others an inkling as to where they live: JFD, IDJ, JLF, JRJ, JWM, HDU, GML, GLX, FWC, HMG, IRT, JBF, KCI, HVD, IBY, JEB, QP, and 6VK5/7. KCI has a new HT-9 transmitter. IDJ still is trying to find the 144-Mc. band. If any of the gang hear JWM, try to contact him slowly as he is blind. A report from HBO, in La Grande, gives news of that location. JOD and IMM are on 28-Mc. 'phone. HBO is on 14- and 7-Mc. c.w. IGI is on all the bands open to 'phone. The Portland Radio Club has been reactivated with about ninety members, after four years of inactivity because of the war. FZK is president, LT vice-president and treasurer, and HTS secretary. Meetings are held the second and fourth Fridays at the Harper-McGee Auditorium. Code and theory classes are being inaugurated and new-comers are invited to contact AEF for details. Most of the activity around Pendleton can be chalked up to MQ. However, the most steamed-up member here is KR. He really is getting interested! BEE manages four or five contacts a day, but none of the high lights have come through yet. May I ask the same cooperation for the new SCM as I have had while I have tried to carry on for GNJ. Very 73. *Cliff.*

WASHINGTON—Acting SCM, Lloyd Norberg, W7EHQ—The Bremerton gang had a basket social. The club has 100 per cent of the available hams. GWL has a new 14-Mc. beam which he built in the basement. CW is on 28 Mc. with three-element beam. JNF and EBL are working 14 and 28 Mc. Navy Day call was PS from PSNY. ARAB officers are GXU, pres.; EBL, vice-pres.; GWL, secy-treas.; BTE, bouncer. KBQ has a new YL operator. JQD is at WSC. ELH has portable-mobile on 28 Mc. DP is on 3.5 Mc. FDD is active on 3.9 Mc. DGN reports the Dreamboat fight kept him active working on the ether, also scheduling KL7CB and working AYO for the first time in ten years! BQW has 70 watts on 28 Mc. CDS is on 3.5-Mc. c.w. KCN is on with 200 watts into three elements. AQB, with 750 watts on 28 Mc., is building model planes. BMB has new HRO and 450 watts on 3.9 Mc. ENR is on 3.9 and 14-Mc. 'phone. FLD has a California kw. and new HRO working all Aberdeen DX. CKZ has new HRO and super-pro three-element transmitter with 4-125A p.p. GVJ is on 14 and 28 Mc. with 200 watts. HGC, ex-8JKO, on 3.5 Mc. schedules Spokane. JJJ reports HXT on 3.9 Mc. with new HT-9 when not at KJR. DET and RY have new three-element beams. FPP reports from Walla Walla. EMP is on 28 Mc. working bundles of DX. GW lost his beam in a windstorm. KBL is a new-comer. DTK is on 3.5 Mc. with 807. FDN is operator at KWWB. GUN is on with flea power and 117L7. FFP is on 3.5 Mc. IMB, on 28-Mc. mobile, works yours truly, who also is on 28-Mc. mobile. FWD has new BC-610. The Radio

Club of Tacoma meets at Labor Temple Wednesday nights. DAI is living with 813s to cure parasitics. JGI is the only living W7 to work ZS the long way around on 28 Mc. GVL is a new addition to Tacoma. Washington State Patrol Net works on 3715 kc. CMX is key station. IVK is chief engineer for Tacoma Police and KVI. FYO operates 28-Mc. mobile between inaking beds at his cabin camp. BG is on 28-Mc. with HT-9 and new HRO. DSZ acquired bug again, and is on with 807 and HQ-129X. The Amateur Radio Association of Bremerton wishes to notify all neighboring clubs of the hamfest to be held in February. Gang, get a report to me by the 7th of each month. Traffic: W7CZY 10, APS 8. 73. Lloyd.

PACIFIC DIVISION

HAWAII — Acting SCM, John Souza, KH6EL — KH6FD, better known as K6ROJ, has finally worked WAC on 28 Mc. KH6AA has found a site atop Mt. Haleakala and finds his 22 watts to single 807 sufficient to work anything he can hear. KH6DF has acquired an "LM" frequency meter. K6NSD has shifted his vertical doublet to a horizontal position and finds DX easier to work. KH6EW is building a three-element beam for 28 Mc. KH6ED received five spot-frequency crystals and is found all over 14 Mc. c.w. K6SDM has moved to new QTH. KH6BA has been appointed QSL Manager. K6LBI, former QSL Manager, now resides in Colorado Springs, Colo. The Maui Amateur Radio Club held a bang-up Initiation Party Oct. 12th for nine new members, including two YLs. KH6ET has been keeping the 28-Mc. band under close scrutiny. Don't forget to address a card to Box 1755, Wailuku, Maui. 73 and Aloha. Johnny.

NEVADA — SCM, N. Arthur Sowie, W7CX — Asst. SCM, Carroll Short, jr., 7BVZ. RM: 7PST. ECs: 7JU, 7TJY. Asst. EC: 7OPP. ECs: 7JUO. OES: 7TJL. 7JUO, ex-6GSB, has his Nevada kw. on 3.9-, 14-, and 28-Mc. 'phone. 7JLN has opened a radio supply store in Las Vegas for the boys. 6OPP is W7 now so the only remaining W6 is 6IAJ. 7PGD will have his 809s on soon. 7JU has 308 at 300 watts on 7 and 3.5 Mc. 7CDM is building a high-powered e.c.o. and will have it on soon. 7BVZ has a new BC-610R on the Sagebrush Net (3898 kc.) and the Nevada State Net (3660 kc.). 7ONG has a pair of VT127As and a fine signal. 7RXG is very active on 3898 kc. 6FUO, now 7GC, is building a 14- and 28-Mc. beam using aircraft propeller pitch motor, as is 7BYR and 7CX. 7TQZ is active on the HIGH end of 28 Mc. with an FB beam made of surplus gadgets. 1OKG is back in Reno to stay. 95 per cent of the reports this month were from Southern Nevada. 73. Art.

SANTA CLARA VALLEY — SCM, Roy E. Pinkham, W6BPT — Asst. SCM, Geoffrey Almy, 6TBK. PAM: QLP. LCF worked on OK on 7 Mc., which is the first report we have had of Europe being worked on 7 Mc. postwar from this section. Bill uses a long wire and a BC-610. ZZ, formerly 1WV, reports DX good on 14 and 28 Mc. Miles has thirty-nine countries. CIS now is ORS and has two European contacts on 28 Mc. using an indoor doublet with input to final of 60 watts. Ken made 21,352 points in recent CD QSO Party working forty-two stations in twenty-four sections during a six-hour operating period. SYW reports a new HQ-129-X, and new speech amplifier and mike. PBV still is busy at his work with CAA but finds time to push the San Mateo Radio Club. Bob reports the club has eighty-one members with most of these holding amateur calls. He changed a p.p. 4E27 driver stage to a single 100TH doing away with many bugs. Bob now advocates triodes. His total of countries worked is forty-four. WUI, formerly 7IKU, has his list of countries up to thirty-nine. Lee uses 1 kw. input and a four-element rotary. CFK changed his final back to p.p. 812s and is trying to get an antenna beamed on Europe. KG's evening pastime is working Japan and China on 28-Mc. 'phone. IXJ is QRL teaching code class two nights a week so is not very active on the air. YAL is new call heard from San Jose on 28-Mc. 'phone. I would like to have reports of the activity in the Santa Cruz, Watsonville, and Monterey areas. How about it, gang? What's doing over your way? Traffic: W6DZE 12, ZZ 10, TBK 4. 73. Pinky.

EAST BAY — SCM Horace R. Greer, W6TI — Asst.

SCM, C. P. Henry, 6EJA. RM: ZM. EC: QDE. Asst. EC u.h.f.: OJU. OO: ITH. OBS: TT, IDY, ZM, ITH, RMM, UZX, AKB, TI. ORS: LMZ, EY, EJA, QDE, TT, ZM, RMM, OJU, TI, QXN, DDO, WNI, DUB, NRM, QUL, KEK. OPS: EY, ITH, TT, QDE, OJU, ZM, CRF, CDA, TI, DUB, RMM, EJA, QUL, KEL. Those interested in traffic should apply to yours truly for ORS or OPS appointment at once. EE has resigned as Section EC. To help stimulate interest in DX, at a dinner meeting, held Oct. 10th at the Hotel Coit in Oakland, a new organization was born and will be known as the Northern California DX Club, Inc., with headquarters in Oakland. The following twelve charter members were present: IKQ, UPV, QLH, BUY, TT, DUB, TI, JLM, EJA, AED, PB, and ITH. AM is an associate member. PB was elected president, IKQ, vice-president, and EJA, secretary-treasurer. Monthly meetings are being held. Your SCM wishes to take this opportunity to wish everyone, everywhere, Season's Greetings BUY and PB are sporting new Hallcrafters SX-28A receivers. CRF reports that the employees of Naval Electronics Facilities (radio lab) have organized the Mare Island Radio Club and have been assigned the call W6USN. The station was in operation Navy Day and messages were handled for visitors. A new club, the Vallejo Radio Club, has been formed. LMZ finally hooked an LU for postwar WAC with 807 final. EJA is working his share of 14-Mc. c.w. DX. ITH puts out the official bulletins on 3.9-Mc. 'phone immediately following the WIAW broadcast on the 14- and 7-Mc. bands. QXN is on the Atlantic-Pacific Net Mon. through Thurs. at 8 P.M. KEK hopes to have 28-Mc. mobile rig going soon. TT has new Hammarlund Super Pro. NRM is looking for a plate transformer to run his projected VT127A final. WKF, ex-9VWJ, built a new e.c.o. and is working very FB driving an 802, 211 on 7-Mc. c.w. NAO and CWR are building new rigs. CWR was chief and last station on Guam. WNI and VDY visited the boys in ZL-Land and attended SART monthly meeting in October. WP is back on the air with FB signal with p.p. 35Ts in new transmitter. SAN is on the high seas, but while home built a new ham shack. He has new BC-610 and HQ-129X. UZX is good OBS. Traffic: W6QXN 166, ITH 36, KEK 16, WNI 12, CRF 5, UZX 5, TI 4, DUB 2, NRM 2, TT 2. 73. TT.

SAN FRANCISCO — SCM, Samuel C. Van Liew, W6CVP — Asst. SCM, Joseph Horvath, 6GPB. RM: RBQ. ECs: DOT, KZP, LLJ, SRT, UHN, VCG, QFX. OO: NJW, WB. OBS: FVK, KNH, DJI, OZC, BYS. ORS: RFF, BIP, ATY, RBQ, CVP. OPS: OZC, NYQ, EYY has new RME-45 receiver and is active on all bands; he also has 4FQY/6 for a neighbor with 450 watts on 28 and 14 Mc. 28 Mc. is doing fine with lots of activity and new recruits. AHH worked AG and EI with 18 watts on 28-Mc. 'phone. He has a very fine rotary beam. VQB, with 5 watts to 802 worked 6NAQ S-9 on 28-Mc. 'phone using folded dipole antenna. Dave is planning new crack at 420-Mc. record. Ex-KOV, now WQO, is back on 28-Mc. 'phone with 807 final. PTS is building mobile 28-Mc. rig. DWK has 28 Mc. mobile rig. VPJ is on 28-Mc. 'phone. KNH is trying out narrow-band f.m. on 28-Mc. 'phone. JQC burnt out his rotary beam motor but it is now rewound and perking again. UDY is on 28 Mc. with 807 final. NPO is running 100 watts on 28 Mc. LGC schedules 6HBM, St. Cloud, on 28 Mc. HUY is converting DC-375 for c.w. work. JXK uses folded dipole on 14 Mc. and contacts South Africa with ease (ZS5M). Gunnar Ahlstrom, ex-QJ, is VK2AQ in Australia and is the only American to receive a VK call. He is the proud father of a fine boy. Louis Querolo, ex-RV, is in Germany as civilian engineer for the Army Air Force and will remain about six months. NYQ is building a new 250-watt rig for his country home and will operate on 3.5-7-, 14-, and 28-Mc. 'phone and c.w. FVG is rebuilding but expects to be on soon. QFX has 144-Mc. rig at home QTH and also a 144-Mc. walkie-talkie. VCG also is on 144 Mc. He is the proud papa of twin harmonics, a boy and girl. Congratulations. EQA sold his rig and is building again. RFF has almost completed new 500-watt c.w. rig using p.p. 35Ts. The CD QSO Party brought out quite a number of participants in this section and some good scores should be turned in. RBQ should be well up with 150 QSOs. The San Francisco Naval Shipyard Amateur Radio Club held a picnic and field day Oct. 12th. Hamming on 144 Mc.,

ROANOKE DIVISION

boating, and taking snapshots furnished a pleasant day for all. The San Francisco Radio Club held its monthly meeting Oct. 25th. The speaker of the evening was Mr. Winfield Wagner, of Eitel-McCullough. His talk on "Using the New Tetraodes in R.F. Circuits" proved very interesting to all. The ARRL Emergency Corps membership is building up rapidly and anyone wishing to join should send in his name and address to the SCM, 215 Knowles Ave., Daly City. Traffic: W6RBQ 26, RFF 8, BIP 7, CVP 4. Sam.

SACRAMENTO VALLEY — SCM, John R. Kinney, W6MGC — The SARC, Inc., has moved meeting place to the Clunie Memorial Club House. At the Oct. 16th meeting RMP won a Vibroplex donated by the Sacramento Electric Supply. Newly-elected members are: WTL, NRZ, WSD, and 7KBN/6. SYN, an applicant for ORS appointment, reports a get-together for a daughter and mother-in-law, who had never met each other, via 8CBY. He also reports using a four-element beam on 28 Mc. with 35Ts in p.p. PIV, newly-appointed ORS, reports that REB was the organizer of the Pioneer Net which includes TFO, ABD, UXF, PIV, REB, and 8ZAR on 3725 kc. and 71WU, 7IEE, and 7MH on 3745 kc. DBP reports the nineteen hours of operation on 7 Mc. in the Get Acquainted Party netted him a score of 4212 on 7 Mc. OJW is rebuilding to be on e.c.o. on 3.5, 7, 14 Mc. and 28 Mc. on 'phone and c.w. with off-center-fed antenna. MGC received his Millen exciter. Plans now are for united 812s in p.p. for final with center-fed antenna for 7- and 14-Mc. c.w. RMT put up a three-element beam and intends to represent Walnut Grove for DX. GVM reports following DX worked on 14-Mc. 'phone: ZK1AB, P21G, F7AE, FG3FP. He received BCL QSL from EL4A. WSL recently received call and first stations worked were KH6FD, W6QBM/KH6, VK3XA, XE1LE, XE1JS, and XE1AG. WTL, another new station, reports first DX worked was J2EUG. MDI, former SCM, now is in Ashland, Ore., and is on 3.5 Mc. PBE, in Weed, has been honeymooning. Our best wishes to him and his bride. Traffic: W6REB 71, PIV 70, SYN 15, GVM 4, OJW 2. Very 73. Jack.

PHILIPPINES — SCM, George L. Rickard, KA1GR — The following report was sent in by Craig B. Kennedy, KA1CB (KA3CB), Acting. Active on 28 and 14 Mc. are 1ABA 500, 1AK 500, 1AW 750, 1CB 1000, 1SS 750. On 14 Mc.: 1AL 500, 1NR 500, 1RC 500. On 28 Mc.: 1ABR 500 and 1ABN 50. 1AL, 1NR, 1RC, and 1CB are the only civilians on the air. 1AW, 1ABA, and 1SS are QSOing on 28 Mc. 1SS, 1AW, and 1CB are building for 50 Mc. QSLs may be sent to Philippine Amateur Radio Association, Manila. B.C.N.U. on all bands. 73 and DX. Tex.

SAN JOAQUIN VALLEY — SCM, James F. Wakefield, W6PSQ — Bakersfield has organized the Kern County Radio Club with MEL as president and PLJ as secretary-treasurer. They meet the 2nd and 4th Tuesday evenings in the Chamber of Commerce Bldg. in the Fair Grounds. Down there MEL, RJE, DYJ, and TUN are the 144-Mc. hounds. MEL and RJE also are active on 50 Mc. RZQ, in McFarland, is on 28 Mc., as is WMU in Wasco. FIS and TUN are on 3.9 Mc. and PLJ is on 7 and 14 Mc. From around Stockton comes word that WHO and UWY are the big DX boys up that way. PRD has a pair of 6L6s on 7 Mc. VPV has a pair of 3C24s. GHS, Manteca, has a pair of 813s on 28 Mc. OYF has p.p. 8005s and SYR is on 28 Mc. WBZ has folded doublet on 3.9 and 14 Mc. WHO is using vertical "J" antenna up 60 feet. PRD is on 3.5 and 7 Mc. with p.p. 812. PNM is on 28 Mc. with an 807. In the Fresno area LTO, WKT, JPU, and OWL are e.c.o. on all bands using LM-13 as the "poosers." They can give you a frequency check anytime. SGH had the University of Hawaii football team over to talk with the families through K6ETF. KUT has HK-354 with a kw. on 7 Mc. NJQ is located in Oakland. LTO has 450T on all bands with a kw. 'phone and c.w. PCS has kw. on 14 Mc. using p.p. 250THs into three-element rotary. WJI has 300 watts on 3.5 Mc. using p.p. 811s. PJF, the XYL of INP, in Stockton, is on 3.5 Mc. Any other YL operators in the section? Drop me a line with a picture for possible QST use. Send in more dope. 73. Jimmie.

NORTH CAROLINA — SCM, W. J. Wortman, W4CYB — Ex-9SEA is in Greensboro and is 4GHB again. KHR is ex-20PR operating 3.9-Mc. 'phone. 2CPU is operating fixed portable near Burlington on 14-Mc. c.w. and has lots of DX to his credit. 4INL is with W.E. at Burlington. HLK, IPB, and HEQ also are with W.E. Contacts are wanted in the State by 6OZD, ex-4CPT, who is on 7 Mc. 4COO is rebuilding for 14 and 28 Mc. EYG is trying more power on 28 Mc. 2ASQ is active in Winston-Salem. NC, CPT, and BYA are heard. HER is working a nice bunch of DX on 28 Mc. FXU had over 200 contacts in the CD Contest and is handling traffic. Contact Bob, who is RM, if you are interested in traffic. KFM, a brand-new ham at Asheville School, promises a monthly report. The Charlotte AEC had a simulated emergency test with DCS as control station and DCS and EYF as operators. CFL, HJY, HGC, CAY, BX, HUJ, AJF, KKG, FCB, and CYB took part. Portable equipment was taken to a specified location and set up and was in operation twenty-five minutes after the "emergency" was declared. We still are looking for clubs to forward recommendations for EC appointment. A list of these appointees has been requested by the Atlanta office of the Red Cross. How about it, fellows? Lots of illegal operation in one section of the State on 144 Mc. has been reported. How about running it down, fellows? One of the gang reported that he was ashamed of some of the quality of signals coming from our section. It is reported here for what it is worth. Maybe I am guilty, are you? We wish the entire gang a very nice operating year from all viewpoints. Please keep us posted on your activities so we can put your call in this column.

SOUTH CAROLINA — SCM, Ted Ferguson, W4BQE/ANG — BPD reports that the hurricane took two of his rhombics and that he has a ten-element curtain on 28 Mc. that really works. DPN is reported to be on 14 Mc. EGH is working 28-Mc. 'phone. FNC can be heard on 3.9-Mc. 'phone. FNT reports an FB list of DX from the "Rock" and says that he will have the assignment of handling traffic from the boys on Okinawa. MJ works 14-Mc. 'phone. GKD says it is 28 Mc. for him. CZA can be heard pounding them out on 3.5 Mc. FNS still is working c.w. all bands. EC BAT reported on the emergency test by the Charleston club. Those taking part were AFQ, CXE, DFC, CZN, HJR, KAB, BAT, DNR, CZA, FXH, HTR, and IZD. HMG originated several messages from Columbia officials for the Charleston officials. IZQ is increasing power. The Columbia Amateur Radio Club, Inc., meets the 1st and 3rd Friday, at Laurel Street USO. I wish to thank ERF, IRU, KZ, CEL, and HWZ for their campaign letter. Don't forget me in '48. RMs CZA and FNS are looking for net members for the South Carolina 3.5-Mc. C.W. Net. The ARRL has given us the frequency of 3735 kc. for our 3.5-Mc. net. The SCM will receive applications for ORS and OPS appointment and hopes that other nets will develop soon. A jr. operator is announced by EZF and GUZ. Traffic: W4HJR 12, HMG 9, CZA 8. Ted.

VIRGINIA — SCM, Walter R. Bullington, W4JHK — JFM has an 833 in the final, with a kw. input. INS worked a KH6 on 3.5 Mc. 3ER now is 4RI. QY encountered an antenna ban at his housing development and is wondering if there is any substitute for this item. 3HV/4 is active in Manassas. KJT, ex-6PJP, and KFC, ex-6KFC, are neighbors again. The Arlington Radio Club held an election of officers at its November 7th meeting. All amateurs in the District area, i.e., Washington and vicinity, are cordially invited to meetings, which are held every other Thursday evening. Those interested in attending should contact Jerry Scarano, 4JFM, 207 S. Courthouse, Arlington. IYC snagged VS9AB on 28-Mc. 'phone. He also schedules P7AA in Paris handling informal traffic. 3HAE/J is back in Norfolk. He acquired an XYL Aug. 31st. HBF helped tie the knot. Congrats, Bus! AGH is on 3.9-Mc. 'phone daily. KQJ is on 7 Mc. He is ex-3HWG. The amateurs around Roanoke have organized a new club. Officers are: JDT, pres.; BTL, vice-pres.; Armisted, activities manager. The club name will be announced later. We need more ORS in Virginia as traffic is beginning to roll. Anyone interested

(Continued on page 88)



Merry Christmas

and

Happy New Year

from

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| Paul Silbert..... | W1AGE | Leo Green..... | W1LML |
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| T. P. Leonard..... | W1AUJ | Richard Thurston..... | W1MFZ |
| Herman S. Bradley..... | W1BAQ | Frank Nault..... | W1MKC |
| Lawrence Amann..... | W1BG | Carl Beckman..... | W1MPF |
| James Ciarlone..... | W1BHW | Robert Wallace..... | W1MQV |
| Calvin Hadlock..... | W1CTW | Edmund Ogden, Jr..... | W1MTO |
| Henry Minich..... | W1DEU | Victor Penney..... | W1MTS |
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| Seth Card..... | W1DRO | Dexter Atkinson..... | W1MYH |
| Harry Gardner..... | W1EHT | Richard W. Houghton..... | W1NKE |
| J. Francis Bartlett..... | W1EU | Joseph Margi..... | W1NSQ |
| William Osborne..... | W1EXR | Martin Oxman..... | W1NYU |
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| Robert Murray..... | W1FSN | William McNamara..... | W1OTK |
| Barton Mitchener..... | W1GNV | Thomas Saragosa..... | W1PBN |
| David Smith..... | W1HOH | Harry Harris..... | W1PFF |
| John Baxter..... | W1HRK | William Bartell..... | W1PIJ |
| Vincent Messina..... | W1HRW | Clyde Tillotson..... | W1PKA |
| Jack Ivers..... | W1HSV | Charles Coyle..... | W1PME |
| Leon Tritter..... | W1HK | Harry Paul..... | W1PMS |
| Edmund Harrington..... | W1JEL | S. W. Bateman..... | W1RX |
| Alfred Zerega..... | W1JMK | Roger Semons..... | W1SD |
| Robert Williams..... | W1JOX | William S. Doyle..... | W1TV |
| Frank Lopez..... | W1KPB | Arthur H. Lynch..... | W2DKJ |
| Harold Gould..... | W1KWU | Edward Braddock..... | W3BAY |
| Richard Gentry..... | W1LEN | Myrl B. Patterson..... | W5CI |
| John Stanley..... | W1LFF | Herb Becker..... | W6QD |

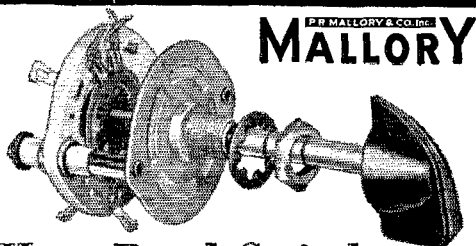
★ For many years it was our custom each year to buy National Tuberculosis Society Christmas Seals and have QST stick one on this page in each copy of the January issue. But this year, like the last couple of years, there seem to be more important jobs for girls to do than licking 90,000 stamps! We are making our contribution in the same amount as if we had bought the Christmas Seals, and the printed reproduction above is a symbol of the stamp we wish were there.



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(Continued from page 80)

write the SCM for application forms. EOP schedules Traffic Outlet Net, 3705 kc., 10 p.m. Mon. through Fri. CLD is new OPS. KAO is PAM. 3EHL now is in Fredericksburg. Activity reports are picking up. Keep sending 'em and let's make this a swell column. Traffic: W4EOP 94, KFC 11, INS 6, AGH 2, 73. Monk.

WEST VIRGINIA — SCM, Donald B. Morris, W8JM — YCK, one of our most active ORS, has a new four-element 28-Mc. beam, 60-watt mobile rig and is building a kilowatt for 3.5-Mc. traffic work. VAN arranged for a student at Morris Harvey College to talk with his family in Puerto Rico over VAN's 28-Mc. rig. A QSO with KP4AL lasted one hour. CSF is acting as NCS for the MARA 3770 Net and doing a swell job. MOP and FMU have new 28-Mc. beams and report good DX. TDJ, working 50.6 Mc., has made several contacts with stations in Pennsylvania and Ohio. 10AJ is located at Beckley and is working 3.9-Mc. 'phone. DFC has new antenna poles with nice signal increase. BWK, formerly of Wheeling, now is located at Charleston. BOK has moved to Fairmont. ESQ has new rig on 28 and 14 Mc. with 813 final. MARA has started a rag-chewing net on 3830 kc. for those not interested in traffic. NEU and GQE are the NCS and the net meets nightly at 8 p.m. ESQ, BOK, JM, and GBF spent a Sunday afternoon trying to tune up GBF's three-element 14-Mc. beam with no luck. KWI is back on all bands with high power. Don't forget to report the number of counties worked since July 1st so that you will be eligible for the MARA prizes on Jan. 15th. Traffic: W8FMU 5, VAN 4, YCK 4, CSF 3, 73. Don.

ROCKY MOUNTAIN DIVISION

COLORADO — SCM, Glen Bond, W9QYT — Here is a list of those on 144 Mc. as sent in by QDC: ACA, ZMI, LUF, BML, MLH, OYO, YXW, and YFJ. The San Isabel Amateur Radio Society held its first reorganization meeting in Pueblo attended by 9BAV/6, 9FBE/6, FWH, HFV, IGM, UEL, PBC, WTN, JVJ, LVS, QIS, Ted Castle, Wm. Caddel, Bert Howe, Carl Mardsen, Roger Stenderfer, Art Trevithick, and L. B. Walker. Thanks, JVJ, for this dope. Members of the newly-organized Arkansas Valley Emergency Net are: Pueblo, JVJ; La Junta, PGX and NDM; Lamar, MOM; Denver outlet, NPT; Albuquerque outlet, 5GGX. This net operates each Sunday at 7:00 a.m. on 3860 kc. NDM is control station. Battery-powered portable equipment is available at each station. EHC hopes to be in his new home in Oklahoma City soon. DRB, in Canon City, may leave for New York State for a year or so. BZV, in Akron, Colo., is active on 4- and 14-Mc. 'phone and 7 Mc. c.w. He will be on 144 Mc. with 100 watts soon and hopes to work some of the Denver and Cheyenne gang. WAP and AMB, of Loveland, are knee deep in an electronic metal locator which shows some good results. FPL, ex-6QDW, in Boulder, has a three-element 144-Mc. beam 1-10 receiver and 250 watts and is looking for Denver schedules. IQZ worked XEIA on 3.9-Mc. 'phone QSA5 87 90 watts, also UA3GL, Moscow, USSR, on 14-Mc. c.w. Mitch needs Africa for WAC. OEV is mobile on 28 Mc. with an 807 and a Gon-set converter. Traffic: W0ZAR 114, WAP 46, DRB 4, 73. Glen.

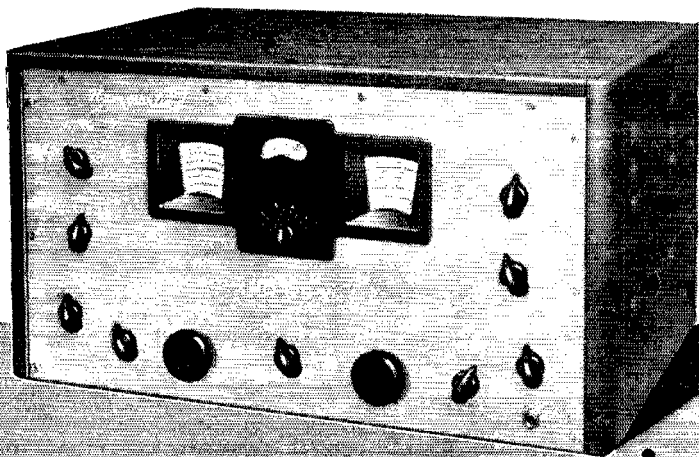
UTAH-WYOMING — SCM, Victor Drabble, W7LLH — 7GBB is putting out a husky signal on 3.5-Mc. c.w. with 200 watts. 7JKH is on 28-Mc. 'phone. 7JXU is on 14-Mc. 'phone. 6TWI/7 is on 7 Mc. 7JWG has a snappy Signal Shifter. The Milford Radio Amateurs are in need of antenna masts. 7KDJ is on 14 and 3.9 Mc. The Milford Radio Club held a picnic at Pomorosa Park recently. 4GFC/7 is working plenty of DX on 14-Mc. 'phone. He has built a BFO. 6KOZ has moved to Delta, Utah. 6RIZ has trouble keeping his e.c.o. from drifting. 7MQL is getting on with a new 150-watt job on the lower frequency bands. He also is on 144 Mc. He keeps a schedule with his father in California. 6DPJ is making a v.h.f. survey for the Air Lines. 6SID has his complete station with a "for sale" sign on it. 6WUI is on 14-Mc. 'phone. The following is submitted by the Shy-Wy Club of Wyoming, W7HDS: 2PDZ/7 is a new Shy-Wy Club member. 3LTJ/7 now is living in Seattle, Wash. 7HRM also is e.c.o. with an 813 in the final. His centered flat top antenna is fed with 25 1/2 ft. of 600-ohm open line and 8 1/2 ft. of 300-ohm amphenol cable with fine results. 7EVH has an 802 e.c.o. on 3.9-Mc. 'phone. 7ICZ has a new 28-Mc. rig with an 829 final. 7KEZ has 40 watts to an 807 on 28-Mc. 'phone using a folded dipole antenna. 7JHL has

(Continued on page 84)

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(Continued from page 88)

been experimenting with beam antennas on 144 Mc. with W9OWZ/7, who has three rigs on this band, and who has been appointed Assistant Co-ordinator for the 144-Mc. band. 7EZC has an HY51 in the final and a Super-Pro receiver. 7ABO, 7GSQ, 7FLO, and 7HDS have been operating on 3760 kc., the old Army net frequency. The Shy-Wy Club, 7HDS, has 100 per cent ARRL membership. 7FST is building a new 28-Mc. beam, and handles traffic on two Trunk Lines. 7UQM is building a 27-Mc. rig in his car which will enable him to go to the homes of bed-ridden people and enable them to talk to their relatives. A PCDX net is being formed with 7FST, 7DTB, 7RXG, 7JST, 7RUM, 7JGS, and 6WBZ participating. 7DTB is building a super-duper 28-Mc. beam antenna. 7LLH expects to have his rig on the air by Christmas. He and 7UOM have acquired new 40-ft. cedar poles. The SCM and all section appointees extend Season's Greetings to the gang. Traffic: W7FST 814, 7DLR 3, 7MQL 3. 73. Vic.

SOUTHEASTERN DIVISION

ALABAMA — SCM, Lawrence J. Smyth, W4GBV — CYC is on 3.5 through 28 Mc., c.w. and 'phone, with 250 watts. His XYL, GDV, is on 7 Mc. with an 807. ATF, member of Rebel Net, has a traffic total of 25. Would like to hear from the fellows on the Cracker Net and those interested in the Ole Alabama Net. KIX has worked twenty-seven countries on 14-Mc. c.w. 5EQG/4 is KSE on 14 Mc. JYB has 100 watts with p.p. 807s, four-element on 28 Mc. and extended double Zepp on 7 Mc. DGS is looking for EBZ and CJZ on 14-Mc. 'phone. Frequencies are 14,230 and 3870 kc. GBR, of the Cracker Net, on 3.9-Mc. 'phone, handles traffic for northern section of Alabama, while JLB handles south central part on the same net. If interested in appointments and nets get in touch with me or EVJ, GBR, or JOB. FRI passed away after a prolonged illness. The Muscle Shoals Amateur Radio Club is affiliated with ARRL. The club station, JNB, located at Sheffield Municipal Bldg., is operated on 3.5 and 7 Mc. JKU is active on 14 Mc. GOF has new shack, receiver, rig, and antenna. KF has new receiver, rig, and antenna. CDC has two new receivers. BLG is active on 3.9-Mc. 'phone. FMR has new rig and receiver. FZC has new receiver. EUT works 14-Mc. 'phone and c.w. EW is on 7 Mc. 73. *Larry.*

EASTERN FLORIDA — SCM, Robert B. Murphy, W4IP — We are very proud of the activity of our two nets, the Knights of the Kilocycles 'phone net under the guidance of ACZ, and the Cracker Net under the guidance of BYF. Florida has a nice group of c.w. fellows on 3635 kc., high and low power, who meet almost every evening. The Tropical Net winds up its daily QSOs around the world by having local rag-chews on 29.5 Mc. Ex-3CLQ/8QIS, now GHP, is being set up as ORS. DRB has some wonderful measuring equipment. Activities are beginning to pick up but we must have more ORS. The Trunk Lines are beginning to function and we will be looked to for handling all the traffic in and out of the U. S. to South America, Central America, etc. NB has set up a very nice link with the Rebel Net and is contact man over on this end. BYF and AYV made a remarkable score in the CD QSO Party. BYF worked 121 stations and 425 sections with a score of 103,505 points and AYV tailed right along behind him. KMM is the new call of VV. KES is helping the Dade Radio Club with meetings, which are held in the Pamsco Bldg. KCV reports from Key West that he was elected treasurer of the local club, which holds weekly meetings. BXL reports that the Fall Call Book shows 320 amateurs in Miami and sixty-three in Coconut Grove. FWZ says he could QSO only twenty-nine sections and sixty-nine stations. FWZ wonders where the c.w. gang meets. Try 3635 kc. DQW scored 117,360 points in the CD QSO Party. CUZ and HXL are on 3.5 Mc. AFO has a new 450-watt rig on 3910 kc. He has organized a radio club of fifteen members in Punta Gorda. BNR is reporting into the Rebel Net each week at 8:30 P.M. The Tampa Radio Club has new quarters. Let's get on the band wagon and get an appointment to one of the ARRL field offices and put our section out front. Traffic: W4BYF 55, BNR 28, DQW 5, FWZ 4, BXL 3. 73. *Merf.*

WESTERN FLORIDA — SCM, Lt. Comdr. Edward J. Collins, W4MS — JV is the new EC and is organizing emergency nets. DZX is on 28 Mc. 5KXM/4 works all bands. EQR has VHF-152 ordered for v.h.f. DX. HJA has new four-element beam and HT-9. BCC is getting all-band rig ready. JBI is looking for high power. BKQ has re-

(Continued on page 86)

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(Continued from page 84)

built present rig. FHQ is enjoying 7 Mc. JM visited the Pency gang. JNP is busy getting much needed parts for the rest of the gang. KFP is on with a two-element beam. KIK is getting out FB with folded di-pole. IVY is rebuilding transmitter and enjoying HQ-129X. KAS has new RME-45. AXP is on c.w. HIZ is changing QTH. EGN is on 14 Mc. after dark when 28 Mc. goes dead but it takes the XYL to raise VP9s. MS has moved to 1003 East Blount St. Please send QSL envelopes to that address. CNK wants v.h.f. contacts. CPA is enjoying 7 Mc. DAO is building an FB new 28-Mc. rig. AXF has a nice new license in her shack. LT works all bands. JV is busy building beams for 14 Mc. His XYL now is KJE. QK is getting an FB new transmitter ready. JJZ is looking for a new receiver. UC is getting set for QSOs. JBJ is a crystal expert. What about a 50-Mc. storm net? We need stations all along the Gulf. Write MS or JV, if interested. 73 and DX.

GEORGIA — SCM, Thomas M. Moss, W4HYW — We are glad to report that interest in the Emergency Corps is at an all-time high for the section. An emergency net known as "Cracker Emergency Net" is functioning on Sundays at 0830 and 1000. QRQ is 3995-kc. 'phone. KV is NCS and BPT is ANCS. Member stations are: ZD, BIW, GUN, BOL, AAY, BTB, 3UO/4, BIN, KLW, DBM, FCD, BTL, GMA, BB, DWE, BYY, CAN, and JGP. The Red Cross is giving full cooperation as per recent agreement with ARRL. Successful October simulated emergency drills were reported from Augusta, Brunswick, Waycross and Atlanta. Cartersville will hold drill later. FKN has succeeded HYW and FBH as EC for Fulton and DeKalb. Local net is on 29.6 Mc. with ZD serving as liaison station with Cracker Net. Asst. ECs are ZD and HZG. The 144-Mc. net is in operation at Atlanta, Augusta, and Waycross. New ECs: GUN, Cherokee; JZV, Lowndes; and IRL, Upson. New EC members are: DIA, GHU, GLB, ATO, ADH, IPV, IJA, IJX, HDC, EFC, JBM, 2PAF, BBR, DXM, CFJ, HT, IU, KLT (ex-10MIE), ACR, and several Augusta members who are "sweating" their tickets. IIS is Asst. EC for Richmond. Stations supporting Florida Emergency Net during hurricane included: ZD, BPT, BOL, BIW, BTB, BB, GMA, and HYW. Mobile rigs were used in October test at Augusta and Atlanta. We still are in need of Emergency Corps members in every part of the section, and vacancies exist for ARRL EC or Provisional EC in many counties. Now that public support is being given our Emergency Corps activities, we urge you to participate in this important section program. Traffic: 4HYW 44, JBM-41 ERS 30, BOL 7, 73. Tom.

WEST INDIES — Acting SCM, Everett Mayer, KP4KD — The section has suffered a great loss with the passing of K4DDH. BK, our OO, is operating on 7- and 14-Mc. c.w. with 500 watts. NY4CM, ex-W8LZK, is ORS. He works 3.5-, 7-, 14-, and 28-Mc. c.w. and schedules W8PNY daily. AM has 3-4 Mc. ATA for v.f.o. working nicely. BE, owned and operated by KP4AM, at Guaynabo, went on the air on Oct. 21st with 807 running 15 watts modulated by 6L6 on 28-Mc. 'phone. BJ copied Navy Day message. CN has 1-kw. rig operating. AW built new modulator and has new 28-Mc. beam. AE is active on 14-Mc. c.w. BY picked up a message at Boringham Field and relayed it to Dayton, Ohio, for Army captain. CF installed long wire antenna which gets out well on 7, 14, and 28-Mc. KD has new HRO 5TA1. BC reports that K4AAN now is KV4AA. KV4AD will be active week ends on St. Croix in V.I. Traffic: (Sept.) NY4CM 45. (Oct.) NY4CM 37, KP4KD 2, KP4AM 1. 73. Ev.

SOUTHWESTERN DIVISION

LOS ANGELES — SCM, Ben W. Onstenk, W6QWZ — The Council of Southwestern Division Amateur Radio Organizations met for the second time November 4th at the San Marino City Hall. The articles were revised and agreed upon by the clubs in attendance. They were the Inglewood Amateur Radio Club, represented by MSO and QIR; the Mike and Key Club, by SQO and TVK; the Metropolitan Radio Club of Los Angeles, by MNC and AOA; the Leimert Park Radio Society, by BPM and VQB; the Associated Radio Amateurs, by RO and ANN; the Tri County Amateur Radio Club, by LGO; the Foothill Radio Club, by CRY and FFN; the San Fernando Valley Radio Club, by FL and SRJ; the Valley Radio Society, by MEP and HHJ; the Glendale Amateur Radio Club, by EQM; the Pasadena Short Wave Club, by MYG. The Los Angeles section was

(Continued on page 88)



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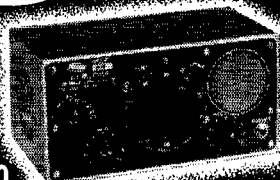
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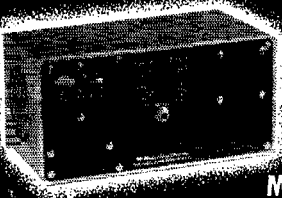
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(Continued from page 86)

represented by QWZ, KEI and AQM were kibitzers. The next meeting will be held January 6th at the San Marino City Hall at 8 p.m. All clubs in the Southwestern Division are urged to send two delegates to attend this meeting as we feel it will be of special interest to all. The logs received so far for the Los Angeles Section Field Day are from SD and PZV. SD scored 1631 and PZV 425. The Mike and Key Club has decided to expand its membership to the prewar standing and is holding meetings on the first and third Fridays at 1447 16th St., Santa Monica. New MK officers are DLL, pres.; OMB, vice-pres. and treas.; RIU, secy.; and ESR and UJG, executive board members. The San Fernando Valley Radio Club participated in the L.A. Field Day using an 807 on 7 and 3.5 Mc. p.p. 616s on 28 Mc. with Bretings for modulators and a 6C4-9002 transceiver on 144 Mc. For power they used 1 350-watt and 1 500-watt gas-driven generators. Operators were KEI, UMI, VKY, LUG, VQA, LVR, and PGX. The call used was SD. The AEC incident drill of October 13th proved very satisfactory. Areas that took part were Centinella Valley with ten stations under MSO, East Los Angeles, with twelve stations and sixteen operators under SYP. The Santa Monica area had nine stations under PTR, Covina area had ten stations under FPN. The Mike and Key Club has a new club call, VB. Plans are under way to establish a 50-Mc. net in Inglewood along the lines of the MK Net. If interested the Inglewood Club will loan the necessary crystal to club members. The Glendale Club plans to publish a sectional magazine with news of local interest. Editor is EQM. There is a need for more Official Observers, as the FCC advises there are many needless violations in this section. OOs are ON, OQB, IWU, GM, and GZZ. CMN is building a new receiver and is using a kw. on 3.5-Mc. c.w. ERT reports NDC and IVG are back on the air. UFJ has a 3.9-Mc. rig on 3.5, 7, and 14 Mc. OGM is working 27- and 3.9-Mc. 'phone. TZD is looking for a net on 7 Mc. AM has an 810-ft. by 260-ft. rhombic pointed at London. EPL has his mast up now. AAE wonders why some of you fellows don't get up a little earlier in the morning to get away from the QRM on 7 Mc. CQK is using p.p. 304TLs in an all-band rig. KEI is building a p.p. 4-250A all-band rig. OHM reports 1200 contacts on 50 Mc. in two months. OGM reports the Pasadena Club averages fifty to sixty-five at each meeting. Traffic: W6CMN 86, IOX 49, ERT 15, UFJ 15, OGM 14, AM 6, TZD 6, ASW 5, MERP 4. 73. Ben.

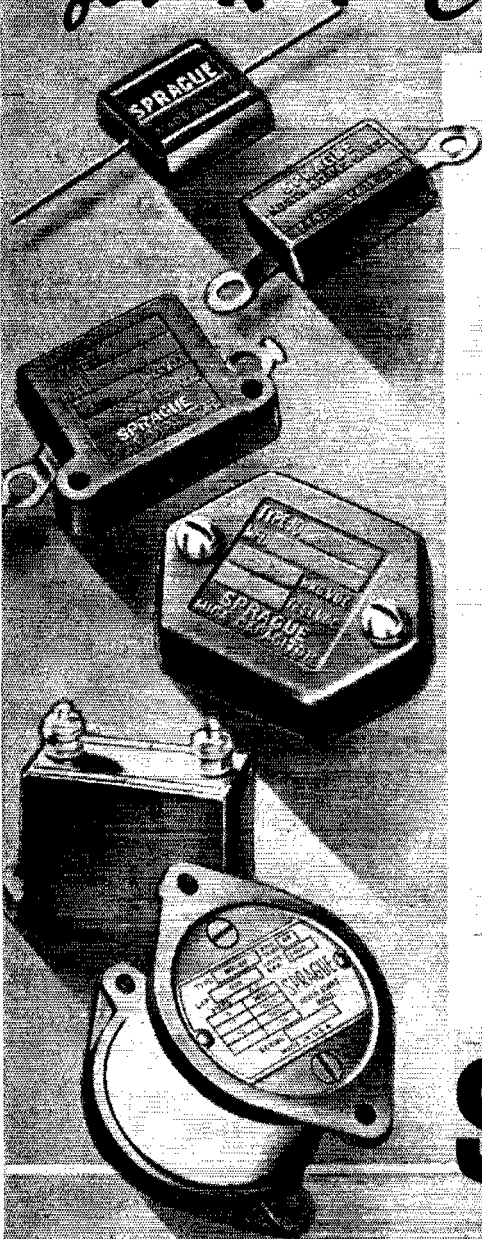
ARIZONA — SCM, Gladden C. Elliott, W7MLL — About 225 showed up for the 7th Annual Arizona Hamfest in Tucson on Oct. 13th and everyone had a fine time. Tucson nosed out Phoenix in a wild baseball contest to win the first leg on the cup. KMM won the prehamfest QSO contest, with QWG second. Arizona loses one of its outstanding hams, as KMM has moved to San Francisco. 2IQX now is 7KEY. IXC is 7JZY. SOG is running 27-Mc. code practice for Phoenix. NZS has a Millen exciter on 7 Mc. at Dos Cabezos. UPM, JGU, and JMQ are on 3.5 Mc. at Bisbee. RU and JDZ work 3.5 and 7 Mc. at Williams. Arizona hams greatly appreciated the appearance of John Bickel and Rudy Jepson at the hamfest. OAS has his Old Timers Club certificate. JOK has an FB homemade super. Arizona nets are 3515, 3865, 7156, and a 29,000-ke. rag-chew net in Tucson. ACN is on 3.9-Mc. 'phone at Yuma. QLZ is on 50 Mc. 6UDZ is on 28 Mc. U. of A. hams are TFM, JKK, LHS, QWG, JKN, KBV, UPW, JMO, RUR, JIY, JFG, PNX, 5HIE, RFJ, and Carl Clemette, operator's ticket. UPR has made several hour-long contacts with KAs to enable Tucson residents to contact relatives in Manila. About 125 attended OZM's open house on Oct. 12th. Get on a net and meet the gang and out down QRM. Traffic: W7MLL 66, TCQ 66, MNH, 10. 73. Glad.

SAN DIEGO — SCM, Ralph H. Culbertson, W6CHV — The San Diego Radio Club had an FB hamfest with approximately 500 in attendance. VSG is a new ham in Laguna Beach. JUM, BOS, and WNN are active on 50 Mc. BZE has new kw. rig on 14-Mc. 'phone. QMM has a total of fifty countries on 28 Mc. MKW reports 9JHD/6 is active on 28 Mc. at Trabuco Canyon. ALO, TIK, JSZ, VPP, VKN, WWX are active on 28 Mc. in Santa Ana. MQF is doing good DX on 14 Mc. FCI is on 7 Mc. with a Signal Shifter. YBI is new call at Costa Mesa. VEK got his old call back and now signs PM. DEY is active on 3.5 Mc. BAG has Meissner 150-B on 3.5 and 3.9 Mc. at Newport Beach. IZ is active on 3.9 Mc. at Balboa. QRT is on 3.5 Mc. in Orange. PHJ is the only active mobile station on 144 Mc. using

(Continued on page 88)

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(Continued from page 88)

TR-4B. BFE is plugging away on 7 Mc. at Tustin. The Orange County Amateur Radio Club has moved to permanent rooms in former Army building and meets the second and fourth Wednesdays of each month. MKW and HWJ are active on 144 Mc. at fixed locations. QG tried horizontal antenna on 50 Mc. and worked a number of new stations. ME was transferred to San Pedro. LKC worked VU2LR in New Delhi, India, and VS1BG, in Singapore on 28-Mc. 'phone and has been doing pretty well in the mornings with some swell QSOs with England, Scotland, Wales, and France. CNQ is back at Calexico and is working at KYZE, local broadcasting station. TBI has new rig on 28-Mc. 'phone. EWU has been working on his 28 Mc. beam but is having trouble with feed lines. He also is active on 3.9-Mc. 'phone. GC has been appointed OO and MKW is new OES. LUJ reports traffic from KA1AK and VS1BX. He was VS1BX's first W6. Traffic: W6LUJ 10, FMJ 7, WNN 7, CNQ 5, LKC 5, BAM 4. 73. Ralph.

WEST GULF DIVISION

NORTHERN TEXAS — SCM, N. C. Settle, W5DAS — SEC: QA. RM: CDU. PAM: ECE. HJX is back at Western Auto. HIP has made plans for h.c. station in McKinney. IME is the Dallas Amateur Radio Club station at 2911 Elm, Dallas. HKK is back on the air. J calls at 29,200 and 28,700 kc. 6 to 8 p.m. III is back on 28 Mc. KIJ has a Meck in action. GZH has 4 watts on 28 Mc. JQY has a double-folded dipole. LDE is on 3.5-Mc. 'phone. AJG is on 50 Mc. Mobile stations are: LXH, FFX, IYJ, ECE, AVU, HMH, DAS, TW, EDW, and JNK. KWC has an HRO and BC-610. The East Texas club held a successful meeting at Caddo Lake. IJC is back from the Navy. LUQ has gone to Midland. IMZ has a three-element beam. BVH should be on soon. ARV likes lots of traffic. JPF is busy with new jr. operator. DN wants a c.w. net. ECE is on Sunday 8 a.m. EC Net. Waco hams in action are: KXR, KYN, KLC, LYX, KOE, ILF, and BYX. OJ, Ft. Worth, has a nice net. OL, of Dallas, who has been working at the Atom Bomb project in New Mexico, had a serious accident. Let's write him. His address is: Bob Huffines, P. O. Box 1663, Los Alamos, N. M. KXY of Dallas, is off the air. He is at Dormitory 11, Sanatorium, Tex. Drop him a line. In order for DAS and IME to do the job well we want you boys and girls to write or come to see us. We are at our place of business from 8:30 a.m. to 5:15 p.m. daily except Sunday. Draw a line east to west below Waco on the map of Texas. Every town above the line is in the Northern Texas section. Let us hear from you. Skippy.

SOUTHERN TEXAS — SCM, James B. Rives, W5JC — AX now is chief engineer of San Antonio's new f.m. station, KYFM. GDH has a new jr. operator. KWB is stationed at Biggs Field and is active on 14 and 7 Mc. with 60 watts input. The El Paso Club has requested affiliation with ARRL. GEL and BOY have new HRO receivers and LVU is sporting a new SX-42. 6EPZ/5 has replaced the 250TH with a pair of 4-125s in his BC-610 rig. CCD and FBC are building new three-element beams and HIF has a four-element job under construction. The Corpus Christi Naval Air Station held "open house" on Navy Day and provided transmitting equipment on 28, 14, and 7 Mc. for visiting hams. IFU has a new 60-foot vertical constructed of two-inch aluminum tubing. CX is building a kw. with a 304TL final modulated by a pair of 100THs. LGC is stationed at Pyote Army Air Field and is on 28 Mc. with an HT-9 and three-element beam. JPC is trying out a new end-fed Zepp on 14 Mc. MN has a Collins 32-RA with 150 watts input and is busy with a number of early-morning schedules. LCU reports local AEC activity at Harlingen which includes FAH, EWZ, and 6UBP/5. LJH worked some DX on 14 Mc. at 2 a.m. under freak conditions. EWZ enjoyed the CD QSO Party and is getting out well on 28-Mc. 'phone. HGG is using a pair of RK-28As with 600 watts input and handling a lot of traffic on the Rebel Net on 3635 kc. The Corpus Christi Radio Club now is affiliated with ARRL and at a recent hamfest there were more than 250 hams and their friends. Traffic: W5HGG 62, JPC 8, CX 6, EWZ 4, MN 4. 73. Jim.

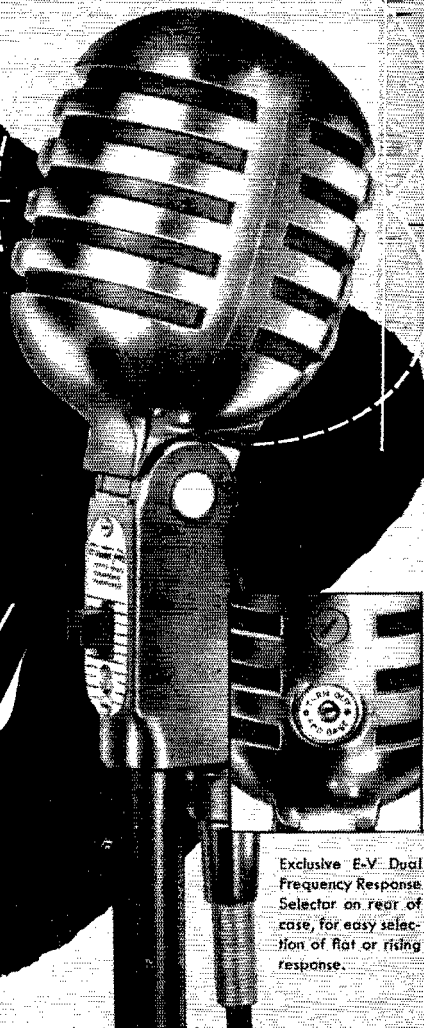
NEW MEXICO — SCM, J. G. Hancock, W5HJF — HGV won national fame for his part in a 28-Mc. relay that brought aid to 300 snowbound motorists out of Albuquerque early in November. GXL is scouting all over 3.5, 7, and 14 Mc. with his version of the v.f.o. in September QST. Dell hooked a J9 in the Marshall Islands. FAG has a BC-375. GSD now is in St. Paul. HJF burned his r.f. section out and was off three days replacing wires and parts burned in the

(Continued on page 94)

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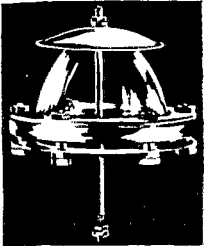
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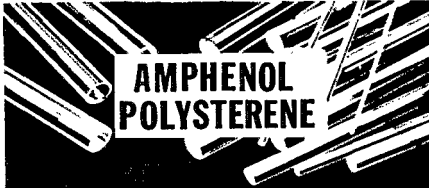
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(Continued from page 98)
blaze. To these, and to the gangs in Albuquerque, Santa Fe, Roswell, Clovis, Silver City-Deming, Carlsbad, Portales, and all the rest, a sincere wish for the merriest Christmas of all time. May old Santa be good to all of you. I am sorry there is not room to list each one of you individually. 73. Jake.

CANADA

MARITIME DIVISION

MARITIME — SCM, A. M. Crowell, VE1DQ — A new club, the Lakeburn Radio Club, meets the 1st and 3rd Mondays of each month at 8:00 P.M., and extends a welcome to all visiting hams. AYL, press representative of the LARC, reports the gang still is happy over the interesting meeting with W1HDQ and his XYL in St. John. FC and IZ have 'phone on 3824 kc. with 807, 50 watts. RS has returned to the air. GP has his 14-Mc. beam pointed at Athens, Greece. LI is on 3.7-Mc. c.w. week ends. IE has nightly schedules with VE2XA, ex-1BF, on 3.7-Mc. c.w. IL also is going on 3.7-Mc. c.w. New calls in the LARC area are AO, RX on 14 Mc., CW, RQ, VB, VD, and QL on 3.7-Mc. c.w. WG, Campbellton, got his ticket and is on 3.8- and 14-Mc. c.w. QO is on 28 Mc. with 60 watts and worked three W5s on his first transmission. CT is going strong on 3.8-Mc. 'phone with 100 watts. There is a great deal of activity in the vicinity of Halifax on 50 Mc. with Sunday A.M. hunts being well attended. Night owls on 14-Mc. 'phone are FQ, HV, MZ, ET, and DQ. EP is raking in the DX cards. DB schedules VE2LC Sunday at 10 A.M. FQ, QSL Manager, says that many of the boys send in small envelopes which are no good. Send larger envelopes for your cards, please. Traffic: VE1EJ 12, DB 3.

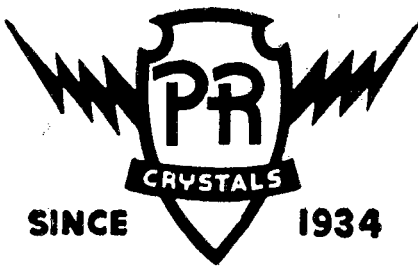
ONTARIO DIVISION

ONTARIO — SCM, David S. Hutehinson, VE3DU — QK reports schedules with 1EJ, 2DR, 3WX, and 3GN nightly. This is half a transcon! CP and FP are active on 3.9-Mc. 'phone. The HARC held its second h.f. test at Watertown, with rigs on 3.5-Mc. 'phone, 50-Mc. 'phone, and 144-Mc. 'phone, each with its own antenna and receiver, with gas-driven generator. KM has a 65-ft. pole up now. HP is the big traffic man this month. OJ has 5 watts on 3.9-Mc. 'phone. BBO reports from Ottawa that he is on 14-Mc. 'phone with TZ40 and 150 watts; also that OARTA is all set for the coming season with a transmitter and receiver. UD works VKs with 50 watts on 14 Mc. YZ is back on 14 Mc. with 813. BCD, BCN, BDY, ZZ, JA, LC, and BLM are active on 28-Mc. 'phone. LC has p.p. 813s and four-element rotary. JA, in Braside, works Ottawa on 28 Mc. BCN has an AR-88. BCO and KE are working plenty of DX. BAJ reports from Pagwa that he is coming on 7 Mc. with a 6L6G; also that WB has worked at least twenty-five countries since June. BfJ reports first VE QSO hut of town. MB is back on the air regularly. AXQ, new ORS, took part in the CD Party. ASR, London, has No. 19 set on c.w. BJT is having code trouble. WY and AJP swear by the new v.f.o. from Sept. QST. BHU, Maitland, transferred his ticket from Germany to Canada. AGT is having harmonic and BCI trouble. BGW is a new-comer to Toronto. DU visited OI and WY recently. WX got his 14-Mc. vertical to load on 3.5. Mc. HI is sticking to c.w. until his voice clears up from operation. Where are AJE, FD, ADC, and APH? ADB has No. 19 set on 3.5-Mc. 'phone and p.p. 35Ts on 14-Mc. 'phone with rotary antenna. BEN is a new-comer to Parkhill. Plans are under way for traffic nets. Traffic: (Sept.) VE3HP 115. (Oct.) HP 151, QK 33, CP 14, CAR 10, KM 5, GT 4 ATR 2, AXQ 2, BCS 2. Dave.

VANALTA DIVISION

ALBERTA — SCM, W. W. Butchart, VE6LQ — JB and XZ are AO's proteges. II is using 815 on 28 Mc. trying to work DX. BU rebuilt rig and works LU and G. HQ got RME-69 and worked ZS to make WAC. It took him 20 years! TM and GD figure AC and AO pull a fast one by working DX while they work for a living! DV built a v.f.o. using 802-807. OD leaves 3.9 Mc. long enough to haunt the 28-Mc. band in the evenings. HI is ex-4HI, now in Calgary, using a pair of 813s. AO made A-1 Operator Club in October! He went on 28 Mc. October 21st and since then has netted thirteen countries with forty-one DX contacts! LJ, of Medi-

(Continued on page 96)



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(Continued from page 94)

cine Hat, was copied in Calgary on 28 Mc. Q5R4 while he was QSO 3BG. MJ is heard regularly with official bulletins on both 'phone and c.w. LL and IE are new calls. The Camrose gang threw a hamfest for LL's "coming out" party, with NARC represented by LG, MJ, AT, BW, EA, SZ, AE, LQ, and 8AO. TO SW goes most of the credit for its success. BW is on the air with a 200-watt rig. EA is busy completing his 813 rig. SZ is knocking over DX. WS, EY, AL, and LQ are using beams on 28 Mc. with good results. HM is rebuilding final with 35TGs. GA is on with an exciter unit. IR put up off-center-fed Hertz. Traffic: VE6AO 108, LQ 56, ZL 12, JB 10, MJ 7.

BRITISH COLUMBIA — SCM, W. W. Storey, VE7WS — ADB now is IM running 35 watts on 3.9-Mc. 'phone and worked a W-WQA recently. IM uses e.c.o. 7GN is getting out very well with his 10-watt station. WL and ABU have been on 28 Mc. AE, CH, CB, BK, SW, WP, and XX are working swell DX. AAZ sold his rig to TZ. XD, AJG, HR, and EU have headed for 28 Mc. ZF, ADI, AIE, AIS, ALP, and DO are putting a nice signal into Victoria. IM is president of the Victoria Net. The Navy Amateur Radio Club at H.M.C.S., Mordon, for Navy and ex-Navy personnel only, is going ahead FB. JV was on 3.9-Mc. 'phone recently. AJW now is YY. YR and YW recently received calls. PO is on 3.9-Mc. 'phone. YA met IM in Victoria recently and had a nice ragchew. OH returned to the air on c.w. AHH has renewed his rag-chew with IM but not on 160 meters. FY has his rotary up. ZJ is brasspounding on 14 Mc. YB surprised everyone by returning home from China. BQ says the old prewar ham pamphlet, *The Amateur*, will resume publication. The RCARA is maintaining a pool of parts donated by members. The money received from sale of parts fattens the club's treasury. There was a big turnout at the Nov. 6th BCARA meeting held at Brock Hall, U.B.C. Six members of the Collingwood Radio Club visited the Vancouver Amateur Radio Club recently and had a very pleasant evening. Collingwood Club activities: BE, president, is located on 3.5-Mc. c.w. AJR hooked ZL1BY on 28-Mc. c.w. using a 28-Mc. Zepp. OJ frequently is on 7-Mc. c.w. with 100 watts. GH and AKK have combined efforts to produce a really decent home-brew receiver. AK finds 28-Mc. 'phone lonely at night and has QRT to 3.9 Mc. ADV can be worked on 28-Mc. 'phone almost any night. He has all the parts for a 28-Mc. mobile rig. UU sports a three-element beam which sure puts out an FB signal for 30 watts input.

PRAIRIE DIVISION

MANITOBA — SCM, Art Morley, VE4AM — During the past month the WARC held a very successful banquet with about 100 sitting down to dinner. October 13th saw the ARRL simulated emergency plan tested. The 24th-26th saw the Hobby Show. The display by the WARC was judged the best in the show. Traffic is reported for the first time since the war. AC has applied for reinstatement of his appointments. From Brandon comes word that IF is building the super rig-relay controlled automatic switching all-band 'phone/c.w. rig. All parts but tubes are being homemade and IF says it will take him three years. HD was visitor to Winnipeg. 5PK is now in this section and soon will be signing VE4. BC has a better harmonic on 7 Mc. than fundamental on 3.5 Mc. Result — he tunes both hands after a CQ. WF is rebuilding. NI is on 'phone and has a lovely new beam on top of 35-ft. pole. JN is using BD's receiver while the latter is in California. JG left for Vancouver, HI for Calgary, and AT for Ottawa. 5QG was erroneously reported as being in RCAF. Bill is with the Army. LS is on 7 Mc. BO is talking about trying 3.5 Mc. How about more CD appointments? Interested? Traffic: VE4AM 71 KD 18, AC 14, YM 2, CU 2, HS 2, 73. Art. SASKATCHEWAN — SCM, Arthur Chesworth, VE-55Y — SY now is living at new QTH. GH put his rig on 7 Mc. for the SS Contest. HB has secured a new modulation transformer and expects to be on 'phone soon. CO is back on 3.5 Mc. 'phone and c.w. with an 802 e.c.o. 807 final and is working on a new 300-watt final. OP is new QSL Manager and has his rig on 14-Mc. 'phone using cathode modulation. OM is on 14-Mc. 'phone and is having some very good QSOs. He had a very FB contact with 8MV at Fort Resolution; he also hears EL5B every evening with an S8 signal and would like to QSO him. WM is trying to get the gremlins out of a 9-tube super. Les Penno has new RME-45 receiver and expects to get his ticket soon. Following is some

(Concluded on page 100)

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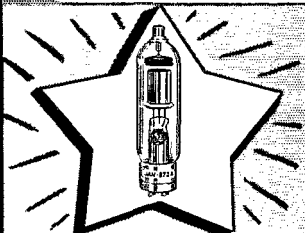
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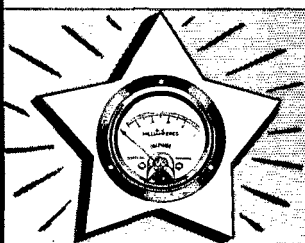
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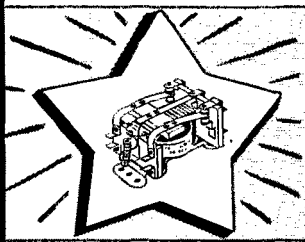
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3E29/829B	4.95	931-A, electron multiplier phototube	2.95
829-B socket & shield	.75	9001	} U.H.F. MIDGETSeach
3C24/24G 25 watt H.F. triode	1.95	9002	
6AK5, miniature pentode	1.50	9003	



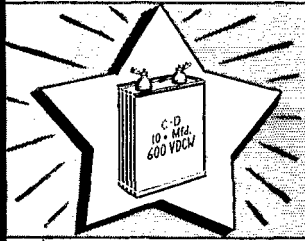
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VM-3, 125 Watts	15.64
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300 OHM twin-lead, per ft.	.03

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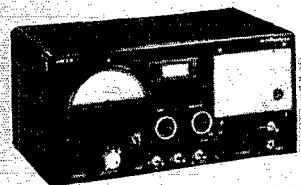


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all receivers complete with speakers, except SX-42 & 1-10-A

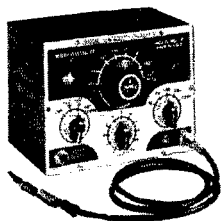
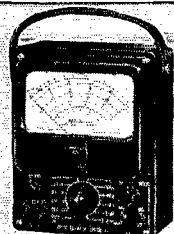


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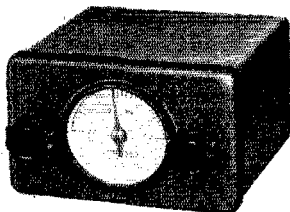
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Crystal controlled oscillator ideal
for servicemen, amateurs and labo-
ratories. I.F., F.M. and R.F. Align-
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For fixed or mobile use with any
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A "MUST" for the Modern Radio
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WARRANTY — No change in our policy.
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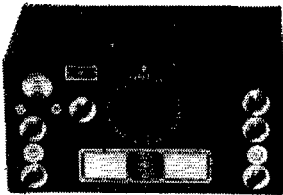
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GREATEST NAMES
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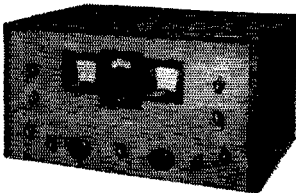
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Here they are—the newest Post-War "Ham" Receivers with all the latest improvements in technique and design.



NATIONAL HRO-5TA-1 • Net \$274.35
697 Power Unit \$20.36 • MCS Speaker \$12

A Receiver, designed for the Amateur, to provide dependable communications, under most severe conditions. New Noise Limiter incorporated. Band spread on all "Ham" Bands—Coverage 1.7 to 30 MC.



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Performance and beauty are combined in this outstanding Receiver value. Many circuit refinements never before available at this price. Electrical Bandspeed Dial—Coverage 540 KC to 43 MC.

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(Continued from page 98)

news picked up by our R.I., JS, while on an inspection tour: VA is busy keeping his 'phone schedules. EV is doing good work on 30 Mc., also 3800 kc. JG is on the air with a pair of 813s in the final and is making use of the 3900-kc. channel. EN is getting ready to rebuild. AQ is busy in the radio store. BA has finished a nice c.w. rig. KO has his vibrator going and gets a nice signal. NH has been OKed for 'phone on 3850 kc. CH and MP are putting real 'phone signals on the air. Traffic: VE5MW 2 CO 2. 73. Ches.

BOOK REVIEW

Understanding Microwaves, by Victor J. Young. Published by John F. Rider, Publisher, Inc., 404 Fourth Ave., New York 16, N. Y., 1946. 380 pages + 5 index pages + XI pages. 5½ × 8¼ inches. 171 illustrations. Price \$6.00.

The book rigorously works toward the goal and title "Understanding Microwaves." The author makes no pretext that what he has to say is the latest word on the subject but in a straightforward, logical, concise manner weaves a scientifically-sound fabric of useful information.

The book is divided into two sections. Section I is a chapter-by-chapter development of the various concepts essential for thinking in terms of microwaves, from the theoretical to practical discussions including design facts and figures on such pertinent subjects as transmission lines, wave-guides, resonant cavities, antennas, microwave oscillators, radar and communication applications. Section II (approximately 90 pages) is an alphabetically-arranged glossary of microwave terms, ideas and theories. In Section I, mathematical development of formulas is footnoted in some instances and explained in detail at the end of the chapter.

The author seems to have an appreciation of the pitfalls in theoretical concepts and tactfully advises against them, as if anticipating the questions arising in the reader's mind as he progresses. Excellent use is made of illustrations, both pictorial and schematic, with the added advantage that the explanations are near at hand.

Throughout the book, the frequent use of actual values of frequencies, dimensions, and so on, has served to provide satisfaction for the practically-bent electronic enthusiast.

A reader requirement is a genuine interest in radio waves about or below 10 centimeters. It is the reviewer's contention that the realm of microwaves finds many persons who are but hazily or sketchily versed in the concepts required. These concepts are difficult and the wordiness of the text is necessary in spots and is unavoidable where the reader lacks an understanding of a mathematical statement which in a few terse symbols can state pages of printed words. The book should appeal to anyone who has been working in electronics on the frequencies below 100 Mc. or so and who wants an understanding of microwave behavior and technique. It is hoped that the reader will not be dissuaded by the occasional presence of a mathematical formula and by some vigorous but very essential discussions. There is plenty of cold fact in this volume for any reader who will take the time to digest the contents.

— E. B. Redington, WIAM

Strays

"If you're in need of a suitable absorbent padding material to deaden a loudspeaker cabinet — especially the bass-reflex type — a satisfactory substitute will be found in 'Chux,' a disposable baby diaper, available at the corner drugstore in case you have no little harmonics at your house."

— W5CVO/4

The 1947 HANDBOOK

THE LATEST EDITION of THE RADIO AMATEUR'S HANDBOOK is postwar in content, containing the kind of information which has made the HANDBOOK world-famous. To maintain the high standard of practical usefulness set by previous editions, a new treatment of the constructional sections of the HANDBOOK has been accomplished. The theory and design sections cover every subject encountered in practical radio communication. Completely sectionalized by topics with abundant cross-referencing, and fully indexed. The HANDBOOK continues to be the world's most valuable and widely-used radio book.

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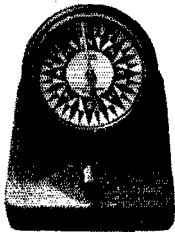
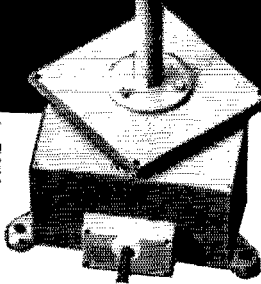
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**ROTATOR and \$14250
INDICATOR**

Built to rotate a 10-20 combination as well as your UHF antenna, this sturdy, simple mechanism will give you many years' trouble-free service.

NOTE THESE SPECIFICATIONS

- Rotates full 360 degrees at 1 RPM.
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- 110 volt a-c, geared motor for positive drive.
- ROTATOR sealed into aluminum case.
- Handles Workshop 2, 6, & 10 meter beams without adapters or wood cradles; is readily adaptable to other beam structures.
- Allows use of coaxial line continuous from transmitter to antenna; no rotating joints.
- Indicator with compass-card dial housed in cast aluminum case with black wrinkle finish.

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2-meter 6-element Model 146-AB	\$19.00
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Detailed description of any
WORKSHOP item free on request.

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DX Contest

(Continued from page 18)

licensing area for all bands, equals the score

IV) Logs must be marked "phone" or "c.w." Separate entries may be made for c.w. and 'phone. This is optional. Cross-band work may not be counted in claimed scores.

V) Quotas. There is no quota limit on the number of W/VE stations that "outside" stations may work for credit. W/VEs: (c.w.) The quota of three stations per country may be worked in each different band. (If one-way exchanges for less than the three points per station have been made, an additional station may be worked to give not more than nine points (basic) per country, per band. This quota may be filled in each different band. ('phone) There is no quota limit on the stations per country.

VI) Multipliers: W/VE: The number of countries worked on one band plus those worked on a second band, plus those worked on a third band, etc., shall be used as a multiplier.

VII) All others: The number of continental U.S.A. and Canadian licensing areas contacted (a possible eighteen) shall be used as a multiplier of the sum of all claimed QSO points for the total score. This multiplier is increased further by working the same areas on additional frequency bands. (Example: Ten, eight, and five licensing areas, as indicated by call prefixes of W/VE stations, are worked on three bands. The sum, twenty-three licensing areas, is the multiplier to use to get the gross score.)

VIII) All entrants agree to be bound by all provisions of this announcement and the regulations of their licensing authority. In a contest of this magnitude no correspondence can be entered into regarding Contest Committee decisions.

IX) The highest-scoring individual operator's score is the official score for all awards. Other operator's scores must also be submitted separately if more than one operator works a station. The station score (all points by all countries) may be stated for purposes of comparison only.

X) Reports: No reports should be sent until both sections of the contest have been completed. Entries from participating stations must be postmarked on or before noon April 10, 1947, to be considered for awards. Play safe . . . mail your report immediately at the end of the contest so your results can be credited. Show your claimed score in full, following a tabulation of points in the log form indicated with this announcement.

XI) The entries will be passed upon by an ARRL award committee whose decision will be final in all cases.

Warning!

FCC monitoring-station personnel are acquainted with the dates of our DX Competition. ARRL Official Observers will be on the job. Do not risk disqualification, or monitoring-station citation! Avoid poor notes, overmodulated signals, and off-frequency operation. Avoid parasites and improperly strong harmonics (which may disqualify) by careful check of transmitters in advance. Better lose some operating hours rather than jeopardize amateur standing.

Competitors are invited to submit lists, even if they show only a small score, to support claims made in logs from other stations.

The BC-348-Q

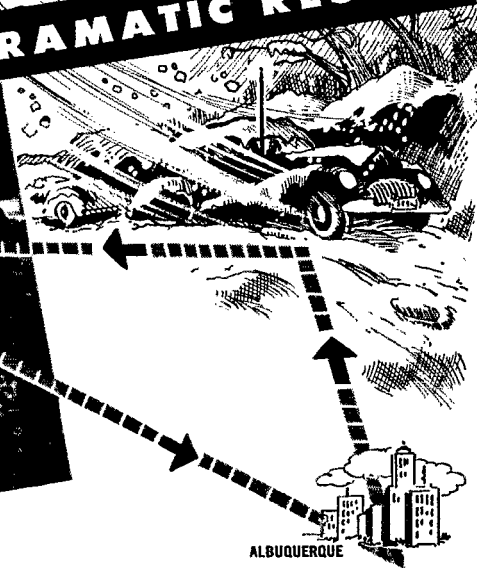
(Continued from page 21)

socket and also made it possible to mount the socket at the extreme rear edge of the chassis, using the same tapped holes and screws which were used with the original fitting. It was necessary to replace the original fitting, since no plug was available which would match SO 104. Terminals 1 and 5 were disregarded, since they were taken care of by the speaker jack already mentioned. The send-receive connections, paralleling the s.p.s.t. switch on the panel, were made to two of the socket terminals. In this way an external relay can be used with the send-receive switch on the panel remaining in the "off" posi-

(Concluded on page 104)

ALERT AMATEUR EFFECTS

DRAMATIC RESCUE



TRAPPED, recently, in a terrific snowstorm, 65 miles west of Albuquerque, N. M., a caravan of more than 300 motorists sent out a radio call for help.

Some 1,750 miles away, at his home in Hartville, Ohio, Paul L. Hughes, listening in on the 10-mefer band, caught the message, switched on his transmitter and got busy. In a few minutes he had raised Foy A. Roger, an Albuquerque amateur, who notified the New Mexico State Police. The rescue party was under way 26 minutes after the call for help.

Mr. Hughes, a radio fan since 1940, operator on a Catalina Navy patrol plane during the war, is to be congratulated on his short wave accomplishment and the dramatic rescue his work made possible.

MODEL D-104

In making his rescue call to Albuquerque, Mr. Hughes used an Astatic D-104 Crystal Microphone... long a favorite with amateurs the world over. "Model D-104," says Mr. Hughes, "is a grand microphone for use with amateur rigs."



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Astatic Crystal Devices Manufactured
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LINE SPACER

- Low Loss
- Easily Attached
- No Metal Contact



PATENT APPLIED FOR

Type LX-2 (2 in.) Type LX-4 (4 in.)
 Type LX-6 (6 in.)

- Fabricated from Amphenol 912-8 (low moisture absorption—low power factor—low loss factor).
- Easily attached to line wires without threading wire through holes.
- No metal contact between line wires and spacer to cause noise or changes in line characteristic.

FREE—Ask your jobber or write for pamphlet, "Some Methods of Feeding Half-wave Antennae with Open-wire Lines," by A. L. Munzig, W6BY.

SEE THEM AT YOUR SUPPLY HOUSE!

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 Lomo Linda, California

THE *Arthur L. Munzig*
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CLEAN ACCURATE HOLES



cut in radio chassis

Greenlee Punches make this tough job easy. No reaming, filing or tedious drilling. Tool has three parts: *punch* cuts through chassis, *die* supports metal to prevent distortion, *cap screw* is turned with wrench to cut holes. Sizes for holes $\frac{3}{4}$ " to $3\frac{1}{2}$ ". Ask your radio supply or electrical jobber or write for folder and prices. Greenlee Tool Co., 1869 Columbia Ave., Rockford, Illinois.

WRITE FOR FREE FOLDER



Converting the BC-348-Q

(Continued from page 102)

tion. This facilitates break-in operation. Terminals 2, 6 and 7 or 8 (ground) were connected to three of the other terminals and the three make up the point where the S-meter connects into the circuit. The 1000-ohm potentiometer was mounted on a small angle and the resistor network mounted on it. The meter leads were then carried forward to the meter position on the panel. In order to use a plug to fit the 6-prong socket it was necessary to enlarge the rectangular opening in the rear of the cabinet with a rat-tail file. The metal is very soft and is easily removed to the desired configuration. In order to mount this new plug arrangement, it was necessary to remove the shield which separated the original from the rear of the cabinet. The screws which held this shield in place were used to fill in the holes in the panel resulting from the removal of the nameplate. Removing this plate made the receiver take on a less military appearance. Black paint was used to cover the various unwanted markings on the panel. "Decal" titles now available could be used to complete the panel markings for the new controls.

Upon completion of all changes, the i.f. stages were peaked with the crystal in the circuit. The effectiveness of this receiver need not be described to those who already own it, for it makes a very satisfactory amateur instrument. The changes described can be made in a few hours at a minimum of expense. The author wishes to acknowledge his gratitude to W6FTU and W6SHK for the suggestions and help which they gave in the conversion of the receiver.

15 Watt Modulator

(Continued from page 28)

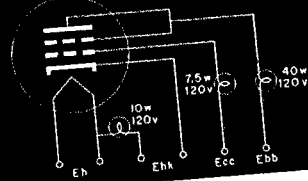
6F6s made this system of biasing impractical without some form of regulation. The cathodes should be about 80 volts above ground and the grids 60 volts. A 25-per-cent swing in plate current would vary the cathode potential over 20 volts which would either double the bias or reduce it to zero which definitely would not do. The problem was solved by the addition of a VR-75-30 to regulate the cathode voltage of the 6F6s. The current limits of this tube are just about right to accommodate the difference between the resting and maximum-signal values of cathode current. A conventional 6SJ7 pentode and a 6SC7 phase inverter provide plenty of gain to drive the 6SN7.

The only difficulty experienced in getting the circuit to operate properly was in the adjustment of modulator bias. This is affected to a great extent, of course, by the plate current of the 6SN7 flowing through its cathode load resistors. Bias may be adjusted by changing the value of either R_{17} or R_{20} . It is quite probable that the 400-ohm value specified for R_{20} is as high a value as one would want to use because of the reduction in regulation when this resistance is high.

MAKING TUBES IS EASY..

*If YOU
KNOW
HOW!*

FUNDAMENTAL AGING CIRCUIT



AGING SCHEDULE FOR HYTRON 50L6GT

Step	Min-utes	Eh a-c	Ehk a-c	Ecc d-c	Ebb d-c
1	5	50	110	0	0
2	3	70	110	0	0
3	5	80	110	0	0
4	3	80	110	0	0
5	5	70	0	120	120
6	4	0	0	0	0
7	5	50	0	-10	120

Electrode potentials are varied as shown in the schedule. Actual voltages at the socket depend on currents drawn through the incandescent lamps used as economical, interchangeable current-limiting resistors.

Operations performed in seven steps are: (1) discovery of heater-cathode shorts (2) beginning of cathode processing to stabilize emission (3) further seasoning and burning off of h-k leakage (4) h-k potential increased to eliminate leakage (5) grid, screen, and plate potentials applied to complete de-gassification (6) cooling off period (7) normal potentials applied to pre-heat for test.

AUTOMATIC AGING FOR BETTER TUBES

Yes, radio tubes also must be "aged in the wood." Aging activates the cathode under accelerated life conditions, just before test. In the fundamental aging circuit shown, final seasoning and de-gassification stabilize characteristics in accordance with the carefully planned aging schedule.

Formerly tubes were plugged into long aging racks. An operator, equipped with the schedule and a timer, adjusted electrode potentials throughout the aging cycle. The human element resulted in errors of timing and switch manipulation.

Hytron's new automatic aging wheel minimizes human error. A motor drives a mechanically-indexing horizontal wheel on which 30 radial sections of

12 tubes each are slowly rotated. Brushes contacting commutator segments automatically apply electrode potentials. The wheel itself requires no operator. The final basing machine operator feeds the wheel. Tubes already pre-heated are removed by the test operator.

Other features of the aging wheel are elimination of needless handling, fast and steady pacing of the work, easy servicing, and readily interchangeable load lamps.

To you this automatic aging wheel means economical, more uniform tubes with stable electrical characteristics. Again Hytron know-how takes a forward step by making your tubes easier and better.



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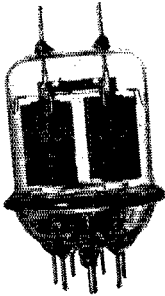
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MORE SELECTED SURPLUS SPECIALS FROM THE *Radio Shack*

TUBE VALUES EIMAC VT-127A

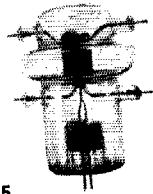
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\$4.95 KENRAD 829-B

In original packing; Signal Corps inspected; A bargain. Socket for 829-B ..89c
AND MORE

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813's, RCA 9.95
211's, GE 4.95
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The Popular
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807's at the Radio Shack
special price of only
\$1.35 each

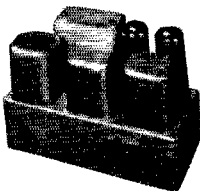


CAPACITOR BUYS Oil Xmtg Type

Mfd.	Volts d-c	Net each
2	4000 (GE)	\$5.95
2	2000	2.95
2	1000	.71
4	1000	1.19
4	600	.71
6	600	.79
8	600	1.19
10	600	1.29



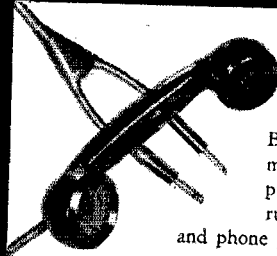
ART-13 SPEECH AMPLIFIER & DRIVER



A compact, 3-watt amplifier that is fine business as speech amplifier and driver in a ham rig, or can be used as phono amplifier. Easily converted to self powered 110 volt operation —instructions furnished. Net price, amplifier only, \$2.95; kit of 2 tubes, \$1.60.

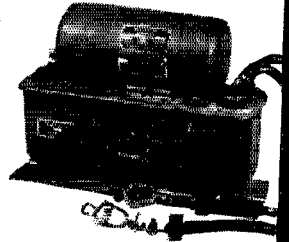
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Audio input transformer, 200 or 400 ohm/line to 80,000 ohms (grid); hum-bucking type with 'static shield'\$2.95

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Audio modulation transformer, PP parallel 6L6 Class AB (3500 ohms) 100 ma d-c each side into parallel 807 Class C at 210 ma d-c RF load (2000-ohm impedance).....\$4.95

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Band switch also controls dial mask; only working band visible.
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Dual dial light has brightness control.
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Quartz crystal filter.
Twin output jacks.
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AVC, MVC, and BFO.
Controls conveniently grouped on front panel.

The BC-348 receiver includes a built-in dynamotor for plate supply when receiver is operated at 28 volts d.c. The dynamotor can be easily removed and replaced by a 110 volt a.c. power supply. Complete instructions are furnished for change-over to 110-volt power supply including 6.3 volt filaments and 50 ma. 250 volt plate power. The exceptionally low price on these receivers is accounted for only because they were removed from aircraft that were never used.

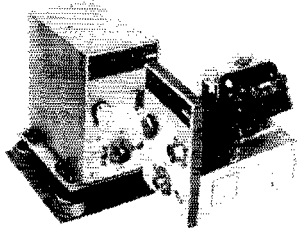
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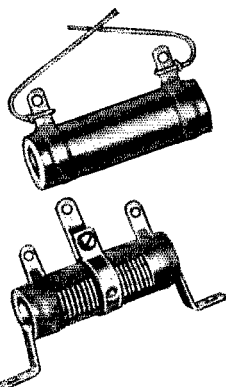
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Happenings

(Continued from page 81)

2 $\frac{1}{2}$ -meter equipment it may interest you to know how it is arranged:

- 108.1 to 111.9 (20 channels): Instrument landing localizer with simultaneous radiotelephone channel.
- 112.1 to 117.9 (30 channels): Airway track guidance (ranges).
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- 121.5 (1): Emergency and distress, simplex, air and ground.
- 121.7 and 121.9 (2): Airport utility, simplex or crossband.
- 122.1 and 122.3 (2): Private aircraft en route, air to ground.
- 122.5 to 122.9 (3): Private aircraft to towers, air to ground.
- 123.1 to 123.5 (3): Flight test and flying schools, simplex. Shared.
- 123.7 to 125.5 (10): Approach control, air to ground.
- 125.7 to 126.5 (5): Aircarrier, aircraft to towers.
- 126.7 (1): Aircarrier, aircraft to airways stations.
- 126.9 to 131.9 (26): Aircarriers en route, simplex.

NOTICE TO MEMBERS DISCHARGED FROM THE MILITARY SERVICES

The requirement of continuous membership in the League for eligibility to A.R.R.L. offices has been waived for members serving in the uniform of the United States or Canada. See particulars on page 27 of *QST* for July last. Those desirous of taking advantage of this arrangement are required to claim the right when renewing membership, stating the beginning and ending dates of their military service.

Technical Topics

(Continued from page 36)

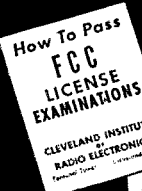
broad, wasting power at high angles, while the horizontal pattern becomes sharp, making it necessary to have the array pointed in exactly the right direction.

High gain and low radiation angle can be obtained with vertical arrays also, but it is necessary to resort to vertical stacking, with attendant mechanical complications. The popular "H" array is a case in point. The vertical "H" and more complicated versions of up to 8 half-wave elements in phase arranged in vertically-stacked pairs provide good performance, but with mechanical complications far beyond those of the simple parasitic array, yet it is doubtful whether their effectiveness is appreciably greater. The ease with which good performance can be obtained with a horizontal array appears to make it the logical choice for amateur 50-Mc. work, even if all other considerations were equal, and the use of horizontal polarization in 50-Mc. work is reaching the point of almost complete standardization.

On 144 Mc. the picture is somewhat different. Here many stations still use simple antennas, and where simple nondirectional dipoles are used there is little doubt but that verticals are superior to horizontals. Here, too, the smaller physical size of arrays makes vertically-stacked systems easier to build and rotate. Not to be forgotten are

(Concluded on page 110)

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33

109

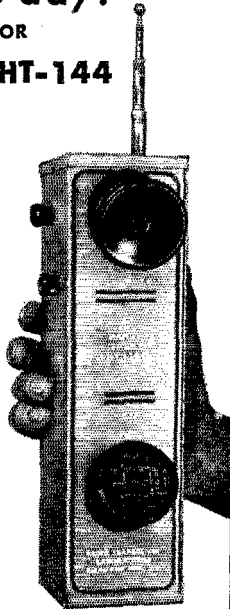
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 - Press-to-talk single hand control.
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Technical Topics

(Continued from page 108)

the hundreds of mobile stations, which comprise much of the activity on this band, and which must, of necessity, use vertical antennas.² It is probable that vertical polarization will dominate the 144-Mc. band in most areas for some time to come, though there is increased use of horizontal arrays on this band, particularly in the Middle West, where the trend to horizontals for 56-Mc. work got its start.

As a rule of thumb, then: For 50 Mc. go horizontal, unless you happen to be in one of the few areas where verticals are still in use, and even here horizontals will be useful in working DX; for 144 Mc. and higher it is well to start with vertical, unless you are sure that most of the stations around you are horizontally-polarized. The serious 144-Mc. worker may wish to try horizontal polarization however, even in the presence of a preponderance of verticals, as experience has shown that there may be enough polarization shift on this band to render matching the polarization of other stations unimportant. This is particularly true for stations situated in poor locations, where the stations to be worked are out of direct line of sight.

— E.P.T.

² For esthetic if not technical reasons.

A Slide Rule

(Continued from page 47)

"Hawaii." Since the slide is extending to the left, it means that it is 8:30 P.M. of the preceding day. Therefore if it is 2 A.M. Tuesday in New York, it is 8:30 P.M. Monday in Hawaii.

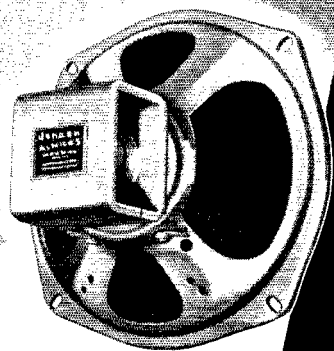
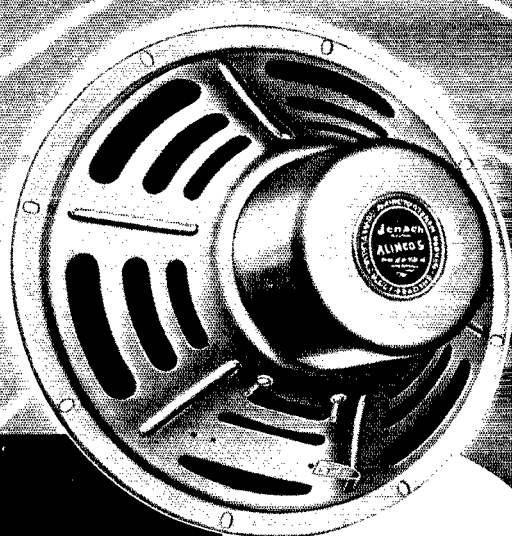
As a second example, if it is 6 p.m. in Chicago, what time is it in Manila? Setting 6 p.m. under "Chicago" brings the right-hand "00" over the 0-degree mark on the bottom scale, leaving "Manila" uncovered. Shifting the left-hand "00" over the 0-degree mark shows that it is 8 A.M. in Manila. Since the slide is extending to the right, it means that Manila is in the next day. If it is 6 p.m. Tuesday in Chicago, it is 8 A.M. Wednesday in Manila.

In general, the time for any given location is taken as the sun time at the nearest 15-degree meridian. For example, EST is 75th-meridian time, PST is 120th-meridian time, etc. Throughout the world, however, there are many local exceptions to this rule. Hawaii, for instance, runs on a time differing from the nearest time meridian by 30 minutes. Bombay also runs on a 30-minute difference, while Calcutta's time is 6 minutes ahead of 90th-meridian (east) time. There is a 20-minute difference in Singapore's time. When these exceptions occur, the time marks for the upper scale will, of course, come in between the even hour marks.

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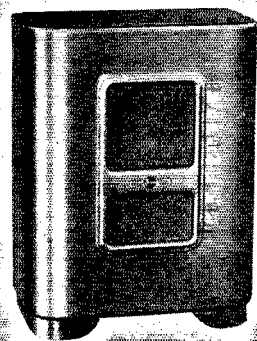
Standard Fidelity Model P12-S. Voice coil impedance 6-8 ohms. Power handling capacity in speech and music systems, 10 watts. List price \$19.70.

Listen ... it's a Jensen SPEAKER

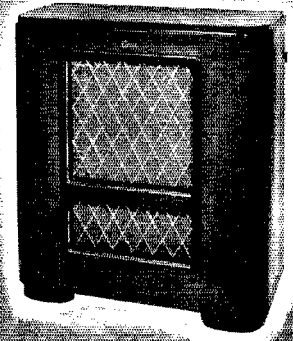
Model P8-SH (Superseding P8-CT). A high-fidelity 8-inch *ALNICO 5* PM speaker. Recommended for use with Jensen Model A-81 Bass Reflex cabinet. Maximum power handling capacity in speech and music systems, 6 watts. . . . Voice coil impedance, 6-8 ohms, List price \$20.

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(Continued from page 54)

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or in keeping it going once it has gotten underway? Try concentrating on one or two evenings each week. Get the gang to agree to a schedule which they will keep. Newcomers will then know when to listen and will not be discouraged by spending hours of listening without hearing anyone on the band. The idea has many ramifications. It can serve as the basis for emergency-net organization, as 144 Mc. is ideal for this sort of work. The group can be formed into a club, with regular get-togethers and a definite program. Regular activity is a fine medium for extending local coverage, too, as it gives the enthusiasts in adjoining areas some clue as to when to be on the band to attempt contacts.

Such "144 clubs" are springing up in many sections of the country, and they are serving a particularly useful purpose at this season of the year, when the atmospheric bending of the summer months has passed, and we don't find DX on the band every few nights. There are occasional good nights in the winter, but if there is no one on the band it will not do anyone any good. The boys in Fort Worth and Dallas, Texas, have a nightly schedule, with activity starting at 7:30 sharp. In Fort Worth are W5KL, W5LAR, W5LPN, W5BBH; in Dallas W5AJG holds the fort, and W5LJ is on in Grand Prairie. They are hoping for recruits in Lancaster, Denton, Mineral Wells, and other adjoining cities and towns within a 50-mile radius.

Springfield, Mass., was the scene of very early activity on 5, back in your conductor's days as a beginner, but only recently has the activity really started on 144 Mc. With Wednesday as their meeting night, Springfield's 144 Club gets underway at 8 p.m. Down the river in the Hartford area, the Monday-nighters warm up at 8 p.m. each Monday, and they invite newcomers. If your neighborhood lacks 144-Mc. activity get the boys together on one night each week. Elect someone to act as key station, preferably one who is in a position where he can hear and work most of the gang. Let us know the schedule, and we'll run it in QST to help attract new members.

Newark, N. J. and vicinity has a 144 Club operating on a spot frequency of 144.138 Mc. through a key station. Members include W2s QUF, IEI, LQV, FKI, BUD, ATK and MRG.

The gang around Cleveland would like to attempt contact with stations in the vicinity of Pittsburgh, according to Helen Harris of W8UKS. This is a hop of more than 100 miles, but it should be workable under good conditions, if not on a regular schedule. It should be a good project for scheduled operation, and 10 p.m. is suggested as a likely time for nightly attempts. Cleveland-area stations will listen for a 5-minute period at that time, and will transmit in the direction of Pittsburgh at 10:05, using m.c.w. whenever possible. W8WJC, located between Cleveland and Akron,

(Concluded on page 116)



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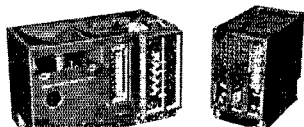
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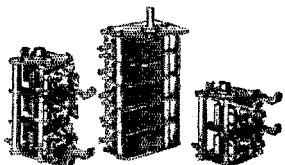
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TUNING CONDENSERS

Beautifully designed with ceramic insulation.

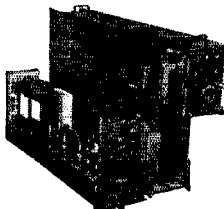
2 gang, split stator 36 mmfd.. **\$1.49**

3 gang, split stator 36 mmfd.. **\$1.99**
(Easily converted to 365 mmfd per section)

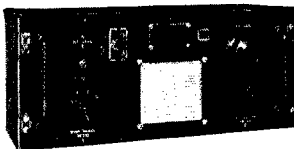
5 gang, 365 mmfd per section.. **\$2.95**

The greatest value ever offered in tuning condensers!

Additional 10% discounts in lots of 12 or more



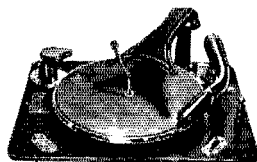
WAVEMETER BC-1073A—Contains a high quality resonant cavity wavemeter with a vernier dial, also oscillator, heterodyne amplifier, electric tuning eye, 110 volt AC power supply. Complete with 19 tubes. Tuning range 150 to 210 megacycles. Guaranteed in excellent condition. **\$24.95**



R.F. TUNING UNIT—Black crackle aluminum cabinet, 2 Variable Transmitting Condensers and 2 Vernier dials, one heavy duty ceramic 4 position wafer switch, 2 or more mica condensers, 2500 Working Volts and coils wound on porcelain ribbed forms. **\$3.89**
Yours for only.....

No. TU5B 1500 to 3000 KC
No. TU6B 3000 to 4500 KC
No. TU7B 4500 to 6200 KC
No. TU10B 10,000 to 12,500 KC

Please specify model

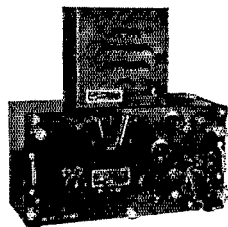


GARRARD RECORD CHANGER

RC/60 110 V.A.C. operation 50,60 cycles intermixes 10 and 12 inch records, automatically cuts off after last record, variable speed motor, comes with new permanent needle with less than one oz. needle pressure..... **\$63.00**

Universal model same as above but operates AC 110/130 and 200/250 volts... **\$73.00**

Walnut wood cabinet for above \$24.00



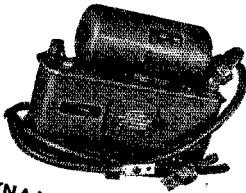
LOW FREQUENCY RECEIVER

BC-344—Brand new, 110 volts A.C., 10 tubes, speaker, 150 to 1500 KC. Complete **\$85.60**

WESTON NO. 689 OHM METER—Scale 0-10-1000. Scale to read 1/20 ohm..... **\$14.97**
Complete with leather case

MICROPHONE
New single button carbon hand microphone.
Please enclose 30c in stamps or money order to cover mailing and handling.
\$1.99

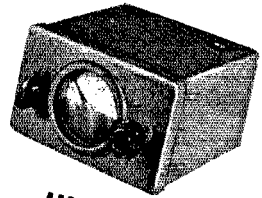
HEADPHONES
Signal Corps 4000 ohm magnetic and head-band..... **\$1.87**



DYNAMOTOR, new, U. S. Army PE-103 operates 6 or 12 volt D.C. Deliver 500 volts D.C. at 160 ma. Original Cost \$300.00!..... **\$13.95**

INPUT TRANSFORMER
\$1.29

Small and high quality for carbon or dynamic microphone; a \$10.00 value.



AM AND FM GON-SET CONVERTERS

AM
20 meters..... \$39.95
10 and 11 meters..... \$39.95
6 meters..... \$39.95
Special-Noise-silencer.. \$ 8.25

FM—NEW BANDS
88 MC to 96 MC } **\$14.95**
96 MC to 104 MC }
100 MC to 108 MC }

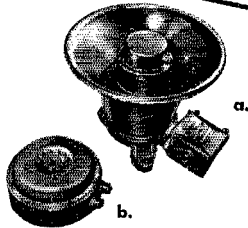
PROVAC V.T.V.M. This beautiful V.T.V. Meter that has met the demands of thousands of Radio engineers and servicemen.

DCV Range 0 to 3-10-100-300-1000. 11 Meg. ohm input resistance 3% ± ACV Range 0 to 10-30-100-300-1000. 1000 ohms per volt.

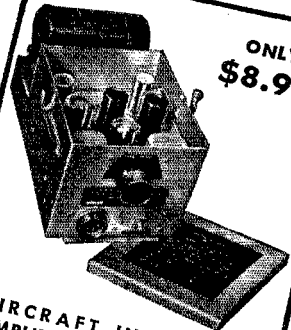
R.F. Range 0 to 3-10-30-50 Frequency range 60 CPS to 100. Megacycles ohm Meter Range 0 to 1000-10,000-100,000. 1 Meg.-10 meg.-1000 meg. Complete.



\$59.50



SPEAKERS—(a) Navy Type waterproof speakers, Stromberg-Carlson and RCA 4 1/2 ft. reentrance trumpet with 25 Watt PM driver unit and line-matching transformer, \$125 value for \$32.50. (b) 25 Watt PM driver unit with line-matching transformer and waterproof projector mounted in a heavy duty round metal baffle. At the lowest price ever **\$14.95** offered!!.....



ONLY \$8.95

AIRCRAFT INTER-COM AMPLIFIER— Comes completely wired in aluminum cabinet with the following: two 12A6, two 12J5 Tubes; one Bath tub condenser; three Can Filter Condensers; twelve Precision Condensers; Mica Condensers; four Low loss octal Sockets; Shielded input and output Transformers; two shielded R. F. chokes, one S.P.S.T.; toggle switch, 28 V D.C. Dynamotor. Sun Radio furnishes the instructions for easy conversion to Hi-fidelity phono or speech amplifier.

ANTENNAS

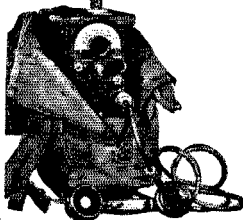
Telescopic Aerial— 15 inches to 45 inches..... **99¢**

22-inch Aerial for 150 to 200 Mc. — with cable connector. **\$1.69**

Telescopic Aerial —from 14 inches to 9 feet, 6 inches.... **\$2.69**

SCR-195— New Walkie Talkies SCR— 195 tunes 52.8 to 65.8 MC. 2 units complete and ready to operate.

\$119.90



ALL ITEMS F.O.B., WASHINGTON, D. C.

All orders \$30.00 or less, cash with order. Above \$30.00, 25 percent with order, balance C.O.D. Foreign orders, cash with all orders plus exchange rate.

SUN RADIO

OF WASHINGTON, D. C.

938 F STREET, N. W. WASH. 4, D. C.

CHOOSE THE HRO



NATIONAL HRO-5-TA1

This finest of all National receivers is now available from stock. The HRO-5-TA1 incorporates new type limiter. Four continuous coverage and band spread coils supplied. Additional coil sets available for broadcast band and to frequencies as low as 50 KC.

- * Extreme sensitivity.
- * 500 divisions (12 feet of dial).
- * 400 division bandspread.
- * Excellent stability.

RECEIVER WITH TUBES net \$274.35
 POWER SUPPLY 115-230 V. 60 CY. net 20.38
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 & ELECTRONIC PRODUCTS CO.

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 West Hartford 7, Connecticut

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.



ENDORSED BY THOUSANDS!

The Instructograph Code Teacher literally takes the place of an operator-instructor and enables anyone to learn and master code without further assistance. Thousands of successful operators have "acquired the code" with the Instructograph System. Write today for full particulars and convenient rental plans.

INSTRUCTOGRAPH COMPANY

4709 SHERIDAN ROAD, CHICAGO 40, ILLINOIS

116

50 Mc.

(Continued from page 118)

at a point where a sign bears the legend "highest point in Summit County," should be a good one to break down this path first. The list of stations logged at W8UKS is now up to 93!

Los Angeles to San Francisco is a path which has never been negotiated on any v.h.f. band, but it should not be impossible. W6BVK, in Sacramento, has heard several Los Angeles stations but has made no contacts as yet. He has a 50-watt crystal-controlled rig on 144.9 Mc., and an excellent coaxial-line superhet. Two beams, a 16-element array and a 4-element job, are used. He works W6OVK, Redwood City, regularly, close to 100 miles over difficult terrain, and hears many San Francisco stations, but finds it hard to make contacts because of the local QRM in the Bay area.

W7JPA, Yakima, Washington, reports quite a bit of activity on 2, with a number of MOPA rigs and superhet receivers coming on. Stations include W7s AWX, KFM, JPH, CAM, GMC, IYB, HQO, ALH, ARF, HCE and ITR. Activity has been pretty much local, but improved rigs and antennas are increasing the range gradually.

A one-way record for 2450 Mc. is reported by W6SUD of Los Angeles. On Nov. 9th, W6BO, operating from Mt. Wilson with a 2450-Mc. transmitter and a 144-Mc. receiver, made contact with W6SUD, who had a 2450-Mc. receiver and a 144-Mc. transmitter in operation at Pasadena, 9 miles distant. The transmitter used on 2450 Mc. was a 2C38, while the receiver employed a 707B. Parabolic reflectors four feet in diameter were used at both ends. When two transmitters and receivers are available the record may be extended to distances which will approach those covered on 144 Mc.

W1BBM, North Harwich, Mass., urges us to keep plugging for more activity on the microwaves, for the possibilities in the range above what are normally thought of as communication frequencies are not appreciated by most amateurs. It is in line with amateur tradition to explore ever higher, but that spirit has not manifested itself within our ranks as far as the microwave range is concerned, except for the work of a few pioneers here and there. Bates has a report that microwave radar has covered 3500 miles, and we know of numerous reports of phenomenal distances recorded during the war period. At this time, exactly 25 years after the first amateur trans-Atlantic communication, it behooves us all to keep an open mind on the subject of the value of the microwave region for amateur use. Remember, it was only a generation ago that we thought all below 200 meters was wasteland. We could be equally wrong when we look askance at the wavelengths below 2 meters!

More Popular Than Ever— The "Tuffy" — TUF-20

High Frequency Triode

FOR PORTABLE, MOBILE AND FIXED STATIONS

General Characteristics

Fil.....6.3 Volts.....2.75 Amps.
Plate Dissipation.....20 Watts
Amplification Factor.....10

Interelectrode Capacities

G-P 3.5MMF • G-F 1.8MMF • P-F 0.9MMF

Overall Dimensions

3¾" high • 1½" diameter • Octal Base

Typical Operation

(Input up to 250 MC.)

OSCILLATOR AND CLASS C RF AMPLIFIER

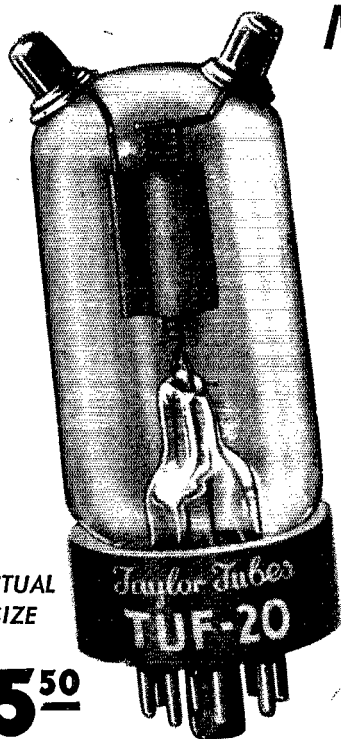
Plate Volts300.....750
Plate Current.....100MA.....80MA
Grid Bias.....-60 Volts.....-150 Volts
Grid Current.....15MA.....15MA

At Your Radio Parts Distributor Now

Although labor and material costs are up, you'll find that Taylor Tube prices have advanced but little compared with other radio items. This again is another example of Taylor Tube's policy of many years, to give the Ham "More Watts Per Dollar."

**COMING SOON! WATCH FOR THE NEW TAYLOR
TUBE CATALOG — NEW CIRCUITS, NEW IDEAS —
PACKED FROM COVER TO COVER WITH INTER-
ESTING, VALUABLE HAM INFORMATION**

"MORE WATTS PER DOLLAR"



ACTUAL
SIZE

\$5⁵⁰

- ★ High Input for Fixed Station Operation
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- ★ Heavy Tungsten Leads Support Grid and Plate, Eliminating Internal Insulators
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Variable Frequency Oscillators
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- ★ 829B TUBE — With Socket... \$4.45
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The Elect in Electronics

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BALTIMORE 17, MARYLAND

Repenter

(Continued from page 59)

by a Lachrymal potentiometer located on the rear panel. All Platonic voltages and Plague currents for the tubes are supplied by a single prejudice supply adequately filtered by use of two open chokes and two leaky capacitors. (Similar components may be picked up at any surplus store.)

Controls

All controls are brought out to the front panel for accessibility. For ready maintenance on the interior of the cabinet the 35 knobs and 15 clamps are removed, and the front panel is then removed by unscrewing 216 machine screws and running an acetylene torch along the edges of the panel. Since all wires and component parts mounted inside the cabinet are imbedded in sealing compound, a trough should be placed below the front panel when it is removed. Ofttimes it may be necessary to blast the panel loose (corrosion, you know). The Repenter is therefore equipped with a detonator charge directly in back of the front panel. To set off the charge, merely hit the Gravity switch with any long stick. (CAUTION: Operator should practise hasty exits before tripping Gravity switch — this maneuver not recommended for old-timers.)

(-) REGRESSION IN DB.(-)

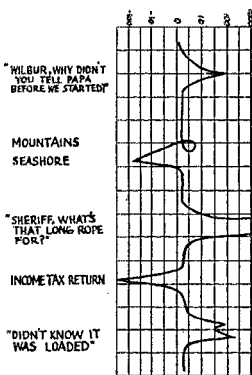


Fig. 4 — Repenter operation with Expectation preselector "on."

Mechanical Arrangement

The Repenter unit is relatively light (3142 pounds, 8 ounces, 10 drams, 1 grain) in weight, moderately small in size (60 × 40 feet), fairly mobile and essentially the type of apparatus known as portable. A typical installation is shown in Fig. 3, wherein may be seen the utter ease of operation.

Preselector Attachment

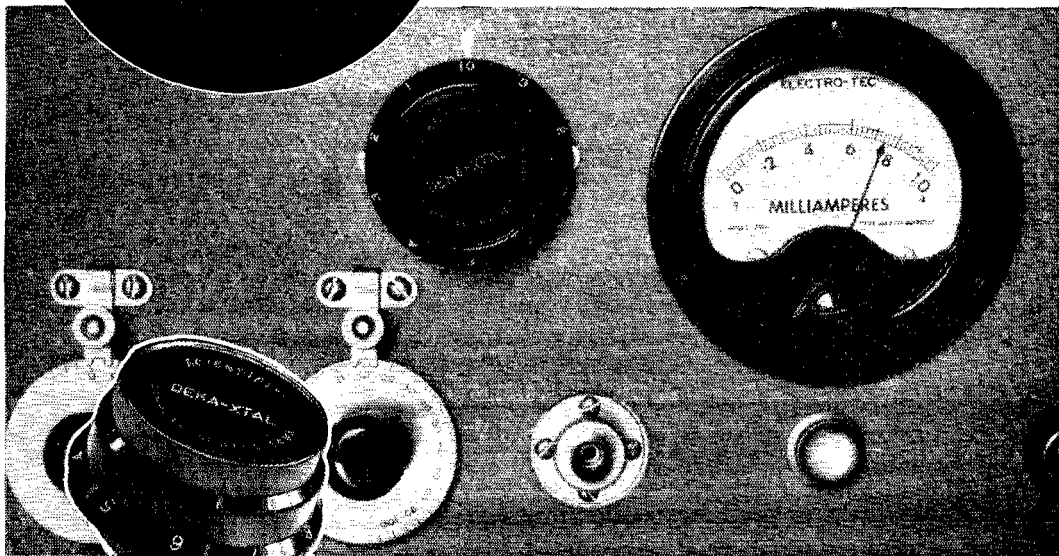
The Expectation preselector is essentially a Faze inverter. Should the attitude of the Repenter become optimistic, the preselector instantly shifts the Attitude current 180 degrees out of faze through a simple Remorse Canopy network (R/C faze shifter) creating a pessimistic

(Continued on page 128)

SCIENTIFIC'S
Sensational New

DEKA-XTAL

**10 Frequencies
with Fingertip
Control!** ★



★ **10 CRYSTALS IN A NUTSHELL**

Here is the most-versatile crystal unit ever designed. Plugged into a standard five-prong tube socket on the front panel of your transmitter, the DEKA-XTAL gives you ten Scientific metalized crystals so arranged that any one of the ten can be connected to the base pins by simply rotating the holder.

Plugged into your oscillator, the DEKA-XTAL gives you crystal control, signal shifting, at less than the cost of a good ECO. It is compact, rugged, and sealed against moisture and dirt.

You may order the holder with as many crystals as you desire, up to ten, cut to your specifications, and add other frequencies later.

DEKA-XTAL Holder without crystals . . . each **\$6.95**

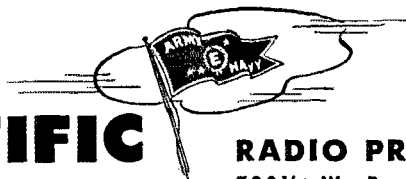
Metalized crystals furnished to plus or minus 1 KC, your specifications from 3500 to 9500 KC. each **\$1.50**

See Your Distributor

SCIENTIFIC CRYSTALS AVAILABLE IMMEDIATELY

NO.	FREQUENCY	HOLDER	SOCKET	PRICE
H-1	3.5 to 9.5 Mc	FT-type	Octal	\$2.65
H-2	12.7 to 18.0 Mc	FT-type	Octal	3.50
S-1	100 Kc	Special	5-prong	12.50
S-2	1000 Kc	Special	5-prong	6.50
F-1	455-456-465 Kc	FT-type	Octal	4.50
A-1	3105 or 6210 Kc	FT-type or 5-prong	Octal or 5-prong	5.00

*Patents Pending



SCIENTIFIC

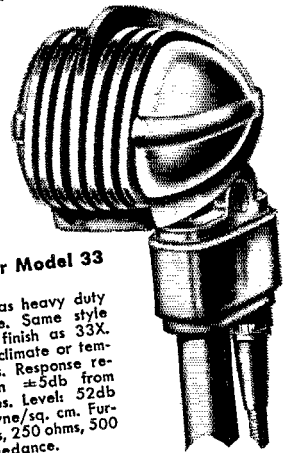
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Here's a mike you can use with confidence in all-around communications, recording, and P. A. work. It's got dependability built right into its precision Turner circuit. Whatever you say is picked up accurately and reproduced without garbles or distortion. Its smooth response is ideal for music. Available at your dealer in a choice of crystal or dynamic models.



The Turner Model 33

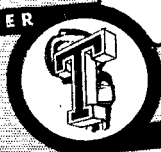
33X Crystal has high quality moisture sealed crystal. Response is flat within ± 5 db from 30-10,000 cycles. Blast and mechanical shock proofed. Automatic barometric compensator. 90° tilting head. 20 ft. removable cable set. High impedance. Level: 52db below 1 volt/dyne/sq. cm.

33D Dynamic has heavy duty dynamic cartridge. Same style and rich chrome finish as 33X. Not affected by climate or temperature changes. Response remains flat within ± 5 db from 40-10,000 cycles. Level: 52db below 1 volt/dyne/sq. cm. Furnished in 50 ohms, 250 ohms, 500 ohms or high impedance.

Licensed under U. S. Patents of the American Telephone and Telegraph Company, and Western Electric Company, Incorporated.



TURNER



TURNER

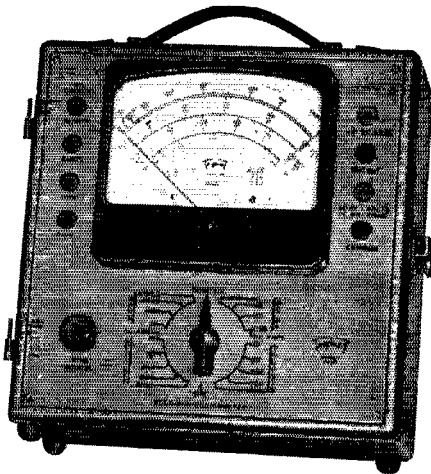
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MODEL 2406

Volt • Ohm • Milliammeter

25,000 OHMS PER VOLT D. C.

STANDARDS ARE SET BY



SPECIFICATIONS

NEW "SQUARE LINE" metal case, attractive tan "hammered" baked-on enamel, brown trim.

■ **PLUG-IN RECTIFIER**—replacement in case of overloading is as simple as changing radio tube.

■ **READABILITY**—the most readable of all Volt-Ohm-Milliammeter scales—5.6 inches long at top arc.

■ **RED-DOT LIFETIME GUARANTEE** on 6" instrument protects against defects in workmanship and material.

NEW ENGINEERING • NEW DESIGN NEW RANGES • 50 RANGES

Voltage: 5 D.C. 0-10-50-250-500-1000 at 25000 ohms per volt.

5 A.C. 0-10-50-250-500-1000 at 1000 ohms per volt.

Current: 4 A.C. 0-.5-1-5-10 amp. 6 D.C. 0-50 microamperes—

0-1-10-50-250 milliamperes—0-10 amperes.

4 Resistance 0-4000-40,000 ohms—4-40 megohms.

6 Decibel -10 to +15, +29, +43, +49, +55.

Output Condenser in series with A.C. volt ranges.

Model 2400 is similar but has D.C. volts

Ranges at 5000 ohms per volt.

Write for complete description

Triplet

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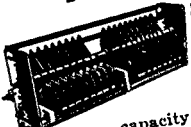
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Thousands of hams have already found that:
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 Get on Buck's mailing list. His big ham flyer is coming out soon.

JOHNSON "D" DUAL CONDENSER



Heavy laminated phosphor bronze contact springs. Ultra-steatite insulation. Center rotor contacts. 7000 V peak rating.

Type	capacity max.	min.	length	price
50DD70	50	13	5-13/16"	\$6.60
70DD70	72	16	7-22/32"	7.50
100DD70	99	21	9-15/32"	8.70

"BUCK" STRETCHER'S BARGAIN BASEMENT

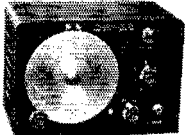
- Speedway electric drill. 1/4" chuck **\$10.95**
- Amphenol 300 ohm twin lead, per foot **.03**
- Kenyon T-499 Mod. Xformer. PP 800's to 13,500 & 2,200 ohms for plate & screen mod. of single RK-28 or 803..... **9.50**
- Filter Condenser, 4 mfd, 600 V, GE Pyranol, 3 for **2.69**
- Johnson 10 QS Antenna..... **5.85**
- Johnson 20 QS Antenna..... **9.90**
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- National ACN Dial **3.00**
- 1" Dial Light Jewel Assembly. Lamp removable from front of panel. 3 for **1.95**

FOR W2'S ONLY!

When hams want to get together these days, they come up to Sun Radio, New York's most popular rag-chewin' rendezvous. C'mon up meet W2LBF, W2KYO, W2NSX, W2QJE and W2JUX, and see all our unadvertised "buck stretchers".

BROWNING AMATEUR FREQUENCY METER

Model MJ-9 Combination Freq Meter-VFO



- Dial reads directly in frequency on seven amateur bands.
- May be used in place of a crystal to furnish RF voltage to exciter or transmitter.
- Accuracy of .05% at all frequencies.
- Secondary standard is 500 kilocycle crystal whose frequency may easily be checked with WWV of the National Bureau of Standards.
- Stable electron-coupled oscillator used covering the 3.5 to 4.0, 7.0 to 7.3, 14.0 to 14.4, 20.5 to 21.5, 28.0 to 29.7, and 50.0 to 54.0, megacycle bands with separate coils. The 144 to 148 megacycle band is covered by harmonics of 20.5 to 21.5 megacycle band.
- Audio detection of zero beat.
- Low power consumption. 40 volt-amperes. 110-120 volt 25 to 60 cycle AC-DC operation.
- Tube complement: one 6SK7GT, one 6SL7GT, one 25Z6GT.
- Crystal check points are marked on dial for all bands.
- Dimensions: Height 7" Width 10" Depth 6 1/2".
- Weight: 7 lbs.
- Shipping Weight: 11 lbs.

\$6975
with tubes

APOLOGY

We're sorry that due to the terrific popularity of our "buck stretchers" we've had to disappoint some of you. From now on you can bet we'll have enough of everything to go around. However, all items are subject to prior sale, so get your order in early.

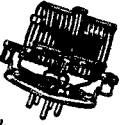
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UTC "PA" SERIES FILTER SWINGING CHOKE



Brand new. Husky, fully shielded potted case, 5/25 by @ 200 ma. 105 ohms DC res. 31" high, 4 1/2" long, 4 1/2" wide, 4 1/2" Reg. list wide, 4 1/2" high. Your cost... **\$445**

B & W AIR-WOUND 75 W PLUG-IN COIL



Fits 5 prong socket. For use on 10, 20, 40, and 80 meters. Excellent for limited-space applications. Specify end or center linked. Set of 4 coils... **\$552**

WESTINGHOUSE METERS 0-500 mils 0-20 mils



Brand new. Insulated zero adjust screw. Complete with mounting hardware. Make-life case. 2-13/16" face. Fits 2-13/16" hole. Specify 0-500 mils or 0-20 mils. Only... **\$475**

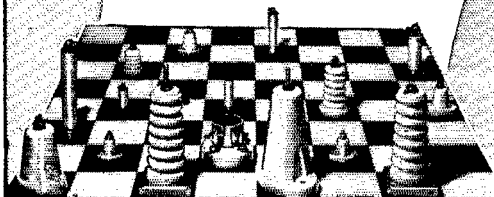
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**A.R.R.L. WEST HARTFORD
CONNECTICUT**

(Continued from page 118)

outlook which is then fed into a Class 4F modu-

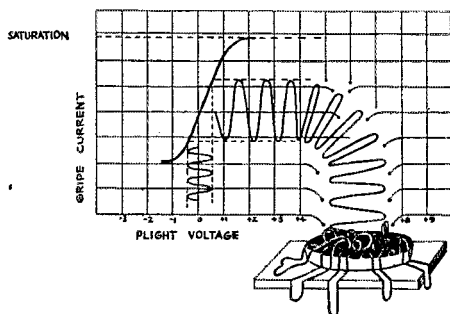


Fig. 5 — Effect of improper gripe leakage.

lator. By means of the thrush discharge characteristics of this Class 4F modulator a Widget is caused to absorb the output of the Attio-amplifier faster than it can be supplied. The net result is that a regression into the past is obtained. This regression essentially is a negative projection, of course, and should bring forth from the past many objects, words, etc., to repent. Fig. 4. illustrates a typical curve of the operation of a Repenter with the Expectation preselector attachment. The Repenter should be mounted horizontally. When mounted vertically the gripe-leak resistors cannot drain rapidly enough and the result is as shown in Fig. 5.

Operation

The operator should turn the Repenter on and wait a while (45 hours, 15 minutes, 8 seconds, 1 microsecond) for the tubes to reach normal operating temperature (1273 degrees Foo). The Repenter is now ready for its first assignment. Generally, the first assignment is used to determine if the apparatus is functioning properly. This should manifest itself to the operator by a great surge of repentance for having purchased the instrument. The procedure outlined below should be followed for best results.

Turn switch SW-3 to the Remorse position and advance the Futility output control to about half-scale. Rotate the Sob dial to the setting marked "Pangs" and look at the invoice reading "Price." Observe that the Repenter has a single high-amplitude pang and note the instant cessation of doubt at having bought that surplus. If it is found that following this reaction a desire to purchase more surplus persists, the Obsession control was adjusted too high. If a slight lingering feeling of guilt is noted, the Idiosyncrasy control was set too low. The Expectation preselector attachments should then be attached to the Repenter and tested by connecting test cord T 15 $\frac{1}{4}$ to jack marked "Anti-Out" and then to "Reg-In" and from "Ut. Fut. On" to "Ant. Hyb. In." Then advance Repenter output. Set Gripe control to "Hppn" and turn Plight switch

(Concluded on page 126)

**Bob Henry says:
MOST MODELS
IN STOCK**

**FOR
IMMEDIATE
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Most models listed below are in stock . . . ready for immediate delivery:

Hallicrafters S38 complete	\$39.50
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Hallicrafters S36A	307.50
Hallicrafters SX 42	250.00
Hallicrafters SP44	99.75
Hammarlund HQ-129X and speaker	168.00
Hammarlund SP-400-X and speaker	342.00
National NC-2-40D (complete with speaker)	241.44
National HRO-5TA1 and HRO-5RA1	274.35
National NC-46	97.50
National 1-10A with tubes and coils	67.50
RME-45 complete	198.70
RME-84 complete	98.70
RME DB-20 complete	68.20
Pierson KP-81 complete	318.00
Panoramic panadapter complete	99.75
Temco 75GA transmitters	495.00
Mack 60T transmitters	150.00
Gordon, Amphenol, Johnson rotary beams	

The new Hallicrafters and Collins receivers, transmitters, VFO, etc. as fast as available. Prices subject to change.

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W9ARA

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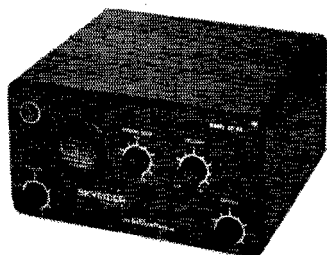
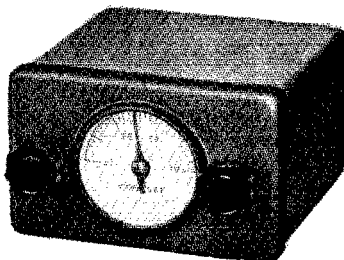


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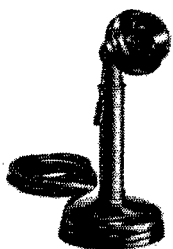
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Only a few left . . . those 5 mc. precision xtals in dustproof holders with neoprene gaskets. Harvey Special Price.....\$1.95

Include 10¢ postage with your crystal order.

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Abbott BM2 5-Element Beam Antenna for 144-148 mc. Constructed of hard aluminum alloy tubing; center boom 1" sq. by 75" long; drilled for the heavy gauge 1/2" aluminum alloy elements; all parts marked for easy assembly. Complete unit weighs only 3 lbs. Specially priced at.....\$14.10

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Cornell-Dubilier TJ-20040, 4 mfd. 2000 working volts DC, Dykanol filled, ceramic insulated terminals, factory installed mounting bracket . . . don't confuse with "surplus", brand new at Harvey special price....\$3.75

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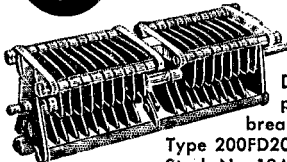
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Type 200FD20. List \$10. Stock No. 18A510. Each **\$2.95**

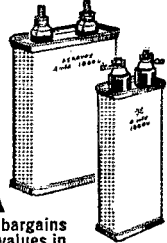
Johnson variable, dual section, 304 mmfd per section. Spacing .045". Type 300ED20. List \$9.95. Stock No. 18A509. Each **\$3.45**

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10 mfd 1000 volts C.D. Dykanol 7JU List \$12.00. Stock No. 17A268. Each **\$2.95**

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ASK FOR OUR BARGAIN BULLETIN

(Continued from page 122)

to "Anythg Cn Hppn" and observe that the Agastat picks up. Normally, an idling current of approximately 0.4 gills is satisfactory although there are exceptions. A few more gills of expectation will do no harm, however; the reader is referred to the author's text titled "The Snore-a-scope," soon to be released (padded cells notwithstanding) for further details.

Theory

From Kant's *Critique of Pure Reason* it can be shown that, given sufficient time, an element of the regression characteristic is a periodic function —

$$RSPV = PDQ \sin wt + O^2P^2A^2 (k)$$

The last term is largely transient as shown by its factor:

$$O^2P^2A^2 = (APO) (OPA) \times 10^{-7}$$

The summation:

$$\sum_{'42}^{'46} (FOB) (COD) = \frac{TNT + DX}{DDT - BO}$$

from which may be derived

$$\lim DX = EG_{nog} \times 2.43 \text{ microelmers.}$$

The latter half of this expression cancels out, of course, where the gripe voltage of the grid approaches cut-off, and where the ratio of 5/4 holds, since:

$$\int_{MON}^{SAT} PRO + RA_{ta} = \text{a constant} \quad (\text{Kerr-Plank constant})$$

and

$$AR = SK \approx j \frac{QRM}{CUL} + AP_{Pio} P_{io}$$

Therefore, it is clear that

$$\mu L \text{ in OPA units (Farleys per cm.}^2\text{)}$$

will be

$$\neq \sin BA_{be} + cosher - NVR SA DRY$$

The tipping coefficient as shown by Haig and Haig is:

$$T = K(1 + 0.00073 \text{ lb.}) \text{ per cavort}$$

which puts the quart before the hearse, and the Repenter dynamic function is:

$$\frac{42 \text{ st.}}{5 \text{ ave.}} + 1 \text{ qt. VAT}_{39} \times 10^4$$

Hence the gullibility factor (FOO) may increase without limit, and at all times equals the numbers of what $P^2T \times 10^9$ Barnum said was born every minute.

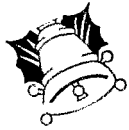
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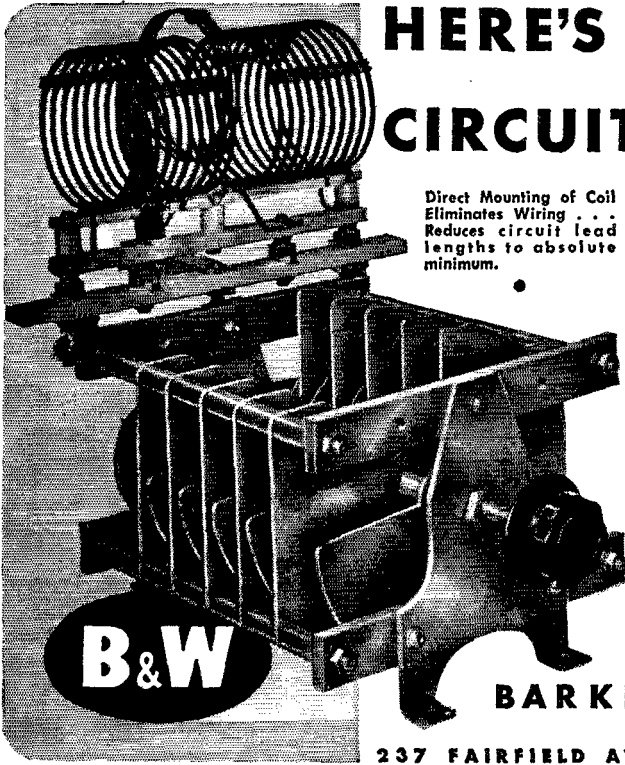


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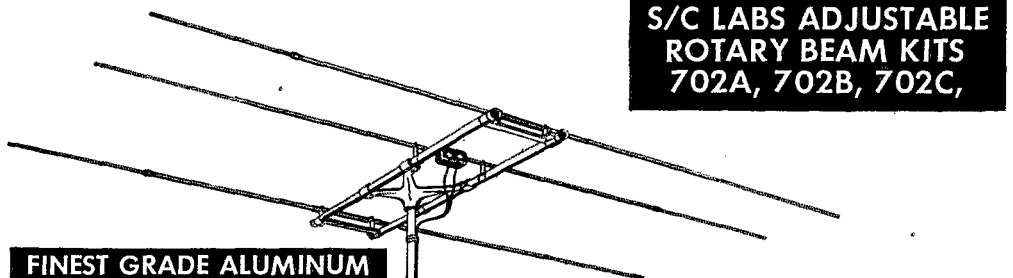
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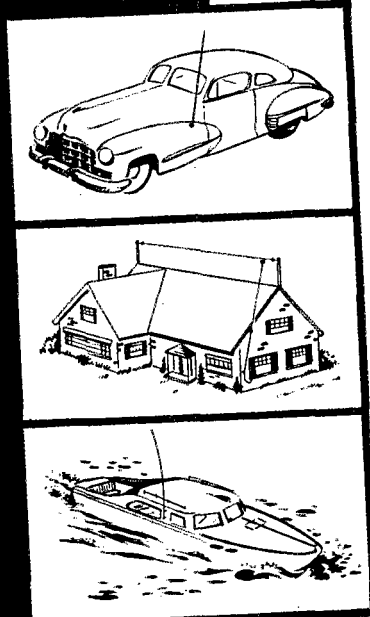
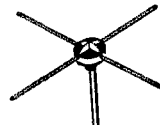
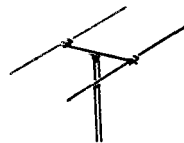
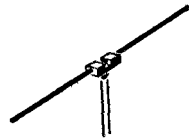
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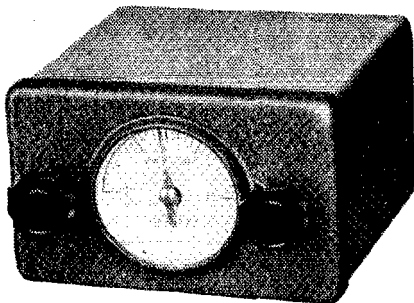
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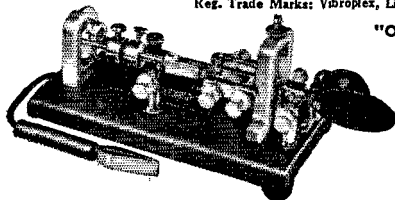
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PATENTED
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Hints and Kinks

(Continued from page 60)

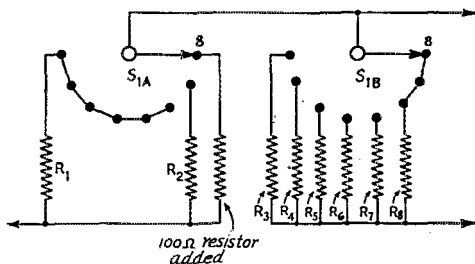


Fig. 3—Modification required for extending the range of the C-R-L bridge to 10 megohms. The original diagram appeared in *QST* for July, 1944.

sition switch was probably used. Move the stop on the switch over so that it covers 8 positions instead of the original 7. Connect a jumper between Positions 7 and 8, so that the 0.1-megohm resistor R_8 is brought in when the switch is set to Position 6, 7, or 8. Insert a 100-ohm resistor between Position 8 and the common terminal on the other gang of the switch. With this simple change, when the multiplier switch is set to Position 8, the C-R-L dial reading is multiplied by 100,000, producing a full-scale reading of 10 megohms.

—Athan Cosmas, W2PKD

Correspondence

(Continued from page 68)

If I ever get all the theory and the 13 w.p.m. and pass my test, when I get on the air I am not answering any jerky and nervous key-jabbers! In closing, I would like to tip my hat to the guys who send smoothly and read *QST* through and through so that they know what is going on.

—Gordon Vickers, ex-4MN

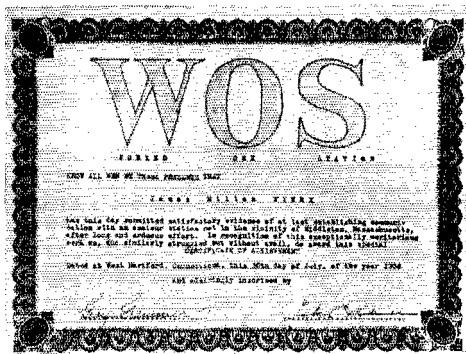
WOS

150 Exchange St., Malden, Mass.

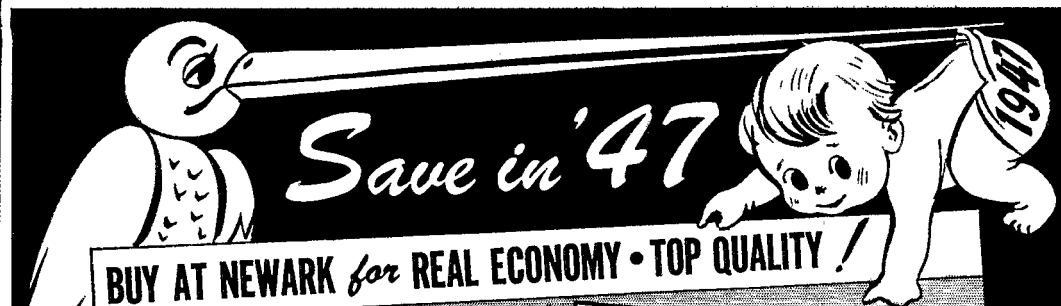
Editor, *QST*:

I was rather interested to note the first "Stray" on page 45 of the September issue of *QST*. Don't you remember a certain certificate that W1DF and W1SZ issued to me, many years ago?

—James Millen, W1HRX



[EDITOR'S NOTE: To jog *QST*'s editorial memory, herewith a picture of OM Millen's prized possession.]



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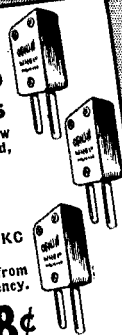
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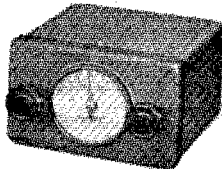
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1	1200 D.C.	3 3/8"	1 3/4"	1"	8 oz.	.49
2	1000 D.C.	4 3/8"	1 3/4"	1"	12 oz.	.89
2.5	1500 D.C.	4 3/8"	1 3/4"	Rd. Can	8 oz.	.99
4	1500 D.C.	4 1/2"	3 3/4"	1 1/2"/16	1 1/2 lbs.	1.99
4	3000 D.C.	5 3/8"	3 3/4"	2 1/2"	2 1/2 lbs.	3.75
6	3000 D.C.	6"	5"	3 1/4"	2 1/2 lbs.	3.95
6	3000 D.C.	6 1/2"	3 3/4"	2 1/2"	6 lbs.	3.25
8	2000 D.C.	7 3/8"	6 1/2"	3 3/4"	7 1/4 lbs.	2.75
8	3000 D.C.	7 3/8"	3 3/4"	3 3/4"	3 1/2 lbs.	3.95
10	3000 D.C.	3 1/2"	3 3/4"	1 1/2"	1 1/2 lbs.	4.75
13	1000 D.C.	4 3/8"	4 3/8"	3 3/8"	5 lbs.	2.25
15	3000 D.C.	4 3/8"	4 3/8"	3 3/8"	5 lbs.	5.25
* 2	600 D.C.	4 7/8"	2 1/2"	1 1/4"	14 oz.	.80
* 4	800 D.C.					
* 2	800 D.C.	4 1/2"	2 3/4"	2 3/4"	2 lbs.	1.25
* 6	1000 D.C.					
* 2	1000 D.C.	3 1/2"	4 5/8"	3 3/4"	4 1/4 lbs.	1.75
* 15						

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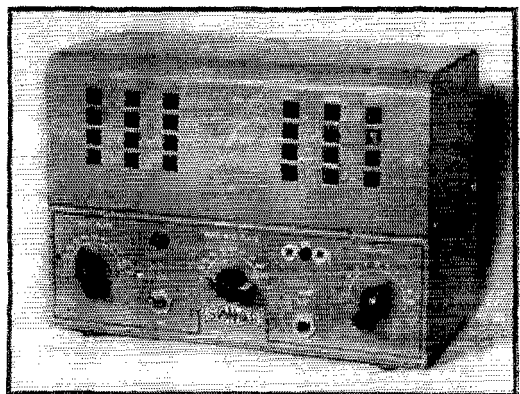
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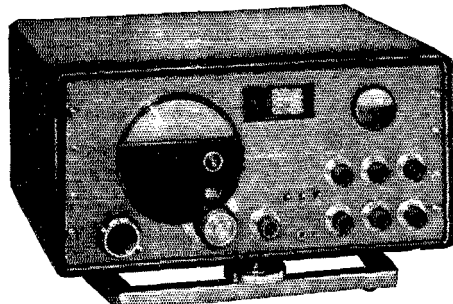


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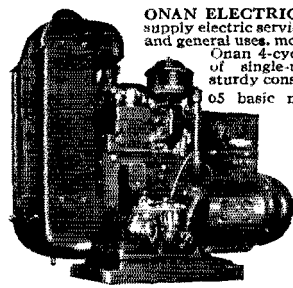
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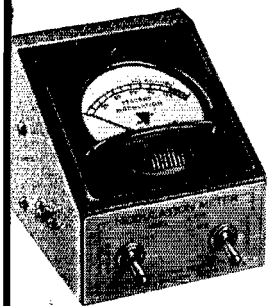


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ANNOUNCING JANUARY

WINNERS OF NEW SYLVANIA MODMETERS!

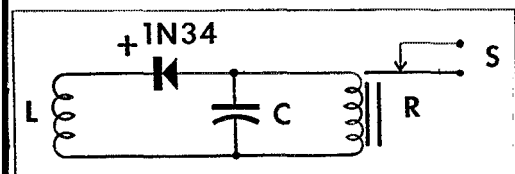


Each month, for three months, three winners will receive—free—a Sylvania Modmeter. For details on this handy instrument see your September, 1946 QST.

— HERE ARE WINNING CRYSTAL KINKS —

1 Contributed by R. J. Segerstrom, W6CQ1
Sonora, California

Protect your Class B Transformer. This kink stops speech when R.F. Amplifier fails. Similar circuits can also be used for other purposes; such as, antenna switching, model plane and train control, and numerous other R.F. switching schemes.



L = Pick-up coil placed near final.
C = .001 mfd mica.
S = Shunt relay across low level speech—preferably across 500 ohm line connecting preamplifier to Class A driver.
R = Normally closed, sensitive relay (0.5 ma d.c.).

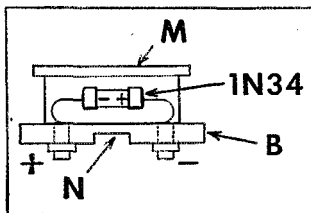
2 Contributed by Richard C. Hopkins, W1GPQ/3
32 Chesapeake Street, N. W.
Washington 20, D. C.

Standing wave indicator for popular Twinlead R.F. Transmission Line. Couples to line with no direct connection necessary. Similar device can be constructed for open wire line or, with the use of a probe, for coaxial cable.

M = 0-100 microampere meter (bakelite case).

N = Notch cut to fit line in use.

B = Polystyrene base (a handle can be used to minimize body effects.)



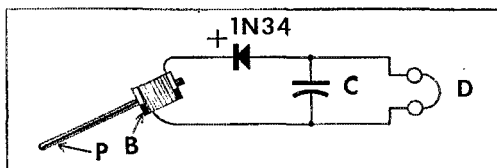
Congratulations to this month's winners and thanks to all you other contributors for the fine interest you've shown. This big response is indicative of the increasingly large number of uses to be found for the 1N34 and 1N35 crystal diodes.

The contest simply consists of submitting your ideas on further applications of these diodes. For details see your May and July 1946 issues of QST. Kinks are judged on their originality, simplicity, presentation, general appeal. We urge submitting only tested ideas. Kinks must be in by midnight January 15, 1947. Write Dept. 6X, address below.

Sylvania assumes no further obligation with respect to any use made of the entries or the ideas expressed therein. In the event of duplicate entries, only the first entry will be considered.

Watch our ads. You may be a winner!

3 Contributed by Rufus P. Turner, W1AY
16 Howland Street
South Dartmouth, Massachusetts
AF-RF Hum Field Tracer for Speech Amplifiers, Receivers, and Transmitters.



P = Exploring probe composed of fiber sleeve or paper straw, filled with polyiron powder and fitted into center of B.

B = Coil form made of bakelite fiber, approximately size of small thread spool, wound full with #36 or smaller enameled or single silk-covered wire.

C = .02 mfd. D = High impedance magnetic headphones.

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SUPREME model 562 Audolyzer	127.00
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SPRAGUE "Telemite" condenser analyzer	52.25
RADIO CITY 665A insulation tester and v.t.v.m.	94.50
JOHNSON 211-B 50 watt sockets	1.00

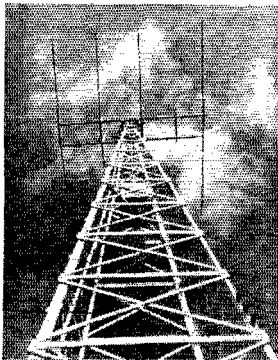
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SKY-LANE PRODUCTS
IRONWOOD, MICHIGAN

Inexpensive Transmitter

(Continued from page 35 December QST — see "Feedback," page 27, this issue)

connected to the antenna posts with the 6-turn antenna coil in place. If C_4 is set properly, the neon bulb will glow or the lamp will light. If this doesn't happen, try tuning the plate condenser until signs of output become apparent. The transmitter can then be checked on the 3.5-Mc. band by putting in the proper coils — remembering, however, to turn off the receiver and hold the key closed until the power pack of the receiver had been discharged, to avoid getting a shock when touching the coil terminals. The tuning condenser setting will be about 85 per cent meshed on the lower-frequency band.

It will not be possible in most cases to check the keying on the receiver used to furnish power to the transmitter, and it is highly advisable to check the keying in a monitor or someone else's receiver. If the keying is chirpy, the cathode coil, L_1 , should be squeezed out of round to reduce its inductance until the keying is better. On the 3.5-Mc. band, best keying will generally be obtained with slightly less capacity at C_4 than the setting for maximum output. In the oscillator shown in the photographs, a slight key click on "break" was reduced almost to oblivion by connecting a 0.1- μ fd. 600-volt paper condenser directly across the key. And don't be surprised if some crystals key better than others — such is always the case.

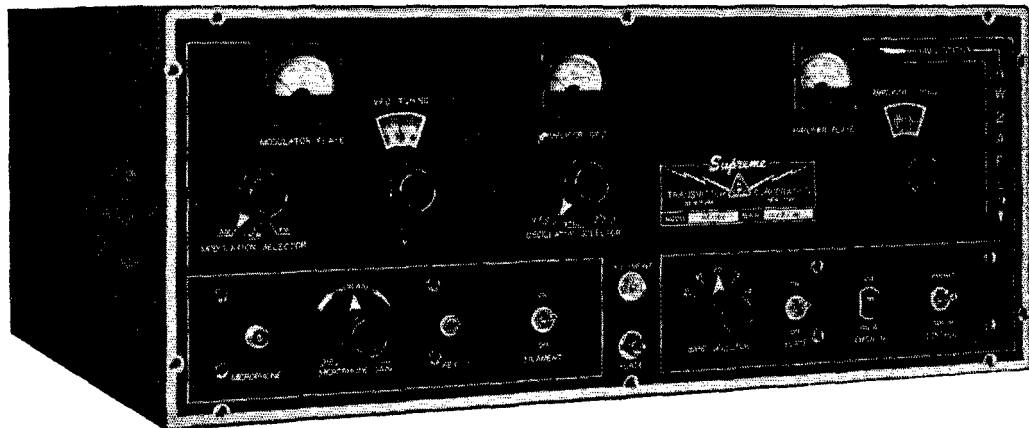
Antennas

It is, of course, impossible to specify an antenna that will suit everyone's location, and we can only recommend that the builder of the transmitter consult the antenna chapters of *The Radio Amateur's Handbook*. However, a 135-foot piece of wire for the antenna can be fed in several ways to give satisfactory results. It can be fed at one end with about 40 feet of open-wire feeders (about 32 feet of Amphenol 300-ohm Twin-Lead) or it can be fed in the center with 100 feet of open-wire feed line (about 80 feet of 300-ohm Twin-Lead). These lengths will enable one to connect the feed line directly to the antenna posts of the transmitter without the necessity for tuning condensers — other lengths may require either series or parallel condensers. Some experiment with the antenna coil may be necessary, but a small flashlight bulb in series with one of the feeders will serve as a good indication of feeder current, and will help in the tune-up process. The lamp need not be shorted during normal operation unless it burns too brightly. A neon bulb will also help in detecting r.f. energy in the transmission line, but it may not always light with this low power.

If room for only a short length of wire is available for the antenna, say 40 or 50 feet, it is best to connect its end to one antenna post and a good ground to the other. Here again some experimentation will be necessary to determine the optimum size of L_3 .

(Concluded on page 138)

COMPLETE-COMPACT and INEXPENSIVE!



SUPREME TRANSMITTER Model AF-100, 6-Band, 100 Watt (output) Desk Type Transmitter. Embodies ALL the features most desired by the majority of the amateurs. Designed to cover the amateur bands most frequently used: 10, 11, 15, 20, 40 and 80 meters for CW, ICW, AM and FM Phone transmission. This is the very first transmitter offered to the amateur which has the new feature of Frequency Modulation in the band of frequencies assigned for this purpose, namely 27.185 to 27.455 and 29 to 29.7 megacycles. Model AF-100 is continuously tunable throughout the range of each of the amateur bands. A highly stable variable oscillator followed by slug-tuned buffer and doubler stages which are ganged to the oscillator dial simplifies the problem of working through

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Front Panel Controls: Oscillator Dial; Final Amplifier Dial; Oscillator Selector Dial; Modulation Selector Dial; Microphone Gain Control; Band Selector Switch; Filament Power Switch; Plate Power Switch; Emission Selector Switch; Standby Control.

Metering: PA Plate Current; PA Grid Current; Modulator Plate Current.

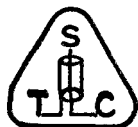
TUBE COMPLEMENT		ELECTRICAL CHARACTERISTICS	
Type	Function		
1—6AC7	Reactance Tube Modulator	Frequency Range:	Amateur Bands—10, 11, 15, 20, 40, 80 meters
1—6J5	Variable Frequency Oscillator	Output Power:	100 watts on CW, ICW and Frequency Modulation 100 watts Amplitude Modulation
1—6AC7	Class "A" Amplifier or Crystal Oscillator	Method of Modulation:	AM—High Level Class AB ₂ FM—Reactance Tube Modulation
1—6L6	80 meter Buffer or 40 meter Doubler	Modulation Capabilities:	AM—100% FM—100% = ± 75 kilocycles
1—6L6	20 meter Doubler	Input Audio Source:	High Impedance Crystal or Dynamic Microphone. Level 60 DB down
1—6L6	15 meter Tripler	Audio Frequency Response:	AM—±2DB, 200 to 6000 cps FM—±1DB, 100 to 7500 cps
1—6L6	10 meter Doubler	Noise Level:	AM—Minus 45DB below 100% modulation FM—Minus 60DB below 100% modulation (± 75 kilocycles)
1—3D23	Final Amplifier	Audio Frequency Distortion:	AM—5% at 85% modulation for 100 watt output FM—1.5% at 100% modulation
2—807	Class AB ₂ Modulators	Frequency Control Elements:	Stabilized Variable Frequency Oscillator or two (2) crystal controlled positions.
1—6J5	Modulator Driver		
1—6SJ7	Speech Amplifier		
2—866A	High Voltage Rectifiers		
1—5R4GY	Low Voltage Rectifier		
1—5R4GY	Modulator Rectifier		
1—80	Speech Rectifier		
1—6X5GT	Bias Rectifier		
1—VR 150	Voltage Regulator		
1—6SN7GT	Audio Oscillator		

COMPACT: 29 3/8" long, 11 1/4" wide, 18 3/8" deep. **Power Source:** 110-117 volts 50/60 cycles AC.

Economical — Power Consumption: 325 watts. **Approximate Weight:** 125 lbs.

COMPLETE: The only items needed to get "on the air" are a key, a mike and two crystals.

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Would you make a receiver today? Aren't you anxious to get that big transmitter? Then why not do them justice and get a good powerful beam, machined parts, completely tuned, spaced, and matched by months and months of "maximizing" on a distant RF field indicator? Users all over the U. S. and Canada report "Received beam. Looks fine. Does all you say it does and more. Working stations never even heard before." No wonder at that. The beam has a power gain of approx. ten out front. And varying height above ground does not affect it. This has been shown many times in lecture-demonstrations on beams where we show a high gain beam lighting a bulb many feet away, and then bring up a ground screen on the flat side of the beam and hold it $\frac{1}{2}$ wavelength away. Still the same held at a distance!

All our beams are completely guaranteed to work as stated, are made by amateurs for amateurs. Elements are all of 24St Duralumin, so the entire beam is also guaranteed to withstand any wind and ice. Read folder on structural strength.

Amateur net prices, 4-element 10-meter beam, \$50. 3-element 20-meter beam, \$100. For shipping prepaid anywhere in U. S. A. or Canada add \$10 for deposit on strong wood box. Refund on return of box less outgoing shipping charges. Beams available for all amateur bands from 14 m.c. up, including two new ones for 2 meters, 16 and 32 elements. Send for literature if interested. Our electricrotator is in production now also.

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(Continued from page 154)

At some later date, the power can be increased by substituting a 6L6 for the 6V6 or 6F6 and adding a separate power supply to give 350 volts at 100 ma., but it is not advisable to increase the voltage much above this value without keeping the screen voltage down by the addition of a dropping resistor and another by-pass condenser. However, one can have plenty of contacts with the few watts obtained with a receiving-tube power supply, and several crystals are a better investment at first than the higher power. The transmitter was used by W1CEG in the recent CD QSO Party, and 60 stations in 18 sections were worked, in 10 hours operating time.

A.R.R.L. QSL BUREAU

FOR the convenience of American and Canadian amateurs, the League maintains a QSL-card distributing system which operates through volunteer "District QSL Managers" in each call area. To secure such foreign cards as may be received for you, send your district manager a standard No. 10 stamped self-addressed envelope. If you have reason to expect a considerable number of cards, put on an extra stamp so that it has a total of six cents postage. Your own name and address go in the customary place on the face, and your station call should be printed prominently in the upper left-hand corner. If you have held other calls in previous years, submit an envelope for each such call to the proper manager — there are many thousands of uncalled-for cards in the files. All incoming cards are routed by Hq. to the home district of the call shown in the address. Therefore, cards for portable operation in other districts should be obtained from the home-district manager.

W1 — Jules T. Steiger, W1BGY, 231 Meadow St., Wilimansett, Mass.

W2 — Henry W. Yahnel, W2SN, Lake Ave., Helmetta, N. J.

W3 — Maurice W. Downs, W3WU, 1311 Sheridan St., N. W., Washington 11, D. C.

W4 — Edward J. Collins, W4MS 1003 E. Blount St., Pensacola, Fla.

W5 — L. W. May, jr., W5AJG, 9428 Hobart St., Dallas 18, Texas.

W6 — Horace R. Greer, W6TI, 414 Fairmount Ave., Oakland, Calif.

W7 — Frank E. Pratt, W7DXZ, 5023 S. Ferry St., Tacoma, Wash.

W8 — Fred W. Allen, W8GER, 1959 Riverside Drive, Dayton 5, Ohio.

W9 — F. Claude Moore, W9HLF, 1024 Henrietta St., Pekin, Ill.

W0 — Alva A. Smith, W9DMA, 238 East Main St., Caledonia, Minn.

VE1 — L. J. Fader, VE1FQ, 125 Henry St., Halifax, N. S.

VE2 — C. W. Skarstedt, VE2DR, 3821 Girouard Ave., Montreal 28, P. Q.

VE3 — W. Bert Knowles, VE3QB, Lanark, Ont.

VE4 — C. J. Campbell, VE4CC, 276 Ash St., Winnipeg, Manitoba.

VE5 — Fred Ward, VE5OP, 899 Connaught Ave., Moose Jaw, Sask.

VE6 — W. R. Savage, VE6EO, 329 15th St. North, Lethbridge, Alta.

VE7 — H. R. Hough, VE7HR, 1785 Emerson St., Victoria, B. C.

VE8 — Yukon A. R. C., P. O. Box 268, Whitehorse, Y. T.

K4, KP4 — E. W. Mayer, KP4KD, P. O. Box 1061, San Juan, P. R.

K5, KZ5 — Signal Officer, KZ5AA, Quarry Heights, Canal Zone.

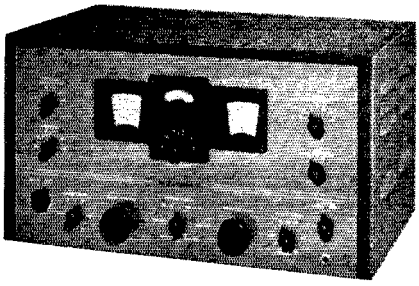
K6, KH6 — Andy H. Fuchikami, KH6BA, 2543 Namaau, Dr., Honolulu, T.H.

K7, KL7 — J. W. McKinley, KL7CK, Box 1533, Juneau, Alaska.

West's Largest Radio Parts Distributor — Established 1932

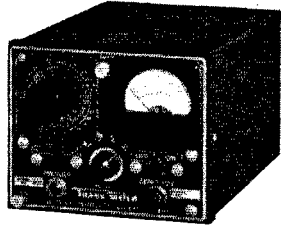
HAMMARLUND HQ-129X

Popular 11-Tube "Ham" Receiver having good sensitivity, stable performance. 54 to 31MC in 6 bands for easy location of stations. Adjustable Meter. Variable sensitivity crystal filter. Any other "Ham" receiver.



Includes Cabinet Speaker, \$173.25 net.

TRANS-METER MODEL 905



For Amateurs, Marine, Police, Aircraft. An instrument to aid in the adjustment and operation of transmitters. Frequency range 1600 KC to 65 MC. Battery life 150 hours. Accuracy 5%.

- FUNCTIONS:**
 1. Field Strength Meter. 2. Wave Meter. 3. % Modulation Meter-Transmitter. 4. "S" Meter in connection with a receiver. 5. % Modulation — Received signal in connection with a receiver. 6. AC Vacuum Tube Voltmeter. 7. DC Vacuum Tube Voltmeter. 8. Phone Monitor, also for checking R.F. Carrier for hum. 9. Neutralizing Indicator.

Complete with Batteries.....\$49.50



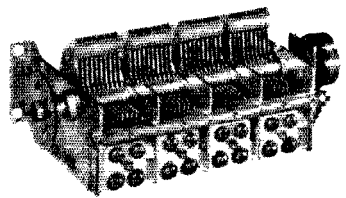
SPEECH AMPLIFIER

Component of Collins Autotune Transmitter PART-13. Complete with tubes (1-2-6V6's). Less power supply. Output transformer to drive pair of 211's as drivers.....\$4.95



TU-49 TUNING UNITS

3.2 to 4MC. E.C.O. or Xtal. Used in Hallcrafters HT-4 (BC-610E) Transmitters and in the new McElroy Exciter Kits.....\$2.50



4-GANG VARIABLE CONDENSER

Isolantite Insulation. Equipped with removable drive gear and potentiometer. 250 Mmf per section variable condenser. Same condenser as used in the BC-348 receivers. \$2.49

EIMAC 24G

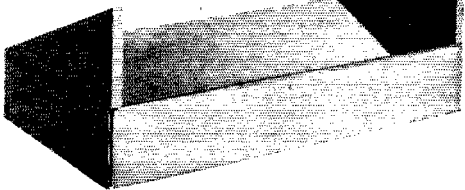
A popular 10 meter tube. Shown at right. 2000V. at 75 mils. 25 Watts Plate dissipation.....\$1.49



G.E. 4C21

Brand new. Same as Type 211 Tubes. 100 Watts Plate dissipation.....\$4.49

ALUMINUM CHASSIS



Easy to work 24ST Aluminum Chassis with Riveted Angle Brackets. Ideal for exciters and R.F. Stages.

- 12" x 17" x 3".....\$2.85
- 10" x 17" x 3".....\$2.70



HY-615

RCA 958A



HY-1148

V.H.F. Tubes for that receiver you're planning.

958A Triode Acorn Tubes.....\$1.95
 on HY-615 and Hytron 1148 Tubes, New.....\$1.89

NAVY KEY \$1.29

Phonic's Navy Key. Rugged construction. Precision and spacing adjustments. Insulated metal cover. Black crackle finish.



HEADSET CORD



Headset Extension Cord. Equipped with phone plug and headset plug receptacle. Handy to have around the shack.

\$0.79

Always carry in stock all standard brands. Regular shipments being received of communications receivers: NATIONAL, HAMMARLUND, PIERSON, HALLICRAFTERS, CARDWELL, WELLEN, RME, COLLINS and all other major lines. Orders shipped promptly.

BLACK BAKELITE PANELS

Type XXX, High Polish Standard 19" Relay Rack Size. Cut your own panels to size.

- 19" x 38" x 1/4".....\$5.95
- 19" x 38" x 1/8".....\$3.75

RADIO SPECIALTIES COMPANY

(Dept. 73) 1956 So. Figueroa Street, Los Angeles 7, Calif.

Please Ship.....Cash \$.....C.O.D.

- HAMMARLUND HQ129X
- SPEECH AMPLIFIER
- G.E. 4C21 TUBE
- NAVY KEY
- 4-GANG VAR. CONDENSER
- HY-615 TUBE
- BAKELITE PANELS
- 19" x 38" x 1/4"
- 19" x 38" x 1/8"
- TRANS-METER MODEL 905
- TU-49 TUNING UNIT
- EIMAC 3C24 24G TUBE
- HEADSET CORD
- 958A ACORN TUBE
- HY-1148 TUBE
- ALUMINUM CHASSIS
- 12" x 17" x 3"
- 10" x 17" x 3"

NAME.....
 ADDRESS.....
 CITY.....ZONE.....STATE.....

THE PANADAPTOR

PANADAPTOR Model PCA-2
Permits visual scanning
simultaneously, of the band
activity above and below the
station you are listening to.
Amateur Net Price, complete
with ten tubes and accessories
for 115 V., 50-60 cycle
operation.

\$99.75



ANOTHER TOP QUALITY ITEM

featured by Kierulff's "Ham Shack" for you.
Thousands of other quality items in stock. Drop in,
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Our Staff
Includes —

W6SJ
W6IFW
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W6PCX
W6SEX
W6TFC
W6VLN
W9YQE

On the Beam



WITH THE NEW

DIRECT-O-BEAM

A ROTARY MECHANISM ENGINEERED FOR THE AMATEUR
Important Engineered Details

Check These Features

- ★ Continuous Rotation in Either Direction
- ★ Rotary Coax Joint for R.F. Feed
- ★ Coax Feed Line
- ★ Built-in Matching Transformer
- ★ Cast Aluminum Weather Proof Housing
- ★ All Parts Readily Accessible
- ★ High Starting Torque, Noise-Free Induction Motor, 115 V. A.C. Antenna Speed of 1-1.6 R.P.M.
- ★ Universal Angles for Antenna Mount

- ★ Seven Wire Connection Between Mechanism and Direction Indicator
- ★ Constant 52 Ohm Impedance from Transmitter Through Rotary Coax Joint to Matching Transformer.
- ★ Polystyrene Insulation
- ★ Matching Transformer Supplied to Match Any Type Close-Spaced Beam Antenna
- ★ Service Entrance on Side — Not Necessary to Dismantle Antenna to Inspect Unit
- ★ Mounting Dimensions—5 3/4" x 9 1/2"
- ★ Weight—35 Pounds

DIRECT-O-BEAM DIRECTION INDICATOR

Tried and Proven In Actual Service

- ★ Attractive Gray Wrinkled Sheet Metal Cabinet
- ★ Accurate—Easily Read Direction Indicator Meter Calibration in Direction and Degrees
- ★ Power—On Switch for Direct-O-Beam Mechanism and Direct-O-Beam Direction Indicator
- ★ Electrical Protection With A 3 Amp. Fuse Easily Accessible From Front Panel of Direction Indicator Box
- ★ Three Position Rotation Control Switch—Counter Clockwise—Off—Clockwise

Priced for the Amateur

- ★ Direct-O-Beam Mechanism \$117.00 ★ Three Element 20 Meter Matching Transformer..... 5.25
★ Direct-O-Beam Direction Indicator..... 26.00 ★ Three or Four Element 10 Meter Matching Transformer 3.75

F.O.B. Kansas City — Sales Tax Not Included

Designed and Manufactured by

ANTENNA SPECIALTIES COMPANY

KANSAS CITY, KANSAS.

14-16-18 EWING STREET

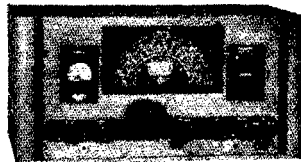


*Come Running, O.M., for
Sky-High Allowances!*

TRADE-IN SALE

TRADE IN YOUR OLD RECEIVER ON A NEW MODEL!

Pay Ashe less cash! Now you can easily own the brand new receiver of your dreams . . . for the bars are down . . . we're giving top allowances for your old receiver in this big trade-in event! Write or wire for our best deal! Tell us what you have to trade, and we'll make you an offer that comes once in a blue moon!



WRITE FOR OUR
BIG CATALOG

Up To \$150.00 For Your Old Receiver On A Splendid New RME 45

Your Ham receiver may be worth up to \$150.00 in trade on the redesigned new RME 45. Send your set in or write us what you have. Deduct our big offer from its low price of \$198.70

TOP ALLOWANCE ON THESE RECEIVERS
 NATIONAL NC 240-D, a value at \$241.44
 HAMMARLUND HQ 129-X at only \$173.25
 NATIONAL HRO 5TA, less speaker and power supply \$274.35

Delivering All Popular Models!

TRANSFORMERS, OM—not regular Amateur Units, but Heavy Duty Commercial Broadcast type with cast iron end plates. Reg. price about 3 times our special!

THORDARSON PLATE TRANSFORMER, 115 or 230 V. pri. 1510-0-1510 V @ .5 amps sec. tapped at 1330 and 1230 V \$39.50

THORDARSON SWINGING CHOKE, 500 mill, 5-16 Hy 7500 V RMS . . . \$11.85

Bombshell Special
From Bomber To You!



REVERSIBLE MOTOR
Bomber Tested
\$4.95

Originally to control heaters on Douglas Bombers, this Reversible Motor offers exciting possibilities as a lightweight rotary beam drive unit. Geared down to 1/2 to 2 RPM with max. torque rating of 50 inch pounds. Physical dimensions: 2 3/4" x 3 3/4" x 9 1/2". Simple conversion instructions included.

RCA 1 KW MODULATION TRANSFORMER, Pri. will match class B P-P tubes up to 10,000 ohms plate to plate. Sec. No. 1 450 Ma. for beam tube plate. Sec. No. 2 80 Ma. for screen grids. \$25.00

RED HOT VALUES!

10 mfd. 1500 V Condensers, GE Pyranol, \$5.50

Surplus Condensers, 110 mmfd max., 15 mmfd min. 2500 V peak, reg. \$3.69 \$1.95

Surplus Filament Transformer, 110 V AC pri., sec. 5 V @ 25 A \$6.15

Midget Transceiver Transformer, Mike to Grid, Plate to Voice Coil 74¢

Thordarson Smoothing Choke, 200 Mills, 12 Hy \$3.50

WØIYD • WØPGI • WØGTF • WØLDO
WØULH • WØZIP

SURPLUS FILAMENT TRANSFORMERS

110 V AC pri., sec. 6.3 V @ 3.6 A, 6.3 V @ .6A . . . \$1.18
 110 V AC pri., sec. 6.3 V @ 3 A \$1.08

Selsyn Motors



Type 5G

PAIR \$12.50

Can be used very successfully for rotary beam to note its position remotely. Originally designed for 115 V 60 cycle as a motor. Work perfectly as transmitter and indicator.

RADIO CO.

Walter Ashe
1125 PINE ST. ST. LOUIS, MO.

American Primary Controls
 Pri. 95 to 130 V @ 9 1/2 A, \$14.95
 Pri. 102 to 128 V @ 16 A \$17.95

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 topographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others.

(3) The Ham-Ad rate is 30c 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 25th of the second month preceding publication date.

(6) A special rate of 7c 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 takes the 7c 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 30c rate. Provisions of paragraphs (1), (2), (4) and (5), apply to all advertising in this column regardless of which rate may apply.

(7) Because error is more easily avoided, it is requested signature and address be printed plainly.

(8) No advertiser may use more than 75 words in any 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., 719 World Bldg., New York City.

CRYSTALS: Precision low drift units. Type 100A in 80, 40, and 30 meter bands. Two units plug in one octal socket. One dollar each. Rex Bassett, Inc., Ft. Lauderdale, Fla.

QSLs in colors. Stamp for samples. Glenn Griffith, W3FSW, 1042 Pine Heights Ave., Baltimore 29, Md.

AMATEUR radio licenses. Complete code and theory preparation for passing amateur radio examinations. Home study course. American Radio Institute, Inc., 101 West 63rd St. New York City.

WRL Transmitting kits—15, 35, 70, and 150-watt units—low priced. All makes of receivers, both new and reconditioned. Leo offers best trade-in deal, and easy time payment plan. One of the country's largest parts supply houses. Write today for free catalog, special radio map offer, tube-base calculator offer, and other items. Leo, at World Radio Labs. Dept. HA, Council Bluffs, Iowa.

COMMERCIAL radio operators examination questions-and-answers. One dollar per element. G. C. Waller, W5ATV, 6540 E. Washington Blvd., Tulsa 15, Okla.

SURPLUS parts and ham equipment at fractional prices. Complete and varied stock of recognized manufacture. All components new and guaranteed. Send for free illustrated catalog of 1001 different items. Surplus Radio, Inc., 2-54 148th St., Whitestone, N. Y.

AMATEURS, experimenters, industrial and export accounts write for catalog and monthly bulletins. Buy the "B" guaranteed write and save. TAB, Dept. 2, 6 Church St., New York 6, N. Y.

DON'T "rush order" Kernz quality QSLs! Rotation, dispatch handling given; they're worth waiting for! Kernz, W2RUT, Fulton, N. Y.

RADIOTELEPHONE first class sample tests, \$10. We correct. New correspondence course. Box 1298, Hollywood, Calif.

PANEL engraving. Gilpin, Box 638R4, Mount Clemens, Mich.

W2SFT is former W3GNU.

DEKA-XTAL. New compact 10-crystal unit for standard 5-prong socket. Looks and operates like a dial-knob. Just plug it in and turn to any of 10 frequencies, your selection. Ask your dealer or write us. Also other low TC ham crystals in FT cases to fit octal sockets. 80 and 40±1 Kc. \$2.65; 20±4 Kc. \$3.50. Scientific Radio Products, 738 1/2 West Broadway, Council Bluffs, Iowa.

KAJM is back home at W3ILD and will QSL all of his 4000 contacts. Look for me from W3ILD on 14012 kilocycles CW. Transmitter Temco 500 GA. Rcvr HRO5TA1. Will measure your frequency to exact kilocycle on request. Moulton, 4912 Quebec St., Washington, 16, DC.

QSLs, highest quality, samples free. VVS Print, 1704 Hale Ave., Ft. Wayne, 6, Ind.

MILLION radio parts at lowest prices. List free. Offenbach-Reimus, 372 Ellis St., San Francisco 9, Calif.

HALICRAFTERS S2OR. New in November 1942. Excellent condition. First reasonable offer takes it. All replies answered. W82FX, 8100 Woodbine Ave., Cincinnati 15, Ohio.

FOR SALE: Acorn ceramic sockets. 29 cents each (4 for \$1), Heights Radio, 40 Hick St., Brooklyn 2, N. Y.

IMMEDIATE shipment recently purchased in factory condition. Halicrafters S2OR. Two professional changes, R indicator, tuning eye, new type germanium crystal limiter added. Excellent performance on 10 meters. \$60 or best offer. Gordon, W3JYZ/2, 182 Hegeman Ave., Brooklyn 12, N. Y.

QSL-SWLS. Meade, W0KXL, 1507 Central Ave., Kansas City, Kans.

SEND for list of parts, few surplus Govt. materials, meters, tubes, condensers, etc. Cheap, Stover, W3BBV, P.O. Box 722, York, Penna.

NEW England amateurs take notice: transmitter 500 or 1000 watt as u like. Par-Metal cabinet, Elmac final, speech amplifier with peak limiter, crystal mike, field strength meter, pair extra Elmac 250a and many other extras. Bretting receiver and U.H.F. labs. four element beam antenna. Come over and see the rig! Local buyer preferred. Excellent, and a give-away at \$550. E. Baro. WIDIK, Evergreens, Barnstead, N.H.

SELLING Collins trans: Ultra Skyriver, 6-80 Mc.; FM/AM VHF receiver; 1 1/4 meter trans; QST from 1917. W3JUX, 6800 Clarendon, Bethesda, Md.

XTALS AT and BT between 4.3 and 6.0 Mc; also 8.0 and 8.5 Mc; within 200 Kc. 25¢ within 100 Kc. 30¢; 5 pin socket type holders, 30¢. Any quantity. C. Hammond, W9PKN, 5 Salem Circle, Evanston, Ill.

QSL cards that stand out. Individualized, original. Cartoon by W2EA (ex-8EA) incorporating your ideas, personality, etc. Reasonable, but not cheap. Send stamps for specimens. Harrison Radio Corp., 10 West Broadway, New York City.

SELL NC-100X receiver and speaker, UHX10 Harvey xmtr with AC power supply, coils 5 to 160 meters. Also transformers, chokes, tubes, Simpson Hammett and misc. parts. Send stamp for list. WOMEN, 1901 Wadsworth Ave., Denver, Colo.

SELL new Meissner 150-B xmtr, signal shifter, complete with tubes, spare parts, partially converted for 10 meters. Best offer over \$300 buys. W5JNN, 4221 Hanover St., Dallas 5, Texas.

MUST sell ARK-5 receiver, AM/FM, 27-145 Mc. Army version Hallicrafters S-36A. Brand new in factory sealed carton. Requires external power supply. 6.3-270 v. Price: \$100. W9SLY, 6440 Nordica Ave., Chicago, Ill.

SELL or trade for cathode modulation trans. (Stancor A 3888 or equiv. of). Numerous small xmtr parts. All new. R. W. Rice, 406 W. Oregon, Urbana, Ill.

WRISTWATCH, Swiss chronograph. Swap for ham receiver. Hardy, 1459 Clinton, Irvington, N. J.

SELL: plate supply complete less tubes 1750 volts, 200 ma; Garrard record player; RCA velocity mic; UTC choke, model S-43. Mike Van Newkirk, W2WBV, 1053 Collings Ave., West Collingwood, N. J.

WANT July 1916 QST, good condition, with both covers. Offer ten dollars. George Meek, Box 94, Burlingame, Calif.

METERS repaired and converted. Correspondence invited. Haledon Electrical Instrument Co., 319 Belmont Ave., Haledon, N. J.

FOR Sale, like new, one Presto 16" recorder, Model V, complete with amplifier and speaker, \$600. Sells for \$800 new. Wilch, 42 Hidden St., Providence, R.I.

QSLs? QSLs? QSLs? No cheap trash! 20¢ for samples. Crystals? RME-45? DB20? "Rusty" Sakkers, W8DED, Holland, Mich. (Veteran).

SELL BC348 receiver, with 110 v. supply, \$55. W2HFM, Merrick, N. Y.

UNUSED Mark II 2.5-8 Mc. VFO xmtr-rcvr, 235 Mc. transceiver, intercom. Phone cw/mcw. With complete set tubes. Two headphone-microphone sets, key, 12V dynamotor, two antennas, variometer. Offer over \$40. O.E. Brooklyn, Mordecai Katz, 1399 Carroll St., Brooklyn, N. Y.

WANTED: good used TR4, W2FHV, Penns Grove, N. J.

FOR Sale: Millen ECO, exciter and power supply. Coils 80, 20, 10, spare tubes QSO 31 countries since April 1937. f.o.b. Bob Simmons, 810 E. Orchard, Kirksville, Mo.

CALL Letters, very attractive white letters on blue dead stand. All "Lucite". \$2.50 postpaid. Bernard Hartz, W. Pine, Frackville, Pa.

HAMMARLUND Super-Pro receiver, Series SP-400-SX. Only a few months old; has had about 4 hours use. Complete with power supply and operating manual. \$275. Hallicrafters 10" speakers in cabinet with ximtr to match Super-Pro, \$10.00 extra. S. E. Lery, W8WDU, 2300 Payne Ave., Cleveland 14, Ohio

NATIONAL TMA150DA split stator 0.171 gap with attached neutralizing condensers, \$5 each. Cardwell TL-190-U 0.265 gap, \$5 offer. Macanold 0.003 3750 working vco condensers, 3 for \$1.00. Thordarson Modulation transformer, 1-45918, 750 watts audio, \$45. G. E. Pyranol 4 mfd 3000 volt working vco condensers, No. 23F44 \$4.50 each. All new and unused. C. Swanson 3938 Greenview, Chi., Ill. A. Fragassi, W9IEF, 892 Vernon, Clencoe, Ill. (W9SCN)

FOR Sale: Transmitter, National NTX30, complete extra crystal holder National NSM modulator for same. Perfect condition, \$110. Leiter, 4600 14th Ave., Brooklyn, N. Y.

WANTED IRE Proceedings Sept, 1939, June 1942. Please state condition and price. W0CSY, 5133 Juanita, Minneapolis 10, Minn. BC221 frequency meter for sale or trade. W9BPU, 513 Kreitzer, Bloomington, Ill.

BEST offer gets 150-watt, plate modulated, phone/c.w. xmtr. Also Superior 1280 set tester, F. Chesluck, 6901 Bulwer St., Detroit 10, Mich.

WILL swap canoe for receiver, best offer considered. New York area. Myron Bobb, W2SUO, 1173 Nelson Ave., Bronx 52, N. Y.

AUTO xtrms, 115-volt, 60 cycle, 16 amp. output. An ideal way to raise the voltage or increase or decrease power. By means of taps output of 72 to 140 volts available in approx. 8 volt steps based on input of 90 to 115 volts. Instructions. Gray steel case, 5 1/4 x 7 x 10. \$4.95. E. Doherr, WHCIR/1, 131 State St. Boston, 9, Mass.

WANTED: "Wireless" apparatus prior 1925; early books, catalogs, magazines, etc., Franklin Wingard, Rock Island, Ill.

SCR-211 Cardwell frequency meters crystal, chart and canvas bag. \$75. W4WU, W. Sheridan, 2027 Nichols Ave. SE, Washington, D. C.

FOR Sale: Hallicrafters S-39 Sky Traveler excellent condition, \$90. R. L. Newsom, Munday, Texas

COMPLETE line Amprex transmitting tubes, RME-45s. Immediate delivery. R.T.L. tube checkers. McNutt, W8CAT, Supreme Radio, 5716 Schaefer, Dearborn, Mich.

CQ and test records. Your call, \$1.00. Jack, W2NRM, Tenally, N. J.

SELL: RME-45 receiver with speaker, perfect condition, only six months old. Also RME-DB-20, preselctor, brand new. Will sell together or separately. Together, \$215. Reason: dismantling station. A. G. Schafer, W8SRZ, 1554 Ridgewood Ave., Lakewood 7, Ohio.

OR Sale: 807 push-pull T-40 CW rig. 400 watts \$200 in parts. Veston, Thordarson, Hammarlund, coils compact, 21" panel, \$225. Write Fred Hinson, W5JDB, 118 West B'way, Elk City, Okla.

ASH for xmr, parts, by shut-in ham. Tex. 2410 No. Haskell, Dallas, Texas

FOR Sale: 150-watt fone xmr, complete with tubes, coils, meters, glass and metal. Write call W. L. Brown, 17 Maple St. West Summit, N. J. Phone Summit 6-6553J.

EN-Meter preselector, brand new, new type circuit. Extremely sensitive and selectivity low noise level. Uses 6AK5 tubes, \$32.50. Write or details, K. Blick, 766-40th Ave., San Francisco, Calif.

WANTED: BC3480 service manual. L. H. Mabley, 502 No. Greenleaf Ave., Whittier, Calif.

QSLs. Pleasant, W9UDZ, Box 733, Sta. A. Champaign, Ill.

W28SV formerly W7BBI.

DUAL hearing aid phones, \$3.25 set. Midget matching transformer, \$1. Ideal for portables. J. McTigue, 55 Galveston Place, Washington D. C.

SELLING out: 25-watt power/cw xmr, ECO/xtal, PP 6L6 Class B coils for ten; 100-watt cw xmr, coils for 80 and 10, companion unit 0 above; two meter xmr/rcvr; 80 meter xmr/rcvr; all well built during year, complete, power supplies, accessories, and diagrams: field-strength meter, coils for all bands; test set meters, tools, books, parts, co-ax, xtal mike, etc. Good buy. \$250 f.o.b. Millard, 702 Redwood Ave., Norfolk, Va.

WANTED: all issues of "Radio" and QST, 1936-1941 inclusive. Write best price and specify what you have. W3KMU, Dundalk, 22, Md.

SELL HRO STA1 new handsread coils power supply, speaker, Mode 1/TA. Same set less limiter Abbott TR4 with tubes. New Weston 772 multimeter, also general coverage HRO, Norton, 7200 Ridge Blvd., Brooklyn, N. Y.

CRYSTALS AT cut to spot frequency for sale. Slightly used. Large tube holders. Frequencies 3510, 3567 S, 3570, 3665, 3670, 3710, 3787, 3838, 3878, 3939, 3535 Kcs. One dollar each. Ten dollars takes all. Complete 80-meter coverage. Geo. M. Clark, Jr., W2JBL, 222 Hicks St., Brooklyn 2, N. Y.

SELL Brand new Hallcrafters, HT-9 xmr, complete with tubes, except 814, less coils and crystals, \$200 or best offer. G. W. Miller, 1535 West 83rd St., Chicago 20, Ill.

PAN-OSCILLO-Receiver: AN/APA/10. Converted to 110 V. A.C. 60 cycle. Like new. With extra new 3BP1 tube. Shock mounts. See P. 51 Nov. CQ. Price \$80. F.o.b. W2WI, 723 Hamilton Ave., Trenton 9, N. J.

WILL pay one dollar for magazine with circuit for F.M. phono oscillator. Published 4 or 5 years ago. J. Stolzenbach, 2850 Glenmore Ave., Dormont, Pittsburgh 16, Penna.

SELL HRO rcvr, best offer. Extra coils, \$10 each. Twelve coil rack \$15. Livingston, Ellis Ave., Fair Lawn, N. J.

WRITE S & G Instrument Co. for sheet-metal work, engraving, machining; for fine equipment to your specifications. Box 1461, Tulsa, Okla.

QSLs. Send today for samples of 12 unique diversified 2-color designs. Price right. 2-day service. Victorian Press, 170 Willow St., Waltham 54, Mass.

SELL: HRO-5T, 9 coils, 2 power supplies. 450-watt c.w. xmr, complete. BC-375-E, coils, dynamotor, microphone, 110 A.C. filament supply included. High voltage supply required. W8QMN.

SELL prewar xmr in steel cabinets, 80 watts c.w. 40 watts fone. Complete speech and RF units. Mike and keys. \$100. Fairburn, 162 No. Taylor, Oak Park, Ill.

LOW drift crystals: mounted in highest grade phenolic holder. Within 80 and 40-meter bands. Two fit in one octal socket. \$1 each. Treatise on quartz crystals included. Breon Labs, Williamsport, Penna.

WANTED: SX-25, T. Kray, Putney, Vt.

10-METER rcvr kits \$3.99. Details free. "Radio", 492 Broadway, Bayonne, N. J.

PE-103A dynamotors, new, postpaid, \$19.95. BC-223A xmtrs, new postpaid, \$27.50. Free list. Selsyn beam rotation kit complete. 110 VAC operated. Includes pair solenoids, motor, drive gears, switches, etc. \$22.50 postpaid. Erecos, 1006 Hewitt, Washington.

QSLs, exclusive designs. J. Rademacher, W0KJ7, Missoula, Montana

STUMPED? I have the machines in my basement workshop and the "know how" to machine any parts, or gadget a ham might think up at a very reasonable price. Try me. Ben West, 30 Willow St., Brooklyn 2, N. Y.

NEW 807s, one buck; 808s, two bucks; 811s, three bucks. Original cartons. Frank Dobbs, 3413 Hartel Ave., Phila., Penna.

YOUR call in 4" neon tube letters, any color. Hangs near antenna lead as power on and off signal. \$9.95 money order or check with order. Specify color. P.C. Sales Co., 170 E. California St., Pasadena 5, Calif.

RC-127-A radar, 63 tubes, \$44 hi, four slide racks, 155-185 Mc. 115 AC operation, brand new, \$133; RK-60 rectifier tubes, 36¢, hundred, \$24. Lab and experimental bargains. Write for surplus bulletins. Electronic Research, 8532 Hegerman, Phila., Pa.

QSLs. Varney's Printery, Richmond, Mo. Samples free.

SELL used 833s tubes, \$5; 805s, \$1; 845s, \$1; 211s, \$1. Curtis, KFRO, Longview, Texas.

FOR Sale: 350-watt fone rig. W9DVW, 236 West 16th St., Chicago Heights, Ill.

MOBILE and custom built radio equipment. Crandell-May, Inc. 356A Longwood Ave., Boston 15, Mass.

SELL: BC-221 or LM-14 frequency meter. Complete with tubes, crystal and calibration book, new, \$90. Meissner 150-B xmr, 813 modulated pair 811s (Sept. '46 QST, P. 123) brand new, \$250. W9YEJ, R. Knochel, Lincoln, Ill.

WANTED: small xmr such as HT-6, Stancor 69, etc. Harry H. Gingrich, 4613 Derry St., Harrisburg, Pa.

QSTs: have 165 extra various 1925/41. Need 28 various 1925/38. Cash or trade. W6SN.

LE90 and DC SW3, five sets coils. Best offers. WIKIK, 34 Glazier St., Gardner, Mass.

WANTED: Like-new Stancor 60P or similar complete rig. Sell or swap; chassis with p.p. 6V6 modulator with univ. mod. xmr and 400 v. well filtered p. supply, best parts, well-built. Also Ernemann f:2, 10 cm camera. W. Kiewel, 520 No. Main, Crookston, Minn.

NC-100 ASD converted to cover 500 Kc. to 33 Mc. \$100 postpaid. Bernard Rowe, 825 Cassopolis St., Elkhart, Ind.

WANTED: HRO (Senior), complete or what you want. Also want DB-20. State price and condition. E. Sund, W6GOZ/3, 1819 Winans Ave., Baltimore 27, Md.

HALLCRAFTERS S-20, perfect condition, \$45. Astatic JT-30 xtal microphone with 25 ft. cord, \$7.50. W7MH, 2514 Baker, Everett, Wash.

SELL: S-29 Hallcrafters Sky Traveler portable rcvr. Volumes 3 and 7 Rider's manual. 1935 Gernsback Service Manual. Best offer. W6VBX, 243 1/2 West 51st St., Los Angeles, Calif.

KENTUCKY values! 20 H 200 Ma. choke, \$2.85; 6.3 V 8.5 amp. transformers, \$2.40; 4520 volt C. T. 700 Ma. Kenyong \$49.95; KW modulation x transformers, \$24.75; 2 pfid, 4000 volt Pyranols, \$5; 1000 ohm resistors, all makes microphones, 300 ohm line, Superior, B&W Valpey, Taylor, Gon-Set, Marion. Inquiries answered. Kentucky Radio Supply Co., Lexington, Ky.

FOR SALE: 400 watt fone and c.w. xmr complete on the air coils for all bands in Budd closed cabinet and new, not junk, \$300. Also have BC654A radio and xmr 3800 to 5800 Kc. new and all extras, complete, \$100 and have many parts for sale. I want a BC610 for cash, used, if you have one to sell, write me. W8WSC, Box 516, Stryker, Ohio.

BC342 AC rcvr, BC654 xmr/rcvr and handie talkies, each \$50. Ship-shore radiophone, \$75. 519R and S20R rcvs. Will sell or trade for other ham equipment. W0OEA, 712 Bergen, London, N. J.

WANTED: complete set of "Radio" through 1945. Pay cash or trade. 250-watt phone xmr for sale. Write for details. Carl McKay, 2315 Springfield, Ft. Wayne 3, Ind. W9IDZ

TRANSMITTING condensers: 33 plate, heavy duty, 250 pfid, size 0.180" overall length, 9/16" ball-bearing mounting. Lucite insulation, counterweighted shaft on 2 gear drive to 1/2" shaft; panel or chassis mounting, \$5.40. R. Fredericksen, W2IMZ, 1213 Long Ave., Hillside, N. J.

NEW Abbott 2-meter transceiver, model MRT-3, \$45. Power supply, GS mike included. W7MWJ, 1147 No. Howard, Tucson, Ariz.

MONITORS: Guard the quality of your signal, C.W. or modulation, aural and visual. New designs. Write for information. Communications Accessories Co. Box 542, Cedar Rapids, Iowa.

SX-28 for sale. Factory overhauled in July with two stages of 1853 RF. Will sell to highest offer. Howard Grounds, W9JMS, 614 So. Lincoln St., Bloomington, Ind.

CIRCUIT diagram and alignment data wanted for German military receiver Phillips type CR101AM01, Thurston Paul, 1215 W. Washington, Champaign, Ill.

QSLs, samples, Albertson, W4HUD, 705 So. Hamilton, High Point, N. C.

W9AUX is former W8JSP.

FOR Sale: S-20R, Nat. 1-10. TR4. W9BAY

SURPLUS: new 805s, \$6.50; RCA 866As, \$1.25, 2 pfid, 2000 v. condensers, \$2. Sepeasy, 39 9th St., North Arlington, N. J.

WANTED: Thordarson 12-watt "Universal" xmr with incorporated 115-volt AC, 6-volt DC power supply. Describe fully. B. Evans W3KCR, 5516 Huntington Parkway, Bethesda 14, Md.

FOR Sale: complete ham station, all commercial equipment. Xmr Collins FX-30, 203A final 200 watts, CW including tubes, two sets coils, crystals, power supply, antenna PI-network in enclosed cabinet. (Value \$375.) Rcvr RME-69, plus PM speaker (value \$150), completely aligned and adjusted for max. performance. Price of complete station, \$300. F.o.b. New York City and vicinity. W2IID, P.O. Box 907, Redbank, N. J.

TUBES: critical numbers. Write for list and discount sheet. Bill's Radio, Dept. xx Q, 2038 Washington, Boston, Mass.

FOR Sale: new 30-watt fone xmr, complete; coils, tubes, antenna. Wanted: HT-6, 28 Mc coils, xtrals, Holstein, 246 E. 148th St., Bronx, N. Y.

IN Stock: new and used Hallcrafters, Hammarlund, National, Flinton, RME, Collins, Penco, other rcvrs and xmtrs. All other amateur parts. Trade-ins accepted. Terms financed by me. Write Henry Radio, Butler, Missouri and Los Angeles 25, Calif.

ROTARY beam mount and rotator with reversible motor, weather-proof, \$30. B-19 radio xmr and rcvr as advertised in September Ham-ad for \$78.50. First \$45 takes it. Wm. Bates, Reynoldsburg, Ohio

BARGAINS: All lines of new equipment in stock. Receivers, transmitters, tubes, parts, etc. Lots of surplus items. Send for large list. Mytronic Co., 121 W. Central Parkway, Cincinnati 2, Ohio.

TRANSMITTER 500-watt 6L6 T220, T40, PP 155a, three power supplies, rack, \$190. Three inch scope, \$45. Misc. xmtg. parts. Washington, DC. GL4400 Ext. 586.

FOR Sale: Hallcrafters SX-28A used less than year, Guaranteed A-1 shape. Cash only. N. K. Stover, P.O. Box 722, York, Penna.

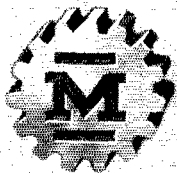
FOR Sale: QSRs Dec. '39 to Dec. '42. SX-28A and speaker in excellent condition. Johnson 65-CD-110 condenser. Any reasonable offer considered. Wanted BC-779 Super Pro. W9MDG, 2511 So. Harding, Chicago 25, Ill.

CRYSTALS: low-drift fundamental oscillators mounted in type CR-1 holder. 0.125 pin spaced 0.505 inches 14-15 Mc. \$2.50. 16-16.5 Mc. \$3.50. Henry S. Palmer Co., 744 Marietta Ave., Lancaster, Penna.

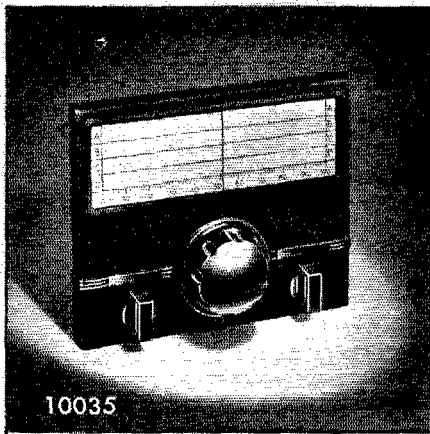
CRYSTALS: Amateur, marine, aircraft, etc. Descriptive price list. Nebel Laboratory, 1104 Lincoln Place, Brooklyn 13, N. Y.

W2BZB now on 2 meters, and on 20, 40, 80 cw from W3KMN.

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10035

The No. 10035 Illuminated Panel Dial

A truly "Designed for Application" control. Compact mechanical design, sturdy construction, easy to mount. Totally enclosed mechanism eliminates back of panel interference. Provisions for mounting and marking auxiliary controls, such as switches, potentiometers, etc. Finish, flat black art metal. Size 8 1/4 x 6 1/2. Ratio 12 to 1. Hinged escutcheon permits direct calibration without necessity for removal of scale, thereby maintaining accurate calibration. Two 4 and 5 line scales furnished with each dial.

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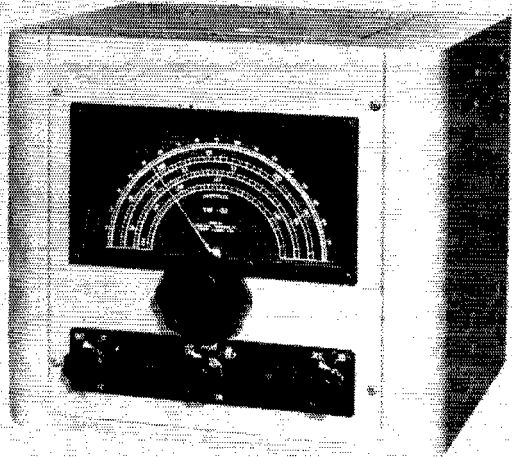
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VHF 152 converter

FOR 2, 6 and 10 METERS



Features

TUNING MECHANISM

An all-gear, planetary drive. The three bands are calibrated to cover the full sweep of a seven-inch diameter scale, calibrated in mc.

MINIATURE TUBES

New miniature tubes are used for sensitivity, stability and extremely low VHF circuit noises. A Built in power supply includes voltage regulator tube.

SENSITIVITY AND IMAGE REJECTION

Order of two microvolts on all bands. Image rejection ratio of approximately 54 db eliminates images.

ANTENNA CONNECTIONS

Provision made for use of four separate antenna connections.

OTHER FEATURES INCLUDE

Shielded output cable, sturdy construction, antenna change-over switch, band selector, tuning control, line switch.

THE NEW VHF-152, used with any communications receiver, will give you peak performance on the 28 to 29.7, 50 to 54 and 144 to 148 mc. bands, utilizing the extremely efficient double detection system. Not only can you enjoy reception on these frequencies economically, but you'll do so more efficiently and effectively than is possible with any higher priced, specifically designed VHF receiver.

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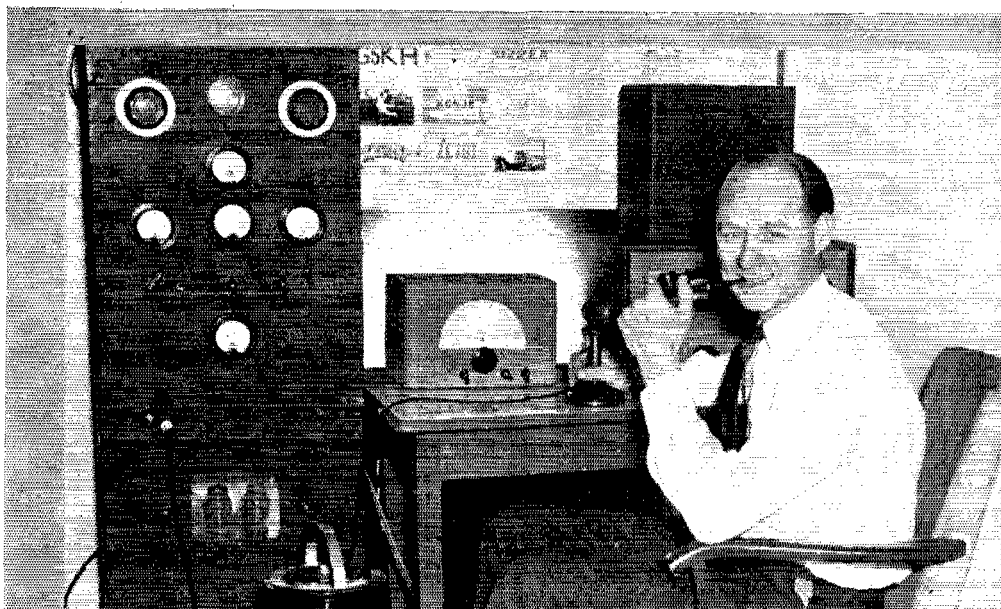


RME

FINE COMMUNICATIONS EQUIPMENT

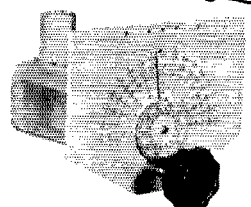
RADIO MFG. ENGINEERS, INC.

Provia 6, Illinois U. S. A.



The Collins 70E-8 wins an Enthusiastic Booster!

Frank W. Oberlander, W9YPS
 When W9YPS got his 70E-8 PTO (permeability tuned oscillator), we asked him to give it a workout and send us his comments. He did, and we'd like to quote him:



Frank's exciter line-up, following the 70E-8, consists of a 6AK6 isolator (untuned), 6AG7 buffer-doubler, 7C5 buffer-doubler. Here are some of the reasons why he's happy with his PTO:

1. The 70E-8 is accurate to within 1/2 kc on 80 meters.
2. It's calibrated directly in frequency.
3. The frequency range of 1600-2000 kc is covered in sixteen turns of the vernier dial.
4. The stability is within 1 dial division.
5. The dial covers the 80, 40, 20, 15, 11, and 10 meter bands.

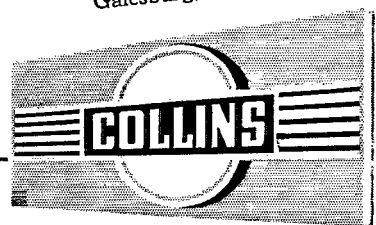
Write for an illustrated bulletin with full details.

FOR RESULTS IN AMATEUR RADIO, IT'S . . .

COLLINS RADIO COMPANY, CEDAR RAPIDS, IOWA

11 West 42nd Street, New York 18, N. Y.

458 South Spring Street, Los Angeles 13, California



Galesburg, Illinois
 October 1, 1946

Collins Radio Co.
 Cedar Rapids, Ia.

Gentlemen:

I wish to express my appreciation of the new 70E-8 PTO. I have used this unit since the latter part of July on 75 meter phone, 80 meter cw, 20 meter phone and cw and 10 meter phone and cw. I cannot fully describe the feeling of assurance that this unit affords in the matter of stability and ease of frequency spotting. I am sure it has enabled me to make many contacts that otherwise I would not have made. All reports are very favorable as to stability and freedom from chirps. All contacts on cw were greeted with T9X reports.

It certainly is one of the finest pieces of equipment that I possess and I would truly feel lost if I had to be without one.

Yours very truly,
 Frank W. Oberlander (W9YPS)
 457 Fifer Street
 Galesburg, Illinois

NATIONAL RADIO PRODUCTS 1947



CATALOG NO. 700

THE NEW 1947 CATALOGUE

The new National Catalogue describes hundreds of parts designed for amateur use. Many items are new, some are unique. The old favorites are there, proved and improved over the years. New or old, the products in the new National Catalogue will improve your rig.

NATIONAL COMPANY, INC.
MALDEN, MASSACHUSETTS, U.S.A.



Why the RCA-8005 is called "THE POWERHOUSE"

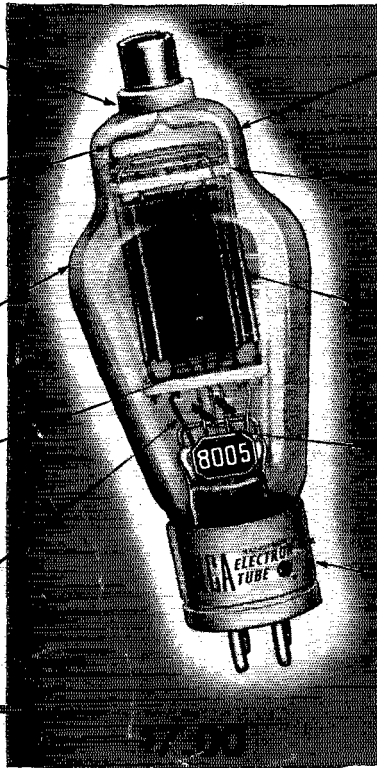
Ceramic washer minimizes corona discharge—provides superior bond to glass and plate cap, eliminating strain.

Heavy ribbon leads between cap and anode improve conductivity and reduce RF resistance.

Nonex hard-glass envelope will not crack, buckle or puncture under high operating temperatures.

Oversized 50-watt filament—the same as used in much larger tubes—has enormous reserve of emission.

Drawn-tungsten seal rods have smoother surfaces—hence, provide superior seals against air leakage.



Dome construction insures rigid support of elements at top of tube—reinforces mount structure.

RCA alumina insulating separators are dimensionally uniform and chemically pure—hence, free of gas.

Zirconium-coated molybdenum anode provides unusually rapid heat dissipation and permits greater power input.

Guarded getter is flashed low on envelope, but fully exposed, so as to be quick and positive in action.

Sturdy metal base and low-loss ceramic insert combine strength with high heat and insulation resistance.

RCA-8005 has extra features for the final of that crystal-controlled "all-band" transmitter

The points of superiority built into the RCA-8005 transmitting triode combine to provide it with remarkable power handling ability and long life for a tube only 6-11/16" high and 2-7/16" in diameter. It is readily capable of taking 300 watts input (ICAS) at 1500 volts in Class C telegraphy, or 240 watts input (ICAS) at 1250 volts in Class C telephony.

The unusual heat-dissipating characteristics of zirconium-coated molybdenum permit the use of a smaller anode with a consequent reduction in the inter-electrode capacitances. This is one reason why the RCA-8005 may be operated at full ratings as high as 60 Mc. An 807 doubler will drive a pair of 8005's at 60 Mc. with power to spare.

Because of its power capabilities, wide operating range and low drive requirements, the RCA-8005 has received preference as a final amplifier for crystal-controlled transmitters covering the amateur bands from 75 to 6 meters. It is the answer to adequate power in all bands at low cost.

For further details, see your local RCA Tube Distributor or write RCA, Commercial Engineering, Section A-211, Harrison, N. J.

Have you seen HAM TIPS? Your RCA Tube Distributor has a free copy waiting for you.

**THE FOUNTAINHEAD OF MODERN
TUBE DEVELOPMENT IS RCA**



TUBE DEPARTMENT

RADIO CORPORATION of AMERICA

HARRISON, N. J.

Attention, All Active Amateurs:

Give Us the Facts and Figures on Your Operating Interests, Please

YOU are invited to register your use of amateur radio with the ARRL Communications Department by using the postcard form printed below. Most prewar amateurs will remember the several earlier CD band-occupancy surveys based on estimates of division of operating time. These were made every few years starting in 1935. Coupons in *QST* and questions incorporated in a "perpetual-survey" letter were used as a basis for analysis of our favorite operating interests and use of bands.

ARRL does not have comparable information on present-day amateur radio use. With your help it is now in order to remedy this deficiency. With the postwar return of 2 meters, *that* was the band of the moment. With "10" available, it became the most popular band. With each succeeding regulatory change, the occupancy and congestion indices changed in all the FCC-authorized amateur bands. On November second the remaining "borrowed" portions of our 7- and 14-Mc. bands were reopened to amateur operation. With all the presently-expected bands operative it now again becomes practical to check the status quo, to note anticipated amateur building for the near-term future, and to establish Occupancy Data against which future trends may be examined. ARRL Communications Department operating activities always have been announced for different amateur groups with the rules dependent on sound knowledge of station distribution and general interest.

With many newcomers, so many readjustments, and a wartime between past and present operating, ARRL now wants to know the actual distribution of amateur interest in the different

bands. Our use of frequency bands today, and some indication of plans for '47 band use, will be explored.

This return card will be the mechanism for giving us information on your use of amateur radio. Each presently authorized band is shown. Modes are indicated in accordance with FCC authority except for 27 Mc. and above 144 Mc. where common knowledge gives sufficient indication of use.

How to Fill Out the Card

1. In the first column (1) please indicate opposite *each frequency band for which you have a transmitter* the Power Input.

That will tell us which bands and modes you *can* use, whether you did in fact use each method in the past month or two or not. This column will tell us your immediate potential set-up for operating, even if you operate very little.

2. The column headed (2) permits you to advise us of your *actual* band operation by hours during the first half of December, 1946. Please advise us *to the nearest half-hour* opposite each "band" designation the hours Total Time on that band for those 15 days, after consulting your official logbook record for the period in question.

We don't mean to ask you to check the time of sending *exactly for each QSO* shown in your log; we do want you to note your operating time (over-all) on each band and by each method from log indications of on-off time by bands. For example, for a certain December date you came on the air on "40" at 7 P.M., worked several stations in two-way exchanges, and went off the air on "40" at 9 P.M. You then changed to "80" for a schedule, operating starting at 9:40 P.M., continuing until you went off the air for the day at 10:40 P.M. For the given day you were on 7-Mc. c.w. for two hours and on 3.5-Mc. c.w. for one hour. (While transmitter time-on-air exclusively *might* be interesting, we know that most amateurs haven't timemeters in their transmitters, and that log examinations for even such a short period as 15 days can't go into such detail as to note how much of each QSO was spent in sending, in receiving,

*Please
Detach
and
Mail
This
Card
Now*

PLACE
POSTAGE
STAMP
HERE

American Radio Relay League,
West Hartford,
Conn.

U. S. A.

or how much in general listening, calling CQ, etc.) The sum of the data obtained from daily examination of operating hours, by bands and methods, for the first 15 days of December, should be set down carefully when tabulated from logbook entries, for column (2) below.

A December period was selected that had no nationwide operating activities of general proportions. It is appreciated that the survey may find some amateurs away from home and station for the entire period, that others may have operated in extraordinary fashion for some personal reason. All these individual differences will average out in analyzing the thousands of individual differences. All our survey asks is strict truth about your station operation (from log record) for the stated time. Column (2) gives a sample of your operation, covering the dates Dec. 1st-15th. Do not estimate data for (2) but base your report of hours on your station log and knowledge of what operation was engaged in for that period. Visitors using your station (under your supervision), use of your station by another licensed amateur operator, mobile or portable operations under your call, all these should be lumped together and reported under appropriate headings, also reflected in the total for column (2).

Previous surveys have been based on estimated data. The above practical operating check is expected to be helpful in showing the progress we have made in band-switching transmitters, as well as the degree of use of all our bands and methods in a limited checked period.

3. The column headed (3) as contrasted to such a check of practical past use (from logs) is for *estimated* division of operating interest as expected to apply to all your operating during the year 1947. All amateurs are constantly thinking, and planning and rebuilding. This column (3) should reflect all plans that will produce completed operative equipment during 1947. Estimate your average operating interest (in percentages adding to 100%) in all these amateur bands over the next 12 months. If, for example, you are building a 28-Mc. 'phone rig, and you expect to complete it in March, the amount of estimated use of this set

in your operating plans for *the rest of 1947* ought to count in your estimated percentage as entered in this third column on our card.

Analysis of results in this column will show to what extent the December sample is true of your work at other seasons, whether over the longer term you use more of the bands and methods for which column one shows you are now equipped, or may point to your future plans and what is under construction for future use.

4. This department, column (4), is for your indication of type-of-interest in use of your equipment. You may check one special interest or all four. *If you check more than one*, it will help considerably if you will estimate the percentage interest, so the indications in (4) add to 100%. Be sure to fill in your call, class of operator's license and to show by check marks whether you are a Prewar Licensee or Licensed Since Pearl Harbor, and whether you are an ARRL Member or get QST at the newsstand. At the lower right please show the ARRL Division your station is located in, to aid in regional examination of use of bands. Authenticate the facts you have given by adding your signature.

A reply is desired from all amateurs licensed by the FCC (U. S.) and the Canadian Government. Amateurs other than these need not reply, since the study concerns only December occupancy and expected '47 operation in our home bailiwick. In filling out the form bear in mind that column (2) must show hours (Dec. 1st-15th inclusive) *actual* operation from examination of your log, if filled in at all, while column (3), the anticipated division of '47 operation (percentage by bands), is by estimate.

You are urged to reply using the card below, as soon as you can. Report your transmitter capability (1), actual kind and amount of operating for the first 15 days of December (2), your '47 expectations (3), and types or kind of amateur use made of frequencies in the course of your operations (4). Help us to help you. Clip the postcard below from QST. Fill it out carefully. Stamp and mail. Do it at once!

— F. E. H.

I am indicating (1) on which bands I have operative transmitters, and maximum power input used, (2) the total hours spent on each band and mode for the first 15 days of December 1946, (3) my anticipated operating interest in each category for the next 12 months, and, (4) my interest in types of amateur activity.

(1) Maximum power input, each band:	(2) Hours operated Dec. 1-15 inclusive:	(3) Future percentage Anticipated '47 Interest:	(4) My operating interests are indicated as checked below:
Bands	hrs.	%	<input type="checkbox"/> Rag Chewing and Casual Contacts
3.5 Mc. c.w.	..... hrs. %	<input type="checkbox"/> Traffic
3.85 Mc. 'phone	..... hrs. %	<input type="checkbox"/> DX Contacts
7 Mc. c.w.	..... hrs. %	<input type="checkbox"/> On-the-Air Experimentation
14 Mc. c.w.	..... hrs.	..... %	Call..... Class Oprs License.....
14.2 Mc. 'phone	..... hrs.	..... %	Prewar Licensee... <input type="checkbox"/> ARRL Member... <input type="checkbox"/>
27.185 Mc.	..... hrs.	..... %	LSPH..... <input type="checkbox"/> QST Newsstand... <input type="checkbox"/>
28 Mc. c.w.	..... hrs.	..... %	Remarks.....
28.5 Mc. 'phone	..... hrs.	..... %	.....
50 Mc. c.w.	..... hrs.	..... %	.....
50 Mc. 'phone	..... hrs.	..... %	.....
144 Mc.	..... hrs.	..... %	.....
235 Mc. and up	..... hrs.	..... %	.....
Total	hrs.	100%	(Signature)

ARRL Division